

Controller Installation

8510/a Graphics Computer System

Variable Density Disk Drive Controller Installation Guide

Part No. 50-0017-001 Rev. A

This document describes the installation of a TERAk Variable Density Disk Drive Controller in an 8510/a Graphics Computer System. The installation involves module and EIB (Extender Interface Board) removal/replacement and strapping and wiring changes to the diskette drives in the 8510, 8512 and/or 8515 units. Modifications to the diskette drive interface converters are also required.

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8510/a GRAPHICS COMPUTER SYSTEM
VARIABLE DENSITY DISK DRIVE CONTROLLER
INSTALLATION GUIDE
FIRST EDITION
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1. 8510, 8512, & 8515 FIELD UPGRADE KITS

Field Upgrade Kits are required to modify the 8510, 8512 and 8515 units for operation with a Variable Density Disk Drive Controller. These kits consist of the PWB assemblies, cable assemblies, labels, a user reference guide and installation instructions required to upgrade the original Single Density Controller-compatible units to Variable Density Controller-compatible units.

The Part Numbers for the kits are:

96-0007-101 8510 Variable Density Controller Field Upgrade Kit
96-0008-101 8512 Variable Density Controller Field Upgrade Kit
96-0009-101 8515 Variable Density Controller Field Upgrade Kit

2. SERIAL NUMBERS OF MODIFIABLE UNITS

The Variable Density Disk Drive Controller can be only be installed in units that contain Shugart drives. A Shugart drive has a door that slides up & down (and a push button release), as opposed to a Remex drive, whose door tilts upward. The TERAk units contain either linear or switching supplies. Certain modifications to the units are dependent upon the type of supply installed in a unit. The unit serial number identifies the type of supply contained in a unit at the time of manufacture.

2.1 Units with Linear Supplies:

8510 Units: 8100645 through 9030900
 9050901 through 9050995

8512 Units: 8100645 through 9060488
 9090493 through 9090502

8515 Units: 8100645 through 9050155

2.2 Units with Switching Supplies

8510 Units: 9050001 through 0100362, and above.

8512 Units: 9080489 through 9080492
 9100503 through 0100189, and above.

8515 Units: 9080156 through 0100057, and above.

3. DISK CONVERSION

PRIOR TO THE INSTALLATION OF THE VARIABLE DENSITY CONTROLLER & EIBS, THE PASCAL AND/OR RT-11 USER MUST UPGRADE THE EXISTING SYSTEM DISKS.

One of three software kits, containing conversion disks for RT-11 V03B, Pascal 1.5, or Pascal 2.0 systems, are offered. These conversion disks are bootable and QX-QB transportable, and contain new device handlers to support the new Controller and bootstrap handlers for Pascal 1.5, Pascal 2.0 or RT-11 V03B systems. The part numbers of the software kits are:

94-0015-001 RT-11 V03B Software Kit
94-0015-003 Pascal 1.5 Software Kit
94-0015-002 Pascal 2.0 Software Kit

The new monitors must be transferred to the user's existing system disks. With both single (QX) and variable (QB) density monitors installed, the system diskettes can be transported between both the original Single Density and the new Variable Density systems. Proceed as follows.

3.1 Pascal Disk Upgrade on Multiple Drive Systems

1. Insert the existing Pascal system disk into drive QX0.
2. Insert the new Pascal conversion disk into drive QX1.
3. Key in F, to load the Filer; then perform the following:

Key in T, (for a file Transfer).

System prompt: "Transfer what File?"

Key in #5:SYSTEM.8510.QB <RET>

System prompt: "To where?"

Key in #4:\$ <RET>

System prompt: "#5:SYSTEM.8510.QB transferred to #4:SYSTEM.8510.QB"

Key in T, for a file Transfer.

System prompt: "Transfer what File?"

Key in #5:Q2BOOT <RET>

System prompt: " To Where?"

Key in #4:\$ <RET>

System prompt: "#5:Q2BOOT transferred to #4:Q2BOOT"

Key in C, to change a file name.

System prompt: "Change what File?"

Key in #4:SYSTEM.8510/A <RET>

System prompt: "Change to what?"

Key in #4:SYSTEM.8510.QX <RET>

System prompt: "#4:SYSTEM.8510/A changed to #4:SYSTEM.8510.QX"

Key in Q, to quit the Filer.

4. Perform the following:

Key in X, to execute a code file.

Key in #5:BOOTER.CODE <RET>

System prompt: "This is general bootstrap mover."

"Enter name of file to be installed as a bootstrap:"

Key in #4:Q2BOOT <RET>

"Enter name of volume on which bootstrap is to be installed"

Key in #4:

The disk in drive QX0 now contains a new bootstrap that differentiates single from double density disk formatting, single sided from two sided disk drives, and provides transparency between the original Single Density and Variable Density Controllers.

3.2 Pascal Disk Upgrade on Single Drive Systems

1. Insert the existing Pascal system disk into the drive.

2. Key in F, to load the Filer.

3. Key in T, for a file Transfer.

System prompt: "Transfer what file?"

4. Remove the Pascal system disk; insert the new conversion disk into the drive.

5. Key in #4:SYSTEM.8510.QB <RET>

System prompt: "To where?"

6. Remove the new conversion disk; insert the Pascal system disk into the drive.
7. Key in #4:\$ <RET>
System prompt: "#4:SYSTEM.8510.QB transferred to #4:SYSTEM.8510.QB"
8. Remove the Pascal system disk; insert the new conversion disk into the drive.
9. Key in T, for a file Transfer.
System prompt: "Transfer what file?"
10. Key in #4:Q2BOOT <RET>
System prompt: "To where?"
11. Remove the new conversion disk; insert the Pascal system disk into the drive.
12. Key in #4:\$ <RET>
System prompt: "#4:Q2BOOT transferred to #4:Q2BOOT"
13. Key in C, to Change a file.
System prompt: "Change what file?"
14. Key in #4:SYSTEM.8510/A <RET>
System prompt: "Change to what?"
15. Key in #4:SYSTEM.8510.QX <RET>
System prompt: "#4:SYSTEM.8510/A changed to #4:SYSTEM.8510.QX"
16. Key in Q, to Quit the Filer.
17. Remove the Pascal system disk; insert the new conversion disk into the drive.
18. Key in X, to execute a code file.
19. Key in #4:BOOTER.CODE <RET>
System prompt: "This program is a general bootstrap mover."
"Enter name of file to be installed as a bootstrap:"
Key in #4:Q2BOOT <RET>
"Enter name of volume on which bootstrap is to be installed:"
20. Remove the conversion disk; insert the Pascal system disk into the drive.

Key in #4: <RET>

The disk in the drive now contains a new bootstrap that differentiates single from double density disk formatting, single sided from two sided drives, and provides transparency between the original Single Density and new Variable Density Controllers.

