Technical Newsletter

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Prerequisite Newsletters None

IBM 4341 Processor
Model Group 1
Functional Characteristics
and Processor Complex
Configurator

This Technical Newsletter provides replacement pages for the subject publication. These replacement pages remain in effect for subsequent versions unless specifically altered. Pages to be inserted and/or removed are:

5, 6

If you are inserting pages from different Newsletters and *identical* page numbers are involved, always use the page with the latest date (shown in the change-page notice at the top of the page). The page with the latest date contains the most complete information.

A change to the text or to an illustration is indicated by a vertical line to the left of the change.

Summary of Amendments

This document contains changes in system storage requirements and removes all references to the IBM 3370 Direct Access Storage Device (DASD).

Note: Please file this cover letter at the back of the manual to provide a record of changes.

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Optional Features

Optional features on the 4341 are:

Channel Group 2:
Three Additional Block-Multiplexer Channels
(or One Byte- and Two Block-Multiplexer Channels)
Channel-to-Channel Adapter
Additional Channel Control Unit Positions
Remote Support Facility
Remote Operator Console Facility
3279-2C Color Display Console and 3287-1C
or 2C Color Printer

Note: Any combination of three 3278-2A, 3279-2C, 3268-2, and/or 3287 devices is optional on the 4341 (in addition to the 3278-2A or 3279-2C Display Console). These devices are ordered separately.

Minimum Configuration for Hardware System Maintenance

The following minimum configuration is required for hardware maintenance. The individual System Control Programs (SCPs) have their own minimum requirements depending on the SCP type and release level.

Minimum Configuration with Demountable Direct Access Storage

- 4341 Processor
- 3278-2A Display Console or 3279-2C Color Display Console
- Access to one of the following groups of devices:
  - 1 Card Image I/O device* and
  - 2 Direct Access devices** and
  - 1 Hard-Copy Output device,

  or:

  - 1 Card Image I/O device* and
  - 1 Direct Access device** and
  - 2 Magnetic Tape devices*** and
  - 1 Hard-Copy Output device,

  or:

  - 1 Card Image I/O device* and
  - 3 Magnetic Tape devices*** and
  - 1 Hard-Copy Output device.

* *Card Image* is defined as:
- Any supported Card Reader, or
- An addressable diskette input/output unit (such as a 3540) and key-to-diskette capability, or
- A magnetic tape drive and provisions for entering card-image formatted records onto magnetic tape, or
- Capability provided by the customer through his operating system facilities to create card-image format on either tape or diskette. The customer must supply an operator to key the card images at the direction of the service representative.

** Must be demountable Direct Access Storage Device (DASD).

*** If 2400 Series, seven-track, magnetic tapes are used, Data Conversion features (No. 3228 and 3236) must be installed on the 2803 or 2804 Tape Control unit.

Minimum Configuration with Nondemountable Direct Access Storage

For configurations with nonremovable direct access storage devices (DASD), the following devices constitute the minimum configuration for hardware maintenance, provided that the first forty cylinders on a nonremovable drive (other than the System Residence drive) are made available for the generation and maintenance of service programs. This space must be allocated for initial installation, for modifications to the configuration, and for the application of maintenance facility updates.

- IBM 4341 Processor
- IBM 3278-2A Display Console or 3279-2C Color Display Console
- Card Image I/O Device (See * above)
- Nonremovable DASD:
  IBM 3350 – The first 40 cylinders of a drive dedicated when required.

  Note: After use of the 3350 by the service representative, this drive may need to be reformatted by the customer for customer use.
- Magnetic Tape Device
- Hard-Copy Output Device

Additional Requirements for Installation and Operational Maintainability

In all configurations, each processor must use IBM programs (or equivalent) that provide for error recording, with elements for handling machine-check interruptions and for recording status of the processor when a failure is detected. Routines for error recording are contained in some releases of DOS/VSE, OS/VS1, OS/VS2-MVS, and VM/370. The ability of IBM to service configurations that do not meet the above requirements may be impaired with an effect on system availability. Making provisions for the Remote Support Facility (RSF) is recommended to further enhance maintainability and availability.

System Residence and Maintenance Storage Requirements

Optimum performance and maximum availability are obtained when a disk-storage facility is provided. The DOS, VS1, MVS, and VM/370 operating systems *require* a disk storage facility. These storage requirements are assumed to be attached through a block-multiplexer channel.

System Storage Requirements

A portion of processor storage is required for dynamic tables. This reduces the amount of processor storage available for user programming. Depending on the processor configuration, the reduction of available processor storage may be from 18K bytes to 117K bytes. The reduction is the sum of the requirements of user selectable options:

- Installed storage size (processor model), plus
- Number of unit control words (UCWs) selected, plus
- Mode of operation, as shown below:

Mode of Operation	*Model K1 (2 Megabytes) Processor Storage Required*	*Model L1 (4 Megabytes) Processor Storage Required*
ECPS:VSE	49,152 Bytes	51,200 Bytes
System/370	10,240 Bytes	10,240 Bytes

Number of UCWs	*Processor Storage Required*
128	8,192 Bytes
next 32	+2,048 Bytes
next 32	+2,048 Bytes
etc.,	etc.,
up to:	up to:
1024	65,536 Bytes

Compatibility with System/360, System/370, and other 4300 Processors

An important difference between the System/370 and the 4300 Processors when operated in ECPS:VSE mode is the concept of virtual storage being mapped to real storage under hardware and microcode control. *Real storage* is the amount of storage that is physically installed. The apparent storage (called *virtual storage*) can be any amount of storage that an application requires, up to 16,777,216 bytes.

Any program written for IBM System/370 can operate on the 4341 Processor in System/370 mode, provided that it:

1. Is not time-dependent.
2. Does not depend on system facilities (storage size, I/O equipment, optional features, etc.) being present when the facilities are not included in the configuration.
3. Does not depend on system facilities (such as interruptions, and operation codes) being absent when the facilities are included in the 4341.
4. Does not depend on results or functions that are defined in the *Principles of Operation* to be unpredictable or model-dependent.

Any program written for the 4300 processors in ECPS:VSE mode operates on the 4341 Processor if it follows the above rules.

Any program written for the System/360 can operate on the 4341 if it follows the above rules and does not depend on functions that differ between System/360 and System/370. The System/370 functions that differ from System/360 functions are described in an appendix of the *IBM System/370 Principles of Operation.*

For additional information about compatibility, see *IBM 4300 Processors Principles of Operation for ECPS:VSE Mode,* GA22-7070.

An important aspect of compatibility is the disk data format. With System/360 and System/370, the Count-Key-Data (CKD) architecture is used. The 4341 supports disk units with both the CKD format and Fixed-Block Architecture (FBA) formats. Existing disk volumes can be mapped onto system disk devices.

Data Representation

The 4341 is both character- and word-oriented. The basic addressable unit is an eight-bit byte (a character, two decimal digits, or eight bits). This provides for efficient use of storage and for high effective input/output rates for decimal data, variable field lengths, broad and flexible code conversion, decimal arithmetic, 32-bit words and 16-bit halfwords for fixed-point arithmetic, 32-bit words and 64-bit doublewords for floating-point arithmetic, and for instructions for such functions as translate and edit.