DUNABUTE

Dual Diskette Storage Unit Technical Manual

5010 DUAL DISKETTE STORAGE UNIT

MAINTENANCE

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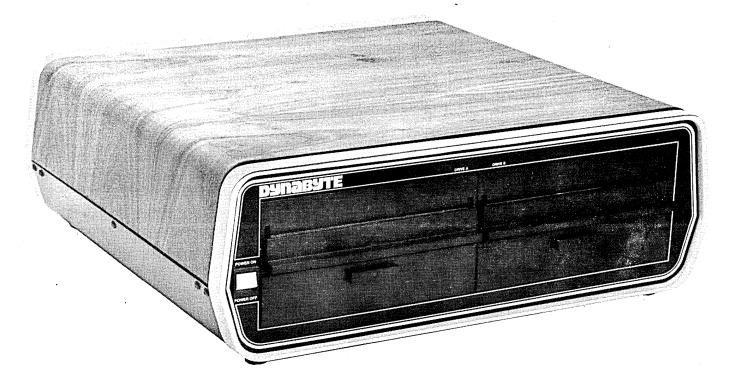


Figure 1-1 - 5010 Dual Diskette Storage Unit

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1. GENERAL

1.01 This manual provides a physical and functional description and operating theory necessary for effective field service of the 5010 Dual Diskette Storage Unit (Unit). Prior to May 1, 1980, the 5010 Unit was designated the DB8/4 and was documented using an eight-digit part number system. This manual uses the current Dynabyte six-digit part number system. Part 7 includes cross-reference tables for referencing old part numbers to current part numbers.

Features

- 1.02 The 5010 Unit, illustrated in Figure 1-1, is supplied individually or as a system component to a larger Dynabyte computer system, Models 5100 through 5900. A high degree of flexibility has been designed into the 5010 Unit for field servicing and provision for expansion to the user's computer system. Features of the 5010 Unit include the following:
 - Dual eight-inch Diskette Drives.
 - Single or double density recording is software selectable. Single density is IBM 3740 format compatible.
 - Double density Disk Controller.
 - Dynabyte S-100 Bus compatible.
 - Dynabyte Disk Operating System.

- Efficient cooling of the 5010 Unit drives and its power supply module is assured by a 4-5/8 inch metal axial fan furnishing air through the chassis and exhausting it out the Rear Panel.
- Heavy duty construction is used with molded bezels front and rear.
- The Front Panel POWER Switch is illuminated.
- A line fuse is provided for ac line protection.
- Each internal subassembly is modular and is unit replaceable for ease in servicing.
- A wood grain veneer enclosure top is optional.
- Each 5010 Unit carries a 180-day warranty on parts and labor.
- Each 5010 Unit is burned in for a minimum of 72 hours.
- 1.03 Dynabyte maintains hardware and software compatibility with Dynabyte S-100 cards used in the Dynabyte S-100 Bus only. The Disk Controller may not operate in cther S-100 Bus Computers. Contact Dynabyte for specific applications.

2. PHYSICAL DESCRIPTION

- 2.01 The 5010 Dual Diskette Storage Unit, illustrated in Figure 1-1, is an integrated piece of electronic equipment incorporating the necessary component assemblies for a mass storage device. The principal assemblies are:
 - (1) Front and Rear Panel Cabinet,
 - (2) Dual Diskette Drives,
 - (3) Disk Controller,
 - (4) Power Supply Module.

Details on these individual assemblies, as well as their schematic diagrams and replaceable parts lists, are furnished under separate cover as individual technical manuals. These assemblies have been enclosed in an exceptionally compact package

- measuring 52 cm x 47 cm x 18 cm (20.5 in. x 18.5 in. x 7 in.) weighing 23 kg (about 50.5 lbs.).
- 2.02 The 5010 Unit draws nominally 90 VA of 115 Vac, 60 Hz commercial power. It may be factory optioned for operation from a 230 Vac, 50 Hz line.
- 2.03 The 5010 Unit is designed to operate efficiently in an environment with an ambient temperature range from 10°C to 35°C (50°F to 95°F) and with a relative humidity of from 20 to 80 percent.
- 2.04 Figures 2-1 through 2-3 provide number key callouts of all components located on the front, rear and interior of the 5010 Unit. Associated Tables 2-1 through 2-3 provide a cross reference for each callout, identifying the respective part as to function, description and/or designation.

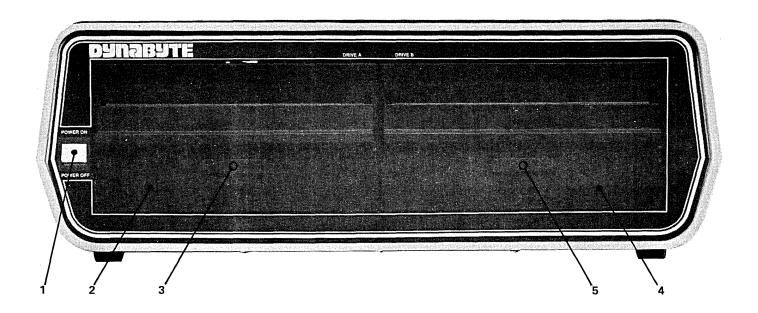


Figure 2-1 - 5010 Dual Diskette Drive Unit - Front Panel - 800912/800950

Front Panel

- 2.05 Refer to Figure 2-1 for the description which follows. The 5010 Unit Front Panel has only one operating control with which the user should be concerned.
 - (1) The POWER ON OFF Switch turns the Unit on and off. This switch also contains an indicator which lights when there is an output from the internal +5 Vdc power supply.

IMPORTANT

The 5010 Unit should never be turned on or off while a diskette is installed in a drive.

2.06 The two eight-inch Diskette Drives occupy the entire Front Panel. The left drive is designated A and the right is B. A red indicator, part of the drive door latch, lights when the drive is performing a read or write operation. The indicator flashes when the drive is selected for booting by the Disk Controller and is unable to perform the operation.

Rear Panel

2.07 Figure 2-2 illustrates the 5010 Unit Rear Panel. Table 2-2 tabulates and describes each of the Rear Panel elements. Ac line and disk drive Input Output (I/O) connections are through the Rear Panel. At the right, the ac line is connected through an IEC connector. This permits the 5010 Unit to be connected domestically to 115 Vac, 60 Hz with a National Electrical Manufacturers Association (NEMA) cord set or internationally with a cord set appropriate for that country. A line fuse provides protection for the 5010 Unit.

Table 2-1 - 5010 Dual Diskette Drive Unit - Front Panel Controls and Indicators

Key	Element	Function
1	POWER ON-OFF Switch Indicator	Applies the ac line to the 5010 Unit. The indicator lights when +5 Vdc is available from the Power Supply Module.
2	Diskette Drive A	Provides for reading and writing onto Dysan 3740 1D or 2D diskette.
3	Diskette Drive B	Same as Key 3.
4	Drive A Select Indicator	Lit when the Disk Controller selects a drive for a read or write operation.
5	Drive B Select Indicator	Same as Key 5.

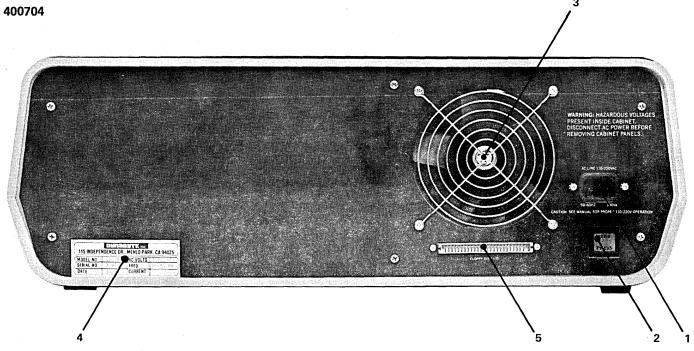


Figure 2-2 - 5010 Dual Diskette Storage Unit - Rear Panel - 800912

Table 2-2 - 5010 Dual Diskette Storage Unit - Rear Panel Controls and Connectors

Key	Element	Function
1	AC Line Receptacle (J1)	IEC standard three-wire male receptacle. Provides for ac line, neutral and a third wire bonded to the chassis frame. Mates with Belden P-2392 ac cord set for U.S. domestic use or the appropriate cord set for the export country.
2	Ac Line Fuse (F1)	Provides ac line overcurrent protection.
		(1) 115 Vac — 3 A.
		(2) 230 Vac — 1.5 A.
 		Early serial number units are provided with a circuit breaker in this position.
3	Axial Fan	Provides for drawing heat from the power supply module and internal heat dissipating pc assemblies.
4	Dynabyte Identification Plate	Furnishes the model and serial number necessary for warranty service. Refer to Figure 6-1.
5	FLOPPY DISK I/O Receptacle	Fifty-conductor ribbon connector. Provides a connection point for the cable to a Dynabyte 5100/5200 Computer Unit.

