

# Innovative Design

## 8" Disks "To Go" Overcome The Elements

The problem with Winnies is that they don't travel. Because of their sensitive nature — the slightest surface defect or contaminant can render them useless — they're destined to remain in protective custody, within the drive chamber, for life.

That is, of course, until now. CDI and Memorex have each developed removable 8" rigid disk cartridges: hard disks cleverly pack-

ed into cases that keep out the elements, yet expose the disks when they're safely inside the drive.

Eliminating contamination is the main problem in designing these cartridges, according to Drew Berding of Memorex Mini Disc Drive Corp. In developing the Memorex 2001 cartridge, the ounce of prevention tack was taken — engineers knew that keeping the cartridge interior free of contamination would be easier than

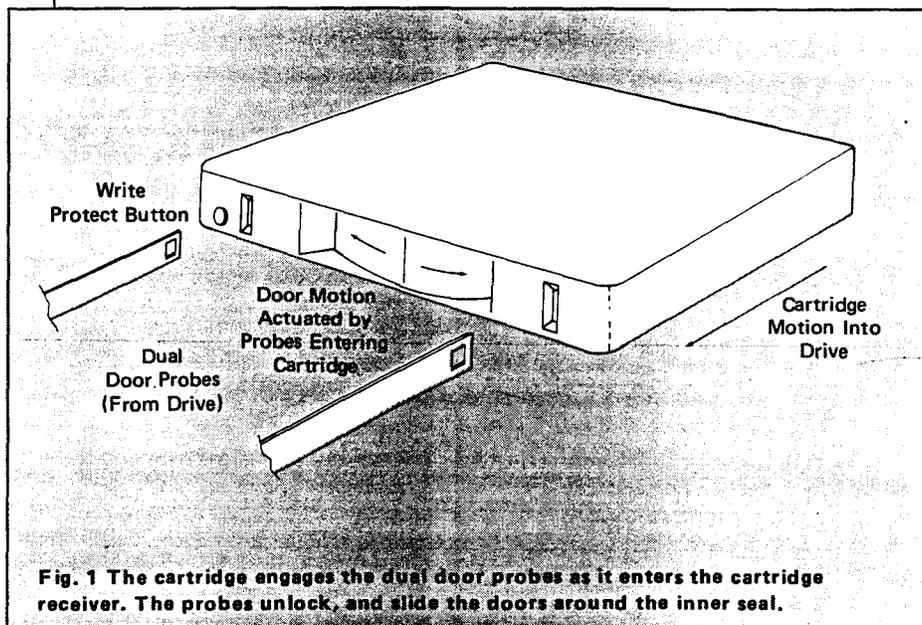
flushing out contamination already inside.

Two entrances exist in any cartridge through which particles may enter. These are the two areas where drive and cartridge mechanisms interact: the disk hub, which must interconnect with the drive spindle, and the doors that allow the Read/Write heads access to the disk.

