



System

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This is a photo of a design model.

System/32 Description

The IBM System 32 is a new compact low-cost data processing system offering system capabilities to the smaller business.

The system is operator-oriented and can be adapted to a wide variety of user processing needs.

Highlights include:

- Keyboard entry of data
- Operator controlled processing
- Large capacity disk storage
- Diskette capability for data input, output, and data interchange
- Printed output in a variety of speeds
- Display screen providing output and operator guidance
- Communications capability BSC or SDLC
- Programming support

System Control Program

- Provides disk system functional capabilities
- Powerful Operation Control Language (OCL) recognizes oneword commands and has logical "IF" capability
- Complete SCP utilities, including those for diskette
- Disk History area records OCL, messages, and responses
- Telecommunications using either BSC or SDLC

Program Products

- RPG II with buffered keyboard Interactive Data Entry (IDE) and Auto Report
- Utilities Program Product includes Sort, Data File Utility (DFU), and Source Entry Utility (SEU)

Hardware Description

Processing Unit

- 600 nanosecond main storage cycle time
- 16K, 24K, or 32K bytes main storage
- 8K bytes read/write control storage (4K 2-byte microwords)
- Overlap of I/O functions with each other and with processing. (Single track seek is only operation overlapped on the diskette drive.) Processing occurs between disk storage sectors
- Technology
 - Processor - Transistor - Transistor Logic (TTL)
 - Storage - Metal Oxide Semiconductor Field Effect Transistor (MOSFET)
 - Power - Rochester High Frequency Technology (RHFT)
 - I/O Control - TTL and FET

Display Screen

- 240-character display
 - Six lines of 40 characters each
- Full 64-character set
- Provides operator guidance and output under program control
- Primary output for CE diagnostic programs



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Keyboard

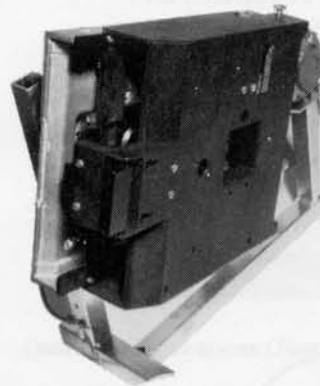
- The operator console has a familiar typewriter layout, a 10-key proof keyboard and system function keys. The top row of typewriter keys are dual defined providing 24 command keys
- All switches, operator controls, and status indicators are located within easy reach
- Capacitive keystroke sensing

Disk Storage Capacity

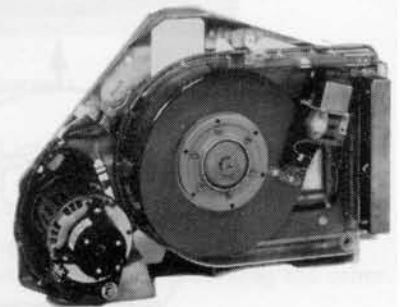
- High performance, reliable non-removable disk storage
- Capacity options: 5.0 or 9.1 million bytes of storage (depending on model)
- Access times (excluding latency) range from 13 msec minimum to 180 msec maximum with an average access or 70.0 msec for the 5.0 MB Disk; 14.2 msec minimum to 167 msec maximum with an average access of 72.5 msec for the 9.1 MB Disk
- 889 kb/sec nominal data transfer rate

Diskette Unit

- Uses low-cost, reusable, removable media
- Offline data entry possible via 3741/3742
- Provides load/dump backup facility
- Provides data interchange with other systems
- Reads at rates up to 3400 128-byte records per minute and writes and verifies at rates up to 1800 128-byte records per minute
- 31 kb/sec nominal data transfer rate



Diskette



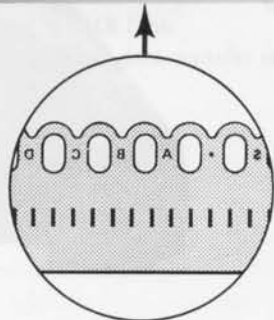
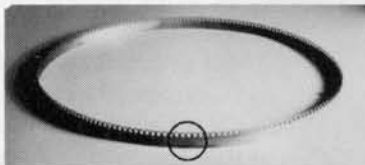
Disk



