

CONTROL DATA® 9776 FIXED MODULE DRIVE

Designed for OEM Original Equipment Manufacturers

GD
CONTROL
DATA

5/78



The Control Data 9776 Fixed Module Drive (FMD) (A2, B2 and C2 configurations) is a mass-storage device containing two spindles of random-access disk memory. Each spindle has a capacity of 400 megabytes. Using the A2 version of this drive assures compatibility with the IBM 3350. Optional fixed-head capability (Models F) provides 1.24 million bytes for increased system flexibility.

Each CDC® 9776 consists of a cabinet and frame containing two decks with two Head Disk Assemblies (HDA), a dc power supply, logic chassis assembly, air circulation system and ac distribution assembly. Front and rear doors and a hinged cabinet cover allow access for all maintenance functions. HDA installation and removal is achieved via a hinged top cover by qualified field service personnel. Installation and removal of the HDA have been facilitated by ramped guides and a docking port.

FEATURES

- Sealed Head Disk Assembly module design improves reliability
- Customer Engineering movable data module can be exchanged in approximately 15 minutes
- A2/B2/C2 configuration
- Diagnostics micro programs for maintenance
- Error detection/correction code provided for up to four bits
- Defect skipping reduces alternate track assignment
- Rotational Positioning Sensing (RPS) saves latency time
- Read-Only Switch provides write inhibit

OPTIONS

- Dual access to all 9776 models
- 1.24 million bytes of fixed-head, zero seek-time capability
- String-switch

Deck Assembly

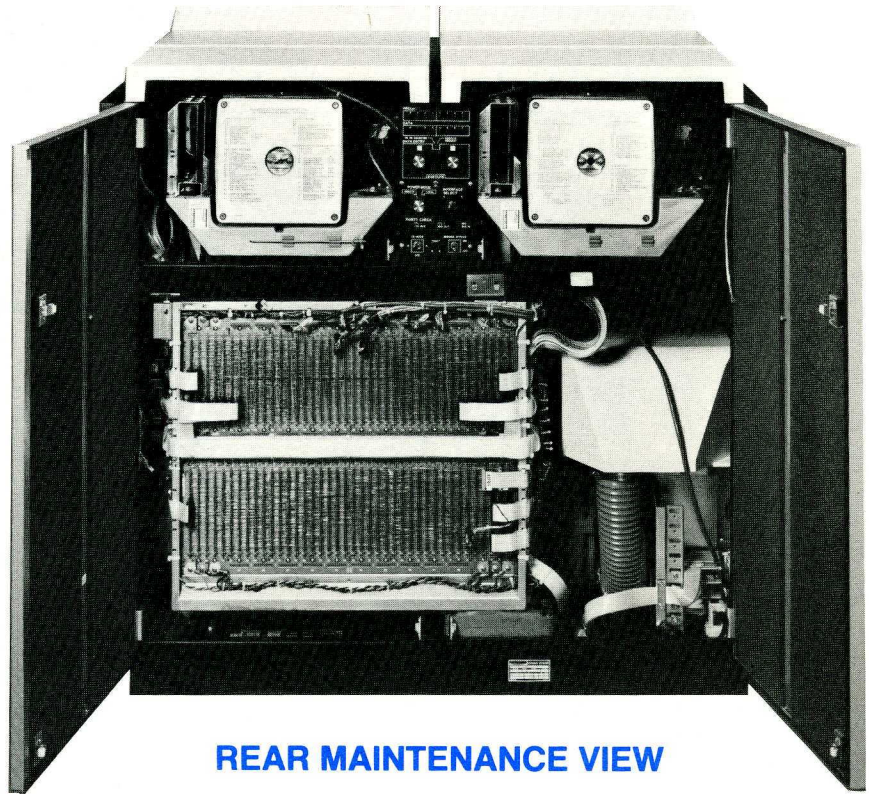
Each deck assembly consists of a drive motor with a fail-safe brake, head disk assembly, voice coil linear motor and read/write electronics.