3.3 RT-11 Disk Upgrade on Multiple Drive Systems

1. Insert the user's RT-11 system disk into drive QX0.
2. Insert the new RT-11 conversion disk into drive QX1.
3. Key in the following, in response to the prompt (.):

```
COPY/SYS QX1:QBMNSJ.SYS QX0: <RET>
```

4. Key in the following, in response to the prompt (.):

```
COPY/BOOT QX1:Q2BOOT.SAV QX0: <RET>
```

The disk in drive QX0 now contains a new bootstrap that differentiates single from double density disk formatting, single sided from two sided disk drives, and provides transparency between the original Single Density and new Variable Density Controllers.

3.4 RT-11 Disk Upgrade on Single Drive Systems

1. Insert the RT-11 conversion disk into the drive.

```
Key in R SETSDS <RET>
```

```
System message: "Single drive system"
```

2. Key in the following, in response to the prompt (.):

```
COPY/SYS QX0:QBMNSJ.SYS QX1: <RET>
```

```
System prompt: "?MOUNT DISK 1"
```

3. Remove the RT-11 system monitor disk; insert the new conversion disk into the drive. The system will automatically read the QBMNSJ.SYS file into memory. The system will prompt you with:

```
"?MOUNT DISK 0"
```

if the entire file is not loaded into memory. Respond by removing the conversion disk and inserting the RT-11 system monitor disk into the drive. Continue to swap these two disks in response to the system message "?MOUNT DISK 0 (or 1)" until the monitor prompt (.) occurs.

4. Key in the following, in response to the prompt (.):

COPY/BOOT QX0:Q2BOOT.SAV QX1: <RET>

System prompt: "?MOUNT DISK 1"

5. Remove the RT-11 system monitor disk; insert the new conversion disk into the drive. The system will automatically read the Q2BOOT.SAV file into memory. The system will prompt you with:

"?MOUNT DISK 0"

if the entire file is not loaded into memory. Respond by removing the conversion disk and inserting the RT-11 system monitor disk into the drive. Continue to swap these two disks in response to the system message "?MOUNT DISK 0 (or 1)" until the monitor prompt (.) occurs.

The disk in the drive now contains a new bootstrap that differentiates single from double density disk formatting, single sided from two sided disk drives, and provides transparency between the original Single Density and new Variable Density Controllers.

4. 8510, 8512, & 8515 UNIT COVER REMOVAL-REPLACEMENT

--WARNING--

Due to the complex nature of the system components, unit cover removal-replacement, and subsequent module and EIB installation, should only be performed by technically-qualified personnel.

--CAUTION--

DISCONNECT THE UNIT AC POWER CORDS BEFORE REMOVING THE COVERS

THE DISK CONVERSION PROCEDURES OF SECTION 3 MUST BE PERFORMED PRIOR TO THE FOLLOWING HARDWARE CHANGES.

The unit covers are held in place by four Phillips-head screws, as indicated by Figure 4-1. Remove the two retaining screws and nylon finishing washers at the rear-sides of the unit. Loosen the two retaining screws with the metal washers at the bottom-front of the unit. It is not necessary to remove these screws completely. Don't stand a unit on its rear feet to loosen the bottom-front screws if cables are connected to EIBs. Instead, slide the unit forward until it protrudes far enough beyond the desk or bench edge to allow access to the bottom front screws. Slide the integral front panel-cover forward until it separates from the chassis.

To re-install a cover, slide it back onto its chassis, taking care not to pinch any ribbon cables that may be protruding slightly. When the cover is in place, replace the rear-side screws and then tighten the bottom front screws .

5. 8510, 8512, & 8515 DRIVE REMOVAL-REPLACEMENT

1. Remove the unit covers (see Section 4).
2. Remove the 8510, 8515 module retainer bracket (if applicable). See Figure 4-1.
3. Remove the modules from the 8510 or 8515 backplane. Refer to Figure 7-1 for the locations of the modules in an 8510 unit. Record the locations of any 8515 modules before removing them from the backplane.
4. Remove the four Phillips-head screws that fasten a disk drive chassis to a unit chassis. In some units, two of these screws are accessed through a hole and a slot in a power supply PWB (see Figure 5-1). The other two screws are on the opposite side of the unit chassis.

NOTE: A unit may contain either 3 linear power supplies or a single switching power supply, depending on its date of manufacture. The location of a switching supply is indicated in Figure 5-1. Two of the linear supplies are in approximately the same location as the switching supply; the third is on the opposite side of the unit.

5. Slide the disk drive chassis forward until the disk drive connectors can be accessed. There are three cables that must be disconnected from the drive; the location of one of these cables is dependent upon the type of supply installed in the unit.

If the unit is equipped with a switching supply, refer to Figure 6-3 and disconnect the Drive AC power connector, P1 of the Disk Drive Converter module, and P5 of the Drive PWB.

If the unit is equipped with linear supplies, refer to Figure 6-4 and disconnect the Drive AC power connector, P1 of the Disk Drive Converter module, and J3 of the Disk Drive Converter module.

6. After the cables are disconnected, continue sliding the drive forward to remove it from the unit chassis.

6. DRIVE MODIFICATIONS

Remove the drive from the unit in accordance with Section 5 of this document and change the strapping as specified in Section 6.1. It is not necessary to remove the PWB from the drive housing to change the straps.

6.1 Strapping Changes

The 8510, 8512 and 8515 units contain either of two versions of single-sided drives. Figure 6-1 identifies the board layout for an SA 800 drive; Figure 6-2 identifies an LSI SA 800 drive. These drives are functionally equivalent; however, because the board layouts are different, the equivalent straps are at different locations. A strap is installed by inserting plastic-cased jumpers over the designated pairs of pins. (Note: Some straps are permanently jumpered by means of PWB foil connections; no pins or plastic-cased jumpers are required.) Only the following jumpers, as shown in Figs 6-1 & 6-2, need be changed to convert a drive for use with the Variable Density Disk Drive Controller:

Remove DS.
Remove B.
Install X.

Move DS2, DS3, or DS4 to DS1. (These straps were used to assign a unit number to a drive, (i.e., QX0, 1, 2, or 3), with the original Single Density Controller. This function is now accomplished via switches on the new Variable Density Controller's EIBs. (See Section 9.)

A complete strap listing is contained in Table 6 for verification:

Table 6. Strap Configuration Listing

Strap	State	Strap	State
A	In	HL	Out
B	Out	NP	Out
C	In	RI	In
D	Out	T1	Out
I	In	T2	In
R	In	T3	Out
S	In	T4	Out
X	In	T5	Out
Y	In	T6	Out
Z	Out	WP	In
DC	Out	DDS	Out
DS	Out	DS1	In
		DS2	Out
		DS3	Out
		DS4	Out

6.2 Jumper Wiring

Further modifications consist of removing and replacing a wire on the drive PWB. The PWB does not have to be removed from the drive chassis. Proceed as follows:

1. If an SA 800 is installed, remove the wire that connects the 50 pin card edge connector pin 2 to pin 16 of IC 3A. (Shown on the left side of Fig. 6-1.)

