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138



### **Description**

*The Model 138 is an intermediate-size computer with performance ranges between those of Models 135 and 145. Model 138 is designed for compatibility with Model 135.*

*Performance increase is achieved via hardware, software, and microcode assist on VMA2, VS1, APL. Users can achieve hardware performance equal up to 1.25 times that of a Model 135.*

*Certain devices have been integrated to the CPU via integrated adapters. These allow the devices to be attached to the CPU, with the integrated adapter performing the function of the control unit. There is no difference to the Operating System between these devices and those attached via a channel-control unit combination.*

*In addition an I/O Controller (IOC) is provided to control the following:*

- Service Panel
- Console File
- Console Keyboard Display
- Console Printer
- Line Printer

*Most announced I/O devices are supported for channel attachment via a byte multiplexer or one of two block multiplexer channels.*

*For a complete list of specific I/O devices that are supported, please refer to the DP announcement material.*

### **Compatibility**

*The Model 138 is program compatible with all System/360 and System/370 programs except time and model dependent programs.*

*DOS emulation allows the user to make a more orderly transition from DOS/VS to OS/VS.*

*System/360 Model 20 compatibility, as well as 1401, 1440 and 1460 compatibility are available as optional features.*

*To further enhance compatibility, 2314 emulation is available as an optional feature. This allows the user to execute programs on a 3340, originally written for 2314 operation.*

### **Technology**

- Advanced Bipolar Monolithic Technology (ABM)
- Cathode Ray Tube (CRT)
- Field Effect Transistor (FET)
- Monolithic System Technology (MST)
- Solid Logic Technology (SLT)
- Standard Modular System (SMS)
- Transistor-Transistor Logic (TTL)
- 400 Hz power, supplied by a 3046 Motor Generator



## Storage

The Model 138 uses FET and ABM technologies for storage. These technologies allow for larger storage sizes to be contained within the processor frame. Speed is improved by utilizing non-destructive readout.

### ■ Control Storage

Reloadable control storage is 128K of ABM storage housed on one board. Control Storage is loaded from the console file.

### ■ Main Storage

Main storage consists of .5 or 1 Meg of FET storage housed on one board. A read cycle will access 72 bits from which the CPU will operate on 18 or 36 bits under control of the microprogram.

Maintainability is achieved by means of the following:

- Parity checking of the CPU data flow and hardware checking of control features
- Microdiagnostic programs and service aids
- System diagnostic programs
  - ST/370
  - Logout Editing
- Instruction Retry
- Comprehensive CE console capable of indicating significant latches and register positions
- Keyboard alter/display function

- Device diagnostic programs to check natively attached devices
- Error Correction Code for Storage
- Functional packaging
- Power Sequence and first fault detect panel
- Maintenance Analysis Procedures

## Main System Features

### Channels

The channel configuration for the Model 138 consists of one byte multiplexer channel, 64 byte multiplexer subchannels and two block multiplexer channels. Optional features can add up to a total of 256 byte multiplexer subchannels, as well as block multiplexer shared subchannels.

### Integrated Adapters

Provision is made to attach some devices via integrated adapters. These adapters replace the control unit that is normally used to drive the associated I/O devices. The following adapters are available as optional features:

- 1403 Integrated Printer Adapter
- 3330/3340 Integrated File Adapter (This feature allows the native attachment of one or two 3333 modules or 3340 mdl A2 units).
- 3344 Integrated File Adapter (in 3340 Mode only)
- Integrated Communications Adapter

Additional adapters controlled by the I/O Controller are listed under IOC



## IOC

The I/O Controller uses an intelligent processor to control the function of the:

- Service Panel - used for off-line service and diagnostics
- 33FD Console File
- 3286 Integrated Console Printer adapter (optional)
- 3203 mod 4 Integrated Printer attachment (optional)
- Display Console with Keyboard

Communication between the CPU and devices is handled by the IOC via a CPU adapter.

## Features

- Clock Comparator and CPU Timer
- System/370 Commercial Instruction Set
- Extended Control Mode
- Dynamic Address Translation
- Channel Indirect Data Addressing
- Program Event Recording
- Interval Timer
- Time-of-Day Clock
- Storage Protection (Store and Fetch)
- OS/DOS Compatibility
- Channel Command Retry
- Conditional Swapping
- PSW Key Handling
- Extended Control Program Support
- Floating Point (includes Extended Precision Floating Point)

For a complete list of features, please refer to the DP announcement material.

## Service Highlights

### Fault Locating Microdiagnostics

These diagnostics will be loaded to check the CPU, adapter and IOC logic, before the microprogram is loaded. Loading of the microdiagnostics is automatic with a power-on sequence or initial microprogram load.

### Instruction Retry

Whenever a CPU error is detected during execution of an instruction, the processor automatically attempts to retry the operation, provided the error occurred before any main storage location, General Purpose Register (GPR) or Floating Point Register (FPR), was altered. This reduces the effects of intermittent failures.

### Error Correction Code

The Model 138 automatically corrects all single bit storage errors and detects all double bit storage errors.

### Service Aids

Microcode traces and traps, will capture significant latches and data at the time of failure. This information can be retrieved at a later time for analyses as an aid in problem isolation.

### Logout

Error data from machine checks and channel checks is logged to an Error Recording Data Set (ERDS). Editing of this logout data can be accomplished by means of EREP. For those errors that cannot be successfully logged to the ERDS, SEREP is provided to retrieve the logout from main storage, edit and print this information on a hardcopy output device.

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