TruCluster Software Products

Hardware Configuration Technical Update for the Compaq 20/40 GB DLT Tape Drive and TL881/TL891 DLT MiniLibraries

December 1999

Product Version:	TruCluster Production Server Software Version 1.6 and TruCluster Available Server Software Version 1.6
Operating System and Version:	Tru64 UNIX Version 4.0F

This technical update describes how to configure the Compaq 20/40 GB DLT Tape Drive and TL881/TL891 DLT MiniLibraries in a TruCluster Software Products environment.

Compaq Computer Corporation
Houston, Texas

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About This Technical Update

There is no TruCluster Software Products release that coincides with the support for the qualification of the Compaq 20/40 GB DLT Tape Drive and TL881 DLT MiniLibrary with Tru64 UNIX Version 4.0F. This technical update provides the configuration information that would appear in the TruCluster Software Products *Hardware Configuration* manual.

This technical update also contains configuration information for the TL891 DLT MiniLibrary.

Documentation exists that covers the configuration of the TL890/TL891 DLT MiniLibrary sold under the DS-TL89x part numbers. Those part numbers are shortly going end-of-life. Only TL891 part numbers for the tabletop model or the TL891 base unit will be available. The other parts (MiniLibrary Expansion Unit and MiniLibrary Data Unit) are common to the TL881.

Therefore, this technical update contains configuration information for the TL891 as sold with the new Compaq 6-3 part numbers.

The only difference between a TL881 DLT MiniLibrary and TL891 DLT MiniLibrary configuration is the type of tape drive the tape libraries use, so the TL881 and TL891 configuration information is combined into one chapter.

Audience

If you plan to use any of the following hardware in a TruCluster Production Server Software Version 1.6 or TruCluster Available Server Software Version 1.6 configuration, read this addendum to the TruCluster Software Products *Hardware Configuration* manual:

- Compaq 20/40 GB DLT Tape Drive
- TL881/TL891 MiniLibrary System

Note

These tape devices have been qualified for use on shared SCSI buses with both the KZPSA-BB and KZPBA-CB host bus adapters.

Organization

This technical update contains a chapter covering cluster configuration for the Compaq 20/40 GB DLT Tape Drive (Chapter 1) and TL881 and TL891 DLT MiniLibraries (Chapter 2).

1

Compaq 20/40 GB DLT Tape Drive

1.1 Compaq 20/40 GB DLT Tape Drive Overview

The Compaq 20/40 GB DLT Tape Drive is a Digital Linear Tape (DLT) tabletop cartridge tape drive capable of holding up to 40 GB of data per Compactape IV cartridge using 2:1 compression. It is capable of storing/retrieving data at a rate of up to 10.8 GB per hour (using 2:1 compression).

The Compaq 20/40 GB DLT Tape Drive uses CompacTape III, CompacTape IIIXT, or CompacTape IV media.

It is a narrow, single-ended SCSI device, and uses 50-pin, high-density connectors.

For more information on the Compaq 20/40 GB DLT Tape Drive, see the following Compaq documentation:

- *Compaq DLT User Guide* (185292-002)
- *DLT Tape Drive User Guide Supplement* (340949-002)

1.2 Preparing the Compaq 20/40 GB DLT Tape Drive for Shared SCSI Bus Usage

The following sections describe how to prepare the Compaq 20/40 GB DLT Tape Drive in more detail.

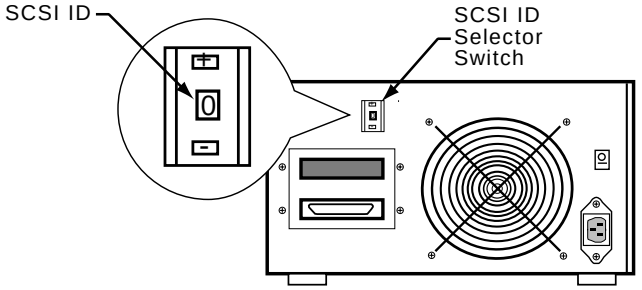
1.2.1 Setting the Compaq 20/40 GB DLT Tape Drive SCSI ID

As with any of the shared SCSI devices, the Compaq 20/40 GB DLT Tape Drive SCSI ID must be set to ensure that no two SCSI devices on the shared SCSI bus have the same SCSI ID.

The Compaq 20/40 GB DLT Tape Drive SCSI ID is set with a pushbutton counter switch on the rear of the unit (see Figure 1–1). Push the button above the counter to increment the address; push the button below the counter to decrement the address until you have the desired SCSI ID selected.

Only SCSI IDs in the range of 0 to 7 are valid. Ensure that the tape drive SCSI ID does not conflict with the SCSI ID of the host bus adapters (usually 6 and 7) or other devices on this shared SCSI bus.

Figure 1–1: Compaq 20/40 GB DLT Tape Drive Rear Panel



1.2.2 Cabling the Compaq 20/40 GB DLT Tape Drive

The Compaq 20/40 GB DLT Tape Drive is connected to a single-ended segment of the shared SCSI bus. A DWZZB-AA signal converter is required to convert the differential shared SCSI bus to single-ended. Figure 1–2 shows a configuration with a Compaq 20/40 GB DLT Tape Drive on a shared SCSI bus.

