Ball

The BD Series.

The first disk drive family you'll want to label as your own.

Everything an OEM will ever need in disk drives.

Ball Computer's BD series of disk drives sets new standards for reliability, accessibility and maintainability for the OEM. The BD series, which includes storage module units of 50 megabyte (BD-50) and 80 megabyte (BD-80) capacities, satisfies the OEM requirement for large capacity disk files to interface with small and medium size computers in applications where trouble free performance is critical. Available in either rack mount or console mount configurations, the BD series combines, proven drive technology with features that insure superior reliability and maintainability.

Easy Maintenance

The BD series of disk drives is designed to speed preventive maintenance, simplify trouble-shooting and repair in the field. The drives incorporate a removable 3330-type short stack disk pack. Deck plate, logic and power chassis are hinged and can be "butterflied" out from the top and sides for instant servicing, cleaning and adjustments. The drives are fully modular using separate chassis for actuator and motor control mechanisms, power supply and logic. All electronic circuitry is on plug-in boards, arranged in functional groupings and provided with built-in test points. All critical parts, including voice coils and heads, are standard assemblies available from multiple sources, and field proven in thousands of installations.

High Data Reliability

To provide the highest possible data reliability, protective features are incorporated in all critical areas. All moving parts in the actuator and disk pack well are sealed in a "clean room" environment. This environment extends from the disk pack shroud along the entire length of the carriage and ways. Protecting both the disk pack shroud and actuator prevents possible contamination of the disk surfaces during periods when the heads are retracted and power is shut down. This eliminates, most of the reasons for loss of data; dust and dirt accumulation on precision mechanisms and the disk surfaces. Moreover, the use of a constant voltage power supply reduces premature component failures and susceptibility to recording errors resulting from line-power variations.

Self-Diagnostic

When a BD disk drive
repaired, it tells you v
the operator in locati
system when it is in ne
series disk drives feat
diode (LED) displays
to isolate the failure n
interface, read, write
When the system det
internal latches moni'
light the easily obser
on the chassis next to
circuits. The operator
from the front panel b
only be over-ridden b
cover and pressing th
next to the LED indic
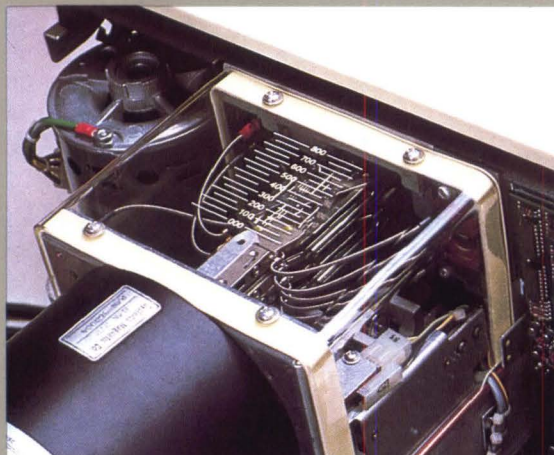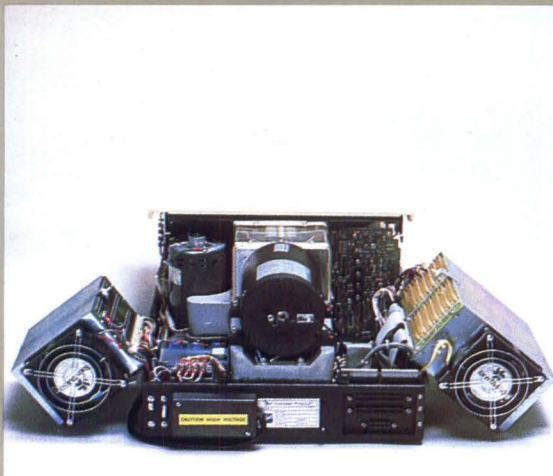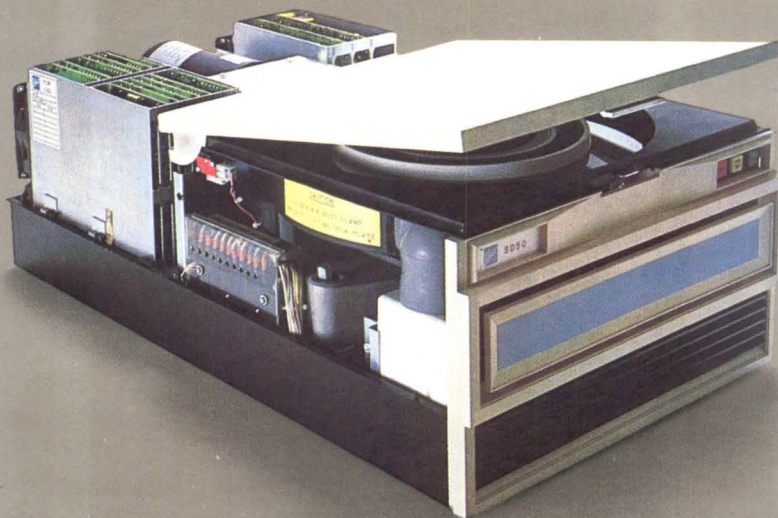
Operation