Solder a piece of insulated #28 AWG wire between pin 16 of IC 3A and pin 12 of the 50 pin card edge connector. Use the wire wrap post that is nearest pin 12, as shown in Fig. 6-1.

2. If an LSI SA 800 is installed, remove the wire that connects the 50 pin card edge connector pin 2, to pin 16 of IC 1A. (Shown on the left side of Fig. 6-2.)

Solder a piece of insulated #28 AWG wire between pin 16 of IC 1A and pin 12 of the 50 pin card edge connector. Use the wire wrap post that is nearest pin 12, as shown in Fig. 6-2).

6.3 Disk Drive Converter Changes

In addition to the strapping and wiring changes, the following modifications must be made to the Disk Drive Converter module.

6.3.1 Modifications to Units with Switching Supplies

Refer to Section 2 for the serial numbers of units with switching supplies. A Disk Drive Converter module, (Assembly No. 92-0017-002), connected to the drive PWB, must be removed from all 8510, 8512 and 8515 units that have switching supplies. Refer to Figure 6-3 for converter removal and proceed with the following steps:

1. Remove the two Phillips-head screws that fasten the Disk Drive Converter to the drive PWB.
2. Grasp the interconnect cable connector at the drive PWB edge, and pull it free of the edge connector. The converter can now be slipped out of the space between the drive PWB and drive chassis. The converter is not required with the new Controller and can be discarded.

3. Go to Section 7.

6.3.2 Modifications to Units with Linear Supplies

Refer to Section 2 for the serial numbers of units with linear supplies. A cable, that connects a Disk Drive Converter module to the drive PWB, must be removed from all linear supply-equipped units. The Disk Drive Converter module, (Assembly No. 92-0017-001) however, must remain installed in all 8510, 8512 and 8515 units that have linear supplies. Refer to Figure 6-4 for cable removal and proceed with the following steps:

1. Remove the two Phillips-head screws that fasten the Disk Drive Converter to the drive board.
2. Remove J4 from P4 of the Converter, (see Fig. 6-4 for location).
3. Grasp the interconnect cable at the drive PWB edge and pull it free of the edge connector. The Disk Drive Converter can now be slipped out of the space between the drive PWB and drive housing by rotating the converter board tab containing P4 past the J5 connector of the drive board, (see Fig. 6-4).
4. Separate the interconnect cable connector, (P2), on the Disk Drive Converter PWB, by forcing a thin bladed tool between the connector's plastic halves. The ribbon cable is sandwiched between the plastic halves; when the halves are pried apart, the cable will be freed. Discard the remainder of the interconnect cable and the freed half of this Converter connector.
5. Re-install the Disk Drive Converter; replace the two Phillips-head screws; and re-connect J4 to P4 of the Converter board.

7. CONTROLLER MODULE & DRIVE EIB INSTALLATION

The locations of the 8510 backplane modules, the new 8510 Variable Density Controller and the 8510, 8515, and 8512 Variable Density Disk Drive EIBs are shown in Figure 7-1. The dual-width Variable Density Controller should be installed in the 8510 backplane slot that has the highest priority in the DMA and Interrupt Priority "daisy-chain" grant path.

A module has a DMA and Interrupt priority that is based on its electrical distance from the processor module. The "daisy chain" grant path, shown as 8510 backplane slot-to-slot arrows on Figure 7-1, signifies the descending order of priority from any slot. As shipped from the factory, an 8510 unit has either a quad-width LSI-11 module installed in slots 1AB and 5CD or a dual-width LSI-11/2 module in slot 1AB. Consequently, the dual-width Variable Density Disk Controller should be installed in slot 2AB.

A dual-width module can use either slot connectors A&B or C&D for priority signaling. A quad-width module only uses slot connectors A&B for priority signaling, but maintains continuity of the priority signals through slot connectors C&D by means of etched circuit jumpers on the module.

To maintain continuity of the priority signals (to modules of lower priority) when the dual-width Variable Density Controller replaces the original quad-width Disk Controller, any module that was originally installed in slot 7CD of the 8510 should be moved down to slot 6CD.

7.1 8510 Installation

Perform the following steps:

1. Remove the original Single Density Drive EIB from the 8510 unit; it is held in place by 4 Phillips-head screws.
2. Position the new Variable Density Drive EIB in the location formerly occupied by the original Single Density Drive EIB and fasten it to the rear of the chassis with the Phillips-head screws.
3. Work the 50 pin cable, at the top of the EIB, down into the chassis; this cable has been pre-folded and must be routed over the top of the unit's transformer and then down between the front of the transformer and the large capacitor mounted at the rear of the drive housing to fit properly. Carefully slide the drive housing back into the unit chassis and insert this EIB cable into the drive PWB connector (J1) that was formerly occupied by the cable from the Disk Drive Converter. This cable's connector is keyed; when inserted properly, the cable's red stripe will be at the left, when viewing the drive connector from the front of the unit and above the unit.
4. Re-connect the Drive AC power connector and P5 of the Drive PWB (if the unit contains a switching supply) or J3 of the Disk Drive Converter module (if the unit contains a linear supply). See Fig.s 6-3 and 6-4 for the locations of these connectors.
5. Re-fasten the Drive to the unit chassis with the 4 Phillips-head screws (see Step 4, Section 5). Carefully align the threaded holes of the drive with the holes on either side of the unit chassis, else the cover will not fit.
6. Re-install the 8510 modules, (except the original Controller, of course) in the backplane (component sides downward); see Figure 7-1 for their locations. Install the new Variable Density Controller in slot 2AB of the 8510 backplane and, if a module was originally installed in slot 7CD, re-install it in slot 6CD. Install the module retainer bracket.
7. Carefully arrange the 40 pin ribbon cable at the bottom of the new Drive EIB along the side of the chassis and attach it to the Variable Density Controller in the backplane. This cable's connector is keyed; when inserted properly, the cable's red stripe will be at the left, when facing the Controller connector.
8. Re-attach the remaining cables to the installed modules.
9. Affix a new label to the unit, (see Section 10), then re-install the unit cover (see Section 4).

7.2 8512/15 Installation

Proceed as follows:

1. Remove the original Single Density Drive EIB from each 8512 and/or 8515 unit; they are each held in place by 4 Phillips-head screws.

NOTE: The Drive EIB of an 8512 unit contains a 2 wire cable, (P4), that must also be disconnected. For 8512 units with a switching supply, P4 connects to J13 on the power supply; for 8512 units with linear supplies, P4 connects to a relay at the rear of the unit.

2. Position the new Variable Density Drive EIB in the location formerly occupied by the Single Density Drive EIB and fasten it to the rear of the unit with the Phillips-head screws.
3. Work the 50 pin cable, at the top of the EIB, down into the chassis; this cable has been pre-folded and must be routed over the top of the unit's transformer and then down between the front of the transformer and the large capacitor at the rear of the drive housing to fit properly. Carefully slide the Drive housing back into the unit chassis and insert this EIB cable into the drive PWB connector (J1) that was formerly occupied by the cable from the Disk Drive Converter. This cable's connector is keyed; when inserted properly, the cable's red stripe will be at the left, when viewing the drive connector from the top of the unit and above the unit.
4. Re-connect the Drive AC power connector and P5 of the drive board (if the unit contains a switching supply) or J3 of the Disk Drive Converter module (if the unit contains a linear supply). See Fig.s 6- 3 and 6-4 for the locations of these connectors.

