

**Burroughs**  
**B 4800/B 3800/B 2800**  
**Systems**



**New Systems Power.**  
**New Levels of Productivity.**



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**B 4800/B 3800/B 2800**

**B 4800/B 3800/B 2800 systems bring new levels of processor, I/O and software power to meet the needs of transaction-oriented processing, employing large data bases with large terminal networks in a centralized or distributed environment.**

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## New Systems Power New Levels of Productivity

New technology provides more power and new software capabilities reduce the human effort needed to effectively utilize and control the power of the hardware.

Burroughs B 4800/B 3800/B 2800 systems offer:

**Increased Power and Compact Size**—microcircuits use Burroughs Current Mode Logic. BCML expands the number of functions performed by each circuit, and results in up to a 50 percent reduction in floor space requirements, greater performance speeds, lower power requirements, improved reliability and maintainability.

**Powerful Input/Output Subsystem**—a powerful, new architecture in the I/O subsystem offers up to 64 channels, each having its own data link processor. Data link processors accept input/output commands and execute them independently of the central processor. This feature allows the system to handle very large data bases and many terminal devices.

**Data Communications**—powerful, flexible computers operate either as large host systems or as remote processors in a distributed data communications network.

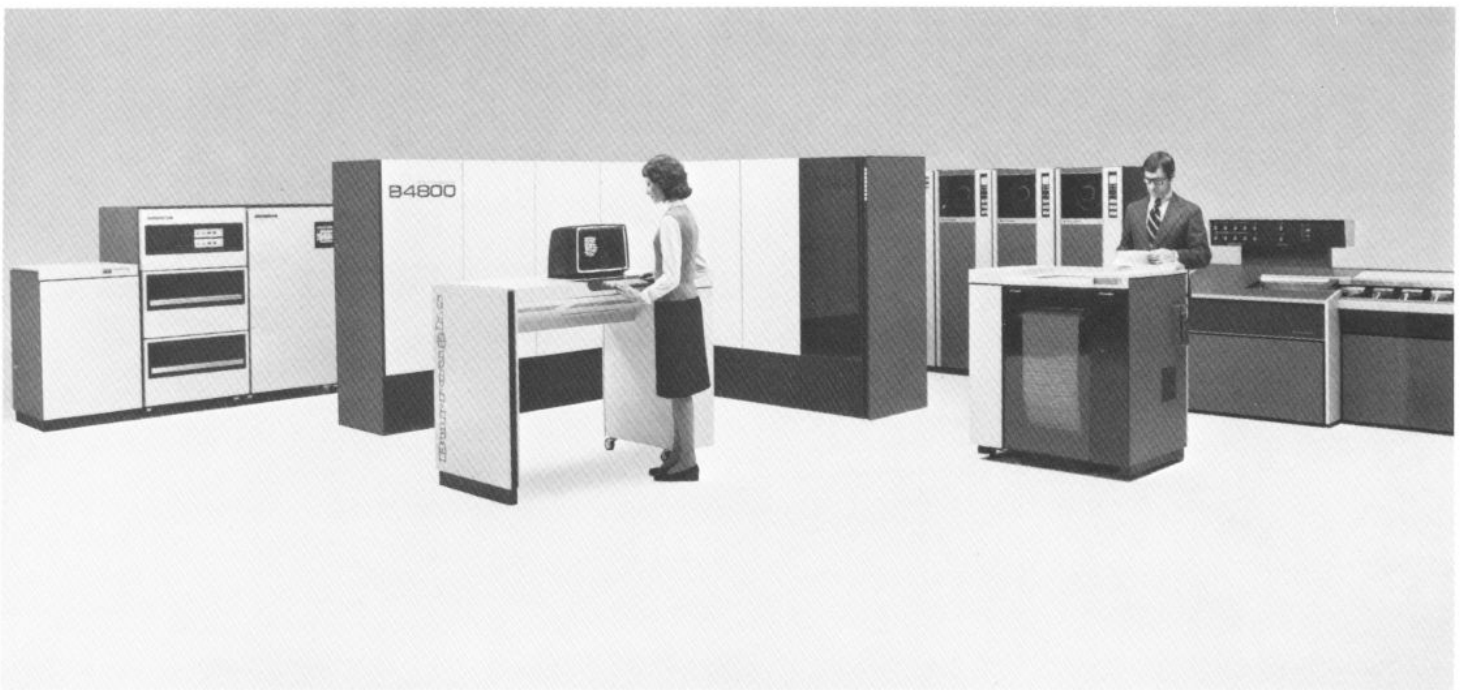
**Advanced System Software**—advanced software includes Burroughs powerful Master Control Program (MCP), plus Network Definition Language (NDL) for simplified data communications network design and modification, and DMS I/DMS II, the data base management systems based on Burroughs years of experience with data and file management systems. This advanced software brings increased efficiency by allowing data processing staffs to concentrate on solving business problems while the computer regulates itself and its resources.

