

# 12960A Cartridge Disc Subsystem

## Features

- Compact on-line storage for HP Computer Systems
- Dual storage media for maximum convenience
- 4.9 million bytes, expandable to 19.6 million bytes
- Average access time less than 30 milliseconds
- Photo-optical head positioning for guaranteed interchangeability
- Reliability through simple and rugged design

The HP 12960A Cartridge Disc Subsystem uses the efficiency and dependability of the 7900 Moving-head Disc Drive. It serves as a low-cost mass storage device for use in HP 2100-based computer systems.

Each drive has a removable 2315-type disc in combination with a fixed disc. Together they store 4.9 million bytes of information. Both discs are served by the same moving-head mechanism. The removable disc is permanently enclosed in a cartridge for protection against contamination and damage. In a typical operating situation, the user has the flexibility of utilizing the cartridge as a removeable medium for data storage while using the fixed disc for on-line storage of programs.

The 12960A Cartridge Disc Subsystem contains the disc drive, power supply, interface controller and all necessary software for operation with HP computer systems.





# Specifications

## CAPACITY

Drive: 4,915,200 bytes  
200 cylinders  
800 tracks  
19,200 sectors  
Track: 24 sectors  
6,144 bytes

Cylinder: 4 tracks  
96 sectors  
24,576 bytes  
Sector: 256 bytes  
Recording Surfaces: 4  
Disc: 2

## RECORDING

2200 bits/inch on inner track, 100 tracks/inch,  
203 tracks/surface.

## ACTUATOR

Voice coil actuator with position and velocity feedback.

## CARRIAGE

Stainless steel rails life tested in excess of two hundred million seeks.

## AIR FILTRATION AND CIRCULATION

65 CFM squirrel cage blower distributes air to both discs. Absolute filter located at outlet side of blower. All air passing over the discs goes through this filter. Positive air pressure is maintained during cartridge change.

## DATA ACCESS

Rotation Speed 2400 RPM  
Head Positioning (including settling time)  
Track-to-Track (Maximum): 7 ms  
67 Tracks (Maximum): 30 ms  
203 Tracks (Maximum): 55 ms  
Rotational Delay (latency)  
Average (1/2 revolution) 12.5 ms  
Maximum (1 revolution) 25 ms  
Total Average Access Time  
(position and rotation) 47.5 ms  
Data Transfer  
8 Bit Bytes/second: 312,000  
Bits/Second: 2.5 million  
Cartridge Change at 60 Hz Power  
Stop Time: 25 sec  
Start Time: 30 sec

## POWER REQUIREMENTS

110/120V ± 10%, 60Hz ± 2%, 3.4A, 1Ø  
220/240V ± 10%, 50Hz ± 2%, 2.0A, 1Ø

## INTERCHANGEABILITY

The 7900's unique photo-optical head positioning system allows any disc written on any 7900 within its operating temperature (10° to 40°C) to be read on any other 7900 unit operating within that temperature range.

## ENVIRONMENTAL

Temperature  
Operating: +10° to +40°C (+50° to +104°F)  
Nonoperating: -40°C to +75°C (-40°F to +167°F)  
Humidity: 8% to 80% non-condensing  
Vibration: 10 to 50Hz at 0.01 inch peak-to-peak excursion  
Attitude (pitch and roll): ±30 degrees about either axis.

## PHYSICAL

### Disc Drive

Height: 10½ inches (26,7 cm)  
Width: 19 inches (48,3 cm) (16¼ inches behind rack mounting ears)  
Depth: 25¾ inches (65,1 cm) (22-15/16 inches behind rack mounting ears)  
Weight: 117 lbs. (53,1 kg)  
Shipping Weight: 140 lbs. (63,7 kg)  
Racking: Fits standard 19 in. EIA rack

### Power Supply

Height: 7 inches (17,8 cm)  
Width: 16¾ inches (42,5 cm)  
Depth: 19¾ inches (50,2 cm)  
Weight: 55 lbs. (25 kg)  
Shipping Weight: 65 lbs. (29,5 kg)  
Racking: Fits standard 19 inch EIA rack

## ORDERING INFORMATION

- A. 12960A: Cartridge Disc Subsystem for 2100-based systems, 4.9M bytes (2.4M 16-bit words). Includes the 7900 disc drive, power supply, interface controller,\* disc cartridge and disc operating system software.
- B. 12960A-010: Serves as 2nd, 3rd or 4th drive for the 12960A. Includes the 7900 disc drive, power supply, disc cartridge and necessary connecting cables. Up to 4 drives may be operated from one interface controller.
- C. 12960A-015: Provides 230V, 50 Hz operation.
- D. 12960A-020: DOS-M Software; no charge.
- E. 12960A-025: DOS-III Software; no charge.
- F. 12869A: Disc cartridge (This is a 2315 type disc cartridge.)
- G. 12961A-010\*\*: Serves as 2nd, 3rd, or 4th disc drive for the 12960A Subsystem. Includes the 2.45M byte 7901A disc drive, integral power supply, disc cartridge and necessary connecting cables.

**Interface Power Requirements for 2100-Series Computers**  
0.06A (+12V); 0.095A (-12V); 0.134A (-2V); 3.78A (+4.5V)

\*Controller occupies 2 computer I/O slots.

\*\*7901A (12961A-010) can be ordered as additional drives on the 12960A Subsystem.



For more information, call your local HP Sales Office or East (201) 265-5000, Midwest (312) 677-0400, South (404) 436-6181, West (213) 877-1282. Or, write: Hewlett-Packard, 1501 Page Mill Road, Palo Alto, California 94304. In Europe, Post Office Box 85, CH-1217 Meyrin 2, Geneva, Switzerland. In Japan, YHP, 1-59-1, Yoyogi, Shibuya-ku, Tokyo, 151.