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T. Gardner Apr 2006

MEMOREX

677 OEM  
Disc Drive



# "The 677 is designed for reliability maintenance of operation.

## **The Memorex 677 OEM Disc Drive**

The Memorex® 677 OEM disc drive is a 200 megabyte, single spindle, direct access disc storage drive measuring 47 inches high by 22 inches wide by 32 inches deep. A product of superior technology and manufacturing resources; it enjoys a heritage of customer preference in all performance categories. The reliability demonstrated in customer installations provides a cost effective drive with the highest on-line availability in the industry. At Memorex, each year brings increases in product quality and resulting increases in our drives' cost-effectiveness.

The full range of products and services assures your customers' satisfaction. It's the security of having the hardware backed-up with customer service support, engineering support, maintenance services, technical training, full documentation, and long-term spares availability.

Memorex is committed to the industry, and to the marketplace and to keeping its commitments. Ultimately our customers' confidence is based on the results we produce. Past records on our products have shown that confidence, on all sides, has been well placed. Given this product and its performance record, we are confident we can demonstrate conclusively its superiority by any product definitions.

## **Methodology**

The 677 disc drive is a compact, stand-alone single-spindle unit that is, in essence,

an advanced version of Memorex's highly successful 3670 and 3675 dual spindle drives. The drive rotates a disc pack at 3600 rpm, selects one of 19 read/write heads for an operation, positions the selected head to one of the 815 tracks on the disc surface, and enables the system to synchronize the data transfer.

The mechanical and electrical characteristics of the 677 can be tailored to match almost any control unit/drive interface specifications a customer might require.

## **Package Design**

The 677 is designed for reliability, maintainability, and ease of operation. First, all areas of the drive are easily accessible. The printed circuit boards are located above the shroud area allowing easy accessibility. Next, components are modularly packaged to simplify their

# ability, and ease

removal and re-installation. They are also functionally packaged to maximize the ease of troubleshooting and replacement.

## Air Circulation

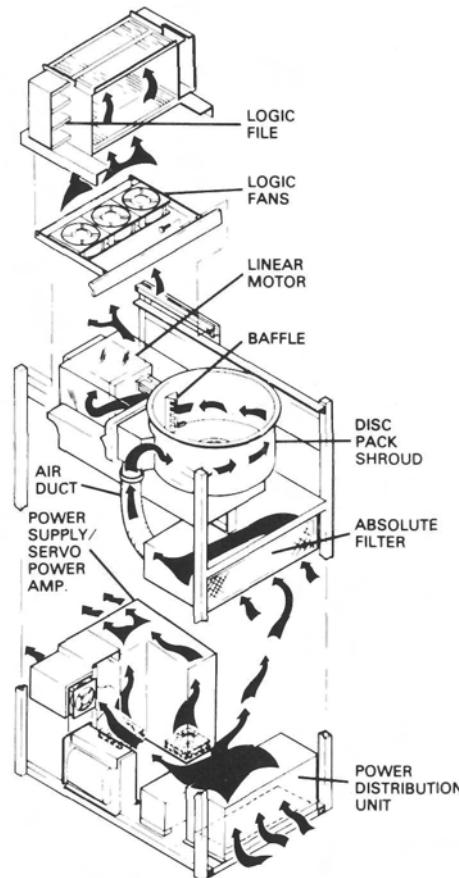
The Memorex-patented Air Flow System reduces the number of parts required in the drive by eliminating the need for a large pack system blower. Utilizing the revolving disc pack as an air pump, the system draws air through special baffles that distribute air. This design enables the 677 to become temperature-stabilized rapidly, greatly reducing idle time.

## Power System

This system has been designed for increased reliability in two significant areas. First, all control electronics are isolated from the electrically noisy power supply area. Second, special monitoring circuits detect losses of power and automatically retract the heads

from the pack at a controlled velocity to insure sensitive calibrations and alignments.

## 677 Airflow



## Read/Write Heads

Over 1<sup>1/4</sup> million Memorex designed and built read/write heads are currently in use in the 677 disc storage drives throughout the world. As part of the effort to make a better product, the 677 heads were designed to fly up to 50% higher than competitive heads and provide superior recording performance. This significantly reduces the possibility of head-to-disc interference.

## Access Time

The Memorex-pioneered linear motor used in the 677 provides an average head positioning time of 28.5 milliseconds while the average rotational latency to a data record is 8.33 milliseconds.

