



Burroughs B 20 Series B 21 & B 22 Systems

■ PROFILE

Operating Systems • Burroughs BTOS real-time, multitasking operating system • Microsoft MS-DOS • Digital Research CP/M-86.

Data Management • ISAM under BTOS; multikey ISAM with B 20 Customizer Package.

Communications/Networks • CCITT X.25, Asynchronous Terminal Emulator, IBM 2780/3780 RJE Terminal Emulator, IBM BSC and SNA 3270 Terminal Emulators, Burroughs Poll/Select, and Burroughs MT983 Emulator using Burroughs Poll/Select.

Languages • BASIC, COBOL, FORTRAN, and Pascal.

Models • B 21 with B 21-1T, B 21-2T, B 21-2PC, B 21-3T, B 21-4T, B 21-5T, B 21-5PC, B 21-6T.

CPU • 16-bit Intel 8086 for all models except B 21-1 which uses 16-bit Intel 8088.

Memory • 128K to 512K bytes on B 21; 256K to 640K bytes on B 22.

Chassis Slots • 2 Multibus slots on B 22 only.

Ports • B 21-1, 21-1T—1 RS-422 port; other B 21 models—1 RS-422 port, 2 RS-232C ports, 1 Centronics parallel printer port; B 22—2 RS-232C ports or 1 RS-232C port and 1 RS-422 port, 1 Centronics parallel printer port.

Mass Storage • none on B 21-1T; 1 630K-byte diskette standard on B 21-2T; 2 630K-byte diskettes standard on B 21-3T; 1 each 5M-byte disk and 630K-byte diskette standard on B 21-4T; 1 each



8.4M-byte disk and 630K-byte diskette standard on B 21-5T; 1 each 12.6M-byte disk and 630K-byte diskette standard on B 21-6T • 8.4M- or 16.8M-byte disk and 0.5M-byte diskette optional on B 22 expandable to 50.4M bytes.

Terminals/Workstations • none on B 21-1T, B 21-2T; other B 21 submodels can have up to 3; B 22 can have up to 16.

Printers • none on the B 21-1Ts; various dot-matrix and letter-quality printers plus a line printer available for the other models.

First Delivery • June 1982.

Systems Delivered • approximately 10,200.

Comparable Systems • IBM PC/XT, Data General Desktop Generation, Honeywell micro-System 6/10, 6/20.

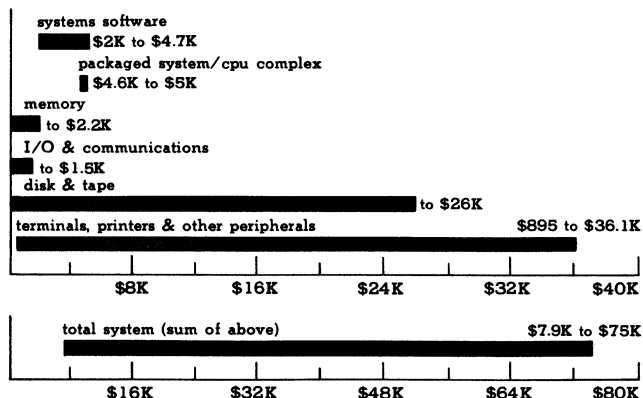
Vendor • Burroughs Corporation; Burroughs Place, Detroit, MI 48232 • 313-972-7000.

Canada • Burroughs-Canada; 801 York Mills Road, Don Mills, ONT M3B 1X7 • 416-445-4030.

Distribution • company-owned stores in the U.S., Canada, and Europe; direct sales worldwide to multisystem customers; independent value-adding dealers and distributors.

PURCHASE PRICE RANGE

hardware & software



BURROUGHS B 20 SERIES PURCHASE PRICING bar graphs illustrate price ranges for small to large systems, with solid bars reflecting software/hardware purchase pricing • **SMALL SYSTEM** is based on B 21-3TS packaged system (includes CPU, 128K-byte memory, monochrome display, keyboard, 2 630K-byte diskette drives, RS-422 port, 2 RS-232C ports, Centronics printer port) and the following options: BTOS operating system, BASIC interpreter systems software and 120-cps dot-matrix printer • **LARGE SYSTEM** is based on B 22 packaged system (includes CPU, 256K-byte memory, monochrome display, keyboard, 2 RS-232C ports) and the following options: BTOS and MS-DOS operating systems, BASIC interpreter, COBOL compiler, asynchronous terminal emulator, 3270 SNA emulator, word processor, Multiplan spreadsheet software; additional 384K bytes of memory; communications I/O processor; 33.6M bytes of hard disk storage, streamer tape for backup; 6 B 21-3TS systems as cluster stations, 150-cps dot matrix, 35-cps letter-quality printers.