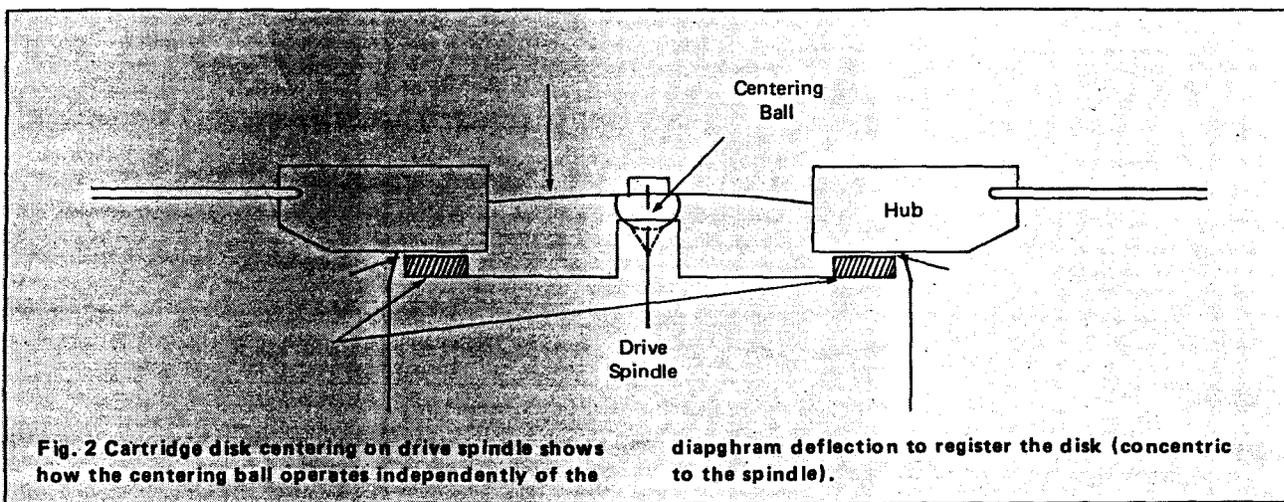
At the hub, designers chose a seal which would remain locked despite pressure applied against the hub. When in use, the cartridge case presses against a fixed ring, releasing the hub seal. This, in turn, frees the hub to rotate without drag.

Between the outer, square cartridge case and a round, inner seal protecting the disk lies the cartridge door mechanism. Two .02" thick actuator probes projecting from the disk drive mechanically interact with this mechanism through twin holes in the cartridge outer case (fig 1), unlocking and pulling open the sliding doors as the cartridge is inserted into the drive. When the cartridge is pulled out, the mechanism closes and secures the overlapping doors. Once locked, the doors "resist even the most determined effort" to open them, according to Memorex.

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**Fig. 1** The cartridge engages the dual door probes as it enters the cartridge receiver. The probes unlock, and slide the doors around the inner seal.



**Fig. 2** Cartridge disk centering on drive spindle shows how the centering ball operates independently of the diaphragm deflection to register the disk (concentric to the spindle).

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Why would someone be determined to break into your disk cartridge? "It's not that they're malicious," says Berding. "People are just curious. When I hand people cartridges, while they're talking to me they're trying to open the things up. It's like a challenge."

Should some contamination manage to infiltrate the inner casing, Memorex provides a second defense:

a flow of clean air from the drive helps keep contamination away from of any perturbations in the surface of the diaphragm on which it is mounted. the disk (this air flow also helps stabilize disk temperature).

The other major difficulty with making disks portable is keeping disks centered each and every time they're plugged into the drive. In the 2001, Memorex built a centering ball into the cartridge disk center (fig 2). When the cartridge is inserted into the drive, this ball slips into a cone-shaped opening in the drive spindle, keeping the disk centered.

Materials choice was another concern, since any substance prone to shedding would pose a serious contamination problem from *inside* the cartridge case. Polycarbonate was chosen for the case; Delrin plastic for the doors.

Several other companies are working on 8" removable disk cartridge designs. However, for removable disks to garner a significant market share, an industry standard is necessary. In Berding's admittedly biased opinion, the 2001 could well become that standard.

—Bob Hirshon

## Ribbon Inker Eliminates Skew Problem

Reinking can cause printer ribbon skew without proper edge alignment and skewing can prevent character imprint at extreme ribbon edges. For example, in a 132-column printer, a skewed ribbon could cause the printer to miss printing characters in column 1 or 132.

A new automatic ribbon reinker (Fig 1), eliminates the problem of ribbon skew. Introduced by Compu-

Rite Corp, Tarzana, CA, the reinker uses an optical alignment system to overcome skew.

Besides eliminating ribbon skew, the CR-170's patented variable metering system can ink 3-mil, 4-mil, as well as the more widely-used 5-mil ribbons. Also, since the ink application roller is immersed in the ink reservoir, it eliminates pumps and the possibility of clogging. The unit

employs an electronic sensor to insure accurate reversing of the winding mechanism.

