

November 18, 1977



# PERSCI, INC.

12210 NEBRASKA AVENUE  
WEST LOS ANGELES, CALIFORNIA 90025  
TELEPHONE (213) 820-3764

## PRODUCT PRICE LIST

<u>Model</u>	<u>Quantity of 1</u>	<u>Quantity of 100 (in 12 months)</u>
277	\$1295	\$ 995
70	695	595
1070	740	595
1071 (1070 with 70 + connector cable)	1435	1190
1072 (1070 with 277 + connector cable)	2035	1590
2031 (1071 System)	2465	2045
2032 (1071 with 70 System)	3160	2640
2042 (1072 System)	3060	2395
2044 (1072 with 277 System)	4355	3390
2142 (Slimline Cabinet)	350	245
Power Cord	10	5
Cable (2 connector)	45	30
Cable (3 connector)	75	40
<u>OPTIONS</u>		
Write Protect (per spindle)	25	20
Remote Eject (per spindle)	25	20
Dual Density (per spindle) (not available in 1000 or 2000 Series)	75	60
RS 232 Serial Interface	100	75
All Manuals	5	2.50



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 TELEX 687444

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### MODEL 70 PRICE LIST

Quantity	Price
1-24	\$695
25-49	670
50-99	635
100-249	595
250-499	585
500-999	570
1000-1999	550

### MODEL 277 PRICE LIST

Quantity	Price
1-24	\$1295
25-49	1195
50-99	1095
100-249	995
250-499	945
500-999	895
1000-1999	845

### MODEL 1070 PRICE LIST

Quantity	Price
1-24	\$ 740
25-49	695
50-99	645
100-249	595
250-499	575
500-999	550
1000-1999	525

### MODEL 1071 (1070 with 70)

1-24	\$1435
25-49	1365
50-99	1280
100-249	1190
250-499	1160
500-999	1120
1000-1999	1075

### MODEL 2031 (1071 System)

1-24	\$2465
25-49	2325
50-99	2185
100-249	2045
250-499	1995
500-999	1945
1000-1999	1895

### MODEL 2032 (1071 System with 70)

1-24	\$3160
25-49	2995
50-99	2820
100-249	2640
250-499	2580
500-999	2515
1000-1999	2445

### MODEL 1072 (1070 with 277)

1-24	\$2035
25-49	1890
50-99	1740
100-249	1590
250-499	1520
500-999	1445
1000-1999	1370

### MODEL 2042 (1072 System)

1-24	\$3065
25-49	2850
50-99	2645
100-249	2445
250-499	2355
500-999	2270
1000-1999	2190

### MODEL 2044 (1072 System with 277)

1-24	\$4360
25-49	4045
50-99	3740
100-249	3440
250-499	3300
500-999	3165
1000-1999	3035

### 2000 CABINET

1-24	\$1030
25-49	960
50-99	905
100-249	855
250-499	835
500-999	825
1000-1999	820

### MODEL 2142

Slimline Cabinet	\$350	\$245
<u>OPTIONS</u>		
Power Cord	10	5
Cable (2 connector)	45	30
Cable (3 connector)	75	40

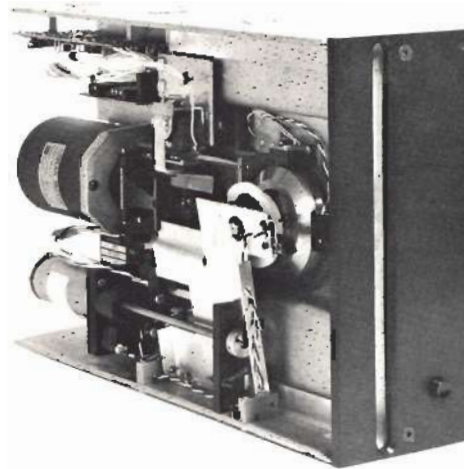
### OPTIONS PER SPINDLE

	1	100
Dual Density	\$75	\$60
Remote Eject	25	20
Write Protect	25	20
RS 232	100	75
All Manuals	5	2

Prices are for delivery over 12 months; for extended delivery schedule, special factory bid.

*Dealer prices are OEM 100 qty - Min order 5 drives/yr.*

# PerSci Model 70 Diskette Drive



## A Fully Compatible Memory Device

The PerSci Model 70 Diskette Drive is a mini-size, low cost, random access memory device that records and retrieves data on a removable, flexible diskette. Ideal for a wide range of applications, this versatile unit provides data storage capacity of up to 3.2 Mbits single density unformatted or 6.4 Mbits double density unformatted. The unit will handle data in IBM 3740 format or selectable hard and soft sectored formats.