2.08 A four-inch fan draws heat dissipated internally out the Rear Panel. Air is drawn into the 5010 Unit cabinet through louvers provided in the bottom of the cabinet. Refer to Figure 2-3.

IMPORTANT

Install the 5010 Unit so as not to obstruct the air flow through the louvers in the bottom of the cabinet. Allow a three-inch clearance from the rear of the fan.

Desk-type system cabinets supplied from Dynabyte are designed to assure constant air flow through Dynabyte system units.

(1) A fifty-pin ribbon cable connector provides for Disk Drive I/O, control and status signals from the Disk Controller installed in the 5100/5200 Computer Unit.

Dual Diskette Drives

- 2.09 Each Diskette Drive is a separate module.

 They are mounted next to each other at the front of the chassis. Ac and dc power for each drive module is supplied from the Power Supply Module. Two OEMs supply eight-inch Diskette Drives for the 5010 Unit.
 - (1) Shugart Associates Model SA 800,
 - (2) Remex Model RFD2000 as a single-sided disk (1D) drive and the Model RFD4000 as a double-sided disk (2D) drive.

Part 7 furnishes reference information to technical manuals for these drives.

Disk Controller

- 2.10 The Disk Controller for the drives is made up of two units. The Main Disk Controller is an S-100 Bus card which is installed into the 5100/5200 Computer Unit. An Auxiliary Disk Controller is mounted to the left of Drive A and works in conjunction with the drives. Both Disk Controller PC Assemblies contain options. Part 5 describes these options in detail.
- 2.11 Computer data, status and control with the 5010 Unit are through a fifty-conductor System Disk I/O Cable. This cable is supplied in two versions:
 - (1) 5100/5200 Computer Unit and one 5010 Unit use P/N 800893,
 - (2) 5100 Computer and two 5010 Units use P/N 804475.

Power Supply Module

2.12 The Power Supply Module is located at the rear of the 5010 Unit cabinet between Drive B and the Rear Panel. The power supply operates on 115 or 230 Vac, 50 to 60 Hz line, optioned internally by straps on a barrier strip. The ac wiring to the Power Supply Module includes an EMI filter. The Power Supply Module is supplied by an OEM. Part 7 furnishes reference information for a technical manual on the module.

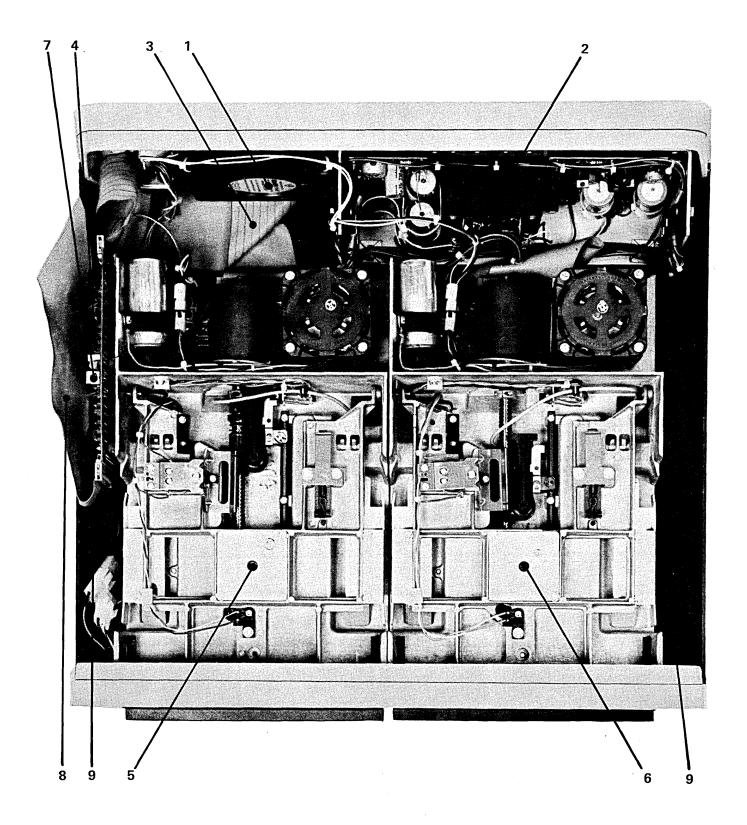


Figure 2-3 - 5010 Dual Diskette Storage Unit - Interior - Shutgart Drives

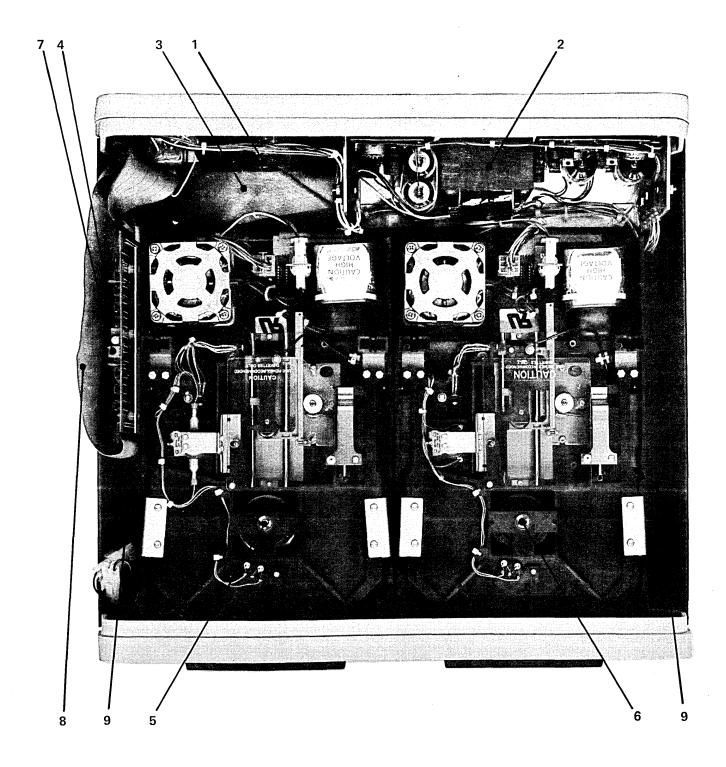


Figure 2-3 — 5010 Dual Diskette Storage Unit — Interior — Remex Drives

Table 2-3 - 5010 Dual Diskette Storage Unit - Interior Major Assemblies

Key	Element	Function
1	Axial Fan	Provides forced air cooling to the Power Supply Module and internal heat dissipating pc assemblies.
2	Power Supply Module 706678	Accepts 115 or 230 Vac, 50-60 Hz and supplies the following regulated voltages to the Auxiliary Disk Controller and Drives:
		(1) +24 Vdc
		(2) + 5 Vdc
		(3) Power Supply common
	·	(4) - 5 Vdc
3	5010 Disk I/O Cable 800893	Provides for interconnection of data, status and control between the Rear Panel Disk I/O connector and the Auxiliary Disk Controller. These signals are exchanged with the Main Disk Controller in the 5100/5200 Computer Unit.
4	5010 Auxiliary Disk Controller PC Assembly 801900	Provides the specialized electrical functions for eight-inch disk drives.
5	Drive A Module	Houses the drive mechanism and control electronics.
6	Drive B Module	Same as Key 5.
7	R 03 Potentiometer	Factory set.
8	Eight-Inch Drive I/O Cable 800855	Provides for supplying I/O signals to the drive module for the Auxiliary Controller.
9	Cabinet Louvers	Provides air inlets for drawing air into the cabinet for ventilation.
	,	
	,	
	·	

3. FUNCTIONAL DESCRIPTION

Overview

- 3.01 Figure 3-1 illustrates the 5010 Unit in block diagram. It should be used in conjunction with the schematic diagrams in Part 7 to familiarize the user with the circuits. The 5010 Unit chassis can be divided into three logical sections:
 - (1) Operational Controls,
 - (2) Power Supply Module,
 - (3) Dual eight-inch Diskette Drives and Auxiliary Disk Controller.

