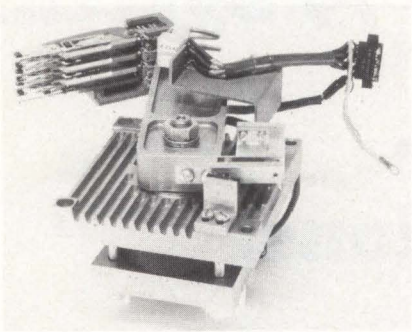

Small size and low cost are achieved in Okidata's series 3300 disc drives through use of a rotary head positioner. Heads are mounted directly on a rotating arm which moves across the disc surface much like a phonograph arm. This design does away with the typical head carriage and its mass, and eliminates precision rails and ball bearings

is the product of mass and radius squared. The positioner arm in the 3300 is mounted directly to the rotor of a high torque brushless dc motor. While the rotor has high mass, its effective radius in the system is small compared to the radius at which the heads are located; this results in minimum inertia and therefore minimum power dissipation.

The resulting positioner is compact. Only two bearings are involved in the entire system, and the motor can be removed from the drive without disturbing the arm or heads, which are located in a "clean" enclosure.

There are two data heads per surface. The track-following positioner servo system uses the bottom surface of the lower disc, which contains prewritten servo tracks used in positioning heads; this eliminates close tolerances and thermal problems common to drives which use devices in the positioner to derive track position information.

Optional fixed heads are mounted on a tray-like assembly containing head terminations and diodes. These assemblies can also be mounted to use a portion of the servo disc surface and also the entire top surface.

The interface is designed such that moving head drives may plug into a system intended to operate with the CDC 9760 storage module and operate to its specifications. Moving head and fixed head hybrid drives use a common interface. A single interface board contains all receivers, drivers, and electronics necessary to the standard interface and interface options.

The low cost units use Winchester 3340-type heads and media, and provide data separation; error recovery features such as early/late datastrobe; and track offset, direct track addressing, and index/sector lookahead. Both fixed and moving heads have 18,560 bytes/track and data transfer rates of 7.33M bits/s. Average access time is 38 ms. Expanded capacity and transfer rate will be accomplished using 3350 Winchester-type heads; maximum moving head capacity is expected to be 127M bytes in the same package.

Circle 142 on Inquiry Card

80M-Byte Disc Drive Incorporates Reliability, Maintainability Features

BD-80 is an IBM 3330-type disc drive which offers 80M bytes of online capacity and design features to improve both reliability and maintainability. When interfaced with the 3300 formatter the drive supports sophisticated file management techniques in real-time, suitable for multiterminal and batch processing systems requiring high speed, random access to mass storage.

In the drive, Ball Computer Products, Inc, 860 Arques Ave, Sunnyvale, CA 94086 has combined reliability and maintainability with features that include a 3330-type spindle interface, a track-following servo-system that requires no external references, a triple cooling system, a sealed-in actuator mechanism, and a constant-voltage power supply. The combination of features reduces common disc problems: dust accumulation on precision mechanisms, head crashes caused by contamination, hot spots in circuitry, and susceptibility to recording errors due to line power variations. Separate chassis for actuator and motor control mechanisms, power supply, and logic, and plug-in cards simplify maintenance as well as troubleshooting and repair. Operating problems are isolated by the system itself to power, interface, read, write, or head problem.

Basic disc drive contains dynamic braking, standard digital I/O, and an ac power cable and power supply. The BD-53 disc pack is based on IBM 3336-11 components; it contains five read/write surfaces with 815 cylinders/surface at 370 tracks/in. Recording densities are 6060 bits/in, 20,160 bytes/track or approximately 100M bytes/pack (unformatted). Start/stop times are 20 s. Average access time is 30 ms and data transfer occurs at 1.2M bytes/s.

The 3300 formatter offers large mainframe disc handling functions such as multiple drive capability. Features include seek overlap operation, multirecord transfers, IBM error correction codes, and high speed drive support. The unit supports variable size record formats, internal data encoding and decoding, error correction, and a sophisticated FIFO buffering technique that matches disc speed to minicomputer timing. It can accommodate up to eight spindles in a daisy chain arrangement. An internal microprocessor permits seek overlap operation.

Circle 143 on Inquiry Card

Battery-Powered Cassette Recorders Playback Directly on Terminals

ICT series write-only incremental digital cassette transports and recorder systems offer up to 2.2M bits of data capacity on a 300-ft cassette. Miniature transport uses a Philips data cassette, low power incremental stepping motor, and CMOS electronics, drawing just 700 mW from a 12-V battery when writing, to provide portable battery-powered data collection.

With the systems, Datel Systems, Inc, 1020 Turnpike St, Canton, MA 02021 offers a simplified approach to design by reducing data entry, retrieval, power-up, and power-down considerations to the point of providing and accepting logic levels at the required times. Circuit card modules are specified in terms familiar to circuit designers who know digital logic. In a complete system, design details of the transport's flux levels and motor drive are transparent to the designer, requiring only knowledge of ultimate word size, bit rate, and data capacity. However, full specification of transport and individual card modules allows customized systems to be created at any level.

Systems accept a variety of data formats ranging from full synchronous serial to 40-bit (five byte) parallel. Basic format is 8-bit bytes recorded at about 6 bytes/s; these bytes are externally coded as ASCII alphanumeric character bytes for direct playback on terminals. Optional analog inputs may be recorded by digitizing channels with low power A-D converters, to provide direct octal printout of A-D informa-