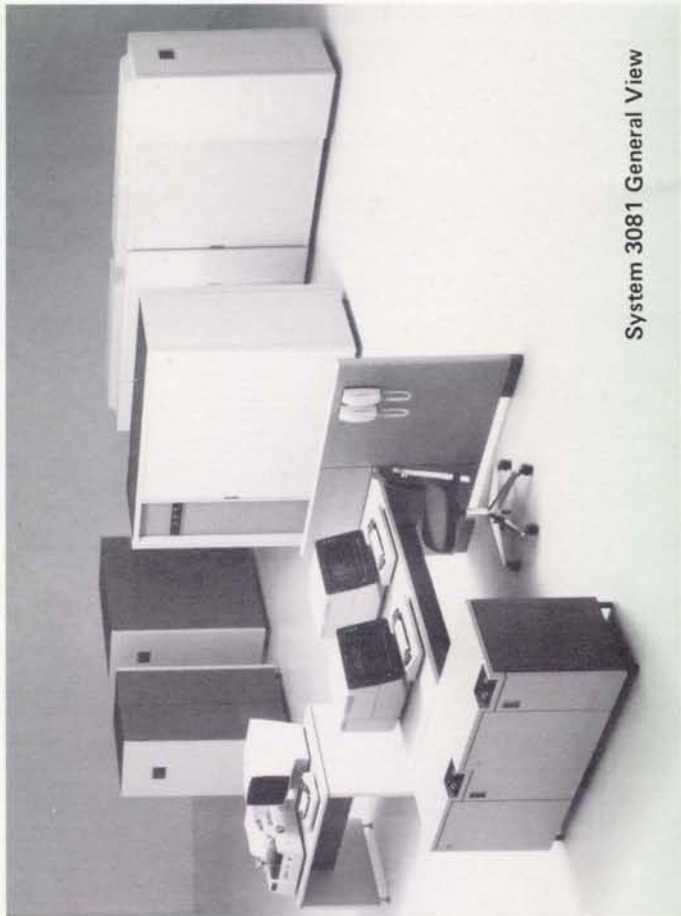


3081

Processors





System 3081 General View

3081

Processor Complex

3081

Technology

3081

Processor Model K

3082

Processor Controller

Remote Support Facility

Field Logistic



System 3081 General View

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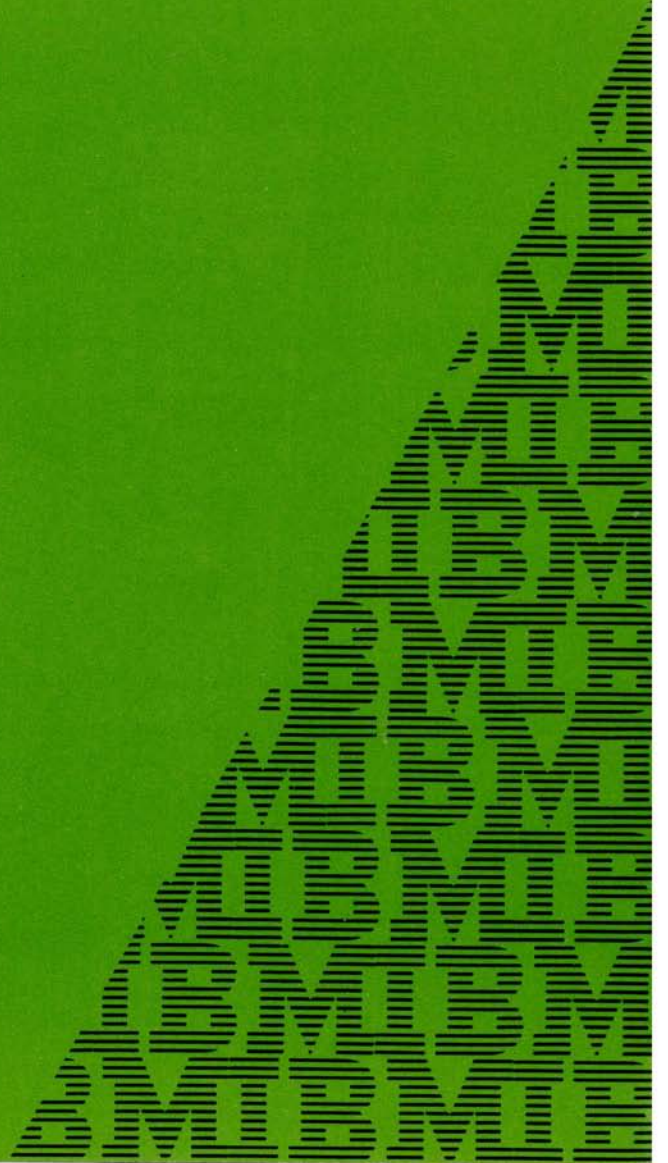
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Field Logistic