■ ANALYSIS

The B 20 Series is the low-end system in the Burroughs family. Driven by an Intel 8086, the microprocessor-based system was designed using Convergent Technologies hardware and an enhanced version of Convergent Technologies operating system. When Burroughs launched its B 20 program, it pledged unequalled support and service for the system.

Recent enhancements to the B 20 line include the addition of 2 new models—the B 21-2 PC and the B 21-5PC—which are configured with color displays and



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TABLE 1: BURROUGHS B 20 SYSTEM CHARACTERISTICS

	B 21-1T	B 21-2T	B 21-2PC	B 21-3T	B 21-4T
Processor	16-bit 8086	16-bit 8086	16-bit 8088	16-bit 8086	16-bit 8086
Speed	8 MHz	8 MHz	8 MHz	8 MHz	8 MHz
Memory					
Min	256K	256K	384K	128K	256K
Max	512K	512K	512K	512K	512K
Display	28x80	28x80	28x80 color & graphics	28x80	28x80
Mass Storage	None	5.25" diskette (630KB formatted)	5.25" diskette (630KB formatted)	5.25" diskette (1.26MB total formatted)	5.25" diskette (630KB formatted) 5.25" Winchester (5.0MB formatted)
Serial Communication	1 RS-422	2 RS-232C 1 RS-422	2 RS-232C 1 RS-422	2 RS-232C 1 RS-422	2 RS-232C 1 RS-422
Parallel Printer Port	None	1 Centronics Interface	1 Centronics Interface	1 Centronics Interface	1 Centronics Interface
Other I/O Slots	None	None	None	None	None
Use	Cluster Station Only	Cluster Station Only	Cluster Station Only	Cluster Station or Standalone System	Cluster, Standalone or Master System

graphics capabilities; the availability of MS-DOS and CP/M-86 on the systems; and the option of utilizing magnetic tape as backup on the B 22. Burroughs has also lowered the prices on the systems, some by as much as 50%.

The B 20 can be utilized in 3 modes: as a cluster station that may require mass storage, printer, or graphics; as a standalone system, since both memory capacity and disk capacity will support most applications; and as a master station serving cluster stations, running an application, or a combination of both.

Burroughs is billing its B 20 Series as a "Distributed Intelligence System" and is therefore not placing a heavy emphasis on capturing the single-user marketplace. According to Burroughs, its distributed intelligence takes distributed processing one step further. Since the B 20 provides the users with processing power, disk storage, printer and data communications capabilities, it offers an alternative solution to the so called "dumb" terminal concept. The B 20 will allow a user to transfer files between B 20s in a clustered environment and transfer files to a remote or local host system. Because each workstation has its own processor and memory set, each workstation can operate individual programs and serve as entry stations to a master unit.

The various models of the B 20 can be targeted for different jobs in the marketplace. The B 22 should be considered when user requirements exceed linking 4 workstations in a network; when disk requirements will exceed 15M bytes and memory requirements will exceed 512K bytes; when Multibus slots will be required; when requirements are such that a workstation would be running applications and sharing its resources with local

network stations; when specialized 34x132-character displays are needed; or when graphic interpretation of statistical data is required.

The B 21-1T can only be used as a cluster station, basically performing data entry. The B 21-2T/PC can be used as low-cost cluster stations when there is a requirement for a local printer and/or data communications and/or minimal local disk storage for running individual applications. The B 21-3T, with its 2M bytes of disk storage, fits the mold of a low-cost standalone system. It can also serve as a cluster station capable of running individual applications.

The B 21-4T, -5T/PC, and -6T can serve as master stations in a small network that requires up to 4 users or as standalone systems where disk requirements are between 2M and 15M bytes. They can also be used as cluster stations if a user feels that each site in the network needs extensive individual storage capacity.

Strengths

The B 20 systems are based on popular and proven processors and system software. Applications development, a prime concern of value-added dealers, will be greatly simplified by the choice of languages available, and by the Customizer Package and Forms Facility.

Burroughs has added an impressive, wide-ranging array of communications software that should facilitate connecting B 20 systems to various hosts and into various networks. This software feature, coupled with the system's communications processor, makes the B 20 one of the very few micros on the market today that is so richly



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TABLE 1: BURROUGHS B 20 SYSTEM CHARACTERISTICS (CONTD.)