NOTE: For 8512 units only: the 2 wire cable (P4) of the new Variable Density Drive EIB must be re-connected to J13 of the switching supply, if the unit is so equipped. If the unit contains linear supplies, P4 must be connected to the adapter cable included with the conversion kit. This adapter cable must then be connected to the same pins (as used by the original Single Density Drive EIB) of the relay at the rear of the 8512 unit. For units with switching supplies, this adapter cable can be discarded.

CAUTION

THE CORRECT RELAY PINS ARE THOSE CLOSEST TO THE 8512 CHASSIS FLOOR. THE PINS AT THE TOP OF THE RELAY, (THEY SHOULD BE INSULATED), ARE AT THE AC LINE POTENTIAL WHEN THE 8512 IS OFF AND CONNECTED TO AN AC POWER SOURCE. ACCIDENTAL CONNECTION TO THESE PINS CAN CAUSE EXTENSIVE SYSTEM DAMAGE.

5. Re-fasten the Drive to the unit chassis with the 4 Phillips-head screws (see Step 4, Section 5). Carefully align the threaded holes of the drive with the holes on either side of the unit chassis, else the cover will not fit.
6. If an 8515 unit has been modified, re-install the modules in the locations recorded in step 3 of Section 5. Re-attach the cables to the modules.
7. Affix a new label, (see Section 10), then re-install the cover, (see Section 4).

8. 8510, 8512, 8515 DRIVE INTERCONNECTION

8.1 Variable Density Controller-Variable Density Controller EIB Interconnection

New 40 circuit "daisy chain" cables are used to interconnect the Variable Density-configured drives of a system. As shown in Figure 7-1, the center connector of the 8510 Drive EIB is used to extend the Variable Density Controller to additional drives. The 40 pin cable from the 8510 Drive EIB should be attached to the bottom connector of an 8512 or an 8515 Drive EIB. Additional drives are interconnected in a similar manner; i.e., center connector of the last Drive EIB in the chain to the bottom connector of the next Drive EIB in the chain, as indicated in Figure 7-1.

To aid interconnection, the "daisy chain" cables are keyed and color-coded (orange and blue); just match the color label on the cable ends to the color label on the Drive EIBs.

8.2 Original Single Density Controller-New Variable Density Controller EIB Interconnection

Drives that have been configured to operate with the Variable Density Controller can still be used with 8510 units that contain the original Single Density Diskette Controller. An optional Auxillary Drive Cable Converter, (P/N 92-0030-001), is required. This module fits in series with one of the "daisy chain" cables used to interconnect the drives, as shown in Figure 8-1. This conversion can only be performed once per "daisy chain". For example, if 3 drives have been modified for Variable Density operation, the Cable Converter would be attached between the (Single Density Controller-equipped) 8510 Drive EIB (Unit 0) and the next (Variable Density) drive in the chain (Unit 1). A mixture of Single Density and Variable Density-configured drives can be utilized; the Cable Converter is attached so that the Variable Density drives are always the last ones in the chain.

To aid interconnection, the Cable Converter cables are keyed and color-coded (orange and blue); just match a color label on the cable end to the color label on the first Variable Density Drive EIB in the chain.

NOTE: When a Cable Converter is installed, the Drive terminator DIP, shown in Figure 8-1, must be installed on the 8510 Single Density Controller EIB.

NOTE: Do not attempt to operate a Variable Density Controller-equipped 8510 with original Single Density-configured drives; they are not compatible. The new Variable Density daisy chain cables are keyed differently, to prevent interconnection errors. Do not attempt to defeat the purpose of these keys.

The 8512 and 8515 units must be upgraded for Variable Density operation before they can be used with the Variable Density Controller. See Section 1 for the Field Upgrade Kit numbers.

9. VARIABLE DENSITY DRIVE EIB ADDRESS SELECTION

Set each unit's Drive EIB Drive Address Selection switches to the respective desired addresses, as shown in Table 9.

Table 9. EIB Drive Address Selection Switch Settings

Switch Settings								Drive Address Selected
SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	
ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	0
OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	1
OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	2
OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	3

NOTE: The resistor terminator DIP should be installed on the 8510 Drive EIB with pin 1 oriented as shown in Figure 8-1.

10. UNIT LABELING

After a unit has been configured for Variable Density operation, (and before the cover has been re-installed), affix a new density label, P/N 44-0022-001, (shown in Figure 10-1), to the configured unit, at the location formerly occupied by the QX0, 1, 2, or 3 label. Peel the old label off of the front panel; a hole in the front panel, (behind this label), has been provided to facilitate label removal. If a unit number other than 0 has been selected, overlay the 0 of the new Dual density label with the drive unit number 1, 2, or 3 label (P/N 44-0023-001), that was assigned to the unit.

11. SYSTEM ACCEPTANCE TESTS

After an 8510/a system has been modified in accordance with Sections 3 through 10 of this document, the system should be tested by means of the TERA System Acceptance Disk (Part No. 95-0011-101). The diskette contains GO/NO-GO tests that exercise the hardware subsystems. Each test is preceded by an explanatory message on the display; user instructions will also appear on the display.

NOTE: After an 8510/a system has been modified, do not use the original TERA Single Density System Acceptance Disk (Part No. 61-0006-001); it is not compatible with the Variable Density Controller.

11.1 Power ON; Diskette Loading

Turn the system on by means of the ac power switches located in the upper right corners of the 8510 and 8515 (if used) front panels. If closed, open the diskette loading door on the 8510 (Drive Unit 0)-by depressing the button just below the door.

Remove the System Acceptance Diskette from its protective envelope; keep your fingers off of the exposed magnetic surfaces of the diskette. Holding the diskette with the label side up, insert it into the QX0 drive until it can go no further. The diskette will "latch" into position. Close the drive door; the drive head-down light (red Light Emitting Diode embedded in the door button) will turn on.

11.2 System Acceptance Test Procedures

NOTE: If the following procedures cannot be accomplished, contact TERA Customer Service for assistance.

After the System Acceptance Test diskette has been inserted in Drive Unit 0, and the drive door has been closed, the operating system should load itself (boot) into main memory. Within 20 seconds, an acceptance test-related message should appear on the display.

The test-related message will prompt the user to execute a carriage return to display the "menu" of tests. Select a test by typing the displayed test name, followed by a carriage return. The test procedures will then appear on the display.