- 3.02 Only one *Operational Control* is available on the 5010 Unit.
 - (1) The POWER Switch applies ac line voltage to the fan, power supply and drive motors. The POWER ON Indicator is lit when the power supply outputs a nominal +5 Vdc.
- 3.03 The Power Supply Module converts ac line voltage to several low dc voltages to power the Auxiliary Disk Controller and disk drive logic and control circuits. Three output voltages are furnished:
 - (1) +24 Vdc,
 - (2) + 5 Vdc,
 - (3) 5 Vdc.

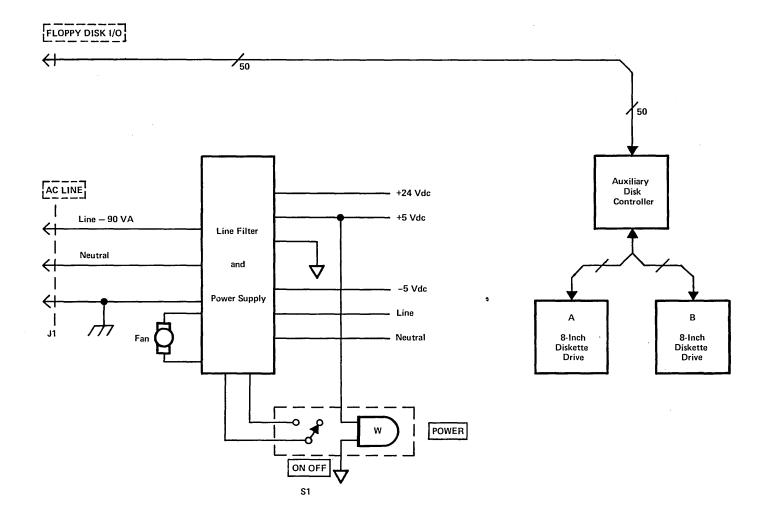


Figure 3-1 — 5010 Dual Diskette Storage Unit Functional Block Diagram

Each voltage is regulated by a linear regulator and is adjustable with an individual potentiometer located on the Power Supply PC Assembly at R11, R16 and R5 respectively.

- 3.04 The ac line to the Power Supply Module contains an EMI filter and is protected by a fuse.
- 3.05 The eight-inch Diskette Drive contains a drive motor, read/write head mechanism and electronics for storing and retrieving data to an eight-inch flexible disk.

Disk Controller

- 3.06 The Main Disk Controller is installed in the 5100/5200 Computer Unit S-100 Bus and provides communication between the computer Bus and the Auxiliary Disk Controller Diskette Drive. Data, status and control signals are exchanged over the System Disk I/O Cable connected between the 5100/5200 Computer Unit and the 5010 FLOPPY DISK I/O connectors located on their respective Rear Panels. A Main Disk Controller will support up to two Auxiliary Disk Controllers which, in turn, can support two 5.25-inch Diskette Drives, e.g., the 5200 or two eight-inch Diskette Drives, e.g., the 5010 Unit.
- 3.07 The Auxiliary Disk Controller works in conjunction with the drives. This unit allows the Disk Controller to be used with either eight-inch or 5.25-inch drives.

- 3.08 The Dynabyte Disk Controller system design provides for several initial equipment configurations as well as add-on configurations.
 - (1) A 5100 Computer with one or two 5010 Units. The storage could include up to four eight-inch Diskette Drives.
 - (2) A 5200 Computer Unit by itself or with one 5010 Unit. The storage could include up to two 5.25-inch and two eight-inch Diskette Drives.
- 3.09 These various computer and drive configurations require ROM and strap options to be installed on the Disk Controller PC Assemblies. Refer to Part 5.
- 3.10 Dynabyte supplies soft-sectored diskettes as a storage media. The total amount of storage available depends upon the drive selected:
 - (1) Single Sided (1D),
 - (2) Double Sided (2D),

and the density of the recording:

- (3) Single Density (SD),
- (4) Double Density (DD).

Table 4-1 lists the formatted capacity for these combinations.

4. SPECIFICATIONS

4.01 Part 4 furnishes the user with information for shipping and installation and should be used to establish acceptance tests if they are

performed. Minor deviations from the specifications tabulated in Tables 4-1 and 4-2 which do not affect the 5010 Dual Diskette Storage Unit are excluded from the Dynabyte Warranty.

Table 4-1 - 5010 Dual Diskette Storage Unit Functional Specifications

Parameter	Characteristics
DISKETTE DRIVE SECTION	
Heads, 1D	1
, 2D	2
Tracks Per Surface	77
Media, 1D	Dysan P/N 800528
, 2D	Dysan P/N 800802
Unformatted Capacity Per Track	
Track, SD	5,212 bytes
, DD	10,425 bytes
Surface, SD	401K bytes
, DD	792K bytes
Formatted Capacity	
Sector Size, SD	128 bytes
, DD	128 bytes
Sectors Per Track, SD	26
, DD	54
Surface, SD , DD	256K 525K
, 55	02013
Transfer Rate	
SD	250K bps
DD	500K bps
Average Latency	83 ms
Head Load	
SA800	35 ms
RFD2000	35 ms
RFD4000	35 ms
Access Time	
Track-To-Track	
SA800	8 ms
RFD2000 RFD4000	15 ms 15 ms
NF D4000	10 1112

Table 4-1 — 5010 Dual Diskette Storage Unit Functional Specifications (Continued)

Parameter		Characteristics	
Settling Time			
SA800	8 ms		
RFD2000	15 ms		
RFD4000	15 ms		
Average Access Time			
SA800	260 ms		
RFD2000	91 ms		
RFD4000	91 ms		
Track Density	48 tpi		
Spindle Speed	360 rpm		
Variation	1%		
- · · ·			
Recording Density	0000 1		
DD	3200 bpi 6400 bpi		
SD	6400 ppi		•
Flux Density	6400 bpi		
Encoding Method			
SD	FM		
DD	MFM		
Reliability	6,000 hours	•	
MTBF, Heavy Use	5,000 hours		
MTBF, Typical	15,000 hours		
MTTR	30 minutes		
Error Rate			
Soft Read Errors	$<1 \text{ in } 10^9 \text{ bits}$		
Hard Read Errors	$<1 \text{ in } 10^{1.2} \text{ bits}$		
Seek Errors	$<1 \text{ in } 10^6 \text{ bits}$		
Media Life	$>3.5 \times 10^6$		
Passes Per Track	$>3.5 \times 10^6$		
Insertions	>30,000		
POWER SUPPLY SECTION			
Type	Linear regulation		
Type	Differ Tegulation		
DC, Voltage	+24 Vdc	+5 Vdc	-5 Vdc
DC, Current	3 A	2.5 A	0.5 A
DC, Over Voltage Protect	None	6.2 ±.4 V	6.2 ±.4 V
Do, Over voltage Frotect	None	U.2 ±.4 V	0.2 ÷.4 V

Table 4-1 - 5010 Dual Diskette Storage Unit Functional Specifications (Continued)

Parameter	Characteristics
AC, Line Regulation DC, Line Regulation	±0.05% for a 10% change ±0.05% for a 50% change
REAR PANEL SECTION	
Disk I/O Connector	50-conductor ribbon

NOTES:

(1) 1D single surface 2D double surface SD single density DD double density

Table 4-2 - 5010 Dual Diskette Storage Unit Physical Specifications

Parameter	Characteristics
Cooling	70 CFM, one 4-5/8 inch axial fan
Operating Temperature	10° to 35°C (50° to 95°F)
Relative Humidity	20% to 80%
Line Voltage, Standard , Optional , Power	115 ±10% Vac, 60 Hz 230 ±10% Vac, 50 Hz 92 VA
Dimension, Width , Depth , Height , Weight	52.1 cm (20.5 inches) 47.0 cm (18.5 inches) 17.8 cm (7.0 inches) 23.0 kg (50.5 lbs.)

NOTES:

- (1) 50 Hz operation requires a pulley and belt change.
- (2) 230 Volt operation requires strapping changes on the power supply module.

5. OPERATION AND INSTALLATION

Unpacking

5.01 After the 5010 Dual Diskette Storage Unit arrives, the shipping cartons should be examined for visible loss or damage.