The Model 70 incorporates many design features previously unique to large disk technology which result in unexcelled reliability and performance, smallest size and fast access to data. And, while offering the advantages of all DC power, the Model 70 is fully compatible with existing stepper motor diskette systems.

## A New Generation in Diskette Drive Design

**Voice coil positioning** speeds access times by 5-7 times over other available diskette drives and makes possible a full stroke 76 track seek in 100 ms. Track to track access is 10 ms and average seek is 33 ms. Unlike stepper motor drives there is no head settling time to add to these times. The advanced design and accuracy of the positioning system will permit easy conversion to double track density operation.

**All DC direct drive motor** with a closed loop feedback servo insures accurate rotational speed of the diskette. Because no AC power is used in the drive, no modification is required for use in foreign countries.

**Fully automatic, electric diskette load and unload**, and LED sensors which signal if the diskette has not been correctly loaded, assure simple accurate diskette insertion and positioning and eliminate the possibility of diskette damage. The unload function can be engaged and disengaged from the computer permitting remote control operation.

**Power consumption is 24 watts**, one quarter of the power required by other drives. Heat dissipation is only 82 BTU/hr, eliminating the need for a cooling fan. This feature, plus a low ambient noise motor, results in noiseless operation.

**Small size** of the Model 70, only 8.56" x 3.38" x 13.75" permits mounting of five units vertically or two units horizontally in a 19" rack.

**PERSCI**

Peripherals a  
Generation Ahead

# PerSci Model 70 Diskette Drive - Specifications

## Capacity

### Unformatted

Per diskette: 3.2 Mbits/400 Kbytes  
Per track: 41.7 Kbits/5 Kbytes

### 3740 Format

Per Diskette: 1.9 Mbits/243 Kbytes  
Per track: 26.6 Kbits/3.3 Kbytes  
Per sector: 1024 bits/128 bytes

### Double Density (Optional)

Per diskette: 6.4 Mbits/800 Kbytes  
Per track: 83.4 Kbits/10 Kbytes

## Track Density

48 tracks per inch  
(data track width .012")

## Bit Density

Single density 3268 bits per inch  
Double density 6536 bits per inch

## Rotational Speed

360 RPM  $\pm$  7 RPM

## Transfer Rate

Single density 250 kilobits per second  
Double density (optional) 500 kilobits  
per second

## Operating Times

Track to track access: 10 msec.  
Head settle time: 0 msec.  
Random average seek: 33 msec.  
76 track seek: 100 msec.  
Head engage: 40 msec.  
Motor start (after DC power applied): 1 sec.

## Media

IBM 3740 diskette or PerSci  
approved equivalent

## Physical Dimensions

Height 8.56" x width 3.38" x depth 13.75"  
Weight 15 lbs.

## Positioning Mechanism

Linear voice coil motor

## Operating Environment

50°F to 120°F  
8 to 80% relative humidity

## Power Requirements

+ 5 volts DC 4.0 Amps.  
Alternately: + 5 V @ 2.0 Amps.  
plus  
+ 5 V unreg. @ 2.0 Amps.  
- 5 to - 15 volts DC .14 Amp.  
+ 24 volts DC .46 Amp.

## Power Consumption

24 watts DC

## Heat Dissipation

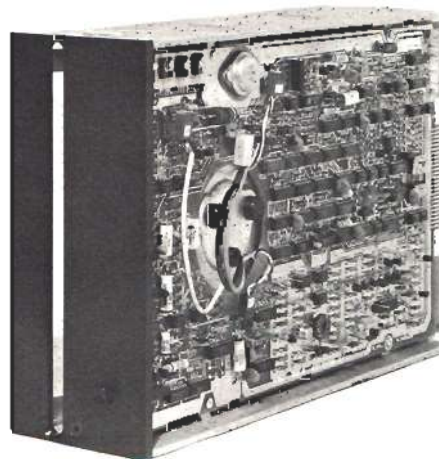
82 BTU per hour

## Reliability

Read error (soft): less than 1 in  $10^9$  bits  
Read error (hard): less than 1 in  $10^{12}$  bits  
Positioning error: less than 1 in  $10^6$  accesses  
MTBF: more than 4000 hours  
MTTR: less than 20 minutes  
Device Life: 5 years or 15,000 hours, whichever  
occurs first