**Program Product Development Aids**—in the past, long-range program development and maintenance costs have typically been greater than the cost of the equipment used to run the programs. Burroughs responds with specialized aids to minimize program development and maintenance costs.

**Application Program Products**—Burroughs ready-to-use application program products offer cost-effective alternatives to either initial program design and development, or program rewriting and refining.

**Advanced Maintenance Techniques**—new diagnostic aids and an early-warning environmental monitor further enhance the maintainability and reliability of these new systems.

**Program Product Conversion Aids**—allow users of other equipment to take advantage of the B 4800/B 3800/B 2800 systems quickly. They also produce COBOL source statements and provide all the benefits of high-level languages.



## New Computing Power

The 800 family of systems brings a new measure of power and cost-effectiveness to data processing departments operating in a multiprogramming environment to economically respond to the information needs of their organizations.

**Central Processors**—B 4800/B 3800/B 2800 systems are built with large-scale integrated circuits. Newly developed Burroughs Current Mode Logic (BCML) greatly expands the number of functions performed within a single circuit board.

This dramatic reduction in size—in some cases up to 100 times—results in smaller floor space requirements, greater performance speeds, lower power requirements, improved reliability, improved maintainability. All at lower costs.

- B 4800—central processor has a clock rate of 8 million cycles per second (8 MHz). The standard main memory of 200,000 bytes operates at 250 nanoseconds for full access of two bytes of data.

The B 4800 memory can be expanded to 1,000,000 bytes. The 250 ns speed is achieved through the use of bipolar large-scale integrated circuit technology.

These high-speed memories are built with automatic error detection and correction, and are extremely reliable.

- B 3835—central processor operates at a clock rate of 4 million cycles per second (4 MHz). The standard main memory of 500,000 bytes (4K-bit chips) operates at 500 nanoseconds for full access of two bytes of data. The integrated circuit memory is built with automatic error detection and correction, and can be expanded, to 1,000,000 bytes.
- B 2815—central processor operates at a clock rate of 3 million cycles per second (3 MHz). The standard main memory of 125,000 bytes (4K-bit chips) operates at 667 nanoseconds for full access of two bytes of data. The integrated circuit memory is built with automatic error detection and correction and can be expanded to 500,000 bytes.
- B 2810—central processor operates at a clock rate of 2 million cycles per second (2 MHz). The standard main

memory of 125,000 bytes (4K-bit chips) operates at 667 nanoseconds for full access of two bytes of data. The error-correcting main memory uses large-scale integrated circuitry, and can be expanded to 500,000 bytes.

- Memory Control—regulates data flow between main memory, the central processor and the I/O subsystem. It allows each of the system components to have access to main memory on a priority basis, giving the highest priority to the I/O subsystem.

Since memory control operates independently of the processor, the processor is free to perform memory-independent functions at the same time memory accesses are being granted to the I/O subsystem.

- An I/O distributor effectively multiplexes the high-speed transfer of message blocks from the data link processors to memory without processor interference.



## New Input/Output Power

Current, accurate information is requisite to sound business decisions. B 4800/B 3800/B 2800 systems deliver information without delay.

The new computing power of the 800 family combines with a powerful I/O subsystem which manages up to 64 separate I/O channels, each with its own processor, and delivers up to 8 million bytes of data a second.

