## Burroughs

# **On-Line Disk File System for Data Storage and Data Communications**

A major breakthrough in performance and capacity for random access information storage, retrieval, and processing



Burroughs On-Line Disk File System is the first random access memory device to combine large scale storage capacity with the

extremely high performance abilities required by today's advanced information processing systems. It provides speed and productivity many times greater than conventional disk systems. And unprecedented reliability—an absolute requirement for effective management control.

This breakthrough opens important new dimensions in information processing. Established record systems and procedures previously considered too complex or unwieldy for automation can now be handled with ease.

The unmatched applications power of random access systems is also made practical, for the first time, for a broad range of businesses, large and small. Disk File Systems are provided for Burroughs low cost B 200 EDP Systems, as well as for the large scale B 5000 Information Processing System.

Firms of every size can benefit from total management systems. More timely management information. Centralized command and control for networks of company facilities. Instant computer communication with remote inquiry stations.

This folder introduces some of the new capabilities and advantages of the new Burroughs Disk File System.



#### **BURROUGHS** On-Line Disk File System

#### Higher performance through new accessing techniques

**SPEED.** Many times the speed of conventional disk files. Average access time to any record 20 milliseconds. Data transfer rate 100,000 characters per second.

**EFFICIENCY.** Major improvements in file addressing and organization, use of storage capacity, data processing efficiency.

**RELIABILITY.** All-electronic operation and control replace mechanical operations—a major source of error in previous disk systems.

**MODULAR CAPACITY.** Much higher density in data packing. Up to almost a billion alphanumeric characters (960 million) available in small independent four-disk modules (9.6 million characters). **HEAD-PER-TRACK.** A separate read/write head is fixed over each track of information on the disk surface. For the first time, the powerful and reliable read/write technique used in high speed magnetic drums has been combined with the low cost, large scale storage capacity of the disk. Electronic switching replaces slow and costly mechanical arm accessing. Each addressable location is available in an average of 20 ms—because all data is located the same "distance" from the computer.

**CONTROLLED HEAD GAP.** A microscopic gap is maintained between read/write heads and the disk surface—with absolute reliability. A "fail-safe" head retraction mechanism prevents any contact with disk. Heads are completely self-adjusting.

**DISK SURFACE IMPROVEMENTS.** New plating methods produce a better recording surface on disks making possible higher packing density.

**FLEXIBLE DATA SEGMENTS.** Designed for variable length record storage in selectable, sequential segments of 96, 240, or 480 characters. Multiple segments can be addressed, read, and written to meet a variety of record requirements.

**ALL-ELECTRONIC ACCURACY CHECKING.** Data is checked electronically for accuracy during all read and write operations; a read-after-write check is performed without tying up the computer.

**RELIABLE COMPONENTS.** Highly reliable plug-in type solid state electronic assemblies simplify the task of equipment maintenance. Each four-disk module is sealed against dust and dirt.



design and manufacture of disks and read/write heads are the basis for the great improvements in information processing power in Burroughs Disk File System. These advances involved the combined accomplishments of Burroughs scientific and engineering research, product development, and production staffs. New techniques in chemistry, physics, and metallurgy were incorporated. From these advances, the user obtains an information processing tool with greater speed, capacity, and reliability.

Most responsive surface ever developed for magnetic disk recording enables this small disk to store almost two and onehalf million characters of information. An extremely high polish is given to the metal surface, producing an ultra-microscopic smoothness and flatness. Disk surface must pass inspection by instruments which detect unevenness measured to less than a millionth of an inch.

Dramatic new chemical and metallurgical techniques are also involved in achieving a plating many times thinner than conventional disk surfaces, to allow much higher density recording.



Head-per-track disk system required revolutionary accomplishments (1) in designing miniaturized multiple-head assemblies; (2) in the ability to "fly" heads within a microscopic gap of the disk surface with absolute reliability. Production of small scale, ultra-precise components requires highly skilled personnel. All but these more critical assembly operations are handled by automated production facilities. This disk unit illustrates the easy accessibility to assemblies for equipment maintenance. Each disk-plate surface stores 1.2 million characters. Superior speed and reliability result from the replacement of mechanical linkages with electronic circuits—only the disk moves.



**B** 5000 Burroughs B 5000 solid state electronic information processing system, with its highly advanced capabilities for effective use of higher-level languages, for automatic self-regulating operation, and for multiple job processing, now has the added capability for on-line disk storage of from 9.6 million to 960 million alphanumeric characters of information.

The tremendous power of the B 5000 can now be extended to exercise an unprecedented degree of automatic control over large scale management information systems with combined applications. It will provide centralized control for broad networks of production, marketing, warehousing, and other facilities, centrally or diversely located, even separated by hundreds or thousands of miles. It will provide instant response to interrogations from hundreds of remotely located inquiry stations.

Extensions of B 5000 ALGOL and COBOL will permit Disk File programs to be written in these powerful programing languages.



Disk File System with five storage modules (48 million character capacity)



**B 200** The workhorse productivity of Burroughs B 200 Series of EDP Systems is now also expanded through the addition of Disk File memory capabilities. From 9.6 million to 480 million alphanumeric characters of on-line random access information storage may be provided for the low cost B 200 punched card, magnetic tape, and MICR systems.

