BA400-Series Enclosures

Storage Devices
Installation Procedures

Order Number: EK–BA44A–IN. J01

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Preface

This manual describes add-on installation procedures for the various storage devices available for BA400-series system enclosures.

Structure of This Manual

Chapter 1 describes the installation of EF-, RF-, and RZ-series integrated storage elements.

Chapter 2 describes the installation of TK-series tape drive subsystems.

Chapter 3 describes the installation of the TLZ-series tape drives.

Chapter 4 describes the installation of the RRD43 CD-ROM drive.

Chapter 5 describes the installation of the RRD43/TLZ07 dual ISE drives.

Chapter 6 describes the installation of the TF/TZ–series tape drive.

Appendix A contains a list of related documentation.

Intended Audience

This document is intended for Digital Services personnel and self-maintenance customers.

1

EF-, RF-, and RZ-Series Integrated Storage Elements

1.1 General

Figure 1–1 shows the EF-series integrated storage elements (ISE). Figure 1–2 shows the RF- and RZ-series ISEs in the 5.25-inch configuration. Figure 1–3 shows the RF/RZ series ISEs in the 3.5-inch configuration. Note that the logic module is located on the right side for the RZ-series, and on the left side for the RF-series.

The three configurations vary as follows:

- EF-series ISEs are solid state disks.

- 5.25-inch RF- and RZ-series ISEs contain only one hard disk storage device.

- 3.5-inch RF/RZ-series ISEs can contain two hard disk storage devices.

BA400-series ISEs contain hardware and a circuit module to allow the ISE to be plugged into the enclosure backplane.

Figure 1–1 EF-Series ISE (Front and Rear View)

Bracket Slides

Bracket Slides

Front View
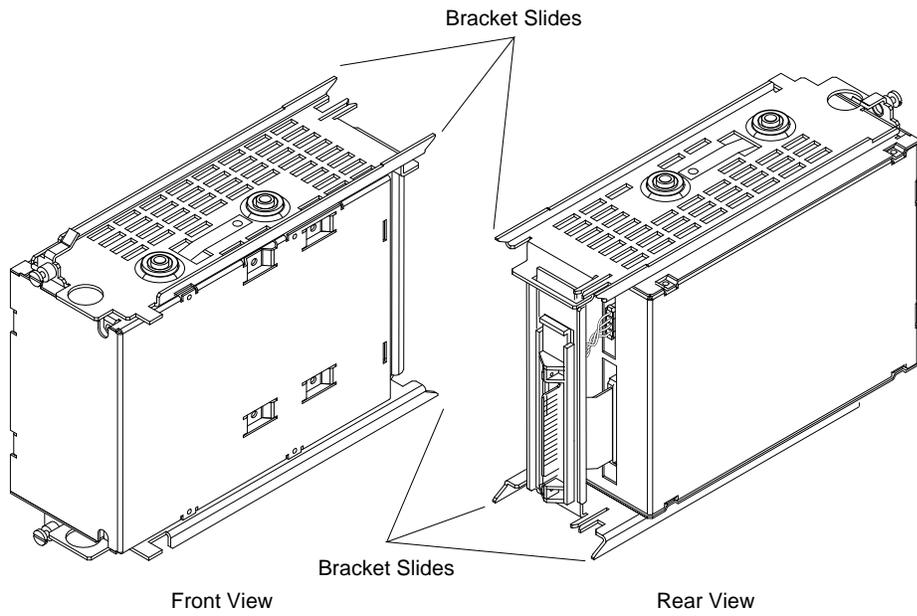
Rear View

MLO-009301

Figure 1–2 5.25-inch RF- and RZ-Series ISE (Front and Rear View)

Bracket Slides

Bracket Slides

Front View
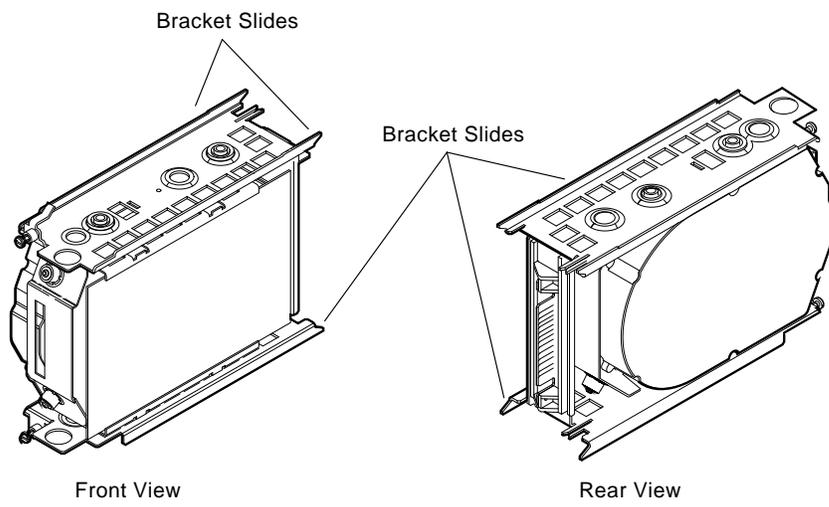
Rear View

MLO-007239

Figure 1–3   3.5-inch RF/RZ-Series ISE (Rear View)

Top Bracket

Tab

Flange

Interface Card
Assembly

50-Pin
Signal Cable

5-Pin
Power
Cable

RF-Series

From back of drive:
the screw hole is
offset to the left
for DSSI.

RZ-Series

From back of drive:
the screw hole is
offset to the right
for SCSI.

50-Pin Signal Cable

4-Pin Power Cable
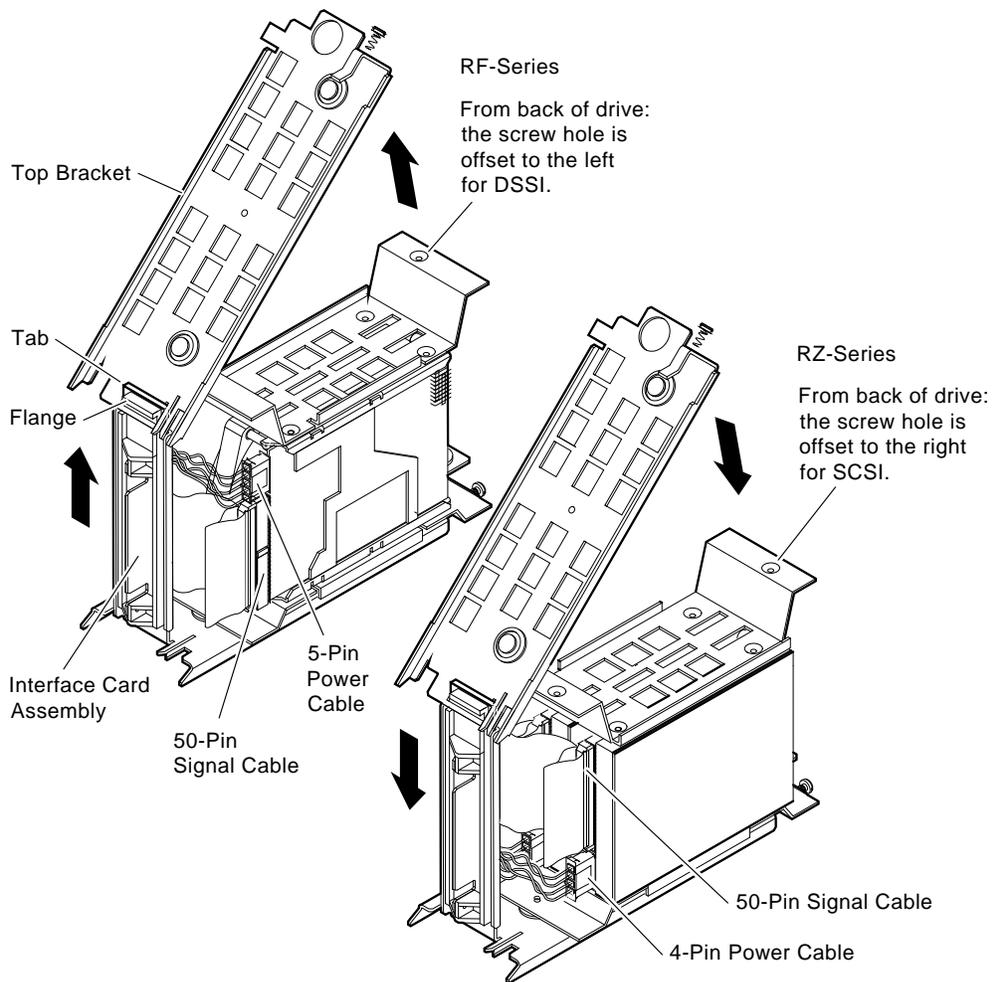
MLO-012804

Figure 1–4 shows the front panel assemblies that come with the ISEs.

_____ **Note** _____

The ISE front panel for 5.25-inch RZ-series ISEs, unlike the front panel
for EF, RF, and 3.5-inch RZ-series ISEs, has no buttons or indicators,
only a plug for the bus node ID.

_____

Figure 1–4 Front Panel Assemblies

EF/RF 5.25-inch   RF/RZ 3.5-inch   RZ 5.25-inch

MLO-007235
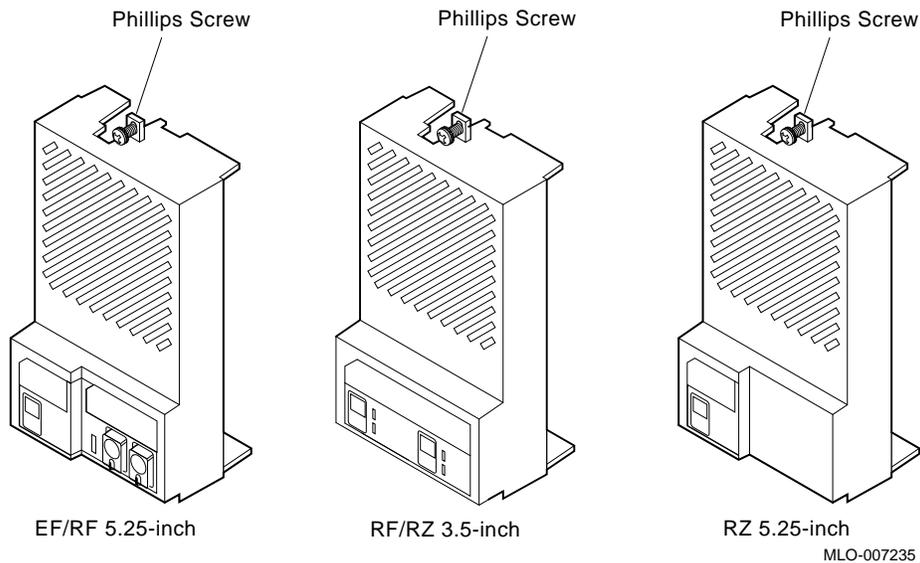
The term "Integrated Storage Element" (ISE) is used for any Digital Storage
Systems Interconnect (DSSI) or Small Computer System Interface (SCSI)
storage device. An ISE contains an on-board intelligent controller in addition
to the drive and the control electronics.

The DSSI interface supports up to seven ISEs. DSSI interfaces can be
embedded within a CPU module, such as the KA670 module. The DSSI
interface can also be separate modules, such as the KFQSA, which is interfaced
by a single cable to a DSSI connector in the host enclosure.

EF-series ISEs are DSSI-based solid state disk drives.

RF-series ISE storage devices are based on the Digital Storage Architecture (DSA). The RF-series ISEs utilize the DSSI bus and interface. There are two versions of the RF-series ISEs:

- 5.25-inch storage device
- 3.5-inch storage device

Note

Within a system enclosure it is possible to have up to seven disk storage devices, provided there is no tape drive in the enclosure. There can be three 3.5-inch dual storage devices and one 5.25-inch or one 3.5-inch single storage device.

RZ-series ISEs utilize the SCSI bus and interface. SCSI interfaces can be embedded within a CPU module, such as the KN220 module. The SCSI interface can also be separate modules, such as the HSD05, which is connected by a single cable to the system backplane in the host enclosure.

Note

VAX 4000 systems do not support RZ-series ISEs unless an HSD05 option is installed.

For more detailed information about configuring EF-, RF-, and RZ-series ISEs in a BA400-series enclosure, refer to the appropriate enclosure maintenance manual listed in Appendix A.

1.2 Installation Procedure

To install an EF-, RF-, or RZ-series ISE in a BA400-series enclosure, perform the following procedures.

1.2.1 ISE Installation in an Empty Slot

CAUTION

Static electricity can damage integrated circuits. Use the anti-static wrist strap and antistatic pad found in the static-protective field service kit (29-26246-00) when you work with the internal parts of a computer system.

Handle the ISE with care. Dropping or bumping the ISE can damage
the disk surface. Carry or hold the ISE by the underside of the lower
bracket to avoid damaging the drive module.

1. After the system manager shuts down the operating system, set the lock
   to the bottom position to open both the top and bottom enclosure doors
   (Figure 1–10).

2. Set the power switch to off (0).

Figure 1–5   Power Switch Location

Power Switch
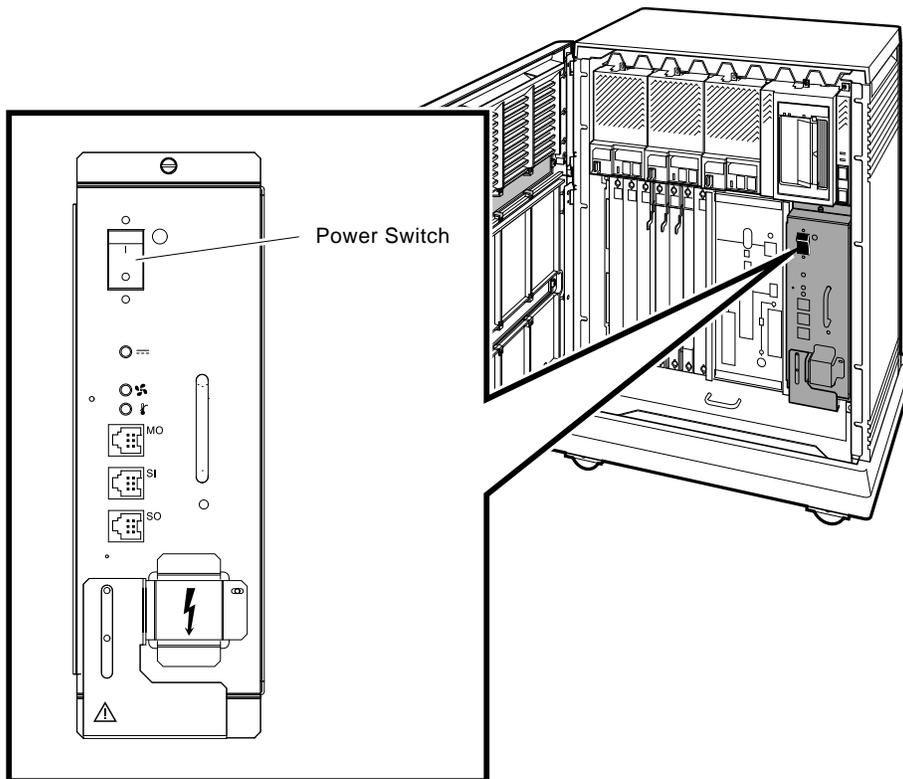
MLO-006627

3. Always install ISEs working from right to left (Figure 1–6).

Figure 1–6   BA440 Enclosure
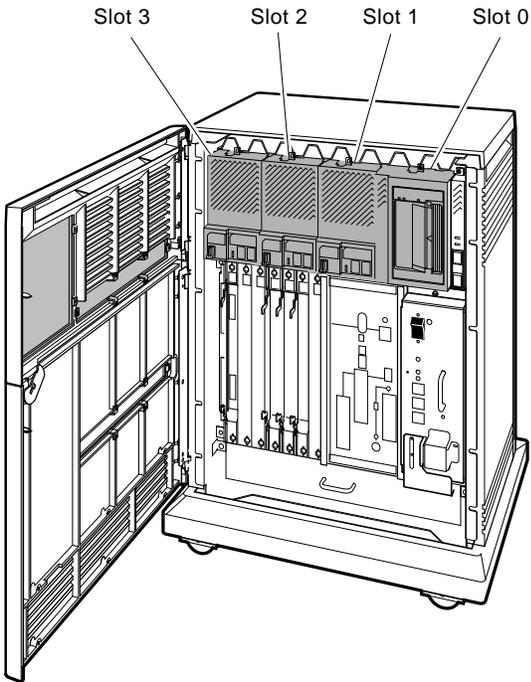
MLO-006528

_____ **NOTE** _____

The first (slot 0) mass storage cavity in the mass storage area is wider than the rest to accommodate a larger device, such as a tape drive. A small filler panel (70-27414-01) is used to fill the gap when an EF-, RF-, or RZ-series ISE is installed in this first cavity.

4. Loosen the captive Phillips screw that secures the blank ISE front panel
    assembly (Figure 1–7), and remove the panel.

Figure 1–7 Blank Front Panel Assembly

MLO-007236
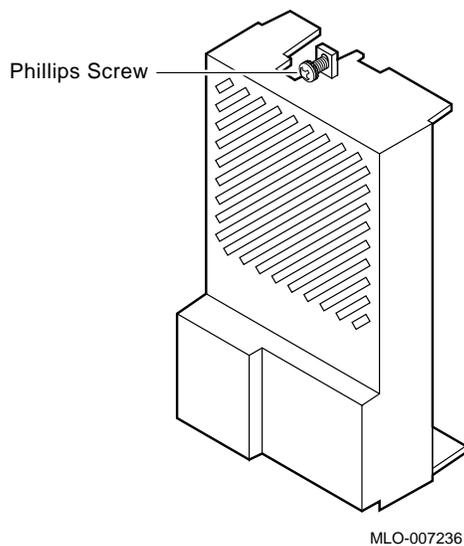
5. For 5.25-inch EF-series ISEs, remove the plastic skid plate from the right side (remove the four screws) of the device (Figure 1–8). Discard the skid plate.

Figure 1–8   Removing the Plastic Skid Plate from the EF-Series ISE

Skid Plate

Screws

Screws

MLO-009302
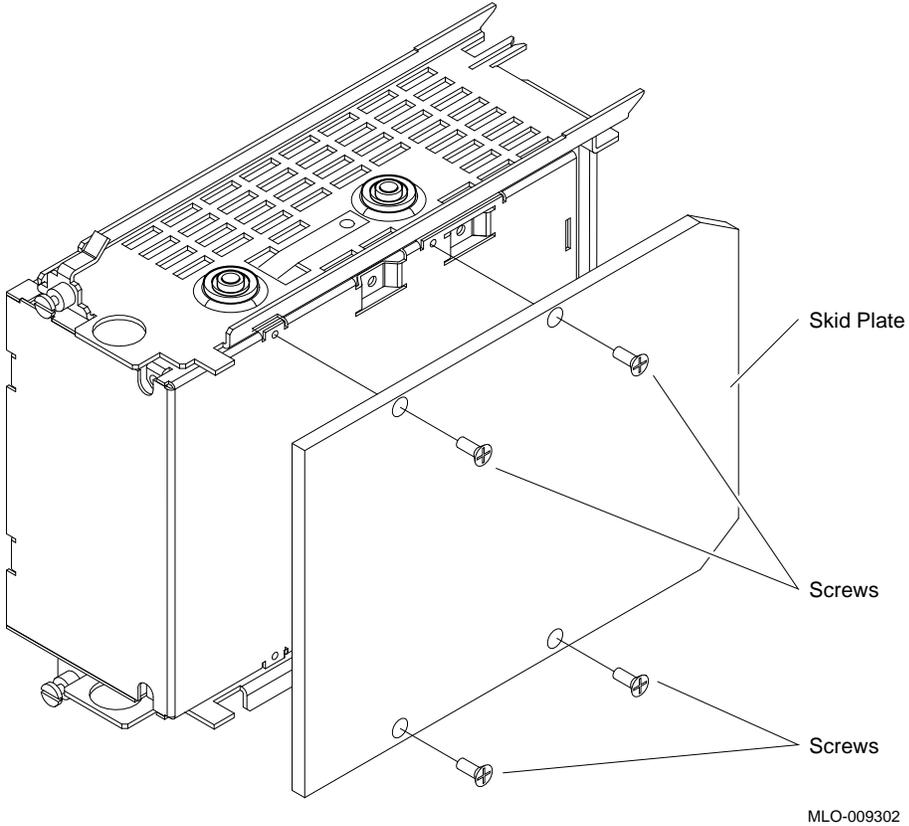
6. For the EF-series ISEs, with the side that had the skid plate attached to it facing to the right, slide the ISE along the guide rails into the mass storage cavity (Figure 1–9A).