### Separate Processor For Each Peripheral Family

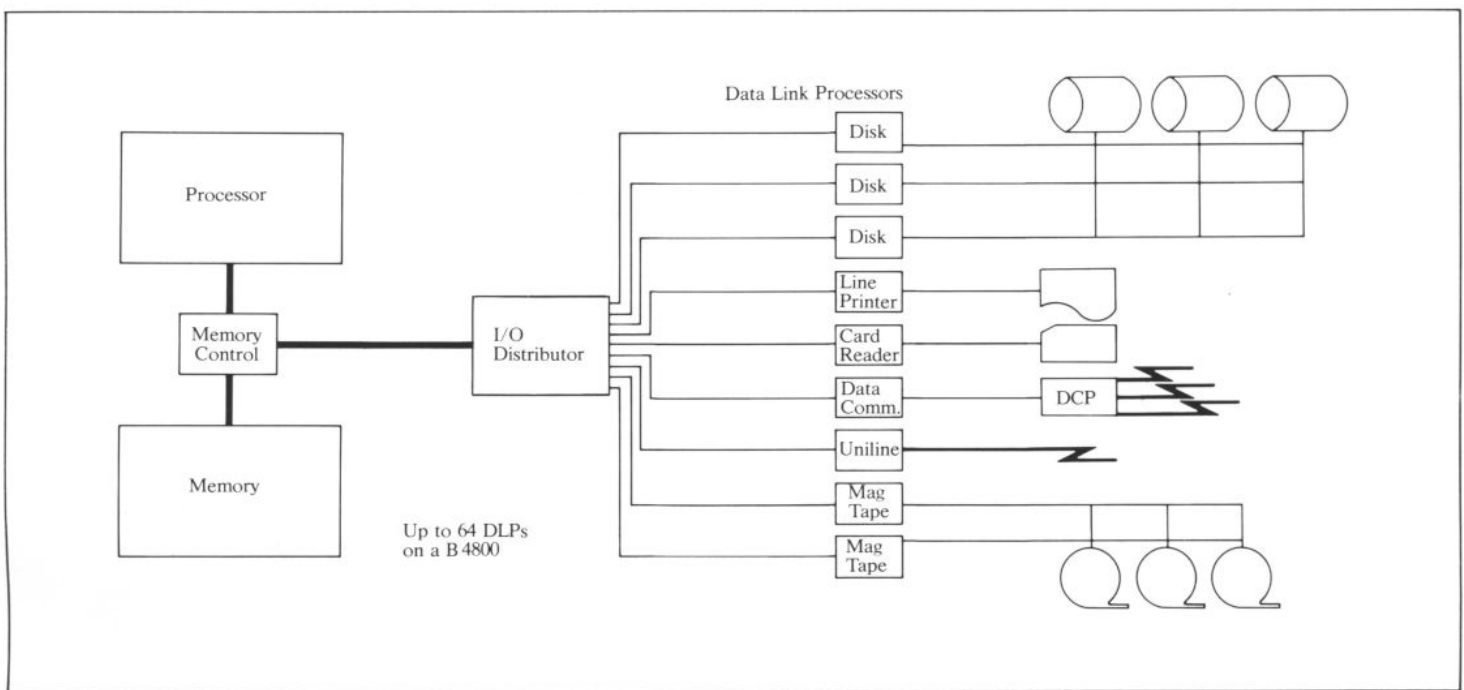
The powerful I/O subsystem allows for a data link processor on each I/O channel. Each data link processor manages data transfer between each peripheral and the central system, but controls peripheral functions independently of the central system.

A single data link processor can drive multiple peripherals. However, additional channels and data link processors can be attached to the I/O subsystem to increase simultaneous data flow.

Each data link processor utilizes large-scale integration and operates at rates up to 500 nanoseconds. An integrated data buffer sufficiently accommodates each peripheral family and transfers data to the central system at the message level.

For stream-mode devices, such as tape or disk, the appropriate data link processor has at least two data buffers. While one buffer is being filled by the sending device, the other full buffer is unloading to the receiving device. The buffers are alternated or "ping-ponged" until the entire message is delivered.

Multiple data paths may be established for data storage subsystems with high activity to enhance the data flow, reduce average access times to data, and increase the multiprogramming and throughput capabilities of the systems. Also, data base subsystems may be shared by multiple processors, using a common external memory called File Protect Memory, in conjunction with data link processors connected to the different central processors.



## Processing Power at All Locations

**Burroughs B 4800/B 3800/B 2800 systems can act as either host computers or remote distributed processors to serve the information needs of their organization.**

### Data Communications

Burroughs B 4800/B 3800/B 2800 systems can act as host systems, as well as remote processors in decentralized networks.

As host computers, they can concurrently handle networks consisting of Remote Job Entry terminals, terminals for interactive computer usage using the Time Sharing Module of MCP, on-line data entry terminals, and terminals referencing and updating a data base transaction-oriented application.

In decentralized networks, the B 4800/B 3800/B 2800 systems can concurrently handle application programs, and direct messages and files to other systems in the network.

Additionally, the systems may be used as specialized medium-to large-scale message switching systems, and as data concentrators for very large-scale computer systems.

Outstanding characteristics which make the B 4800/B 3800/B 2800 systems ideally suited for use in data communications networks include:

- The number and variety of data communications lines that may be attached to the systems without taxing the central processor(s).

Data communications processors and data link processors reduce central processor overhead by executing the line procedures associated with the terminals and systems connected.

- Three types of data link processors are available for data communications. Any combination can answer data communications requirements, ranging from single line to multi-line installations.

One type interfaces with a data communications processor and links the flow of information between main memory of the B 4800/B 3800/B 2800 systems and the data communications lines of the data communications

processor. The other two types are called Unilines. They interface to a single data communications line either direct-connect with a Balance Differential Interface (BDI) or data set-connect employing either Burroughs standard asynchronous or synchronous line procedures.