## Available Options

Double density recording  
Motorized diskette load and unload  
Remote diskette ejection  
Dual side recording  
High performance option kit  
Write protect  
Index/sector separation  
Sector countdown  
Interface controlled spindle motor enable  
Phase locked data separator  
- 12 V or - 15 V power alternates for - 5 V

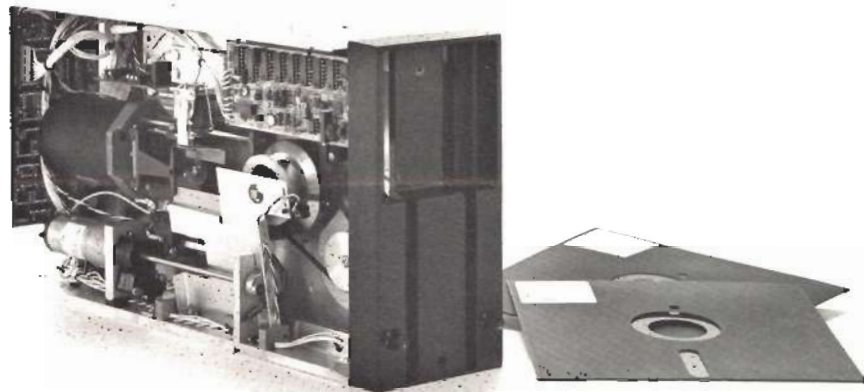


PerSci, Inc. 4087 Glencoe Avenue, Marina Del Rey, California 90291 Telephone (213) 821-5545



# PerSci Model 270 Dual Diskette Drive

The PerSci Model 270 Dual Diskette Drive is a mini size, low cost, random access memory device that records and retrieves data on two removable flexible diskettes, to provide 6.4 Mbits of data storage unformatted, or 3.8 Mbits in IBM 3740 format. The unit also has double density capability increasing total data storage capacity to 12.8 Mbits. The Model 270 design, incorporating many of the features of large disk drives, provides performance and reliability characteristics never before available in a flexible disk drive. At the same time, the Model 270 is fully compatible with existing diskette drive systems.



## A Totally Unique Design Concept...

**Smaller:** 4 Duals in a 19" Rack

The PerSci 270 dual drive is the size of most single diskette drives: 8.6" x 4.4" x 15.0". Two 270's will fit horizontally or four will fit vertically in a 19" rack.

**Faster:** 33 ms Random Average Seek

PerSci's exclusive voice coil positioning system makes possible a full stroke 76 track seek in 100 ms. Track to track access is 10 ms including head settle time and average seek is 33 ms.

**More Reliable:** All DC Power

A DC spindle motor with a closed loop feedback servo insures accurate rotational speed of both diskettes. Because no AC power is used in the drive, the 270 requires no modification for use in foreign countries.

**More Efficient:** 28 Watts Power Consumption

The Model 270 consumes one quarter the power needed by competitive drives. Heat dissipation is only 109 BTU/hr. Elimination of the cooling fan, plus a low ambient noise motor, results in noiseless operation.

**Foolproof:** Electronic Diskette Load

A fully automatic, electronic diskette load and unload feature assures simple diskette insertion, accurate diskette positioning and eliminates the possibility of diskette damage. The unload function can be engaged and disengaged from the computer permitting remote control operation. Further diskette protection is given by the LED sensors which relay a signal if the diskette has not been correctly loaded.

**Designed for Tomorrow:** No-obsolescence

The PerSci Model 270 is a fourth generation flexible disk drive. The accuracy of the positioning system and exact tolerances of the drive configuration will allow easy conversion to double track density operation. The fast access time and exclusive PerSci features, such as the "built-in" hard sector capability, anticipate the requirements of changing applications.

## Compatible With Existing Systems

**IBM Compatibility:** Plus Double Density

The read/write/erase head of the PerSci Model 270 is compatible with IBM 3740 systems; therefore, diskettes prepared on an IBM 3740 system can be read by the PerSci 270 and vice versa. In addition to IBM 3740 format, the PerSci 270 will accept expanded capacity hard and soft sectored formats and, with a double density option, the unit will read and write two double density encoded diskettes.

