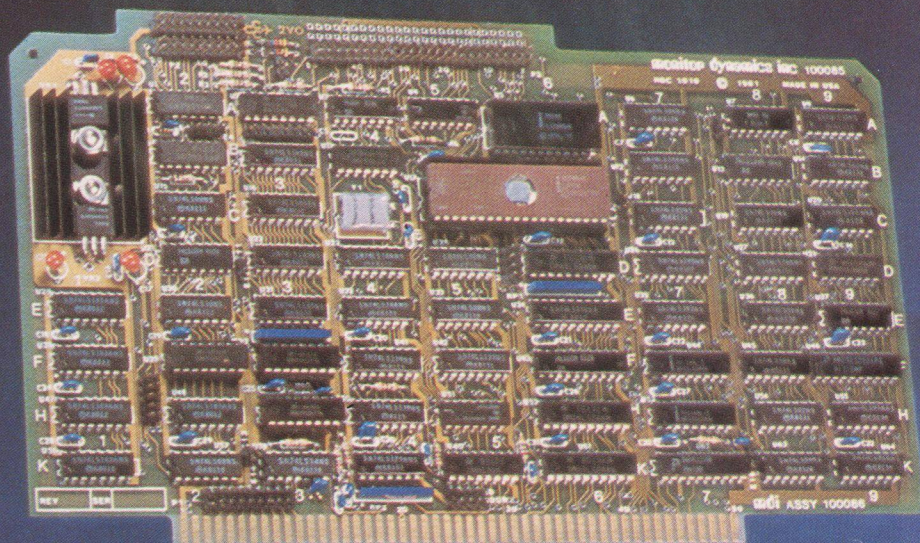


# Winchester Storage – added to your computer system the easy way!

## THE EASY DISK CONTROLLER

For Winchester Disk Drives . . . there's nothing "hard" about Winchester Disk Drives with MONITOR DYNAMICS intelligent EASY DISK CONTROLLER.



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# A World of Ease and Performance

MONITOR DYNAMICS designed the HDC-1010 series Easy Disk Controllers to interface a maximum variety of Winchester Disk Drives to any S-100 system with a minimum of complexity. The HDC-1010 interfaces to many types and sizes of drives - 5¼ inch (Seagate ST-506), 8 inch (Shugart SA-1000) and 14 inch (SA-4000) compatible, including 8 inch Memorex/Fujitsu drives. The New World Computer Mikro Disk\*\*\*\* (5¼" and 8") Drives are supported by the HDC-1110 Controller. Only four switch selectable I/O ports are used, fully compatible with the IEEE-696 standard and all known variants.

A single chip microprocessor, coupled with a simple, high-speed PROM based micro-controller provides bit-slice performance at a fraction of the cost and power consumption. Several innovative features reduce operation system overhead and drive size, including automatic seeking, soft error recovery, write verify and bad sector remapping.