# "Three generations of experience have substantial base of

## **Capacity**

The data capacity of the 677 is 208,118,400 bytes—one of the largest for a removable pack disc drive. Multiple drives may be integrated into a single system configuration depending on system limitations.

## **Customer Interfacing**

Three generations of disc drive experience have yielded Memorex a very substantial base of technology from which to work. That experience has allowed us the design flexibility required to meet not only conventional OEM needs, but unconventional ones as well. A broad range of interface features, from a minimum set to a complex combination that

would accommodate attachment to many systems, offers the kind of versatility that many OEM users require. These features include:

Multiplex or star configuration options.

Dual ports for communication with two controllers at the same time featuring dynamic switching.

Removable, logical address plugs.

Console indicators in a number of configurations, from the minimum required set through customized diagnostic and status feature controls.

Dynamic braking that stops pack rotation in 20 seconds nominal.

50 Hz power supply at standard voltages.

Programmable sectoring from 1 to 128 per track.

Rotational position sensing. Address mark capability for variable length record formats.

Pad record operation that automatically fills the end of a record with zeros, freeing the controller for other operations.

Monitoring of registers.

Diagnostic monitoring.

Data separation within the drive.

NRZ TO MFM encoding and precompensation.

## **Disc Packs**

Memorex® Mark X and Mark XI Disc Packs, companion products with the 677, are unmatched in performance because of their superior quality. Memorex coats every disc with an "armor-tough" surface that extends durability and withstands loading stress. Within this coating, encapsulated oxide particles are circumferentially aligned. This propri-

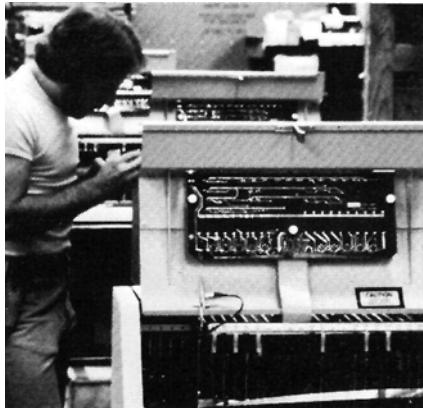
# discdrive yielded Memorex ave technology..."

tary process maximizes head-to-track stability, assures cleaner rewriting, and reduces residual noise.

We also have the "100X" surface shield which complements the "armor-tough" coating. This results in an extension of the useful disc life by one hundred times that of a conventional disc without coating.

## Off-Line Testing

Functional testing of a particular 677 off-line is now a simple operation. Portably packaged to go anywhere, Memorex's full-function off-line testers, using a standard set of hardware (customized for any interface), performs micro-diagnostics on key functional areas within the drive. Use of these easy-to-operate, off-line testers



can greatly reduce costly downtime and system degradation.

## Maintenance

The 677 requires abbreviated scheduled maintenance every two years. If repair is ever necessary, MTTR is less than one and one-half hours. Due to the unique design of the drive, all components are readily accessible.

The companion Dolphin™ tester (a portable off-line tester) is packaged on a PCB and is available for production and service tests. The microdiagnostics provide a quick check of key operating functions.

## Cost Effectiveness

The total cost of ownership involves several factors:

Initial investment

Cost per byte

Cost of maintenance and service

Interface engineering costs

Cost of future up-grades

Compare the 677 disc drive. Compare the 677 quality. Compare the 677 on a cost-per-byte basis. Compare and you'll discover for yourself that the 677 offers you more for your investment.

The 677 drives offer a radical decrease in cost-per-byte as capacity increases.

With the 677, your system requires less maintenance.

High MTBF protects your investment in equipment and data base.

The documentation and engineering support available makes interface both easy and economical.

# 'Our worldwide system of over 1,000 dedicated assistance

## **Service Support System**

Our worldwide Service Support System of over 1,000 people provides dedicated assistance to all our customers in these key areas:

Field Services: with training for your service technicians and a Third-Party Maintenance program.

Customer Service: with computerized spares inventory, order tracking system, and order entry, and a Customer Service Department staffed with interested professionals committed to you and your product.

Product Management: with a team of highly skilled product managers who can supply your sales representatives with detailed data and assistance.