    For 5.25-inch RF and RZ-series ISEs, and 3.5-inch RZ-series ISEs: with the ISE controller module facing to the right, slide the ISE along the guide rails into the mass storage cavity (Figure 1–9A).

    For 3.5-inch RF-series ISEs, with the controller module facing to the left, slide the ISE along the guide rails into the mass storage cavity (Figure 1–9A).

Figure 1–9 Installing the ISE in the Storage Cavity

A

Captive Screws

Remote Front
Panel Cable

Guide
Tabs

Finger Cutouts

Phillips Screw

B

Remote Front
Panel Cable

Velcro
Fastener

RF/RZ 5.25-inch

C

Remote Front
Panel Cable

RF/RZ 3.5-inch

D

RZ 5.25-inch

MLO-007244
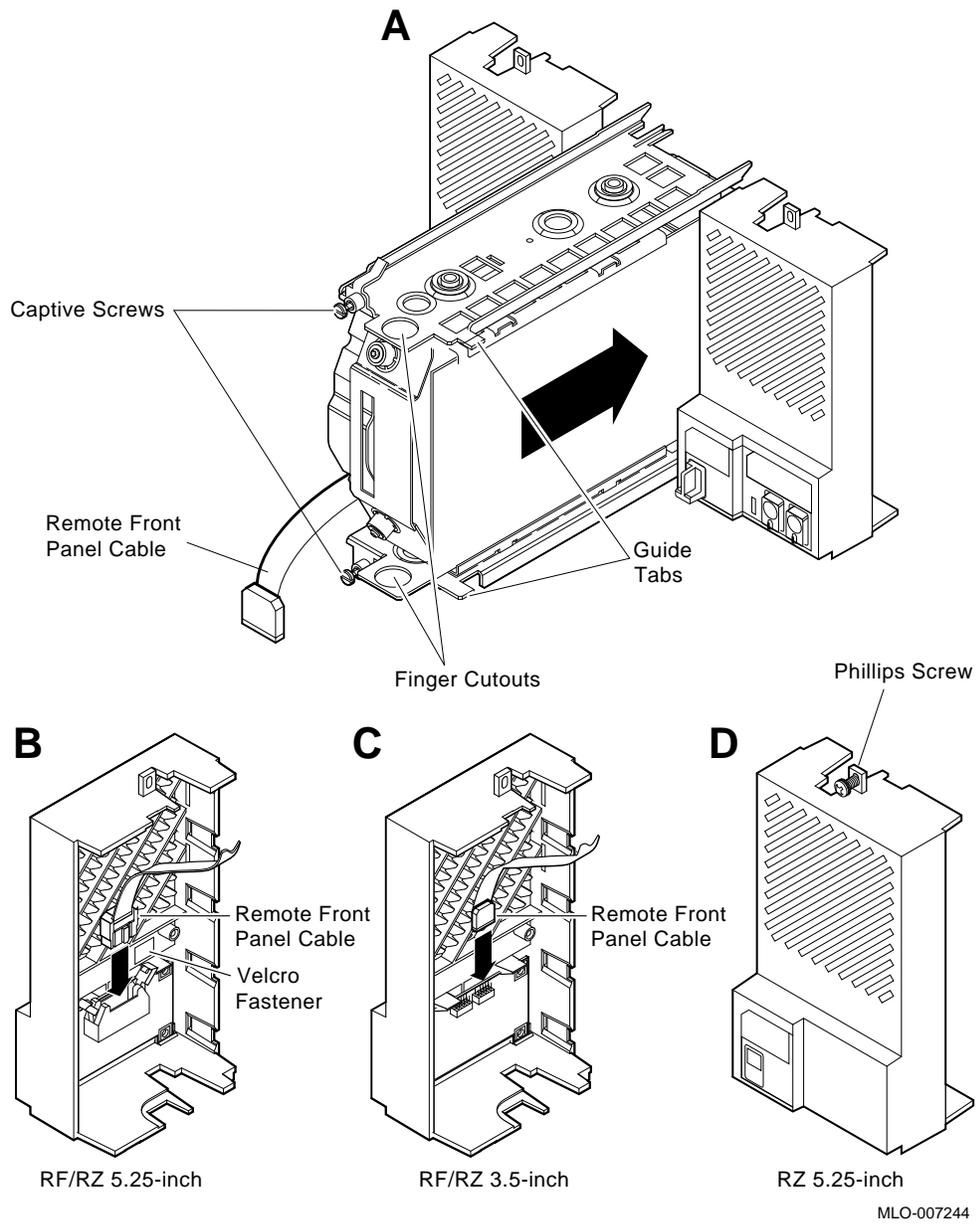
7. Refer to Figure 1–9A and install the ISE.

    √ Using the tabs in front of upper and lower finger cutouts, firmly push
       the ISE brackets until the interface card at the rear of the storage
       device plugs into its backplane connector. The guide tabs on the upper
       and lower bracket should line up with the cutouts in the chassis.

8. Tighten the two captive screws at the top and bottom of the bracket.

    ───────────────────────── **CAUTION** ─────────────────────────

    It is normal for there to be a small gap between the ISE mounting
    bracket tabs and the enclosure frame. Tighten the captive screws only
    until they are securely fastened (9 inch-pounds). Do not try to force the
    tabs to fit flush against the frame.

    ──

9. Plug the remote front panel cable(s) into the connector(s) inside the ISE
    front panel.

    For 5.25-inch ISEs see Figure 1–9B.
    For 3.5-inch ISEs see Figure 1–9C.

    For the 5.25-inch ISEs only, use Velcro on the cable and on the inside of the
    ISE front panel to secure the remote front panel cable. The 3.5-inch ISEs
    have a different connector scheme that does not require Velcro.

    ────────────────────────── **Note** ──────────────────────────

    The front panel for the 3.5-inch ISE has two remote front panel cables
    when there are two storage devices in the ISE. If the ISE contains only
    one storage device there is only one remote front panel cable.

    ──

10. Attach the ISE front panel to the enclosure by first fitting the panel's lower
    tabs into position.

    √ Fit the panel into position and secure the panel with its single captive
       Phillips screw (Figure 1–9D).

1.3 Upgrading the ISE Storage Devices

The system's storage capacity can be increased by:

- Replacing an ISE with one that has a larger storage capacity
- Installing a second storage device on a 3.5-inch ISE

The following sections describe how to upgrade the ISE storage devices.

1.3.1 Removing ISEs

To upgrade a system, it may be necessary to remove an ISE. To remove an ISE, use the following procedures.


CAUTION

Static electricity can damage integrated circuits. Always use the antistatic wrist strap and antistatic pad found in the static-protective field service kit (29-26246-00) when working with the internal parts of a computer system.

Handle ISEs with care. Dropping or bumping the ISE can damage the disk surface. Carry or hold the ISE by the underside of the lower metal bracket to avoid damage to the drive module.

---

1. After the system manager shuts down the operating system, set the lock to the bottom position to open both the top and bottom enclosure doors (Figure 1–10).

2. Set the Power switch to off (0).

Figure 1–10   Keylock Positions

Key Lock

Top Key Position

Power Switch

Bottom Key Position
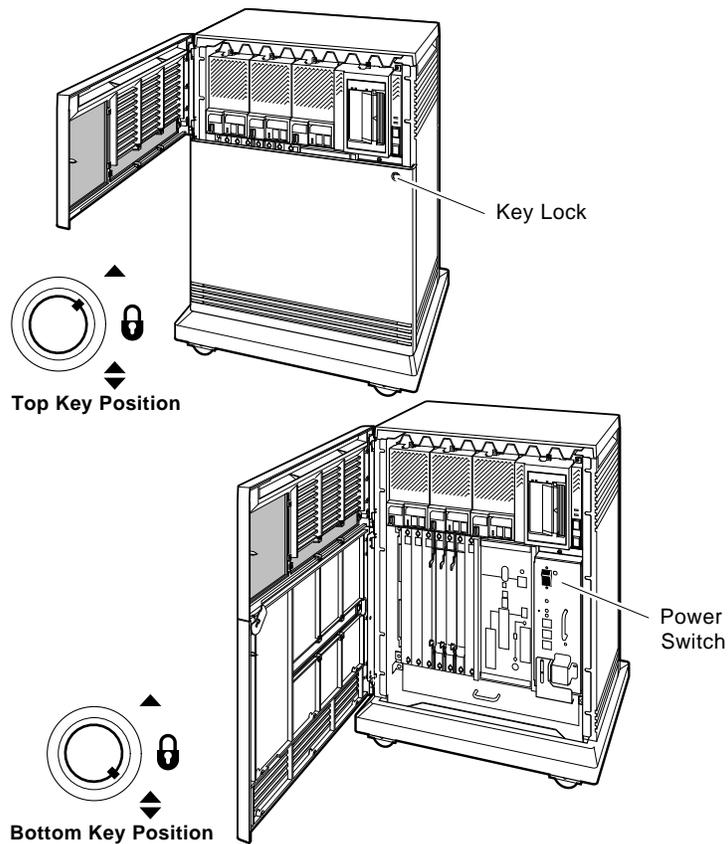
MLO-012859

3. Loosen the captive Phillips screw that secures the ISE front panel and remove the panel (Figure 1–11/Step 1).

4. Separate the ISE front panel from the enclosure, taking care not to strain the remote front panel cable(s) connected to the ISE front panel.

5. Unplug the remote front panel cable(s) from the connector(s) inside the ISE front panel (Figure 1–11/Step 2).

Note

If the ISE is a 3.5-inch device, there can be two cables.

---

6. Loosen the upper and lower captive screws that hold the ISE in place (Figure 1–11/Step 3).

7. Using the upper and lower finger cutouts on the ISE brackets, carefully pull the ISE out of its backplane connector and slide the drive out of the enclosure. Support the weight of the ISE at the underside of the lower bracket as the ISE clears the enclosure (Figure 1–11/Step 4).

CAUTION

Do not touch the drive module. The drive module contains sensitive electronic circuitry.

If you are not upgrading a 3.5-inch ISE with a second storage device, go to Section 1.3.3.

Figure 1–11 Removing the ISE to Be Upgraded or Replaced

1 Phillips Screw

2
Remote Front
Panel Cable

Velcro

RZ 5.25-inch   RF/RZ 5.25-inch   RF/RZ 3.5-inch

3 Captive Screws
(loosen)

Remote Front
Panel Cable

Guide
Tabs

4 Finger Cutouts
(pull)
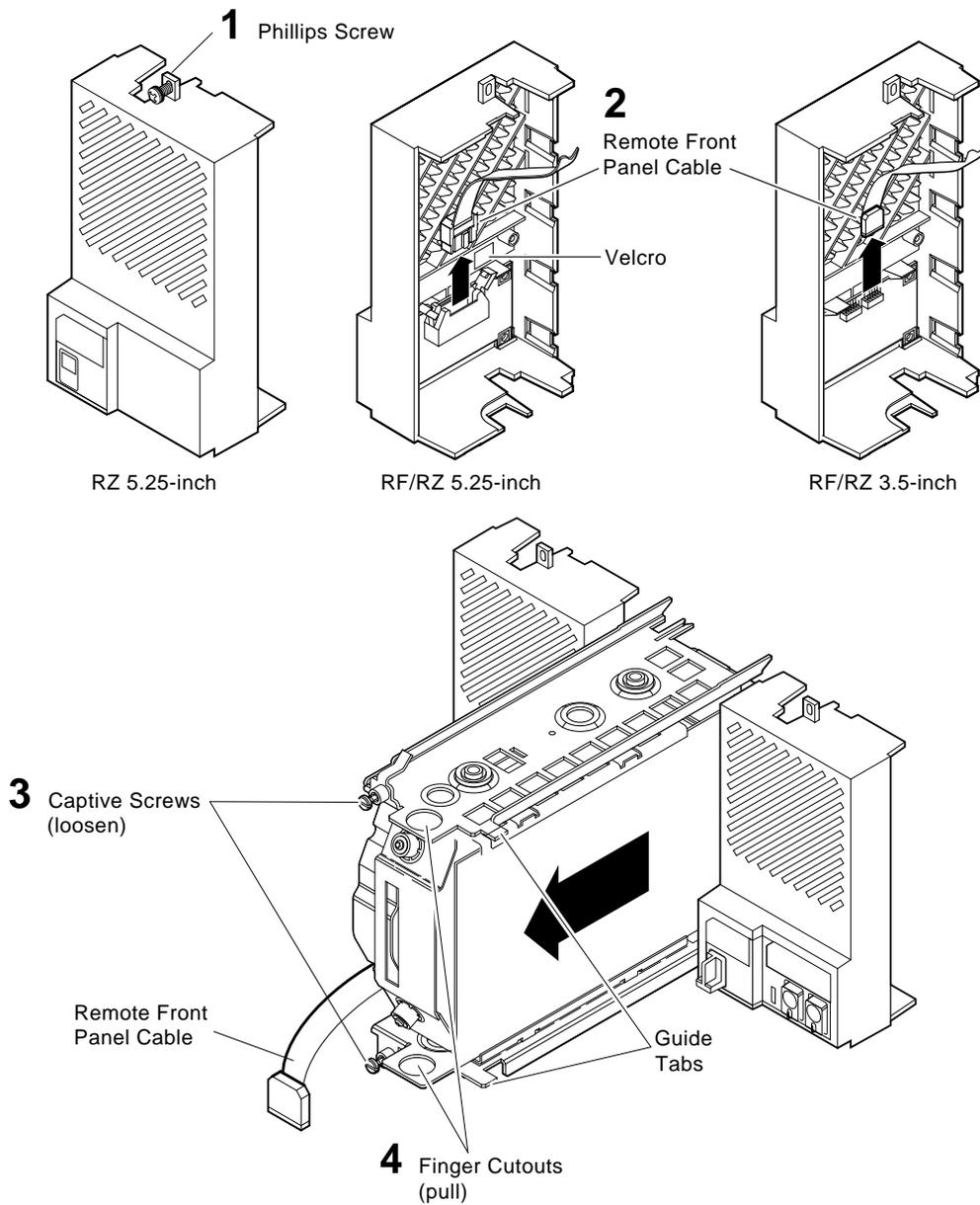
MLO-007247

1.3.2 Installing a Second Storage Device in a 3.5-inch ISE

The upgrade kit for the 3.5-inch ISE contains the following:

- Storage device
- Mounting hardware—four Phillips screws
- Remote front panel cable
- *BA400-Series Enclosures Storage Devices Installation Procedures*

The following sections describe how to install a second storage device in a 3.5-inch ISE.

1.3.2.1 Remove the Top Outside Bracket

Complete the following steps to remove the top outside bracket from the ISE.

_____ **Note** _____

To ensure that each bus node ID plug remains with the original storage device, upgrade one 3.5-inch ISE at a time.

Note the orientation of the mounting bracket before you take it apart. DSSI devices have a different orientation than SCSI devices (refer to Figure 1–3).

_____

1. Unplug the remote front panel cable from the storage device. Set it aside; it will be reinstalled later in the procedure.

2. Remove the two mounting screws on the top outside bracket and put them aside.

3. Push up the plastic flange of the interface card assembly, and lift the top outside bracket's rear slot over the plastic flange.

4. Unplug the power cable and the 50-pin signal cable from their connectors on the ISE controller module (Figure 1–12).

Figure 1–12 Removing the Top Outside Bracket from the ISE
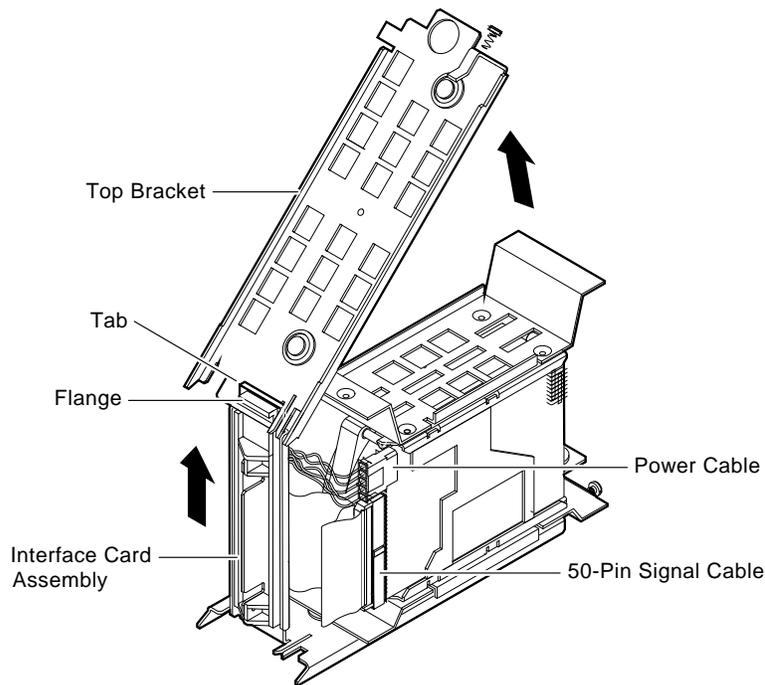
MLO-007241

5. Gently turn the storage device upside down so that it rests on the top inside bracket.

6. After removing both mounting screws on the bottom outside bracket, set the bracket and the screws aside.

1.3.2.2 Installing the New Storage Device

Complete the following procedures to install a new storage device:

1. Secure the bottom inside bracket and the top inside bracket to the storage device using the screws provided in the upgrade kit (Figure 1–13).

2. Reinstall the bottom outside bracket and then the top outside bracket.

3. Connect the power and signal (50-pin) cables to both drives.

4. Connect the remote front panel cable(s) to the controller module(s) on the storage device(s), the original one plus the one provided with the upgrade kit.