**Stepper Motor Compatible:** Plus High Performance

The Model 270 is fully compatible with existing systems designed for stepper motor drives while bringing to these systems the advantages of advanced reliability, extra data storage and compact size. In order to achieve the 270's high speed capability in such systems, a high performance option kit is offered.

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# PerSci Model 270 Dual Diskette Drive – Specifications

## Capacity

### Unformatted

Per drive: 6.4 Mbits/800 Kbytes  
Per diskette: 3.2 Mbits/400 Kbytes  
Per track: 41.7 Kbits/5 Kbytes

### 3740 Format

Per drive: 3.8 Mbits/486 Kbytes  
Per diskette: 1.9 Mbits/243 Kbytes  
Per track: 26.6 Kbits/3.3 Kbytes  
Per sector: 1024 bits/128 bytes

### Double Density (optional)

Per drive: 12.8 Mbits/1600 Kbytes  
Per diskette: 6.4 Mbits/800 Kbytes  
Per track: 83.4 Kbits/10 Kbytes

## Track Density

48 tracks per inch  
(data track width .012")

## Bit Density

Single density 3268 bits per inch  
Double density 6536 bits per inch

## Rotational Speed

360 RPM  $\pm$  7 RPM

## Transfer rate

Single density 250 kilobits per second  
Double density (optional) 500 kilobits per second

## Operating Times

Track to track access (including settle time):  
10 msec.  
Random average seek: 33 msec.  
76 track seek: 100 msec.  
Head engage: 40 msec.  
Motor start (after DC power applied): 1 sec.

## Media

IBM 3740 diskette or PerSci approved equivalent

## Physical Dimensions

Height 8.6" x width 4.4" x depth 15.0"  
Weight 20 lbs.

## Positioning Mechanism

Linear voice coil motor

## Operating Environment

50°F to 120°F  
8 to 80% relative humidity

## Power Requirements

+ 5 volts DC 4.0 amps  
- 5 volts DC .14 amp  
+ 24 volts DC .46 amp

## Power Consumption

28 watts DC

## Heat Dissipation

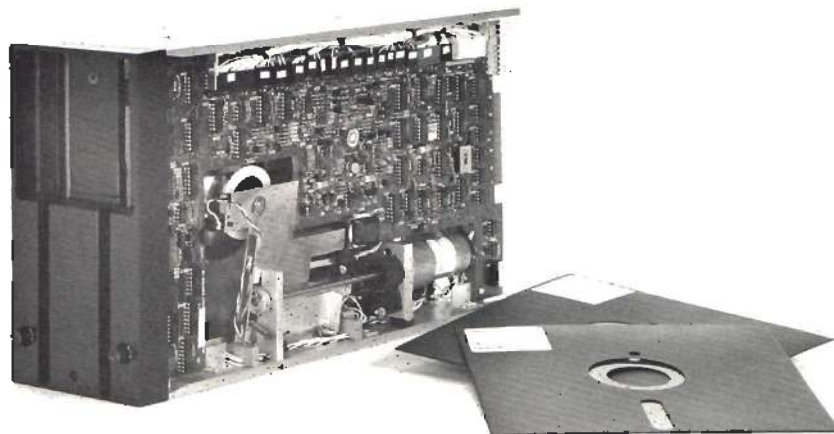
109 BTU per hour

## Reliability

Read error (soft): less than 1 in  $10^9$  bits  
Read error (hard): less than 1 in  $10^{12}$  bits  
Positioning error: less than 1 in  $10^6$  accesses  
MTBF: more than 4000 hours  
MTTR: less than 20 minutes  
Device life: 5 years or 15,000 hours, whichever occurs first

## Available Options

Dual density recording  
Motorized diskette load and unload  
Remote diskette ejection  
Remote diskette lock and unlock  
Dual side recording  
High performance option kit  
Write protect

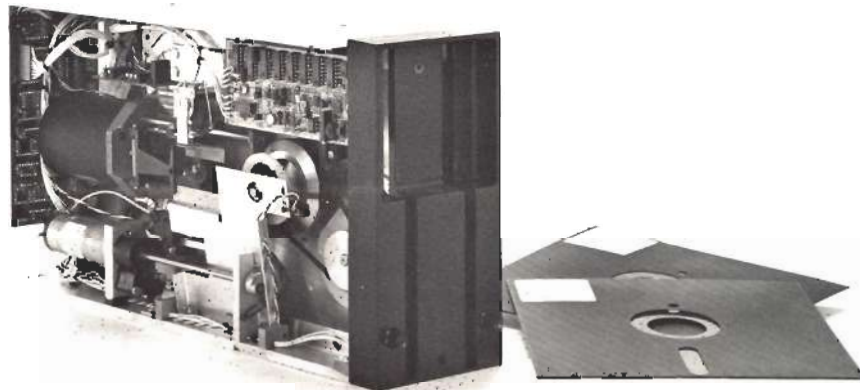


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# PerSci Model 277 Dual Diskette Drive