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FIELD LOGISTIC

○ Generalities

New technology (TCM and TCM boards) is very expensive and is repairable and reworkable in plant. It must be returned when not needed in the field as fast as possible.

To keep track of these parts, each TCM and TCM board has its own unique serial number.

○ Parts Tracking

To locate quickly any TCM or TCM board in the field, a data base in the plant contains the location of the parts shipped from manufacturing :

- in the CEC
- as spare parts
- in Engineering Changes
- in Sales Changes

The data base is updated with detailed field inputs :

- EC and MES installation per machine serial number
- P/N and associated serial numbers per machine serial number in case of part replacement (via a part return document)

CE stockroom is responsible for the tracking of all shelf stocks of the new technology by P/N and serial numbers.

A country part recycling coordinator has been appointed to achieve this objective as well as to ensure that all parts are returned to plants (EC, MES, Maintenance).

○ EC Management

The new technology production and reutilization is planned by manufacturing. To implement this concept :

- The complete EC/MES process will be triggered by the CE based on an agreed installation date with the customer. This date provided to manufacturing will kick-off the EC/MES production for fast delivery. After installation the removed parts will be promptly returned to plant.

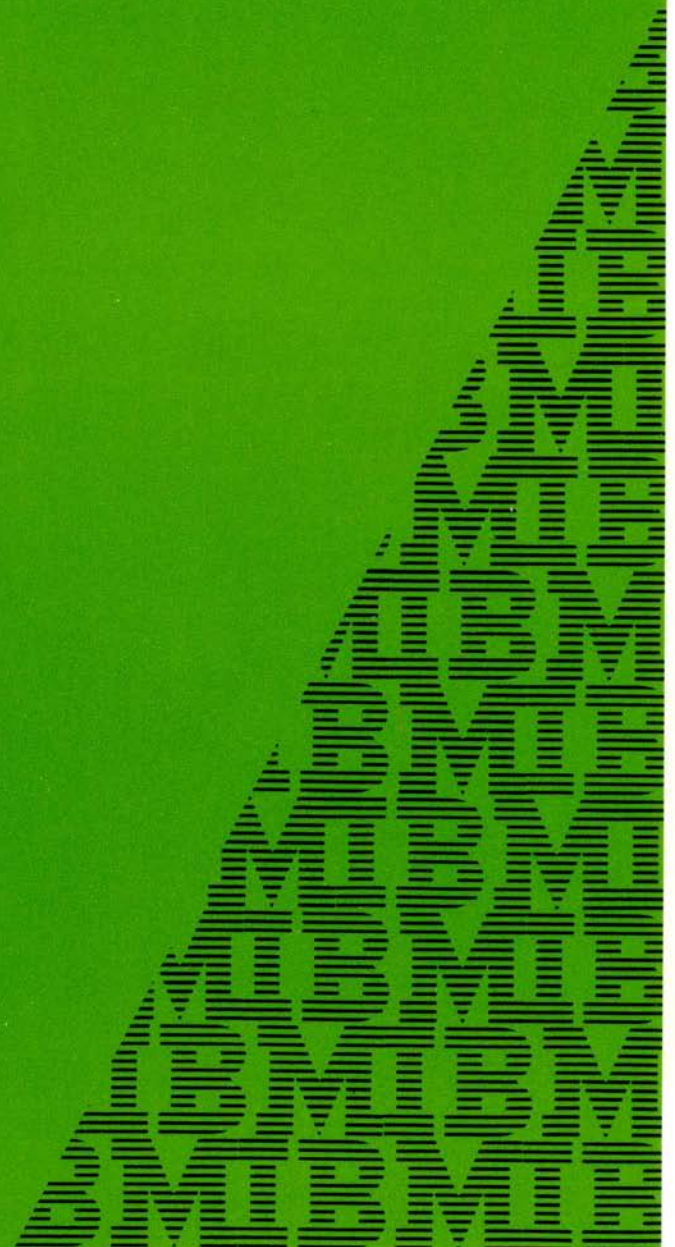
The complete cycle from production to reutilization as well as the elapsed time between all intermediate steps is measured to refine plant planning.