Figure 1–13 Installing the Phillips Screws That Secure the Storage Device to the Inside Brackets
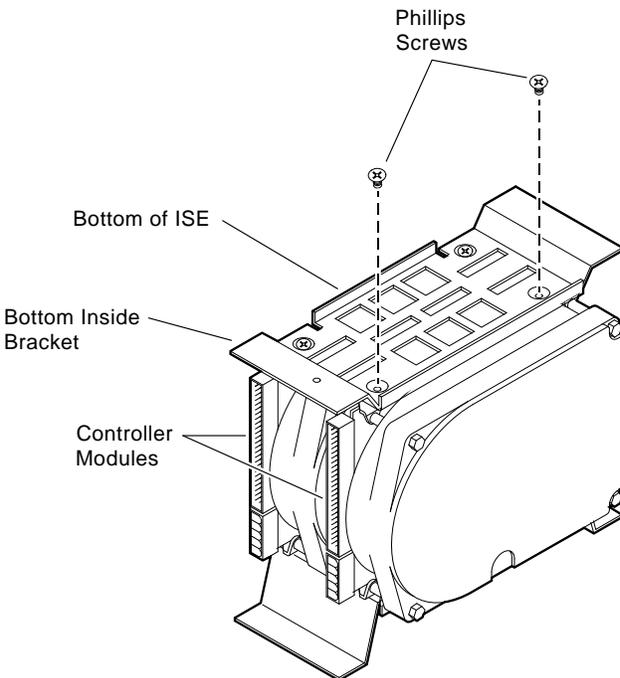
MLO-007246

Installation Notes

When you install the new drive, be sure to complete the following:

1. Align the new storage device in the same orientation as the original device.

2. When reinstalling the top outside bracket, lift the bracket's rear slot over the flange of the plastic interface card assembly, and then over the tab at the back of the bottom outside bracket. Both the tab and the flange must be inside the rear slot of the top outside bracket.

3. Make sure that the grounding foil is in place under the front mounting screw on the bottom outside bracket.

1.3.3 Installing Upgraded ISEs in the Mass Storage Cavity

To install a 5.25-inch ISE upgrade or an upgraded 3.5-inch ISE, complete the following procedure:

1. For the EF-series ISEs, with the side that had the skid plate attached to it facing to the right, slide the ISE along the guide rails into the mass storage cavity (Figure 1–14A).

   For 5.25-inch RF and RZ-series ISEs, and 3.5-inch RZ-series ISEs: with the ISE controller module facing to the right, slide the ISE along the guide rails into the mass storage cavity (Figure 1–14A).

   For the 3.5-inch RF-series ISEs: with the controller module facing to the left, slide the ISE along the guide rails into the mass storage cavity (Figure 1–14A).

2. Refer to Figure 1–14A and install the ISE.

   √ Using the tabs in front of upper and lower finger cutouts, firmly push the ISE brackets until the interface card at the rear of the storage device plugs into its backplane connector. The guide tabs on the upper and lower bracket should line up with the cutouts in the chassis.

3. Tighten the two captive screws at the top and bottom of the bracket.

   _____ **CAUTION** _____

   It is normal for there to be a small gap between the ISE mounting bracket tabs and the enclosure frame. Tighten the captive screws only until they are securely fastened (9 inch pounds). Do not try to force the tabs to fit flush against the frame.

   _____

4. Plug the remote front panel cable(s) into the connector(s) inside the ISE front panel.

    For 5.25-inch ISEs see Figure 1–14B.
    For 3.5-inch ISEs see Figure 1–14C.

    For the 5.25-inch ISEs only: use Velcro on the cable and on the inside of the ISE front panel to secure the remote front panel cable. The 3.5-inch ISEs have a different connector scheme that does not require Velcro.

    _____ **Note** _____

    The front panel for the 3.5-inch ISE has two remote front panel cables when there are two storage devices in the ISE. If the ISE contains only one storage device there is only one remote front panel cable.

    _____

5. Attach the ISE front panel to the enclosure by first fitting the panel's lower tabs into position. Fit the panel into position and secure the panel with its single captive Phillips screw (Figure 1–14D).

Figure 1–14 Installing the ISE Upgrade in the Storage Cavity

A

Captive Screws

Remote Front
Panel Cable

Guide
Tabs

Finger Cutouts

Phillips Screw

B

Remote Front
Panel Cable

Velcro
Fastener

RF/RZ 5.25-inch

C

Remote Front
Panel Cable

RF/RZ 3.5-inch

D

RZ 5.25-inch
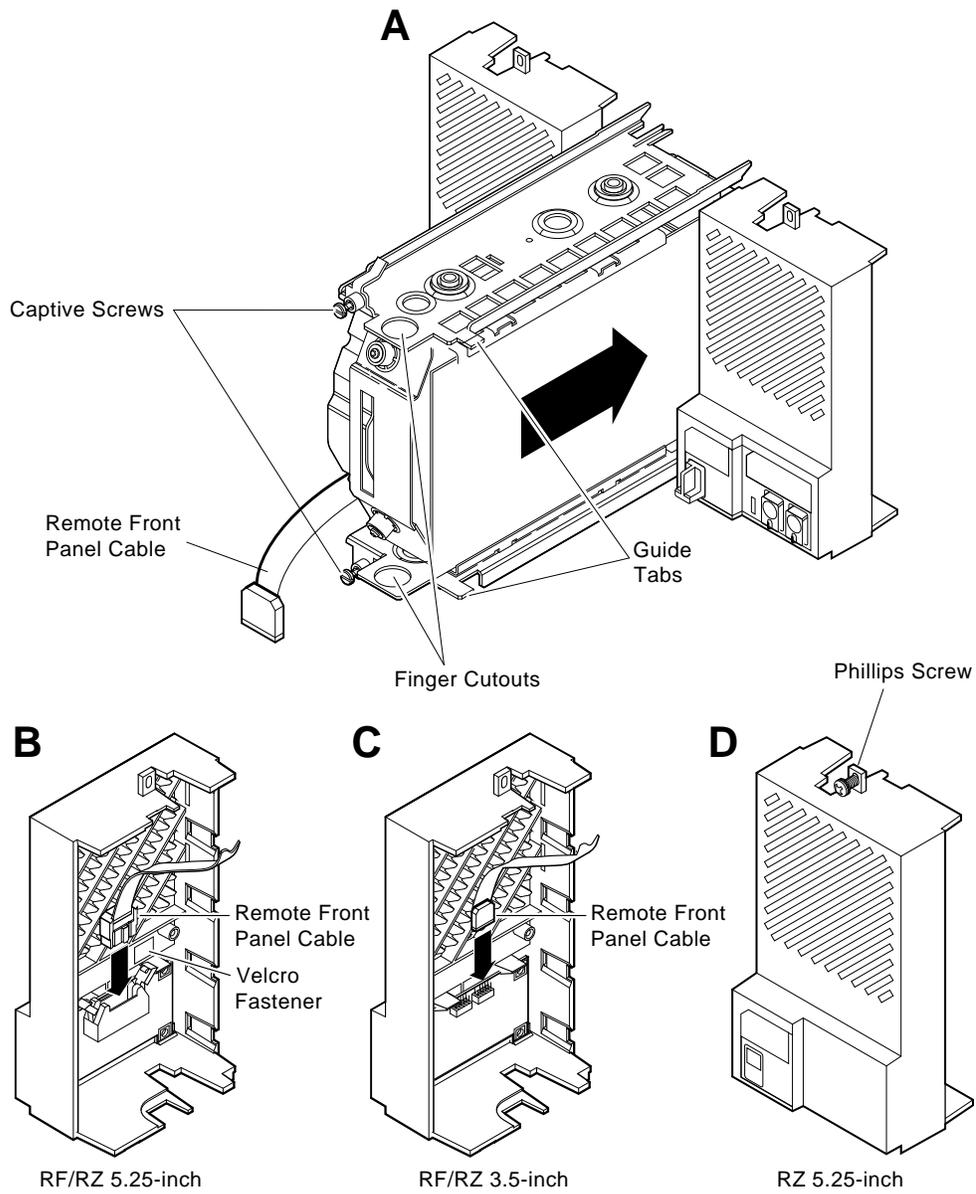
MLO-007244

1.3.4 Bus Node ID Plug Installation

The 3.5-inch configuration has two node ID plugs for two storage devices. When a 3.5-inch configuration contains only one storage device, the node ID plug for the empty cavity is unnumbered.

To insert a bus node ID plug (12-28766-19) align the two center prongs with the two center slots of the receptacle on the ISE front panel (Figure 1–15). Push the plug firmly into the receptacle. To remove a bus node ID plug, grasp it firmly and pull it straight out.

Use the following rules for numbering IDs for EF-, RF-, and RZ-series ISEs:

- For each DSSI bus or SCSI bus, do not duplicate bus node numbers for storage elements. You can have only one storage element on bus 0 identified as node 0, one storage element as node 1, and so on.

- By convention, the ISEs are numbered in increasing order from right to left, starting with 0.

_____ **NOTE** _____

The node ID address assigned by the plug is read only during the power-up sequence. If you change the bus node ID plug while the system is operating, you must turn off the system and then turn it back on for the new ID addresses to take effect.

_____

_____ **Caution** _____

On an EF-series ISE with a data retention unit, you must wait for the data retention cycle to complete, before turning the power back on.

_____

Figure 1–15 Inserting DSSI Bus Node ID Plugs

Bus Node
ID Plug

RF 5.25-inch

Bus Node
ID Plugs

RF/RZ 3.5-inch

Bus Node
ID Plug

RZ 5.25-inch
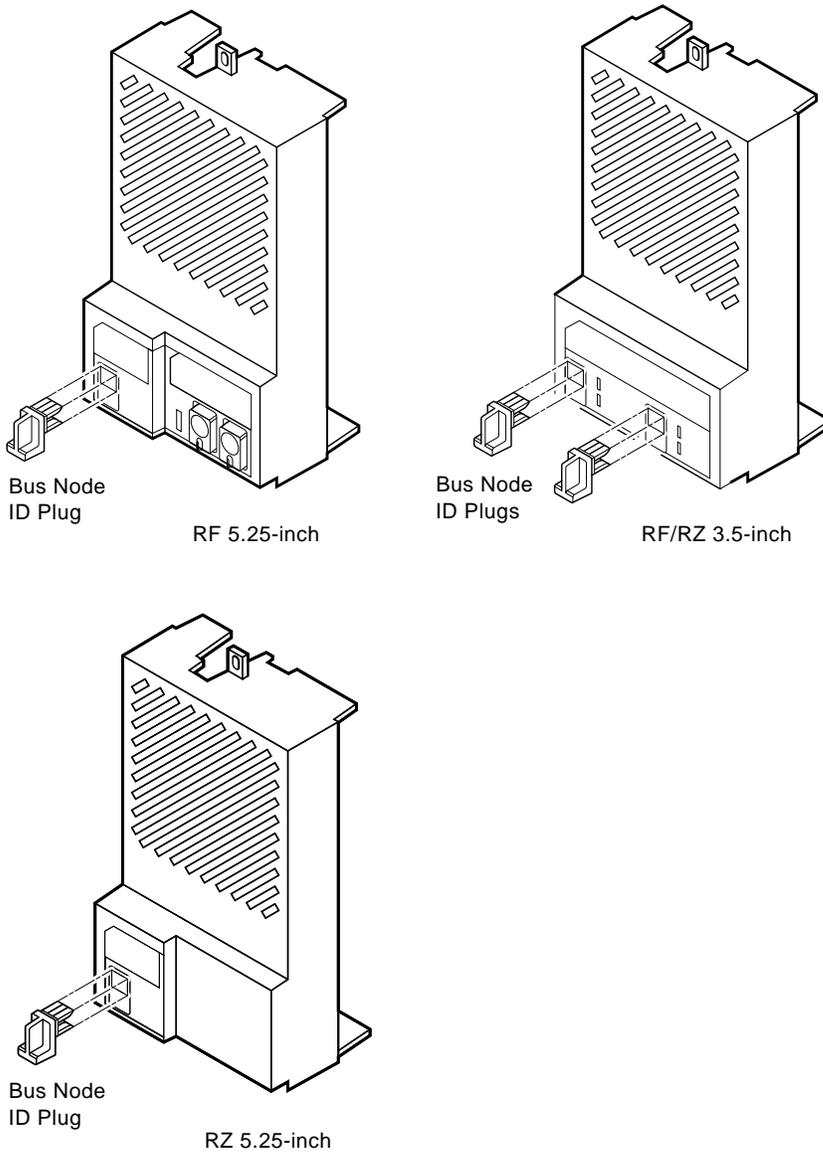
MLO-007237

1.4 Power-On Self-Test (POST)

Once the system is turned on, the EF-series, RF-series and RZ-series ISEs go through a power-on self-test (POST).

1.4.1 EF-and RF-Series, and 3.5-inch RZ-Series POST

POST is executed whenever power is applied. For EF- and RF-series, and 3.5-inch RZ-series ISEs when POST is executed successfully, the green Ready and red Fault LEDs (Figure 1–16) go through the following sequence:

1. Both LEDs are lit.

2. Both LEDs turn off.

3. The green Ready LED flashes.

4. The green Ready LED remains lit steadily, the red Fault LED remains off.

Once this sequence occurs, the ISE is ready to be used. If POST fails, the red Fault LED remains lit.

Figure 1–16   EF- and RF-Series ISE Front Panels
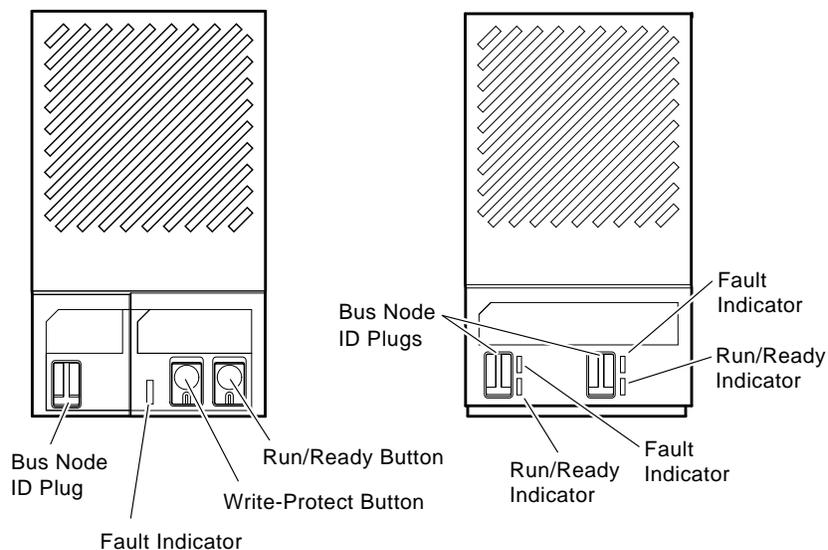
MLO-007238

On the EF-series, POST performs the following:

- Tests the control module.

- Tests the memory modules.

- Checks the configuration of the hard disk.

On the RF-series when POST begins, the first action it takes is to start the spindle spin-up sequence. Other tests are performed while the spindle is spinning up.

POST detects the following types of error conditions:

- *Controller errors*—Caused by the hardware associated with the controller function of the drive module. These errors are fatal to the operation of the ISE since the controller cannot establish a logical connection to the host. Controller errors cause the red Fault LED to light.

- *Device errors*—Caused by the hardware associated with the device control function of the drive module. These errors are not fatal since the ISE can establish a logical connection and report the error to the host. Device errors cause both LEDs to turn off for about 1 second, then the red Fault LED lights.

If the ISE passes POST, continue to Section 1.5.

1.4.2 5.25-inch RZ-Series POST

POST for a 5.25-inch RZ-series ISE is executed during power-up or from a host-initiated command. The execution time for the test should be less than two seconds. If the unit passes POST, it waits for a software command such as SHOW DEVICES. If POST fails, the device will not come on line and will not be listed in the device listing when the SHOW DEVICES command is issued.

1.5 Setting the DSSI ISE Parameters

Once installed and powered up, the DSSI ISE parameters must be set. This is done through the use of the local program PARAMS. The following procedures should be used when performing an ISE installation. If further information on the use of PARAMS is desired, refer to the appropriate integrated storage element user's guide (see Appendix A) for a complete description of the PARAMS utility.

1.5.1 Accessing PARAMS

PARAMS can be accessed in one of three ways, depending on the system you are using.

- Through OpenVMS, using the SET HOST command

- From the console, using the SET HOST command

- Through MDM, using the Device Resident Programs menu

1.5.1.1 Using OpenVMS

To access PARAMS on a system running OpenVMS Version 5.3 or higher, the command is:

```
$ SET HOST/DUP/SERVER=MSCP$DUP/TASK=PARAMS nodename
```

where "nodename" is the node name of the ISE.

_____ **NOTE** _____

To find the node name, enter SHOW DEVICES or SHOW CLUSTER at the $ prompt.

_____

To produce a file in your directory of what appears on the screen, append the qualifier/log=filename.ext (where filename.ext is what you want to name the file) to the above command.

Once you are in PARAMS, control is turned over to the utility. All interaction is through the use of commands and responses.

To exit PARAMS, enter EXIT at the PARAMS> prompt, or press one of the following key combinations: CTRL/C , CTRL/Y , or CTRL/Z .

1.5.1.2 Using Console Commands

From console mode you can access the Diagnostic and Utility Program (DUP) to examine and set parameters. The command syntax depends upon whether your system uses an embedded adapter such as the KA670 module, or a Q–bus adapter (the KFQSA module).

Embedded Adapters

To access PARAMS from a system with an embedded adapter, enter:

```
>>> SET HOST/DUP/DSSI/BUS:<BUS_NUMBER>
<NODE_NUMBER> PARAMS
```

where

<BUS_NUMBER> is the DSSI bus number (0 or 1) and <NODE_NUMBER> is the bus node ID (0–7) for the device on the bus.

NOTE

To find the DSSI bus number and node number, enter SHOW DSSI at the console (>>>) prompt.

KFQSA Storage Adapter

To access PARAMS from a system with a Q–bus adapter, enter:

```
>>> SET HOST/DUP/UQSSP/DISK <controller_number> PARAMS
```

where

<controller_number> is the controller number (provided by the SHOW UQSSP display) for the device on the bus.

After you have completed setting and examining DSSI device parameters, enter the WRITE command at the PARAMS> prompt to save the device parameters you have changed using the SET command. The changes are recorded to nonvolatile memory.

If you have changed the allocation class or node name of a device, the DUP driver utility will ask you to initialize the controller. Answer Yes (Y) to allow the changes to be recorded and to exit the DUP driver utility.

If you have not changed the allocation class or node name, enter the EXIT command at the PARAMS> prompt to exit the DUP driver utility for the specified device.

1.5.1.3 Using MDM

If neither OpenVMS nor console commands are available on your system, you can access PARAMS through MDM using the following procedure:

1. Boot MDM.

2. Enter the date and time.

3. Select the menus in the following order:

   - Service menu

   - Device menu

   - KFQSAA-KFQSA subsystem menu

   - Device Utilities menu

   - Device Resident Programs menu

   When you select the Device Resident Programs menu, the following is displayed:

   ```
   RUNNING A UTILITY SERVICE TEST

   To halt the test at any time and return to the previous menu,
   type  CTRL/C .

   KFQSAA started.
   KFQSAA pass 1 test number 3 started.
   Copyright 1988 Digital Equipment Corporation
   Completed.
   EXIT                        DRVEXR                      DRVTST
   HISTRY                      ERASE                       PARAMS
   DIRECT                      DKUTIL                      PRFMON
   VERIFY

   Please choose a local program or press  Return  to continue.
   ```

4. Enter PARAMS and press Return .

5. Once you are in PARAMS, control is turned over to the utility. All interaction is through the use of commands and responses.

6. To exit PARAMS, enter EXIT at the PARAMS> prompt, or press one of the following: CTRL/C , CTRL/Y , or CTRL/Z .

7. To exit MDM, press the Break key.

1.5.2 Setting the ISE Allocation Class

All DSSI ISEs are shipped with the allocation class set to 0. To determine what the allocation class should be set to, access a different ISE on the system and set the one you are installing to the same allocation class.

In multihost systems, you must assign the same allocation class to all host systems and all connected ISEs. This allocation class must be different from that of other systems or other hierarchical storage controllers (HSCs) in a cluster.