Air Circulation System

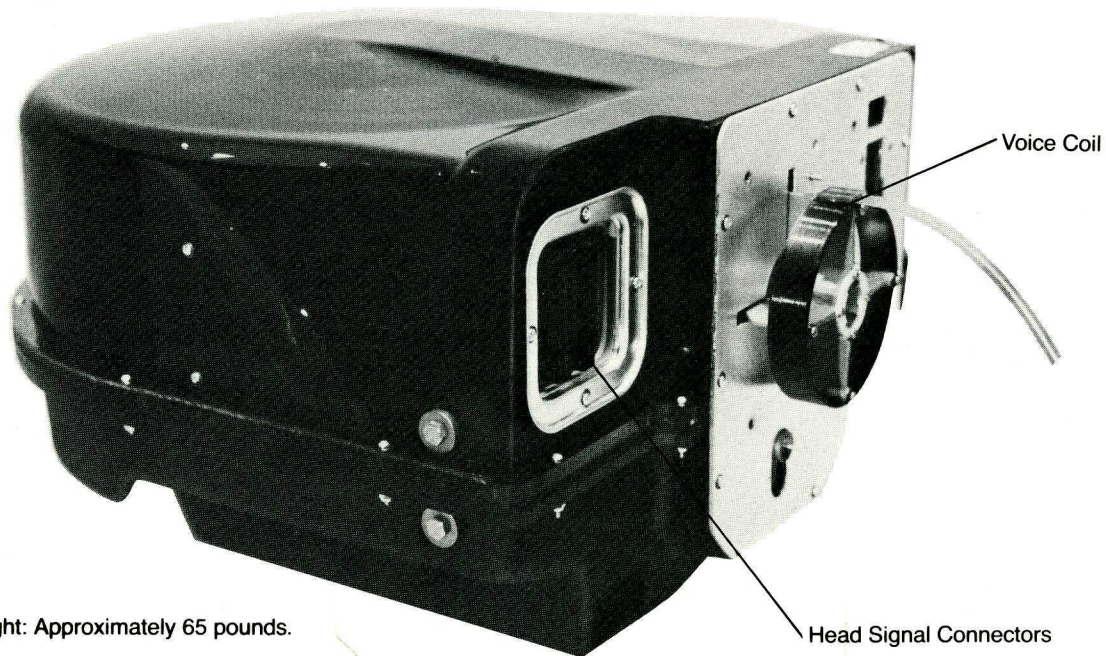
Each Fixed Module Drive has two air flow systems supplied by two impellers driven from a common blower motor. One system provides filtered air to each HDA and the rate of air flow is a minimum of 40 cubic feet per minute (12.2 m³/minute); the air temperature will not exceed 133°F (54°C). Air flow in this system is monitored by a pressure switch.

This system also contains a replaceable absolute filter and a second permanent absolute filter to reduce contaminants. The allowable contamination level of the filtered air to each HDA will not exceed 100 particles per cubic foot (3.5×10^3 P/m) of 0.5 micron and larger.

The second system provides air flow for the logic chassis and both power supplies. A temperature limit switch in the top of the logic chassis will cut ac power if that limit is exceeded.



REAR MAINTENANCE VIEW



Weight: Approximately 65 pounds.

HEAD DISK ASSEMBLY (HDA)