IMPORTANT

Each unit's shipping carton should be retained for the warranty period and used for the return of equipment to Dynabyte if it is necessary.

Check to make certain the Packing Slip agrees with the Purchase Order. Do not apply power to any unit.

5.02 Next, check each unit for concealed loss, damage or omissions in shipment. The cover is secured to the chassis by six 6-32 x 1/2 screws. A hex head wrench is supplied with the 5010 Unit if required.

IMPORTANT

Remove only the three center screws from each side of the cover.

Figure 2-3 illustrates the 5010 Unit interior. Perform the following:

IMPORTANT

The equipment is thoroughly tested, inspected and carefully packed before leaving the Dynabyte factory. Claims for loss or damage should be made upon the carrier, NOT TO Dynabyte, as follows:

- (1) Visible Loss or Damage must be noted on the freight bill or express delivery sheet. The form required to file such a claim will be supplied by the carrier.
- (2) Concealed Loss or Damage means loss or damage which does not become apparent until the equipment has been unpacked and placed in service. When the damage is discovered upon unpacking, make a written request for an inspection by the carrier's agent within fifteen days of the delivery date. Then file a claim with the carrier.

Obvious workmanship problems or incomplete shipments should be reported immediately to Dynabyte.

Step	Procedure		
1	Check the interior for loss or damage during shipment:		
	(1) Loose screws, nuts or washers,		
	(2) Broken wires or loose components,		
	(3) Major assemblies broken at mountings.		
2	Check the following after installing a diskette into Drive A and B:		
	(1) Diskette should insert easily and latch,		
	(2) Drive door should close and latch,		

Step	Procedure .		
	(3) Press the door latch, the door should open and the diskette should eject.		
3	Check all cable connectors are installed in their respective receptacles.		
	(1) Two two-conductor nylon connectors at the POWER Switch.		
	(2) A three-conductor nylon connector to Drive A and B ac power receptacles.		
	(3) A six-conductor nylon connector to Drive A and B dc power receptacles.		
	(4) A four-conductor nylon connector to the dc power receptacle on the Auxiliary Controller PC Assembly.		
	(5) The 5010 Disk I/O Cable is connected between the Rear Panel and the CONTROLLER INTERFACE Receptacle on the Auxiliary Disk Controller PC Assembly.		
	(6) The Eight-Inch Drive I/O Cable is connected between each Drive Electronics pc edge connector, P1, and the FULL SIZE DRIVE INTERFACE Receptacle on the Auxiliary Disk Controller PC Assembly.		

Ac Line

5.03 The 5010 Unit is normally wired and shipped from the factory for operation from a 115 Vac, 60 Hz single ac line. The ac line receptacle, J1, is provided with a third wire bonded to the chassis.

IMPORTANT

Safe operation of Dynabyte equipment depends upon the user providing a two-wire, grounded, 115 Vac, 15 Amp service wall receptacle.

The 5100/5200 Computer Unit is provided with a power receptacle on its Rear Panel for powering the 5010 Unit. The 5100/5200 Front Panel Power Switch applies power to this receptacle. If the user options to use a wall receptacle for power, select a wall receptacle which is not switched except for a circuit breaker. Ideally no other equipment should be connected to the branch circuit.

230 Vac Operation

5.04 Optionally internal wiring connections are provided for operation of the 5010 Unit from 230 Vac, single-phase power. Wiring changes to 230 Vac are made at TB1 and TB2 of the Power Supply Module and are illustrated in Figure 7-2.

50 Hz Operation

5.05 Operation of the 5010 Unit from a 50 Hz power line requires an alternate motor belt and pulley to be installed in each diskette drive.
Table 7-1 lists the appropriate parts for both Shugart and Remex drives.

Set Up

5.06 The following procedure will serve as a useful check list for setting up or resetting up the 5010 Unit.

NOTE

Set the 5010 Unit POWER Switch to OFF.

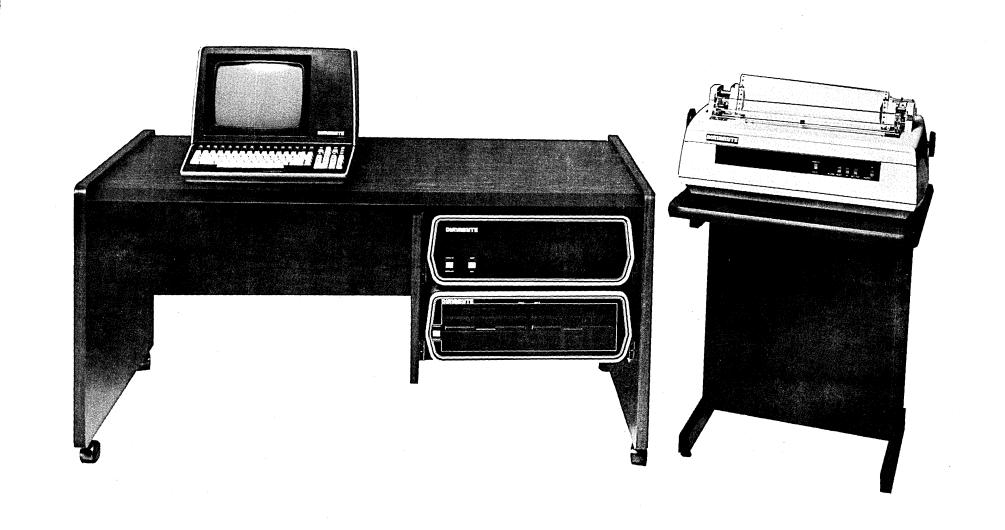


Figure 5-1 — 5010 Dual Diskette Storage Unit Installed In A Dynabyte Desk Enclosure

Step	Procedure		
1	Install the 5010 Unit so as not to obstruct the air flow through the louvers in the bottom of the cabinet. Make certain there is a three-inch clearance from the rear of the fan. Dynabyte desk-type cabinets, Figure 5-1, are designed to assure constant air flow through the equipment cabinets.		
2	Connect the 50-conductor System Disk I/O Cable between the 5100/5200 Computer Unit and the 5010 Unit(s) FLOPPY DISK I/O Receptacles:		
	(1) 5100/5200 Computer Unit and one 5010 Unit, use P/N 800893,		
	(2) 5100 Computer Unit and two 5010 Units, use P/N 804475.		
	NOTE		
	The System Disk I/O Cable is polarized by a (dot) marking. Match the painted dot on the cable connector with the dot on the chassis receptacle.		

Options

5.07 A variety of 5100/5200 Computer Units and 5010 Unit equipment configurations are accommodated through ROM and strap options on the Disk Controller PC Assemblies.

NOTE

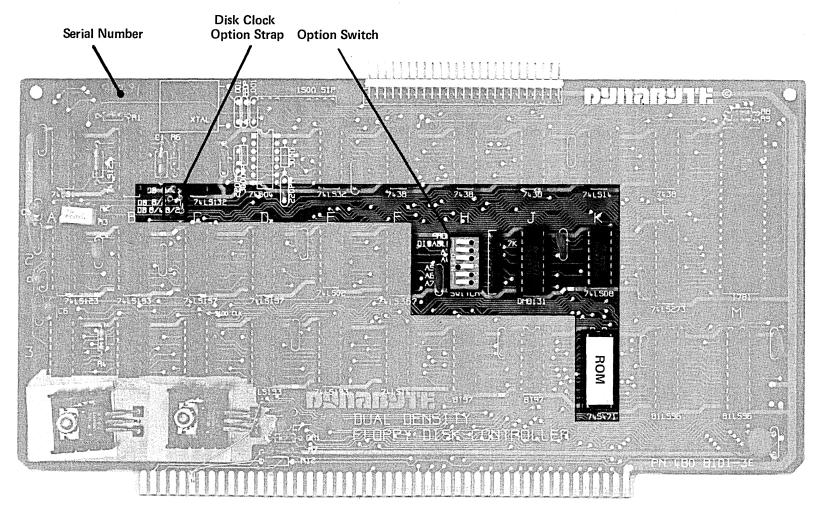
Always check the Disk Controller PC Assembly options agree with the individual system equipment configuration before turning on the Dynabyte computer system.