Use the following procedure to set the allocation class:

1. Determine what the allocation class should be set to by reading it from another ISE that is already working on the system. Use one of the procedures outlined in Section 1.5.1 to access PARAMS on the ISE from which you want to read this information.

2. At the PARAMS> prompt, enter SHOW ALLCLASS. The system displays the following:

```
Parameter     Current       Default      Type     Radix
---------     -----------   -----------  ------   -------
ALLCLASS            1             0       Byte     Dec   B

PARAMS>
```

3. Make a note of the allocation class. In the example above, the allocation class has been set to 1. Exit PARAMS and return to the root prompt (OpenVMS, console, or MDM).

4. Access PARAMS on the newly installed ISE, using one of the procedures outlined in Section 1.5.1.

5. Enter SHOW ALLCLASS. The system responds with:

```
Parameter      Current        Default      Type     Radix
---------    -----------    -----------    ------   -------
ALLCLASS             0              0       Byte     Dec   B
PARAMS>
```

6. Enter SET ALLCLASS 1 (for our example). You want to set the ISE to the same allocation class as all the other ISEs on the DSSI bus.

7. Enter SHOW ALLCLASS to check the new allocation class.

   The system responds with:

```
Parameter      Current        Default      Type     Radix
---------    -----------    -----------    ------   -------
ALLCLASS             1              0       Byte     Dec   B
PARAMS>
```

8. Enter WRITE. The system responds with:

```
Changes require controller initialization, ok? [Y/ (N)]
```

9. Enter **Y** to save the new allocation class value.

1.5.3 Setting the MSCP Unit Number

The ISE is set at the factory to read the DSSI node ID as the MSCP unit number. Unit numbers for all DSSI devices connected to a system's associated DSSI buses must be unique. When more than one bus is being used, and your system is using a nonzero allocation class, you need to assign new unit numbers for devices on all but one of the DSSI buses.

When assigning a different unit number, you must also set the FORCEUNI parameter to 0. This allows the unit number you have set to be used. The factory setting for FORCEUNI is 1, forcing the DSSI node ID to be used as the MSCP unit number.

The following example shows how to change the MSCP unit number:

```
PARAMS> sh unitnum
Parameter   Current        Default        Type      Radix
---------   ------------   -------------  ---------  -----
UNITNUM             5              0        Word      Dec   U

PARAMS> set unitnum 21

PARAMS> sh unitnum
Parameter   Current        Default        Type      Radix
---------   ------------   -------------  ---------  -----
UNITNUM            21              0        Word      Dec   U

PARAMS> sh forceuni
Parameter   Current        Default        Type      Radix
---------   ------------   -------------  ---------  -----
FORCEUNI            1              1        Boolean    0/1  U

PARAMS> set forceuni 0

PARAMS> sh forceuni
Parameter   Current        Default        Type      Radix
---------   ------------   -------------  ---------  -----
FORCEUNI            0              1        Boolean    0/1  U

PARAMS> write
```

1.5.4 Setting the ISE Node Name

Setting the ISE node name is an optional step. All DSSI ISEs come with a computer-generated node name. The user may wish to set this node name to a more recognizable character string.

The following example changes the node name from the default (R1EJAA) to the new string "SUSAN." When entering ASCII strings, you may use single quotes, double quotes, or no quotes at all.

```
PARAMS> show node
Parameter     Current        Default     Type     Radix
---------    -------------   ------------ -------  -----
NODENAME        R1EJAA         RF31       String   ASCII   B

PARAMS> set node "susan"
PARAMS> show node
Parameter     Current        Default     Type     Radix
---------    -------------   ------------ -------  -----
NODENAME        SUSAN          RF31       String   ASCII   B

PARAMS> write
```

NOTE

Using the WRITE command will make any changes permanent.

1.6 Testing the ISE

CAUTION

Running DRVTST may erase all user data on the ISE, and should only be used when installing a new ISE.

Once the ISE parameters are set, test the drive by using DRVTST, the local program. DRVTST is accessed in the same way as PARAMS, using one of the procedures outlined in Section 1.5.1. In this case, instead of specifying PARAMS, specify DRVTST.

DRVTST is a comprehensive hardware test. Once invoked, it will prompt you to specify whether the test should be a read/write test or a read-only test. After you specify the type of test, it will run for 5 minutes. After 5 minutes, DRVTST will indicate either that the test passed, or that a failure occurred.

Once the ISE has passed DRVTST, the installation is complete. If further information on the use of DRVTST is desired, refer to the appropriate integrated storage element user's guide (see Appendix A) for a complete description of the DRVTST local program.

1.6.1 DRVTST Example

The following example shows how to run DRVTST. In this example, DRVTST is accessed through OpenVMS on an ISE with a node name R1EJAA.

```
$ SET HOST/DUP/SERVER=MSCP$DUP/TASK=DRVTST R1EJAA
```

The program displays the following:

```
Copyright © 19nn Digital Equipment Corporation
Write/read anywhere on the medium? [1=Yes/(0=No)]
```

You must respond to the query for the program to continue. By answering yes (1), you select a read-write test, and DRVTST prompts you with another query.

In this case, type 1 Return, selecting a read-write test. DRVTST then displays the following:

```
User data will be corrupted. Proceed? [1=Yes/(0=No)]
```

This query gives you the chance to reconsider. If you answer no (0), then your response to the first query is overridden, and a read-only test is executed. If you answer yes (1), DRVTST begins executing a read-write test of the ISE.

In this case, type 1 Return. During the test, the program displays the following message:

```
  5 minutes to complete.
```

──────────────────────── **NOTE** ────────────────────────

You may abort the test at any time by pressing one of the following key combinations: CTRL/C , CTRL/Y , or CTRL/Z . If you abort the test, the informational message Operation aborted by user will be displayed.

──

If DRVTST is executed successfully, the following message is displayed:

```
Test passed.
```

1.6.2 Error Messages

If an error condition is found during the execution of DRVTST, an error message is displayed. Two types of errors are reported: soft errors, which are corrected during the operation of the ISE, and fatal errors, which prevent the ISE from functioning.

The following table indicates the error messages you may see and what they mean.

Table 1–1   DVTST Error Messages

Message	Description
Soft read error on head xx track yyyy. Soft write error on head xx track yyyy. Soft compare error on head xx track yyyy.	These are soft error messages which indicate that an operation succeeded, but that the error recovery firmware was invoked. These messages may indicate a forced-error flag or correctable ECC error, or that the read/write head was temporarily off-track. These are corrected during normal operation.
xxxx - Unit diagnostics failed.	This is a fatal error. xxxx is the MSCP error code.
xxxx - Unit read/write test failed.	This is a fatal error. xxxx is the MSCP error code.

Make note of any soft error messages that are displayed for possible future reference. If you encounter a fatal error, do not complete the installation.

1.7 Setting the SCSI ISE Parameters

Refer to the *HSD05 DSSI-to-SCSI Bus Adapter Operation Information for BA400-Based VAX 4000 Systems* manual (EK–HSDC5-IN.) for the procedures to set the SCSI ISE parameters.

1.7.1 Problem Resolution

Should you encounter problems during installation, refer to the appropriate system troubleshooting and diagnostics manual.

2

TK-Series Tape Drive

2.1 General

TK-series tape drives (Figure 2–1 and Figure 2–2) are Q–bus devices. A TK-series tape drive subsystem requires a TQK-series controller module.

Detailed information for configuring TK-series tape drives is contained in the *Microsystems Options* manual.

Figure 2–1   TK70 Tape Drive Front Panel


MLO-002292
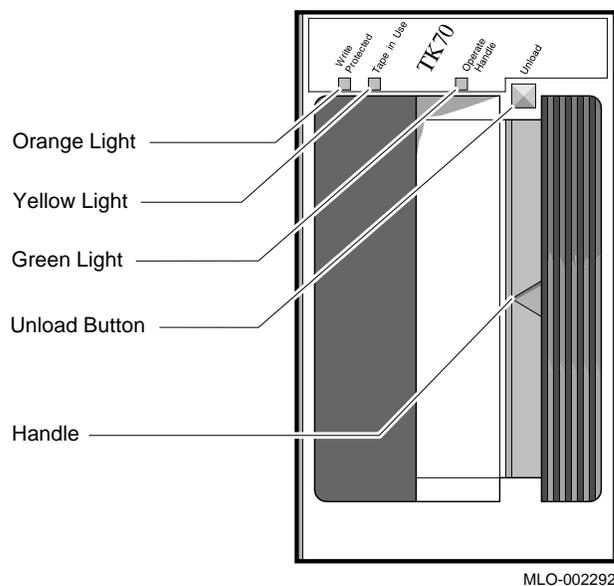
Figure 2–2 TK-Series Tape Drive - Rear View

Data Cable

Interface
Card Assembly
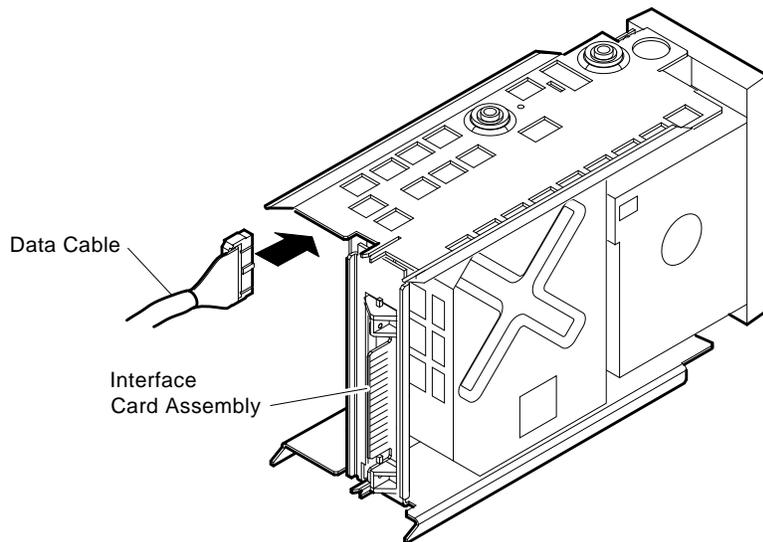
MLO-006529

2.2 TQK-Series Controller Modules

Perform the following procedures to install and configure a TQK-series
controller module.

2.2.1 Using the CONFIG Utility for Module Configuration and Naming

Each module in a system must use a unique device address and interrupt vector. The device address is also known as the control and status register (CSR) address. Most modules have switches or jumpers for setting the CSR address and interrupt vector values. The value of a floating address depends on what other modules are housed in the system.

Set CSR addresses and interrupt vectors for a module as follows:

1. Determine the correct values for the module with the CONFIGURE command at the console I/O prompt (>>>). The CONFIG utility eliminates the need to boot the VMS operating system to determine CSRs and interrupt vectors. Enter the CONFIGURE command, then HELP, for the list of supported devices.

```
>>>CONFIGURE
Enter device configuration, HELP, or EXIT
Device, Number? help
Devices:

 LPV11     KXJ11      DLV11J      DZQ11     DZV11     DFA01
 RLV12     TSV05      RXV21       DRV11W    DRV11B    DPV11
 DMV11     DELQA      DEQNA       DESQA     RQDX3     KDA50
 RRD50     RQC25      KFQSA-DISK  TQK50     TQK70     TU81E
 RV20      KFQSA-TAPE KMV11       IEQ11     DHQ11     DHV11
 CXA16     CXB16      CXY08       VCB01     QVSS      LNV11
 LNV21     QPSS       DSV11       ADV11C    AAV11C    AXV11C
 KWV11C    ADV11D     AAV11D      VCB02     QDSS      DRV11J
 DRQ3B     VSV21      IBQ01       IDV11A    IDV11B    IDV11C
 IDV11D    IAV11A     IAV11B      MIRA      ADQ32     DTC04
 DESNA     IGQ11      DIV32       KIV32     DTCN5     DTC05
 KWV32     QZA
Numbers:
 1 to 255, default is 1
Device,Number? cxa16,1
Device,Number? desqa,1
Device,Number? tqk70
Device,Number? qza
Device,Number? kfqsa-disk
Device,Number? exit

Address/Vector Assignments
-774440/120 DESQA
-772150/154 KFQSA-DISK
-774500/260 TQK70
-760440/300 CXA16
-761300/310 QZA
```

> **Note**
>
> Of the devices listed in the CONFIG display, not all may be supported on your system. See the *Microsystems Options* manual for supported options.

The LPV11–SA has two sets of CSR address and interrupt vectors. To determine the correct values for an LPV11–SA, enter LPV11,2 at the `DEVICE` prompt for one LPV11–SA. Enter LPV11,4 for two LPV11–SA modules.

2. Once you have determined the correct address for any TK device on the system, make sure the jumpers on the controller module (Figure 2–3 and Figure 2–4) are set correctly for that address. See Section 2.2.1.1 for examples of jumper configurations.

**Figure 2–3   TQK-Series Controller Module (TQK50)**

MLO-006532
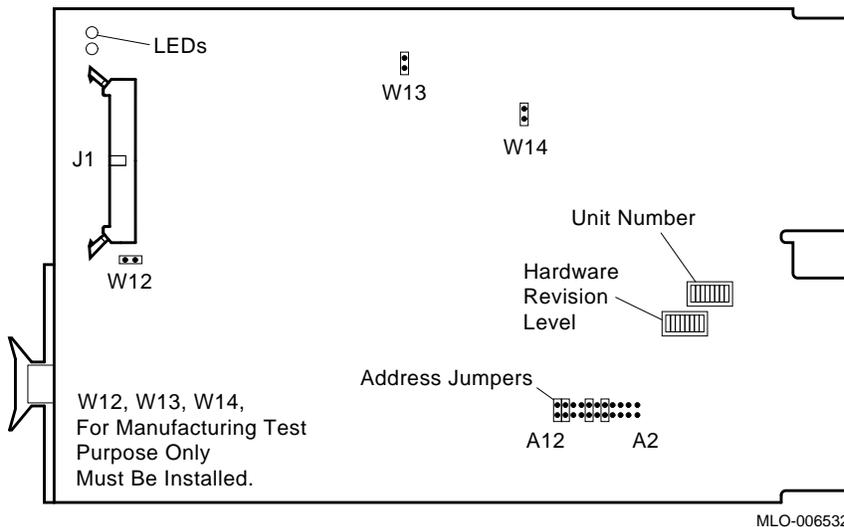
Figure 2–4 TQK-Series Controller Module (TQK70)

MLO-006531
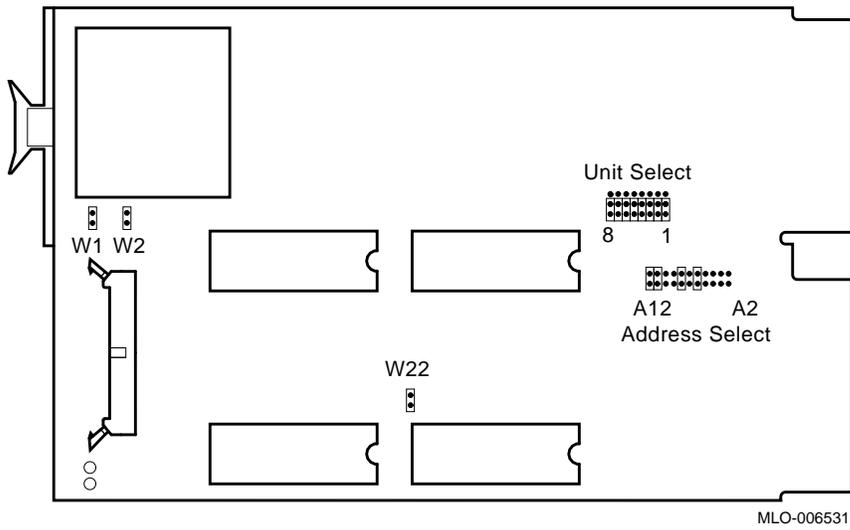
2.2.1.1 Example 1

The following example shows how the jumpers are set for the first logical TK device. (Assume there are two.) Set the jumpers on the new controller as follows:

```
           A12                        A2
           .  .  .  .  .  .  .  .  .  .
Jumpers    |  |        |  |     .  .  .
           .  .  .  .  .  .  .  .  .  .
Address    7     4        5        0     0
```

2.2.1.2 Example 2

The jumper configuration below signifies the I/O (or CSR) address of 774500 for unit 0, and 760404 for unit 1. Check that the controller for unit 0 has its unit number set for unit 0 and that the controller for unit 1 has its unit number set for unit 1.

```
           A12                            A2
           .  . .  .   . .  . .  . .  .
   Unit 0  |  |         |   |
           .  . .  .   . .  . .  . .  .
           7    4       5     0    0


           .  . .  .   . .  . .  . .  .
   Unit 1              |           |
           .  . .  .   . .  . .  . .  .
           6    0       4     0    4
```
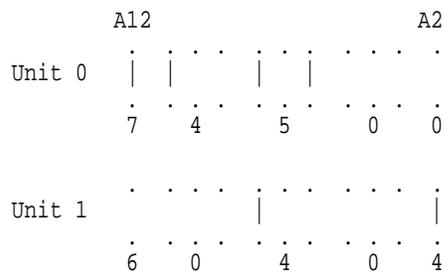
On a TQK70 module you can select the unit number by installing the Unit Select jumpers as shown in the following table. If the OpenVMS operating system is installed, you do not have to change the jumper settings.

Table 2–1 Unit Number Settings

Unit	Jumpers							
Number	8	7	6	5	4	3	2	1
0	0	0	0	0	0	0	0	0^1
1	0	0	0	0	0	0	0	1^2
2	0	0	0	0	0	0	1	0
3	0	0	0	0	0	0	1	1
4	0	0	0	0	0	1	0	0
5	0	0	0	0	0	1	0	1
6	0	0	0	0	0	1	1	0
7	0	0	0	0	0	1	1	1

[1]0 = jumper on center and bottom post

[2]1 = jumper on center and top post

_____ **Note** _____

The unit number settings for a TQK50 module are implemented by
setting a DIP switch on the module (Figure 2–3). Switch 8 of the DIP
switch is located nearest the module edge.

2.2.2 Removing ISEs

If integrated storage devices (ISEs) are installed in any mass storage slots, you must remove those devices to route the TQK-series module data cable.

_____ **CAUTION** _____

Static electricity can damage integrated circuits. Always use the antistatic wrist strap and antistatic pad found in the static-protective field service kit (29-26246-00) when working with the internal parts of a computer system.

Handle ISEs with care. Dropping or bumping the ISE can damage the disk surface. Carry or hold the ISE by the underside of the lower metal bracket to avoid damage to the drive module.

_____

1. After the system manager shuts down the operating system, open the enclosure door (refer to Figure 1–10), and set the Power switch to off (0) (Figure 2–5).