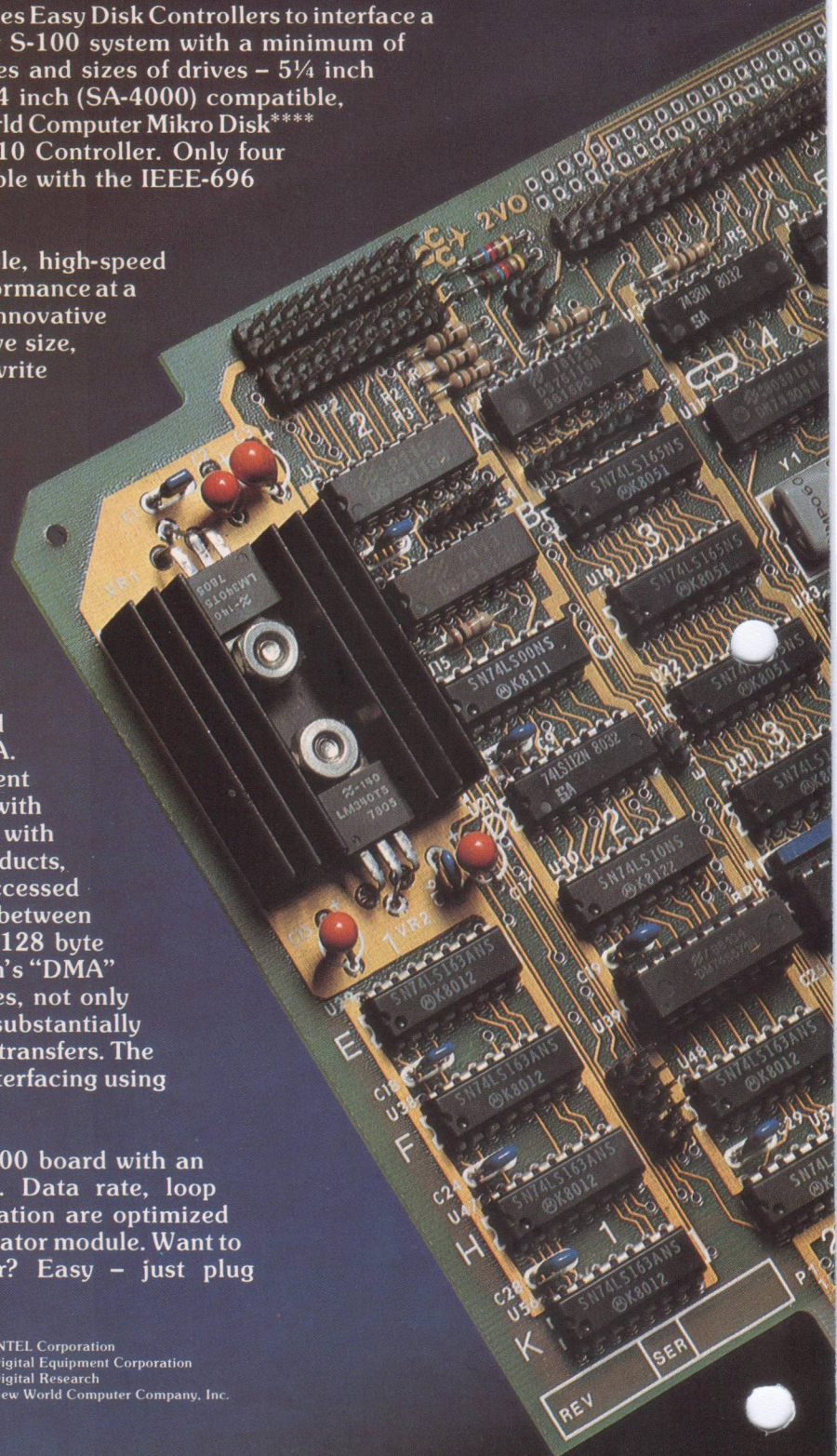
A typical disk operation requires only the new ID parameters (if any) and a read or write command to be sent to the controller, which returns an error code upon completion. What could be easier?

**DMA vs Sector Buffering:** MONITOR DYNAMICS manufactures DMA type controllers for the MULTI-BUS\*, Q-BUS\*\* and a number of custom systems. For S-100 applications, too many processors and dynamic memories are just not compatible with DMA. Most S-100 users operate in a CP/M\*\*\* or equivalent environment using sector blocking and deblocking with larger disk drives. To achieve S-100 compatibility with performance matching that of our other controller products, MONITOR DYNAMICS implemented the port accessed sector buffer so that no sector image transfers between controller and host memory are required. Instead, 128 byte records are moved to and from the operating system's "DMA" address and the controller buffer without wait states, not only freeing up to 1K bytes of system memory, but substantially reducing overhead and needless memory-to-memory transfers. The net result is phenomenal performance with trivial interfacing using an incredibly small driver - in a word, easy!

The model HDC-1010 is packaged on a single S-100 board with an optional plug-on, drive-optimized data separator. Data rate, loop response, write-precompensation and I/O configuration are optimized for each drive type by the interchangeable data separator module. Want to switch to a totally different drive manufacturer? Easy - just plug on another data separator.

\*Trademark of INTEL Corporation  
\*\*Trademark of Digital Equipment Corporation  
\*\*\*Trademark of Digital Research  
\*\*\*\*Trademark of New World Computer Company, Inc.

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## An Easy Move Into Mass Storage

HDC-1010 controller has all the features to easily upgrade your S-100 system to the high performance world of Winchester Disk mass storage.