...needs to be
...where to look. To aid
...ng problems in the
...eed of repair, the BD
...ure light emitting
...in the logic chassis
...node to power,
...or head circuits.
...ects a problem,
...tor operation and
...vable LED indicators
...the corresponding
...can reset the drive
...out the latches can
...by removing the
...e release buttons
...tors.

Highly Reliable

For increased reliability, the industry's first triple cooling system in a compact design has been incorporated into each BD Series unit. One fan cools the logic chassis to eliminate hot spots in the circuitry that cause premature component failures. Another fan cools the power supply and servo drivers. The third circulates cool, clean air through the absolute filter to the disk pack shroud and all moving parts. As a result, Ball's unique cooling system design greatly reduces device failures.
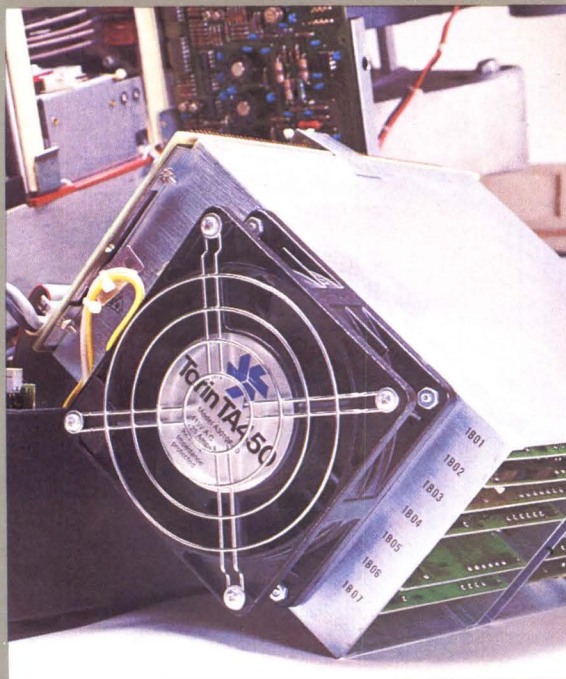
...And More

The list of features from Ball is almost endless. For example, the absolute air filter can be easily accessed by raising the deck plate to the maintenance position. The filter is mounted in a frame and can be lifted out by merely loosening a single locking bolt—a simple five minute operation.

Additional features include:
- a track following servo system with no external reference required;
- field upgrade capability from 50 to 80 megabytes;
- interface compatibility with the CalComp Trident TD-50/80, CDC 9760/62, or Ampex 940/980; and
- static discharge immunity up to 4 kilovolts.

Other disk drives may have some of the features you need, but only the Ball BD series has all of them.
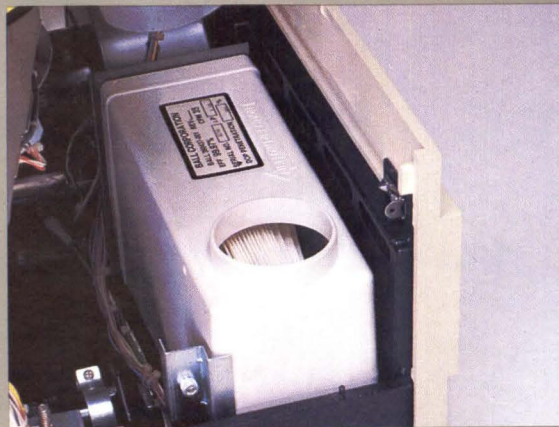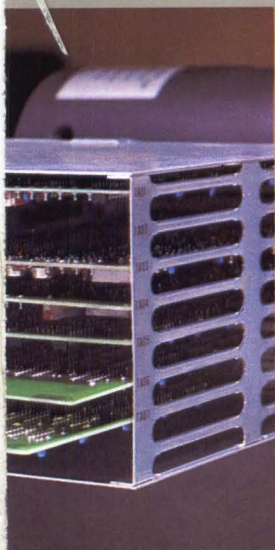
Specifications

