
CONVEX Digital Audio Tape Drive Service Guide



Order No. DHW-058

First Edition
October 1990

**CONVEX
Digital Audio
Tape Drive
Service Guide**

Order No. DHW-058

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Digital Audio
Tape Drive
Service Guide**

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FCC Notice

Warning

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in strict accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Do not connect external equipment to the utility outlets in CONVEX equipment cabinets. Unauthorized connection voids all agencies' emissions certification.

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How To Use This Guide

Purpose and audience

The *CONVEX Digital Audio Tape Service Guide* provides a general overview of the Digital Audio Tape (DAT) drive and related hardware and how to:

- Install the DAT drive, DAT chassis, and related hardware
- Integrate the DAT drive into the CONVEX Operating System (ConvexOS)
- Test the DAT drive and related hardware
- Perform preventive maintenance on the DAT drive
- Remove and replace the DAT drive and related hardware

Primary Audience

This document is intended for:

- CONVEX customer support engineers and CONVEX manufacturing personnel
- CONVEX customers who need to install and maintain their own DAT drive subsystem and related hardware

Scope

The information presented in this service guide applies exclusively to the DAT drive subsystem and related hardware. The DAT drive subsystem can be used with all CONVEX computers that have a VMEbus chassis with a SCSI host adapter installed and have ConvexOS V8.1 or later installed.

Organization

This document consists of the following sections:

- **Chapter 1, Description and Specifications**—Describes the DAT drive, DAT drive subsystem, and related hardware at the block-diagram level. Defines and lists the electromechanical and environmental specifications.
- **Chapter 2, Unpacking and Installation**—Provides guidelines on how to unpack and install the DAT drive, DAT chassis, and related hardware.
- **Chapter 3, Integration and Test**—Explains how to integrate the DAT drive subsystem into the ConvexOS operating system. Explains how to test the DAT drive subsystem and related hardware.
- **Chapter 4, Maintenance Procedures and IPB**—Provides removal and replacement instructions for the DAT drive, DAT chassis, and related hardware.
- **Appendix A, Archive DAT Drive Configurator**—Contains a copy of the *Archive DAT drive configurator* document.
- **Reporting Problems**—Provides an example of the CONVEX *contact* utility for reporting minor software and hardware problems.

Notational conventions

Notational conventions are those systems of characters, symbols, terminology, or abbreviated expressions used to express technical facts or quantities as established by this guide. The following notational conventions are used in this document:

- **Boldface** indicates user-entered information for a computer program and should be entered exactly as they appear.
- *Italic* is used for emphasis and also designates file names, program names, directory paths, release tape titles, and titles of publications.
- All CONVEX illustrations have an illustration file number at the bottom right-hand corner that is for CONVEX use only.

Warnings

The following are examples of warnings and their typical content and locations as used in CONVEX documents:

Warning

A warning highlights procedures or information necessary to avoid injury to personnel. The warning immediately precedes the critical information and includes a description of the hazard.

Cautions

The following are examples of cautions and their typical content and location as used in CONVEX documents:

Caution

A caution highlights procedures or information necessary to avoid damage to equipment, damage to software, loss of data, or that leads to invalid test results. The caution immediately precedes the critical information and includes a description of the possible damage.

Notes

The following is an example of a note and its typical content and location as used in CONVEX documents:

Note

A note highlights information of a supplemental nature. The note immediately precedes or follows the highlighted information.

Associated documents

The following is a partial list of other manuals or books that may provide more detailed information on the topics presented in this manual:

- *CONVEX Archive DAT drive configurator* (CONVEX part number 207-000017-600)
- *CONVEX Processor Operation Guide (C100 Series, C200 Series)* DHW-15
- *CONVEX System Manager's Guide* DSW-004
- *CONVEX SCSI Host Adapter Service Guide* DHW-060
- *CONVEX DAT/3480 Tape Subsystem Test Manual* (CONVEX part number 081-009930-000)
- *Archive Python DDS DAT Tape Drive Product Description Manual* (CONVEX part number 900-000601-001)

Ordering documents

To order the current edition of this or any other CONVEX document, send requests to:

CONVEX Computer Corporation
Customer Service
PO Box 833851
Richardson TX 75083-3851 USA

Include the order number with the request. The order number is on the title page of the manual and begins with the letters "DHW."

Technical assistance

Hardware, software, and documentation support can be obtained through the CONVEX Technical Assistance Center (TAC):

- From all locations in the continental United States, call 1(800)952-0379.
- From locations in Alaska, Hawaii, and Canada, call 1(214)497-4379.
- From all other locations, contact the nearest CONVEX office.

Acknowledgments

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Review team: Ray Anderson, Brian Bianchi, Rob Carruthers, Jim Day, Harold Hinson, Harold Lewis, Chris Magargee, Paul Marshall, Don May, Kris Meier, Dave Muir, Larry Price, Chip Stroup

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Without the efforts of all the aforementioned, this document would not have been possible.

Bill Benson
I/O Documentation

Description and Specifications

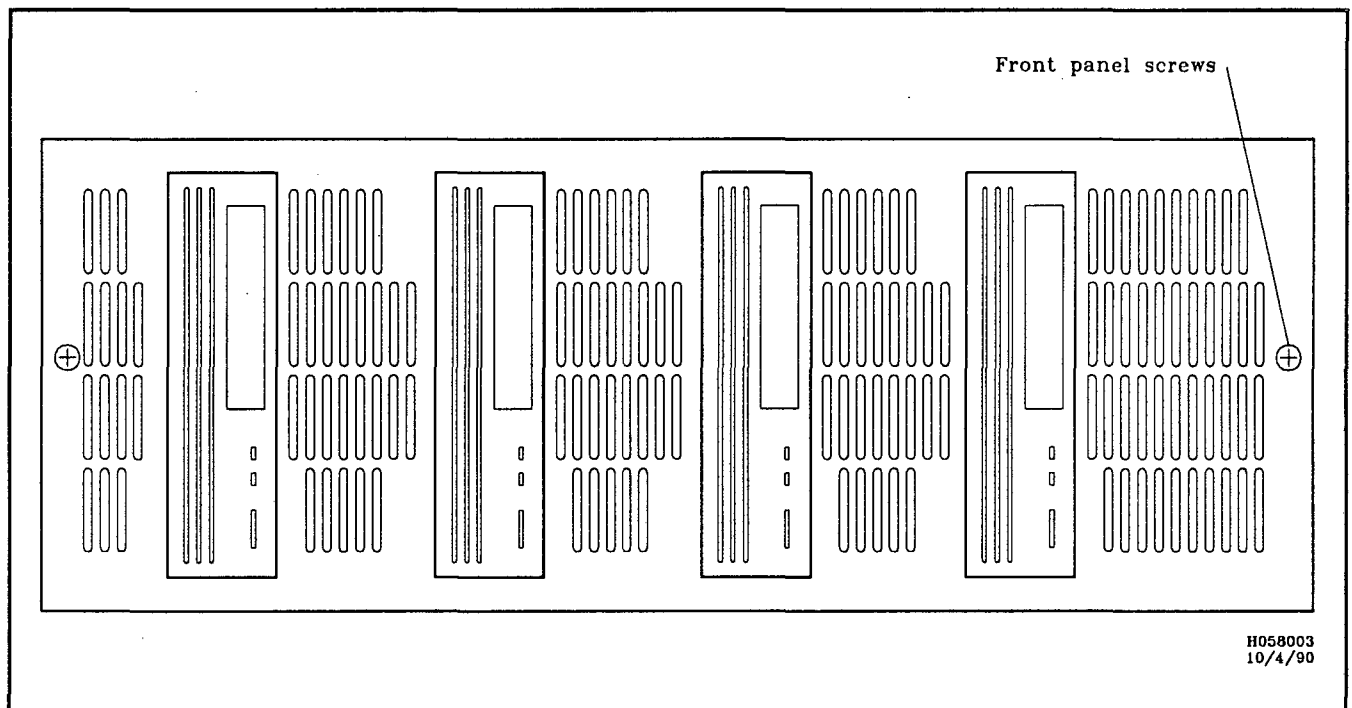
1

1.1 Overview

The CONVEX Digital Audio Tape (DAT) drive system is a high-capacity tape back-up system using a 4-mm tape width. The DAT drive can record up to 1.3 Gbytes of information on a 3 inch x 2 inch x .5 inch DAT cassette. The CONVEX DAT drive system has the following features:

- Sustained data rate of 183 Kbytes/second
- Recording density of 61,000 bits per inch
- Areal density of 114 Mbytes per square inch
- ANSI Digital Data Storage (DDS) recording format
- Helical scan recording
- Average access time of less than 20 seconds

Figure 1-1 DAT chassis with four drives (front view)

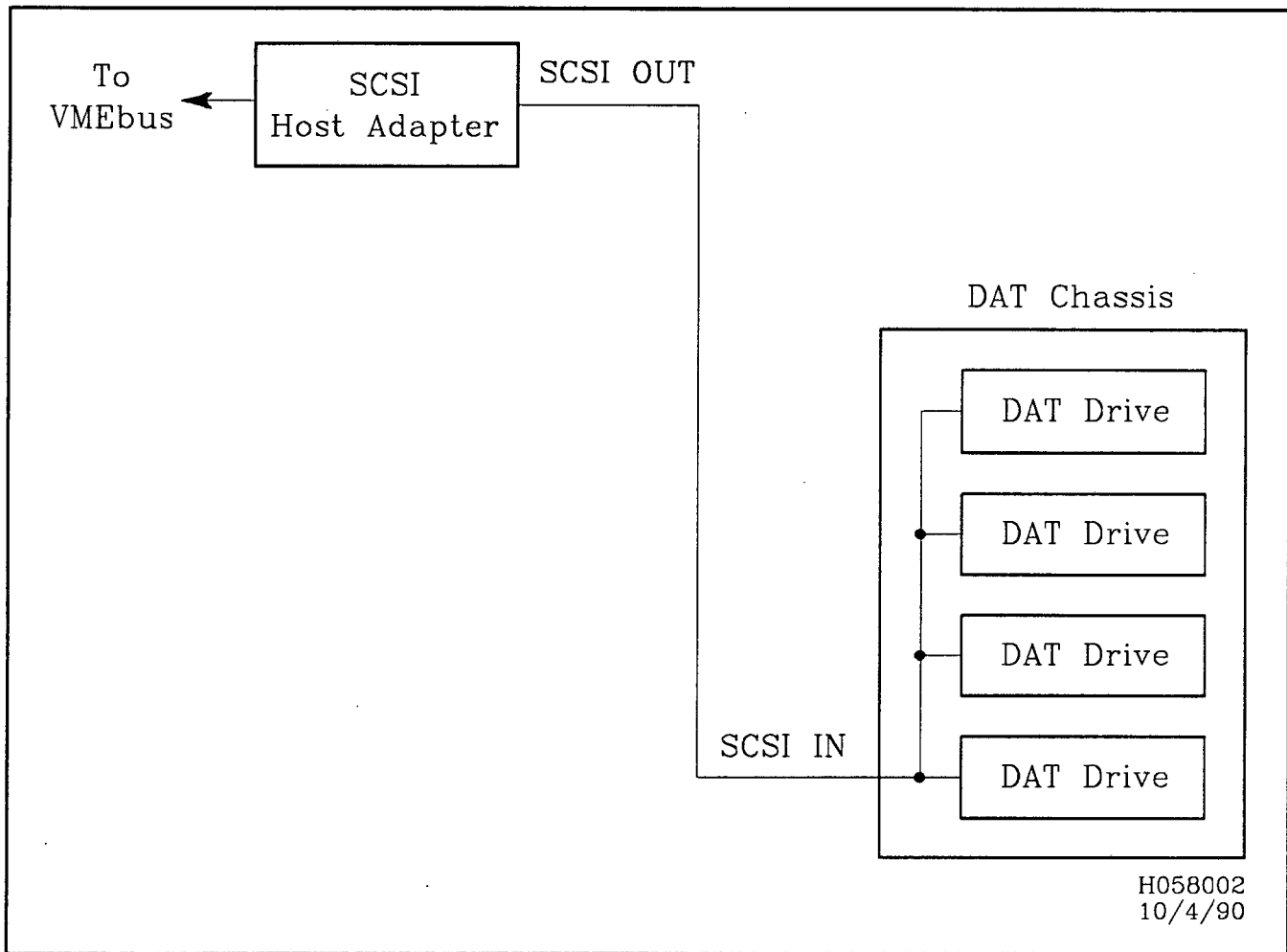


Note

Refer to the *Archive Python DDS DAT Tape Drive Product Description Manual* for more information on the DAT drive.

A Small Computer Systems Interface (SCSI) host adapter installed in a VMEbus chassis is connected with a single cable to the DAT chassis. An internal daisy-chain cable connects one to four DAT drive together within a DAT chassis to form a DAT subsystem. See Figure 1-2.

Figure 1-2 DAT subsystem block diagram



1.2 DAT drive specifications

This section gives the operational specifications for the DAT drive system. See Table 1-1 and Table 1-2.

Table 1-1 Single DAT drive specifications

Parameter	Value/Comment
Width	5.7 in (146 mm)
Height	1.6 in (41 mm)
Depth	8.0 in (203 mm)
Weight	2.5 lbs (1.2 kg)
Voltage range Domestic International	.3 amps@120VAC ±10% .2 amps@240VAC ±10%
Temperature range Operating Nonoperating	+41° F to +113° F (+5° C to +45° C) -104° F to +149° F (-40° C to +65° C)
Temperature change	≤ 3.6° F/min (2.0° C/min)
Humidity range Operating Nonoperating	20% to 80% noncondensing 0% to 90% noncondensing
Wet bulb	79° F (26° C)
Altitude (operating)	-300 ft to +15,000 ft (-100 m to +4,575 m)

Table 1-2 DAT chassis specification (four drives)

Parameter	Value/Comment
Width	19.0 in (48.26 cm)
Height	7.0 in (17.78 cm)
Depth	17.5 in (44.45 cm)
Weight	Chassis with 1 drive 19.5 lbs (8.85 kg) Add 5.5 lbs (2.49 kg) for each add-on drive with power supply
Voltage range Domestic International	1.25 amps@85VAC in chassis with 4 drives 1.25 amps@85VAC in chassis with 4 drives
Temperature range Operating Nonoperating	+41° F to +113° F (+5° C to +45° C) -104° F to +149° F (-40° C to +65° C)
Temperature change	≤ 3.6° F/min (2.0° C/min)
Humidity range Operating Nonoperating	20% to 80% noncondensing 0% to 90% noncondensing
Wet bulb	79° F (26° C)
Altitude (operating)	-300 ft to +15,000 ft (-100 m to +4,575 m)

2.1 Overview

This chapter discusses unpacking and inspection, identifies major components of the DAT system assembly, and provides installation procedures.

2.2 Unpacking and inspection

This section gives general guidelines for unpacking and inspecting the DAT drives and related hardware. Also, this section gives safety and equipment damage precaution information.

2.2.1 Electrostatic discharge damage

Typically, Electrostatic Discharge (ESD) damage occurs to electronic circuit boards during handling. Static charges take place when various objects are separated or rubbed together, often creating a high-voltage charge. If a high-voltage charge is discharged into electronic computer circuits, the charge damages the electronic components. The main factors that determine a voltage level charge are:

- Types of materials
- Relative humidity
- Rate of change or separation

Table 2-1 lists an approximation of ESD levels based on various personnel activities and humidity levels:

Table 2-1 Static charge levels and relative humidity

Personnel Activity ¹	Humidity ² & Charge Levels (Volts ³)			
	26%	32%	40%	50%
Person walking across linoleum floor	6,150V	5,750V	4,625V	3,700V
Person walking across carpet	18,450V	17,250V	13,875V	11,100V
Person getting up from a plastic chair	24,600V	23,000V,	18,500V	14,800V

¹Source: B. A. Unger, *Electrostatic Discharge Failures of Semiconductor Devices* (Bell Laboratories, 1981).

²A high rate of air flow produces higher static charges than a low air-flow rate, for the same relative humidity level.

³Some data in this table has been extrapolated.

2.2.2 Inspection for damage

All shipping containers have been specially designed to protect their contents under normal shipping conditions. Carefully inspect each carton for signs of shipping damages as it is unpacked. If damage is found after visual inspection, document the damage with photographs and contact the transport carrier immediately.

2.2.3 Unpacking

The customer's bill of material lists all equipment shipped from CONVEX. It should be used as a checklist to ensure that all equipment has arrived.

The procedure for unpacking the shipping container is:

1. Unpack each item of equipment from its shipping container.
2. Inspect each item of equipment for any sign of shipping damage as it is unpacked.
3. If equipment damage is found, document and proceed to the next section.

Note

Save all packing material until after operational checkout of the equipment. This enables equipment to be returned safely to CONVEX, if required.

2.2.4 Damage claims

If the DAT drives or related hardware is damaged, a damage claim must be completed. Damage claims should be completed by the customer and given to the shipping representative. Claim forms are normally obtained from the shipping representative.

2.3 Preinstallation

This section gives steps to be done before installing the DAT system into an existing expansion cabinet or a DAT drive into an existing DAT chassis.

