Wren™ III Half-Height 5¼-inch Disk Drive

CONTROL DATA

Designed for Original Equipment Manufacturers (OEM)

The Control Data Wren III Half-Height disk drive provides 101 megabytes of unformatted storage in half the space of a full height 5¼-inch drive.

Incorporating technologies proven in earlier models of the Wren family, the Wren III Half-Height provides high performance (18 millisecond average seek) in a compact package and is available with a SCSI or ESDI interface.

Mean Time Between Failure has been increased to 30,000 hours through extensive use of VLSI electronics.

Features

- ☐ 101-Mbyte capacity
- ☐ 18-millisecond average seek
- ☐ 30,000 hour MTBF
- ☐ SCSI or ESDI interface
- ☐ Fully sealed, ultra-clean, head/disk/actuator chamber
- ☐ Humidity control
- ☐ Balanced rotary voice coil actuator
- ☐ Closed-loop, dedicated servo system
- ☐ Surface mount PWA technology
- ☐ Dedicated head-landing zone
- ☐ Automatic actuator restraint/shipping lock
- ☐ Integral shock mounts
- ☐ Vertical or horizontal mounting
- ☐ Low noise level

Interfaces

The Wren III Half-Height drive is available with two interfaces:

- ☐ SCSI — A system level interface that provides complete compatibility with the ANSI definition. The SCSI electronics are embedded in the drive, eliminating the need for external controllers and cables.
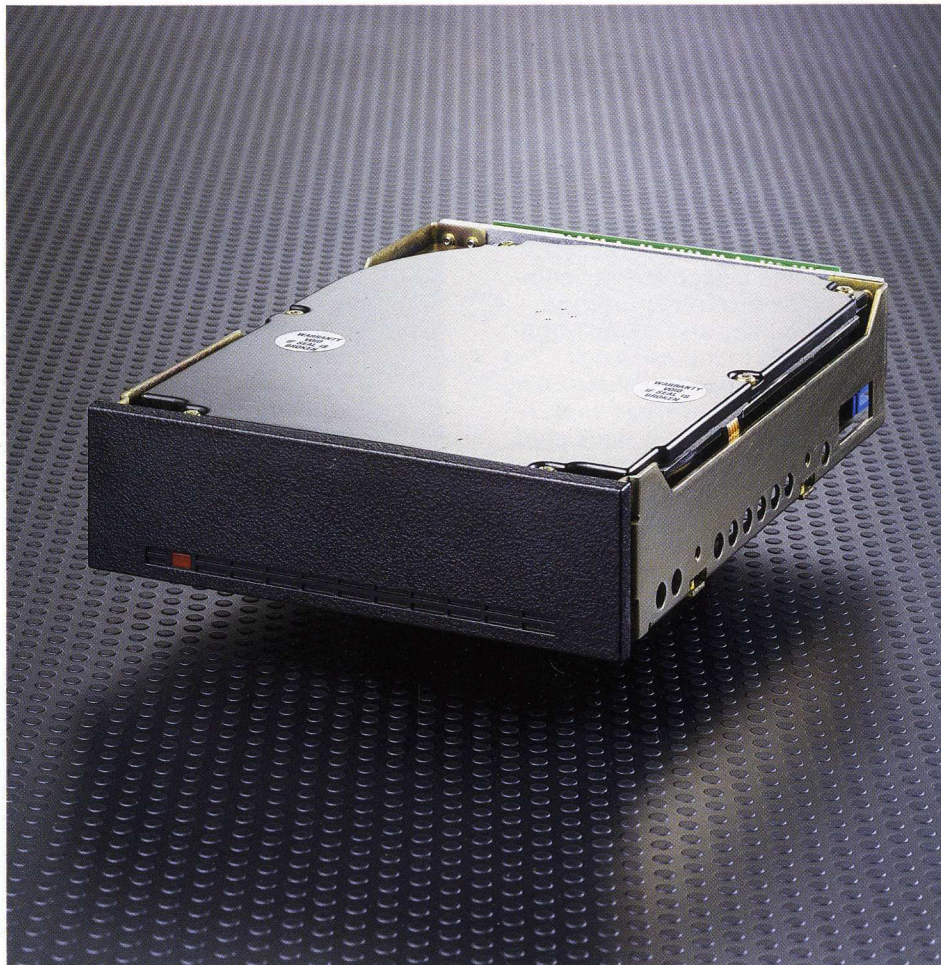
The SCSI controller has a data buffer for increased performance. The controller manages data integrity through automatic flaw sector reallocation and automatic error recovery, improving reliability.

- ☐ ESDI* — The high-performance ESDI interface provides a 1.25 megabyte per second transfer rate. It is a drive level interface that incorporates data recovery and separation in the drive. ESDI supports serial mode and the two following sector modes: address marks or sector pulses.