- A wide variety of transmission speeds and line procedures with speeds up to 50,000 bits per second.
- Dual processor configurations increase systems power and enhance the continuous availability often required in data communications networks.
- Programming tools which allow the user to describe the physical characteristics of networks and the control procedures for the message flow in high-level languages, facilitating program development, as well as program maintenance.
- The facility to interface new terminals.
- An extensive range of terminals.



## High-Performance High-Capacity Storage

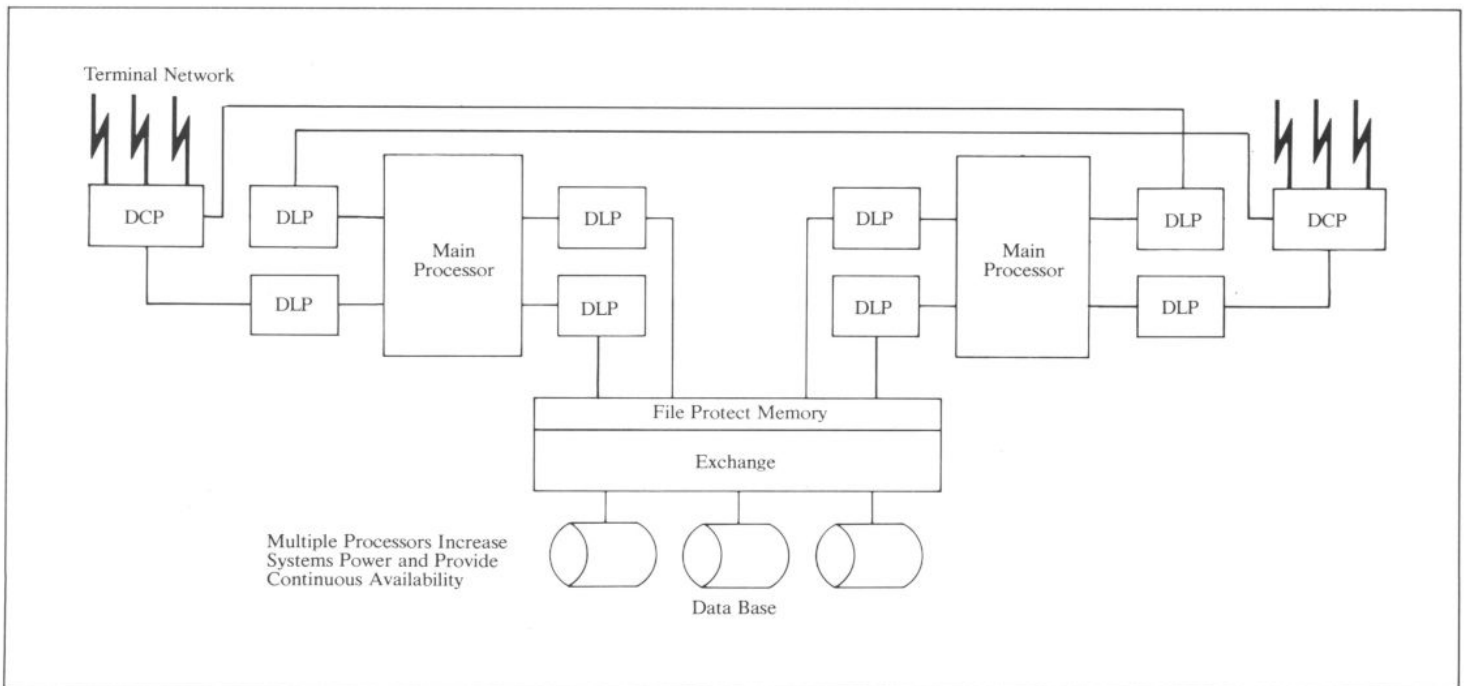
Advanced data storage subsystems enhance the 800 family of systems. A new head-per-track disk file accesses information 4 times faster than current files. New disk-pack subsystems provide up to 50 times more storage capacity than those previously available.

### New Data Storage Subsystems

**Head-per-Track**—In an extremely high-speed subsystem, where data is recorded on head-per-track disks, the total revolution time of the disk is 10 milliseconds. Thus, the average access time to data is 5 ms and the data transfer rate to main memory is 650 KB per second.

**Disk-Pack**—a high-speed, disk-pack subsystem is available with removable disk packs, each storing 65 million bytes of data formatted at 180 bytes per sector. Data is recorded at 6,000 BPI. Average track access time is 25 ms with an average latency time of 8.3 ms. Transfer rate is 605KB per second.