Remote Support Facility

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REMOTE SERVICE FACILITY (R.S.F.)

Enhances IBM Customer Engineering service by linking the customer's system to RETAIN.

○ Retain Data Bank Access

Provides on-site CE access to latest service information, increasing CE self sufficiency.

- Reference Code Data Bank for up-to-date maintenance information.
- Problems tracked by incidents automatically generated.
- "Search Facility" available on-site for Tip's (EC, FBM, FFBM) and symptom fixes.
- "Information Transfer" for quick communication from support function to on-site CE.

○ Retain Data Link Access

Increases support functions effectiveness by providing :

- "Log Transfer" to have a faster understanding of the current problem.
- "Remote Console" with the same service facilities as those available to the on-site CE (as an alternate solution 3275 point to point stand-alone console are available in each Support Center).
- A fast and direct path to transfer microcode patches.

○ TP Characteristics

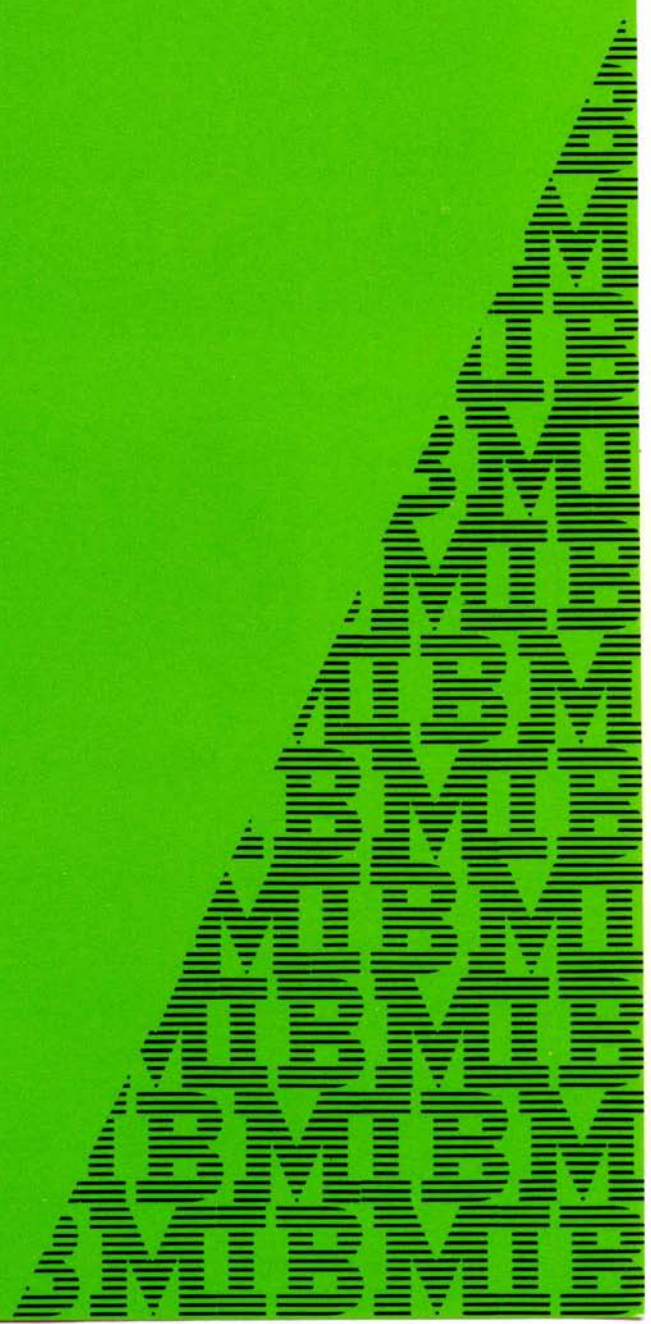
- Public switched network
- 1200 Bps. Line protocol Bi-sync.
- 38LS integrated Modem where approved or CCITT attachment card installed in Processor Controller.