**Figure 2–5 Power Switch Location**

Power Switch
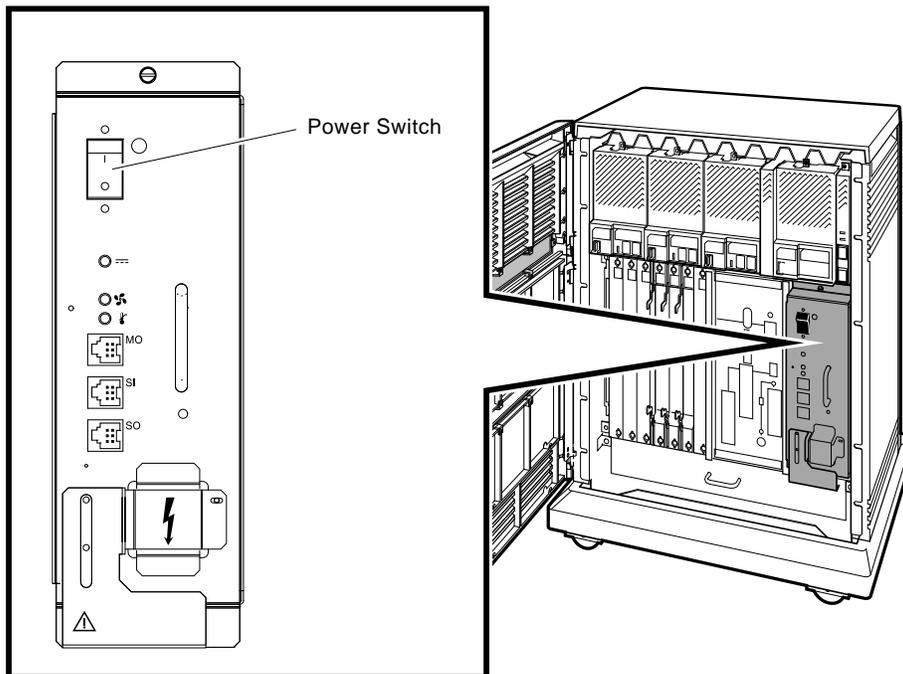
MLO-006628

2. Loosen the captive Phillips screw (at the top) that secures the blank ISE panel (70-27049-01) and filler panel (70-27414-01) in mass storage slot 0. Slot 0 is the right-most mass storage cavity in the top row of the enclosure. Remove both blank panels.

3. Loosen the captive Phillips screw (at the top) that secures an ISE front panel (Figure 2–6A).

4. Separate the ISE front panel from the enclosure, taking care not to strain the remote front panel cable that is connected to the ISE front panel.

5. Unplug the remote front panel cable(s) from the module inside the ISE front panel (Figure 2–6B) and set the panel aside.

6. Label the ISE with the ID number(s) of the front panel that was removed. This front panel must be re-installed with the ISE from which it had been removed so that the unit number (specified by the bus node ID plug) is not changed.

7. Loosen the upper and lower captive screws that hold the ISE in place (Figure 2–6C).

8. Using the upper and lower finger cutouts on the ISE brackets, carefully pull the ISE out of its backplane connector and slide the drive out of the enclosure. Support the weight of the ISE at the underside of the lower bracket as the ISE clears the enclosure (Figure 2–6C).

—————————————————— **CAUTION** ——————————————————

Do not touch the drive module. The drive module contains sensitive electronic circuitry.

Figure 2–6   Removing an ISE

Phillips Screw

A

B

Remote Front
Panel Cable

Captive Screws

C

Remote Front
Panel Cable

Finger Cutouts
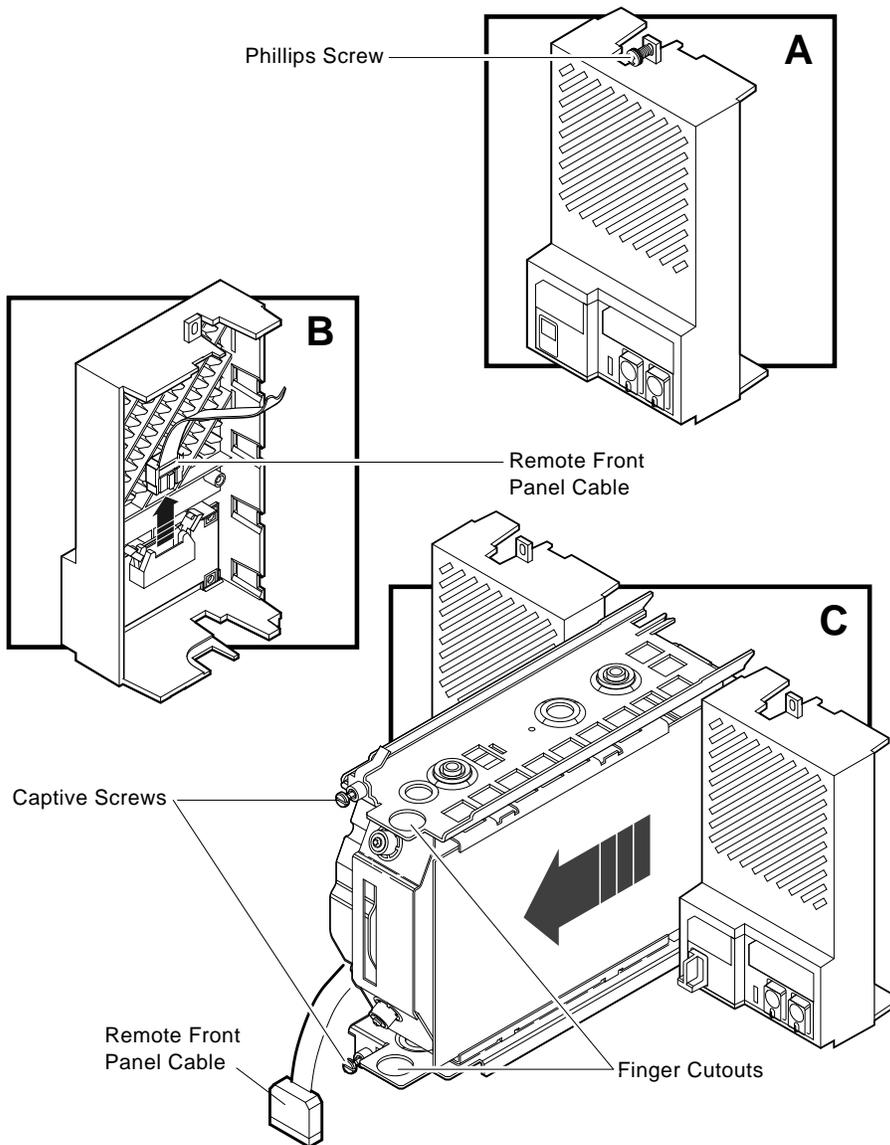
MLO-004210

2.2.3 Installing the TQK-Series Controller Module and TK-Series Tape Drive

Install the TQK-series controller module and TK-series tape drive as follows.

1. Install the TQK-series controller module in the first available Q–bus slot (Figure 2–7).

2. Connect the TQK-series data cable (TK50/TK70: 17-01363-01) to the module. Route the cable up through the card cage and along the front of the hollow cavity between the card cage area and mass storage cavity to slot 0 of the mass storage cavity. Route the cable to the back of slot 0, out of the hollow cavity, and then to the front of slot 0 (Figure 2–7). Dress the cable so that it does not interfere with air flow or the re-installation of ISEs.

Figure 2–7 Installing the TQK-Series Controller Module and Routing the Data Cable
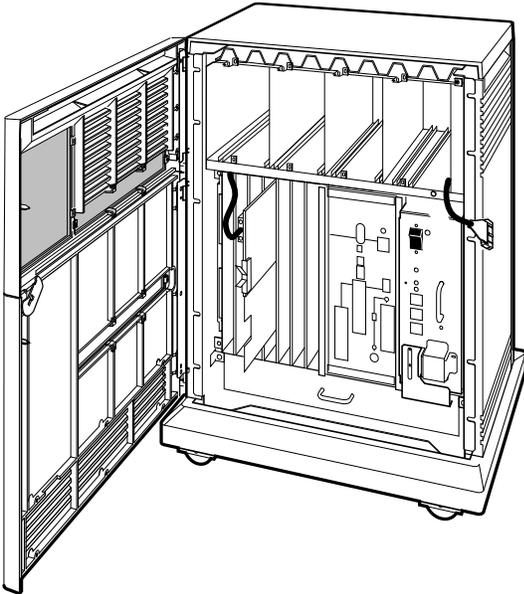
MLO-006530

3. Grasp the TQK data cable located in mass storage slot 0, and connect it to the rear of the TK-series tape drive (Figure 2–8).

Figure 2–8   Attaching the Data Cable to the TK-Series Tape Drive

Data Cable

Interface
Card Assembly
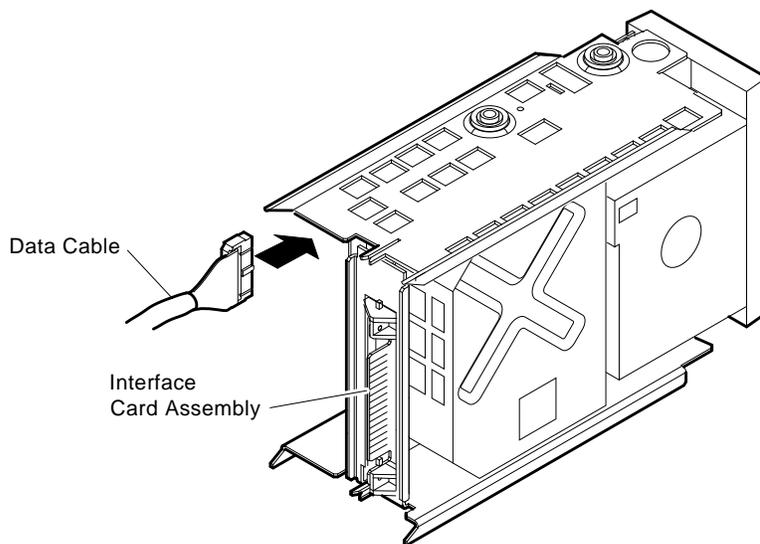
MLO-006529

4. With the TK-series tape drive upright (LEDs at the top), slide the drive along the guide rails (Figure 2–9A) into mass storage slot 0. Tape drives install only into mass storage slot 0.

5. Using the upper and lower finger cutouts on the drive brackets, (Figure 2–9A) firmly push the drive brackets until the interface card at the rear of the drive plugs into its backplane connector. Be careful not to pinch the cable when inserting the drive.

6. Tighten the two captive screws (Figure 2–9A).

_____ **CAUTION** _____

It is normal for there to be a small gap between the drive mounting bracket tabs and the enclosure frame. Tighten the captive screws only until they are securely fastened (9 inch pounds). Do not try to force the tabs to fit flush against the frame.

_____

**Figure 2–9 Installing a TK-Series Tape Drive**
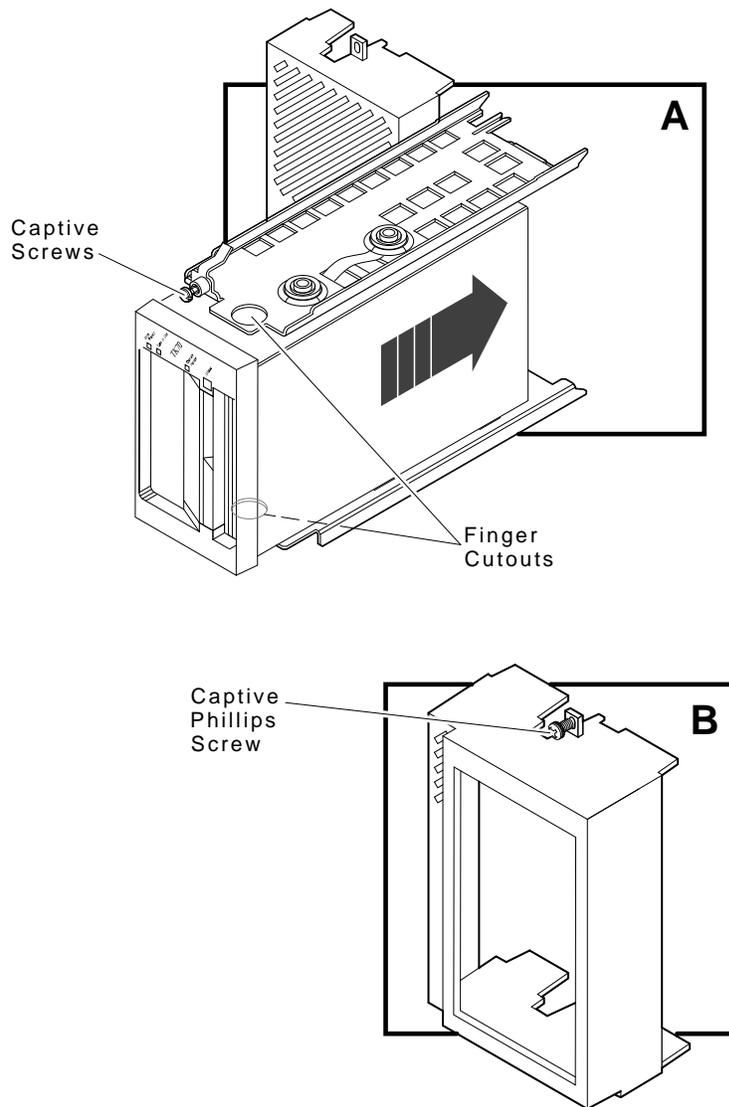
MLO-006534

7. Attach the drive front panel to the enclosure by first fitting the panel's
    lower tabs into position. Secure the panel with its single captive Phillips
    screw (Figure 2–9B).

To replace the ISEs, reverse the procedure in Section 2.2.2. For additional information on removing and replacing the ISEs, refer to the appropriate BA400-series enclosure maintenance guide (see Appendix A).

The ISEs and tape drive are shown installed in Figure 2–10.

Figure 2–10   ISEs and Tape Drive Installed
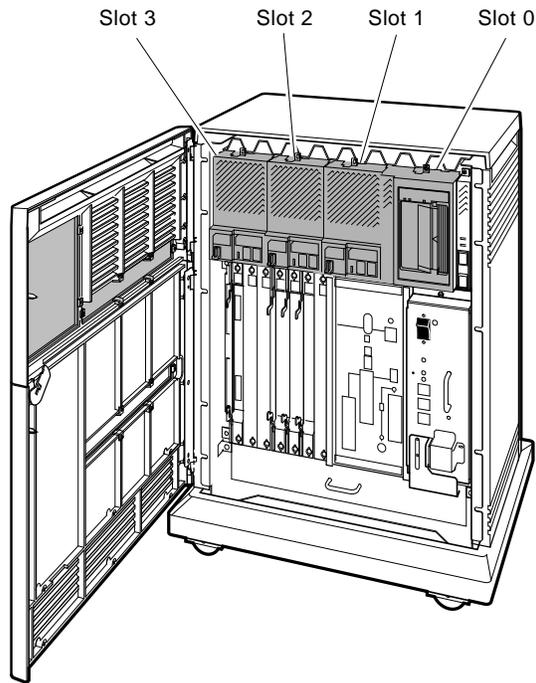
MLO-006528

2.3 Power-On Self-Test

The tape drive board contains firmware that enables testing of basic drive functions. Faults are indicated by the LED indicators on the front panel and error codes are sent to the controller.

2.3.1 TK70 Tape Drive POST

Use the following procedure to execute the POST.

1. Power on the system.

    *   All three indicators (orange, yellow, and green) light (see Figure 2–1.)

    *   The yellow indicator flashes for about 15 seconds indicating that the self-test is running.

Successful POST

After successful completion of the POST:

*   The green indicator remains on indicating that you can now operate the handle and install a tape cartridge.

*   All other indicators shut off.

After completing a successful execution of the POST, have the system manager restart the operating system and assign a device name to the TK70 drive.

Unsuccessful POST

The POST failed if all three indicators continue to flash.

√ Attempt to clear the failure by pressing and releasing the Unload Button (see Figure 2–1).

√ If the failure continues, refer to the appropriate system troubleshooting and diagnostics manual (Appendix A).

2.3.2 TK50 Tape Drive POST

Use the following procedure to execute the POST.

1. Power on the system.

   - The red indicator flashes for about 15 seconds to indicate that the self-test is running (see Figure 2–11).

   - The green indicator remains off.

Successful POST

After successful completion of the POST:

- The red indicator stops flashing and shuts off.

- The green indicator lights indicating that you can now operate the handle and install a tape cartridge.

After completing a successful execution of the POST, have the system manager restart the operating system and assign a device name to the TK50 drive.

Unsuccessful POST

The POST failed if the red indicator continues to flash.

√ Attempt to clear the failure by pressing and releasing the LOAD/UNLOAD button four times.

√ If the failure continues, refer to the appropriate system troubleshooting and diagnostics manual (Appendix A).

Figure 2–11   TK50 Tape Drive Front Panel

Load/Unload
Button,
Red Light

Handle Closed

Green
Indicator
Light

MLO-006586

3
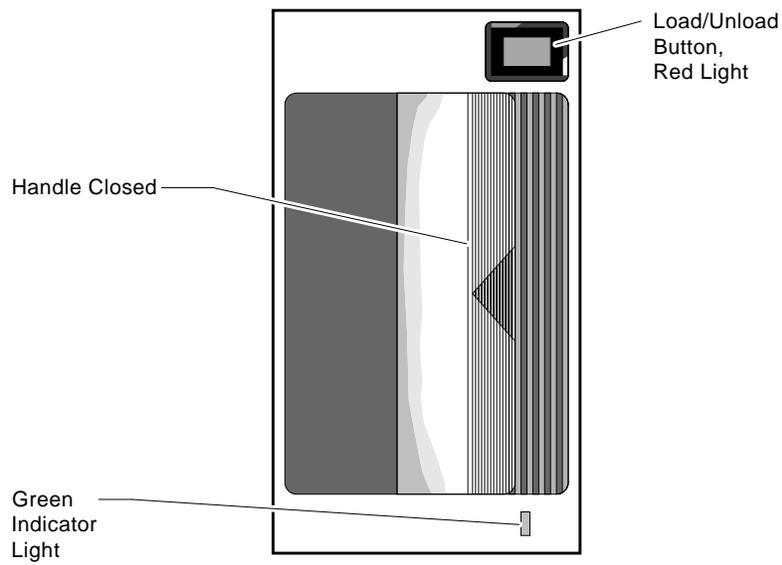
TLZ-Series Tape Drives

3.1 General

This chapter describes how to install the TLZ-series tape drive. For more
detailed information about installing add-on storage devices into a BA400-
series enclosure, refer to the appropriate enclosure maintenance guide (see
Appendix A).

3.2 TLZ04 Tape Drive

The TLZ04 tape drive (Figure 3–1) is a 5.25-inch tape drive with a data storage
capacity of 1.2 gigabytes. The TLZ04 tape drive interfaces to the system by
means of a Small Computer System Interface (SCSI).

Figure 3–1   TLZ04 Tape Drive
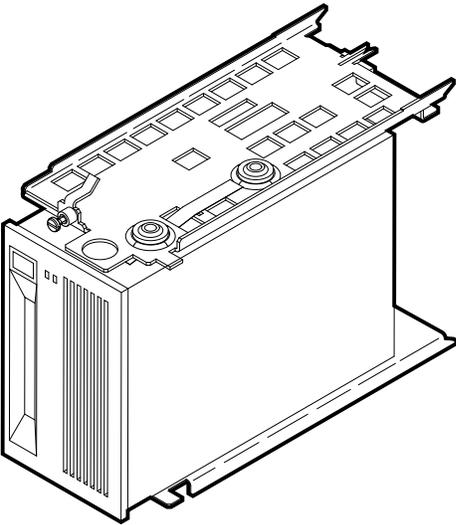
MLO-006535

3.3 TLZ04 Installation Procedure

Use the following procedure to install the tape drive into a BA400-series enclosure. Have the system manager shut down the operating system before installing the tape drive.

CAUTION

Static electricity can damage integrated circuits. Use the antistatic wrist strap and antistatic pad found in the static-protective field service kit (29-26246-00) when you work with the internal parts of a computer system.

---

1. Open the top and bottom enclosure doors.

2. Power off the system and unplug the power cord from the wall outlet.

3. Loosen the captive Phillips screw (at the top) and remove the drive front panel and filler panel located in mass storage slot 0.

