

The MSC9101 Mass Storage Controller offers 6/30 Model users the capability of attaching medium-capacity disk units to their system. Incorporating sophisticated hardware and firmware, the MSC9101 microprogrammed control supports the connection of up to four CDU9101/9102/9103/9104 Cartridge Disk Units in configurations of single removable cartridge disk or removable and fixed cartridge disk units.

The cartridge disk units interface with the MSC9101 via a Disk Device-Pac (CDM9101). Each Device-Pac can connect up to four disk units of the same density. Only one Device-Pac per MSC is permitted.

FEATURES

- Attaches single removable or removable and fixed cartridge disk units
- Offers disk configurations of from one to four units (2.5MB to 44.8MB)
- Enables multiple disk seeks concurrent with one data transfer operation
- Provides maximum throughput rate of 312K bytes per second
- Executes all data transfers in Direct Memory Access (DMA) mode

CAPABILITIES

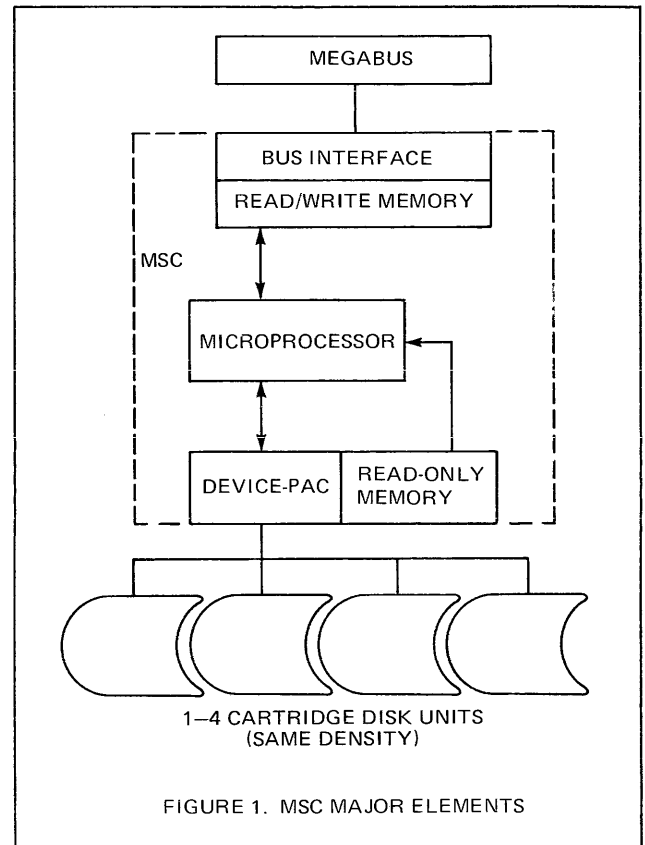
The MSC9101 performs general purpose control functions such as:

- Execution of bus sequences
- Command decoding
- Data transfer control
- Status and control register storage
- Direction of the general flow of command execution

FUNCTIONAL DESIGN

The MSC9101 consists of five major elements (see Figure 1):

- *Microprocessor* – interprets the various instructions issued by the CP program and performs the specified operations.



- *Bus Interface* – enables the dialogue between the disk devices and CP memory as controlled by firmware resident in the microprocessor.
- *Read/Write Memory* – a 256-byte read/write memory with 64 bytes of this memory dedicated to each device. The memory is used for all active storage in the MSC relative to a specific device and includes the DMA address, range, interrupt level, status, and other internal MSC working storage.
- *Device-Pac* – disk units are attached to the MSC through a Device-Pac that contains all of the hardware necessary to control one to four disk units. Functions of the Device-Pac include: device interface dialogue control, sync word detection,

check word generation/verification, device state monitoring, data recovery not performed by the device, and bit-serial-to-byte and byte-to-bit-serial conversion.

- *Read-Only Memory* – a 2K x 16-bit word ROM that is resident in the Device-Pac and contains control logic for all of the devices.

OPERATION

The Mass Storage Controller provides the 6/30 system with the facility to store and retrieve data from mass storage media. Devices attached to the controller are addressable via peripheral commands that allow read, write, and seek operations. In addition, status, control, and interrupt operations can be performed. Multiple seek operations can be performed during a data transfer.

The disk units are serviced on a rotating priority basis so that no one device will dominate subsystem usage. Data transfers are normally in word mode, but byte mode transfers are achieved by the first and/or last memory cycle of a particular data transfer when the main memory buffer begins or ends on an odd byte boundary.

CONFIGURABILITY

- Connects up to four low-density CDU9101/9102 disk units, or
- Connects up to four high-density CDU9103/9104 disk units

MAINTAINABILITY

A portion of the MSC firmware is reserved for a hardware verification routine called Basic Logic Test (BLT), which supplies a go/no-go visual indication of an MSC hardware failure. Its purpose is to verify basic data paths such that Device-Pac test routines can be loaded and run.

The BLT is initiated in the MSC in response to a Master Clear on the Megabus or an initialize command (issued by software) received on any of the four MSC channels. Results of the BLT appear as a visual indication on the edge of the MSC board and on the CP control panel. The indicator lights up during execution of the BLT and goes out only if the BLT is successfully completed.

Specifications may change as design improvements are introduced.

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