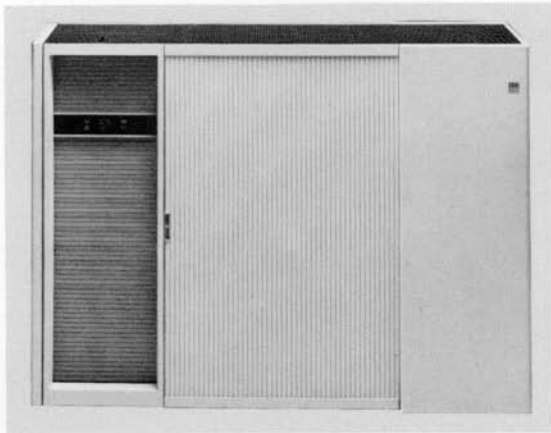
3082 Processor Controller

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PROCESSOR CONTROLLER

The Processor Controller (PC) is the center for control, monitoring and diagnostics.

The main part of this PC is the Monitoring and System Support Facility (MSSF). The MSSF can communicate with all areas of the Processor Complex.

Functions such as Power-On, Initialization, Microcode loading and Error recovery procedures are supported by the MSSF.

When a failure occurs, after recovery, Analysis Routines (AR) are automatically invoked by the MSSF. These routines attempt to isolate the failures to a single FRU. Once the MSSF has completed FRU isolation, it will post a message on the system console informing the customer of a Processor Complex error. This message enables the Customer Engineering :

- To determine what parts to bring
- To search into the Retain files
- To enter into the maintenance procedures.

Maintenance procedures provide assistance to the on site CE in areas such as :

- providing validation test's to reduce the size of a FRU group, and after the FRU change verify the repair.
- reconfiguring the system to permit replacement of FRU's
- power off and on of the involved areas

The MSSF supports also the consoles which are

- System Console (3278 - 2A)

Provides the hardware system functions for customer usage, such as IPL, system reset, start, stop

- Service Support Console (3278 - 2A)

Integrated into the Processor Controller. This console is the basic communications path between the CE and the Central Complex. It allows the CE to communicate with the MSSF for system management and service, or remote support locations via the Remote Support Facility.

- Operator Console

Channel attached via a 3274 control unit (or equivalent) it allows the operator to communicate with the Operating System. The customer is responsible for supplying the operator console.

- Remote Console

The MSSF can be connected to :

- A stand-alone console located in a Field Support Center.
- A remote console via a Retain data link.

The remote specialist has access to the same facilities in the processor controller as the local CE.

3081

Processor Model K



PROCESSOR MODEL K

The 3081 Model K series of processors contain two integrated central processors, each of which has access to a shared central storage and to all channels (only /370-XA Mode). Both processors operate under control of a single control program. Thus, the 3081 Model K series use the structure of the 3081 Model D series previously announced.

The new processor models utilize existing support units, that is:

- the 3082 Processor Controller
- the 3087 Coolant Distribution Unit
- the 3089 Power Unit (optional)
- the 3278-2A Display Console

All I/O devices supported by the 3081 Model D are also supported by Model K.

Model K Unique

The 3081 Model K achieves improved performance via:

- Doubling the size of the high speed buffers to 64KB each.
- Adding overlap to the previous machine organization.
- Internal performance: 1.3 – 1.4 x 3081 D

INSTALLABILITY

Installation time of new 3081 Model K processor complex is projected to be about one day (24 hours).

Field conversion from Model D to Model K takes approximately 14 consecutive system hours.