Figure 3–2 Opening the Enclosure Doors

Key Lock

Top Key Position

Slot 0

Power
Switch

Bottom Key Position
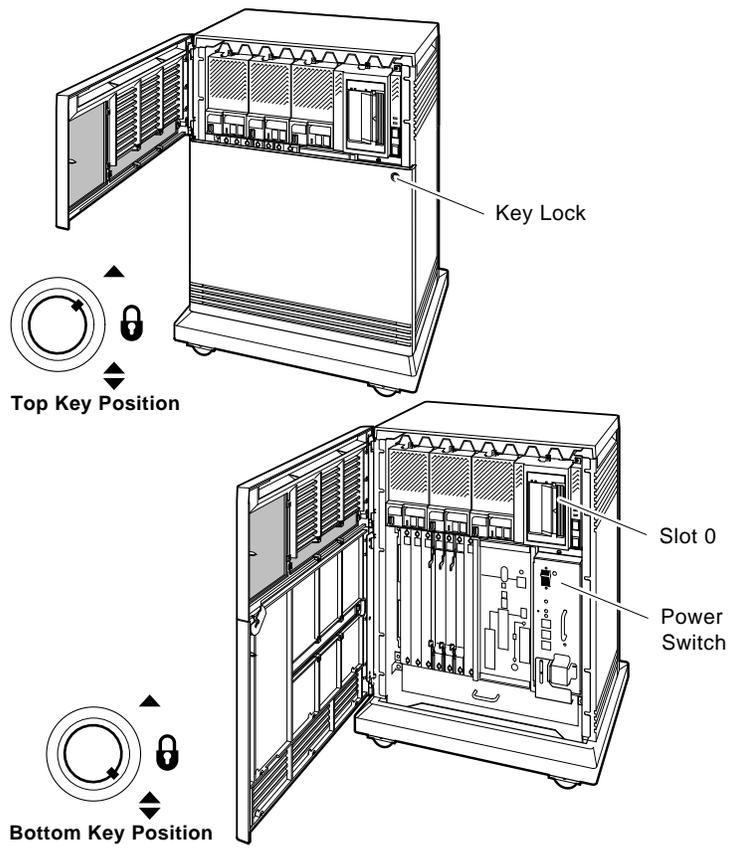
MLO-012856

4. With the tape drive right side up (LEDs at top), slide the drive (Figure 3–3A) into mass storage slot 0.

5. Using the tabs in front of the upper and lower finger cutouts, firmly push the drive brackets until the interface card at the rear of the drive plugs into its backplane connector.

6. Refer to Figure 3–3 to complete the installation of the drive.

   a. Tighten the two captive screws at the top and bottom of the bracket (**A**).

   _____ **CAUTION** _____

   It is normal for there to be a small gap between the mounting bracket tabs and the enclosure frame. Tighten the captive screws only until they are securely fastened (9 inch pounds). Do not try to force the tabs to fit flush against the frame.

   _____

7. Plug the ID cable into the connector inside the drive front panel (**B**).

8. Attach the drive front panel to the enclosure by first fitting the panel's lower tabs into position and then securing the panel with its single captive Phillips screw (**C**).

9. Insert the proper SCSI node ID plug into the front panel.

   √ See Section 3.8 for additional information about the SCSI bus node ID plug.

Figure 3–3 Installing the TLZ04 Drive

Captive Screws (2)

Finger Cutouts

ID Cable

A

Guide Tabs

Phillips Screw

B

ID Cable

C
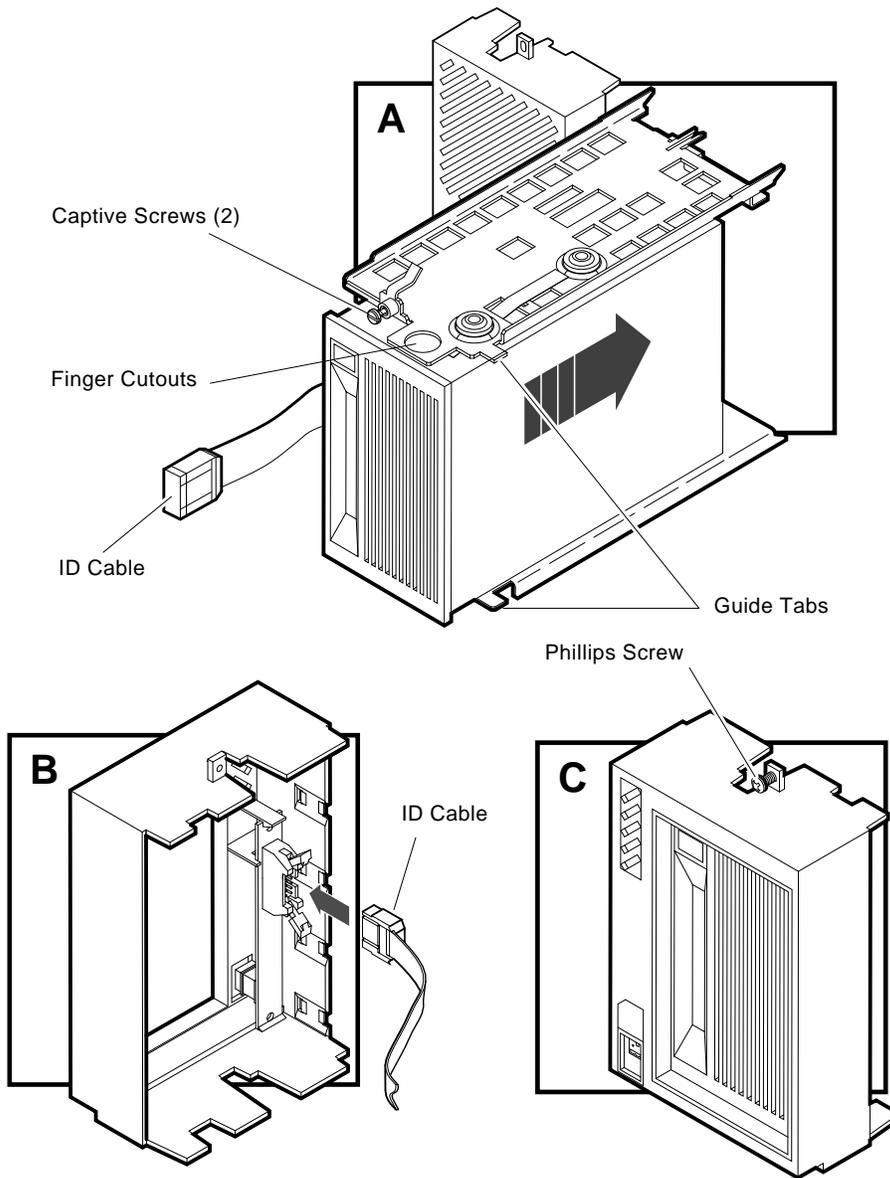
MLO-005788

3.4 Completing the TLZ04 Installation

This section explains how to verify the correct operation of the TLZ04 tape drive by performing the power-on self-test (POST).

3.4.1 TLZ04 Power-On Self-Test

Use the following procedure to execute the POST.

1. Power on the system.

   - The tape and drive indicators flash for approximately 30 seconds.

Successful POST

After successful completion of the POST, the Tape Activity indicator:

- Shuts off if there is no cassette in the drive.

- Remains on if there is a cassette in the drive.

After completing a successful execution of the POST, have the system manager restart the operating system and assign a device name to the TLZ04 drive.

Unsuccessful POST

If the Tape and Drive indicators continue to flash for more than 30 seconds, then the POST has failed.

√ Attempt to clear the failure by powering off the system and then re-executing the POST.

√ If the failure continues, refer to the appropriate system troubleshooting and diagnostics manual (Appendix A).

3.5 TLZ07 Tape Drive

The TLZ07 is a 5.25-inch half-height cassette tape drive that provides high capacity, off-line data storage. The TLZ07 interfaces to the system by means of a Small Computer System Interface (SCSI). The following table lists the storage capacity for each type of 4 mm data cassette.

Tape Type	With No Compression	With Compression
TLZ04-CA (60 m)[1]	1.3 GB	2.6 GB
TLZ06-CA (90 m)[2]	2.0 GB	4.0 GB[3]
TLZ07-CA (120 m)	4.0 GB	8.0 GB[3]

[1]The TLZ07 is compatible with TLZ04 (60 m) cassette tapes in the noncompressed mode only.

[2]The TLZ07 is compatible with the TLZ06 using 60 m and 90 m tapes only.

[3]The compression measurements are typical for a 2-to-1 data compression ratio, but the actual ratio is dependent on the data.

_____ **Note** _____

VAX 4000 systems do not support TLZ07 tape drives unless an HSD05 option is installed.

_____

3.6 TLZ07 Installation Procedure

Use the following procedure to install the TLZ07 tape drive into a BA400-series enclosure. Have the system manager shut down the operating system before installing the tape drive.

---------------------------- **CAUTION** ----------------------------

Static electricity can damage integrated circuits. Use the antistatic wrist strap and antistatic pad found in the static-protective field service kit (29-26246-00) when you work with the internal parts of a computer system.

---

1. Open the top and bottom enclosure doors.

2. Power off the system and unplug the power cord from the wall outlet.

3. Loosen the captive Phillips screw (at the top) and remove the drive front panel and filler panel located in mass storage slot 0.

Figure 3–4   Opening the Enclosure Doors
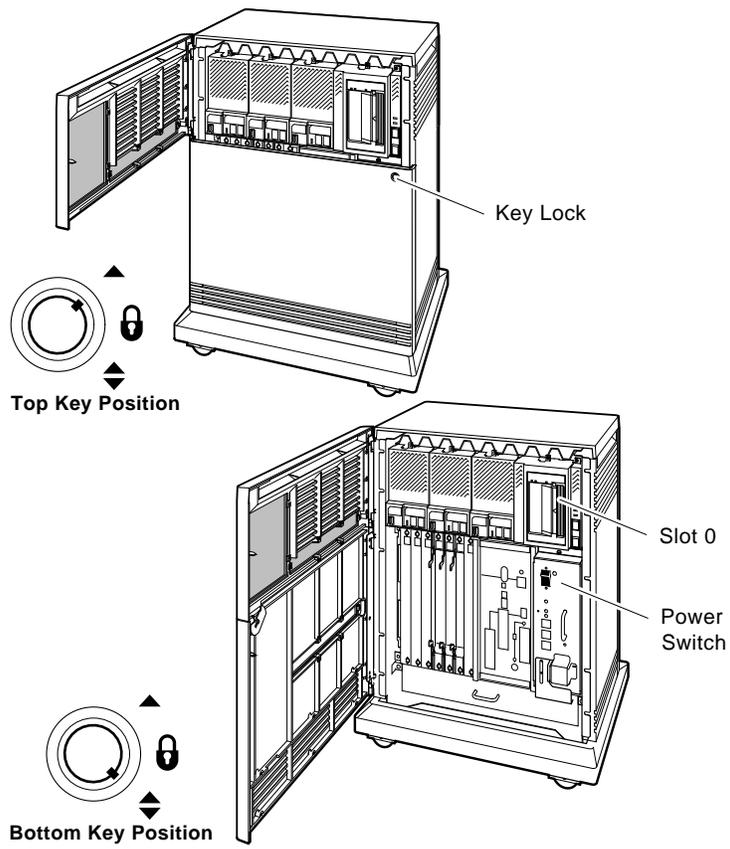
Key Lock

Top Key Position

Slot 0

Power
Switch

Bottom Key Position

MLO-012856

4. With the tape drive left side down (LEDs at the bottom), slide the drive
    into mass storage slot 0.

    √   Using the tabs in front of the upper and lower finger cutouts, firmly
        push the drive bracket into the enclosure until the interface card at the
        rear of the drive plugs into its backplane connector.

5. Refer to Figure 3–5 to complete the drive installation.

    a. Tighten the captive screws at the top and bottom of the bracket (**1**).

    _____ **CAUTION** _____

    It is normal for there to be a small gap between the mounting bracket
    tabs and the enclosure frame. Tighten the captive screw only until it
    is securely fastened (9 inch pounds). Do not try to force the tabs to fit
    flush against the frame.

    _____

    b. Plug the SCSI ID cable into the bottom connector inside the drive front
        panel (**2**).

    c. Attach the drive front panel to the enclosure by first fitting the panel's
        lower tabs into position (**3**).

    d. Secure the front panel with its single captive Phillips screw (**4**).

    e. Insert the proper SCSI node ID plug into the front panel (**5**).

        √   See Section 3.8 for information about choosing the proper SCSI ID
            plug.

Figure 3–5 Installing the TLZ07 Drive

1
Tighten
screw.

4
Tighten
screw.

2
Insert
SCSI ID
connector.

5
Insert
SCSI
ID plug.

3
Insert
bezel.
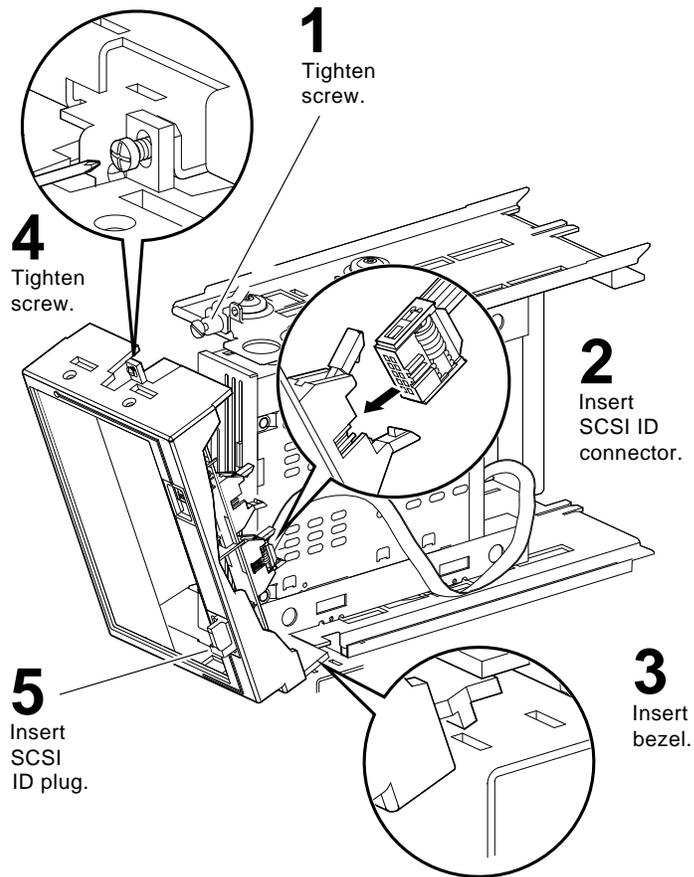
MLO-012820

3.7 Completing the TLZ07 Installation

This section explains how to verify successful installation of the TLZ07 drive by performing the power-on self-test (POST), and then assigning a device name to the drive.

3.7.1 TLZ07 Power-On Self-Test

Use the following procedure to execute the POST:

1. Power on the system.

    - If there is no cassette in the drive:

        The Cassette and Write-Protect indicators flash for approximately 1 to 5 seconds and then shut off.

    - If there is a cassette in the drive:

        The Cassette and Write-Protect indicators flash for approximately 5 seconds, then the Write-Protect indicator indicates write-protect status and the Cassette indicator continues to flash at a slower rate until the cassette is loaded. After the cassette is loaded, the Casette indicator remains on.

After completing a successful execution of the POST, have the system manager restart the operating system and assign a device name to the TLZ07 drive.

Unsuccessful POST

The POST failed if the Cassette and Write-Protect indicators flash continuously for more than 30 seconds.

√ Attempt to clear the failure by powering off the system and then re-executing the POST.

√ If the failure continues, refer to the appropriate system troubleshooting and diagnostics manual (Appendix A).

3.8 Bus Node ID Plug

The TLZ-Series tape drives use a bus node ID plug to identify, or address, the drive. The bus node ID the drive uses is dependent on other SCSI devices in the system. The ID must be unique for each device on the bus.

Prongs at the back of the bus node ID plugs identify the bus node ID number (and by default, the unit number) of the drive to the system. Bus node ID plugs are shipped with the host system or host expander.

To insert a bus node ID plug, align the two center prongs with the two center slots of the receptacle in the front panel assembly. Push the plug firmly into the receptacle. To remove a bus node ID plug, grasp it firmly and pull it straight out.

_____ **NOTE** _____

If you change the bus node ID plugs while the system is operating, you must turn off the system and then turn it back on for the new plug positions to take effect.

_____

4

RRD-Series CD–ROM Drive

4.1 General

RRD-Series CD–ROM drives are compact disc, read-only memory (ROM),
Small Computer System Interface (SCSI) devices. These drives read data
from industry standard 600-MB discs. To meet the requirements of a wide
variety of applications, the RRD-series of CD–ROM drives support all CD–
ROM standards including CD–ROM-XA (CD–ROM-eXtended Architecture),
Multisession Photo CD, and MPC (Multimedia Products Council) 1 and 2, and
is CD-I ready.

4.2 Installation Procedure

Use the following procedure to install the RRD-series CD–ROM drives into the
BA400-series enclosure. Have the system manager shut down the operating
system before installing the CD–ROM drive.

_____ **CAUTION** _____

Static electricity can damage integrated circuits. Use the antistatic
wrist strap and antistatic pad found in the static-protective field service
kit (29-26246-00) when you work with the internal parts of a computer
system.

_____

1. Open the top and bottom enclosure doors.

2. Power off the system and unplug the power cord from the wall outlet.

3. Loosen the captive Phillips screw (at the top) and remove the front panel from the first available storage slot.

Note

The first mass storage cavity in the mass storage area (slot 0) is wider than the rest to accommodate a large device, such as a tape drive. A small filler panel (70-27414-01) is used to fill the gap when an RRD-series ISE is installed in this first cavity.

Figure 4–1 Opening the Enclosure Doors

Key Lock

Slot 3
Slot 2
Slot 1

Top Key Position

Bottom Key Position

Power
Switch
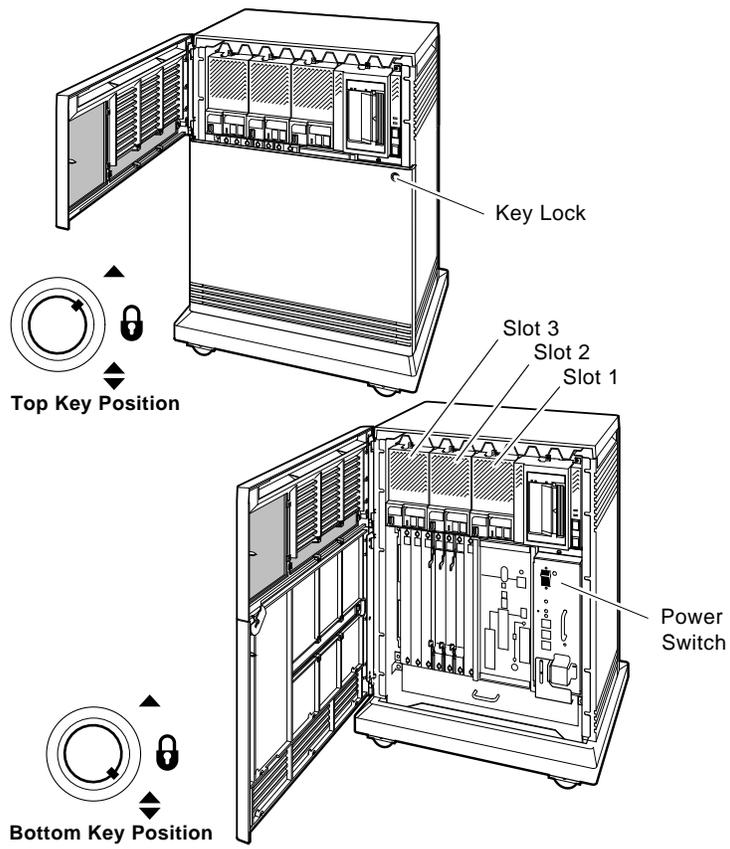
MLO-012857

4. Refer to Figure 4–2 to install the CD–ROM drive into the mass storage slot:

   √ Using the tabs in front of the upper and lower finger cutouts, firmly push the drive brackets until the interface card at the rear of the drive plugs into its backplane connector (**A**).