Advertising: with the image of Memorex, an industry leader with a reputation for quality

excellence, with advertising support, and with a complete series of publications and documentation on the disc drives.

Engineering: with a team of skilled high technology engineers to assist you in interfacing and with technical support.

Manufacturing: with Memorex's unique "Total Quality System" and through producing our own media and heads.

In all, you'll find the Memorex OEM Service Support System to be the most comprehensive in the industry. All of these support functions are staffed with dedicated Memorex employees who are committed to making you a success.

Memorex also supplies a complete line of computer media OEM products—disc packs, computer tape, and flexible discs.

At Memorex we pride ourselves on quality excellence, in our products and our ability to serve you.

## **Memorex Corporation— Quality, Value, Service.**

Founded in 1961, Memorex employs nearly 12,000 highly skilled people in more than 100 locations throughout the world. With modern headquarters and major manufacturing facilities in Santa Clara, California, Memorex also has production facilities in Liege, Belgium; Nogales, Mexico; Eau Claire, Wisconsin; and Irvine, Santa Ana, and Anaheim, California plus a network of regional warehousing and distribution centers.

Memorex is a worldwide supplier of high technology equipment and magnetic recording media used in data storage, retrieval and communications. The growing line of products today includes high quality disc tape and semiconductor data storage systems; telecommunications processors and terminals; computer tape, disc packs and data modules; audio and video tapes; word processing supplies; and field engineering and facilities management services.

# support people provides

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## Specifications

### Data Retrieval Times

Average Latency: 8.33 msec  
Track-to-Track Access Time: 6 msec (maximum)  
Maximum Access Time: 53 msec  
Average Access Time: 28.5 msec  
Data Transfer Rate: 806,000 bytes/sec

### Disc Pack Characteristics

Number of Recording Discs: 10  
Number of Recording Surfaces: 19  
Tracks per Surface: 815  
Track Density: 370 tracks/inch  
Bit Density (Innermost Track): 4040 bits/inch  
Bit Density (Outermost Track): 2660 bits/inch  
Encoding Scheme: MFM (Miller)  
Coating Material (Memorex Mark XI): Oriented pfizer iron oxide  
Servo Surface: Surface 10  
Index Pattern: 111110101101  
Rotational Speed: 3600 rpm

### Capacity

Track Capacity: 13,440 bytes  
Cylinder Capacity: 255,360 bytes  
Disc Pack Capacity: 208,118,400 bytes

### Dimensions

Width: 22 inches  
Depth: 32 inches  
Overall Height (Top of Control Panel): 47 inches

### Start/Stop Time

20 sec nominal

### Weight

550 lbs.

### Power Requirements

Voltage: 60 Hz model  
208/230 VAC  $\pm 10\%$   
3 phase  
(DELTA)  
50 Hz model  
220/230/240 VAC  $\pm 10\%$   
3 phase  
(DELTA)  
380/398/415 VAC  $\pm 10\%$   
3 phase  
(WYE)  
Frequency: 60 Hz model  
**60  $\pm 1\%$**   
50 Hz model  
**50  $\pm 1\%$**

### Maximum Heat Dissipation

4450 BTU/hour

### Internal Air Flow

550 CFM

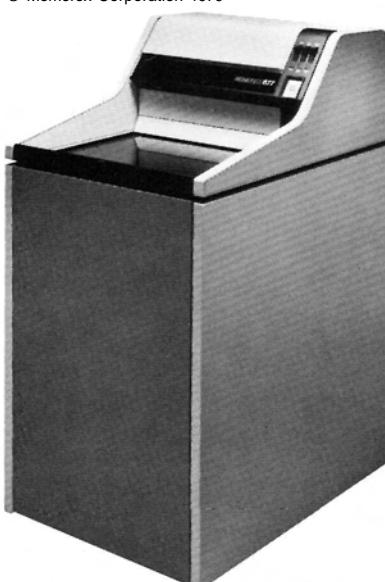
### Operating Environmental Conditions

Temperature: Range, 60° to 90°F;  
Optimum, 75°F; Allowed variation,  
5°F/hour  
Relative Humidity: Range, 20% to 80%;  
Optimum, 50%  
Maximum Wet Bulb: 78°F

### Non-Operating Environmental Conditions

Temperature: Range, 50° to 110°F;  
Allowed variation, No condensation  
Relative Humidity: 10% to 90%  
Maximum Wet Bulb: 80°F

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