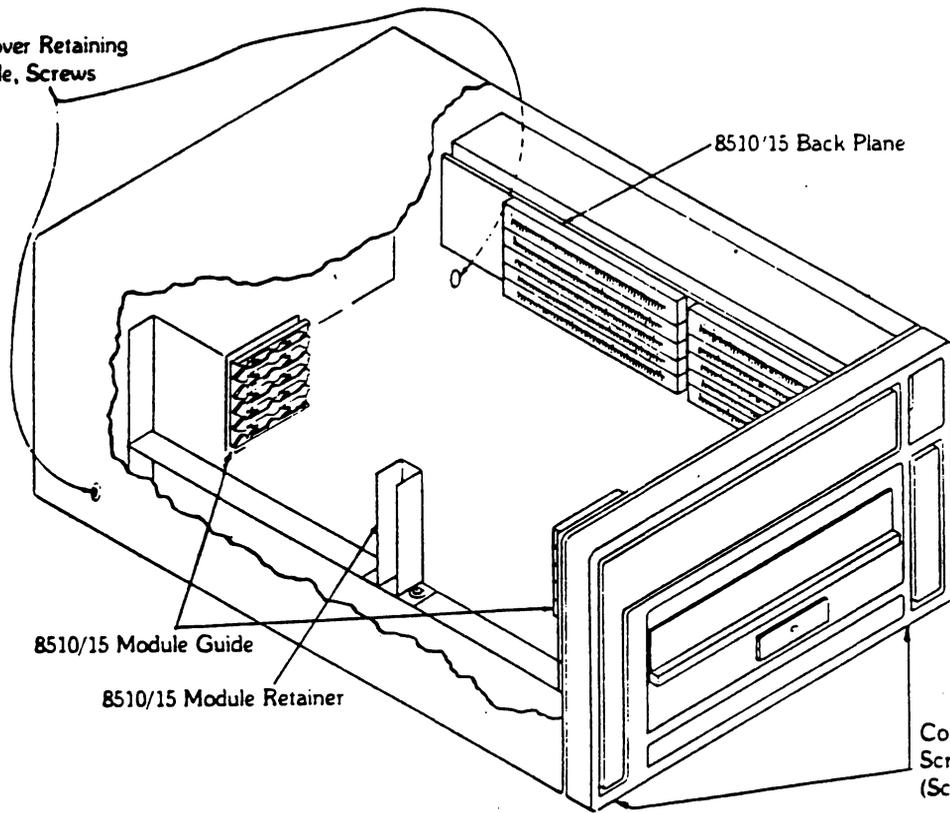
NOTE: Once a test has begun, the user should not type anything, unless prompted by a message. Typing during the test execution can produce unpredictable results and an apparent test failure.

NOTE: To exit from any test, at any time, re-boot the system by depressing the upper half of the 8510 ac power switch; the acceptance test-related message will re-appear on the display.

11.3 Diskette Removal

After the System Acceptance Tests are completed, remove the diskette by depressing the drive door button. The door will open and the diskette will be partially ejected. Remove the diskette and return it to its protective envelope.

Cover Retaining
Side, Screws



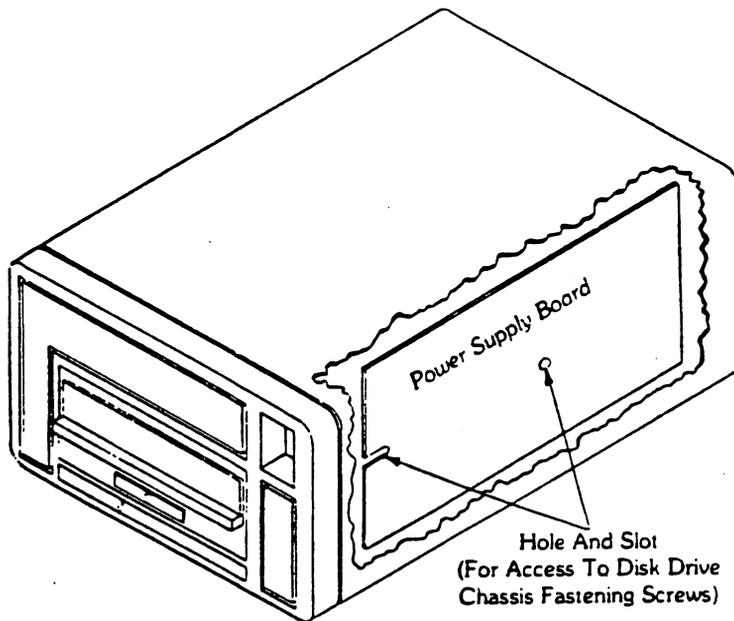
8510/15 Back Plane

8510/15 Module Guide

8510/15 Module Retainer

Cover Retaining
Screws, Bottom
(Screws With Metal Washers)

Figure 4-1 8510/12/15 Cover Removal-Replacement & 8510/15 Module Retaining Hardware

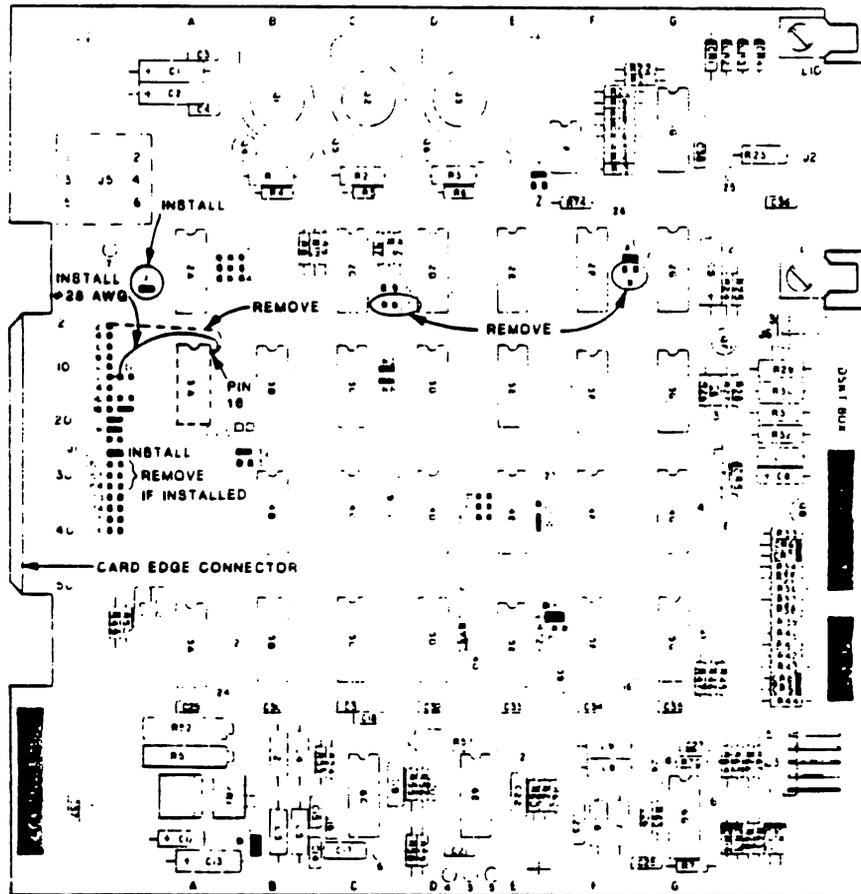


Power Supply Board

Hole And Slot
(For Access To Disk Drive
Chassis Fastening Screws)