5. Tighten the captive screws at the top and bottom of the bracket (**A**).

   _____ **CAUTION** _____

   It is normal for there to be a small gap between the mounting bracket guide tabs and the enclosure frame. Tighten the captive screw only until it is securely fastened (9 inch pounds). Do not try to force the tabs to fit flush against the frame.

   _____

6. Plug the SCSI ID cable into the connector inside the drive front panel (**B**).

7. Attach the ISE front panel to the enclosure by first fitting the panel's lower tabs into position.

   √ Fit the panel into position and secure the panel with its single captive Phillips screw (**C**).

8. Insert the proper SCSI node ID plug in the front panel (**C**).

   √ See Section 4.3.2 for additional information about the SCSI bus node ID plug.

9. If you do not have a KZQSA installed, go to Section 4.3 to complete the installation.

   If you do have a KZQSA installed, continue with the next step.

Figure 4–2 Inserting the RRD CD–ROM drive

Captive Screw

Finger Cutouts

A

Guide Tabs

B

ID Cable

Phillips Screw

C

SCSI
ID Plug
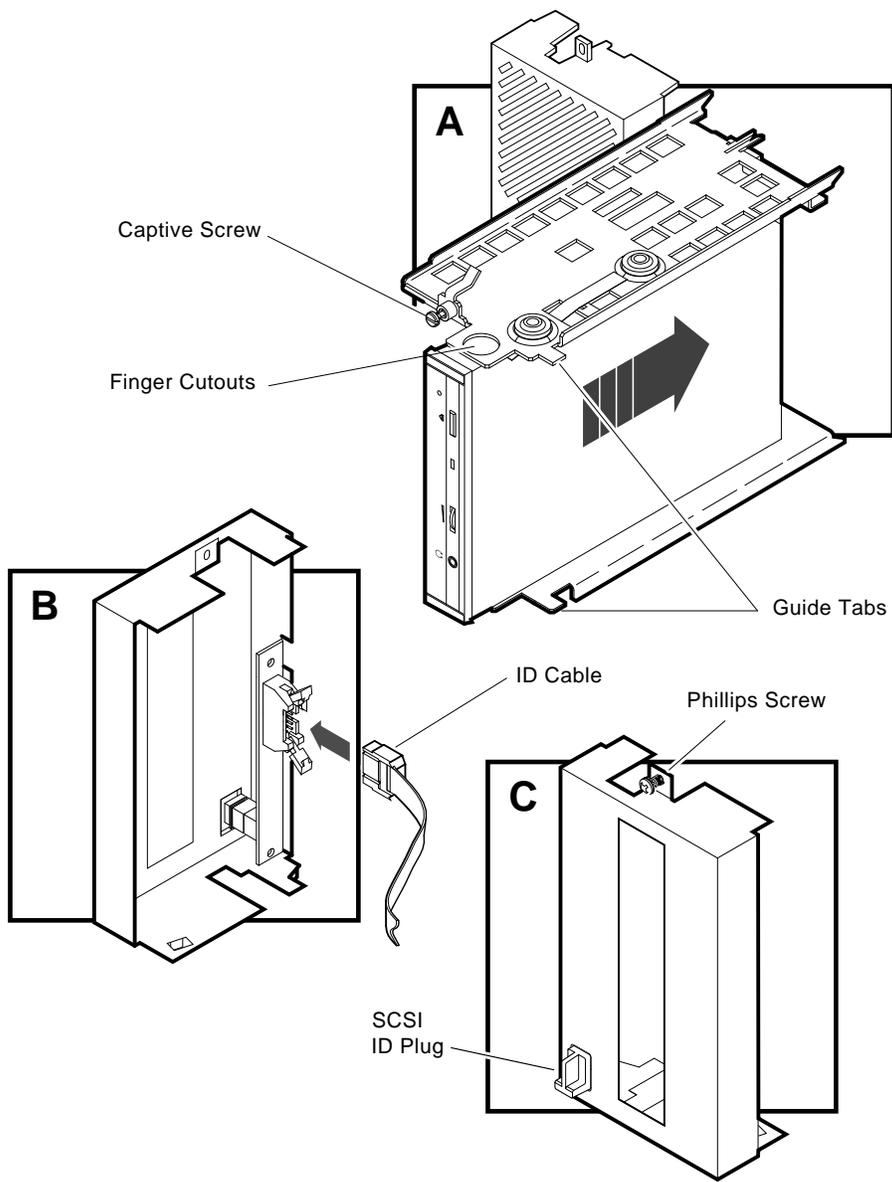
MLO-012842

10. Locate the KZQSA IN connector on the I/O bulkhead.

Figure 4–3   KZQSA IN Connector
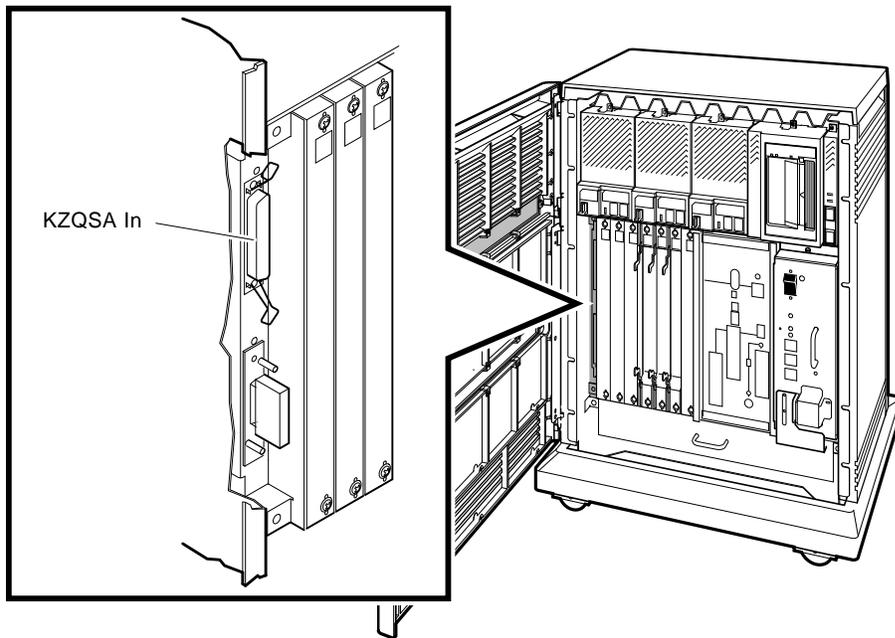
KZQSA In

MLO-007150

11. Remove the protective cover from the KZQSA IN connector.

Figure 4–4   Removing the Connector Cover

Protective Cover

MLO-007168
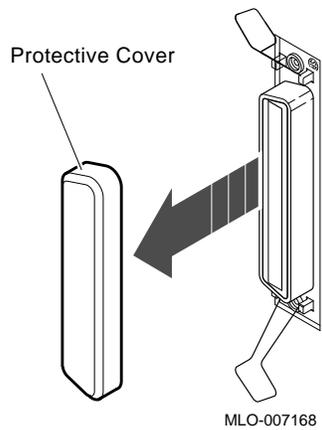
12. Locate the KZQSA internal cable labeled BC06P–2F that ships with the RRD drive.

Figure 4–5   KZQSA Cable

MLO-007151
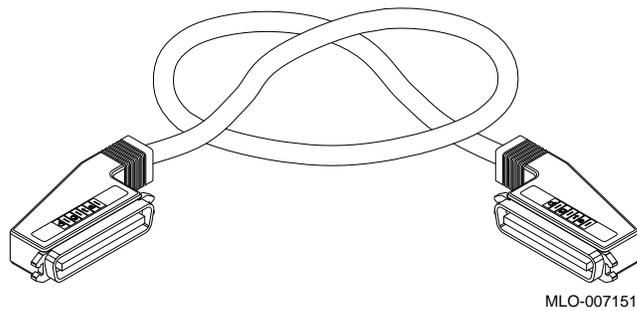
13. Connect one end of the cable to the KZQSA IN connector.

   √ Press the bail latches onto the cable connector to lock it in place.

Figure 4–6 Connecting to KZQSA IN
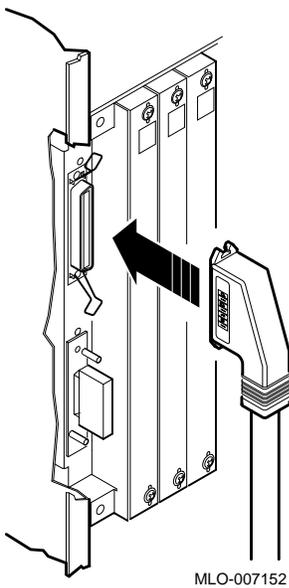
MLO-007152

14. Locate the KZQSA module identified by the KZQSA-SA indentification label on the module cover.

Figure 4–7 KZQSA Label

KZQSA
-SA

M5976
-SA
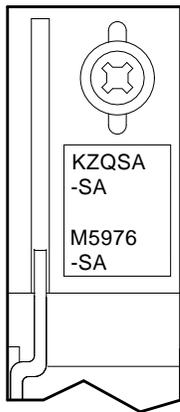
MLO-007153

15. Remove the terminator from the upper connector on the module.

Figure 4–8 KZQSA Module Connector
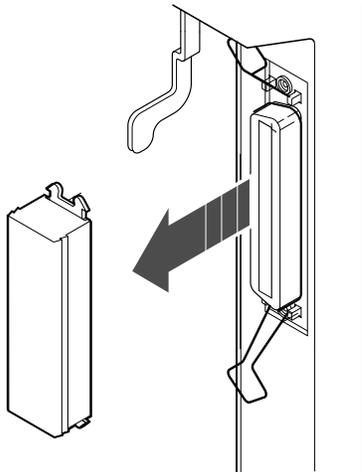
MLO-007179

16. Connect the other end of the cable to the KZQSA module connector.

√ Press the bail latches onto the cable connector to lock it in place.

Figure 4–9 Connecting to KZQSA IN

Bail
Latch

Feed Cable Under System
and Up Through Opening.
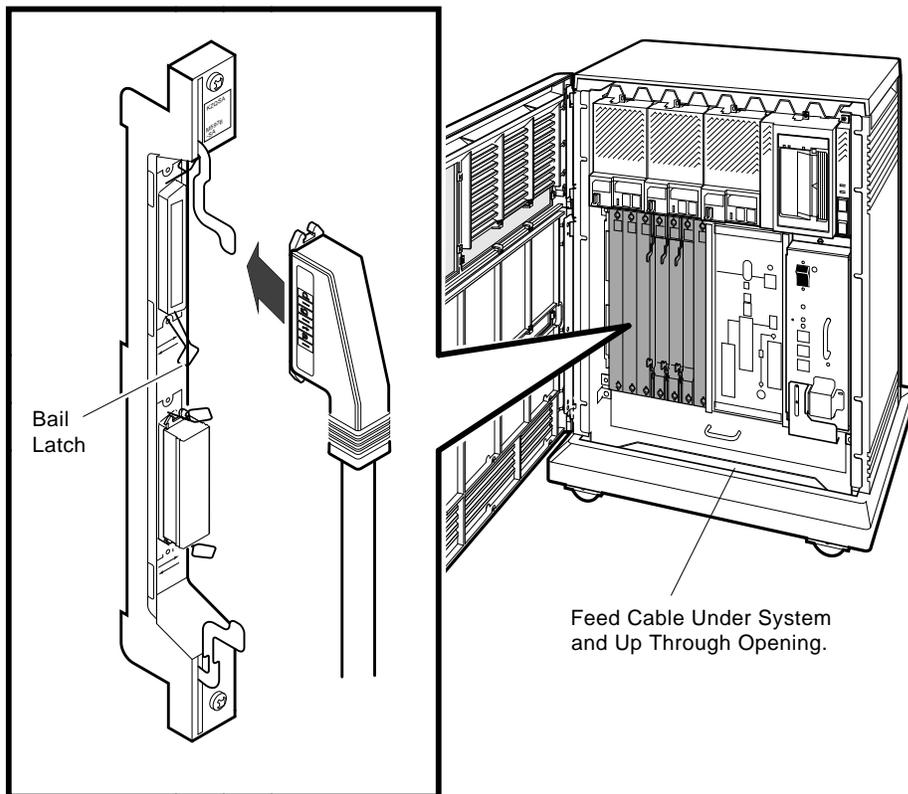
MLO-007154

4.3 Completing the Installation

This section explains how to verify successful installation of the RRD
CD–ROM drive by performing the power-on self-test (POST).

4.3.1 RRD CD–ROM Power-On Self-Test

Use the following procedure to execute the POST:

1. Power on the system.

    - The Busy indicator flashes for approximately 10 to 20 seconds.

Successful POST

After successful completion of the POST, the Busy indicator shuts off.

Have the system manager restart the operating system and assign a device name to the CD–ROM drive.

Unsuccessful POST

If the Busy indicator remains on continuously then the POST failed.

√ Attempt to clear the failure by powering off the system and then re-executing the POST.

√ Check to be sure the CD is not loaded upside-down.

√ Check and reseat all ISE cable connections.

√ If the failure continues, refer to the appropriate system troubleshooting and diagnostics manual (Appendix A).

4.3.2 Bus Node ID Plug

The RRD-Series CD–ROM drives use a bus node ID plug to identify, or address, the RRD drive. The bus node ID that the RRD drive uses is dependent on other SCSI devices in the system. The ID must be unique for each device on the bus.

Bus node ID plugs have prongs on their backs that identify the bus node ID number (and by default, the unit number) of the RRD drive to the system. Bus node ID plugs are shipped with the host system or host expander.

To insert a bus node ID plug, align the two center prongs with the two center slots of the receptacle in the front panel assembly (Figure 4–2 (*C*)). Push the plug firmly into the receptacle. To remove a bus node ID plug, grasp it firmly and pull it straight out.

_____ **NOTE** _____

If you change the bus node ID plugs while the system is operating, you must turn off the system and then turn it back on for the new plug positions to take effect.

_____

5

RRD/TLZ07 Dual ISE Drives

5.1 General

This chapter describes how to install the RRD/TLZ07 Dual ISE in the BA400-series enclosure. The RRD/TLZ07 Dual ISE contains a multi-purpose CD–ROM drive and a 5.25-inch cassette tape drive.

_____ **Note** _____

VAX 4000 systems do not support the RRD/TLZ07 Dual ISE unless an HSD05 option is installed.

_____

5.2 Installation Procedure

Use the following procedure to install the dual ISE drives into a BA400-series enclosure. Have the system manager shut down the operating system before installing the ISE.

_____ **CAUTION** _____

Static electricity can damage integrated circuits. Use the antistatic wrist strap and antistatic pad found in the static-protective field service kit (29-26246-00) when you work with the internal parts of a computer system.

_____

1. Open the top and bottom enclosure doors.

2. Power off the system and unplug the power cord from the wall outlet.

3. Loosen the captive Phillips screw (at the top) and remove the drive front panel and filler panel located in mass storage slot 0.

_____ **Note** _____

The RRD/TLZ07 Dual ISE can be installed in slot 0 only.

_____

Key Lock

Top Key Position

Slot 0

Power
Switch

Bottom Key Position
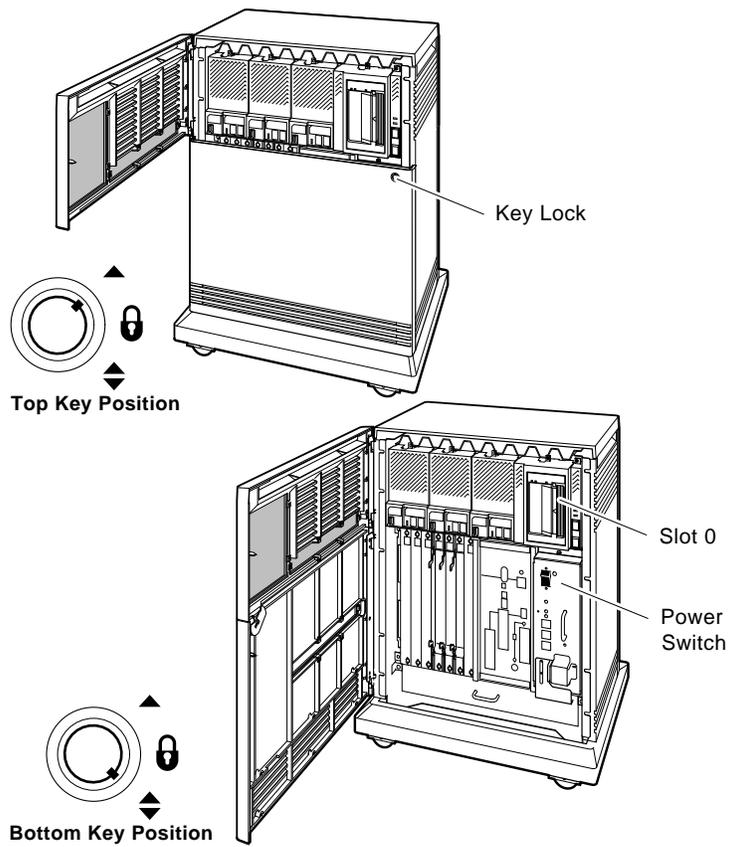
MLO-012856

4. Remove the center (plastic) card guides from the top and bottom storage divider in slot 0 (the guides are a pressure fit and lift right out).

5. With the tape drive left side down (LEDs at the bottom), slide the drive into mass storage slot 0.

   √ Using the tabs in front of the upper and lower finger cutouts, firmly push the drive bracket into the enclousure until the interface card at the rear of the drive plugs into its backplane connector.

6. Refer to Figure 5–1 to complete the installation of the drives.

   a. Tighten the captive screws at the top and bottom of the bracket (**1**).

   _____ **CAUTION** _____

   It is normal for there to be a small gap between the mounting bracket tabs and the enclosure frame. Tighten the captive screws only until they are securely fastened (9 inch pounds). Do not try to force the tabs to fit flush against the frame.

   _____

   b. Plug the TLZ07 SCSI ID cable into the bottom connector inside the drive front panel (**2**).

   c. Plug the RRD SCSI ID cable into the top connector inside the drive front panel (**2**).

   d. Attach the drive front to the enclosure by first fitting the panel's lower tabs into position (**3**).

   e. Secure the front panel with its single captive Phillips screw (**4**).

   f. Insert the proper SCSI node ID plug into the top receptacle of the front panel for the RRD CD–ROM (**5**).

      √ See Section 5.3.3 for additional information about the SCSI bus node ID plug.

   g. Insert the proper SCSI node ID plug into the bottom receptacle of the front panel for the TLZ07 tape drive (**5**).

      √ See Section 5.3.3 for additional information about the SCSI bus node ID plug.