BD-50
STORAGE CHARACTERISTICS

Read/Write Surfaces	5
Tracks per Surface	815
Tracks per Inch	370
Recording Method	MFM, BIT SERIAL
Data Transfer Rate (at 3600 RPM)	806 Kbytes/sec.
Bits per Track (maximum including header and gaps)	107,520
Bytes per Track	13,440
Bytes per Pack (unformatted)	54.7×10^6

BD-80
STORAGE CHARACTERISTICS

Read/Write Surfaces	5
Tracks per Surface	815
Tracks per Inch	370
Recording Method	MFM, BIT SERIAL
Data Transfer Rate (at 3600 RPM)	1.2 megabytes/second
Bits per Track (maximum including header and gaps)	161,280
Bytes per Track	20,160
Bytes per Pack (unformatted)	82.1×10^6

BD SERIES (Applies to both BD-50 and BD-80)
PERFORMANCE CHARACTERISTICS

Positioning Technique	Continuous track following servo controlled linear motor
Access Time (maximums)	
Track to track (adjacent)	5 milliseconds
Maximum tracks (0 to 814)	55 milliseconds
Average access time	30 milliseconds
Pack Rotational Speed	3600 RPM ±3%
Latency Time	16.7 milliseconds
Start Time	20 seconds
Stop Time	20 seconds

POWER REQUIREMENTS

AC Power Voltage	115(±17)VAC, 60(±.6)Hz, 1 phase
	220(±35)VAC, 50(±.5)Hz, 1 phase
Running Current	7.5 AMP (115VAC @60Hz) (Seeking)
Starting Current	22.5 AMP (115VAC @60Hz) (For 10 seconds)
Standby Current	2.5 AMP (115VAC @60Hz)

PHYSICAL CHARACTERISTICS

Height	10.5 inches (26.7 cm)
Width	17.5 inches (44.5 cm)
Depth	31.5 inches (80.0 cm)
Weight	180 pounds (81.6 kg)

ENVIRONMENTAL LIMITS

|	
Operating:	
Temperature	60°F to 90°F (15.4°C to 31.9°C), with a maximum gradient of 12°F (6.6°C) per hour
Humidity	10% to 80% noncondensing
Non-operating:	
Temperature	−40°F to +150°F (−39.6°C to 64.9°C), with a maximum gradient of 36°F (20°C) per hour
Humidity	5% to 95% noncondensing

ADDITIONAL STANDARD FEATURES

Address Mark Detection
Variable Sector Sizes
Sector Address/Cylinder Address Read Commands
Uniform cooling with individual fans per electronic chassis

OPTIONS

Rack or Pedestal Mounting	
NRZ Data Interface	
Signal Cables	7, 10, 15 or 25 feet (2.13, 3.05, 4.57 or 7.62 meters)
Read/Write Cables	7, 10, 15 or 25 feet (2.13, 3.05, 4.57 or 7.62 meters)

ALSO AVAILABLE

Ball Comprehensive Controllers with error correction, variable record length and multiple drive capability
CPU Interfaces for various minicomputers
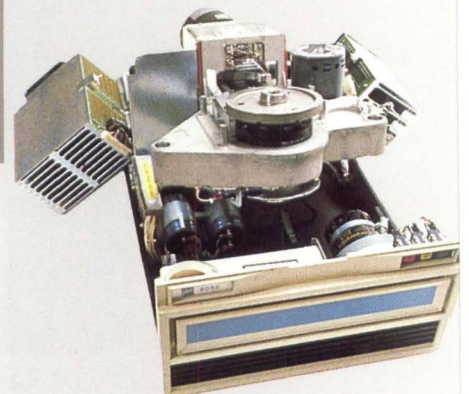
Ball Computer Products Division