Other subsystems are available for users requiring very large amounts of data to be stored on-line. Up to 174.4 million bytes of data can be stored on each removable pack when the data is recorded at 180 bytes per sector. Data is recorded at 4400 BPI and 400 TPI. Average track access time is 30 ms and average latency time is 12.5 ms. Transfer rate is 625KB per second.



## More Power Per Dollar

Hardware specifications indicate a system's power potential. System software determines how much of that power is usable by the customer.

Burroughs integrated hardware/system software design philosophy gives the user far more power per investment dollar.

### System Software

As the industry leader in multiprogramming systems, Burroughs has continuously added new functional responsibilities to the MCP. Therefore the user staff's functional workload lightens and productivity increases. Thus, more time is spent doing and less time figuring out what to do.

Here's how Burroughs MCP lightens the workload of data processing professionals:

**Multiprogramming**—jobs are automatically initiated until all portions of the computer system are productive.

**Dynamic Modularity**—when the configuration changes through the addition of memory, tapes, disk or other components, MCP adjusts automatically to the additional capabilities and puts them to work without programmer or operator intervention.

**Device Independence**—tape and disk can automatically be used as backup or "pseudo" devices for card readers, punches and printers. Job completions are not delayed waiting for access to a busy peripheral device. Jobs are automatically—or at operator option—streamed through to a backup device.

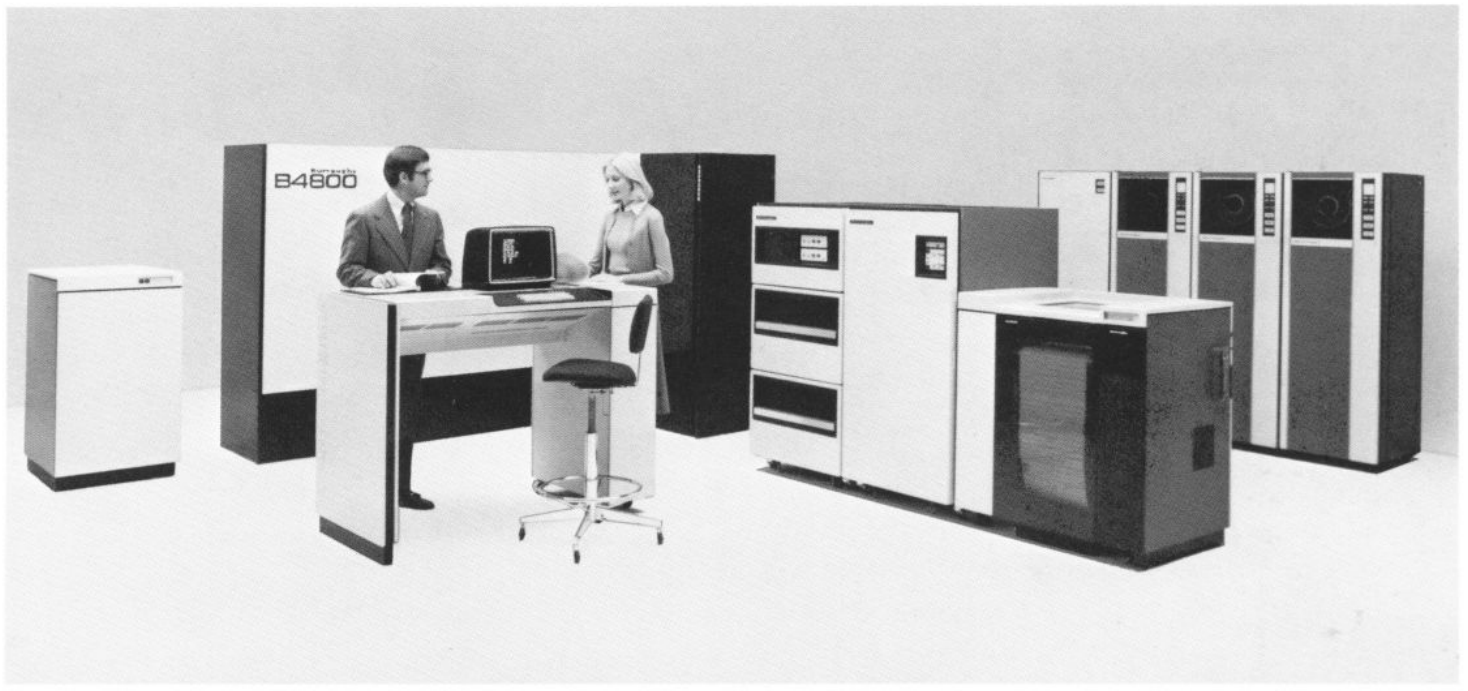
**Automatic Volume Recognition**—all programs and data files are called by name rather than by I/O unit. Jobs can therefore be initiated on any device available at the moment. The operator's job is simplified, and system performance is increased. Programs can continue to run without modification when the system configuration changes.