Figure 5–1 Installing the RRD/TLZ07 Dual ISE

1 Tighten screw.

4 Tighten screw.

2 Insert SCSI ID connectors.

5 Insert SCSI ID plugs.

3 Insert bezel.
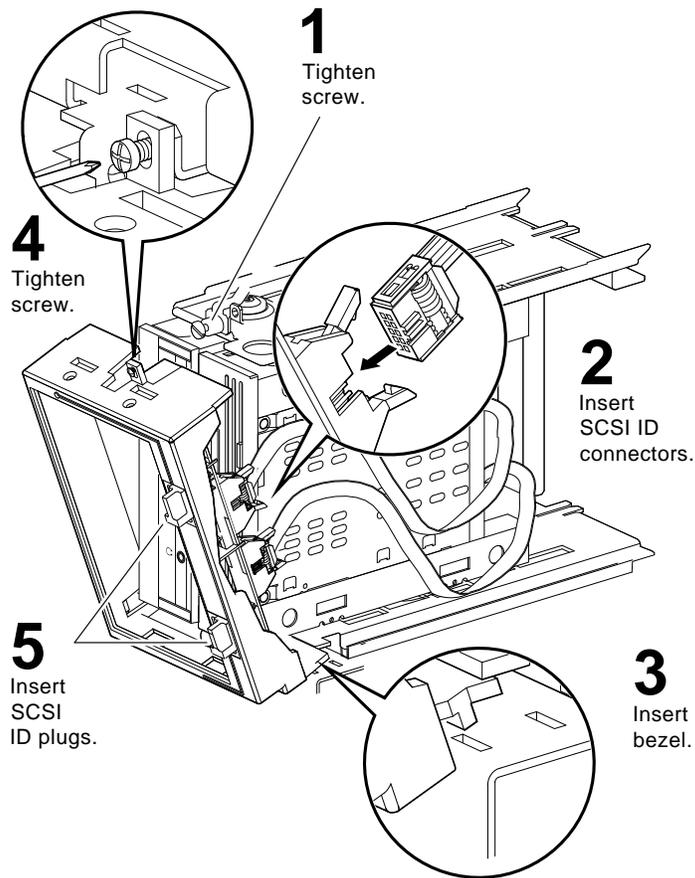
MLO-012858

5.3 Completing the Installation

This section explains how to verify correct installation of the RRD/TLZ07 dual ISE drives by performing the power-on self-test (POST).

Section 5.3.1 describes the POST for a CD–ROM drive.

Section 5.3.2 describes the POST for a TLZ07 tape drive.

5.3.1 RRD CD-ROM Power-On Self-Test

Use the following procedure to execute the POST:

1. Power on the system.

   • The Busy indicator flashes for approximately 10 to 20 seconds.

Successful POST

After successful completion of the POST, the Busy indicator shuts off.

Have the system manager restart the operating system and assign a device name to the CD–ROM drive.

Unsuccessful POST

If the Busy indicator remains on continuously then the POST failed.

√ Attempt to clear the failure by powering off the system and then re-executing the POST.

√ Check to be sure the CD is not loaded upside-down.

√ Check and reseat all ISE cable connections.

√ If the failure continues, refer to the appropriate system troubleshooting and diagnostics manual (Appendix A).

5.3.2 TLZ07 Power-On Self-Test

Use the following procedure to execute the POST:

1. Power on the system.

   - If there is no cassette in the drive:

     The Cassette and Write-Protect indicators flash for approximately 1 to 5 seconds and then shut off.

   - If there is a cassette in the drive:

     The Cassett and Write-Protect indicators flash for approximately 5 seconds, then the Write-Protect indicator indicates write-protect status and the Cassette indicator continues to flash at a slower rate until the cassette is loaded. After the cassette is loaded, the Cassette indicator remains on.

After completing a successful execution of the POST, have the system manager restart the operating system and assign a device name to the TLZ07 drive.

Unsuccessful POST

The POST failed if the Cassette and Write-Protect indicators flash continuously for more than 30 seconds.

√ Attempt to clear the failure by powering off the system and then re-executing the POST.

√ If the failure continues, refer to the appropriate system troubleshooting and diagnostics manual (Appendix A).

5.3.3 Bus Node ID Plug

The RRD CD–ROM drive and the TLZ07 tape drive each use a bus node ID plug to identify, or address, the drives. The bus node ID that each drive uses is dependent on other SCSI devices in the system. The ID must be unique for each device on the bus.

Prongs on the back of bus node ID plugs identify the bus node ID number (and by default, the unit number) of the drives to the system. Bus node ID plugs are shipped with the host system or host expander.

To insert a bus node ID plug, align the two center prongs with the two center slots of the receptacle in the front panel assembly (Figure 5–1). Push the plug firmly into the receptacle. To remove a bus node ID plug, grasp it firmly and pull it straight out.

_____ **NOTE** _____

If you change the bus node ID plugs while the system is operating, you must turn off the system and then turn it back on for the new plug positions to take effect.

_____

6

TF/TZ-Series Tape Drive

6.1 General

This chapter describes how to install the TF/TZ-series of tape drive. Figure 6–1 shows the front panel of the TF85 tape drive and is representative of this series of drives.

Figure 6–1   TF85 Tape Drive Front Panel
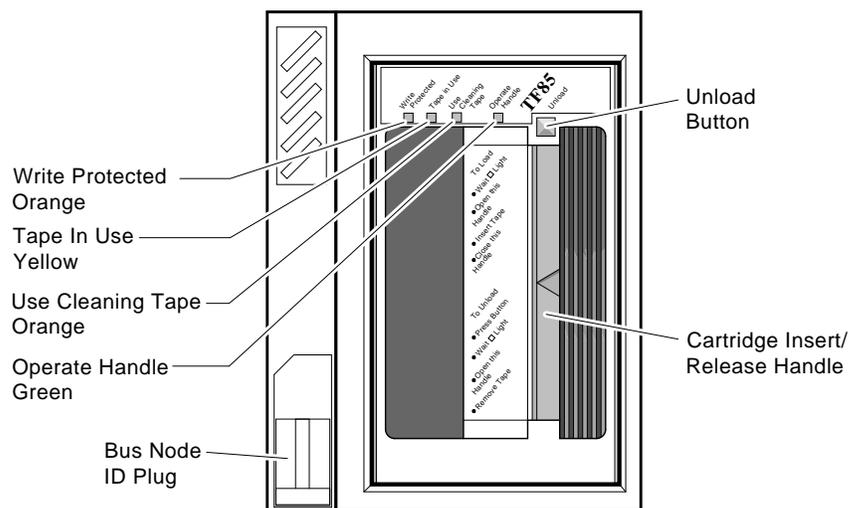
MLO-006543

The Digital Linear Tape Drive (DLT) family cartridge tape drives are 5.25-inch streaming linear recording tape devices, designed for systems requiring high performance, high data integrity, and unattended backup.

The DLT cartridge tape drive subsystems use the CompacTape III cartridge, which contains 335 meters (1100 feet) of half-inch-wide metal powder (MP) tape.

The TF/TZ-series cartridge tape subsystems are used primarily for data backup, for data archiving, and for loading software onto computer systems. The TZ-series cartridge tape subsystems use the Small Computer System Interface (SCSI) bus. The TF-series cartridge tape subsystems use the Digital Storage Systems Interconnect (DSSI) bus.

6.2 TF/TZ-Series Tape Drive Installation

Use this procedure to install TF/TZ-Series tape drives.

_____ **NOTE** _____

VAX 4000 systems do not support TZ-series ISEs unless an HSD05 option is installed.

_____

_____ **CAUTION** _____

Static electricity can damage integrated circuits. Use the antistatic wrist strap and antistatic pad found in the static-protective field service kit (29-26246-00) when you work with the internal parts of a computer system.

Handle the TF/TZ-series tape drive with care. Dropping or bumping the drive can damage the product. Carry or hold the drive by the underside of the lower metal bracket to avoid damaging the drive module.

_____

1. After the system manager shuts down the operating system, open the enclosure door (refer to Figure 1–10), and set the power switch to off (0) (Figure 6–2).

Figure 6–2 Power Switch Location
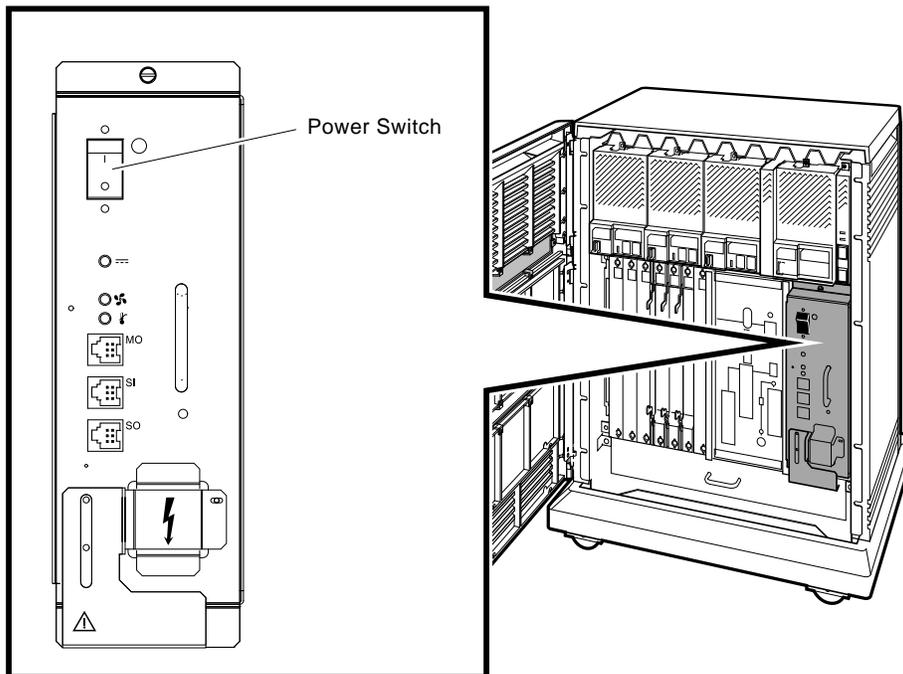
MLO-006628

2. Loosen the captive Phillips screws (at the top) and remove the blank front panel (70-27049-01) and filler panel (70-27414-01) located in mass storage slot 0.

_____ **Note** _____

The TF/TZ-series tape drive is installed only in mass storage slot 0.

_____

3. With the tape drive right side up (Unload button at top), slide the drive (Figure 6–3A) into mass storage slot 0.

4. Using the tabs in front of the upper and lower finger cutouts, firmly push the drive brackets until the interface card at the rear of the drive plugs into its backplane connector.

5. Refer to Figure 6–3 to complete the installation of the drive.

   a. Tighten the two captive screws at the top and bottom of the bracket **(A)**.

   _____ **CAUTION** _____

   It is normal for there to be a small gap between the mounting bracket tabs and the enclosure frame. Tighten the captive screws only until they are securely fastened (9 inch pounds). Do not try to force the tabs to fit flush against the frame.

   _____

   b. Plug in the ID cable:

      √ For TF-series tape drives, plug the connector from the front panel **(B1)** to the front of the ISE controller board **(A)**.

      √ For TZ-series tape drives, plug the connector from the ISE controller board **(A)** to the front panel connector **(B2)**.

   c. Attach the ISE front panel to the enclosure by first fitting the panels lower tabs into position.

      √ Fit the panel into position and secure the panel with its single captive Phillips screw **(C)**.

Figure 6–3 Installing the TF/TZ-Series Drive

Finger Cutouts

Captive Screws (2)

Remote ID Cable
Connector (TZ87)

Remote ID Cable
Connector
(TF-Series, TZ86)

A

B1

ID Cable

Guide Tabs

Phillips Screw

C

B2

ID Cable

MLO-012864
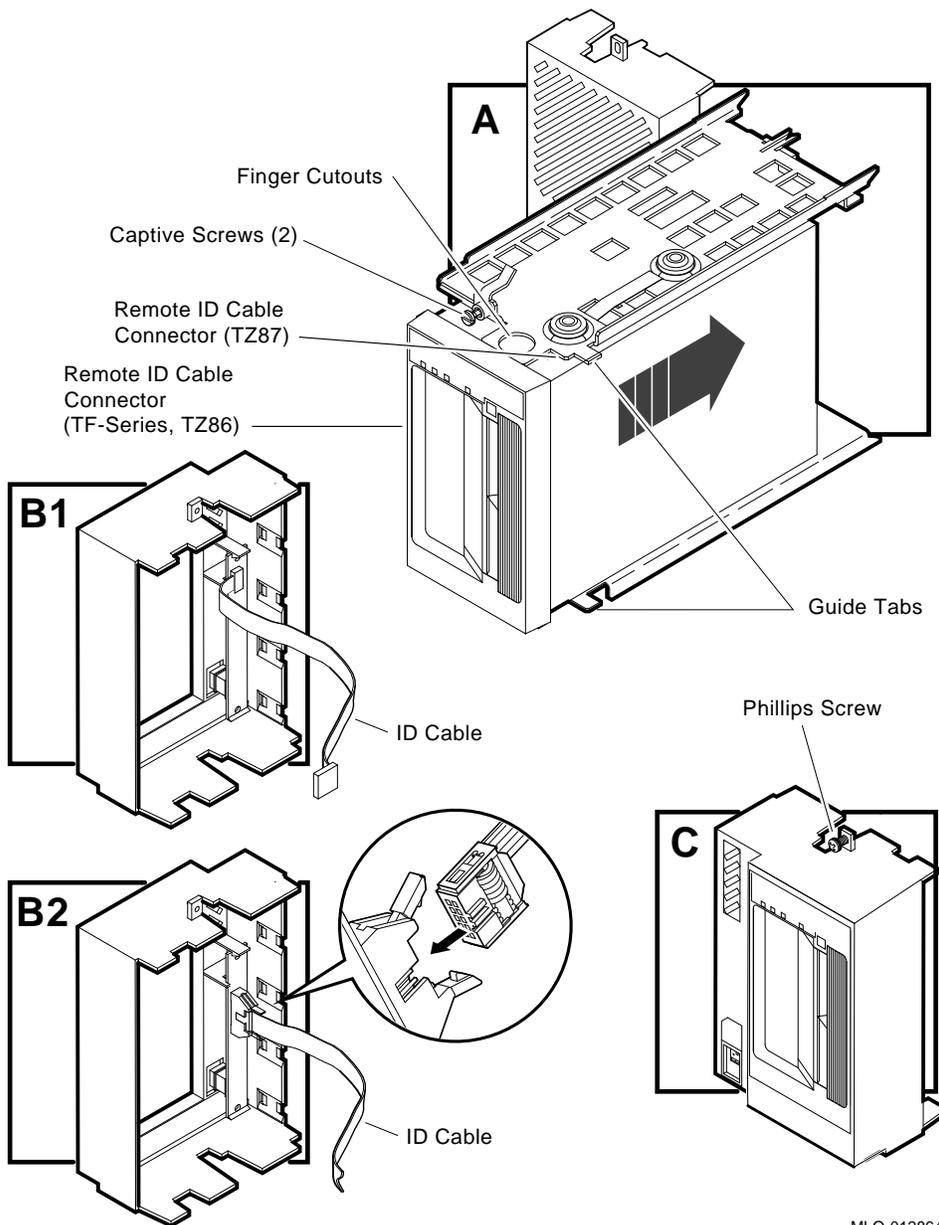
Figure 6–4 shows the TF/TZ-series tape drive installed in the enclosure.

Figure 6–4   TF/TZ-Series Drive Installed in Mass Storage Slot 0
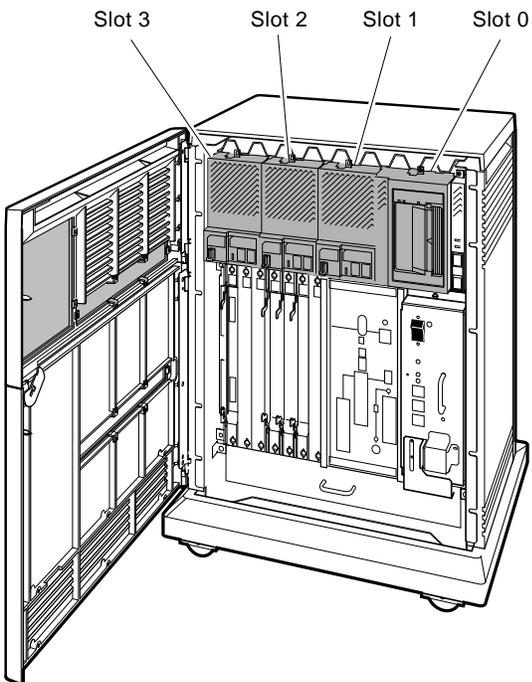
MLO-006528

6.3 Completing the Installation

This section explains how to verify successful installation of the TF/TZ-series tape drives by performing the power-on self-test (POST).

6.3.1 TF/TZ-Series Power-On Self-Test

When the TF/TZ-series subsystem is powered on, the drive performs the power-on self-test (POST). The sequence of events are listed in Table 6–1.

Table 6–1   Power-on Self-test Events

Stage	What Happens
1	The indicators on the TF/TZ-series top front panel light sequentially, from left to right and then stay on for a few seconds.
2	All indicators on the TZ87 bottom front panel light at the same time for about three seconds and then shut off.
3	The green Operate Handle, the orange/yellow Write Protected[1], and the yellow Use Cleaning Tape indicators shut off.
4	The yellow Tape in Use indicator flashes while the tape drive initializes.
5	After initialization, with no cartridge loaded, the green Operate Handle indicator lights and a "beep" sounds.

[1]The Write Protected indicator is yellow on the TZ87 tape drive, and orange on the TZ86 and TF-series tape drives.

Successful POST

POST completes in about 13 seconds and the subsystem responds normally to all commands. However, it might take longer for the media to become ready. After a bus reset, the tape drive responds with a bus selection timeout period.

After completing a successful execution of the POST, have the system manager restart the operating system and assign a device name to the TF/TZ-series drives.

Unsuccessful POST

The POST failed if all indicators continue to flash.

√ Attempt to clear the failure by powering off the system and then re-executing the POST.

√ If the failure continues, refer to the appropriate system troubleshooting and diagnostics manual (Appendix A).

6.4 Setting the ISE Parameters

Once the tape drive passes power-on self-test, the DSSI parameters must be set. For TF-series tape drives this is done in the same manner as the RF-series ISEs (refer to the procedure in Section 1.5).

For TZ-series tape drives the SCSI ISE parameters are set in the same manner as the RZ-series ISEs. Refer to the *HSD05 DSSI-to-SCSI Bus Adapter Operation Information for BA400-Based VAX 4000 Systems* manual (EK–HSDC5–IN.) for this procedure.

A
Related Documentation

Document	Order Number
BA430/BA440 Enclosure Maintenance	EK–348A*–MG
EFxx-Series Solid State Disk User Guide	EK–EF51x–UG
Microsystems Options	EK–192A*–MG
MicroVAX Diagnostic Monitor User's Guide	AA–FM7A*–DN
R400X Expander Installation and Maintenance	EK–349A*–MG
RF Series Integrated Storage Element User Guide	EK–RF72D–UG
TF85 Cartridge Tape Subsystem Owner's Manual	EK–OTF85–OM
TX86 Series Cartridge Tape Subsystems	EK–OTX86-OM
TZ87 Cartridge Tape Subsystems	EK–OTZ87-OM
BA400 Series Mass Storage Devices	EK–441AC–IP
HSD05 DSSI-to-SCSI Bus Adapter Operation Information for BA400-Based VAX 4000 Systems	EK–HSDC5–IN

_____ **Note** _____

* Indicates the revision code. The latest revision is always shipped
when a manual is ordered.

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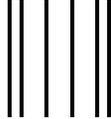
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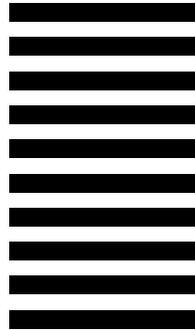
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