The PerSci Model 277 Dual Diskette Drive is a mini size, low cost, random access memory device that records and retrieves data on two removable flexible diskettes, to provide 6.4 Mbits of data storage unformatted, or 3.8 Mbits in IBM 3740 format. The unit also has double density capability increasing total data storage capacity to 12.8 Mbits. The Model 277 design, incorporating many of the features of large disk drives, provides performance and reliability characteristics never before available in a flexible disk drive. At the same time, the Model 277 is fully compatible with existing diskette drive systems.



## A Totally Unique Design Concept...

### **Smaller:** 4 Duals in a 19" Rack

The PerSci 277 dual drive is the size of most single diskette drives: 8.6" x 4.4" x 15.0". Two 277's will fit horizontally or four will fit vertically in a 19" rack.

### **Faster:** 33 ms Random Average Seek

PerSci's exclusive voice coil positioning system makes possible a full stroke 76 track seek in 100 ms. Track to track access is 10 ms including head settle time and average seek is 33 ms.

### **More Reliable:** All DC Power

A DC spindle motor with a closed loop feedback servo insures accurate rotational speed of both diskettes. Because no AC power is used in the drive, the 277 requires no modification for use in foreign countries.

### **More Efficient:** 28 Watts Power Consumption

The Model 277 consumes one quarter the power needed by competitive drives. Heat dissipation is only 109 BTU/hr. Elimination of the cooling fan, plus a low ambient noise motor, results in noiseless operation.

### **Foolproof:** Electronic Diskette Load

A fully automatic, electronic diskette load and unload feature assures simple diskette insertion, accurate diskette positioning and eliminates the possibility of diskette damage. The unload function can be engaged and disengaged from the computer permitting remote control operation. Further diskette protection is given by the LED sensors which relay a signal if the diskette has not been correctly loaded.

### **Designed for Tomorrow:** No-obsolescence

The PerSci Model 277 is a fourth generation flexible disk drive. The accuracy of the positioning system and exact tolerances of the drive configuration will allow easy conversion to double track density operation. The fast access time and exclusive PerSci features, such as the "built-in" hard sector capability, anticipate the requirements of changing applications.

## Compatible With Existing Systems

### **IBM Compatibility:** Plus Double Density

The read/write/erase head of the PerSci Model 277 is compatible with IBM 3740 systems; therefore, diskettes prepared on an IBM 3740 system can be read by the PerSci 277 and vice versa. In addition to IBM 3740 format, the PerSci 277 will accept expanded capacity hard and soft sectored formats and, with a double density option, the unit will read and write two double density encoded diskettes.

### **Stepper Motor Compatible:** Plus High Performance

The Model 277 is fully compatible with existing systems designed for stepper motor drives while bringing to these systems the advantages of advanced reliability, extra data storage and compact size. In order to achieve the 277's high speed capability in such systems, a high performance option kit is offered.

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# PerSci Model 277 Dual Diskette Drive – Specifications

## Capacity

### Unformatted

Per drive: 6.4 Mbits/800 Kbytes  
Per diskette: 3.2 Mbits/400 Kbytes  
Per track: 41.7 Kbits/5 Kbytes

### 3740 Format

Per drive: 3.8 Mbits/486 Kbytes  
Per diskette: 1.9 Mbits/243 Kbytes  
Per track: 26.6 Kbits/3.3 Kbytes  
Per sector: 1024 bits/128 bytes

### Double Density (optional)

Per drive: 12.8 Mbits/1600 Kbytes  
Per diskette: 6.4 Mbits/800 Kbytes  
Per track: 83.4 Kbits/10 Kbytes

## Track Density

48 tracks per inch  
(data track width .012")

## Bit Density

Single density 3268 bits per inch  
Double density 6536 bits per inch

## Rotational Speed

360 RPM  $\pm$  7 RPM

## Transfer rate

Single density 250 kilobits per second  
Double density (optional) 500 kilobits per second

## Operating Times

Track to track access (including settle time):  
10 msec.  
Random average seek: 33 msec.  
76 track seek: 100 msec.  
Head engage: 40 msec.  
Motor start (after DC power applied): 1 sec.