**Virtual Memory**—is a specialized memory management technique that allows for the design and execution of application programs which are larger than main memory. It also allows more programs to run concurrently, and thereby, increase system throughput.

**Priority Scheduling**—defines levels of importance for each job to be executed. If requirements change, the operator can dynamically reallocate priorities based on urgent business needs of the moment.

**Complete System Logging and Reporting**—MCP keeps track of all work performed and produces detailed reports needed to attain the highest level of performance.

**High-Level Languages**—all B 4800/B 3800/B 2800 programming is in problem-oriented, high-level languages: FORTRAN, BASIC, COBOL and NDL. High-level language programming removes machine dependencies and enhances programmer productivity.





## Increased Programmer and Operator Productivity

Burroughs Data Management Systems, DMS I and DMS II, introduce new levels of system capability and control. They allow efficient use of computing resources to manage one of your most valuable resources—data (information).

### Data Management Systems (DMS I/DMS II)

DMS I and DMS II relieve application programmers of the burdensome programming effort related to data storage and retrieval. When using DMS I or DMS II, data file structures and interrelationships are described once to the system. Programmers may then add, update and retrieve data without concern for data placement, organization or access methods.

### Burroughs DMS I/DMS II

- Centralizes management of information, and effectively isolates data management from individual applications programs.
  - Lets programmers and analysts use the information without concern for the description or the structure of it.
  - Makes data management truly transaction-oriented.
  - Provides easy-to-use, user-oriented interfaces to the data base.
  - Allows common information to be accessed simultaneously from batch, on-line time sharing and remote job entry environments.
- Speeds efficient retrieval of timely information.
  - Helps maintain security and privacy of data.
  - Provides record level protection.
  - Provides centralized audit and recovery.
  - Allows multi-threading of transactions for high volume throughput.



## Low Program Development Cost

**Program Product Development Aids** reduce program development effort and costs by assuming many programming tasks formerly performed by programmers.

### Program Product Development Aids

Burroughs Environmental Software Program Product Development Aids and the B 4800/B 3800/B 2800 systems' logical power lighten the load of technical staffs and speed information flow necessary for sound decisions. They can dramatically increase productivity because these program products manage the:

- Data communications network—Network Definition Language (NDL)
- Information flow between the network and application (NDLMCS)
- Information reporting requirements from the data base (REPORTER)

### Disk FORTÉ<sup>®</sup>/2

Burroughs Disk FORTÉ/2 is a generative data retrieval and maintenance aid. It provides all required data file organization and accessing techniques.

A programmer uses a free-format language to describe the relationship to be established between data elements

and the accessing techniques required for retrieval, updating and reporting of data elements. This information is used by Disk FORTÉ/2 to produce the data base directory, COBOL source routines to perform the required functions, and documentation to describe the data base generated. A Disk FORTÉ/2 precompiler provides file descriptions and access routines to COBOL programs using the data base.

### Network Definition Language

NDL allows the user to describe data communications networks in terms of station names, terminal types, line speeds and line procedures used. From this network description, the NDL compiler generates the necessary code and the tables required for the management of complex networks.

Specialized data communications expertise is not required in using NDL. Because NDL is configuration-independent, the user need not be concerned about whether data communications processors, an integrated multi-line controller or data link processors are used.