COMPATIBILITY

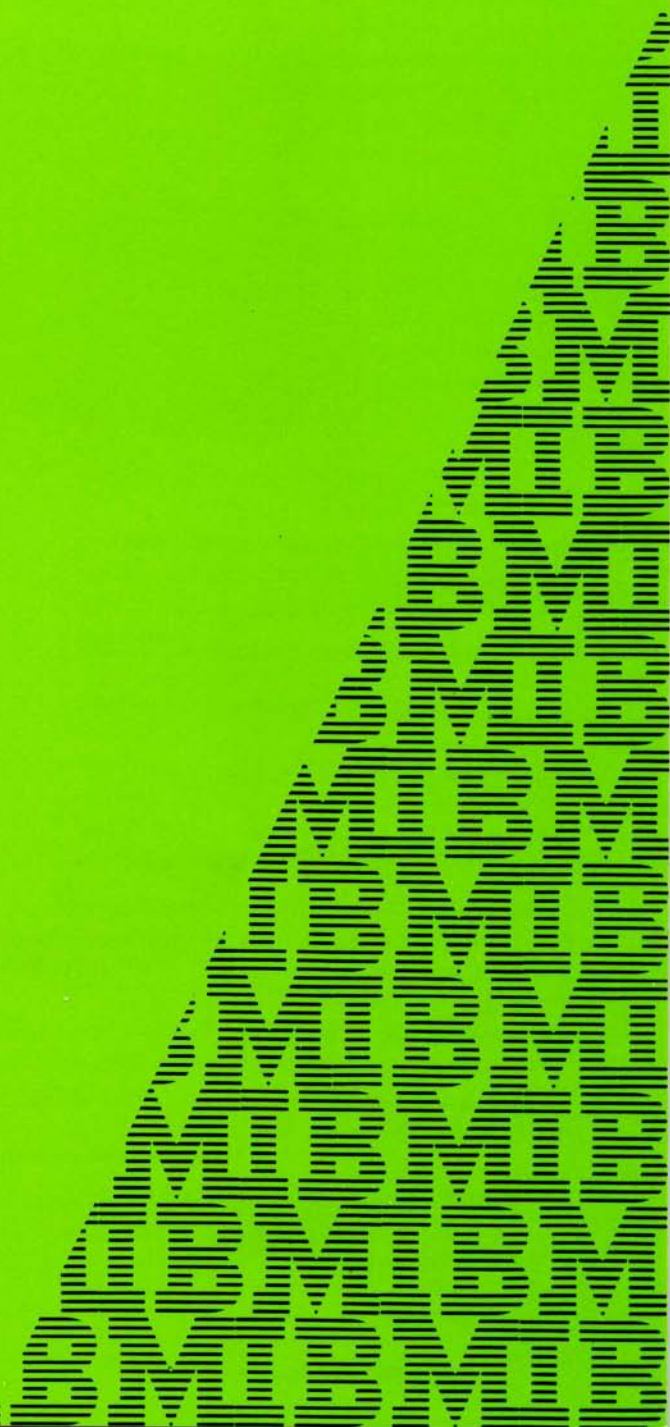
The additional mode of operation 370-XA will become available on 3081 Model K with the installation of new microcode.

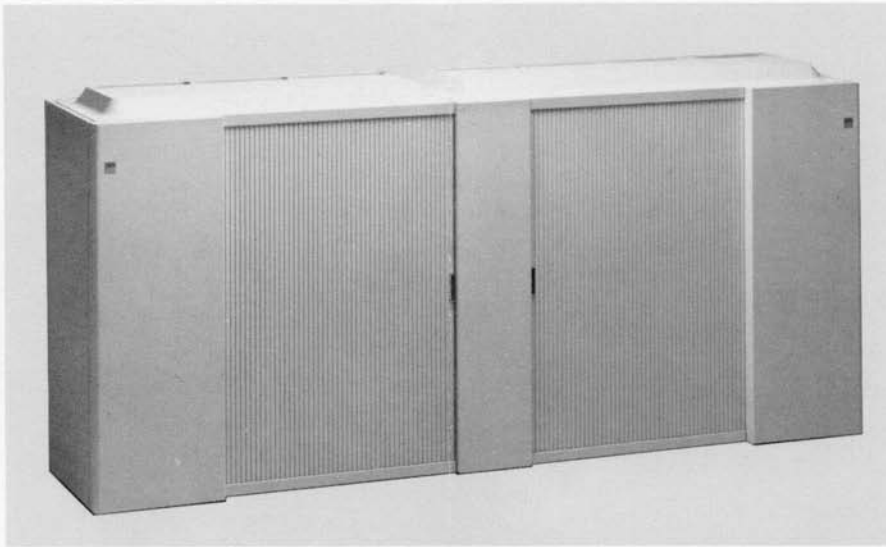
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3081

Processor Model D





PROCESSOR MODEL D

The 3081 Processor comprises the following elements:

- **Two Central Processors (CP)**

Microcode controlled — 8 TCM's each.