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Line Printing

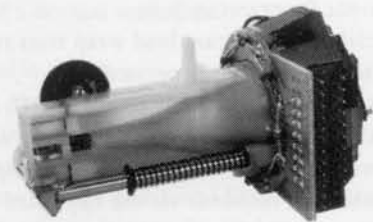
- 132 print positions
- 48 or 64-character set easily changed engraved font print belt
- Available in three nominal print speeds (depending on model):
 - 50 lines/minute - with either character set
 - 100 lines/minute - with either character set
 - 155 lines/minute - with 48-character set . . .
120 lines/minute with 64-character set
- Up to 6-part continuous forms



Print Belt

Serial Printing

- 40 or 80 characters per second (depending on model)
- Highly legible matrix printing
- 64-character set, 132 print positions
- Bi-directional printing
- Up to 6-part continuous forms
- Single form/ledger card capability similar to a typewriter



Wire Matrix Print Head

Data Communications (Feature)

- Synchronous Data Link Control or Binary Synchronous Communications
- Integrated modems (1200 bps or 2400 bps)
- Transmission speeds range from 600 bps to 7200 bps
- Data transmission overlapped with processing and other I/O operations except the diskette
- Communicates with a variety of systems and terminals



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Maintenance Package

- MAP charts
 - Easy to Use - Integrated with the Introduction and Maintenance Manual, Diagnostic User's Guide, Parts Catalog, and Installation Instructions
- Other documentation includes:
 - Theory/Diagrams MLM
 - System Logic Diagrams
 - Microcode Program Listings
- Diagnostic Programs include:
 - Initial microprogram load wrap tests run each time system load key is depressed
 - MAP/Diagnostics - Integration (MDI). Essentially MAPs converted into diagnostics run at electronic speed. May call for CE probing via display screen or printer. CE responds via the keyboard or CE panel. Failing FRU callouts will be made via display screen or printer similar to MAP type callout
 - System Test Exerciser - used to check for correct system operation.
 - FRIENDS Exerciser - CE can "build" sequences of disk operations
 - Diskette Alignment Test - Electronically determines head position relative to prerecorded track on CE diagnostic diskette
 - Timing Tests - Special tests for special purposes. Example: Line Printer Hammer Fire Test.

Hardware Service Aids and Features

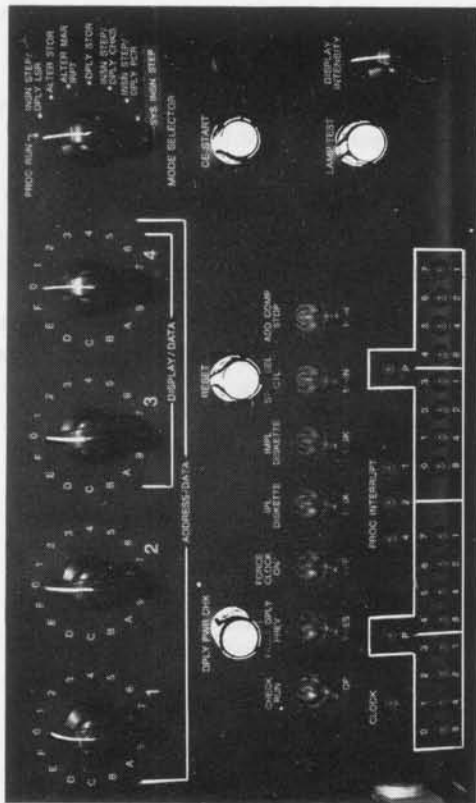
- No scheduled P/M
 - Product design eliminates need for scheduled P/M.
 - Design improvements include:
 - Sealed Disk Storage
 - Print Belt
 - Stepper Motors
 - No Replaceable Air Filters

All cleaning and lubrication required will be done at the completion of a normal service call.

- CE Panel includes:
 - Step Mode - Micro and system instruction level
 - Display - Storage, Local Store Registers, Check Bytes and Indicators
 - Alter - Storage and Local Store Registers
 - IMPL - From Disk or CE Diskette
 - Address Stop
 - Force Clock - Forces CPU Clock to run
 - Check Stop Override
- Power Failure Indicators:
 - Failures detected include:
 - Over voltage (OV)
 - Over current (OC)
 - Under voltage (UV)
 - Failure information stored includes:
 - Type of failure (OV, OC, or UV)
 - Which supply failed
 - Which voltage failed
 - Two separate failure incidents can be stored.
 - Either failure can be displayed - past or present.



