SPECTRA 14

Perkin-Elmer Compatible Disk Controller
A Spectrum of Benefits

SPECTRA LOGIC

A Spectrum Of Benefits With The Spectra 14

Just as the prism produces the continuous range of colors of the spectrum, the SPECTRA 14 provides a range of benefits for Perkin-Elmer computer users. Whether you are an OEM or end user, the SPECTRA 14 will provide the following benefits:

▲ **Embedded single board design for any Perkin-Elmer computer.**

▲ **Full emulation of the Perkin-Elmer MSM-80 and MSM-300 disk subsystems under OS/16MT2 and OS/32MT operating system software.**

▲ **Compatibility with the full range of 16 and 32 bit Perkin-Elmer computers via the SELCH, ESELCH, and BSELCH host interfaces.**

▲ **Attachment of up to four (4) SMD compatible disk drives.**

▲ **Dual microprocessor design for high performance control of the CPU and disk interfaces and ability to attach next generation 2.0MB/second transfer rate disk drives.**

▲ **Substantial savings through attachment of independent disk drives, ease of maintenance, reliability, and software transparency.**

▲ **Reliability through reduced parts count, pretested IC's and elimination of multi-board interconnections.**

▲ **Performance features such as 1536 byte six (6) sector buffering, 11 bit burst Error Correction Code (ECC), support of overlapped seeks and dual port disk drives to help sell your systems.**

▲ **Expanded emulation for maximum disk capacity and attachment of any SMD compatible disk.**

▲ **Ease of maintenance through automatic self-test microdiagnostics.**

△ **Embedded Design** — The SPECTRA 14 occupies only a single slot in any Perkin-Elmer computer, saving space and costs associated with additional expansion chassis and power supply. Further cost savings are realized through ease of maintenance, convenient sparing, and increased reliability.

△ **Full Emulation** — The SPECTRA 14 allows you to run standard OS/16MT2 and OS/32MT operating systems and diagnostic software. Total emulation of the Perkin-Elmer MSM-80 and MSM-300 disk subsystems is provided by the SPECTRA 14 when attaching 80MB and 300MB SMD compatible drives respectively. This transparency to Perkin-Elmer operating system and diagnostic software reduces engineering and field service support costs associated with software drivers and updates.

△ **Compatibility** — In addition to software transparency, the SPECTRA 14 is completely compatible with the full range of 16 and 32 bit Perkin-Elmer computers. The SPECTRA 14/SMD disk drive combination may be used to replace or add to existing Perkin-Elmer disk subsystems.

△ **SMD Interface** — The SPECTRA 14 attaches up to four (4) 80MB or 300MB SMD compatible disk drives without any modification to the Perkin-Elmer operating system software. SMD compatible drives of any capacity may be attached through expanded emulation. This requires only a simple software parameter change to the standard Perkin-Elmer operating system.

△ **Advanced Architecture** — A unique dual bipolar microprocessor design simultaneously controls both the CPU and disk interfaces providing the fastest command and data transfer speeds available. This modular design simplifies configuration changes to accommodate a wide range of SMD drives including the next generation 2.0MB/second transfer rate disk drives.

△ **Cost Savings** — The SPECTRA 14 will provide substantial savings with the initial subsystem purchase by combining total
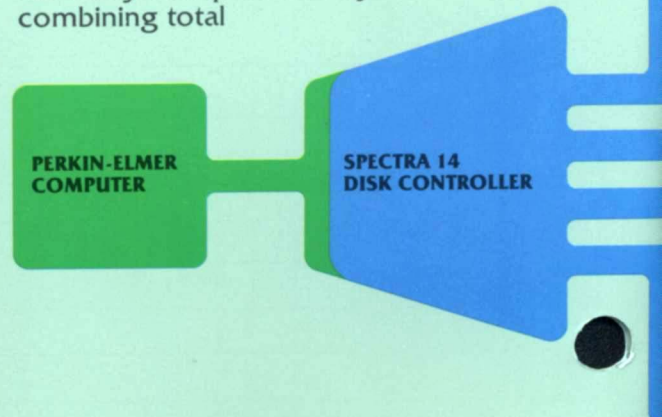
A prism is a transparent solid which refracts or bends light waves as they pass through it. The various colors that we see are actually different wavelengths of light the human eye perceives as colors. These light wavelengths are dispersed by a prism to varying degrees. When natural sunlight, which contains all colors, is passed through a prism, a brilliant range of continuous color is produced. This display of color is called a spectrum.