## Media

IBM 3740 diskette or PerSci approved equivalent

## Physical Dimensions

Height 8.6" x width 4.4" x depth 15.0"  
Weight 20 lbs.

## Positioning Mechanism

Linear voice coil motor

## Operating Environment

50°F to 120°F  
8 to 80% relative humidity

## Power Requirements

+5 volts DC 4.0 amps  
-5 volts DC .14 amp  
+24 volts DC .46 amp

## Power Consumption

28 watts DC

## Heat Dissipation

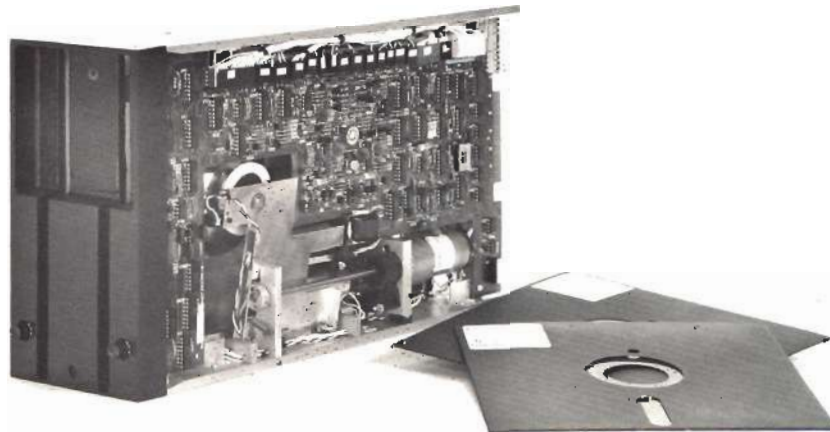
109 BTU per hour

## Reliability

Read error (soft): less than 1 in  $10^9$  bits  
Read error (hard): less than 1 in  $10^{12}$  bits  
Positioning error: less than 1 in  $10^6$  accesses  
MTBF: more than 4000 hours  
MTTR: less than 20 minutes  
Device life: 5 years or 15,000 hours, whichever occurs first

## Available Options

Dual density recording  
Remote diskette ejection  
Write protect



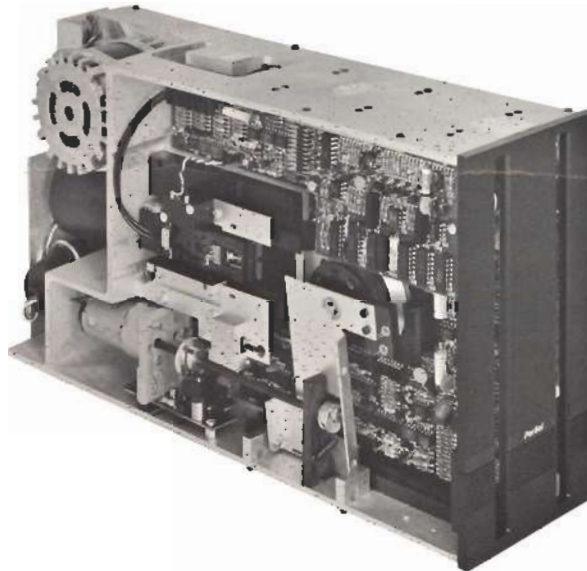
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# PerSci Model 299 Four-Headed Dual Diskette Drive

The PerSci Model 299 is a low cost, random access memory device which reads and writes on one or both sides of two 8" diskettes by means of four read/write/erase heads. When recording on four diskette surfaces in double density encoding, on-line data capacity can be as high as 3.2 Mbytes. Head positioning is accomplished by a high speed linear voice coil system. Thus, in capacity and speed the PerSci Model 299 approaches the performance of rigid disc drives, while still maintaining the low cost, convenience and small size of diskette drive technology.



#### **Up to 3.2 Mbytes in Selectable Formats:**

The unformatted data capacity of the Model 299, recording on both sides of two 8" diskettes, is 1.6 Mbytes in single density (FM) encoding and 3.2 Mbytes in double density (MFM or M<sup>2</sup>FM). When IBM 3740 compatible format is required, the 299 will read and write 1 Mbyte of data per drive. Expanded capacity, soft and hard sectored formats can also be employed. In system configurations, an option provides for multiplexing of up to 8 drives (16 diskettes) for a total system capacity as high as 25.6 Mbytes.