- 1** User selectable sector sizes of 256, 512 and 1024 bytes
- 2** Intelligent controller provides simple interfacing with implied seek and error recovery
- 3** Operating system transparent re-mapping of media faults by controller with no performance penalty for normal operations
- 4** User selectable controller address and software maskable interrupt vector
- 5** Cylinder seeking routines optimized for drive type, including implementation of Seagate "fast seek" algorithm
- 6** High performance phase-locked-loop data separator optimized for drive type
- 7** Drive parameters programmable by host processor as desired to assure compatibility with future drive types
- 8** Handles up to two drives each with up to 4096 cylinders, 8 heads and 64 sectors per track
- 9** On-board sector buffer addressable as multiple records minimizing operating system data transfers, reducing system memory overhead and avoiding complicated DMA requirements
- 10** Conforms to IEEE-696 specifications using only four I/O ports
- 11** Plug-on data separator (if required) is optimized for and tested with specified drive type to minimize soft error rate
- 12** All data and header fields CRC checked

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(714) 985-7214

Bulk Rate  
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## Step into Winchester's World at Surprisingly Low Cost

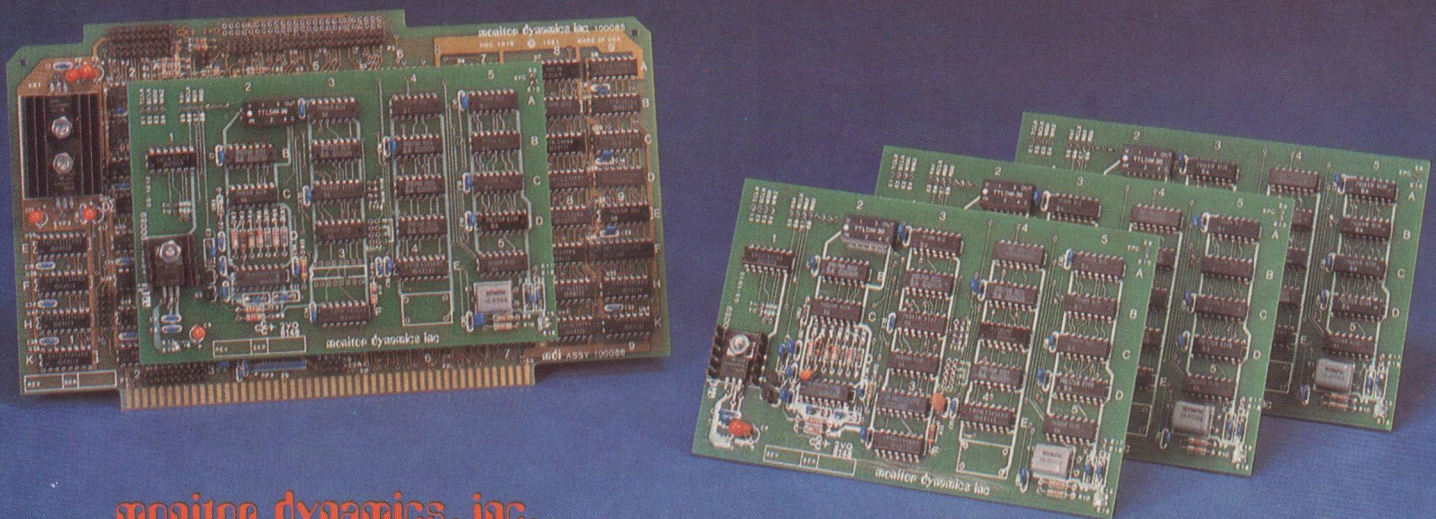
MONITOR DYNAMICS supplies the HDC-1010 Easy Disk Controller to OEM's at very competitive prices. Drivers are available for CP/M\*\*\* version 2.2 and other operating systems upon request. All controllers are factory tested and burned in, using only top quality, pre-tested parts.

MONITOR DYNAMICS also manufactures Winchester Disk Controllers for MULTIBUS\* and Q-BUS\*\* and a general purpose host-adaptor type controller. In addition, MONITOR DYNAMICS designs and manufactures or licenses hard disk controllers for custom applications, including

word processors, minicomputers and a wide variety of micro-computers.

Complete disk systems, including controller, drive, enclosure, backup storage and operating system software are available for the end-user or low volume OEM.

If you are using or plan to use a Winchester Disk, call or write MONITOR DYNAMICS for technical information, pricing and delivery. You will be surprised how easy and inexpensive the Winchester world can be.



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