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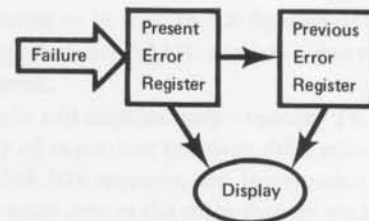
Pannel

Error Retry

- Many system level errors are retried. The decision to retry is made by the microprogram and depends upon the ability to preserve data integrity.

■ Error Logging

- Approximately 3.5K bytes are reserved on disk for error logging.
- Errors are recorded for:
 - I/O soft and hard stops
 - CPU machine checks (except hard stops)
- Error Recording is arranged into tables:
 - Error History Table
 - Error Counter Table
 - I/O Counter Table
- A CE Program is provided to interpret, format, and print the error information contained in the log areas.



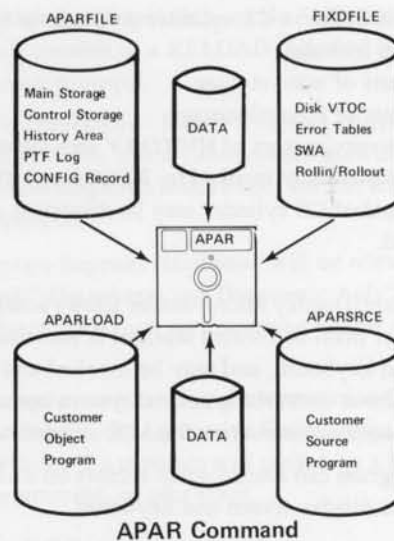


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Programming Service Aids/Features

- APAR Command writes the following information relating to problems on a diskette
 - Main and control storage dump contents
 - HISTORY area on current OCL/operator interactions
 - PTF log
 - CONFIG record
 - Disk VTOC
 - Hardware error tables
 - Copy of SWA
 - Rollin/rollout area
 - Source program*
 - Object program*
 - Data file(s)*

*Optional with additional entries



The APAR diskette can be sent to support APAR submission or be used by CE for deferred support activity. Reduces APAR abeyance due to lack of documentation.

- Dynamic and continuously - running TRACE. Keeps a history of supervisor transient calls, relocating loader calls, disk IOS requests, etc. Information is logged into a wrap area in the main storage nucleus; selection of items to be included is provided by the TRACE command.
- HISTORY area contains a history of most recent system events (OCL commands and statements, error messages, and operator responses).



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- Automatic dump to CE cylinder on program failures
This dump includes:
 - Contents of main storage
 - Contents of control storage
 - Last twenty sectors of HISTORY area Dump may also be manually invoked by RESET and START. Contents of CE cylinder may be displayed or printed.
- Storage Alter/Display Microroutine allows access to any part of main or control storage. It uses the display screen and keyboard, and may be invoked and terminated without disturbing normal system operation. Also included in instruction TRACE capability.
- Patch Program can alter/display sectors on disk or diskette; uses display screen and keyboard.
- PTF Program can apply corrections to S,P,O, or R modules; will execute with or without checksum, depending on type of PTF (formal or field developed).
- BSC Debug Facility traces control and data area information for BSC operations. Does not require recompilation for use.
- BSC Automatic Wrap Test: Automatically called when an unrecoverable BSC error occurs. Based upon test results, a message is displayed indicating whether the error was caused by the BSC Adapter or Modem (if IBM).
- PTF distribution on diskettes. Each PTF diskette contains all current PTFs; mass apply or install PTFs individually. Distribution is by ASG's subscription to PID.

- Simplified SCP Installation. No SYSGEN is required install consists of a RELOAD followed by configuration prompts.
- HIPO (Hierarchy - Input - Process - Output) Diagrams used in PLMs. These function-oriented diagrams make problem diagnosis much easier for the PSR or Program Support CE.
- Program Support Handbook will be released as a PLM titled "Data Areas and Diagnostic Aids". It will be updated with each programming release via SLSS.
- Comprehensive Problem Determination Section, contained in the Operator's Guide, helps the user determine if a problem was caused by a hardware, programming, or user error.

Service Group

This product is serviced by GSD customer engineers.

IBM World Trade Corporation
DP Customer Engineering
EHQ - Paris, France
A/FE - New York, U.S.A.

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