## Macintosh SE PC 5.25 Floppy Disk Controller Card: Description

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TOPIC -----------------------------------------------------------

This article describes the Macintosh SE PC 5.25 Floppy Disk Controller
Card.

DISCUSSION ------------------------------------------------------

The Floppy Controller card is capable of interfacing up to four drives
though the cable limits actual connection of only one drive. Installed by
the dealer, the card interfaces the Apple PC 5.25" Drive to the Macintosh
SE through the bus expansion slot on the Macintosh SE logic board

Through software, you can select two recording formats: IBM 3740 Single
Density Format and IBM System 34 Double Density Format. The controller
allows for multi-track and multi-sector transfer capability, permitting
the entire disk to be read/written in one read/write operation.

Full IBM PC/AT data format compatibility allows the IBM PC/AT to read
disks formatted and written by the Macintosh SE. The Macintosh SE is also
able to read data files created on the IBM PC/AT but does not give the
Macintosh SE the ability to run programs written for the IBM PC/AT.

Key Components

Control PAL's: These three 20 pin PAL's provide the address decoding and
timing control for the disk controller. All controlling firmware and
sector buffering RAM exists in the Macintosh SE. The control registers are
mapped into the Macintosh SE's address space from $800000-$8FFFFF.

Data Bus Transceivers: These 74LS245 buffers provide multiplexing control
and sufficient current drive to and from the controller onto the data bus.
During high byte transfers, data is placed on D8-15; during low byte
transfers, the data goes on D0-7.

Status Driver: The status driver allows the signals disk controller
interrupt and diskette change to be read by the Macintosh SE.

NEC 765A Floppy Disk Controller IC:  This LSI chip contains the circuitry necessary to interface to the Apple PC 5.25" Drive. Coupled with the companion NEC 9201 chip, it handles all operations with the drive including read and write data, formatting, seeking, sensing drive status, and recalibrating.

NEC 9201 Floppy Disk Interface IC: This chip provides drive and timing support to the NEC 765A IC. It contains write precompensation and phase locked loop circuitry.

Disk Interface Driver: The disk interface driver buffers and provides current drive for several signals coming from and going to the disk. It also is used as a multiplexer for four signals: FLT/TRO, WP/TS, FR/STP, and LCT/DIR.

16 MHz Crystal Clock Oscillator: This oscillator provides a 16 MHz clock to the NEC 9201 for use in the drive interface.

AMD 9516 Dual Channel DMA Controller and DMA Control PAL: The 9516 DMA controller handles all DMA data transfer operations between the NEC 765A and the Macintosh SE memory.

DMA Address and Data Multiplexing Logic: The 9516 has a multiplexed address and data bus. The multiplexing logic is used to demultiplex this bus. THe logic consists of two 74LS373's and two 74LS245's.

Interface Logic

The controller interfaces to the 68000 bus via several drivers and PAL's. The timing of the 68000 bus is followed by the controller whether in PIO or DMA transfers.

All control information is passed to the disk controller and all status information is transferred to the host using Programmed I/O transfers. All data information is transferred to or from the host using DMA transfers.

Back panel to Drive: A cable composed of a 37 pin male connector on one end and a 34 pin edge connector and 4 pin DC connector on the other. Pinouts for the 37 pin, 34 pin, and 4 pin connectors correspond to the pinouts of the Apple PC 5.25" Drive.

Power Requirements:

Operating Voltages:

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  + 5V  +/- 5%
  +12V  +/-10%
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Maximum Ripple:

```
  @ + 5V   50 mV peak to peak
  @ +12V  100 mV peak to peak
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Operating Current (Apple PC 5.25" Drive Attached)


  @ + 5V    3.3A (max)/1.9A (typ)
  @ +12V    0.9A (max)/0.25A (typ)
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