	B 21-5T	B 21-5PC	B 21-6T	B 22
Processor	16-bit 8086	16-bit 8088	16-bit 8086	16-bit 8086
Speed	8 MHz	8 MHz	8 MHz	5 MHz
Memory				
Min	256K	384K	256K	256K
Max	512K	512K	640K	640K
Display	28x80	28x80 color & graphics	28x80	34x80 or 132
Mass Storage	5.25" diskette (630KB formatted); 5.25" Winchester (8.4MB formatted)	5.25" diskette (630KB formatted); 5.25" Winchester (8.4MB formatted)	5.25" diskette (630KB formatted); 5.25" Winchester (12.6MB formatted)	opt 5.25" diskette (630KB formatted); 5.25" Winchester (8.4MB or 16.8MB formatted up to 50.4MB)
Serial Communication	2 RS-232C 1 RS-422	2 RS-232C 1 RS-422	2 RS-232C 1 RS-422	2 RS-232C or 1 RS-232C, 1 RS-422
Parallel Printer Port	1 Centronics Interface	1 Centronics Interface	1 Centronics Interface	1 Centronics Interface
Other I/O Slots	None	None	None	2 Multibus Slots
Use	Cluster, Standalone or Master System	Cluster, Standalone or Master System	Cluster, Standalone or Master System	Cluster, Standalone or Master System

endowed with sophisticated data communications capabilities.

Because of the various configurations that are offered, the B 20 provides a user with plenty of flexibility in choosing a system to meet his/her needs—from standalone or cluster units; from 630K bytes to 50M bytes of storage capacity; from different size character displays; and from a selection of 7 different printers. Besides its flexibility, another major highlight of the system is its multilanguage capability. The B 20 can presently display and print in 6 languages other than English.

The B 20's external design is another system plus. The unit is an attractive piece of equipment that takes many ergonomic factors into consideration. This is evident when one touches the sculptured keyboard with its palm rest or gazes at the green phosphor 15-inch display with its tilt and swivel base. The lectern on the front of the electronics enclosure adds a nice finishing touch to the unit.

□ Limitations

The B 21 models do not offer any provisions for upgrading should a user's disk requirements increase. Whatever the disk capacity a user initially orders, he/she must live with it. Memory expansion on both the B 21 and B 22 is also rather limiting. It would be nice if the systems could go to 1 Meg.

■ SOFTWARE

□ Terms & Support

Terms • fees are one-time licenses • no service, but 90-day from invoice warranty • all separately priced software available to purchasers of more than 10 systems for 10 times individual price except Customizer Package (maximum \$6,500) and Multiplan

and WRITEone (discounted as hardware).

Support • 90-day warranty, extendable to 1 year.

□ Software Overview

The Burroughs B 20 runs under its own proprietary operating system, BTOS, as well as under MS-DOS and CP/M-86. Under BTOS, the systems support several communications packages including IBM 2780/3780 and 3270 emulation and the X.25 network. Data management capabilities are incorporated in BTOS. Applications available from Burroughs include a word processor, the Multiplan spreadsheet, business graphics, and various accounting packages.

□ Operating System

B 20 Operating System (BTOS)

The BTOS operating system is available in 4 versions: B 21 Master or Standalone and B 22 Master or Standalone. The standalone versions include the operating system, system utilities, and ISAM data management facilities. The master versions, which were designed to run in multiuser environments, include a master operating system capable of controlling 3 other cluster workstations; a cluster operating system; a spooler; and a queue manager plus utilities and ISAM functions. Applications which have been written to run on B 20 standalone systems will execute on cluster units without modification.

BTOS • real-time, multitasking operating system provides event-driven, priority-based schedules; handles system calls for interprocess communication/synchronization • ISAM supports access to fixed-length data records contained in ISAM data sets; each logical ISAM data set holds one type of data record; each data set is stored as 2 physical files: a data store file and an index file; each index is implemented as a B-tru structure; provides record-level lockout for shared ISAM files • sort facility supports variable length records with fixed-length keys; provides multilevel sorts (up to 15 levels) • system utility functions include initialization, backup, copy files, disk maintenance, list files, and a print spooler (cluster system configurations only) • system-level graphics primitives provide a user with file control over the



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graphics processor (utilized with the B 22 and B 21-2PC, B 21-5PC only):

\$2,000 lcms

MS-DOS 1.25 • single-user, interactive and batch processing disk operating system developed by Microsoft; has its equivalent in IBM PC-DOS 1.2 • supports maximum diskette storage of 160K bytes in up to 64 different files in single-density double-sided format; handles records from 1 to 65,546 bytes long in file transfers; executes external (disk based) commands, giving the user ability to expand the DOS vocabulary to the limits of disk space • includes batch processing capabilities with automatic execution on power up; user commands include DATA, TIME, DISKCOPY, FORMAT, RENAME, ERASE, COMP (compare), CHKDSK (check disk) • innovations include a double File Allocation Table (disk map) with third memory resident copy for efficient disk access, a disk mapping technique which conceptualizes conventional tracks and sectors as a single dimensioned array of logical sectors, and allocation units which subdivide data section into 1, 2, 4, 8, 16, 32, 64, or 128 logical sector groups, eliminating disk external fragmentation typical of conventional track-sector mapping • MS-DOS is divided into four parts: a device independent I/O handler, an I/O command processor, reference and jump vectors in low memory, and a command processor; the device independent I/O handler on hidden file MSDOS.SYS is the core of MS-DOS through which I/O must be directed; the I/O processor physically moves data and instructions by means of hidden file IO.SYS as commanded by MSDOS.SYS; the command processor, using the COMMAND.COM program, is responsible for interface between user and MS-DOS, error trapping, batch file processing, interpreting user commands and executing file names • MS-DOS 1.25 is a predecessor of MS-DOS 2.00:

NA

CP/M-86 • a 16-bit enhanced version of the 8-bit CP/M operating system designed to support the Intel 8086 or 8088 microprocessors; incorporates all the basic elements of the CP/M system but adapts these functions to the larger and faster operating environment • consists of 4 elemental structures: Basic Input/Output System (BIOS); Basic Disk Operating System (BDOS), Command Console Processor (CCP), and a Transient Program Area (TPA) • BIOS is the modifiable portion of the operating system enabling users to tailor CP/M systems to meet specific configurations; allows users to define all hardware-independent elements of the system by defining low-level interface and the peripheral I/O for the system • BDOS provides all the disk management control; supports up to 16 logical drives containing up to 8M bytes each, for a maximum of 128M bytes of online storage; any one file can reach the full drive size • CCP provides the interface between the user's console and the rest of the CP/M system; it reads, interprets, and executes commands entered from the console; commands are both built-in commands and transient commands; transient commands are loaded into the TPA and executed • TPA is the area designated to hold programs that are loaded from disk and then executed • standard utilities provided include: DDT-86 interactive debugger; PIP file transfer utility; SUBMIT batch control utility; ED command-oriented text editor; ASM-86 assembler; STAT system status utility; and GENCMD that processes Intel "H86" format files • memory requirements depend on number and types of options implemented • supports up to 1M bytes of memory; requires 56K bytes of memory as an ASCII terminal:

NA

Utilities

Various utilities including a sort inherent in the operating system.

Data Management

ISAM facilities are inherent in the operating system.

Communications/Networks

Emulation Software

3362-8009 B 20 ATE Asynchronous Terminal Emulator • lets B 20 emulate an asynchronous character-oriented terminal, displaying or storing data received • also handles binary data •

20 to 19,200 bps • half-/full-duplex • terminal control dynamically on various communication/file parameters • requires 256K bytes for standalone or cluster, 384K bytes for master:

\$500 lcms

3362-8066 B 20 RJE 2780/3780 Remote Job Entry Terminal Emulator • lets B 20 system emulate an IBM 2780 or 3780 RJE terminal device • operates in background, uses disk instead of cards • files come from editor, word processor, or application program, are queued for transmission • configuration files specify mode (2780/3780) and facility (2- or 4-wire), also sign-on to host • requires 256K bytes for standalone or cluster, 384K bytes for master:

750

3362-8074 B 20 32E 3270 Terminal Emulator • lets B 20 emulate various BSC IBM controllers: 3271, 3274, 3275, and 3276 • 80/132 columns, up to 31 lines (B 22) • up to 9600 bps, bisynchronous • application program access • 10 function keys with SHIFT/CODE keys provide 30 possible functions • requires 256K bytes for standalone or cluster, 384K bytes for master:

750

3362-8090 B 20 535 SNA 3270 Terminal Emulator • supports same functional interfaces to IBM hosts as does the IBM 8100 • being developed in 3 major phases; Phase I, Transport Service and SNA 3270 subsystem (available second quarter of 1983); Phase II, SNA RJE workstations; Phase III, Distributed Transaction Processing interface (not yet available) • Transport Service layers include SDLC protocol, path control, transmission control, PU and LU network functions • supports 3270 command and data stream processing • speeds from 2400 to 9600 bps:

995

3362-8017 B 20 POS Burroughs Poll/Select • supports B 20 emulation of standard Burroughs asynchronous terminals:

500

3362-8694 B 20 MTE • includes B 20 POS and incorporates emulation of a Burroughs MT983 Input and Display System:

750

Network Software

3362-8082 B 20 X25 X.25 Communications Manager • allows B 20 operation on public packet-switching networks • synchronous, via RS-232 modem at up to 9600 bps • packet level for usual X.25 usage; bytestream level for independent I/O and to use B 20 sequential access method without X.25 protocol knowledge by user; terminal emulation level for same on network • requires 256K bytes for standalone or cluster, 384K bytes for master • optional RS-232 serial or parallel Centronics interface printer supported:

\$500 lcms

Program Development/Languages

3362-7910 B 20 BAI BASIC Interpreter • ANSI X3.60-1978 plus extensions: ability to call another program from disk and pass parameters; read/write disk files via sequential and random access; write to line printer; read/write to memory and/or I/O ports; extended data types (e.g., double-precision floating point); error condition processing; IF-THEN-ELSE and other structured programming constructs • serial/parallel printer support • requires 256K bytes for standalone/cluster, 384K bytes for master:

\$750 lcms

3362-7928 B 20 COB COBOL Compiler • ANSI X3.23-1974 Level 2 and GSA high/intermediate • interactive debugger • includes editor • access to ISAM, sort/merge, and Forms Facility • serial/parallel printer support • requires 256K bytes for standalone/cluster, 384K bytes for master:

750

LCNS: one-time license fee. NA: price not available from vendor. Prices effective as of January 1984.



