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 is repaired, it tells you the operator in local system when it is in need of repair. A series disk drives feature a light emitting diode (LED) displays to isolate the failure at the interface, read, write circuits. When the system detects internal latches malfunction, the easily observed on the chassis next to the LED indicators.

[Image of BD series disk drives]
Operation

When problems in the need to repair, the BD feature light emitting in the logic chassis mode to power, or head circuits. A problem, or operation and LED indicators the corresponding can reset the drive but the latches can by removing the release buttons.

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: MF-M, BIT SERIAL
- Data Transfer Rate (at 3600 RPM): 866 KB/sec.
- Bytes per Track (maximum including header and gaps): 107,520
- Bytes per Pack (unformatted): 13,440
- Bytes per Pack: $54.7 \times 10^8$

#### BD-80

**STORAGE CHARACTERISTICS**
- Read/Write Surfaces: 5
- Tracks per Surface: 815
- Tracks per Inch: 370
- Recording Method: MF-M, BIT SERIAL
- Data Transfer Rate (at 3600 RPM): 1.2 megabytes/second
- Bytes per Track (maximum including header and gaps): 161,280
- Bytes per Pack (unformatted): 20,160
- Bytes per Pack: $82.7 \times 10^8$

#### BD SERIES (Applies to both BD-50 and BD-80)

**PERFORMANCE CHARACTERISTICS**
- Continuous track following servo controlled linear motor
  - Positioning Technique: 5 milliseconds
  - Track-to-Track (adjacent): 58 milliseconds
  - Maximum Tracks (0 to 814): 30 milliseconds
  - Average access time: 3400 RPM: 3.3
  - 16.7 milliseconds
  - 20 seconds
  - 20 seconds

**POWER REQUIREMENTS**
- 115 (±17) VAC, 60 (± 6) Hz, 1 phase
- 220 (±35) VAC, 50 (± 5) Hz, 1 phase
- 7.5 AMP (115 VAC @60Hz) (Seeking)
- 22.5 AMP (115 VAC @60Hz) (For 10 seconds)
- 2.5 AMP (115 VAC @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: 150 pounds (68.1 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 90% non-condensing
- Non-operating temperature: -40°F to +150°F (-40°C to 66°C), with a maximum gradient of 30°F (20°C) per hour
- Humidity: 5% to 95% non-condensing

**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
- Read/Write Cables

**ALSO AVAILABLE**
- Ball Comprehensive Controllers with error correction, variable record length and multiple drive capability
- CPU Interfaces for various minicomputers

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**Computer Products Division**

860 East Arques Avenue, Sunnyvale, California 94086

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(408) 733-6700