- **A System Controller (SC)**

Hardware controlled — 3 TCM's — which controls all communications and data transfers that occur between the various elements.

- **A Central Storage (CS)**

Composed of 4 Basic Storage Modules (BSM) 4 MB each, (cards) and 2 BSM Controllers, (TCM's)

- **An External Data Controller (EXDC)**

Which handles all data transfers to and from I/O Devices (3 TCM's)

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Central Processor (CP)

As a Dyadicprocessor, the 3081 Processor Unit integrates two CP's, within a single unit, each of which has access to a shared central storage. Channel set switching allows either processor to continue all channel activity if one of the 2 CP's experiences a failure (/370 Mode).

Each Central Processor consists of the following elements :

- Buffer Central Element (BCE)
32K cache buffer

Handles all processor references to and from central storage.

- Instruction Element (IE)

Performs all prefetching, decoding and sequencing of programmed instructions. Generates all instructions and operand addresses and initiates request to storage. The IE also executes most two and four byte logical, shift and single arithmetic instructions, and is controlled by hardware and microcode.

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- Variable Field Element (VFE)

Executes all of the byte-type storage-to-storage variable field length instructions, under microcode control.

- Execution Element (EE)

Executes all hexadecimal floating point, fixed-point multiply and divide and miscellaneous convert instructions and is hardware controlled.

- Control Storage Element (CSE)

Controls the sequencing of microcode thru the processor by use of control words stored in the CSE buffer. The buffer consists of 1024 control words of pageable storage and 1024 control words of non-pageable storage.

System Controller (SC)

The SC is the communication center for the processor complex. All communications and data transfers that occur between the other elements and storage must pass through the System Controller.

The System Controller performs the following essential functions :

- Interconnects and controls communications between Central Storage and the CP, EXDC or Processor Controller.
- Resolves conflicts between the CP's when both require the same line of data.

External Data Controller (EXDC)

The EXDC is an integrated I/O Processor containing up to 24 channels, 4 of which may be designated for byte mode operation. The remainders are block multiplexer channels permitting data rates up to 3 MB/second. The EXDC handles all data transfers to and from I/O devices external to the Central Complex, and is composed of the following elements :

- Channel Processing Element (CPE)

Provides the administrative functions such as store and fetch requests to and from Central Storage, maintains status records and dispatches operations to each of the Data Server Elements, under microcode control.

- Data Server Element (DSE)

Controls the taglines and data gates to each of the 8 channels it controls. Two DSE's are standard, a third is optional. Each DSE is microcode controlled.

- Interface Adapter Element (IAE)

The IAE's (8 per DSE) provide the data/communication link and data buffering between attached I/O devices and the DSE. In addition, they provide signal powering for the I/O interface.

COMPATIBILITY

The additional mode of operation 370-XA will become available on 3081 Model D with the installation of new microcode.

Conversion From Model D To Model K

3081 Model D are field convertible to Model K. This conversion takes approximately 14 consecutive system hours.

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3081

Technology



TECHNOLOGY

The new packaging improves the reliability by reducing the number of FRU's and the number of discrete wires.

The processor utilizes a new highly integrated circuit technology packaged in Thermal Conduction Modules (TCM).

The TCM is a helium encapsulated module measuring 125 X 134 X 35 mm.