The CR-170 printer ribbon reprocessor reinks a ribbon in five minutes at a typical cost of less than one dollar. The manufacturer says that you may reink a ribbon at least three times and still maintain new ribbon quality and specifications.

—Loren Werner

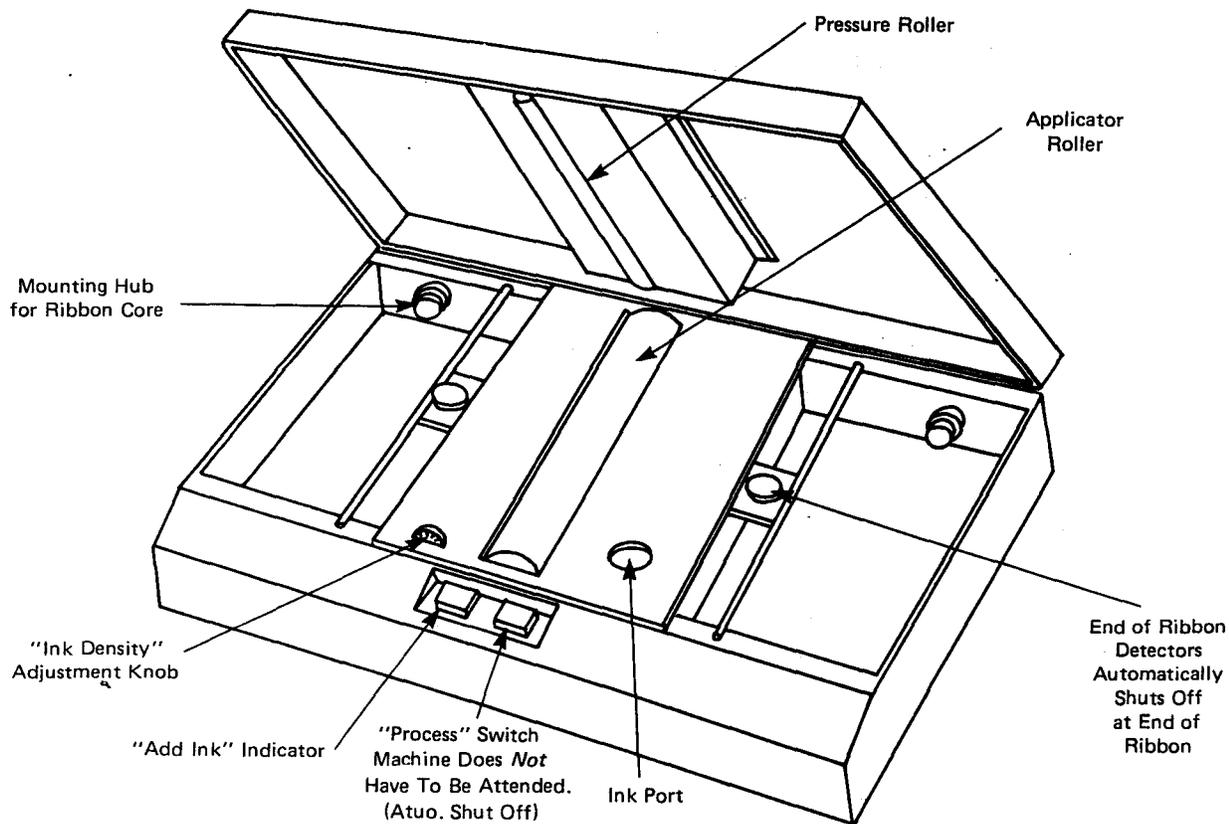


Fig 1 The CR-170 printer ribbon reprocessor operates automatically; the user simply loads the ribbon into the unit, and closes it. Once started, the unit automatically reinks the ribbon, rewinds it and turns itself off.