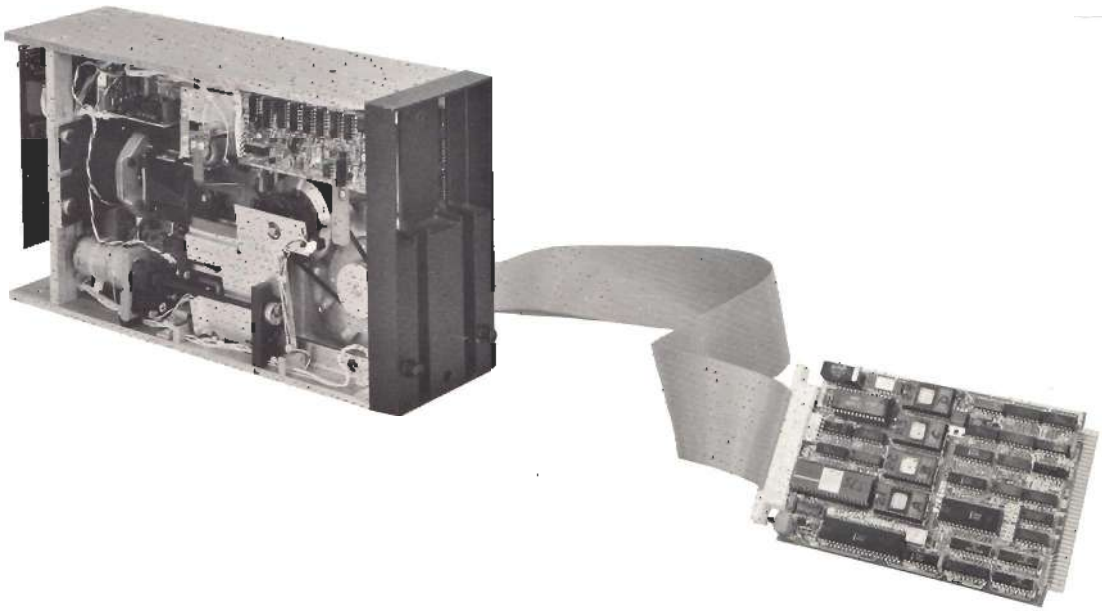
PerSci Intelligent Flexible Diskette Drive Controllers

PerSci's stand-alone diskette drive controllers for single and double density applications provide high level intelligence on single, economical circuit boards using state-of-the-art microprocessor technology, advanced software techniques and high density packaging. The sophisticated firmware resident in ROM on each PerSci controller board offers the file management capabilities of advanced disk operating systems.

PerSci controllers are able to perform a wide range of disk operations including initialization; allocation and deallocation of diskette space; error detection and retry; creating, deleting, renaming and copying files; CRC checks; and even diagnostic testing of the diskette drives under their control without greatly increasing the software burden of their host computers.



Model 1070 Single Density Diskette Drive Controller

The PerSci 1070 controller is designed to initialize and transfer data in IBM 3740 data compatible single density diskette format. A microprocessor and its associated support ICs, a single-chip LSI diskette drive controller, 4 Kbytes of ROM containing the file management firmware, 1 Kbytes of RAM used for input/output buffering, an eight-bit parallel microcomputer interface, and an optional RS232 serial asynchronous interface are combined on a single board only 4.5" wide and 7" long.

The 1070 controller supports up to four PerSci Model 70 single diskette drives or up to two PerSci Model 277 dual diskette drives, providing a low cost, high performance mass storage subsystem with a formatted on-line capacity of more than one million bytes.

Model 1170 Double Density Diskette Drive Controller

Extending the advanced design and high performance features pioneered in the single density 1070, the PerSci 1170 controller is capable of managing either single or double density recording on as many as 32 diskette sides. It is designed for full IBM Diskette 2D or IBM 3740 and S-100 bus compatibility. For maximum interchangeability the 1170 and 1070 controllers employ the same command set.

The 1170 controller board incorporates a microprocessor and its associated support ICs, a single-chip LSI diskette drive controller, 4 Kbytes of ROM containing the file management firmware, 2 Kbytes of RAM used for input/output buffering, an eight-bit parallel microcomputer interface, and an optional RS232 serial asynchronous interface.

Addressing drives in the diskette select mode, the Model 1170 will handle up to four PerSci Model 70 single diskette drives or two Model 277 dual drives or two Model 299 four-headed dual diskette drives. In the multiplex mode, the Model 1170 will support up to eight PerSci Model 299 drives (32 diskette sides) for a maximum subsystem formatted data storage capacity of 16 Mbytes.

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PerSci Intelligent Flexible Diskette Drive Controllers–Specifications

Model 1070 Single Density Controller

Physical Dimensions:
4.5" x 7" circuit board

Operating Environment:
Temperature: 0°-70°C

Power Requirement: +5 V ± 12 V

Encoding Method: Single Density (FM)

Media Requirements:
IBM 3740
77 tracks
26 sectors/track
128 bytes/sector

Interfaces:
Parallel
Serial
RS232 Serial Asynchronous (optional)

Subsystem Support Capability:
4 PerSci Model 70 Drives
2 PerSci Model 277 Drives

Model 1170 Double Density Controller

Physical Dimensions:
5" x 10" circuit board

Operating Environment:
Temperature: 0°-70°C

Power Requirement: +8 V ± 16 V

Encoding Methods: Single Density (FM)
Double Density (MFM)

Media Requirements:

IBM 3740	IBM 2D
77 tracks	154 tracks (2 sides)
26 sectors/track	26 sectors/track
128 bytes/sector	256 bytes/sector (double density)