- 5.08 Main Disk Controller Figure 5-2 illustrates the option locations on the Main Disk Controller. A three-position Disk Clock strap located at B1 on the Main Disk Controller sets the clock rate to the addressed Auxiliary Disk Controller.
 - (1) Position DB8/4 sets the Disk Clock Rate permanently to that appropriate for eightinch diskette drives.

- (2) Position DB8/2 sets the Disk Clock Rate permanently to that appropriate for 5.25-inch diskette drives.
- (3) Position DB8/4 8/2 causes the Clock Rate to change following the Disk Select Line.
- 5.09 A ROM located at K3 contains software appropriate to the number of drives for different drive options installed, e.g., manufacturer, single or double sided and size of diskette.
- 5.10 An option switch located at M2 sets the starting address. The setting shown in Figure 5-2 is correct for all Dynabyte disk systems.
- 5.11 Auxiliary Disk Controller Figure 5-3 illustrates the option locations on the Auxiliary Disk Controller.
 - (1) A board address strap is located at E2.

 Two positions are provided, 0 and 1.

 The 5010 Auxiliary Disk Controller is normally strapped to 1 at the factory.
 - (2) Terminating resistor pack is located at A3. This pack is normally installed in the last Auxiliary Disk Controller of the system.



NOTE:

1. The dots on the switches indicate the direction in which the switch should be set for correct operation.

ROM Option Selection

Dynabyte Part Number	Mnemonic	Dynabyte Equipment
803952	RBOOT1A	5100 and 5010 Shugart 1D Drives, 5200 and 5010 Shugart 1D Drives, 5200 alone
802033	RBOOT2	5100 and 5010 Remex 1D Drives, 5200 and 5010 Remex 1D Drives, 5200 alone
802052	RBOOT3	5200 and 5010 Remex 2D Drives, 5200 and 5010 Remex 2D Drives, 5200 alone
803971	RBOOT4A	5100 and two 5010s 2D Drives
804741	RBOOT5	5100 and two 5010s 1D Drives

NOTE: 1. 1D is a single-surface diskette. 2D is a double-surface diskette.

Figure 5-2 — Main Disk Controller — Options

5100 Computer

5.12 Refer to the following option check procedure when operating the 5100 Computer with one or two 5010 Units.

Step	Procedure
1	For a single 5010 Unit installation, check the Main Disk Controller PC Assembly options:
	(1) Disk Clock strap to DB8/4 8/2 position,
	(2) A ROM should be installed appropriate to drive manufacture and number of surfaces. Refer to Figure 5-2 for the locations of these options.
2	Check the Auxiliary Disk Controller PC Assembly options for a single 5010 Unit installation:
	(1) Address strap to 1,
	(2) Terminating resistor pack installed at A3.
3	For a two 5010 Unit installation, check the Main Disk Controller PC Assembly options:
	(1) Disk Clock strap to DB8/4 position,
	(2) A ROM should be installed appropriate to drive manufacture and number of surfaces. Refer to Figure 5-2 for the locations of these options.
4	Check the Auxiliary Disk Controller PC Assembly options for a two 5010 Unit installation:
	(1) Unit 1 address strap to 0,
	(2) Unit 2 address strap to 1,
	(3) Unit 1 A3 vacant,
	(4) Unit 2 terminating resistor pack at A3.
·	Refer to Figure 5-3 for the locations of these options.

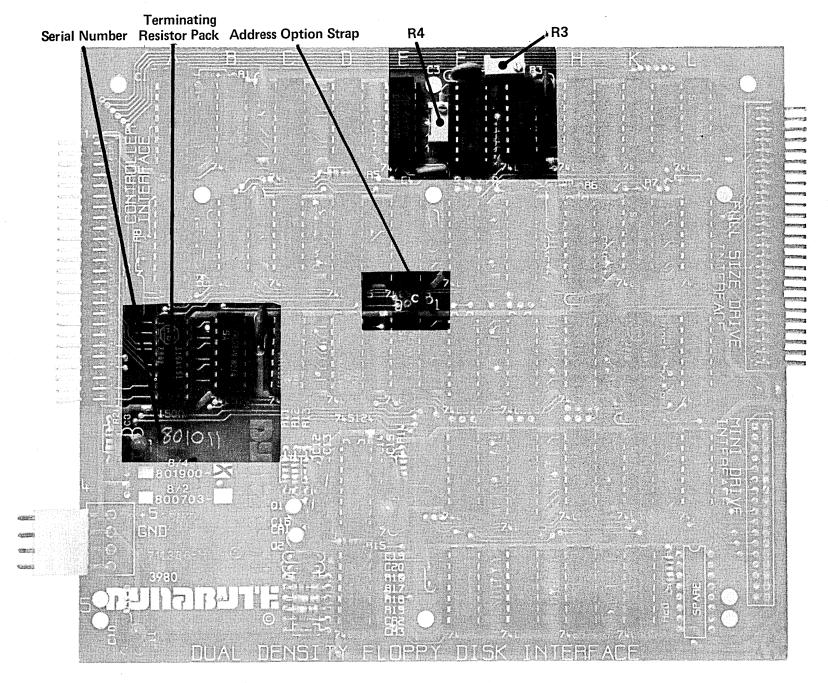


Figure 5-3 - Auxiliary Disk Controller - Options

5200 Computer

5.13 Refer to the following option check procedure when operating the 5200 Computer with a 5010 Unit.

Step	Procedure
1	Check the Main Disk Controller PC Assembly options:
	(1) Disk Clock strap to DB8/4-DB8/2 position,
	(2) A ROM should be installed appropriate to drive manufacture and number of surfaces.
	Refer to Figure 5-2 for the locations of these options.
2	Check the Auxiliary Disk Controller PC Assembly options in the 5200 Computer:
	(1) Address strap to 0,
	(2) No terminating resistor pack at A3.
3	Check the Auxiliary Disk Controller PC Assembly options in the 5010 Unit:
	(1) Address strap to 1,
	(2) Terminating resistor pack at A3.
	Refer to Figure 5-3 for the locations of these options.
	•
	•

400704

Diskette Loading

The diskette is a flexible disk enclosed in a 5.14 plastic jacket. The interior of the jacket is lined with a wiping material to clean the disk of foreign material. Figure 5-4 shows the proper method of loading a diskette into the 5010 Unit. Perform the following procedure to load a diskette.

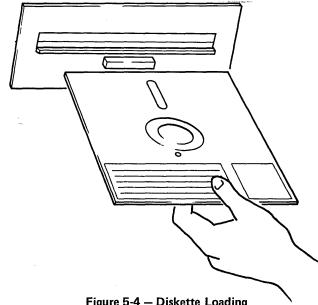


Figure 5-4 — Diskette Loading

Step	Procedure
1	Press the door latch
2	Check there is no diskette in the drive.
3	Insert the diskette into the drive, label up. Refer to Figure 5-4.
4	Pull the latch handle down to lock the diskette onto the spindle.

Diskette Storage and Handling

After a diskette is removed from a drive, 5.15 the diskette should be stored in an envelope. Perform the following procedure:

Step	Procedure
1	Return the diskette to its storage envelope.
2	Keep diskettes away from magnetic fields and from ferromagnetic materials which may have become magnetized. Strong magnetic fields can distort recorded data.
3	Replace the envelopes when they become worn, cracked or distorted. Envelopes are designed to protect the diskette.

6. MAINTENANCE

6.01 The 5010 Dual Diskette Storage Unit is a result of several years of design, development and modern electronic manufacturing. The units are designed around the latest semiconductors and integrated circuits. They operate at relatively low power levels with adequate cooling. Each 5010 Unit is operated under power and functionally tested in the Dynabyte factory for a minimum of 72 hours before shipment. The 5010 Unit can be expected to operate at peak performance for long intervals. No routine maintenance is required except to the heads, refer to 6.03, and occasional dusting and cleaning of the painted surfaces with a good all-purpose cleaner which does not attack or scratch painted surfaces or plastics.

(1) Formula 409 All Purpose Cleaner Distributed by Clorox Company Oakland, CA. 94612

available from most supermarkets is well suited for this application.

Drive Heads

6.02 The Read/Write Heads do accumulate oxide over a period of time. The procedure for cleaning or NOT CLEANING varies depending on the drive and the OEM. Refer to the OEM Technical Manual for the appropriate procedure.

NOTE

Dynabyte Authorized Service Centers (ASC) are staffed with factory-trained technicians that are supplied with technical manuals and routinely receive service bulletins and design change information on Dynabyte equipment.