Caution

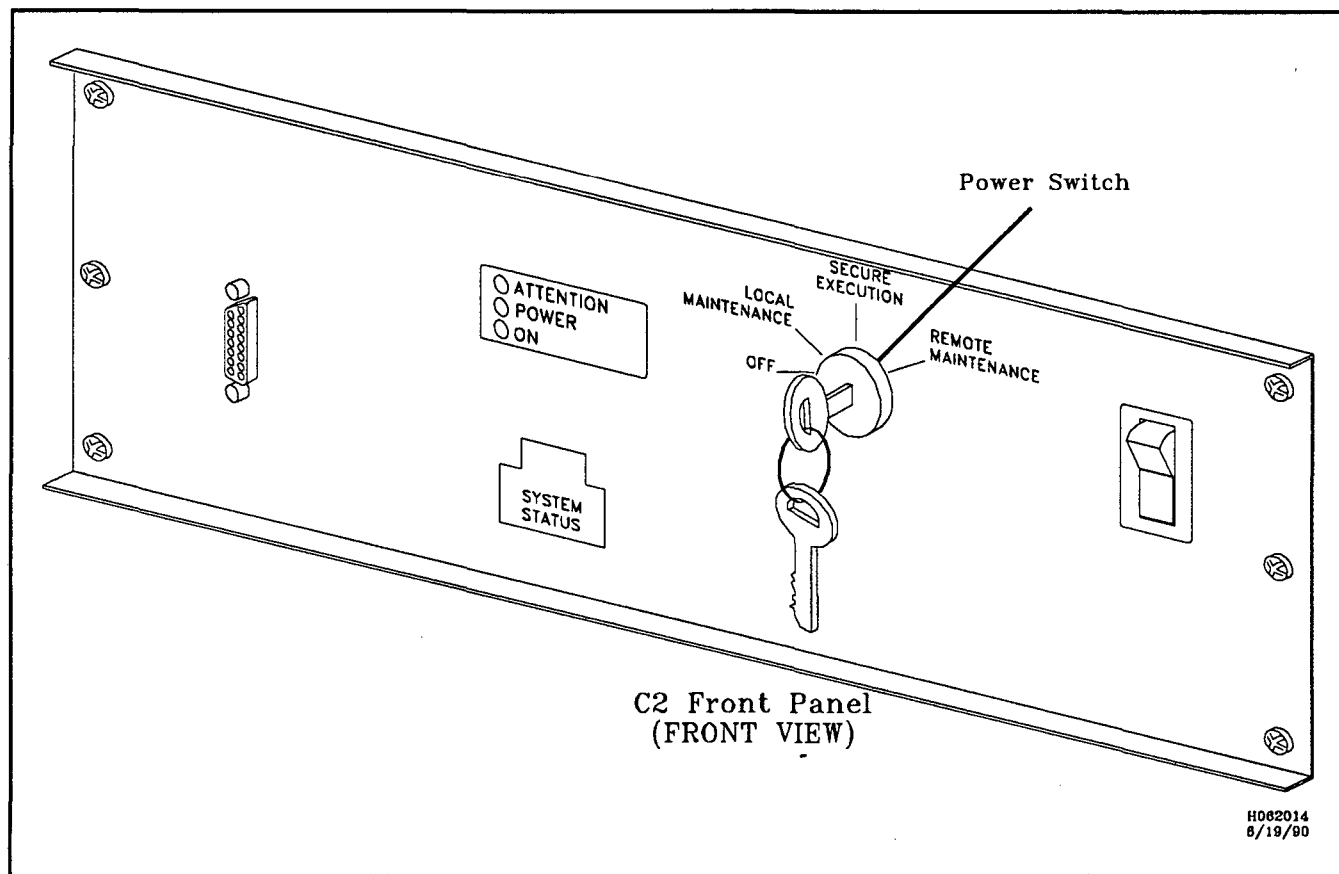
Shut down the system before removing power to the existing expansion cabinet. Failure to do so will cause a system crash and possible loss of data. Refer to the *CONVEX Processor Operation Guide (C100 Series, C200 Series)* for power-down procedures on a CONVEX supercomputer.

Note

The maximum length for the SCSI host adapter cable to the DAT chassis is approximately 75 ft (24 m).

1. Turn the processor's front panel key switch to the OFF position. See Figure 2-1.

Figure 2-1 Front panel power switch

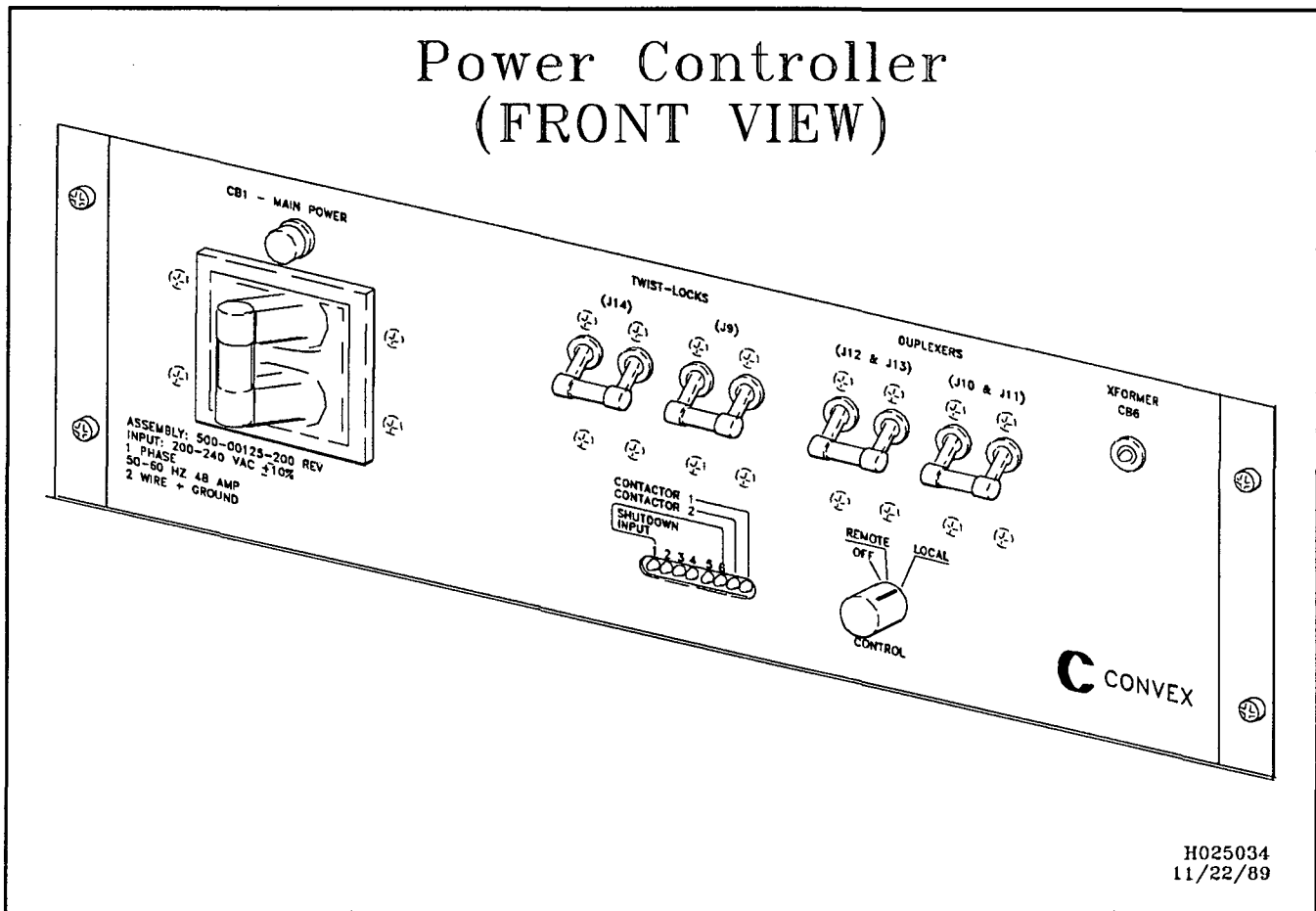


Caution

Remove power to the expansion cabinet before installing or removing equipment. Failure to do so will damage electronic equipment components.

2. Remove power to the expansion cabinet.
 - To remove power from a CONVEX EXP-101 or EXP-102 expansion cabinet, disconnect the cabinet's AC power cord.
 - To remove power from a CONVEX EXP-105 high-performance expansion cabinet, set the main power control switch to the OFF position. See Figure 2-2.

Figure 2-2 EXP-105 power controller

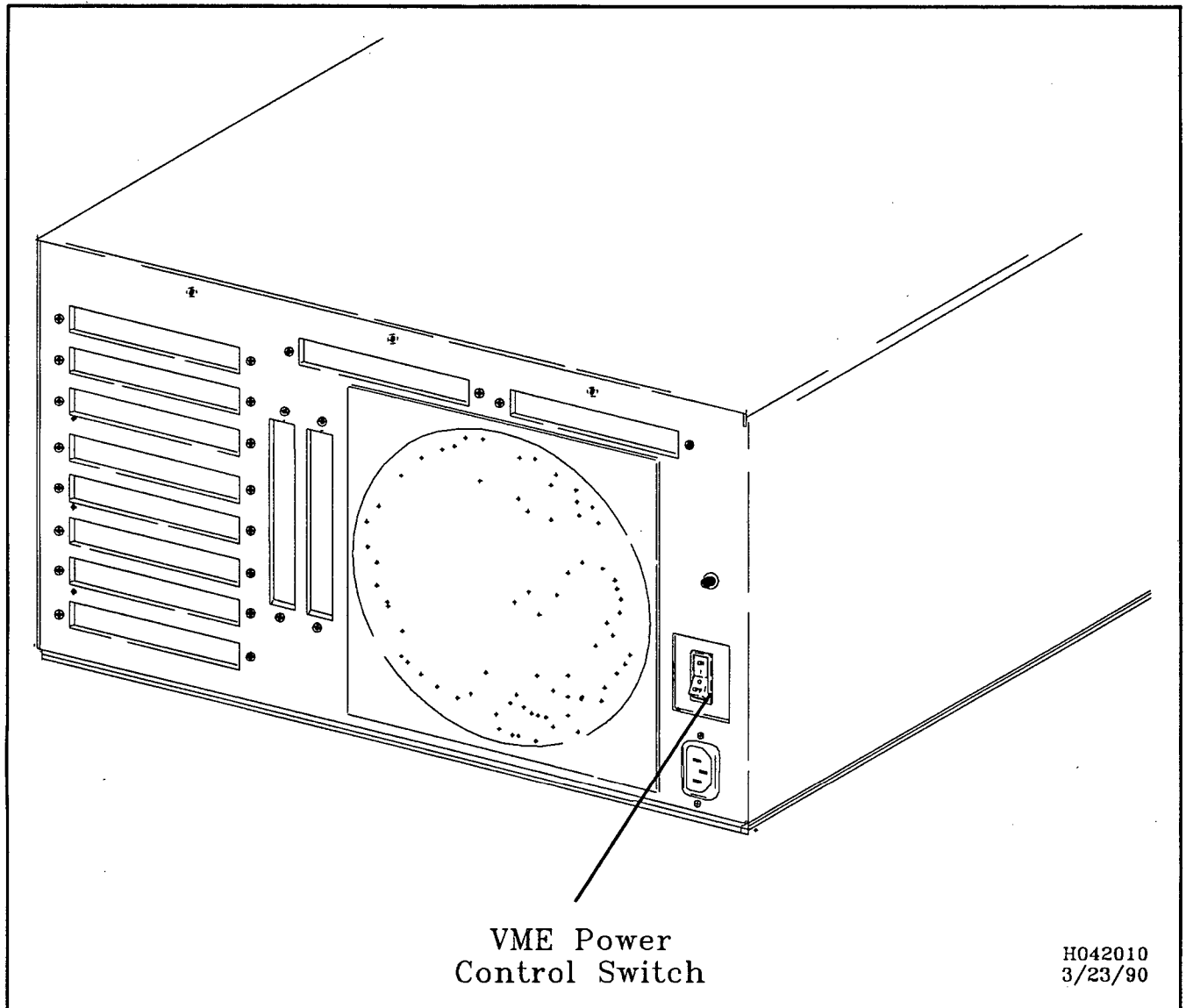


Warning

Expansion cabinet stabilizer bars *must* be extended before installing a DAT chassis or before extending the DAT chassis assembly from its expansion cabinet for service. Failure to do so will make the expansion cabinet unstable, increase the possibility of it falling forward, can cause injury to personnel, and will cause damage to equipment.

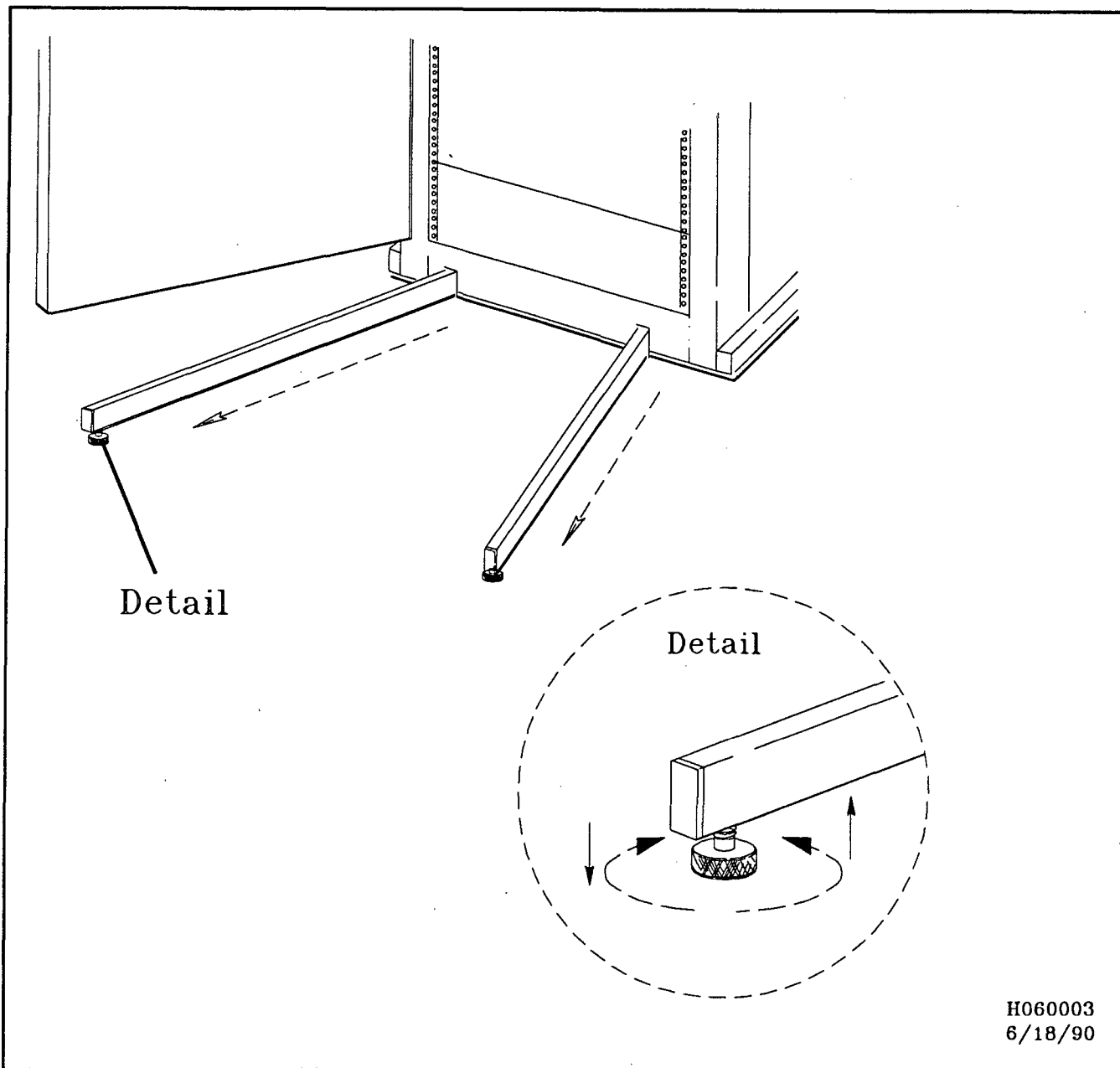
3. Set the VMEbus chassis power control switch to the OFF position. See Figure 2-3.

Figure 2-3 VMEbus chassis power control switch



4. Extend the expansion cabinet stabilizer bars and adjust the feet until they are in firm contact with the floor. See Figure 2-4.

Figure 2-4 Expansion Cabinet Stabilizer Bars



2.4 Installing a chassis into an expansion cabinet

The following sections give procedures for installing a DAT system into an existing CONVEX expansion cabinet.

2.4.1 Expansion cabinet configuration requirements

The CONVEX DAT system can be installed in any CONVEX expansion cabinet. The DAT chassis should be installed in the upper third of the expansion cabinet.

2.4.2 Installing a DAT Chassis

This section gives the procedure for installing a DAT chassis into a expansion cabinet.

1. Do the preinstallation steps listed in Section 2.3.

Notes

Refer to the *CONVEX SCSI Host Adapter Service Guide* for more information on installing the SCSI host adapter.

The maximum cable length allowed between the SCSI host adapter and the DAT chassis is approximately 75 ft (24 m).

2. Install the SCSI host adapter in the VMEbus chassis.

Note

The recommended position for the DAT chassis is in the upper third of the expansion cabinet.