#### **Double and Single Sided Diskettes:**

The 299 accepts one or two IBM Diskette IID or equivalent diskettes for soft sectored, double sided, double density recording and IBM Diskette II for double sided applications in single density. Double sided, hard sectored media such as the Dysan 101/2 and 101/2D may also be used.

The unit will also accommodate single sided media, hard or soft sectored, optimized for either single or double density encoding. Two index sensors on the drive automatically distinguish single and double sided diskettes.

#### **Average Seek Time of 33 MS:**

PerSci's exclusive voice coil positioning system, a miniaturized version of the type used on large disc drives, makes possible a full-stroke 76 track seek in 100 ms. Track to track access is 10 ms and no settle time is required. A random average seek is 33 ms, five to seven times faster than stepper motor based diskette drives.

#### **High Reliability:**

The unique high performance characteristics of PerSci's 299 are achieved without sacrificing reliability. The soft error specification is 1 in 10<sup>9</sup> and hard errors are 1 in 10<sup>12</sup>. Data integrity is further assured by an optical write protect device. MTBF is 6000 hours and component life is 15,000 hours.

#### **Ease of Operation:**

A motorized autoloader diskette positioning and ejection device simplifies operation, increases precision and assures gentlest media handling. Drive options permit diskette unload and eject by software remote control. An in-use LED indicates diskette selected.

#### **Compact, Interchangeable Size:**

The PerSci Model 299 Four-Headed Dual Drive measures only 8.72" x 4.38" x 15.4" therefore, four drives can be mounted vertically or two horizontally in a 19" rack. The 299 is interchangeable with the PerSci Model 277 in mechanical mounting and electrical interface.

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# PerSci Model 299 Four-Headed Dual Diskette Drive—Specifications

## Capacity:

Unformatted Single Density

Per drive: 1.6 Mbytes

Per disk: .8 Mbytes

Per track: 5.2 Kbytes

3740 Type Format

Per drive: 1 Mbyte

Per diskette: .5 Mbyte

Per track: 3.3 Kbytes

Unformatted Double Density

Per drive: 3.2 Mbytes

Per diskette: 1.6 Mbytes

Per track: 10.4 Kbytes

## Encoding Method:

Single density: FM

Double density: MFM or M<sup>2</sup>FM

Track Density:

48 tpi

Tracks:

77

## Bit Density:

Single Density: 3288 bpi

Double Density: 6536 bpi

## Rotational Speed:

360 RPM  $\pm$  7 RPM

## Transfer Rate:

Single Density: 250 Kbps

Double Density: 500 Kbps

## Operating Times:

Track to track access: 10 ms

Settle: 0 ms

Random average seek: 33 ms

76 track seek: 100 ms

Head load time: 35 ms

## Media Requirements:

Single sided, soft sectored

single density: IBM Diskette 1 or equivalent

double density: IBM Diskette 1 or equivalent

Single sided, hard sectored

single density: Good quality OEM type  
diskette

double density: Good quality OEM type  
double density diskette

Double sided, soft sectored

single density: IBM Diskette 2 or equivalent

double density: IBM Diskette 2D or  
equivalent

Double sided, hard sectored

single density: Good quality OEM type  
diskette

double density: Good quality OEM type  
double density diskette

## Physical Dimensions:

Height: 8.72"; width: 4.38"; depth: 15.4"

Weight: 22 lbs

## Positioning Mechanism:

Linear voice coil motor

## Operating Environment:

40° to 115°F

## Power Requirements:

### AC voltage:

50/60 Hz  $\pm$  0.5 Hz

110/115 VAC installations --

90-127 V @ .4 A typical

200/230 VAC installations --

180-253 V @ .2 A typical

### DC voltage:

+24 VDC  $\pm$  5%, 5.0 A Avg., 8.5 peak

+ 5 VDC  $\pm$  5%, 2.0 A max

-- 5 VDC  $\pm$  5%, 0.25 A typical

## Reliability:

Read error (soft): less than 1 in 10<sup>9</sup> bits

Read error (hard): less than 1 in 10<sup>12</sup> bits

Seek error: less than 1 in 10<sup>6</sup> accesses

MTBF: More than 6000 hours.

MTTR: 30 min.