Customer Support Service

6.03 Maintenance and procedures described in this manual should be performed in accordance with local instructions and the individual user's maintenance plan. Maintenance and repair of the 5010 Unit during the warranty period should be limited to:

(1) returning the 5010 Unit,

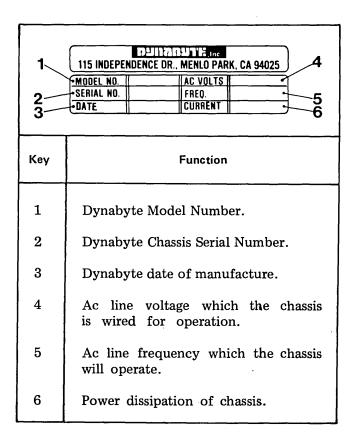


Figure 6-1 — Dynabyte Identification Plate

- (2) isolation of a fault to a specific pc assembly or unit,
- (3) replacement of the ac line fuse once.

Repacking and Returning Material

6.04 The Dynabyte Customer Support staff is available by telephone for assistance in troubleshooting and recommendations for repairs. If equipment is to be returned for repair or replacement, the following procedure will expedite repair and return of the equipment. All communications and material should be directed to:

Dynabyte, Inc. Customer Support 115 Independence Drive Menlo Park, CA. 94025 (415) 329-8021 TWX 9103732019

Step	Procedure
1	Call Dynabyte Customer Support by telephone and provide the following information:
	(1) The nearest Dynabyte Authorized Service Center name and number if known,
	(2) The Dynabyte Model Number and Serial Number of the equipment. Figure 6-1 illustrates the Dynabyte Identification Plate for equipment. Normally this is located at the rear of the equipment.
2	If the fault has been traced to a specific subassembly, e.g., an S-100 Bus card, furnish the type, part number and serial number. This information is marked on the component side of the pc assembly:
	(1) Subassembly replaced into the failed equipment if one was available,
	(2) Subassembly to be returned to Dynabyte.
3 -	Furnish a brief statement of the problem.
4	Customer Support will issue a Return Material Authorization Number (RMA Number):
	(1) The RMA permits the Dynabyte Customer Support staff to provide better coordination of returned material,
	(2) The RMA permits the Dynabyte customer to easily reference material returned to Dynabyte.
	NOTE
	Material returned to Dynabyte without a Return Material Authorization for repair will be sent to the customer's nearest Dynabyte Authorized Service Center.
5	Package equipment in the Dynabyte packing carton in which the equipment was received. If the original packing material is not available, Dynabyte Customer Support will provide information and recommendations or material to be used.
6	Fill out and enclose a Dynabyte Repair Service Report with the equipment or provide the following information in writing:
	(1) The RMA number furnished by Dynabyte.
	(2) The nearest Dynabyte Authorized Service Center.
	(3) Model number and serial number of equipment. Refer to Step 1 above.
	(4) A brief statement of the problem.
7	Ship the equipment to Dynabyte, shipment prepaid.

Diagnostics

6.05 A diagnostic program supplied on a diskette is available for the 5100 Computer and is intended for use with a 5010 Dual Diskette Storage Unit and by a Dynabyte Authorized Service Center. This program performs a three minute test to verify the 5100/5010 works in general and the diskette drives are functioning properly. The program diskette is supplied with a Technical Manual describing the program operation in detail.

Fault Location

- 6.06 A troubleshooting chart has been included in the 5100/5200 Computer Unit Technical Manual which describes fault location procedures to problems in the diskette drives. The chart will assist the user in isolating a fault location to one of three areas.
 - (1) The fault symptom resulted from incorrect user operation of the 5010 Unit.
 - (2) The fault symptom resulted from some other piece of equipment, e.g., 5100/5200 Computer Unit, cable, diskette or terminal.
 - (3) The fault symptom resulted from a 5010 Unit Auxiliary Disk Controller, drives or power supply module.

The fault location chart does not tabulate all the possible symptoms, only those Dynabyte Customer Support has found most likely to occur. The diagnostic programs, refer to 6.05 above, will also provide pointers for troubleshooting hardware malfunctions.

Table 6-1 — Power Supply Module Test Points and Voltages

Terminal	Voltage	Tolerance
Red	+24 Vdc	3%
Orange	+ 5 Vdc	3%
Black	0 Vdc	PS Common Reference
Yellow	- 5 Vdc	3%

Power Supply Module Voltages and Adjustment

6.07 The procedure which follows will assist the user in checking and adjusting the power supply should it be necessary. The user will need a digital multimeter (DMM), e.g., Fluke 8020A or equal. Refer to Table 6-1 for terminal locations and voltage tolerances.

Step	Procedure
1	Remove the top cover. Refer to 6.09 below.
2	The power supply module is located behind Drive B next to the Rear Panel. The output voltages appear along the top of the power supply(s) pc boards on pc terminals. Each has a distinctive wire color on the respective terminal.
3	Connect the DMM (-) lead to PS Common Reference terminal, black wire.
4	Connect the DMM (+) lead to +24 Vdc terminal, red.
	(1) Adjust R11 to bring into tolerance.
5	Connect the DMM (+) lead to +5 Vdc terminal, orange.
	(1) Adjust R16 to bring into tolerance.
6	Connect the DMM (+) lead to -5 Vdc terminal, yellow.
	(1) Adjust R5 to bring into tolerance.

Removing Assemblies

- 6.08 The user will need the following handtools to remove the major assemblies from the 5010 Unit chassis:
 - (1) 3/32 hex Allen wrench,
 - (2) 11/32 socket wrench,

- (3) 1/4 socket wrench,
- (4) No. 2 Phillips head screwdriver,
- (5) No. 3 Phillips head screwdriver.
- 6.09 Top Cover The descriptions which follow view the 5010 Unit from the front. Perform the following procedure.

Step	Procedure	
	WARNING	
	Hazardous voltages are present inside the cabinet. Disconnect ac power before removing the cabinet cover or assemblies.	
1	Remove the <i>center</i> three screws from each side of the top cover.	
2	Remove the cover and place it in position so the woodgrain surface will not be marred during servicing.	

6.10 Power Supply Module — is located behind Drive B next to the Rear Panel. Perform the following procedure.

Step	Procedure		
1	Disconnect the power harness from each chassis unit: (1) 115 Vac power from P4 connector on Drive A and B, (2) Dc power from P5 connector on Drive A and B, (3) Dc connector to Auxiliary Disk Controller,		
	(4) Two ac connectors at the front panel switch. NOTE Handle Disk I/O cables with care as they can be easily damaged.		

Step	Procedure
2	Remove the four 6-32 x $1/4$ Phillips head screws from the chassis floor which secure the power supply.
3	Lift the power supply from the 5010 Unit.

6.11 Front or Rear Panel — Both panels are secured to the respective cabinet bezel by five 6-32 Kep nuts. It is more convenient to remove the entire bezel. Perform the following.

Step	Procedure
1	Remove the two 3/32 hex head screws from each side.
2	Remove the five $8-32 \times 3/4$ Phillips head screws and star washers which secure the bezel to the cabinet base. Two of these screws also secure rubber bumpers.
3	Disconnect the electrical connections from the respective panel.
	(1) Front Panel — Disconnect the ac line cable from the Rear Panel.
	(2) Rear Panel — Disconnect the ac line cable to the Front Panel and the ac line cable to the power supply.
4	Remove the panel.

6.12 Auxiliary Disk Controller — is secured to Drive A by three nylon fasteners.

Step	Procedure		
1	Remove the following cables:		
	(1) 5010 Disk I/O from the Auxiliary Disk Controller receptacle marked CONTROLLER INTERFACE.		
	(2) Eight-Inch Drive I/O from the Auxiliary Disk Controller receptacle marked FULL SIZE DRIVE INTERFACE.		
	(3) Dc power from the Auxiliary Disk Controller four-position receptacle.		

Step	Procedure		
	NOTE		
	The 50-conductor I/O cables are polarized with a painted . (dot) marking at Pin 1.		
3	Remove the Auxiliary Disk Controller PC Assembly from Drive A. The plastic retainer detents must be released before the Auxiliary Disk Controller can be removed.		

6.13 Diskette Drives — are mounted as separate units. Internal Dynabyte factory-installed options characterize each drive as either A or B. A new Dynabyte part number is assigned to Drive A or Drive B after the options are installed. Table 7-1 lists both Shugart and Remex Drive A and Drive B replacement units. Perform the following procedure.