3. Select a position 7.0 inches in height in the expansion cabinet and remove the blank panels to open the space for the chassis installation.
4. Install the left and right chassis rails in the selected position in the expansion cabinet making sure the rails are level front to back and level side to side.
5. Unlock the 2 captive screws holding the front panel to the DAT chassis. See Figure 1-1.
6. Carefully place the DAT chassis in the rails and slide into the expansion cabinet.
7. Install the 4 screws that hold the DAT chassis to the front RETMA rails in the expansion cabinet.

Caution

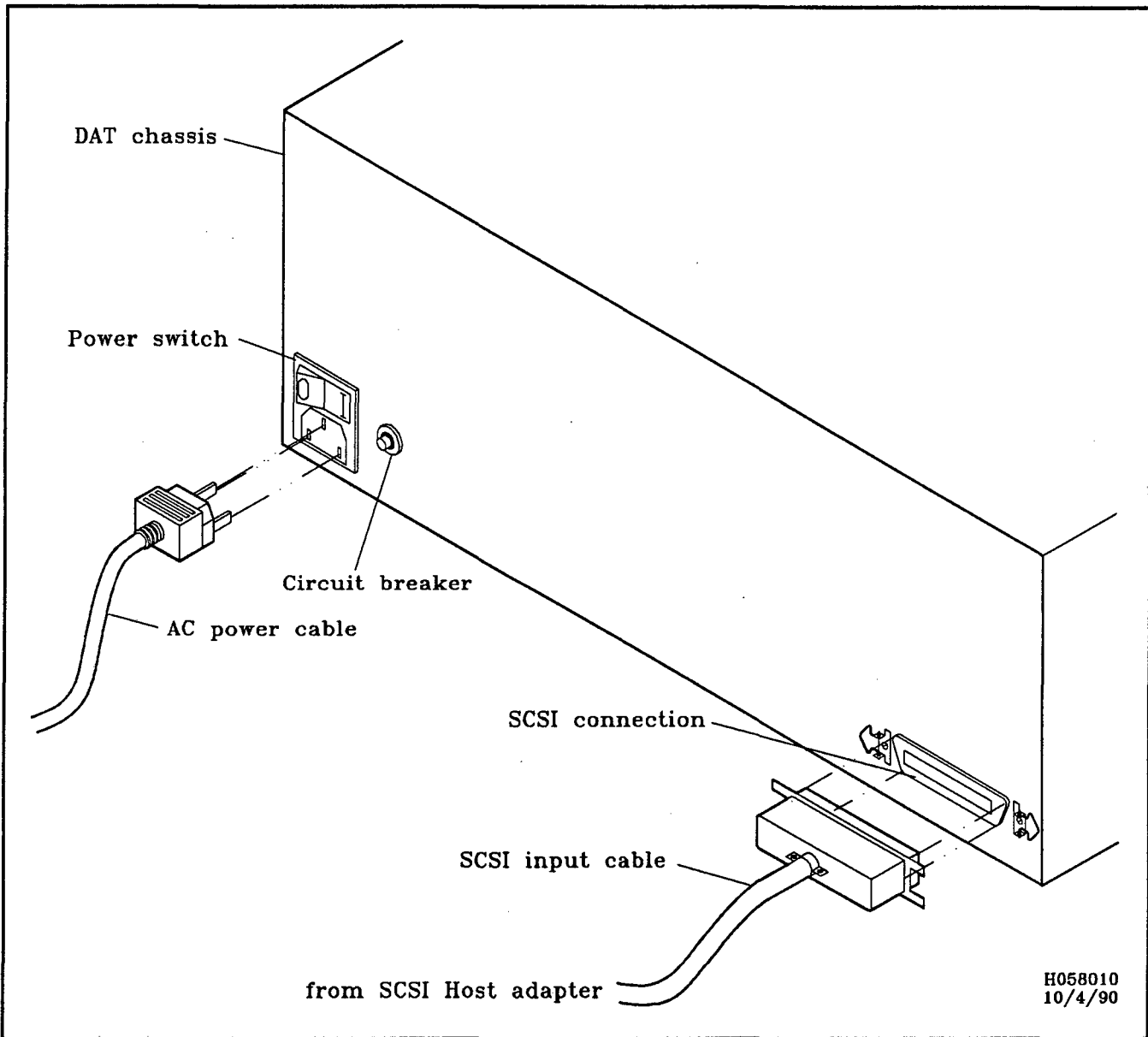
Power *must* be removed from the VMEbus chassis before connecting the SCSI host adapter to the DAT chassis. Failure to do so will cause damage to equipment.

Note

Refer to the *CONVEX SCSI Host Adapter Service Guide* for more information on installing and cabling the SCSI host adapter.

8. Connect the cable from the SCSI host adapter to the connector on the rear of the DAT chassis. See Figure 2-5.

Figure 2-5 DAT chassis SCSI cable connection



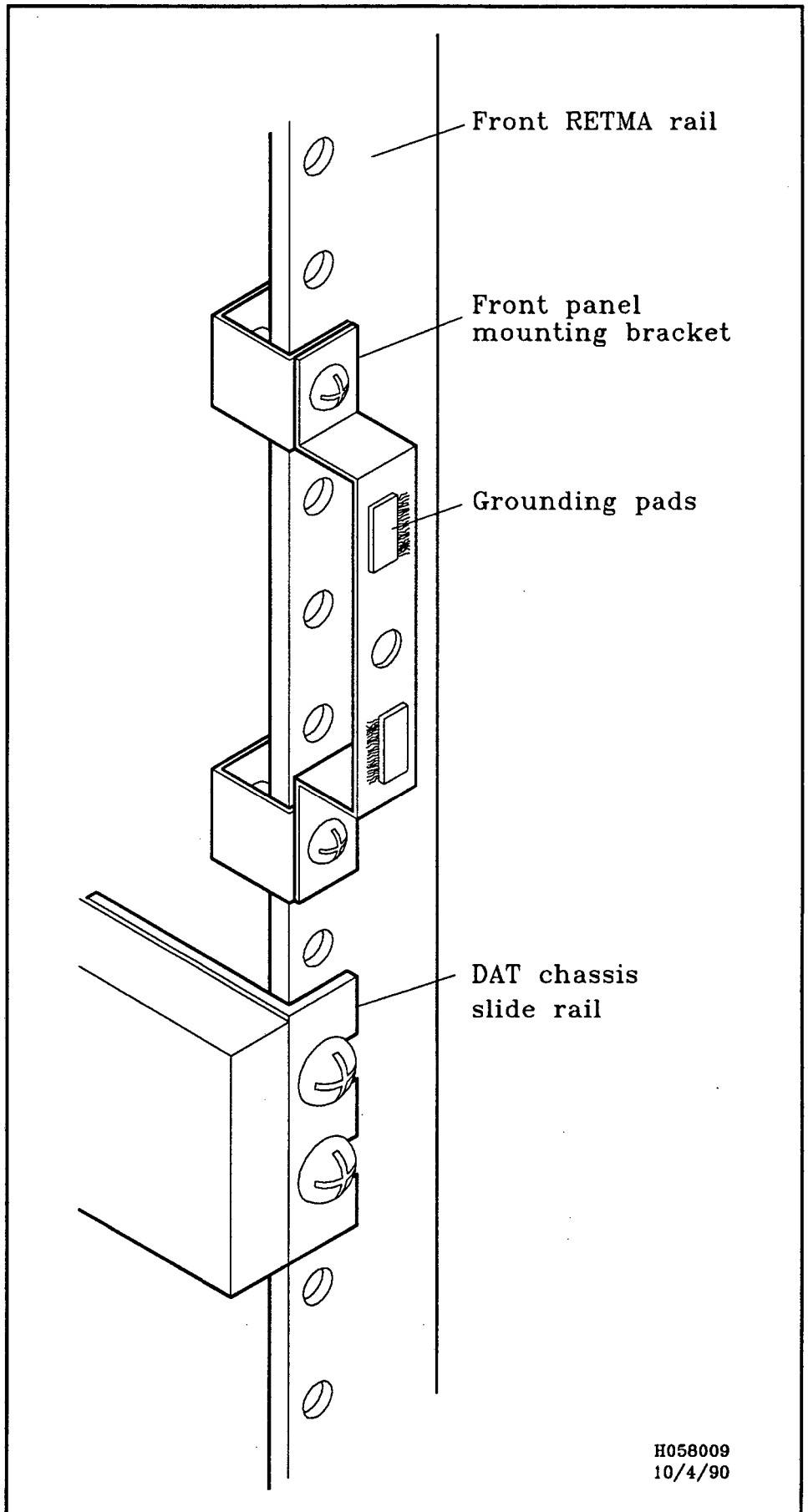
9. Connect the AC power cable to the rear of the DAT chassis.

Caution

Ensure that the grounding pads are firmly attached to the front panel mounting brackets. Failure to do so may cause ESD damage to components within the DAT chassis.

10. Attach the grounding pads, 2 per bracket, to the front panel mounting brackets. See Figure 2-6.

Figure 2-6 Front panel mounting bracket



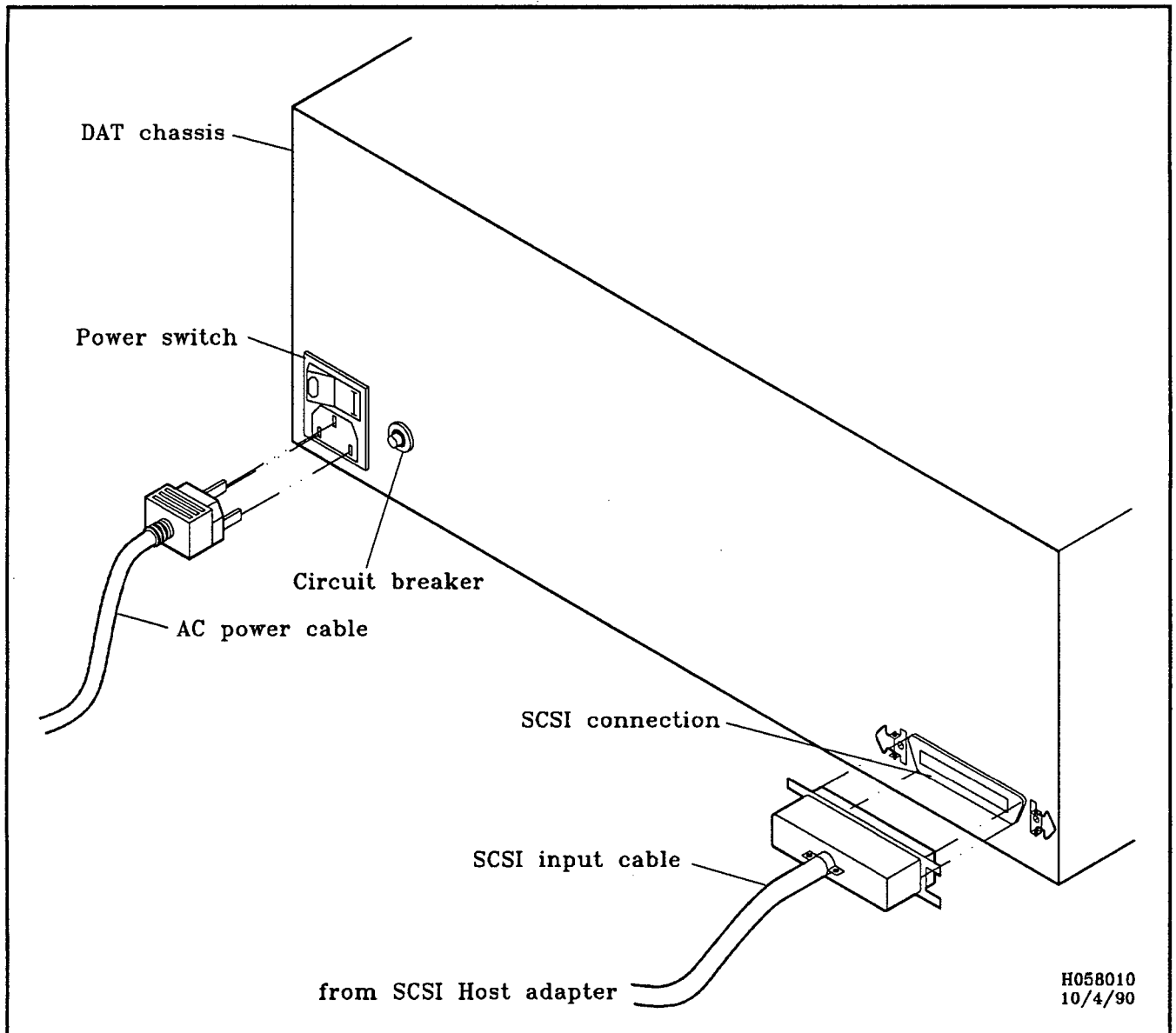
11. Install the 2 front panel mounting brackets on the first 4 holes in the front RETMA rail above the DAT chassis with the screws provided.
12. Set the DAT chassis power switch to the ON position.
13. Position the front panel on the DAT chassis and secure the 2 captive screws.
14. Do the postinstallation steps listed in Section 2.6.

2.5 Installing a drive into a DAT chassis

This section discusses the installation of a DAT drive and power supply into an existing DAT chassis.

1. Do the preinstallation steps listed in Section 2.3.
2. Set the DAT chassis power switch to the OFF position. See Figure 2-7.

Figure 2-7 DAT chassis power switch



Caution

Power *must* be removed from the VMEbus chassis before connecting the SCSI host adapter to the DAT chassis. Failure to do so will cause damage to equipment.

3. Disconnect the cable from the SCSI host adapter and the AC power cable from the rear of the DAT chassis. See Figure 2-7.
4. Unlock the 2 captive screws holding the front panel of the DAT chassis and remove the panel.
5. Remove the 4 screws holding the DAT chassis to the front RETMA rails of the expansion cabinet.
6. Pull the DAT chassis out of the expansion cabinet until the side rails lock into place.
7. Remove the 14 screws that hold the top panel of the DAT chassis and remove the panel.
8. Remove, if present, all of the internal terminators from the DAT drive. See Figure 2-8.

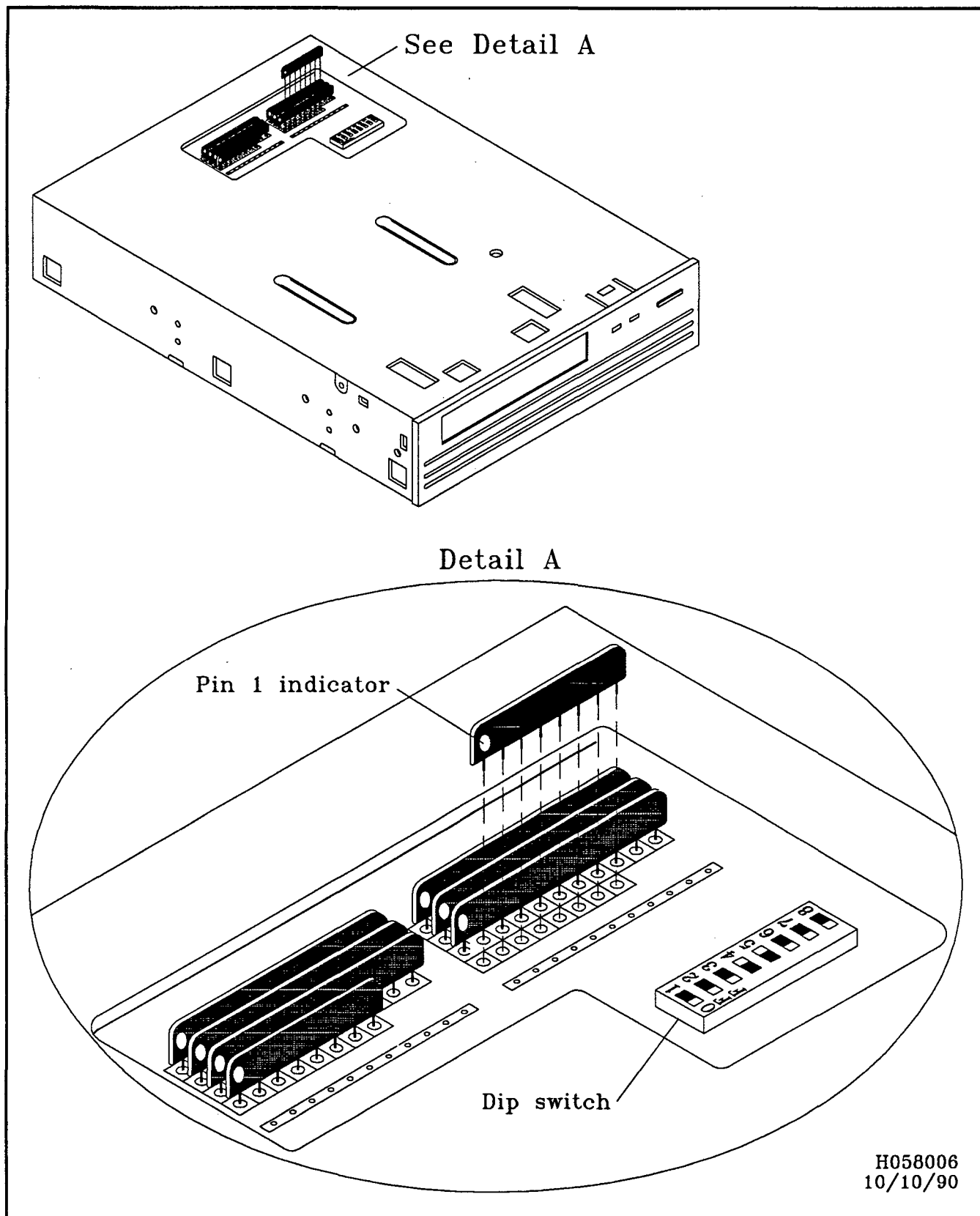
Note

The DAT chassis internal SCSI cable (See Figure 4-11) is terminated. This termination will be in one of two different versions.