With B 200 Systems, as with the B 5000, Burroughs Disk File operates as a standard, integrated input/output unit, performing in perfect balance with the other system components. Burroughs Disk File is the first with the ability to match the performance of the high speed input/output devices used in B 200 Systems.

Small and medium size businesses can now implement economical total system approaches to data processing, and incorporate applications beyond standard accounting and record-keeping, to provide management with more complete and more timely control information.

#### INQUIRY AND COMMUNICATIONS SYSTEMS

In addition to Disk File storage capabilities Burroughs B 5000 and B 200 Series EDP Systems are now provided with facilities for diversified on-site and long distance inquiry and data communications networks. Centralized records and data processing operations can be tied in with information sources at remote locations, and will provide instant on-line response to interrogations and input data from a large number of inquiry stations. Communication networks may include a maximum of 15 teletype and typewriter terminals in any combination.



Teletype inquiry stations (up to 5,985) may be located as far away from the computer system as telegraph lines permit. Operation is completely buffered to and from the computer with buffer capacity of up to 240 characters. When not used for direct computer communication, teletype stations may be used for normal teletype network operations. Typewriter inquiry stations (up to 120) may be used for remote "in-house" interrogation and data communication up to 2,000 feet from the computer. Operation is completely buffered to and from the computer with a separate input buffer for each typewriter on the network. The typewriter network can accept up to eight inquiries simultaneously on the same net.

#### A GREAT NEW TOOL FOR BUSINESS MANAGEMENT.

All the significant facts about your business at your fingertips. Management reaction time can be reduced in responding to competitive opportunities and correcting problem areas. With complete electronic reliability.

**FASTER JOB PROCESSING.** Extremely low access time. Matches the performance of other input/output units, even when multiple accesses are required per transaction. Data transfer at 100,000 characters per second makes possible unprecedented sorting, file scanning, file dumping, and report generation speeds.

**IMPROVED EFFICIENCY-MORE EASILY ACHIEVED.** Access time to all records is equal: no need to arrange complicated "cylinders" of data to overcome head positioning problems. File addressing and organization are improved and storage used more efficiently. Each transaction instantly updates all affected records. First practical use of randomizing and indirect addressing.

**COST ADVANTAGES.** Many times the productivity-per-dollar of conventional disk systems. Competitive with magnetic tape systems, with broader benefits tape systems cannot match.

**MORE INFORMATION IN LESS SPACE.** Extremely high packing density for data. Almost 2½ million alphanumeric characters per disk. Independent four-disk modules (9.6 million characters) may be field installed. A system may use from one to 100 modules, tailored to exact requirements, permitting buildingblock approach in constructing a system, and complete freedom to increase capacity at any time. Maximum storage almost a billion characters (960 million).

**SIMPLE PLANNING REQUIREMENTS.** Requirements for preinstallation planning, systems design, and programing are much simpler than with conventional disk systems.

**EASY MAINTENANCE.** Improved data organization makes file maintenance a much easier task. Component reliability and the elimination of complicated mechanical parts reduce the amount of equipment maintenance.

**PROGRAMING.** Comprehensive software packages are provided for use with B 5000 and B 200 Disk File Systems, to assist the user in bringing the system into efficient operation quickly. These include a Disk File Sort Generator, Disk File Report Generator, and a large variety of operating control programs.

**APPLICATIONS:** Burroughs Disk File System provides applications power far beyond conventional electronic data processing systems. While many new applications will be identified, the present list of practical Disk File applications is already impressive. Here are a few of them: FINANCIAL: Consolidated demand deposit, savings, loans, trust accounts. Teller inquiry and processing systems. MANUFACTURING: Improved management information systems. Interaction of entire business cycle: sales forecasting, requirements planning, inventory management, production scheduling, pur-chasing, accounting DISTRIBUTION INDUSTRIES: Pre-billing order entry systems for wholesale groceries, hardware, drugs, automotive parts, electrical equipment, etc. Centralized warehousing, inventory and credit control for chain, retail and discount stores. HOSPITALS: Patient charges and insurance accounting. Patient care evaluation. Best patient therapy. Medical records and diagnosis. **INSURANCE COMPANIES:** Consolidated functions for life and fire & casualty GOVERNMENT: Local government fund and appropriation accounting. State government driver licensing and control, employment security. Federal government single manager plans COMMUNICATIONS: Consolidated subscriber records, service order and cable pair assignment processing SCIENTIFIC: Remote "Compile and Go." Auxiliary memory for operating systems, tables, subroutines, and "scratch storage." New applications for: PUBLIC UTILITIES MAIL ORDER MERCHAN-DISING AIRLINE, MOTEL, AND HOTEL RESERVATIONS SYSTEMS CENTRALIZED CREDIT AGENCIES INFOR-MATION RETRIEVAL





### **Burroughs Corporation**

"NEW DIMENSIONS / in electronics and data processing systems"

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And we hope you'll find some ideas in it that you can use to profit... If you would like to know how our products might be used in your business, call our nearby branch. Or write Burroughs Corporation, Detroit 32, Michigan. Thank you for your interest.

Sincerely yours,

KEN T. BEMENT Vice President, Marketing