You Cannot Outdistance Control Data

* Available third quarter 1987

Heads and Disks

The Wren III Half-Height drive contains three thin-film disks in an environmentally sealed chamber. No unfiltered outside air is drawn into the unit. Air is recirculated within the disk/actuator chamber and passes through a filter to ensure a contamination-free environment. A proprietary humidity control system provides superior environmental reliability.

Positioning System

A high performance system (patent pending) provides a precise placement of the read/write heads over the data. The result is high performance combined with unexcelled data integrity.

The heads are mounted on a straight-line arm that is connected to a balanced rotary voice coil actuator. The straight-line design has substantially less mass than other designs, improving accuracy and speed. High energy magnets in the voice coil further improve performance, resulting in an 18 millisecond average seek. A microcomputer controlled, dedicated, closed-loop servo system provides precise positioning control.

In another performance improvement, the servo control moves the actuator with the first seek pulse received, increasing throughput.
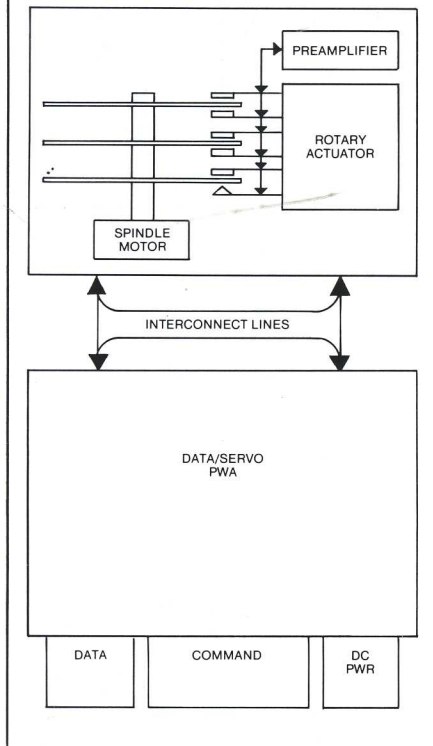
Automatic Actuator Lock

An automatic actuator lock and emergency head retract system automatically move the heads to the landing zone when power is removed. The landing zone contains no data, thus there is no potential for data degradation from heads landing.
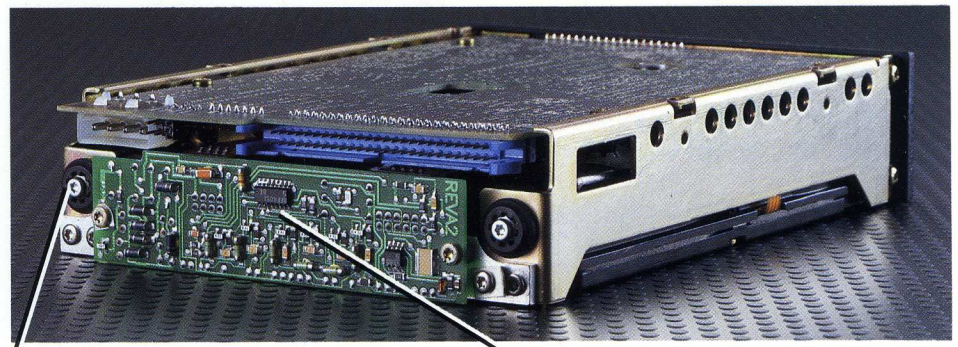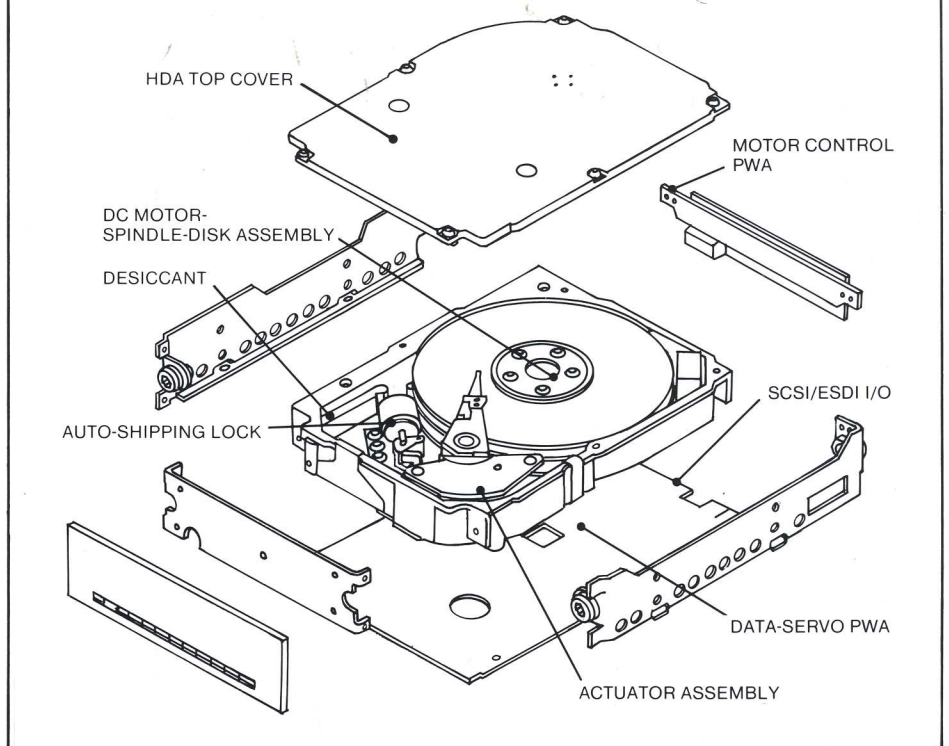
Shock mounts integral to the drive isolate the HDA from vibration.

