IBM

4331

IBM 4331 Processor

Product Description

The IBM 4331 Processor is designed to provide a high degree of System/360 and System/370 compatibility. It features large storage sizes and new RAS enhancements. The 4331 offers enhanced levels of performance and simplicity for distributed and stand-alone data processing solutions. It provides a growth path for System/360 and System/3 users.

Its concepts include:

- Ease of installation with minimum disturbance of existing I/O configurations.
- Selectable system modes that allow running in System/370 mode or in ECPS:VSE mode (Extended Control Program Support: VSE).
- Adapters for direct attachment of certain types of DASD and tape devices.
- Attachments for direct connection of teleprocessing lines and basic I/O units.
- Byte/Block multiplex channels for attachment of I/O units.
- Support Processor for maintenance.
- 5424 Adapter.
- Remote Support Facility (RSF).
- Enhanced System/370 architecture.
- Uses an IBM 3278-2A as a Display Console for the customer console and as the CE input/output device.
- Provides connectors for attachment of certain combinations of up to fifteen (15) 3278, 3287, and 3289 devices.

Most I/O devices are supported for channel attachment via byte or block multiplexer channel.

For a complete list of supported I/O devices, refer to the DPD announcement material.

Technology

- Bi-Polar LSI logic
- FET-LSI
- MST
- ELSI (Early Large Scale Integration)
- 208/230 VAC 1 Phase
- Ferro-Resonant Power Supplies

Main System Features

The 4331 processing unit, storage, and channels are functionally packaged and executed in new high density circuitry.

Processing Unit

Uses microcode to decode machine instructions. Processor cycle time is 200 to 1600 nanoseconds.

Storage

Main storage is offered at 0.5 MB and 1.0 MB. Control storage is 64 KB or 128 KB.

Channels

One (1) byte multiplexer with 31 sub-channels and one (1) block multiplexer with 40 sub-channels are available as optional features.

Support Processor (SP)

The 4331 contains an independent Support Processor that provides support for maintenance. It is used for:
- Error logging
- Error recovery
- Error Log Analysis (ELA)
- Power and Voltage Monitoring
- Control of the Display Console and console printer.
- Control of the User Diskette Facility (optional)
- Control of the System Diskette Facility
- Control of a Remote Support Facility
- Control of the Support Bus Adapter (SBA)

I/O Subsystem

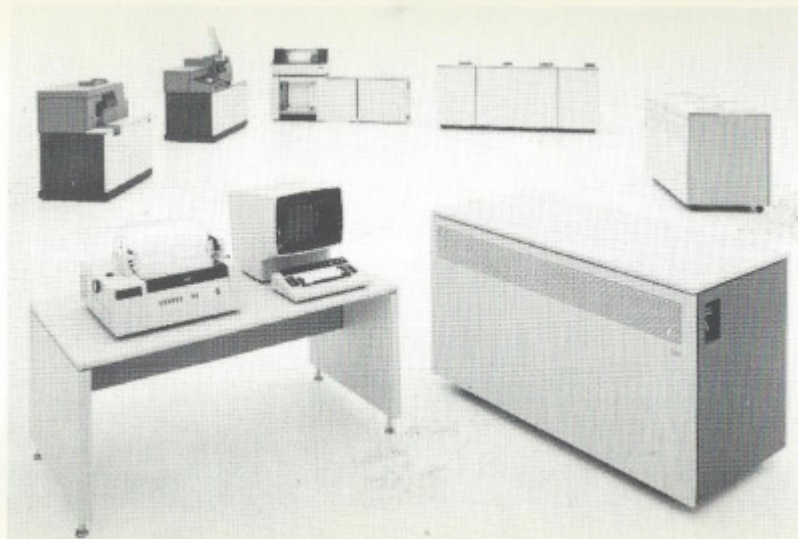The I/O subsystem contains an independent processor controlling the MFCU (5424) Adapter.

Integrated Channel Bus

The Integrated Channel Bus (ICB) carries all communications between the processing unit, I/O units, and all common subassemblies. Attached to the IC bus are:
- DASD Adapter
- 8809 Magnetic Tape Unit Adapter
- Channel Adapter
- Communications Adapter
  - Ability to attach up to eight (8) lines
- I/O Subsystem
- Support Processor

Maintainability

Maintenance of the 4331 is by the use of:
- Maintenance Analysis Procedures (MAPs)
- Error Log Analysis (ELA)
- Scan Ring Latches
- Extensive Parity Checking
- Diskette Resident Diagnostics
- Inline Diagnostic Tests for certain Adapter Attached I/O
- Fault Locating Diagnostics
- New System Test (NST)
- Error Correction Code (ECC) for main storage
- Remote Support Facility (RSF)
- Channel Sequence Logging
- CE Bring-Up Panel
- Integrated Power System (IPS) test station
- Power and Temperature Monitors EREP, FRIEND, NST, and OLT-SEP/OLTEP will support channel attached I/O.

Photo is of a Design Model

Compatibility

The 4331 is compatible with System/360 and System/370, provided the programming adheres to the rules as described in the IBM 4300 Processors System Principles of Operations (GA22-7070).

Two modes of operation are available. The mode is selected at Initial Program Load (IPL) time.
- System/370 mode with ECPS: VM/370 assist as a performance option
- ECPS: VSE mode

The 4331 is supported by applicable releases of DOS/VSE, OS/VS1, and VM/370.

Emulation features for easy transfer from System/3 and 1401/1440/1460 Series are available.

For additional information, refer to the DPD announcement material.

Service Highlights

The 4331 is serviced using an eight (8) digit error code called a Reference Code, which is displayed on the console through the Support Processor (SP). The SP monitors error checking circuits and provides failure recording and isolation for machine errors. It also provides manual operations from the 3278-2A Display Console.
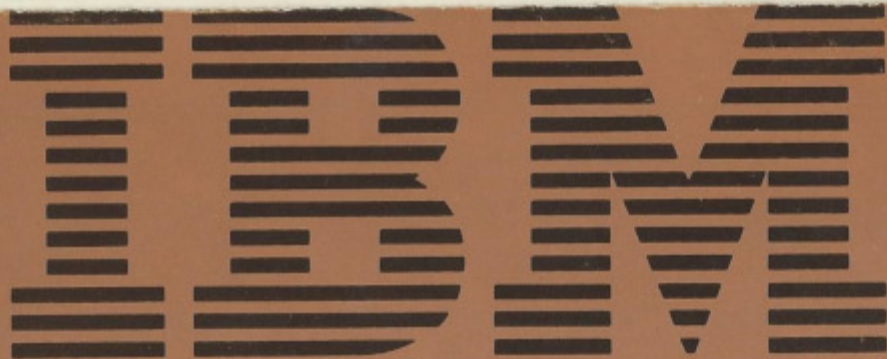
Error Log Analysis (ELA) or diagnostics provide a Reference Code to enter the MAPs. Machine errors are logged onto the System Diskette Facility and time stamped.
- Single bit error correction in Main Storage and redundant bit assignment are transparent to the customer and causes no machine degradation.
- Scan Ring Latches can report the condition of all the latches in the Processing Unit and Storage Control Units of the 4331.
- Machine Errors, Power, and Voltage are constantly monitored. Error conditions are logged onto the System Diskette Facility.
- Remote Support Facility (RSF) will provide the IBM CE with access to the TIP/DIAG File, Information Transfer Facility, Installation Incident Facility and Reference Code Data Bank. RSF will allow console operation from a remote IBM terminal or an IBM 3275 with switched line dial capability.

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