Step	Procedure			
1	Remove the following cables from the drive(s):			
	(1) Eight-Inch Drive I/O from P1 connector on Drive PC Assembly.			
	(2) 115 Vac power from P4 connector on drive motor,			
	(3) Dc power from P5 connector on Drive PC Assembly.			
2	If Drive A is being removed, remove the Auxiliary Disk Controller PC Assembly. Refer to 6.12 above.			
3	Remove the six $8-32 \times 1/2$ Phillips head screws from the chassis floor which secure the drive.			
4	Lift the drive from the 5010 Unit.			

REFERENCE

Schematics and Replaceable Parts

- 7.01 Figure 7-1 furnishes the chassis wiring for the 5010 chassis. Table 7-1 tabulates replaceable parts for the 5010 chassis covering:
 - (1) Front Panel Assembly,
 - (2) Rear Panel Assembly,
 - (3) Frame Assembly.

Schematic diagrams and replaceable parts lists for all other assemblies, drives, power supply module or pc assemblies are covered in the individual Dynabyte or OEM Technical Manual.

- 7.02 On May 1, 1980, Dynabyte changed its part number system.
 - (1) The old part number system used an eight-digit part number with a letter suffix indicating the revision level.

Format:

NNNNNN-NL

Example:

1800002-4A

(2) The current system uses a six-digit part number.

Format:

NNNNNN

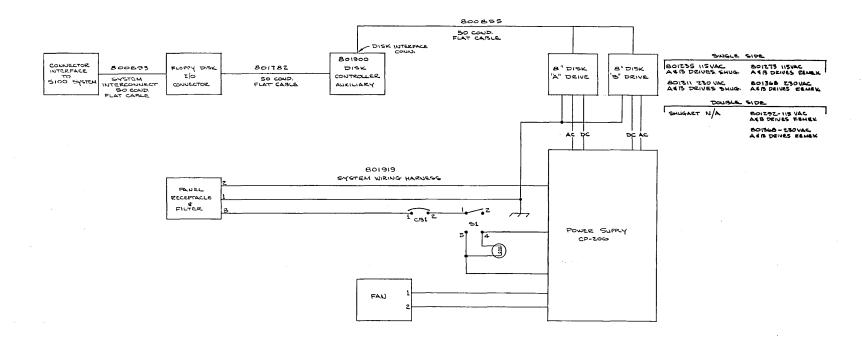
Example:

803439

All references in this manual reference the current six-digit part numbering system. Tables 7-2 and 7-3 furnish the user with a cross reference for parts and assemblies discussed in this manual.

OEM Equipment

- 7.03 Physical and functional descriptions, maintenance information and replaceable parts list for OEM equipment portion of the 5010 Unit are provided under separate cover or may be ordered from:
 - (1) Diskette Drive
 Ex-Cell-O Corporation
 REMEX
 1733 Alton Street
 P. O. Box C-19533
 Irvine, CA 92713
 (714) 557-6860
 - (2) Diskette Drive
 Shugart Associates
 435 Oakmead Parkway
 Sunnyvale, CA 94086
 (408) 733-0100
 TWX: 910-339-9355
 SHUGART SUVL
 - (3) Power Supply Module Power-One Inc. Power-One Drive Camarillo, CA 93010 (805) 498-2806



NOTES: 115 OF ZBOVAC JUMPER WIRING CHANGES.

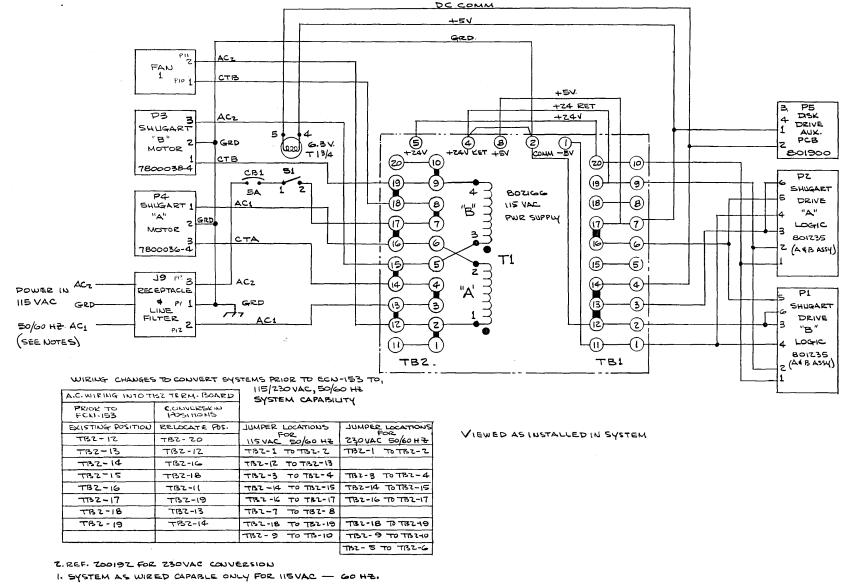
Figure 7-1 — 5010 Dual Diskette Storage Unit Chassis Wiring Diagram

Table 7-1 — 5010 Dual Diskette Storage Unit Replaceable Parts List

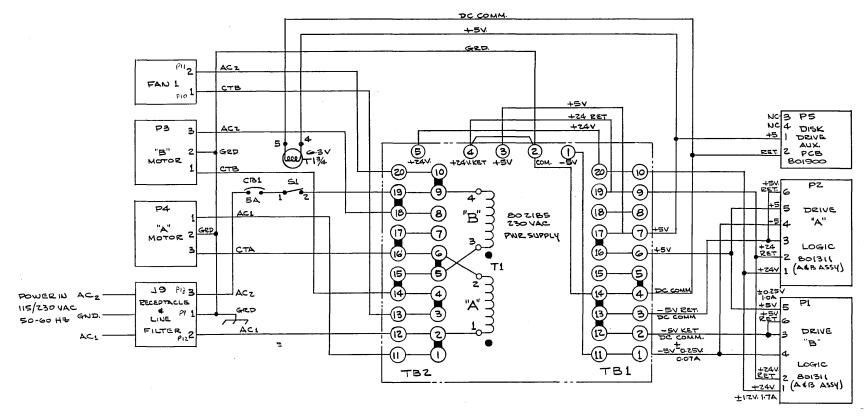
Reference	Description	Manufacturer	Manufacturer's Part Number	Dynabyte Part Number
	ASM: ENCLOSURE	DYNABYTE	800019	800019
1 1	COVER: VENEERED TOP	DYNABYTE	700144	700144
1	PANEL: BOTTOM	DYNABYTE	700036	700036
	BEZEL: CABINET	DYNABYTE	700054	700054
	FOOT: RUBBER	DYNABYTE	700216	700216
	ASM: 5010 1D FRONT PANEL	DYNABYTE	800912	800912
	ASM: 5010 2D FRONT PANEL	DYNABYTE	800950	800950
	HARNESS: FRONT PANEL	DYNABYTE	800798	800798
	SWITCH: ALTERNATE ACTION	CK	5101/W/BEZEL	711206
	LAMF: 6.3V	PRECISION	PL7321	705706
	ASM: 5010 REAR FANEL	DYNABYTE	800931	800931
1	FUSEHOLDER: 3AG	LITTLEFUSE	348-8-7-1	700594
1	FUSE: 3AG 1.5A	LITTLEFUSE	312001.5	705760
	FUSE: 3AG 3A -	LITTLEFUSE	312003	700198
1	FAN: 115 VAC	IMC	2107F-2	700504
.1	FAN: 230 VAC	ROTRON	WRA31	714866
	GUARD: FAN	IMC	005-009	700522
	HARNESS: REAR PANEL	DYNABYTE	801919	801919
	CONNECTOR: IEC M 250V 6A	BELDEN	17252	702880
	MODULE: 5010 POWER SUPPLY	POWER ONE	CP-206	706678
	DRIVE: A DISKETTE 1D	SHUGART	SA 801	804133
1 1	DRIVE: B DISKETTE 1D	SHUGART	SA 801	804152
1	PULLEY: 50 HZ MOTOR	SHUGART	50357	705796
1 1	BELT: 50 HZ MOTOR	SHUGART	50355	705778
	DRIVE: A DISKETTE 1D	REMEX	RFD-2000	804171
	DRIVE: B DISKETTE 1D	REMEX	RFD-2000	804190
	DRIVE: A DISKETTE 2D	REMEX	RFD-4000	804323
1	DRIVE: B DISKETTE 2D	REMEX	RFD-4000	804342
j	PULLEY: 50 HZ MOTOR	REMEX	112819-004	705832
].	BELT: 50 HZ MOTOR	REMEX	716001106	705814
	DISKETTE: 8-IN 1D	DYSAN	800609	711134
	DISKETTE: 8-IN 1D	DYSAN	800802	711602
	DISKETTE: DYNABYTE DOS 2.1	DYNABYTE	500128	500128