Figure 5-1 Disk Drive Fastening Screw Locations

0077-001

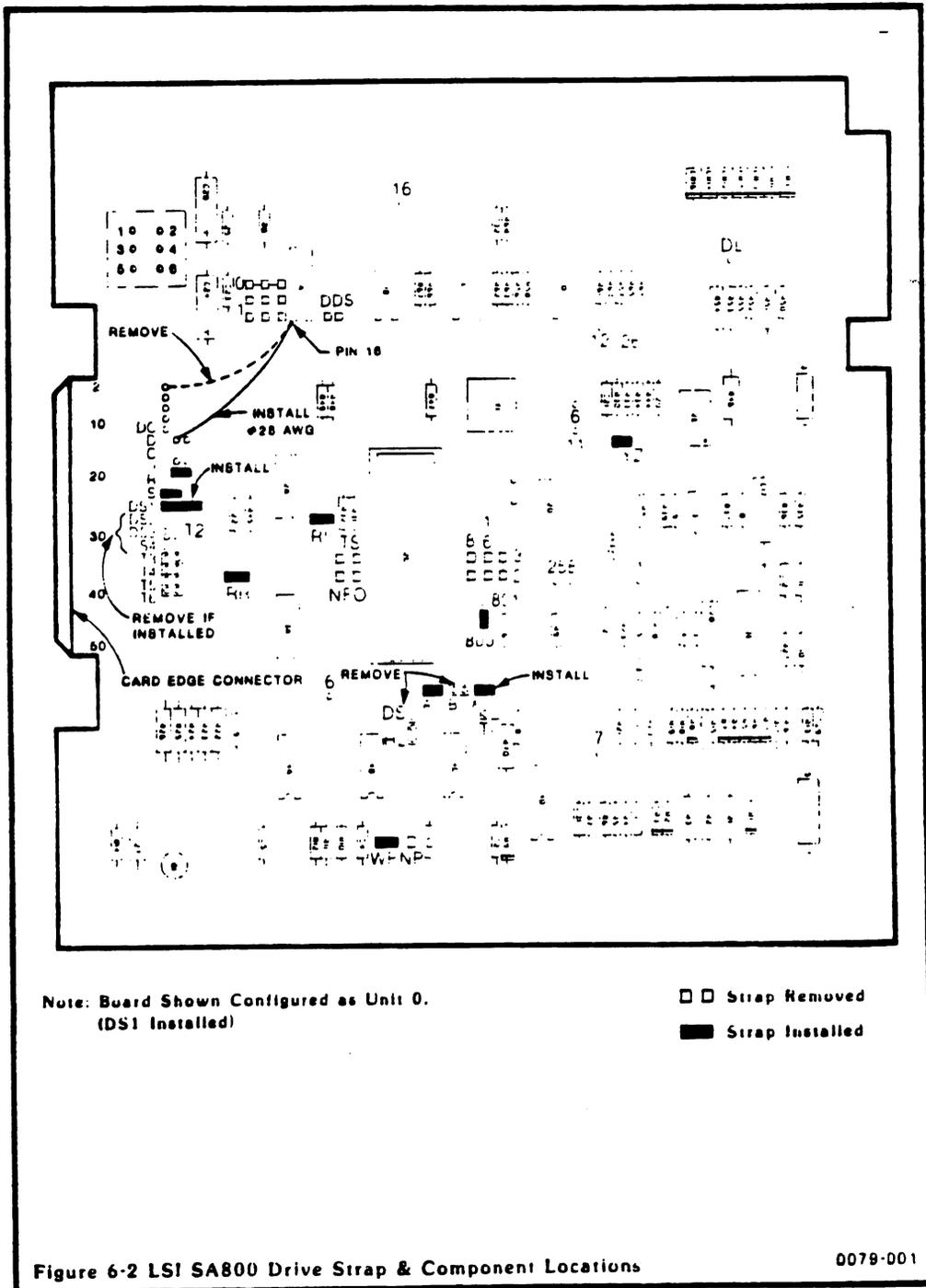


Note: Board Shown Configured as Unit 0.
(DS1 Installed)