Version 1: Early production versions of the internal SCSI cable will have a removable terminator on the fourth SCSI connector on the cable.

Version 2: Standard production versions of the internal SCSI cable will have a permanent terminator attached a few inches beyond the fourth SCSI connector on the cable. See Figure 4-11.

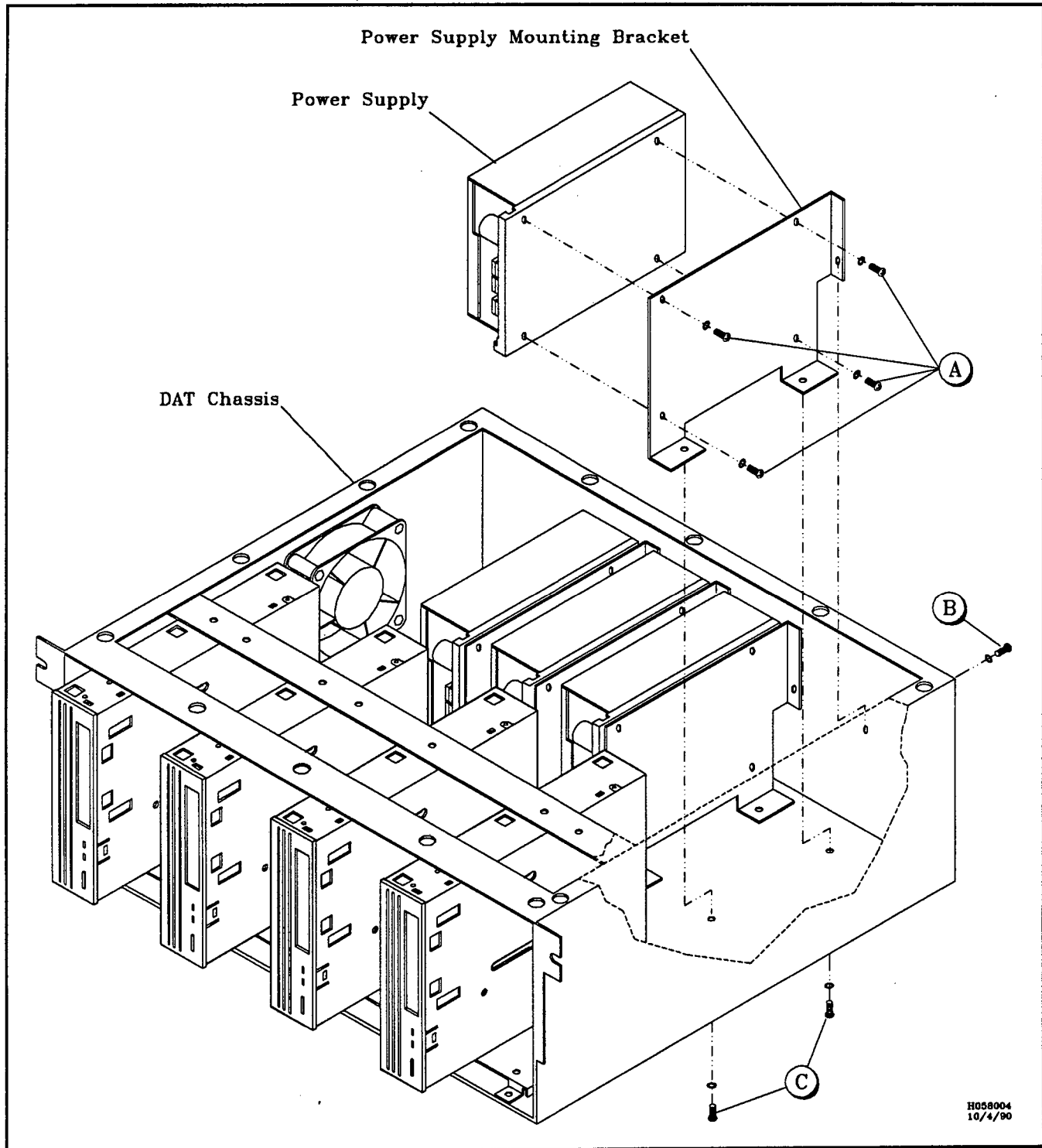
Figure 2-8 DAT drive terminators



9. Select the position the tape drive will occupy.
10. Remove the tape drive power cable from the plastic cable clamp at the bottom of the DAT chassis.

11. Connect the tape drive power cable to the power supply.
12. Position the power supply in the DAT chassis. See Figure 2-9.

Figure 2-9 DAT drive power supply



13. Install the screw (B in Figure 2-9) that holds the power supply to the rear of the DAT chassis.
14. Install the 2 screws (C in Figure 2-9) that hold the power supply to the bottom of the DAT chassis.
15. Connect the input power cable to the power supply.

16. Check and, if necessary, change the SCSI address, the parity enable, and the self-test enable switch settings selected on the tape drive. Refer to Table 2-2 for the dip switch settings. See Figure 2-8 for the location of the dip switch.

Table 2-2 Dip switch settings with SCSI address

SCSI device address	S1	S2	S3	S4	S5	S6	S7	S8
	SCSI ID	SCSI ID	SCSI ID	SCSI-1 or SCSI-2 ¹	Parity enable ²	Reserved	Reserved	Self-test enable ³
0	OFF	OFF	OFF	ON	ON ⁴	OFF	OFF	ON ⁴
1	ON	OFF	OFF	ON	ON	OFF	OFF	ON
2	OFF	ON	OFF	ON	ON	OFF	OFF	ON
3	ON	ON	OFF	ON	ON	OFF	OFF	ON

¹ OFF = SCSI-1; ON = SCSI-2

² OFF = Parity disabled; ON = Parity enabled

³ OFF = Self-test disabled; ON = Self-test enabled

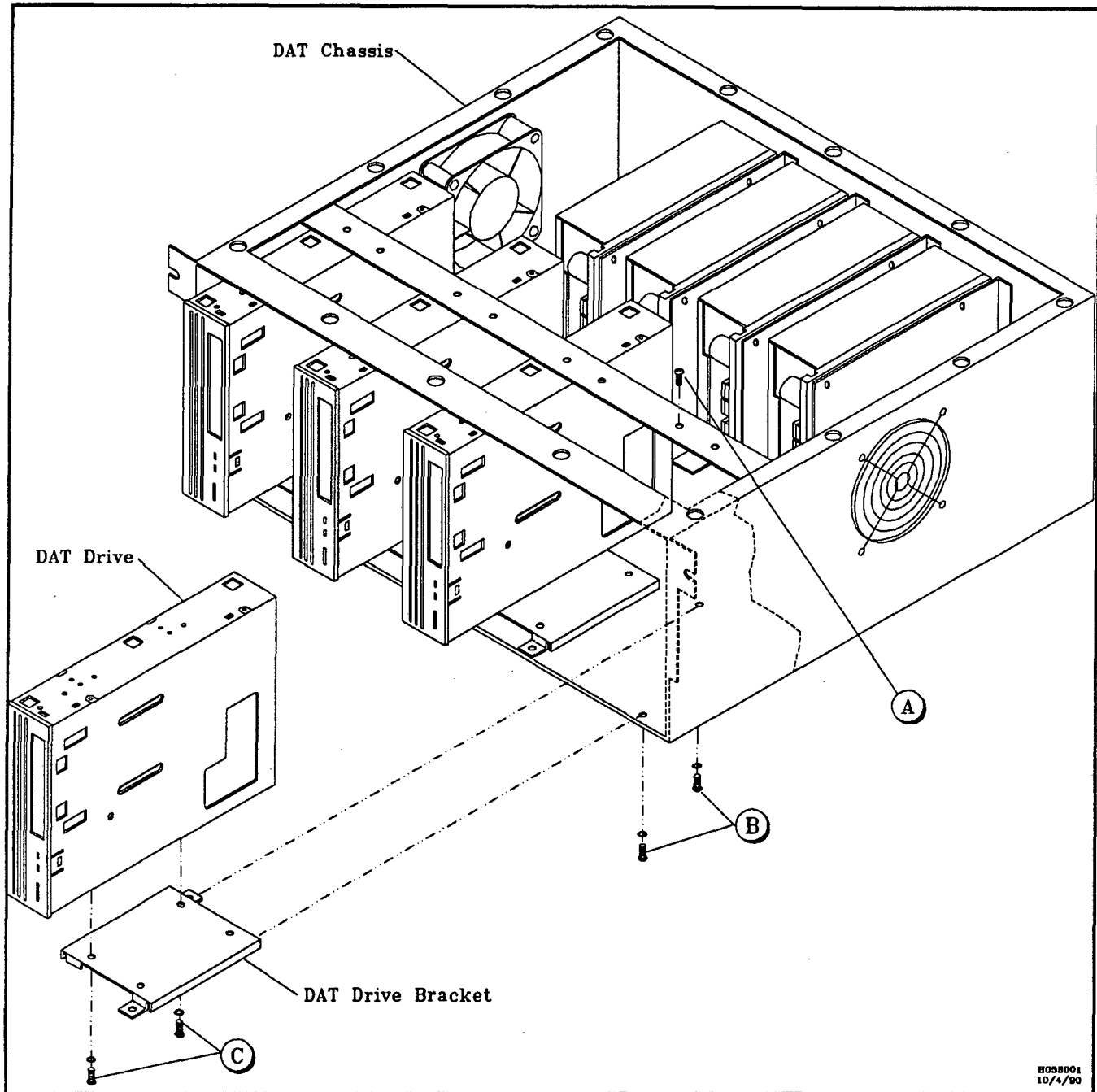
⁴ These switches may not be set correctly on a replacement or add-on DAT drive.

Note

Refer to the *Archive Python DDS DAT Tape Drive Product Description Manual* for procedures on selecting and setting the SCSI address on the DAT drive.

17. Position the tape bracket on the DAT drive and install the 2 screws that hold the bracket to the drive. See Figure 2-10.

Figure 2-10 DAT drive position in DAT chassis



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18. Position the DAT drive in the selected slot of the DAT chassis.
19. Install the 2 screws (B in Figure 2-10) that hold the DAT drive to the bottom of the DAT chassis.
20. Install the screw (A in Figure 2-10) that holds the DAT drive to the top of the DAT chassis.
21. Connect the SCSI ribbon cable to the back of the DAT drive.
22. Connect the power cable, from the power supply, to the back of the DAT drive.
23. Position the top panel on the DAT chassis and secure the 14 captive screws.
24. Slide the DAT chassis back to its retracted position.
25. Remove the block from the selected slot in the DAT chassis front panel.
26. Remove appropriate insert from front panel.

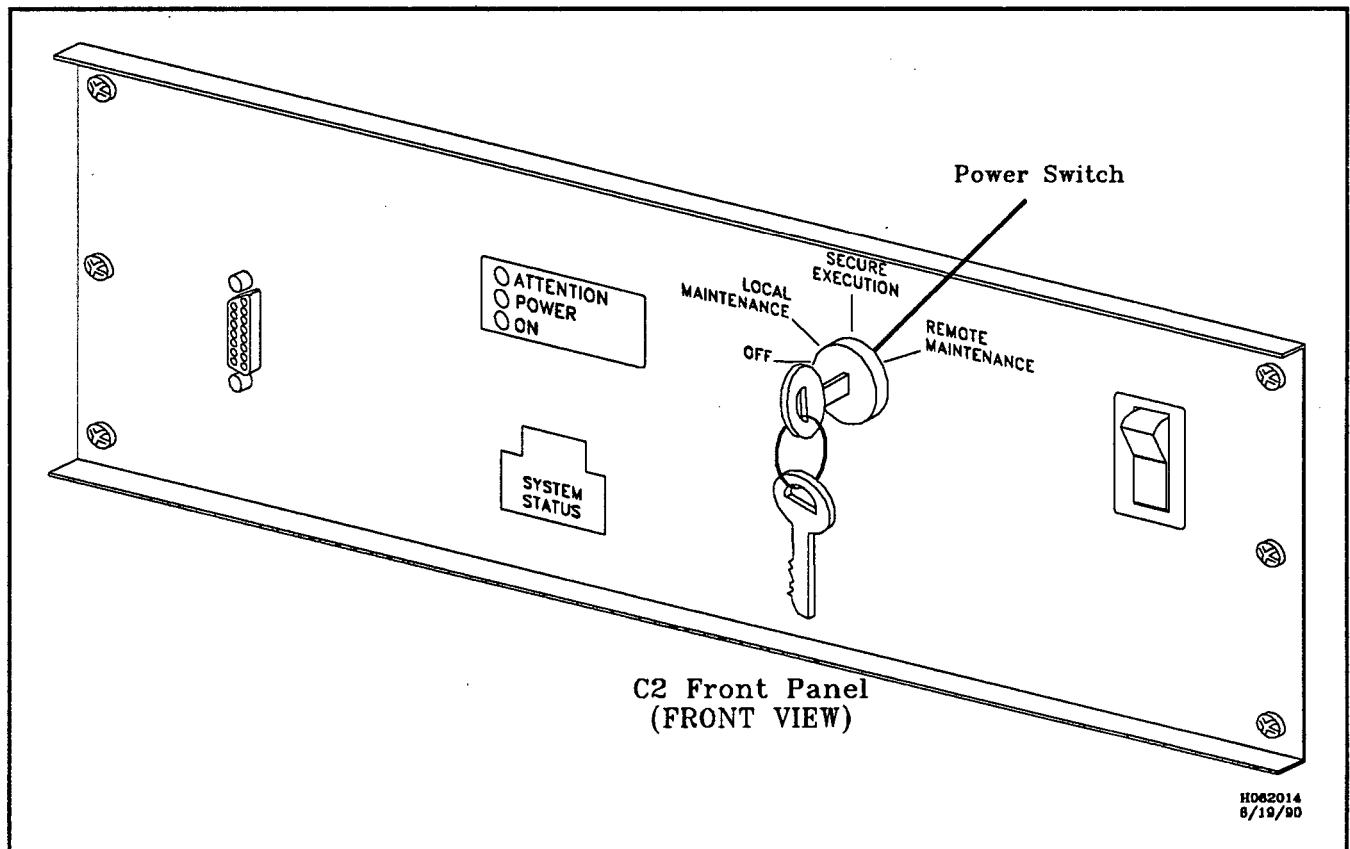
27. Position the front panel on the DAT chassis and secure the 2 captive screws. See Figure 1-1.
28. Do the postinstallation steps listed in Section 2.6.

2.6 Postinstallation

This section gives steps to be done after a DAT system installation:

1. Return the expansion cabinet stabilizer bars to their retracted position. See Figure 2-4.
2. Return power to the VMEbus chassis. See Figure 2-3.
3. Return power to the expansion cabinet.
 - To return power to a CONVEX EXP-101 or EXP-102 expansion cabinet, connect the AC power cord to the site source.
 - To return power to a CONVEX EXP-105 high-performance expansion cabinet, set the main power control switch to the ON position.
4. Turn the processor's front panel key switch to the ON position. See Figure 2-11.

Figure 2-11 Front panel power switch



3.1 Overview

The CONVEX Digital Audio Tape (DAT) drive system must be integrated into the CONVEX Operating System (ConvexOS) before it can be used. This chapter contains guidelines for integrating a DAT drive into ConvexOS as well as information on the CONVEX diagnostic tests for the DAT drive system.

Notes

ConvexOS V8.1 or greater is required to operate a CONVEX DAT drive system.

ConvexOS V8.1 and V9.0 require a system generation of the software drivers when a SCSI host adapter and DAT drive system are installed.

Versions of ConvexOS later than V9.0 contain all the software drivers needed for the SCSI host adapter. This means a system generation is not required when a SCSI host adapter and DAT drive system are installed.

3.2 Software integration

The software for the CONVEX DAT drive system is released separately from ConvexOS and utilities. Refer to the *ConvexOS System Manager's Guide* for additional software integration information. That document includes a complete description of the software integration procedures for DAT drive system software.

System-level hardware is identified to ConvexOS via a configuration file (*/ioconfig*) located on the Service Processor Unit (SPU) disk. The */ioconfig* file describes, in hierarchical fashion, the connections between VIOPs, VMEbus chassis number, controller type, Control and Status Register (csr) address, interrupt number, and peripheral device type. The device codes for the DAT drive system are listed below:

- MTC-202—SCSI host adapter
- MTD-208—DAT drive system

The marketing numbers for the DAT drive system are listed below:

- MTC-202—SCSI host adapter
- CTD-301—DAT chassis with 1 DAT drive and a SCSI host adapter
- CTD-201—an add-on DAT drive

Figure 3-1 shows a typical */ioconfig* file with DAT drive system and SCSI host adapter specific items in bold type:

Figure 3-1 Example */ioconfig* file

```
iop 3
  mbus 0
    ctrl DKC-001 csr 0x3f0 int 2
      unit 0 type DKD-005
    ctrl MTD-001 csr 0x0c0 int 4
      unit 0 type MTC-001
    ctrl ACM-001 csr 0x3c0 int 7
      unit 0 type TTY
      unit 1 type TTY
      unit 2 type TTY
      unit 3 type TTY
      unit 4 type TTY
viop 4
  vme 0
    ctrl LAN-202 csr 0x7740 int 3
      unit 0 type unet
  vme 1
    ctrl MTC-202 csr 0xee00 int 2
      unit 0 subunit 0 type MTD-208
      unit 1 subunit 0 type MTD-208
      unit 2 subunit 0 type MTD-208
      unit 3 subunit 0 type MTD-208
    ctrl DKC-203 csr 0x800 int 3
      unit 0 DKD-214
      unit 1 DKD-214
    ctrl DKC-203 csr 0xa00 int 4
      unit 0 DKD-214
      unit 1 DKD-214
```

Whenever DAT drives are added or removed, the information in the hardware section of the configuration file (*/ioconfig*) must be changed, otherwise system operation problems will occur. Refer to the *ConvexOS System Manager's Guide* when making these changes.