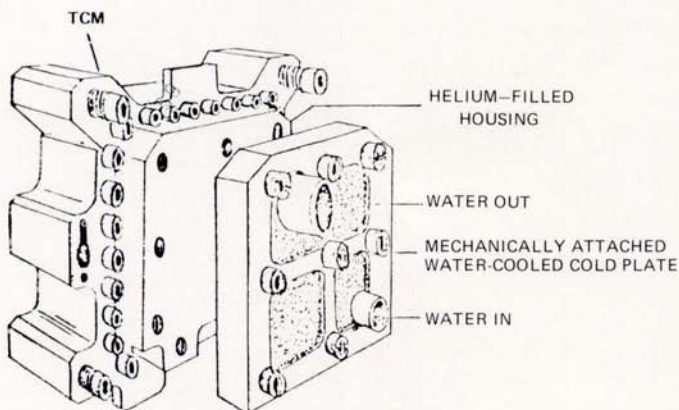
It has 1800 I/O connectors to provide power and to transfer logic signals. Inside are around 100 logic chips.

Heat generated by the circuits is conducted to the outer covering of the TCM, where a cold plate is attached (coolant is circulated through this cold plate).

Those TCM's are mounted on special boards. We have two types of boards, one which can hold 9 TCM's, the other one which can hold 6 TCM's.

On a basic machine we have two 8 TCM boards, two 6 TCM boards and twenty five TCM's (27 full configuration).

Processor Controller is card on board technology.



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Processor Complex



PROCESSOR COMPLEX DESCRIPTION

The IBM 3081 Processor Complex Models are designed to provide a high degree of compatibility and growth path for IBM general purpose, high performance, large scale computer users.

They feature improved levels of performance and two modes of operation:

- S/370 mode
- New System/370 Extended Architecture mode (370-XA)

The new mode is an evolutionary extension of S/370 architecture.

Model D and Model K of the 3081 Processor Complex will be capable of two modes of operation, which are selected at IML time.

- Existing S/370 mode continuous full compatibility with 303X.
- The new 370-XA provides for problem program compatibility with evolutionary enhancements that include:
 - Bi-modal addressing capability providing for intermixed residency and execution of programs using either 24 or 31 bit addresses.
 - Real and virtual storage address capability up to 2 gigabytes (GB).
 - New instructions added to the System/370 instruction set along with a new and extended repertoire of supervisory instructions.
 - A dynamic channel subsystem that allows any channel to operate with any central processor without CP affinity.
 - Channel path management as a hardware function.
 - An expandable I/O interruption mechanism to eight subclasses which are assignable under program control to a device or group of devices.
 - Queued I/O operations (that function similar to 3081 SIOF in S/370 mode).
 - CCW compatibility permitting execution of existing channel programs.
 - MVS/SP and 3081 having the capability to attach up to 4K devices.

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- Device addressing capability extended up to 64K unique device identifications within an I/O configuration. The ability to dynamically reconnect the 3880 Model AA4 to the first available of multiple channel paths.

The Processor Complex consist of:

— a Processor	3081
— a Processor Controller	3082
— a Coolant Distribution Unit	3087
— a System Console	3278
— a Power Unit	3089

GENERAL CHARACTERISTICS

Processor

- Instruction rate around twice the 3033 for Model D
- 26 nano second clock cycle
- Large capacity storage 16 MB to 32 MB.
- Channels 16 to 24 are integrated within the processor complex and therefore require no additional space.
- Extensive use of new dimension technology which means:
 - Less parts, less wiring.
 - Significant reductions in power, space and cooling requirements.
 - New maintenance philosophy. No scoping in the processor
 - Extensive error checking throughout
- Highly integrated technology.

Processor Controller

- Supervises and controls the Processor Complex and provides the human to machine communication mechanism. Upon demand it supplies the status of various elements within the Processor Complex.
- Card on board technology.

Coolant Distribution Unit

- Supplies cooled water to the electronics and power frames.

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System Console

- Provides the hardware system functions for customer usage. These include architected manual controls and indicators, and display frames for alter/display and system control.