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3362-7936 B 20 FTN FORTRAN Compiler • ANSI FORTRAN 77 subset level plus selected full-level features and ANSI FORTRAN 66 compatibility features • includes text editor and linker/librarian • supports serial/parallel printer • requires 256K bytes for standalone/cluster, 384K bytes for master:

750

3362-7944 B 20 PAS Pascal Compiler • upward-compatible extension of current ISO draft standard (ISO/TC9/SC5/N509) • complies to native machine code for fast execution • includes text editor and linker/librarian • system programming extensions, such as ability to break/recast type, originate interrupt, initialize values, manipulate strings • runtime error checking • optional compile-time optimization • supports serial/parallel printer • requires 256K bytes for standalone/cluster, 384K bytes for master:

750

Program/Application Development Aids

3362-8686 B 20 DMR Data Manager • for file functions without resort to programming languages • interactive, with menus and prompts • has screen layout defaults • uses ISAM • users can add to menu • requires BTOS • supports serial/parallel printer:

\$1,200 lens

3362-7977 B 20 FRM Forms Facility • interactive display screen graphic design callable from any B 20 language • requires a B 20 language • B 21 version availability with BTOS Level 2:

990

3362-8025 B 20 CST Customizer Package • structured set of software components to assist in application program development • includes the operating system, utilities, optional languages, program development tools, data management facilities and generators:

2,500

3362-8116 B 20 FON Font Designer • extends graphic display/printer support • for B 22 displays:

500

Applications Packages

3362-7829 B 20 BWP Executive WRITEone System • single-/multiple-user combined word/data processing • scrolling • split screen • undo/redo keys • 80/132 characters per line "200M" on B 22 • output formatting independent of typist • requires BTOS • supports 64-/96-character serial/parallel direct/spooled printer and letter-quality serial printer direct/spooled • multiple copies discounted with hardware:

\$500 lens

3362-8033 B 20 BMP Multiplan • statistical spreadsheet modeling • command driven with math functions • can interface with B 20 Business Graphics package to translate grids into graphic representations • requires BTOS standalone/cluster system • supports serial/parallel printer • multiple copies discounted with hardware:

200

3361-1740/2011/2003/2029/2037/2045 B 20 Executive Accounting System (EASY) • 6 modules including order entry/invoicing, accounts receivable, inventory control, accounts payable, payroll, general ledger • price below is per module:

895

Budgetary Accounting • comprised of 5 modules; budget control, accounts payable, revenue, general ledger, purchase order purchasing:

NA

Utility Billing • performs 5 functions; file maintenance, consumption calculations, management reporting, utility bill preparation, cash posting:

NA

Government/Education Payroll • handles security provisions,

recovery techniques, contract pay, flexible payroll cycles, cost center analysis, state reporting, tax sheltered annuities, check reconciliation, hourly/salary payroll, user-defined deductions and earnings, budgetary accounting interfaces, and standard/on-demand reports:

NA

Construction EASY • for the construction industry • modules include payroll, accounts payable, purchase orders, job costing, accounts receivable, general ledger:

NA

Manufacturing EASY • for manufacturers • modules include payroll, accounts payable, purchase orders, job costing, accounts receivable, and general ledger:

NA

3545-7662 B 20 BGP Business Graphics Package • graphically displays and prints data used in release 2.0 or higher of Multiplan • cut and paste functions • changes shading and label font styles • merges, scales, and moves charts and graphs • saves pictures on disk • supports HP 7470A color plotter • requires 384K bytes of memory on standalone/cluster system and 640K bytes on master system:

750

Other Facilities

None available from Burroughs.

■ HARDWARE

Terms, Support & Documentation

Terms • purchase only • quantity discounts by Burroughs to direct-sale multisystem customers • annual maintenance payments.

Support • 90-day equipment warranty • 5-day-per-week 8:00 AM to 5:00 PM shift maintenance • hot-line.

Documentation • includes B 20 Installation Planning Guide; B 20 Operations (Part I—Hardware, Part II—Systems Software, and Quick Reference Guide); various installation, operation, and maintenance guides on individual pieces of hardware.

Physical Specifications (H x W x D); Weight

CPU • 13.75 x 30 x 12 inches for B 21 and B 22; 45 pounds for B 21 and 50 pounds for B 22.

Display • integrated with CPU unit.

Keyboard • 2.4 x 18 x 8.5 inches for B 21 and B 22; 4 pounds for B 21 and B 22.