Interfaces:
Parallel
Serial
RS232 Serial Asynchronous (optional)
S-100 bus compatible

Subsystem Support Capability:
4 PerSci Model 70 Drives
2 PerSci Model 277 Drives
2 PerSci Model 299 Drives
} (Diskette Select Mode)
8 PerSci Model 299 Drives (Multiplex Mode)

File Management Firmware

Command	Command Syntax	Command Functional Description
Allocate	A file sectors	Allocates an empty file "file" of "sectors" sectors.
Copy	C file1 file2 sectors	Copies files matching "file1" to same or different diskette, optionally renaming according to "file2" and reallocating according to "sectors."
Delete	D file	Deletes files matching "file."
Eject	E /drive	Ejects diskette in drive "drive."
File	F unit file	Opens "file" and associates with "unit."
	F unit	Closes the open file associated with "unit."
	F	Closes all open files.
Gap	G /drive	Reallocates diskette in "drive" to eliminate gaps.
Input	I track sector/drive	Reads the specified sector.
Kill	KK volume/drive seq	Initializes diskette with interleave "seq."
	KK volume/drive	Deletes all files on diskette without initializing.
Load	L file	Reads entire file "file" as a stream.
Mode	M date:options/drive	Sets current date, I/O options, and/or default drive.
Name	N file1 file2	Renames file "file1" in accordance with "file2."
Output	O track sector/drive	Writes the specified sector.
Position	P unit sector byte	Positions the open file associated with "unit."
	P unit	Reports current position of file associated with "unit."
Query	Q file	Reports index information for files matching "file."
Read	R unit bytes	Relative read of file associated with "unit."
	R unit	Punctuated read of file associated with "unit."
Save	S file	Creates new file "file" by writing as a stream.
Test	T option/drive	Executes a diagnostic test on drive "drive."
Write	W unit bytes	Relative write to file associated with "unit."
	W unit	Punctuated write to file associated with "unit."

Special characters may be used to make a file reference ambiguous so that it may match a number of files. For example, Q* would return index information for all files.

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PERSCI MODEL 1170 DUAL DENSITY DISKETTE CONTROLLER

SUMMARY OF FEATURES

The Model 1170 is the second intelligent controller developed by PerSci and will operate in either single (FM) or double (MFM) density modes in support of the recently released IBM Diskette 2D format. It continues the concept pioneered by the Model 1070 in providing an advanced disk operating system resident in controller firmware, resulting in minimum software burden to the host computer. The Model 1170 uses a Z80 and associated LSI circuitry mounted on a S100 board and will support four PerSci Model 70 single diskette drives, or two Model 277 diskette drives, or up to eight of the new PerSci Model 299 Four-Headed Dual Drives. When used with the Model 299, the new controller provides high-performance mass storage with up to a maximum of 16 megabytes.

HARDWARE

The controller board incorporates a microprocessor and its associated support ICs, a single-chip LSI diskette drive controller, 4K bytes of ROM (optionally EPROM) containing the file management firmware, 2K bytes of RAM used for input/output buffering, an eight-bit parallel microcomputer interface, and an optional RS 232 serial asynchronous interface. Required power for the controller is +8 volts and ±16 volts. Signal pin locations are compatible with the standard S100 bus.

FIRMWARE

The controller program resides in ROM on the controller board and performs the file management functions normally associated with a microcomputer disk operating system. These include: diskette format initialization; maintaining and searching an index of files on each diskette; allocation and deallocation of diskette space; blocking and unblocking of both fixed and variable length records; error detection and retry; creating, deleting, renaming, copying of files; and even performing diagnostic testing of the diskette drives. These file management functions are specified by means of a high-level controller command language which requires only minimal unique routines in the host computer software (for example, 168 bytes in a typical 8080-based minicomputer). Firmware commands are an extension of the set used by the PerSci Model 1070 controller.

INTERFACES

Two alternative methods are provided for interfacing with the controller: parallel and serial. The optional RS 232 serial asynchronous interface provides sixteen switching selectable transmission speeds from 50 to 9,600 bits/second, interfacing directly with virtually any standard terminal modem, or serial input/output port.

DISKETTE DRIVES SUPPORTED

The 1170 addresses supported drives in one of two modes; Diskette select or multiplex. In the diskette select modes, the 1170 can support:

a) Four Model 70 drives
b) Two Model 277 drives
c) Two Model 299 drives (option 2)

In the multiplex mode, the 1170 can support up to 8 Model 299 drives (32 sides) with a maximum capacity of 16 megabytes.

DISKETTE DRIVE AND MEDIA COMPATIBILITY

The 1170 when used with the 299 will work with single or double sided soft sectored diskettes. The 1170 will not allow operations to the wrong side of a single sided diskette inserted in a 299 drive nor will it allow any operation with a double sided diskette inserted in a Model 70 or 277 drive.

DISKETTE FORMAT

The 1170 is designed for diskettes having the IBM Diskette 2D format which has 153 tracks on two sides of 26 sectors/track with 256 data bytes/sector, recorded double density (MFM). Track 0 of side 0 is recorded in single density (FM) and has 26 sectors of 128 data bytes/sector.

The 1170 can initialize and transfer data for either the diskette 2D or the single density format (IBM 3740) used by the PerSci 1070. For either format the zero track is used by the controller as an information index file while the remaining tracks are used for data storage. Formated data capacity (excluding index track) for the 2D diskette is 1,018,368 bytes, and for the diskette I (3740) is 252,928 bytes.