PERKIN-ELMER COMPUTER

SPECTRA 14 DISK CONTROLLER

Perkin-Elmer compatibility with the advantage of buying lower cost independently supplied disk drives. Throughout its life, the SPECTRA 14's reliability, ease of maintenance, and adaptability to higher speed disk technology will continue to save time and money for your business.

△ **Reliability** – The SPECTRA 14's high reliability is achieved through the reduced parts count of the single board, use of pretested IC's and the elimination of multi-board interconnections and power supplies. On a system level, the SPECTRA 14 contains on-board self-test microdiagnostics and a 32 bit ECC to assure reliable disk subsystem operation.
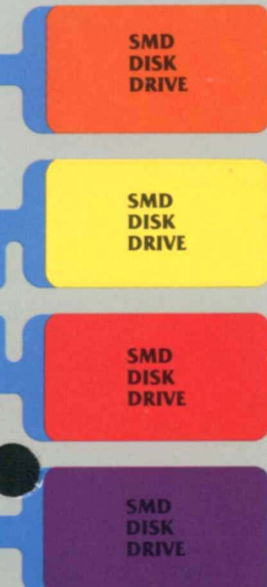
△ **Performance** – For OEM's, the SPECTRA 14 will provide system performance features important to your success as a supplier of quality systems. Six sector (1536 byte) buffering eliminates "data late" errors and achieves optimum speed by smoothing transfer rate differences between the disk and SELCH. The SPECTRA 14 also provides multiple sector data transfers, 11 bit burst ECC, and support of overlapped seeks and dual port disk drives. Expanded emulation increases your systems flexibility by attaching SMD compatible drives using removable, fixed Winchester, or combination fixed/removable media. Optional protocol is supported on SELCH's so equipped to improve transfer rate between the controller and SELCH.
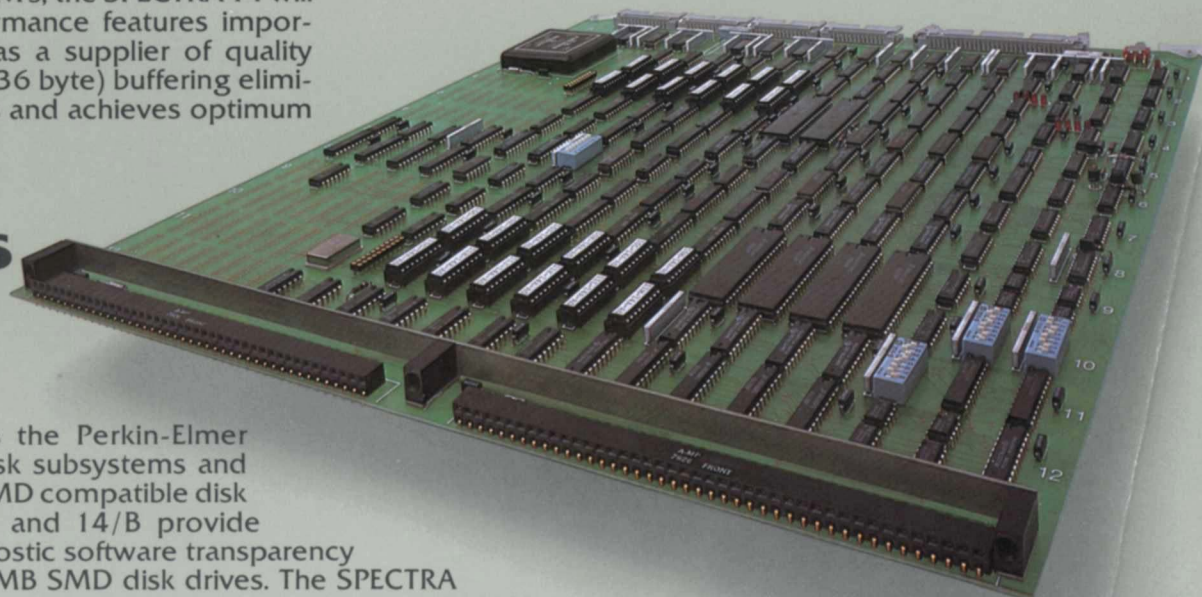
The Versions Of The Spectra 14

The SPECTRA 14 emulates the Perkin-Elmer MSM-80 and MSM-300 disk subsystems and can attach a wide range of SMD compatible disk drives. The SPECTRA 14/A and 14/B provide operating system and diagnostic software transparency when using 80MB and 300MB SMD disk drives. The SPECTRA 14/C version provides increased storage capacity by attaching 675MB FMD disk drives through a software parameter change (expanded emulation). Similarly, the SPECTRA 14/D version utilizes expanded emulation to attach popular fixed/removable media CMD compatible disk drives. All other SMD compatible drives can be attached through the expanded emulation found in the SPECTRA 14/X version.