Systems Overview & Configurability

The Burroughs B 20 combines a 16-bit Intel 8086 CPU, memory ranging from 128K bytes to 640K bytes, a 15-inch video display, and a detached keyboard, all integrated in a desktop unit. The system comes in 2 versions, the B 21 which is currently available in 8 models, and the B 22 which consists of 1 model that may be configured with various options.

The 8 models of the B 21 differ with respect to disk storage capacity, number of I/O slots, and whether they can operate standalone or as a master station. All models can serve as cluster units. Additionally, 2 of the models sport color displays with graphics capabilities as opposed to the monochrome displays on the other models. For a breakdown of the B 21 models, refer to the table on page 2.

The B 22 is the high end of the B 20 Series. It is configured with a minimum of 256K bytes of memory, 2 Multibus slots, a parallel printer port, and 2 RS-232C ports, or 1 RS-422 port and 1 RS-232C port. A graphics capability is optionally available. The system can be employed as a standalone unit, as a master station, or as a cluster station.

Storage units on the B 22 are optional. The mass storage base unit is housed in a 7.5-inch floorstanding enclosure. It contains a Winchester controller, a floppy disk controller, a non-removable Winchester disk, and a floppy backup. A floorstanding expansion



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unit is also available. This unit utilizes the controller and the diskette drive in the mass storage base unit.

A B 21 master station can support up to 3 cluster units via its RS-422 channel. With a B 22, 16 workstations can be clustered. When more than 3 cluster units are connected to a B 22 master station, a Communications I/O processor must be employed. Two Communications IOPs can be attached to the system with each one handling up to 4 cluster units.

The internal architecture of the B 21 differs from that of the B 22. However, the 2 systems are compatible and can be mixed in the same network.

Maximum configurability is stated below; minimum configurations are discussed under Packaged Systems.

B 21 System Maximums • varies by submodel • all models include CPU, up to 512K bytes of memory, RS-422 cluster communications port, and keyboard/display.

B 21-1T System Maximums • includes basic configuration without disk or diskette storage, printer, or additional data communications ports.

B 21-2T/-2PC System Maximums • includes base configuration plus 630K-byte formatted diskette storage; 2 RS-232C ports; parallel printer port; printer.

B 21-3T System Maximums • same as B 21-2T except 2 diskette drives.

B 21-4T System Maximums • same as B 21-2T plus 5M-byte formatted hard disk; 3 additional B 20 workstations.

B 21-5T-/5PC System Maximums • same as B 21-2T plus 8.4M-byte formatted hard disk; 3 additional B 20 workstations.

B 21-6T System Maximums • same as B 21-2T plus 12.6M-byte formatted hard disk; 3 additional workstations.

B 22 System Maximums • 2 different configurations • both include CPU, 640K bytes of memory, display, keyboard, disk storage, printer, and parallel port • 16-unit Master Station maximum includes base configuration plus 2 RS-232C ports, 2 Communications IOPs, 16 B 20 cluster workstations with 16 printers, 50.4M bytes of formatted disk storage, and 1 500K-byte floppy backup plus 32 630K-byte diskettes (2 per cluster unit) on the workstations • Graphics Master Stations maximum includes base configuration plus 1 RS-232C port, 1 RS-422 port, 1 Communications IOP, 11 B 20 cluster workstations with 11 printers, 50.4M bytes of formatted disk storage, 1 500K-byte floppy backup plus 22 630K-byte diskettes (2 per cluster unit) on the workstations, and graphics processor board.

□ Packaged Systems

3545-5666 B 21-1TS Level I Workstation • 8086 CPU, 256K-byte memory, 28x80 character display, keyboard, 1 RS-422 port

\$2,955 prch \$296 maint

3545-9411 B 21-2TS Level I Workstation • 8086 CPU, 256K-byte memory, 28x80 display, keyboard, 1 5.25-inch 630K-byte diskette, 1 RS-422 channel, 2 RS-232C channels, 1 Centronics printer interface:

4,325 484

3548-6096 B 21-2PC Level I Workstation • same as B 21-2TS except with 384K-byte memory, color display, graphics processor:

6,780 830

3545-5690 B 21-3TS Level I Workstation • same as B 21-2T except with 128K-byte memory and 2 630K-byte diskettes:

5,040 574

3545-3257 B 21-4TS Level I Workstation • same as B 21-2T plus 1 5.25-inch 5M-byte fixed disk:

6,435 998

3545-5708 B 21-5TS Level I Workstation • same as B 21-2T plus 1 5.25-inch 8.4M-byte fixed disk:

7,200 1,045

3548-1712 B 21-5PC Level I Workstation • same as B

21-5TS except with 384K-byte memory, color display, graphics processor:

10,145 1,391

3545-5716 B 21-6TS Level I Workstation • same as B 21-2T plus 1 5.25-inch 16M-byte fixed disk:

8,745 1,089

3361-9776 B 22 Level II Workstation • 8086 CPU, 34x80 or 34x132 display, keyboard, 256K-byte memory, 2 Multibus Slots, 1 each RS-232C and RS-422 channel or 2 RS-232C channels, Centronics printer interface:

4,595 930

□ CPUs

B 21 CPU • 16-bit Intel 8086; 8-MHz clock; 4K-byte ROM.