AC Power Distribution Assembly

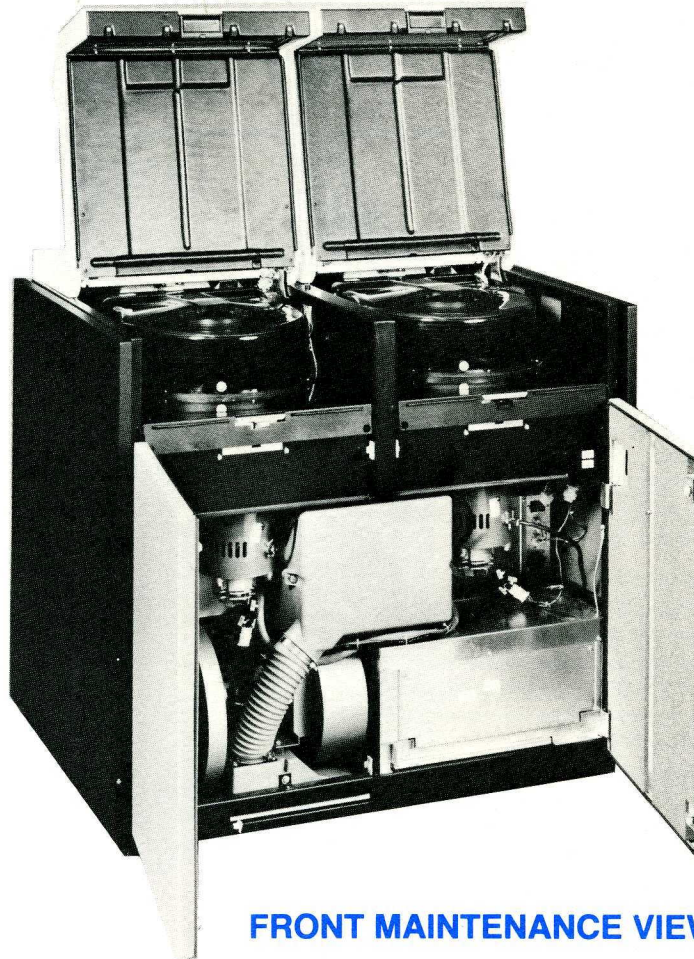
The 9776 ac power distribution assembly provides primary power protection, phase rotation sensing, power sequencing, control and distribution functions associated with each FMD.

DC Power Supply Assembly

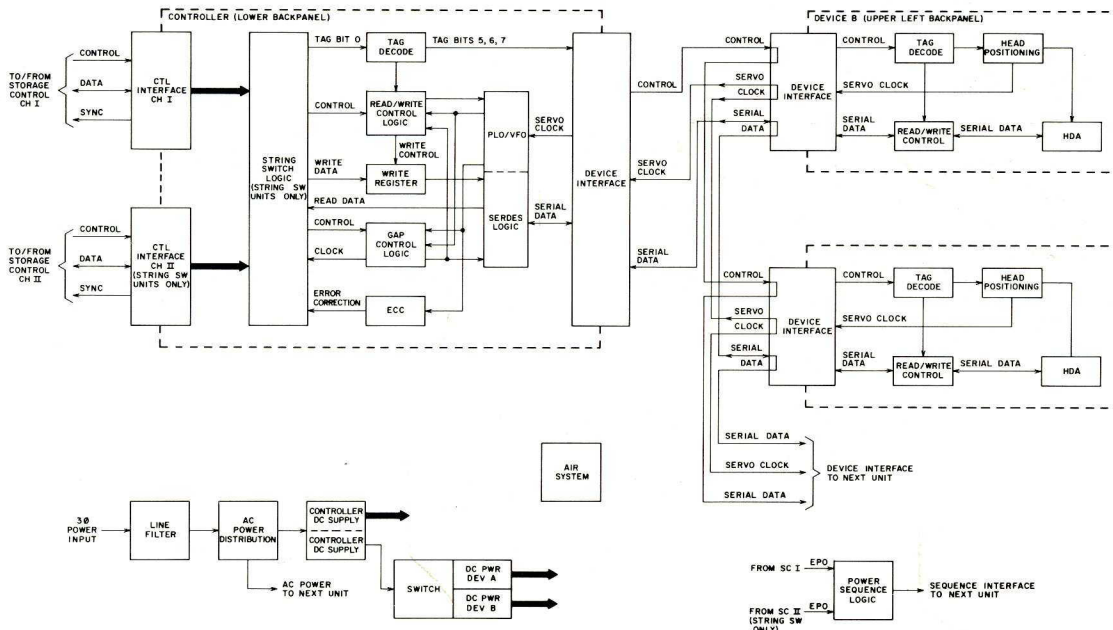
A self-contained dc power supply assembly provides all of the dc power required for drive operation. In the 2X configuration, a switch allows dc power to be removed from the electronics for either spindle for independent on-line operation of one spindle while the other is being serviced.