3.3 Testing the DAT drive

The CONVEX DAT tape system is tested by the *dev_vscsit* diagnostic program. This program verifies the operation of the DAT drive system. The *dev_vscsit* diagnostic program verifies the:

- Functional ability of the SCSI host adapter to operate in the CONVEX VMEbus I/O environment, including main memory access and interrupt generation and detection
- Ability of the host adapter to detect anomalous conditions on the SCSI bus
- Operational integrity of the cable interface between the DAT drive and the tape unit

The *dev_vscsit* diagnostic program is an offline program that must be executed on the SPU while the CPU is halted. The procedures for executing this test are beyond the scope of this manual. This information is contained in the *CONVEX DAT/3480 Tape Subsystem Test Manual*; consult that manual before running CONVEX diagnostics.

4.1 Overview

This chapter gives information on preventive maintenance, removal and replacement procedures, an Illustrated Parts Breakdown (IPB), and CONVEX part numbers for the CONVEX DAT system.

4.2 Preventive maintenance

This section gives information on the preventive maintenance schedules and procedures for the DAT drive.

4.2.1 DAT drive front panel LEDs

The front panel of the DAT drive contains two LEDs. The amber LED indicates the drive status. The green LED indicates the cassette status. See Figure 4-1 and Table 4-1.

Figure 4-1 DAT drive LED indicators

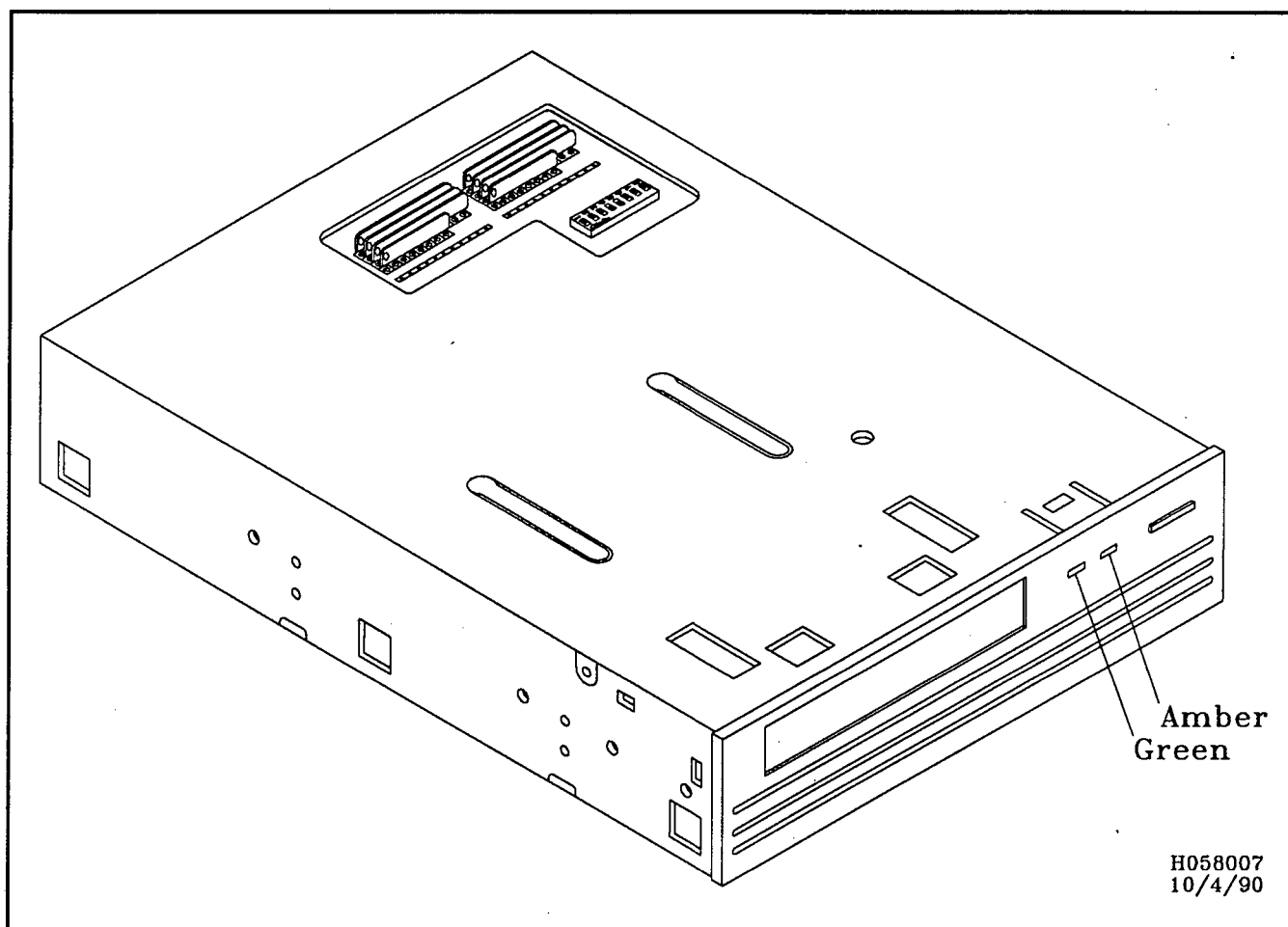


Table 4-1 DAT drive LED indicators

LED	Action	Description
Amber	On	The drive is active.
Amber	Blinking	Indicates a hardware fault has occurred or condensation was detected.
Green	On	A DAT cassette is inserted.
Green	Blinking slowly	A DAT cassette is inserted and generates excessive errors.
Green	Blinking slowly (with amber LED On)	A prerecorded audio cassette is inserted and being played automatically.
Green	Blinking rapidly	The drive could not write the tape correctly or the cleaning cassette being used has reached the end of its life.

4.2.2 Cleaning the DAT drive

Whenever the green LED blinks slowly, the DAT drive heads should be cleaned with the cleaning cassette. Normally, the green LED will begin to blink after every 50 hours of operations. Cleaning cassettes are shipped with each DAT chassis.

Notes

A blinking green LED may indicate a damaged DAT cassette or a data cassette nearing the end of its life. If cleaning the DAT drive heads does not correct the blinking LED, replace the data cassette currently in use.

A DAT cleaning cassette has approximately 100 uses and then will need to be replaced. A rapidly blinking green LED after a cleaning cassette has been inserted may mean the cleaning cassette has reached the end of its life or the drive could not write the tape correctly. When this occurs eject and discard the cleaning cassette.

To clean the DAT drive heads insert the cleaning cassette. The DAT drive will automatically sense the cleaning cassette, run the cassette approximately 10 seconds, and automatically eject the tape.

4.2.3 Removing cassettes manually

Refer to the *Archive Python DDS DAT Tape Drive Product Description Manual*, chapter 3, "FUNCTIONAL DESCRIPTION," subsection "UNLOADING A CASSETTE (MANUAL OPERATION)," for the procedure to manually remove a cassette for a DAT drive.

4.3 Maintenance procedures

This section gives information on removal and replacement procedures for Field Replaceable Units (FRUs) for the DAT drive.

4.3.1 Pre-service procedures

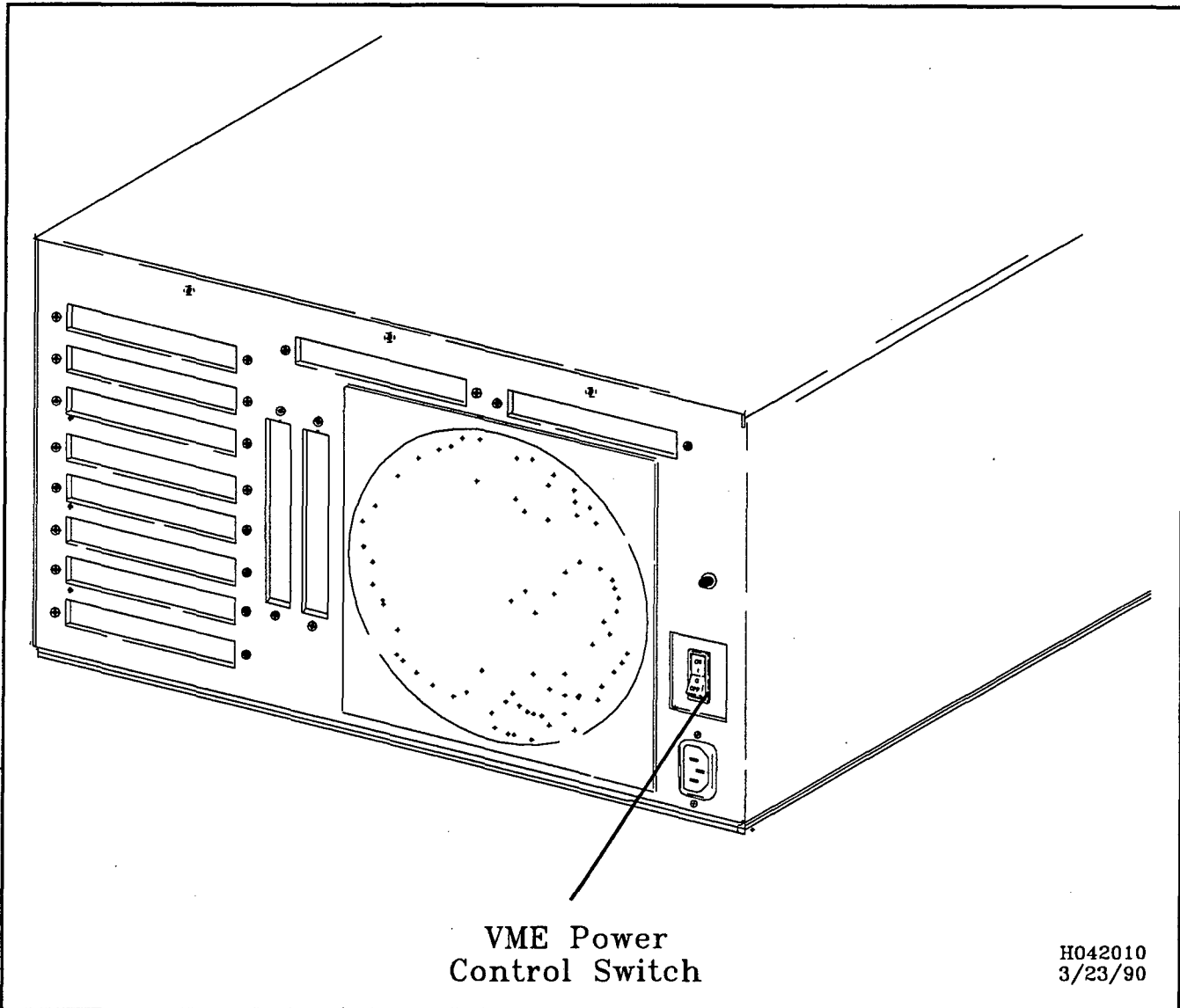
This section gives procedures that need to be performed before continuing with any of the removal or replacement sections:

Caution

Power *must* be removed from the VMEbus chassis before disconnecting and connecting the SCSI host adapter to the DAT chassis. Failure to do so will cause damage to equipment.

1. Set the VMEbus chassis power control switch to the OFF position. See Figure 4-2.

Figure 4-2 VMEbus chassis power control switch



Caution

Remove power to the expansion cabinet before removing or servicing any equipment. Failure to do so will cause damage to electronic equipment components.

2. Remove power to the expansion cabinet.

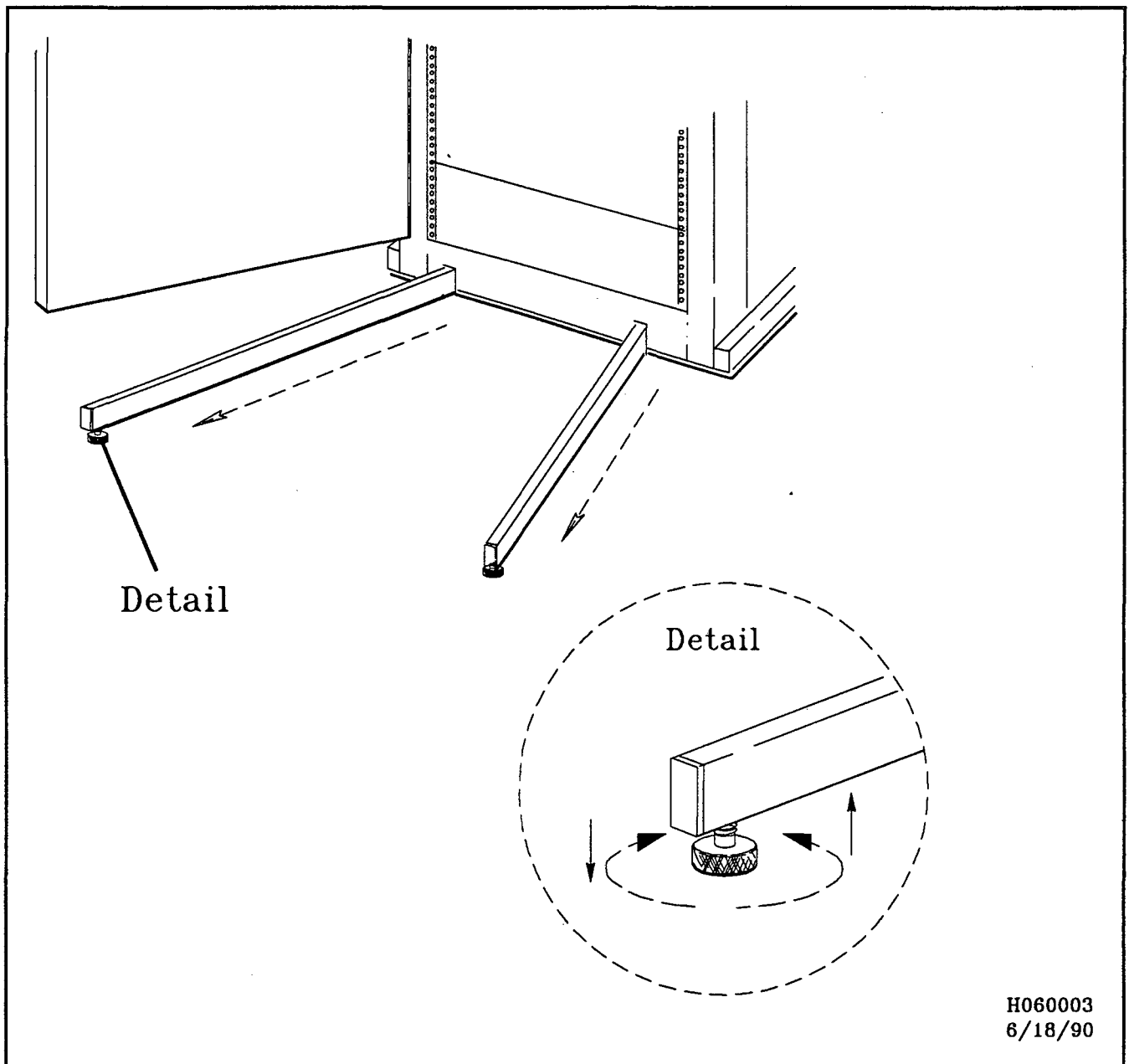
- To remove power from a CONVEX EXP-101 or EXP-102 expansion cabinet, disconnect the AC power cord from the AC power source.
- To remove power from a CONVEX EXP-105 high-performance expansion cabinet, set the main power control switch to the OFF position.

Warning

Expansion cabinet stabilizer bars *must* be extended prior to extending any component installed in the expansion cabinet. Failure to do so will make the expansion cabinet unstable, increase the possibility of it falling forward, can cause injury to personnel, and will cause damage to equipment.