Power Unit

- 400 Hz Motor Generator (Optional)

COMPATIBILITY

System/370 Mode

The 3081 is intended to operate under MVS/SP or VM/SP using dyadic—processing with shared real storage in a multitasking/multiprogramming environment. Within this environment, any 3081 processor operating in S/370 mode will execute any program written for System/370 or 303X provided that it:

- Is not time dependent.
- Does not depend on system facilities (such as storage capacity, I/O equipment, or optional features) being present when the facilities are not included in the configuration.
- Does not depend on system facilities being absent when the facilities are included on the 3081. For example, the program must not depend on interruptions being caused by operation codes not installed in some models but installed on the 3081.
- Does not depend on results or functions that are unpredictable or model dependent (as defined in the IBM System/370 Principles of Operation).

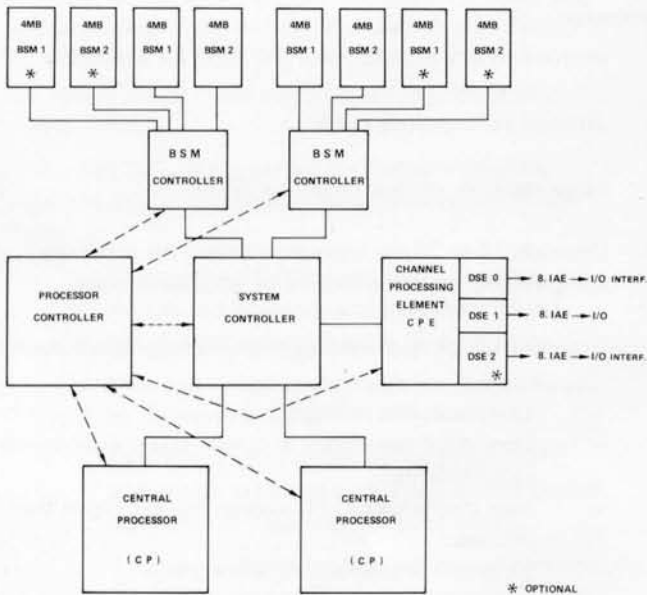
System/370 Extended Architecture (370-XA) Mode

Similarly, within this multitasking/multiprogramming environment, any 3081 processor operating in 370-XA mode will execute problem programs written to run on System/360, System/370, 303X or 43XX, provided that the program:

- Meets the first three requirements above.
- Does not depend on results or functions which are defined in the appropriate principles of operation to be unpredictable or model dependent.
- Does not depend on control program facilities which are unavailable in MVS/SP or VM/SP.

The Virtual Machine Assist (VMA) feature is extended to include Preferred Machine Assist (PMA). Preferred Machine Assist (S/370 mode) permits an MVS/SP V = R virtual machine (the preferred guest) to operate with a minimum of interpretive instruction execution and thus to achieve near its original performance.

Preferred Machine Assist also permits the preferred guest to use storage in excess of 16 MB, but only for a preferred MVS/SP 1.3 guest.



PROCESSOR COMPLEX

Standard Features

- Universal Instruction Set
- System/370 Extended Facility
- 3033 Extension Feature
- Extended addressing
- Storage Protection
- Interval Timer
- Byte-oriented Operands
- TOD Clock
- Machine Check Handling
- Channel Set Switching
- Multiprocessing
- Processor Check point Retry
- Storage Error Checking and Correction (ECC)
- Virtual Machine Assist.
- Set/Store Prefix
- Extended Precision Floating Point
- Program Event Recording (PER)
- Set System Mask Suppression
- Dynamic Address Translation (DAT)
- CPU Timer and Clock Comparator
- Store Status
- Conditional Swapping Instruction
- PSW – Key Handling Instructions
- Block Multiplexing
- Byte Multiplexing
- Start I/O Fast Release
- Limited Channel Logout
- Channel Indirect Data Addressing (IDA)
- Clear I/O
- Highspeed Transfer (Data Streaming)
- Store CPU Address
- Signal Processor
- 16 MB Central Storage
- 16 Integrated Channels.

Optional Features

- 8 Megabyte Increment of Central Storage (2 increments)
- Channel-to-Channel Adapter (1 or 2)
- 8 Additional Channels (1 increment)
- 40 Additional I/O Seq. Ports (5 increments of 8)

CE Career Path

This is a DP product.

Manufacturing Plants

- | | | |
|---|--------------|----------|
| – | POUGHKEEPSIE | U. S. A. |
| – | MONTPELLIER | France |
| – | YASU | Japan |

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