Logic Chassis Assembly

The logic chassis assembly consists of a wire-wrapped back-panel with pluggable circuit card assemblies, plus card guiding and support hardware. The assembly is cooled by forced air. A single-port device contains 67 cards, including a four-increases to 73 for an optional string-switch device.



FRONT MAINTENANCE VIEW



CDC 9776-AZ BLOCK DIAGRAM

SPECIFICATIONS

Data Organization:

| | IBM Emulation Mode | | |
|----------------------------|--------------------|-------------|----------|
| | 2 X 3330-1 | 2 X 3330-11 | 1 X 3350 |
| Cylinders/Volume: | 404 | 808 | 555 |
| Tracks/Cylinder: | 19 | 19 | 30 |
| Tracks/Volume: | 7,676 | 15,353 | 16,650 |
| Track Capacity (Bytes): | 13,030 | 13,030 | 19,069 |
| Cylinder Capacity (Bytes): | 247,570 | 247,570 | 572,070 |
| Volume Capacity (Mbyte): | 100 | 200 | 317.5 |
| Spindle Capacity | | | |
| Moving head (Mbyte): | 200 | 400 | 635 |
| Fixed Head: | N/A | N/A | 1.24 |

Performance—

Data Transfer Rate: 1198K bps (9.6-MHz)

Spindle Speed: 3600 rpm

Average Latency: 8.3 ms

Seek Time

 Minimum: 10 ms

 Average: 25 ms

 Maximum: 50 ms

Power Requirements—

The 9776-A2 FMD requires three-phase power obtained from either a wye or a delta source as noted below. A line filter is provided and filtered power is then daisy-chained to the other FMDs.

60 Hz (59.0 to 60.6 Hz)

| Nominal | Range |
|----------|--------------|
| 200 V ac | 180–220 V ac |
| 208 V ac | 187–229 V ac |
| 230 V ac | 207–253 V ac |

50 Hz (49.0 to 50.5 Hz)

| Nominal | Range |
|--------------------------|--------------|
| 200/208 V ac delta | 170–220 V ac |
| 220 V ac delta | 187–242 V ac |
| 230/235/240 V ac delta | 195–259 V ac |
| 380 V ac wye | 323–426 V ac |
| 398/400/408/415 V ac wye | 340–449 V ac |

The FMD is delivered prewired for 208 V ac, 60 Hz or 380 V ac, 50 Hz line voltages and frequencies.

Conversion to the other line voltages within a frequency is achieved by rewiring terminal strips within each FMD as outlined in the Equipment Maintenance Manual.

Physical Characteristics (single drive basis)—

| | <u>A2/A2F/C2/C2F</u> | <u>B2/B2F</u> |
|---------|----------------------|---------------------|
| Height: | 50.0 in (1270 mm) | same |
| Width: | 42.0 in (1067 mm) | same |
| Depth: | 33.3 in (844 mm) | same |
| Weight: | 1100 lb (410 kg) | 900 lb (344 kg) |
| Heat: | 6000 Btu/h (1740 W) | 4875 Btu/h (1413 W) |
| Power: | 2.0 kVA | 1.7 kVA |

Specifications subject to change without notice

Environmental—

| | <u>A2/A2F/B2/B2F/C2/C2F</u> |
|------------------------|--------------------------------|
| Operating Temperature: | 60°F to 90°F (16°C to 32°C) |
| Operating Humidity: | 10% to 80% R.H. |

CONTROL DATA SALES OFFICES ARE LOCATED IN PRINCIPAL CITIES THROUGHOUT THE WORLD

OEM PRODUCT SALES
BOX, 0, MINNEAPOLIS, MINNESOTA 55440
TELEPHONE: (612) 853-3111
TWX: 910-576-2978