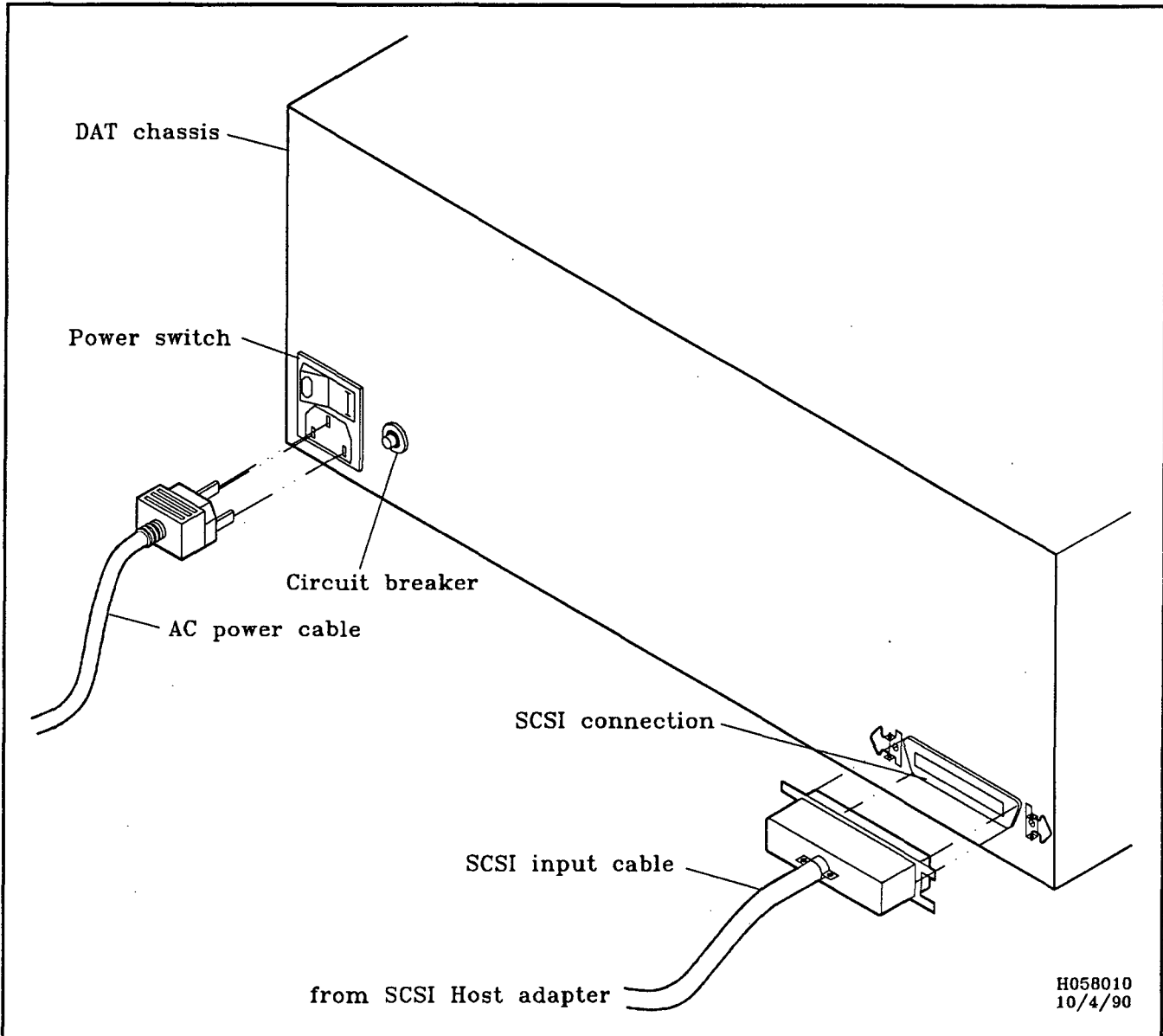
3. Extend the expansion cabinet stabilizer bars and adjust the feet until they are in firm contact with the floor. See Figure 4-3.

Figure 4-3 Expansion Cabinet Stabilizer Bars



4. Unlock the 2 captive screws on the front panel of the DAT chassis.
5. Remove the DAT chassis front panel.
6. Remove the 4 screws holding the DAT chassis in the expansion cabinet.
7. Slide the DAT chassis out of the cabinet until the side rails lock into position.
8. On the back side of the DAT chassis, set the power switch to the OFF position. See Figure 4-4.

Figure 4-4 DAT chassis power switch

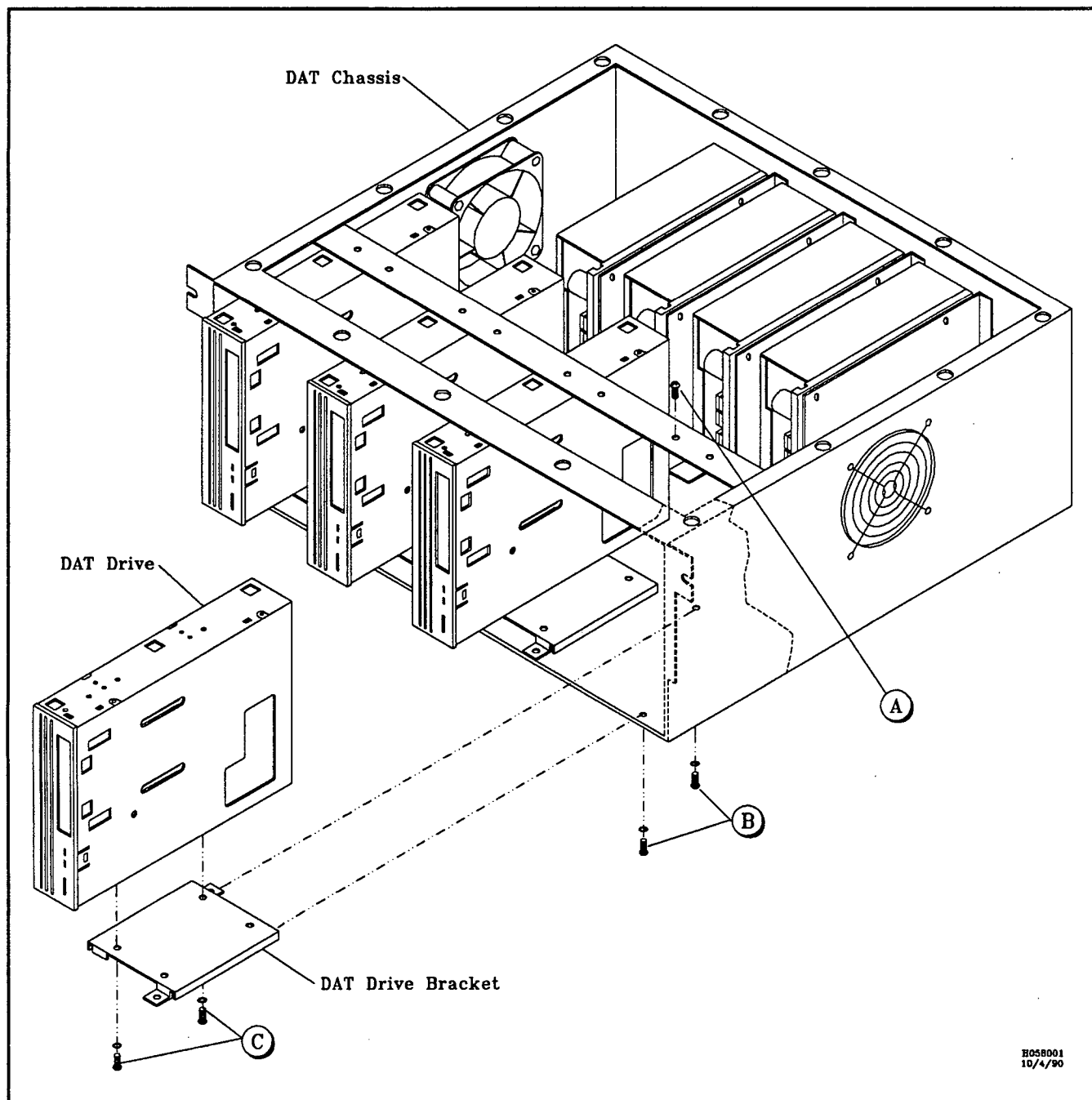


9. Remove the 14 captive screws that secure the top of the DAT chassis and remove the top.

4.3.2 DAT drive unit removal and replacement

This section gives the procedure for removing and replacing the DAT drive. See Figure 4-5.

Figure 4-5 DAT drive unit



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4.3.2.1 Removal

1. Do the preservice procedures listed in Section 4.3.1.
2. Remove DAT drive power cable from DAT drive.
3. Remove SCSI ribbon cable from DAT drive.
4. Remove the screw (A in Figure 4-5) holding the DAT drive to the top of the DAT chassis.
5. Remove the 2 screws (B in Figure 4-5) holding the DAT drive bracket to the DAT chassis.
6. Remove the DAT drive.
7. Remove the 2 screws (C in Figure 4-5) holding the bracket to the DAT drive.

4.3.2.2 Replacement

Note

Refer to the *Archive Python DDS DAT Tape Drive Product Description Manual* for procedures on selecting and setting the SCSI address on the DAT drive.

1. Check and, if necessary, change to match replaced drive, the SCSI address, the parity enable, and the self-test enable switch settings selected on the dip switch of the DAT drive. See Table 2-2.
2. Remove, if present, all the internal terminators from the new DAT drive. See Figure 4-6.

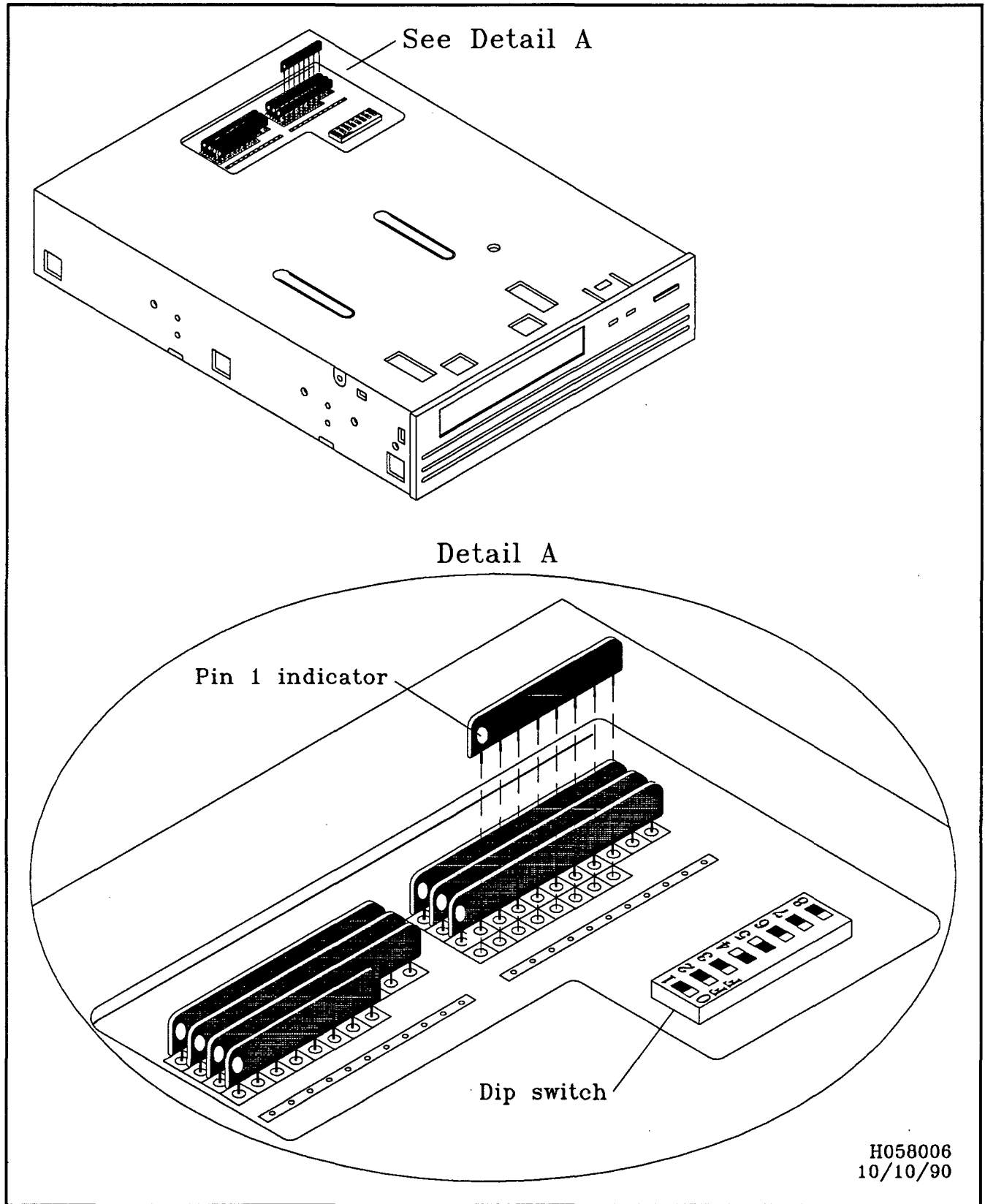
Note

The DAT chassis internal SCSI cable (see Figure 4-11) is terminated. This termination will be in one of two different versions.

Version 1: Early production versions of the internal SCSI cable will have a removable terminator on the fourth SCSI connector on the cable.

Version 2: Standard production versions of the internal SCSI cable will have a permanent terminator attached a few inches beyond the fourth SCSI connector. See Figure 4-11.

Figure 4-6 DAT drive terminators



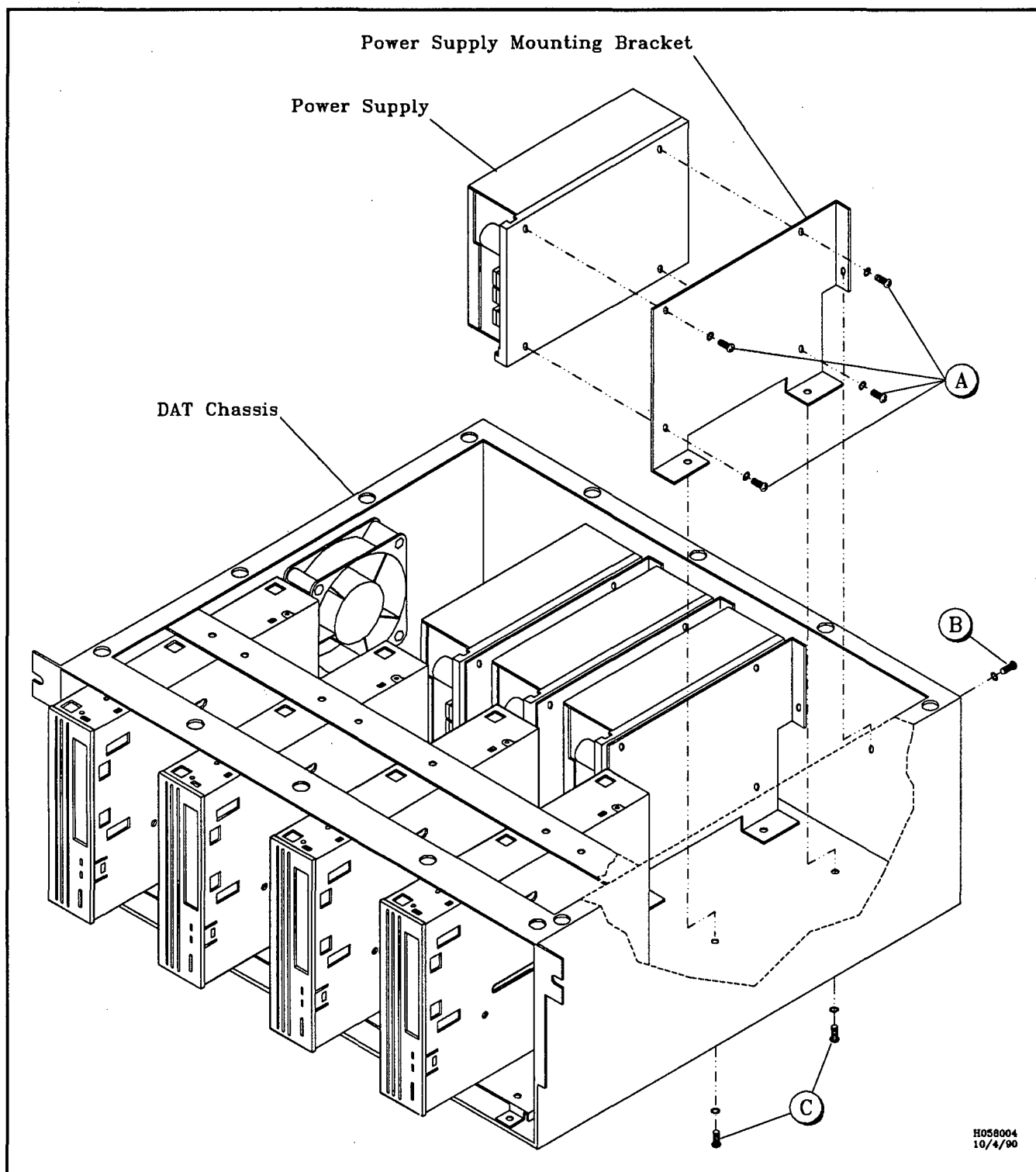
3. Install the 2 screws (C in Figure 4-5) that hold the bracket to the DAT drive.
4. Install the DAT drive into the chassis.

5. Install the screw (A in Figure 4-5) that holds the DAT drive to the top of the DAT chassis.
6. Install the 2 screws (B in Figure 4-5) that hold the DAT drive bracket to the chassis.
7. Connect the SCSI ribbon cable to the back of the DAT drive.
8. Connect the power cable to the back of the DAT drive.
9. Do the postservice procedures listed in Section 4.3.8.

4.3.3 Power supply removal and replacement

This section gives procedures for removing and replacing the DAT drive power supplies. See Figure 4-7.

Figure 4-7 Dat drive power supply



4.3.3.1 Removal

1. Do the preservice procedures listed in Section 4.3.1.
2. Remove power cable from the DAT drive.
3. If necessary, uncouple the cable going to the fans.
4. Disconnect the input power cable from the power supply.
5. Remove the 2 screws (C in Figure 4-7) connecting the power supply to the bottom of the DAT chassis.