B 22 CPU • 16-bit Intel 8086 • 5-MHz clock • 4K-byte ROM • 16-bit programmable maskable interrupt timer with 19.5-KHz clock, 6 priority levels.

□ Memory

Memory is available via initial order or field add-on, with the latter incurring a \$60 one-time installation charge, and having an exchange credit (given in parentheses after each description). 64K-bit chips are used with byte parity.

B 21 Initial Order Memory Options

3545-5724 B 21-T12 Memory Add-On • 128K bytes:

\$300 prch \$86 maint

3545-5732 B 21-T25 Memory Add-On • 256K bytes:

600 160

3545-5740 B 21-T38 Memory Add-On • 384K bytes:

2,395 280

B 21 Field Upgrade Memory Options

3362-9031 B 21-2EX Memory Upgrade • to 256K bytes (\$1,400):

\$3,500 prch \$231 maint

3362-8959 B 21-3EX Memory Upgrade • to 384K bytes (\$1,600):

4,000 264

3362-8967 B 21-5EX Memory Upgrade • to 512K bytes (\$1,800):

4,500 297

B 22 Initial Order Memory Options

3361-9800 B 22-128 Memory Add-On • 128K bytes for 384K-byte total memory:

\$750 prch \$116 maint

3361-9826 B 22-384 Memory Add-On • 384K bytes for 640K-byte total memory:

2,195 330

B 22 Field Upgrade Memory Options

3361-9818 B 22-256 Memory Upgrade • to 384K bytes (\$1,000):

\$3,000 prch \$230 maint

3361-9834 B 22-512 Memory Upgrade • to 640K bytes (\$1,000):

5,000 450

□ I/O & Communications

No optional I/O features exist for B 20 Series systems. Disks have standard direct memory access (DMA) I/O. B 21 systems have 3

PRCH: purchase price. MAINT: annual maintenance fee. Prices effective as of January 1984.



Burroughs B 20 Series

B 21 & B 22 Systems

DMA channels (high-speed cluster communications, video refresh, disk), and B 22 systems have a fourth (Multibus slave for Communications IOPs). DMA rate is 3.3M bytes per second.

All B 21 systems come standard with at least 1 communications channel. The B 21-1TS provides an RS-422 cluster communications channel while all other B 21 systems offer 1 RS-422 channel and 2 RS-232C channels as standard features. The RS-422 channels operate at 307K bps up to 410K bps and the RS-232C devices from 110 to 19.2K bps. The RS-422 channel is used in clustering B 20s and the RS-232Cs are used for external data communications and/or serial printers. Data communications on the B 22 consist of either 2 RS-232C interfaces or 1 RS-232C interface and 1 RS-422 interface. On the B 22, the RS-422 channel operates at up to 615K bps. The channels can support such protocols as Burroughs Poll/Select, Bisync, ADCCP, SDLC, and HDLC.

When connecting more than 3 cluster stations to a master B 22, users must add a Communications I/O Processor. The Communications IOP fits into a Multibus slot in the master station and supports up to 8 cluster units. It offloads the B 22 and handles all polling of and acknowledgements to the cluster stations. Up to 2 Communications IOP boards can be inserted into a B 22.

3362-7662 BC 100 Comm IOP • communications IOP board for B 22 • provides 2 multidrop 307K-bps RS-422 (channel B) communication channels • includes Intel 8085, 32K-byte RAM, and serial I/O controller • requires 1 Multibus slot • maximum of 2 per system:

\$1,500 prch \$160 maint

□ Mass Storage

B 21 Disk Storage

B 21 models are configured with either no disk drives, 1 or 2 diskette drives, or 1 diskette drive and 1 Winchester drive. Formatted diskette capacities are for systems running under BTOS.

B 21-2TS/-2PC/-3TS Diskette • integral 5.25-inch double-sided, double-density drive • 630K bytes formatted • average access 158 milliseconds; track/track access 6 milliseconds; 15-millisecond settling time; 83-millisecond average rotational latency; 32K-byte-per-second data transfer rate • 1 drive on 2TS; 2 drives on 3TS.

B 21-4TS Disk • integral 5.25-inch Winchester fixed disk; 5M bytes formatted • average access 95 milliseconds; track/track access 3 milliseconds; 624K-byte-per-second data transfer rate.

B 21-5TS/PC Disk • same as B 21-4TS disk, except 8.4M bytes formatted and 105-millisecond average access.

B 21-6TS Disk • same as B 21-4TS disk except 12.5M-byte formatted and 105-millisecond average access time.