- ■ Strap Removed
- ▨ Strap Installed

Figure 6-1 SA800 Drive Strap & Component Locations

0078-001

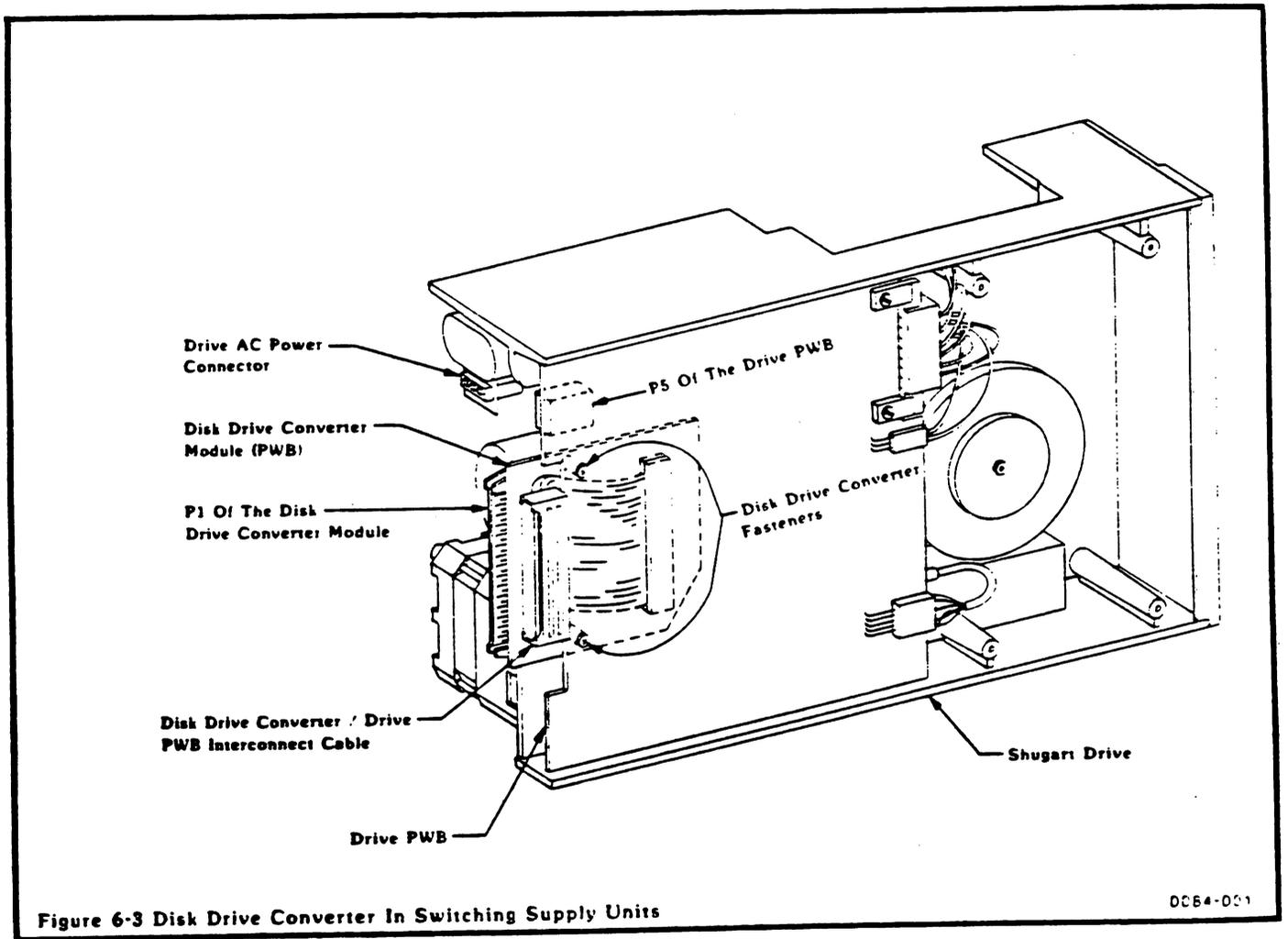


Note: Board Shown Configured as Unit 0.
(DS1 Installed)