Characteristics	14/A	14/B	14/C	14/D	14/X
P-E Emulation	MSM-80	MSM-300	MSM-300	MSM-80	Various
SMD Compatible Drives	CDC 9762 SMD CDC 9730 MMD Ampex 980 Century T82	CDC 9766 Ampex 9300 Century T302	CDC 9775 FMD	CDC CMD 9448 Ampex DFR 900 Century Hunter	Other SMD Compatible Drives
Drive Capacity (MB)	80	300	675	32/64/96	Several
Media Type	Removable, Fixed Winchester	Removable	Fixed Winchester	Fixed/Removable	Various
Emulation Mode	Standard	Standard	Expanded	Expanded	Expanded
Sector/Track	64	64	64	64	–
Track/Cylinder	5	19	40	2/4/6	–
Cylinder/Drive	823	823	843	823	–
Sector Size(bytes)	256	256	256	256	256
Formatted Capacity (MB)	67.4	256.2	552.5	27.0/53.9/80.9	Various

SMD DISK DRIVE

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Spectra 14 Specifications

Functional

Computer Interface – SELCH, BSELCH, or ESELCH of any 16 or 32 bit Perkin-Elmer computer.

Disk Interface – Up to four (4) industry standard Storage Module Drives (SMD) utilizing either removable SMD, CMD, or fixed media Winchester technology.

Software Transparency – Transparent to standard Perkin-Elmer operating system and diagnostic software. Fully emulates the Perkin-Elmer MSM-80 and MSM-300 disk subsystems under OS/16MT2 and OS/32MT operating systems when attaching 80MB and 300MB SMD compatible drives.

Design Architecture – Dual bipolar microprocessors dedicated to both the SELCH and disk interfaces provide high speed data transfers and ability to attach next generation 2.0MB/second transfer rate disk drives.

Data Buffer – A 1536 byte (6 sector) high speed RAM buffer to eliminate "data late" conditions and achieve optimum speed.

Configurations – In addition to standard Perkin-Elmer MSM-80 and MSM-300 disk subsystem emulation, expanded emulation for attachment of a wide range of SMD compatible drives.

Error Correction – A 32 bit ECC polynomial for detecting and correcting data errors up to 11 consecutive bits. Bad block or defective sector flagging is also provided under standard Perkin-Elmer software.

Position Verification – Automatic sector preamble comparison and 16 bit CRC check prior to data transfers to eliminate sector, head, and cylinder addressing errors.

Self-Test – An automatic diagnostic self-test provided by on-board microdiagnostics.

Controller Address – Switch selectable with "FB" standard.

Device Address – Switch selectable with "FC" to "FF" standard.

Performance

Multiple Sector Transfers – Dual bipolar microprocessors efficiently control data transfers between the SELCH and disk allowing single command data transfers up to a complete cylinder of data with automatic head switching.

Error Correction – Full 11 bit burst ECC on data is provided. Data is corrected transparently within the controller buffer.

Data Buffering – A 1536 byte (6 sector) RAM buffer eliminates "data late" conditions and achieves optimum speed.

Overlapped Seeks – Seeks may be overlapped on up to four drives to improve access times.

Dual Port Drives – Software transparent support for dual port drives is standard.

Hardware

Single Board – Embedded single board design saves space and combines high reliability with ease of maintenance.

Error Display – On-board LED error status display allows convenient user diagnosis.

Drivers/Receivers – SELCH compatible transceivers present a single unit load to the bus. SMD compatible drivers and receivers assure reliable performance of the disk drives up to 50 feet from the CPU.

Flat Cable Connectors – Single 60 pin daisy chain control cable connector and four 26 pin radial data cable connectors attach up to four SMD compatible drives.

Power – Use of internal +5V (@ 7 amps) eliminates the need for external power supplies or cooling.

Environmental – Exceeds Perkin-Elmer temperature and humidity specifications.