B 22 Disk Storage

All B 22 disk storage units are optional and come in 7.5-inch floorstanding enclosures. The master enclosure unit houses the Winchester and floppy disk controllers as well as one hard disk and one floppy drive. An expansion unit is also available for housing 2 additional hard disk drives.

B 22 Diskette • included with 8.4- or 16.8M-byte formatted disk in master enclosure unit • 8-inch single-side 0.5M-byte formatted drive • average access 260 milliseconds; track/track access 8 milliseconds; average rotational latency 83 milliseconds; settling time 8 milliseconds; head load time 8 milliseconds; 62.5K-byte-per-second data transfer rate.

3361-9784 B 22-10M Disk • 8.4M-byte formatted fixed disk plus 0.5M-byte formatted diskette in freestanding chassis with disk controllers • 70-millisecond average access; 19-millisecond track/track access; 15-millisecond head settling; 543K-byte-per-second data transfer:

\$7,495 prch \$1,300 maint

3361-9792 B 22-20M Disk • same as B 22-10, except disk is 16.8M bytes formatted, and average access is 50 milliseconds:

9,000 1,700

3362-8934 B 22-20X Add-On Disk • same as B 22-10, but includes pair of 8.4M-byte formatted disks in expansion unit • controller in B 22-10M/20M:

8,500 1,495

3362-8942 B 22-40X Add-On Disk • same as B 22-20X, except both disks are 16.8M bytes formatted • controller in B 22-10M/20M:

11,500 2,275

B 21 Disk Upgrades • exchange credits in parenthesis.

3545-6664 B 21-45U • 5M-byte upgrade from a B 21-4TS to a B 21-5TS (\$1,000):

4,800 300

3545-6680 B 21-56U • 5M-byte upgrade from a B 21-5TS to a B 21-6TS (\$2,000):

7,500 300

3545-6672 B 21-46U • 10M-byte upgrade from a B 21-4TS to a B 21-6TS (\$1,000):

7,500 600

Tape

Streamer Tape • industry-compatible 0.5-inch magnetic tape • for B 22 only:

\$8,500 prch NA maint

□ Terminals/Workstations

Each B 20 system is configured with the CPU, memory, display, and keyboard, all inherent in the workstation unit. Display capabilities for both systems are basically similar. Exceptions on the B 21 are the B 21-2PC and -5PC which have color displays and a graphics board inherent in the units. The B 22 has more characters per screen and a full 256-character programmable font. The keyboard is the same for both systems.

Situated to the left of the B 20 display is the systems workstation electronics housing where the CPU, memory, and I/O ports reside. On the B 21, the disk controllers and drives are also stored in this unit; the B 22 contains 2 Multibus slots in its cabinet. The front of the electronics enclosure serves as a lecturn with clips to hold documents.

Display • 15-inch landscape screen; green phosphor except for B 21-2PC, -5PC, which are color; tilt and swivel capability • half-bright, underline, reverse video, blinking character attributes • reverse video, cursor position screen attributes • multiple frames capability • 256 displayable characters on B 22 • 28 lines x 80 characters in a 9x11 matrix on the B 21; 34 lines x 80 or 132 characters in a 10x15 matrix on the B 22.

Keyboard • detached, typewriter-style, sculptured surface with a palm rest; connects to display via a 5-foot coiled cable • 14-key numeric pad; 8-key status/control function pad; 6-key cursor control pad; 4-key page control pad; 10 user-definable function keys; all keys programmable; software controllable LED indicators on 8 keys.

3545-9361 B 22-GRA B 22 Mono Graphics Board • Multibus graphics board with a dedicated 8-MHz 8086 graphics processor, 128K bytes of display memory, 16K bytes of firmware in ROM • 2 drawing modes, vector and raster; 656x510 pixels • for B 22 only:

\$1,600 prch \$160 maint

□ Printers

System maximum is 1 parallel (Centronics) interface printer and 1 serial printer on an RS-232 channel. Burroughs serial printers are letter quality.

3362-9023 AP1303 Letter-Quality Printer • 20 cps • economy model:

\$2,300 prch \$408 maint

3362-9015 AP1302 Letter-Quality Printer • 35 cps • no vertical format features:

3,250 408



Burroughs B 20 Series B 21 & B 22 Systems

3544-8976 AP1300-20 Letter-Quality Printer • 35 cps • vertical format control:

4,568 350

3361-5915 B 9251-1 Matrix Printer • parallel interface • 230 cps • 15-inch wide tabletop unit:

3,486 360

3358-7916 B 9252 Matrix Printer • parallel interface • 150 cps • 13.5-inch wide tabletop unit:

1,295 300

3545-9353 B 9253 Matrix Printer • parallel interface • 120 cps • 9.5-inch wide tabletop unit:

895 135

3256-7927 B 9249-31 Line Printer • parallel interface • 370/270 lpm:

9,800 959

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