□ □ Strap Removed
■ Strap Installed

Figure 6-2 LSI SA800 Drive Strap & Component Locations

0079-001



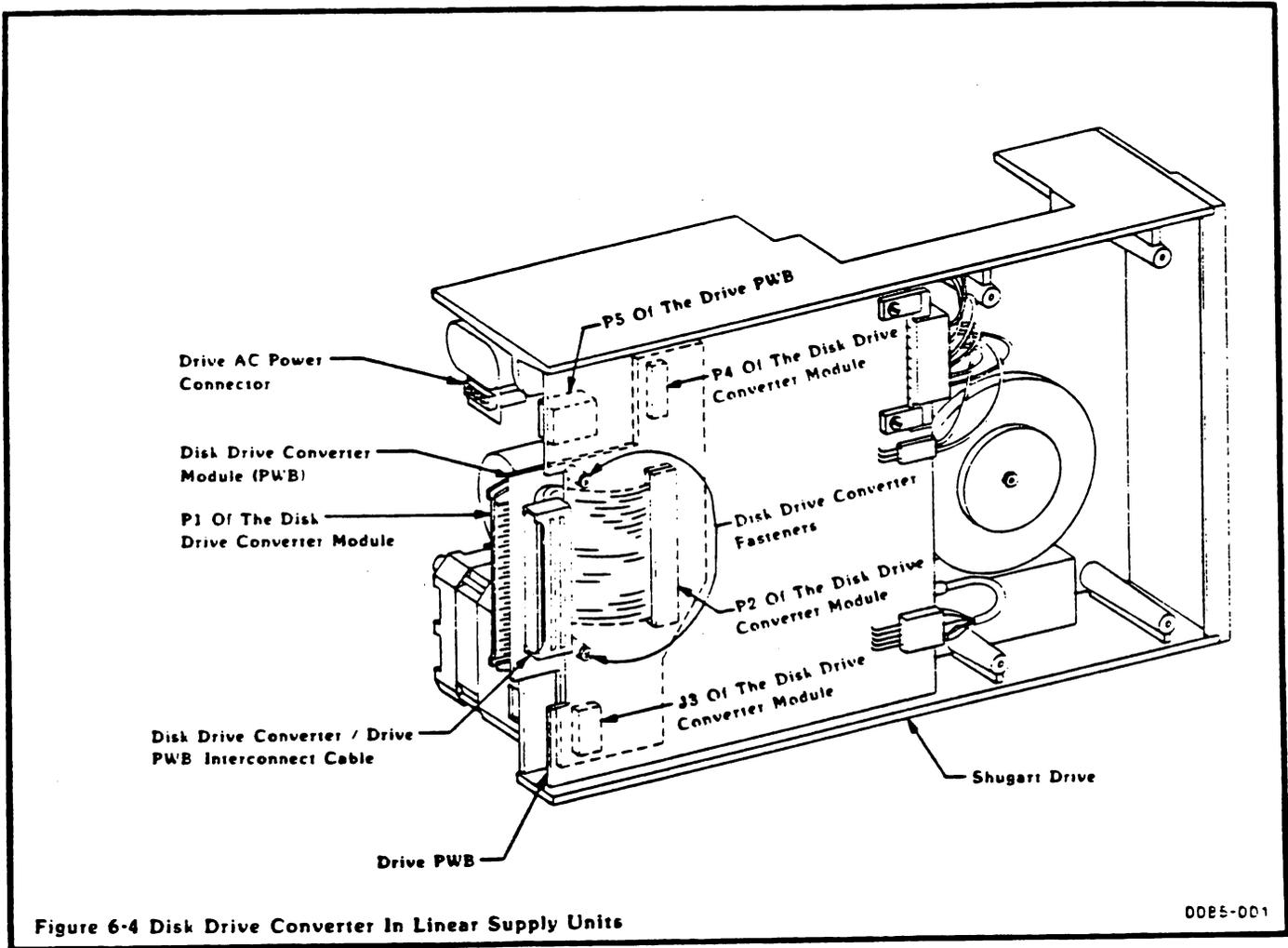


Figure 6-4 Disk Drive Converter In Linear Supply Units

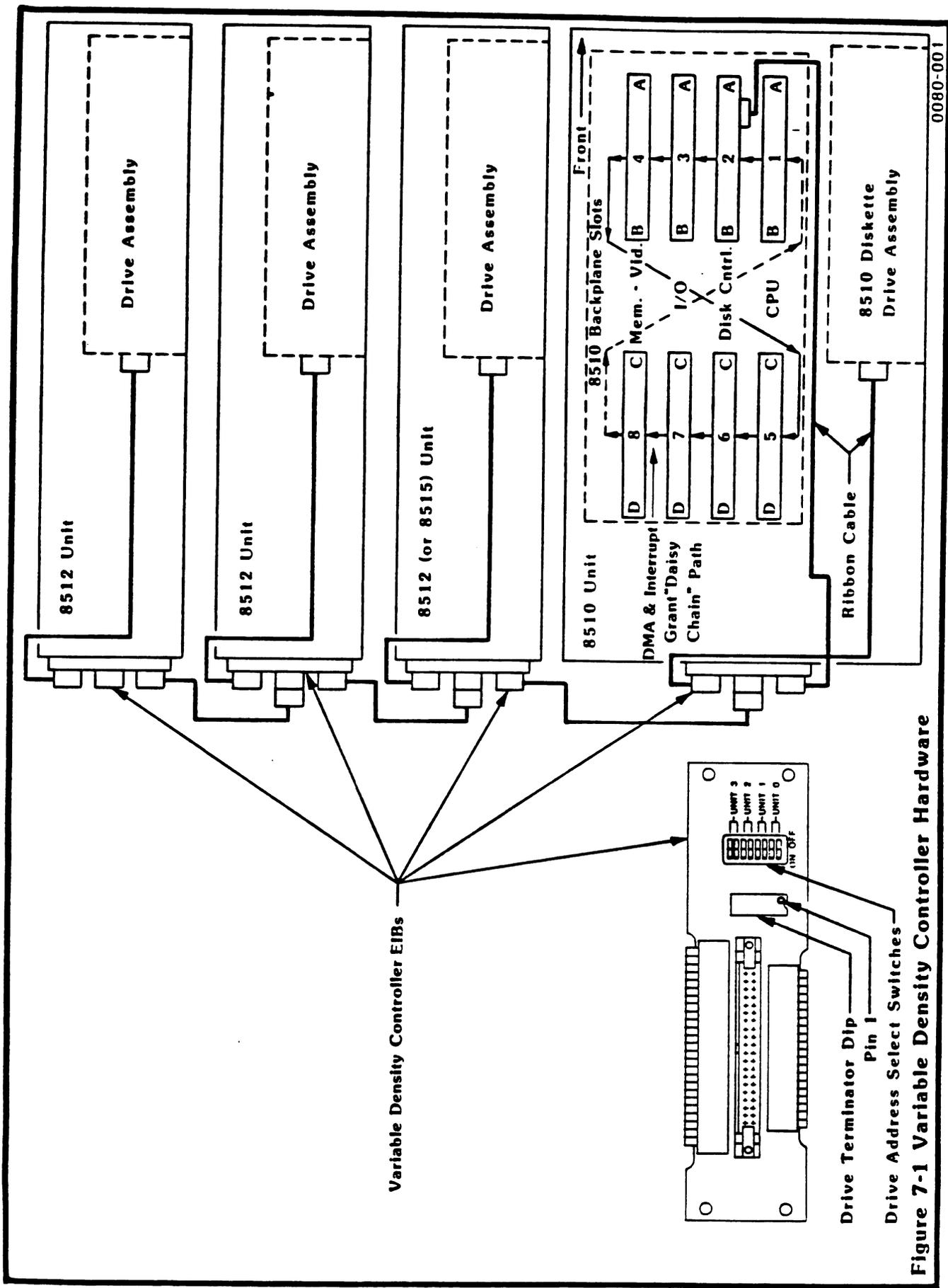
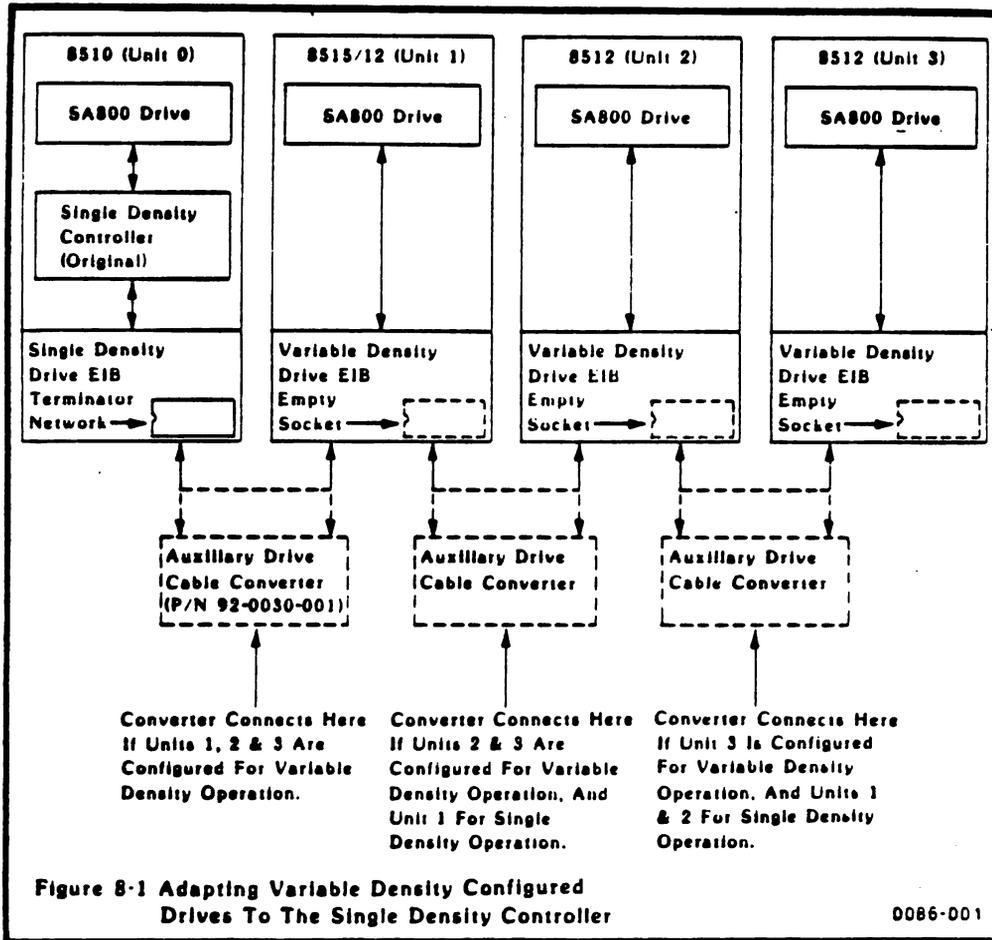


Figure 7-1 Variable Density Controller Hardware



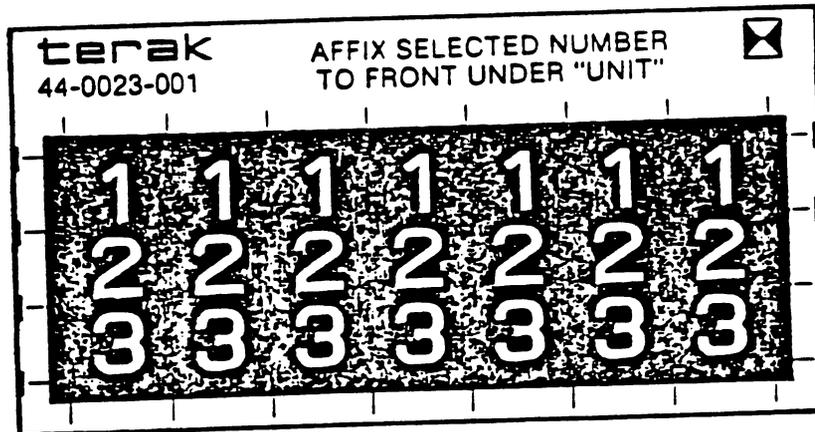


Figure 10-1 Unit Labeling