### REPORTER

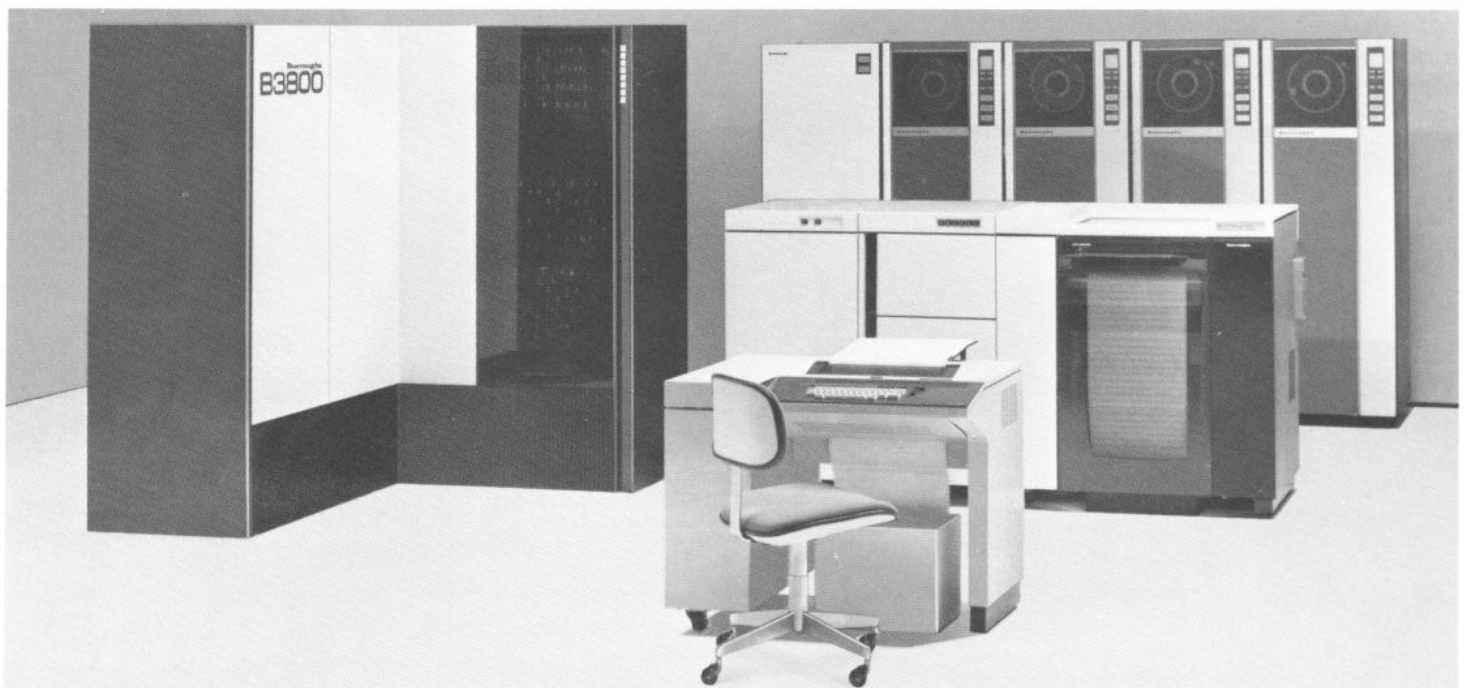
REPORTER (REPORT writER) can significantly reduce the cost and time usually associated with report generation. It's a generative system and accepts simplified parameters describing the information to be printed or displayed from data bases and other available files (tape, card or disk).

### AUDIT-REPORTER

AUDIT-REPORTER is a generalized auditing and reporting system which provides the EDP auditor with an effective method for testing and evaluating the records produced by a data processing system.

### Test Data Generator

TEST DATA GENERATOR produces one or more test data files from specifications written in Test Data Definition Language. This test data is then used to test new applications thus reducing the time involved in developing new programs.



## Low Program Maintenance Cost

The exclusive use of Program Product Development Aids and high-level languages contributes to complete documentation, provides hardware-independent programs, and reduces program maintenance costs.

### Data Entry

Operators can use Burroughs TD 800 Input and Display Systems for data entry, verification and correction using display screen formats supplied by the B 4800/B 3800/B 2800 systems.

**Programming Development and Maintenance by Time Sharing**  
Programs for the B 4800/B 3800/B 2800 systems may be developed and tested in a time sharing mode concurrently with the execution of user application programs.

The Remote Compilation System provides compilation facilities for all compilers available with the B 4800/B 3800/B 2800 systems. Program and data files are entered through terminals, and are edited and modified using the

Time Sharing module of MCP. All programs prepared for B 4800/B 3800/B 2800 systems may be executed in a time sharing or batch mode.

The remote compilation system, the time sharing module, and the program and data file editor provide users with the ability to reduce compilation and testing time, greatly increasing programmer productivity.



## Quick Contributions to Profit

Application Program Products produce vital information at low cost.

### Application Program Products

Burroughs Application Program Products provide complete solutions and allow users to make quick contributions to profit.

A user can implement application products quickly, and can also modify them and move them from one computer to another because Burroughs program products are machine-independent.

Application Program Products available with B 4800/B 3800/B 2800 systems include:

#### Manufacturing

Production Control System II (PCS II)

- Engineering Data Control Module
- Inventory Module
- Requirements Planning Module
- Capacity Requirements Planning Module
- On-Line Inquiry Module Burroughs Inventory Control System
- Analysis Module
- Control Module
- Inquiry Module Numerical Control System

#### Commercial Banking

- Item Processing System
- Demand Deposit System
- Personal Trust System
- Total Information System
- Commercial Loan System
- Installment Loan System

#### Thrift Industry

- Savings and Loan Teller Program
- Thrift System Consumer Loan System
- Time Deposit System
- Mortgage Loan System
- On-Line General Ledger System
- On-Line Credit Union System
- Credit Union Teller System