Surface-mount technology reduces electronics to two printed circuit boards.

General Block Diagram

PREAMPLIFIER

ROTARY ACTUATOR

SPINDLE MOTOR

INTERCONNECT LINES

DATA/SERVO PWA

DATA | COMMAND | DC PWR

Wren III HH

HDA TOP COVER

MOTOR CONTROL PWA

DC MOTOR-SPINDLE-DISK ASSEMBLY

DESICCANT

SCSI/ESDI I/O

AUTO-SHIPPING LOCK

DATA-SERVO PWA

ACTUATOR ASSEMBLY

Electronics

The use of surface mount technology allows the controller to be included on the single main board of the Wren III Half-Height unit.

The Wren Family

The Control Data Wren 5-1/4 inch family provides a range of models with capacities from 48 to 300 megabytes:

☐ Wren II: 48 to 86 Mbytes
☐ Wren II Half-Height: 51 Mbytes
☐ Wren III: 101 to 182 Mbytes
☐ Wren IV: 300 Mbytes (formatted)

Applications

The Wren III Half-Height is designed for applications where capacity and performance are important. These applications frequently are in multi-user, multi-tasking systems and local area networks with file server requirements.

☐ Desk top systems
☐ Small business systems
☐ Office automation
☐ Word processing
☐ Local area networks
☐ Multi-user microcomputers
☐ Low-end minicomputers
☐ Engineering workstations
☐ CAD/CAM
☐ Artificial intelligence

Options/Accessories

☐ Front panel
☐ OEM users manual

Maintenance and Spares

All Control Data products are backed by comprehensive maintenance and spare parts support programs.

SPECIFICATIONS

Configuration
Number of disks	3
Data surfaces	5
Servo surfaces	1
Tracks per surface	969
Track density	960 TPI
Recording density	19,058 BPI
Recording method	2.7 RLL

Performance
Rotation speed	3600 r/min
Average latency	8.33 ms
Seek time	*Typical*
Single track	4 ms
Average	18 ms
Maximum	35 ms

Typical access times are derived from observed values under normal operating conditions.

Interface
	SCSI	ESDI
Type	SCSI	ESDI
Transfer rate		
Sustained	Supports a one-to-one interleave for a 10-Mbit/sec internal disk data rate	10 Mbits/sec
Burst	1.25 Mbyte/sec	NA
Data code	Digital	NRZ

Reliability and Maintainability
Error rate	
Recoverable	1 in 10^{10} bits read, max
Unrecoverable	1 in 10^{12} bits read, max
Seek	1 in 10^6 seeks, max
MTBF	30,000 hours
MTTR	1/2 hour
Preventive maintenance	None
Service life	5 years

Power Requirements
AC	Not required
DC	+12 V (+5%), 1.4 A (Typical operating)
	+5 V (+5%), 1.0 A (Typical operating)
Power dissipation	22 W

Environmental
Temperature	
Operating	10 to 50°C (50 to 122°F)
Storage	−10 to 50°C (14 to 122°F)
Transit	−40 to 70°C (40 to 158°F)
Relative humidity	
Operating	8 to 85%
Storage	8 to 95%
Transit	5 to 95%
Altitude	
Operating	−305 to 3,048m (−1,000 to 10,000 ft)
Transit	−305 to 12,210m (−1,000 to 40,000 ft)

Physical
Height	41.28mm (1.625 in)
Width	147mm (5.75 in)
Depth	203mm (8 in)
Weight	1.9 kg (4.2 lb)

Distributed by:

6DA050DB

CDC®