6. Remove the screw (B in Figure 4-7) connecting the power supply to the rear of the DAT chassis.
7. Remove the power supply from the DAT chassis.
8. Mark and disconnect the DAT drive power cables and the fan cable, if necessary, from the power supply.

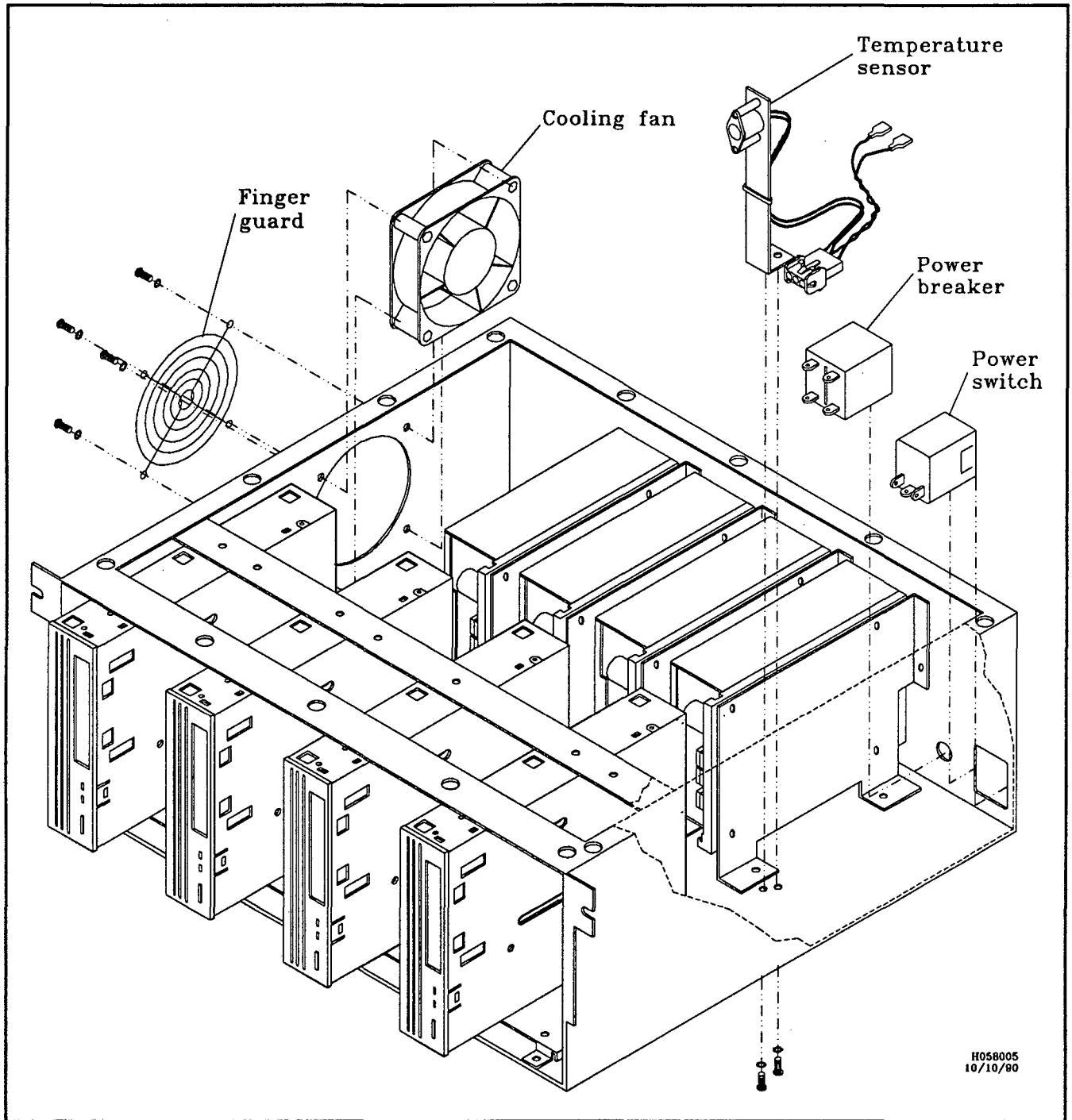
4.3.3.2 Replacement

1. Connect the DAT drive power cables and the fan cable, if necessary, to the power supply.
2. Position the power supply in the DAT chassis.
3. Install the screw (B in Figure 4-7) that holds the power supply to the rear of the DAT chassis.
4. Install the 2 screws (C in Figure 4-7) that hold the power supply to the bottom of the DAT chassis.
5. Connect the input power cable to the power supply.
6. If necessary, couple the cable going to the fans.
7. Connect the power cable to the DAT drive.
8. Do the postservice procedures listed in Section 4.3.8.

4.3.4 DAT chassis cooling fan removal and replacement

This section give the procedures for removing and replacing the cooling fan in the DAT chassis. See Figure 4-8.

Figure 4-8 DAT chassis fan and power control FRUs



4.3.4.1 Removal

1. Do the preservice procedures listed in Section 4.3.1.

Caution

Fan nuts are not captive and may be lost within the chassis. This may cause damage to equipment.

2. Remove the 4 screws and 4 nuts attaching the fan to the side of the DAT chassis.

3. Disconnect the fan power cable.
4. Remove the fan.

4.3.4.2 Replacement

1. Connect the power cable to the fan.
2. Position the fan to the side of the DAT chassis.
3. Install the 4 screws and 4 nuts that attach the fan to the DAT chassis.
4. Do the postservice procedures listed in Section 4.3.8.

4.3.5 DAT chassis power breaker

This section gives the procedures for removing and replacing of the power breaker from the back of the DAT chassis. See Figure 4-8.

4.3.5.1 Removal

1. Do the preservice procedures listed in Section 4.3.1.
2. Mark the 4 wires connected to the chassis power breaker.
3. Disconnect the 4 wires connected to the chassis power breaker.
4. Remove the nut holding the breaker to the DAT chassis rear panel.
5. Remove the chassis power breaker.

4.3.5.2 Replacement

1. Position the chassis power breaker in the hole in the rear panel of the DAT chassis.
2. Install the nut that holds the breaker to the rear panel of the DAT chassis.
3. Connect the 4 wires to the chassis power breaker.
4. Do the postservice procedures listed in Section 4.3.8.

4.3.6 DAT chassis power switch removal and replacement

This section gives the procedures for removing and replacing the DAT chassis power switch. See Figure 4-8.

4.3.6.1 Removal

1. Do the preservice procedures listed in Section 4.3.1.
2. Remove the DAT chassis power breaker.
3. Mark the 2 wires connected to the DAT chassis power switch.
4. Disconnect the 2 wires connected to the power switch.
5. Press the stop tabs on each side of the power switch inward.
6. Push and remove the power switch out the rear of the DAT chassis.

4.3.6.2 Replacement

1. Press the power switch in the rear of the DAT chassis until the stop tabs lock into place.
2. Connect the 2 wires to the DAT chassis power switch.
3. Install the DAT chassis power breaker.
4. Do the postservice procedures listed in Section 4.3.8.

4.3.7 DAT chassis temperature sensor

This section gives the procedures to remove and replace the DAT chassis temperature sensor. See Figure 4-8.

4.3.7.1 Removal

1. Do the preservice procedures listed in Section 4.3.1.
2. Mark the 2 wires connected to the DAT chassis power breaker.
3. Remove the 2 wires connected to the DAT chassis power breaker.
4. Uncouple the temperature sensor cable from the wiring harness.
5. Remove the 2 screws that hold the temperature sensor to the bottom of the DAT chassis.

4.3.7.2 Replacement

1. Position the temperature sensor on the bottom of the DAT chassis.
2. Install the 2 screws that hold the temperature sensor to the bottom of the DAT chassis.
3. Couple the wiring harness to the temperature sensor coupler.
4. Connect the 2 wires to the DAT chassis power breaker.
5. Do the postservice procedures listed in Section 4.3.8.

4.3.8 Post-service procedures

This section gives procedures that need to be performed after any of the removal and replacement procedures:

1. Position the top on the DAT chassis and lock the 14 captive screws in place.
 2. On the back of the DAT chassis, set the chassis power switch to the ON position. See Figure 4-4.
 3. Push the buttons inward on the side rails and slide the DAT chassis into the expansion cabinet.
 4. Install the 2 screws that hold the DAT chassis in the expansion cabinet.
 5. Position the DAT chassis front panel on the chassis and lock the 2 captive screws that secure the panel to the chassis.
 6. Return the expansion cabinet stabilizer bars to their retracted position. See Figure 4-3.
 7. Set the VMEbus chassis power control switch to the OFF position. See Figure 4-2.
 8. Return power to the expansion cabinet.
- To return power to a CONVEX EXP-101 or EXP-102 expansion cabinet, connect the AC power cord to the AC power source.
 - To return power to a CONVEX EXP-105 high-performance expansion cabinet, set the main power control switch to the ON position.

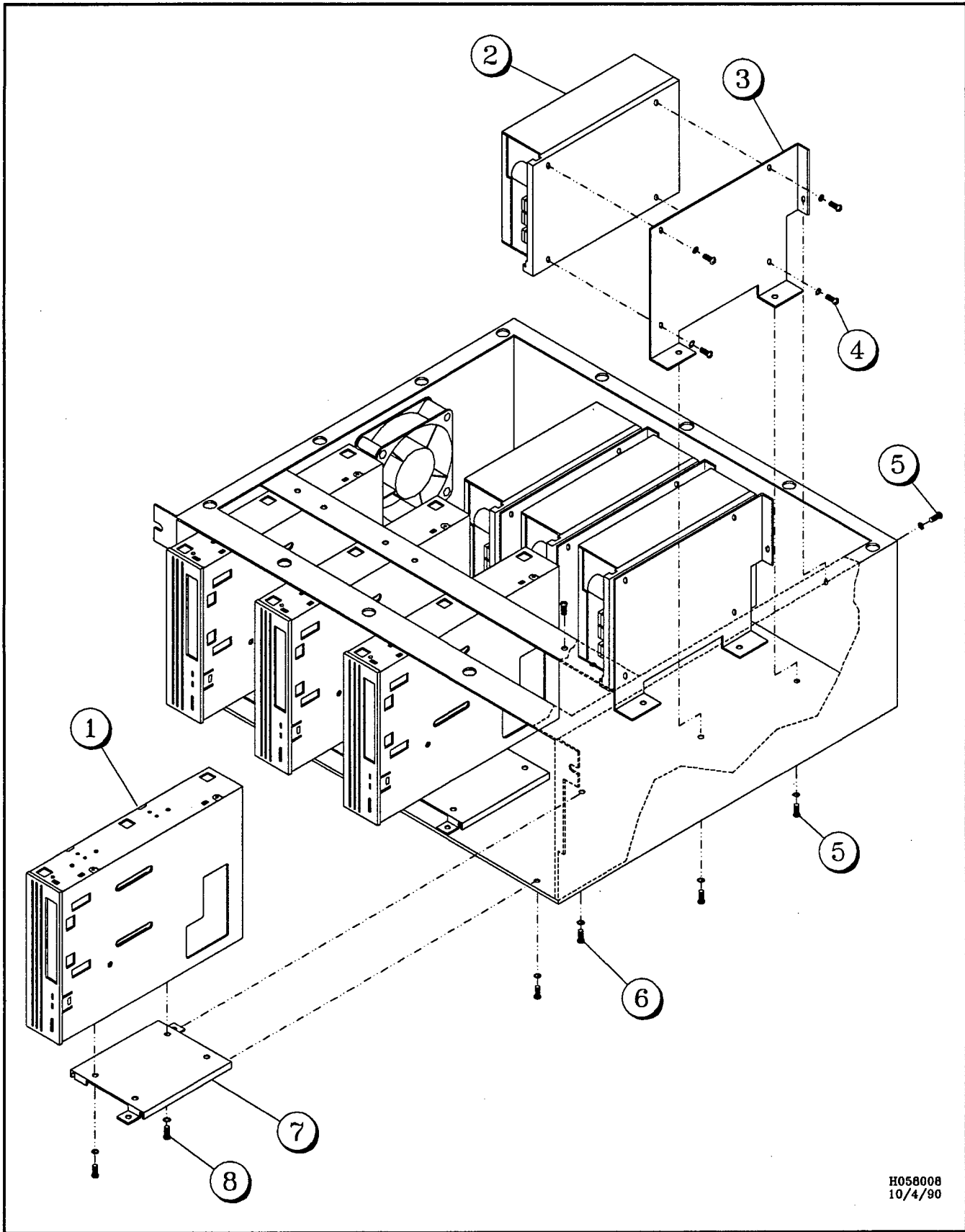
4.4 DAT chassis and DAT drive IPB

This section supplies an Integrated Parts Breakdown (IPB) for the DAT chassis, drive, power supply, and all associated cables.

Table 4-2 Tape unit and power supply list

Item Number	CONVEX Part Number	Description
1	207-000017-200	DAT tape drive
n/a	500-000304-200	Power supply subassembly with bracket attached (recommended FRU)
2	200-001016-200	Power supply
3	320-001648-500	Power supply bracket
4	310-002301-002	Power supply bracket screw 6-32 x 1/4 (bracket to power supply)
5	310-002302-004	Power supply bracket screw (chassis to bracket) 6-32 x 3/8 with washer
6	310-002302-004	Tape drive bracket screw(chassis to bracket) 6-32 x 3/8 with washer
7	320-001646-500	Tape drive bracket
8	310-005200-001	Tape drive bracket screw 3 mm x 6 mm (bracket to drive)

Figure 4-9 DAT drive and power supply IPB



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Table 4-3 Fan, sensor, breaker, and switch list

Item Number	CONVEX Part Number	Description
1	310-002302-004	Fan assembly screws 6-32 x 3/8 with washer
2	230-000013-002	Cooling fan finger guard
3	230-000013-001	Cooling fan
4	310-000200-003	Thermostat screw 4-40 x 1/4
n/a	250-000013-002	Thermostat
5	500-000310-200	Thermostat subassembly (recommended FRU)
6	253-000113-003	Circuit breaker
7	125-000011-001	DAT chassis power switch
8	310-002302	Thermostat bracket screw 6-32 x 3/8 (chassis to bracket)

Figure 4-10 Fan, sensor, breaker, and switch IPB

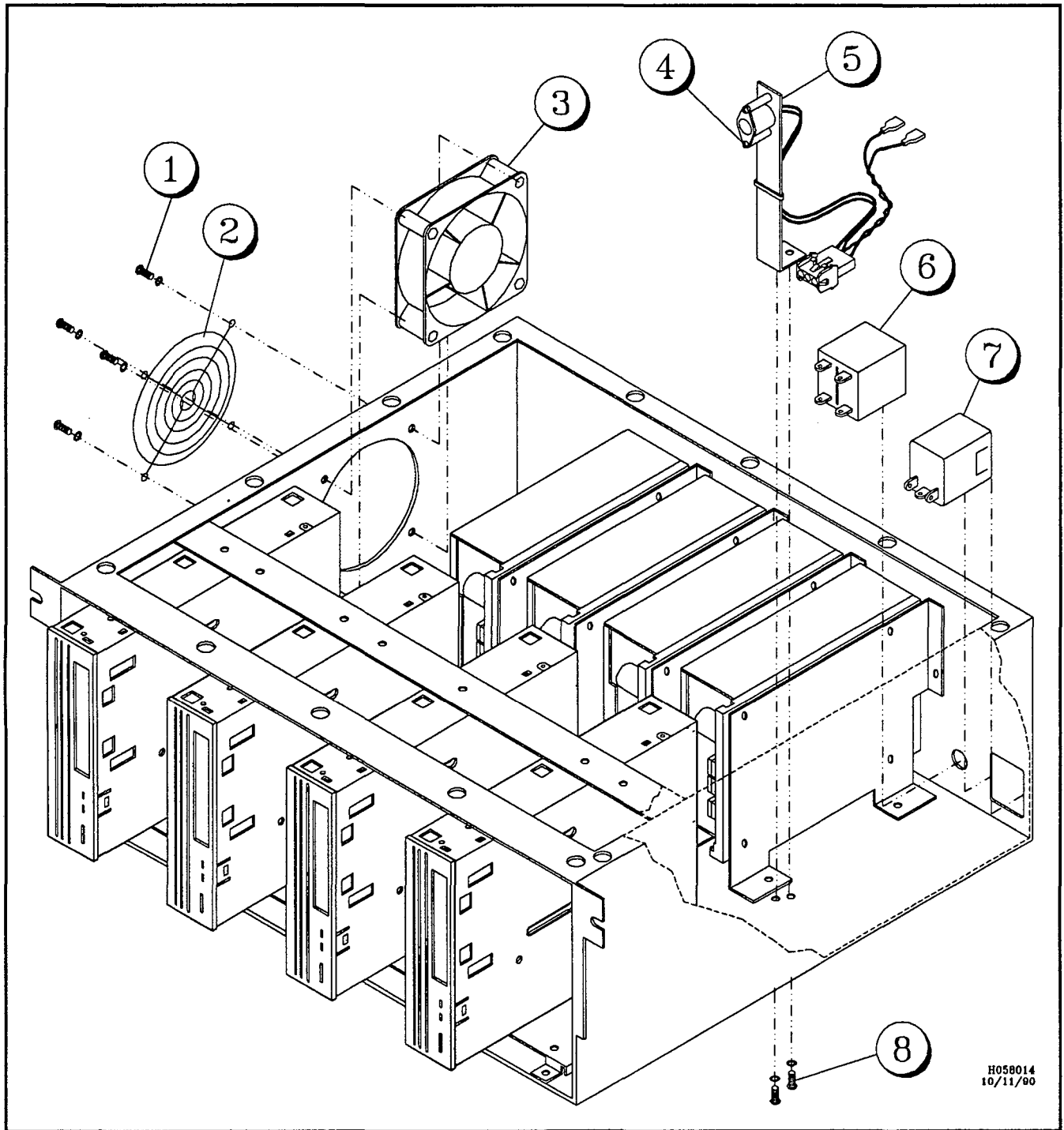


Table 4-4 DAT drive and power cabling list

Item Number	CONVEX Part Number	Description
1	603-020050-200	Fan DC power cable assembly
2	601-500045-200	Internal SCSI DAT drive daisy-chain cable assembly
3	603-060029-200	DAT drive DC power daisy-chain cable assembly
4	603-020049-200	Power supply daisy-chain cable assembly
5	603-020001-200	AC filter and chassis switch cable assembly
6	603-010029-200	Ground strap cable assembly