Component life: 15,000 hours

## Consumer-Installable Options:

Addressing for 1 to 8 drives (2 to 16 diskettes)

Separated 8 or 16 sector I/O

Manual Eject Inhibit I/O

Remote Eject I/O

Write Protect Disable

Parallel Line Terminator



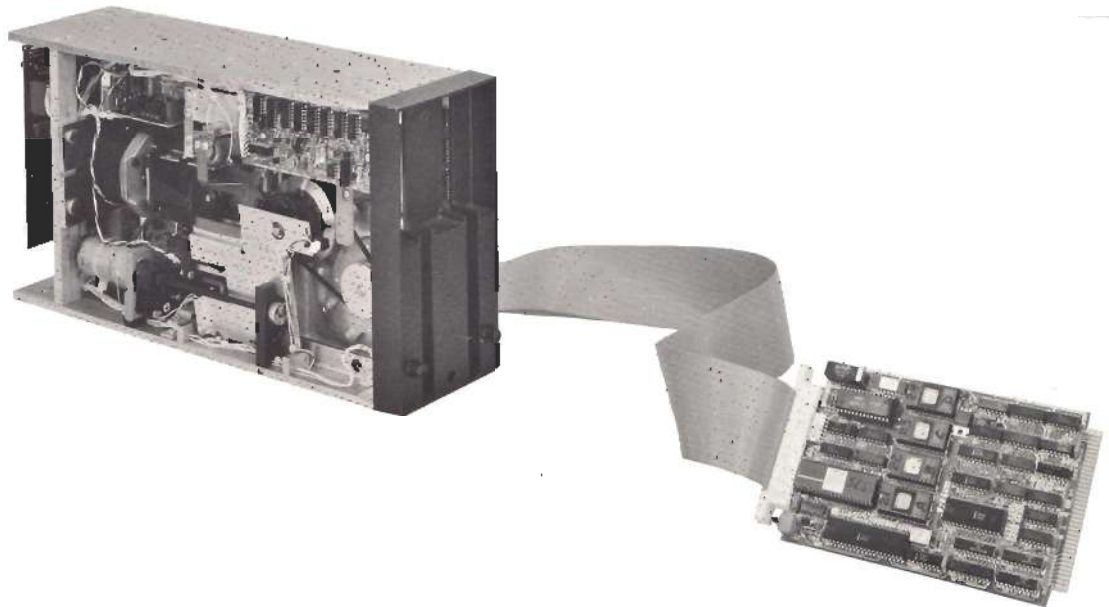
Peripherals a  
Generation Ahead

PerSci, Inc., 12210 Nebraska Avenue, West Los Angeles, California 90025  
Telephone (213) 820-3764 Telex 687-444

# 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.

**PERSCI**

Peripherals a  
Generation Ahead

# 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

8 PerSci Model 299 Drives (Multiplex Mode)

(Diskette  
Select Mode)

## File Management Firmware

Command	Command Syntax	Command Functional Description	Name	N file1 file2	Renames file "file1" in accordance with "file2"
Allocate	A file sectors	Allocates an empty file "file" of "sectors" sectors.	Output	O track sector/drive	Writes the specified sector.
Copy	C file1 file2 sectors	Copies files matching "file1" to same or different diskette, optionally renaming according to "file2" and reallocating according to "sectors."	Position	P unit sector byte	Positions the open file associated with "unit."
Delete	D file	Deletes files matching "file."		P unit	Reports current position of file associated with "unit."
Eject	E /drive	Ejects diskette in drive "drive."	Query	Q file	Reports index information for files matching "file."
File	F unit file	Opens "file" and associates with "unit."	Read	R unit bytes	Relative read of file associated with "unit."
	F unit	Closes the open file associated with "unit."		R unit	Punctuated read of file associated with "unit."
	F	Closes all open files.	Save	S file	Creates new file "file" by writing as a stream.
Gap	G /drive	Reallocates diskette in "drive" to eliminate gaps.	Test	T option/drive	Executes a diagnostic test on drive "drive."
Input	I track sector/drive	Reads the specified sector.	Write	W unit bytes	Relative write to file associated with "unit."
Kill	KK volume/drive seq	Initializes diskette with interleave "seq."		W unit	Punctuated write to file associated with "unit."
	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.			

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 CONTROLLERSUMMARY 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. Formatted data capacity (excluding index track) for the 2D diskette is 1,018,368 bytes, and for the diskette I (3740) is 252,928 bytes.