#### Hospitals

- Burroughs Hospital Administrative System II (BHAS II)
- Patient Accounting Module
- Medical Records Module Burroughs Hospital Information Processing System (BHIPS)
- On-Line Admissions Module
- On-Line Pharmacy Module
- On-Line Laboratory Module

#### Distribution Systems

- On-Line Wholesale Distribution System

#### Education

SCHOLASTIC

- Financial
- Scheduler
- Test Scorer
- Student Records
- Instructional Materials
- Payroll

#### General Applications

- Project Oriented Management Information System (PROMIS)
- Time Module
- Cost Module
- Resource Module
- Statistical Analysis System
- Linear Programming System
- Discrete Change Simulation Language
- Mathematical Programming System



## Ready Processing Power

New levels of system availability result from distributed power sources, program diagnostics, and an automatic environmental monitoring system.

Each system can diagnose itself and its environment. Should some standardized component malfunction, it is quickly and easily identified and the situation corrected through a new level of man/machine relationships.

### New Maintenance Techniques

B 4800/B 3800/B 2800 computers are capable of monitoring system performance. Through a combination of newly designed hardware and software, each computer can detect and isolate a malfunction.

As a result, the field engineer spends time correcting a situation rather than trying to isolate the nature of the problem. The practical result to the user? Processing power is available when needed.

### Snap Processor

The Snap Processor monitors the status condition of the main processor circuitry as it performs each operation cycle, and reports that condition to special field engineering software. It compares the conditions to known test patterns to determine if the main processor performed each operation cycle correctly.

Additionally, the special field engineering software allows the field engineer to create customized test cases at the console and then execute them with the Snap Processor.

The Snap Processor and field engineering software allow the field engineer to quickly isolate processor malfunctions and to take immediate corrective action.

### Automatic Environmental Monitoring System

Automatic Environmental Monitoring allows B 4800/B 3800 users to react to potentially harmful environmental conditions before they cause damage to the system and create downtime. The result? More hours of uninterrupted work, meaning more performance at less cost.

If the temperature rises above an acceptable level, a warning light on the processor is illuminated and a warning message is sent to the operator at the Operator Control Station. The condition is also recorded in the field engineer's maintenance log for future

reference. The warning light and message are continued until either the temperature level drops to an acceptable level or rises to an intolerable level. An intolerable temperature causes the system to store the in-process programs and data and bring itself to an orderly shutdown. Restart can be initiated when the temperature level becomes acceptable for safe operation.

The B 4800/B 3800 systems also monitor the power source. Power fluctuations, which indicate potential brownout conditions, are recorded in the field engineering maintenance log for future reference and investigation.



## Effective Conversion

Users of other manufacturer's equipment can move to Burroughs B 4800/B 3800/B 2800 systems with maximum efficiency using Burroughs Program Product Conversion Aids.

### Program Product Conversion Aids

Burroughs basic philosophy is to reduce data processing cost by using high-level languages effectively. The result? A dramatic reduction in cost of equipment and personnel.

Burroughs conversion aids offer the user more than an ability to execute his work on different hardware. They represent an opportunity to take a large leap forward in data processing and to reduce cost.

Burroughs conversion aids allow users of other systems to quickly take advantage of the capabilities of the B 4800/B 3800/B 2800 systems. They translate existing programs to COBOL source statements that can be recompiled into the native language of the B 4800/B 3800/B 2800. Many benefits result from this conversion technique. Some of the benefits are:

- Improved Program Maintainability. Programs can be maintained at the source level in an easy-to-use high-level language.

- Complete Documentation COBOL automatically provides complete documentation that is easy to read and maintain.
- Cost-Effective Processing. The recompiled programs are in the native language of the B 4800/B 3800/B 2800. Therefore, they will be executed at maximum speed and efficiency taking full advantage of all the capabilities of the B 4800/B 3800/B 2800 systems, such as a fully automatic operating system, a more productive operations and program staff, and greater production throughput.

Burroughs will assist in planning for and carrying out system conversion from start to finish.

First—With an objective evaluation of immediate and long-range requirements.

Second—With an equipment recommendation to meet requirements at the lowest costs now, and provide for orderly, economical system growth.

Third—By developing cost-justified conversion solutions and a schedule for their implementation.

Fourth—With professional guidance and counsel in using Burroughs conversion aids to speed key aspects of the conversion process.

Fifth—With professional training courses for system managers, operators, programmers, and analysts.

Burroughs Master Control Program (MCP) offers valuable assistance in conversion. It provides programming and operating system independence, and protects against future operating system conversions. Automatic functions replace many of the utility programs usually necessary with conventional computer systems. MCP is very powerful yet extremely easy to use, and fully proven.