Table 7-1 - 5010 Dual Diskette Storage Unit Replaceable Parts List

Reference	Description	Manufacturer	Manufacturer's Part Number	Dynabyte Part Number
	CABLE: 5100 DISK I/O CABLE: 5200 DISK I/O CABLE: 5010 DISK I/O CABLE: SYSTEM DISK I/O CABLE: SYSTEM DISK I/O CABLE: SYSTEM DISK I/O CABLE: 8-IN DRIVE I/O CABLE: 5.25-IN DRIVE I/O CORD: 115 VAC POWER CORD: 230 VAC POWER	DYNABYTE DYNABYTE DYNABYTE DYNABYTE DYNABYTE DYNABYTE DYNABYTE DYNABYTE BELDEN STORM	800228 800247 801862 800893 804475 800855 800437 17250 C2123-02M-GY	800228 800247 801862 800893 804475 800855 800437 700414 708100
	PCA: MAIN DISK CONTROLLER PCA: MAIN DISK CONTROLLER	DYNABYTE	800741	801700
	OBSOLETE PARTS	•		
	CIRCUIT BREAKER: 115VAC 5A FASTENER: 8-32 COVER	EPA TINNERMANN	41-06-P30 C1802-832	715360 715342



NOTES: REF. ECN -153



VIEWED AS INSTALLED IN SYSTEM

- 3. REF. WIRING HARNESS & LIST 801919 POWER SUPPLY HARNESS 800708, FRONT PANEL SWITCH HARNESS
- 2. 230 V.AC 50 HZ, AS SHOWN
- 1A. 115 VAC TO 230 VAC AT DRIVES, PULLEY & BELT MUST BE CHANGED
- 18.115 VAC. TO 230 VAC CONVERSION AT POWER SUPPLY CONNECT WITH JUMPERS TBZ-5 TO TBZ-6

NOTES:

REMOVE JUMPERS - TBZ-7 TO TBZ-8, TBZ-12 TO TBZ-13

Figure 7-3 — 5010 Dual Diskette Storage Unit — Ac and Dc Power Schematic — 230 Vac

Table 7-2 - 5010 Dual Diskette Storage Unit/Part Number Cross Reference - Old To Current

Old Part Number	Current Part Number	Description
00-00000-0	500128	DISKETTE: DYNABYTE DOS 2.1
00-00000-0	700198	FUSE: 3AG 3A
00-00000-0	700216	FOOT: RUBBER
00-00000-0	700414	CORD: 115 VAC POWER
00-00000-0	700504	FAN: 115 VAC
00-00000-0	700522	GUARD: FAN
00-00000-0	700594	FUSEHOLDER: 3AG
00-00000-0	702880	CONNECTOR: IEC M 250V 6A
00-00000-0	705706	LAMP: 6.3V
00-00000-0	705760	FUSE: 3AG 1.5A
00-00000-0	705778	BELT: 50 HZ MOTOR
00-00000-0	705796	PULLEY: 50 HZ MOTOR
00-00000-0	705814	BELT: 50 HZ MOTOR
00-00000-0	705832	FULLEY: 50 HZ MOTOR
00-00000-0	706678	MODULE: 5010 POWER SUPPLY
00-00000-0	708100	CORD: 230 VAC POWER
00-00000-0	711134	DISKETTE: 8-IN 1D
00-00000-0	711206	SWITCH: ALTERNATE ACTION
00-00000-0	711602	DISKETTE: 8-IN 1D
00-00000-0	714866	FAN: 230 VAC
00-00000-0	715342	FASTENER: 8-32 COVER
00-00000-0	715360	CIRCUIT BREAKER: 115VAC 5A
00-00000-0	800912	ASM: 5010 1D FRONT PANEL
00-00000-0	800950	ASM: 5010 2D FRONT PANEL
00-00000-0 00-00000-0	804133 804152	DRIVE: A DISKETTE 1D DRIVE: B DISKETTE 1D
00-00000-0	804171	DRIVE: A DISKETTE 1D
00-00000-0	804190	DRIVE: B DISKETTE 1D
00-00000-0	804323	DRIVE: A DISKETTE 2D
00-00000-0	804342	DRIVE: B DISKETTE 2D
00-00000-0	804475	CABLE: SYSTEM DISK I/O
48-08101-4	23 A A 23 A 4	PCA: MAIN DISK CONTROLLER
48-08102-4	300741 301900 808108	PCA: 5010 AUXILARY CONTROLLER
68-00010-4	800437	CABLE: 5.25-IN DRIVE I/O
68-00011-4	800893	CABLE: SYSTEM DISK I/O
68-00012-4	801862	CARLE: 5010 DISK I/O
68-00013-4	800855	CABLE: 8-IN DRIVE I/O
68-00015-4	800247	CABLE: 5200 DISK I/O
68-00016-4	800228	CABLE: 5100 DISK I/O
68-00021-4	800019	ASM: ENCLOSURE
68-00024-4	800798	HARNESS: FRONT PANEL
68-00026-4	801919	HARNESS: REAR PANEL
98-00007-8	700054	BEZEL: CABINET
98-00010-8	700036	PANEL: BOTTOM
98-00027-8	700144	COVER: VENEERED TOP
98-00041-4	800931	ASM: 5010 REAR PANEL

Table 7-3 - 5010 Dual Diskette Storage Unit/Part Number Cross Reference - Current To Old

Current Part Number	Old Part Number	Description	
500128 700036 700054 700144 700198 700216 700414 700504 700522 700594 702880 705760 705760 70578 70578 705814 705832 706678 705832 706678 701134 711206 711134 711206 7115360 800019 800228 800247 800741 800798	00-0000-0 98-00010-8 98-00027-8 98-00027-8 00-00000-0 00-0000-0	DISKETTE: DYNABYTE DOS 2.1 PANEL: BOTTOM BEZEL: CABINET COVER: VENEERED TOP FUSE: 3AG 3A FOOT: RUBBER CORD: 115 VAC POWER FAN: 115 VAC GUARD: FAN FUSEHOLDER: 3AG CONNECTOR: IEC M 250V 6A LAMP: 6.3V FUSE: 3AG 1.5A BELT: 50 HZ MOTOR PULLEY: 50 HZ MOTOR PULLEY: 50 HZ MOTOR PULLEY: 50 HZ MOTOR DISKETTE: 8-IN 1D SWITCH: ALTERNATE ACTION DISKETTE: 8-IN 1D FAN: 230 VAC FASTENER: 8-32 COVER CIRCUIT BREAKER: 115VAC 5A ASM: ENCLOSURE CABLE: 5100 DISK I/O CABLE: 5200 DISK I/O CABLE: 5.25-IN DRIVE I/O PCA: MAIN DISK CONTROLLER HARNESS: FRONT PANEL	
800228 800247 800437 800741	68-00016-4 68-00015-4 68-00010-4 48-08101-4	CABLE: 5100 DISK I/O CABLE: 5200 DISK I/O CABLE: 5.25-IN DRIVE I/O PCA: MAIN DISK CONTROLLER	
801862 801900 801919 804133 804152 804171 804190 804323 804342 804475	68-00012-4 48-08102-4 68-00026-4 00-00000-0 00-00000-0 00-00000-0 00-00000-0 00-00000-0 00-00000-0	CABLE: 5010 DISK I/O PCA: 5010 AUXILARY CONTROLLER HARNESS: REAR PANEL DRIVE: A DISKETTE 1D DRIVE: B DISKETTE 1D DRIVE: A DISKETTE 1D DRIVE: B DISKETTE 1D DRIVE: B DISKETTE 2D DRIVE: B DISKETTE 2D CABLE: SYSTEM DISK I/O	

DYNABYTE