Figure 4-11 DAT drive and power cabling IPB

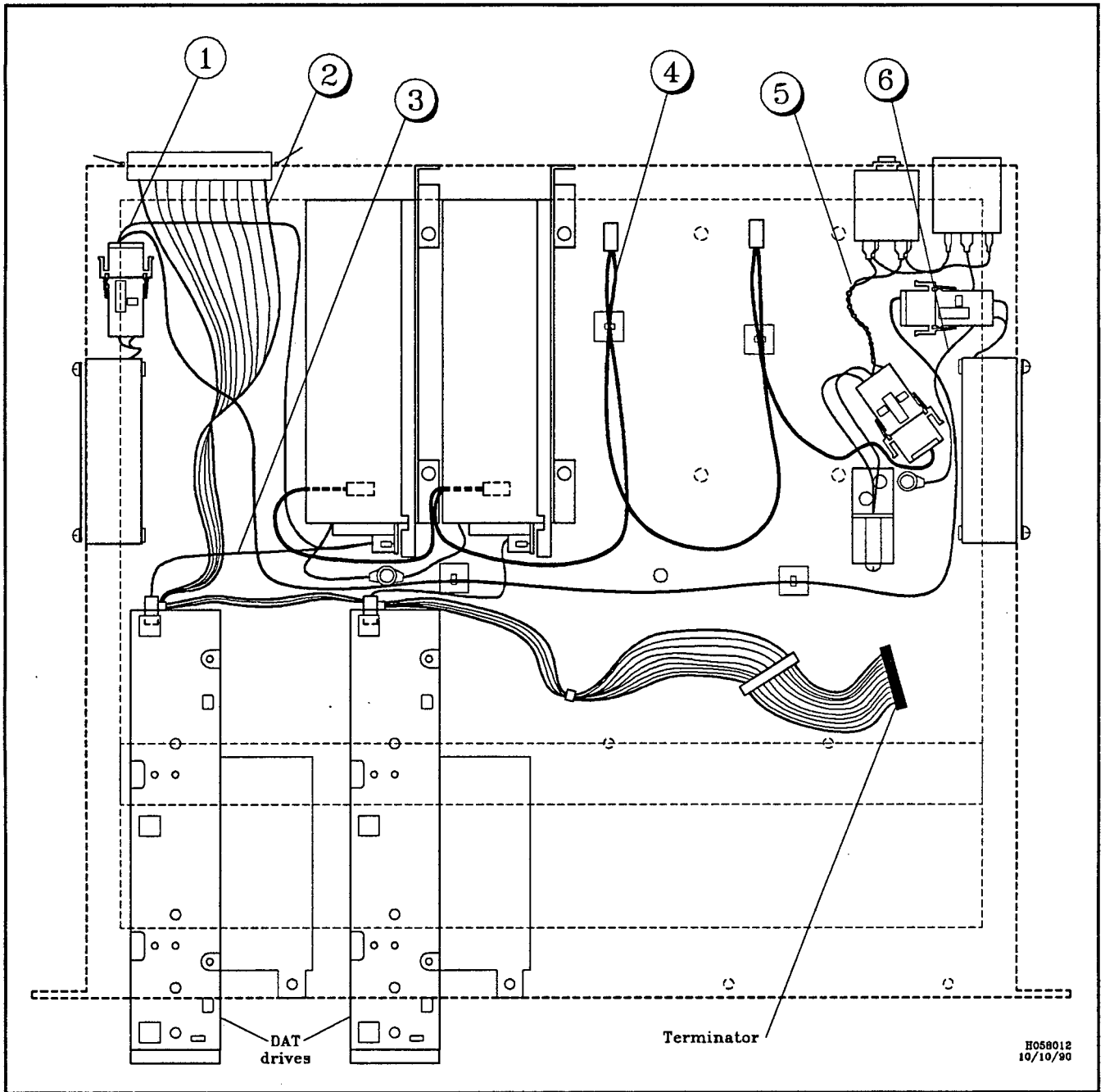


Table 4-5 Miscellaneous parts list

Figure Number	CONVEX Part Number	Description
n/a	312-000345-001	DAT chassis slide rail (universal)
Figure 2-6	320-001461-500	Front panel mounting bracket
Figure 2-6	312-001461-500	Front panel mounting bracket grounding pads
Figure 2-6	310-002501-001	Front panel mounting bracket screws 10-32 x 1/2
Figure 1-1	320-002370-500	DAT chassis front panel
n/a	320-002371-500	DAT chassis front panel blank insert
n/a	310-150503-001	RETMA rail nut
n/a	310-002501-001	RETMA rail screw 10-32 x 1/4
n/a	207-000017-001	DAT cleaning cassette
n/a	621-000105-001	DAT cassette, 1.3 Gbyte blank

Archive DAT Drive Configurator



A.1 Overview

This appendix contains a copy of the DAT drive system configurator document.

D	D	D	D
r	r	r	r
i	i	i	i
v	v	v	v
e	e	e	e
1	2	3	4

S1	S2	S3	SCSI Device Address	Drive # in chassis
off	off	off	0	1
on	off	off	1	2
off	on	off	2	3
on	on	off	3	4

Following are the rest of the switches and their meaning and settings:

Switch:	S4	S5	S6	S7	S8
Setting:	ON	ON	OFF	OFF	ON
Meaning:	SCSI-2	Parity	reserve	reserve	Self-Test

1.2.3 Cable Termination

There are two possible internal SCSI cables. Both are flat 50 pin ribbon cables with connectors for the four drives. For cable P/N 601-500045-200, the terminator is built onto the cable. Most subsystems will have this cable, and will require no further action.

If SCSI cable number 601-500030-200 is used, terminator P/N 109-000007-001 is required. Attach the terminator on the connector for the fourth drive. Be sure pin one on the cable (signified by the arrow on the connector) goes to pin one on the terminator (terminator pins are numbered on the male side). If there are four drives in the chassis, the terminator will plug into the back of the fourth drive.

DOCUMENT REVISION HISTORY

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A	106882	Initial release	11/15/90	

COMPANY CONFIDENTIAL. COPYRIGHT CONVEX COMPUTER CORPORATION 1990



CONVEX

TITLE: Archive DAT drive configurator

DOCUMENT #: 207-000017-600

REV: A 11/15/90

ENGR: Paul Marshall

PAGE: 2

Reporting Problems

B

B.1 Overview

This appendix introduces the CONVEX Technical Assistance Center (TAC) and the *contact* utility.

The *contact* utility is an online system for reporting problems to the TAC. Enter *contact* at the system prompt and then answer the questions as they appear on the screen.

This appendix describes:

- Prerequisites for using *contact*
- Tips for using *contact*
- The step-by-step process *contact* takes you through

B.2 Technical Assistance Center

The CONVEX Technical Assistance Center (TAC) is staffed by technical specialists who can address the diverse questions and problems that arise in a supercomputing environment. If you have a hardware, software, or documentation problem, contact the TAC. This group stands ready to solve such problems.

B.3 The *contact* utility

The TAC recommends using the *contact* utility to report a hardware, software, or documentation problem. The *contact* utility is an interactive program that helps the TAC track reports and route them to the CONVEX personnel most qualified to fix a problem.

After invoking *contact*, it prompts you for information about the problem. When you finish your report, *contact* electronically mails it to the TAC. The TAC notifies you within 48 hours that your report has been received.

To use *contact* requires:

- UNIX-to-UNIX Communication Protocol (UUCP) connection to the TAC
- Full path name of the program or utility in question
- Version number of the program or utility in question

B.3.1 UUCP connection

Before using *contact*, ask your system administrator if your site has a UUCP connection to the TAC. A UUCP connection allows files to be copied from one UNIX-based system to another. The *uucp* (UNIX-to-UNIX copy) command relies on either a dial-up or hard-wired UUCP communication line.

B.3.2 Finding the program path name

To determine the full path name of the program or utility in question, use the *which* command. Figure B-1 illustrates use of the *which* command to find the full path name of the loader (*ld*) utility:

Figure B-1 Using the *which* command

```
>which ld
/bin/ld
>
```

In this example, the full path name of the loader is */bin/ld*.

If you use the C shell (*cs*h), you can also use the *whence* command to find the program path name. The *whence* command works like *which*, only faster.

For more information on the *which* command, refer to the *which(1)* man page. You can also use the *info* online information system by entering *info which* at the system prompt.

B.3.3 Finding the program version number

To determine the version number of the program or utility in question, use the *vers* command. Figure B-2 illustrates use of the *vers* command to find the version number of the loader(*ld*) utility. Enter *vers*, then the path name of the program or utility:

Figure B-2 Using the *vers* command

```
> vers /bin/ld
/bin/ld: 7.0
>
```

In this example, the loader utility version number is 7.0.

For more information on the *vers* command, refer to the *vers(1)* man page. You can also use the *info* online information system by entering *info vers* at the system prompt.

B.4 Using *contact*

The *contact* utility prompts for the following information:

- Your name, title, phone number, and corporate name
- Name and version of the product
- One-line summary of the problem
- Detailed description of the problem
- Priority of the problem
- Instructions on how to reproduce the problem
- Comments about the problem
- Comments about the documentation supporting the problem
- Files to include in the *contact* report

The following is a step-by-step discussion of these prompts.

B.4.1 Step 1a

To invoke the *contact* utility, enter **contact** at the system prompt. The system responds with a welcome message and a series of questions regarding your hardware, software, or documentation question. Figure B-3 illustrates the *contact* command and the resulting system response:

Figure B-3 Beginning a *contact* session

```
> contact
Welcome to contact version 0.11 ()

Enter your name, title, phone number, and corporate name (^D to terminate)
>
```

B.4.2 Step 1b

If there is a *.contact* file in your home directory, *contact* skips the first prompt. Figure B-4 illustrates the *contact* command and the system response when a *.contact* file is in your home directory:

Figure B-4 Starting session with *.contact*

```
> contact
Welcome to contact version 0.11 ()

Enter the name of the product involved
>
```

B.4.3 Step 2

The *contact* utility prompts for the version number of the product. If you do not know the version number, press **CTRL-Z** to suspend the session. Use the *which* (or *whence* if using *csh*) and *vers* commands to find the version number of the product. Use the *fg* command to return to the session; enter the version number in the form *X.X* or *X.X.X.X*.

B.4.4 Step 3

The *contact* utility prompts for a one-line summary of the problem. This summary is the subject header in any further correspondence regarding the problem. Make this summary as descriptive as possible in one line.

B.4.5 Step 4

The *contact* utility prompts for a detailed description of the problem. Please make this description as complete as possible. Include source code and a stack backtrace whenever possible. (Refer to the *adb(1)* or *csd(1)* man page for information on obtaining a stack backtrace.) The more information provided, the quicker the TAC can isolate and solve the problem.

B.4.6 Step 5

The *contact* utility prompts for the priority of the problem. Figure B-5 illustrates this prompt and the priority levels from which to choose; enter a priority number:

Figure B-5 Specifying the priority of a problem

```
Enter a problem priority, based on the following:  
1) Critical - work cannot proceed until the problem is resolved.  
2) Serious - work can proceed around the problem, with difficulty.  
3) Necessary - problem has to be fixed.  
4) Annoying - problem is bothersome.  
5) Enhancement - requested enhancement.  
6) Informative - for informational purposes only.  
>
```

B.4.7 Step 6

The *contact* utility prompts for an explanation of how to reproduce the problem. Please include the command syntax and options you used and anything else you did to make the program run.

B.4.8 Step 7

The *contact* utility prompts for any other pertinent comments. Please include all relevant information.

B.4.9 Step 8

The *contact* utility prompts for suggestions regarding documentation supporting the product. Indicate whether the documentation could be revised to address the question.

B.4.10 Step 9

The *contact* utility asks for the names of files necessary to reproduce the problem. Figure B-6 illustrates the *contact* prompt and sample user response:

Figure B-6 Including files in *contact* reports

```
Are there any files that should be included in this report (yes | no)?  
> yes  
Please enter the names of the files, one to a line (^D to terminate)  
> test.f  
> ~/subroutines/sub.f  
>
```

Note

Tilde-escape sequences are not recognized in responses to this prompt. Instead, *contact* treats a tilde in this section to mean your home directory. This convention is based on use of the tilde for expanding file names in *csh*.

If the files specified are small text files, they are automatically included in the *contact* report. If the files are too big to be included in this report, *contact* gives further instructions on how to submit these files.

To specify a directory, combine the directory files into a single file using the *tar* command (refer to the *tar(1)* man page for further information) or enter each file name in the directory on a single line in the *contact* report.

B.4.11 Step 10

The *contact* utility prompts you to review, edit, submit, or abort the report. Figure B-7 illustrates this prompt:

Figure B-7 Prompt to review, edit, submit, or abort

```
Please select one of the following options:
1) Review the problem report.
2) Edit the problem report.
3) Submit the problem report.
4) Abort the problem report.
>
```

Choose the number of the option you want to select. These options let you do the following:

- **Review**—Review the text of your *contact* report. You are then prompted again to select an option.
- **Edit**—Edit the text of the contact report. If you choose to edit the report, *contact* puts you in your default text editor.
- **Submit**—Send the report to the CONVEX TAC. The TAC notifies you within 48 hours that your report has been received. Choosing this option exits the *contact* utility and returns you to the shell environment.
- **Abort**—Save the text of your report in a file named `~/dead.report`. This option exits the *contact* utility and returns you to the shell environment.

B.5 Tips for Using *contact*

The *contact* utility is interactive and easy to use. This section lists tips to help use it efficiently. In particular, this section tells how to:

- Use a *.contact* file
- Abort a *contact* session
- Resubmit an aborted report
- Suspend a *contact* session
- Move within *contact* from one prompt to another
- Use tilde-escape sequences in the *contact* utility

B.5.1 Using a *.contact* file

When you invoke *contact*, it prompts for information regarding the problem. The first prompt is for your name, title, phone number, and company name. You can, however, create a *.contact* file to skip this first prompt. Follow these steps to create a *.contact* file:

1. Create a *.contact* file in your home directory.
2. Enter your name, job title, phone number, and company name, each on a new line.

When you invoke *contact*, it automatically includes the *.contact* file as input for the first prompt and proceeds to the next prompt.

B.5.2 Aborting the report

To abort a *contact* report, either enter the interrupt key (usually CTRL-C) or choose the abort option when prompted by the *contact* utility. Using CTRL-C to abort does not save the contents of the report. Using the *abort* option saves the contents of the report in a file named `~/dead.report`.

B.5.3 Submitting the *dead.report* file

After you abort a *contact* session, the *contact* utility saves the report in a file named *~/dead.report*. Using the *contact* command with the *-r* option automatically merges the contents of the *~/dead.report* file into the new *contact* session. Enter **contact -r**

and *contact* finds the *~/dead.report* file and merges it into the *contact* report. You can then edit the report. When you end the editing session, *contact* resumes at the final prompt, which asks you to review, edit, submit, or abort the report.

B.5.4 Suspending a report

Sometimes it is necessary to stop in the middle of a *contact* report and return to the shell (for instance, to suspend the *contact* session to find the program path name or version number). To suspend the *contact* session, press **CTRL-Z**.

To return to the *contact* session, press **fg**. Using **CTRL-Z** and the *fg* (foreground) command, you can toggle back and forth between the *contact* utility and the shell. You cannot, however, use **CTRL-Z** and *fg* to switch back and forth if you are using a Bourne shell (*sh*).

B.5.5 Ending a response

The *contact* utility prompts for information pertinent to your hardware, software, or documentation question. Some prompts require one-line responses; to move to the next prompt, press **RETURN**. Other prompts require more than a one-line response; to move to the next prompt, press **CTRL-D**.

B.5.6 Tilde-Escape sequences

The *contact* utility treats input beginning with a tilde (~) as a special sequence. The character following the tilde is considered a request for a special function. The following tilde sequences are recognized by *contact*:

- **~e**—Start the text editor (defined in your **EDITOR** environment variable).
- **~h**—Display a list of available tilde-escape sequences.
- **~p**—Print the *contact* report to the terminal screen.
- **~r filename**—Read the contents of *filename* as a response to the current prompt. Some prompts require only a one-line response. This tilde-escape sequence only works for prompts that allow more than a one-line response.
- **~**—Insert a single tilde as the first character in the line.

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