To configure the shared SCSI bus for use with a Compaq 20/40 GB DLT Tape Drive, follow these steps:

1. You will need one DWZZB-AA for each shared SCSI bus with a Compaq 20/40 GB DLT Tape Drive.

   Ensure that the DWZZB-AA jumpers W1 and W2 are installed to enable the single-ended termination.

   Remove the termination from the differential end by removing the five 14-pin SIP resistors.

2. Attach an H885-AA trilink connector or BN21W-0B Y cable to the differential end of the DWZZB-AA.
3. Connect the single-ended end of the DWZZB-AA to the Compaq 20/40 GB DLT Tape Drive tape drive with cable part number 199629-002 or 189636-002 (1.8 meter cables).
4. Install terminator part number 341102-001 on the other tape drive SCSI connector.
5. Connect the trilink on the DWZZB-AA to another trilink or Y cable on the differential shared SCSI bus with a 328215-00X, BN21K, or BN21L cable. Keep the length of the differential segment below the 25-meter maximum length (cable part number 328215-004 is a 20-meter

cable). Ensure that the trilink or Y cable at both ends of the differential segment of the shared SCSI bus is terminated with an HD68 differential terminator such as an H879-AA.

The single-ended SCSI bus may be daisy chained from one single-ended tape drive to another with cable part number 146745-003 or 146776-003 (0.9 meter cables) as long as the SCSI bus maximum length of 3 meters (fast SCSI) is not exceeded. Ensure that the tape drive on the end of the bus is terminated with terminator part number 341102-001.

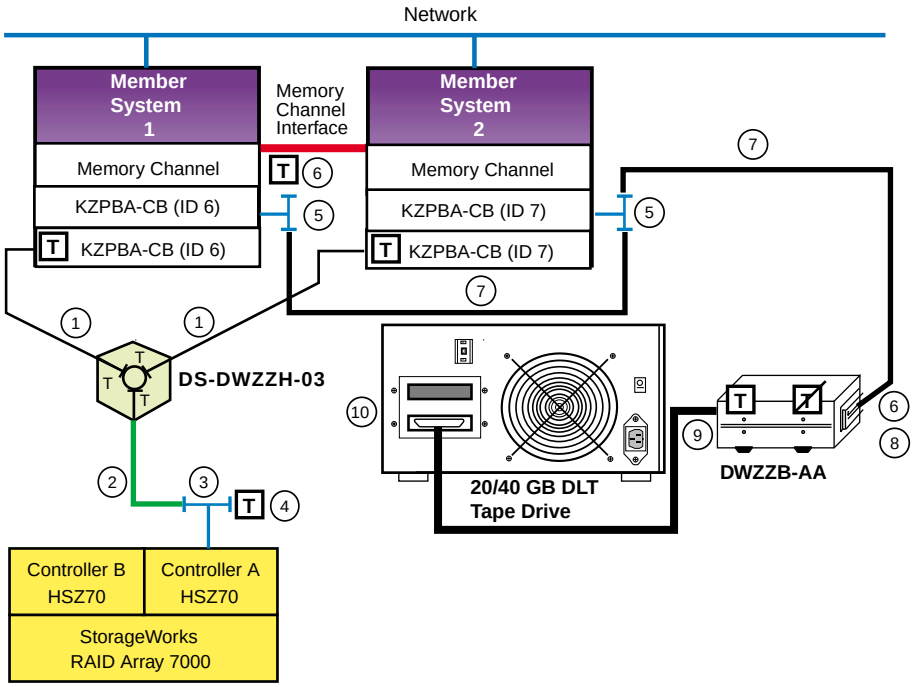
You can add additional shared SCSI buses with Compaq 20/40 GB DLT Tape Drives by adding additional DWZZB-AA/Compaq 20/40 GB DLT Tape Drive combinations.

Notes

Ensure that there is no conflict with tape drive and host bus adapter SCSI IDs, and that you keep the number of SCSI devices on a SCSI bus to a maximum of eight.

To achieve system performance capabilities, we recommend placing no more than two Compaq 20/40 GB DLT Tape Drives on a SCSI bus, and also recommend that no shared storage be placed on the same SCSI bus with the tape drive.

Figure 1–2: Cabling a Shared SCSI Bus with a Compaq 20/40 GB DLT Tape Drive



NOTE: This drawing is not to scale.

ZK-1604U-AI

Table 1–1 shows the components used to create the cluster shown in Figure 1–2.

Table 1–1: Hardware Components Used to Create the Configuration Shown in Figure 1-2

Callout Number	Description
1	BN38C or BN38D cable[a]
2	BN37A cable[b]
3	H8861-AA VHDCI trilink connector
4	H8863-AA VHDCI terminator
5	BN21W-0B Y cable
6	H879-AA terminator
7	328215-00X, BN21K, or BN21L cable[c]
8	H885-AA trilink connector

Table 1–1: Hardware Components Used to Create the Configuration Shown in Figure 1-2 (cont.)

Callout Number	Description
9	199629-002 or 189636-002 (1.8 meter cable)
10	341102-001 terminator

[a]The maximum length of the BN38C (or BN38D) cable on one SCSI bus segment must not exceed 25 meters.
[b]The maximum length of the BN37A cable must not exceed 25 meters.
[c]The maximum combined length of these cables must not exceed 25 meters.

2

TL881 and TL891 DLT MiniLibraries

The topics in this chapter provide an overview of the Compaq StorageWorks TL881 and TL891 Digital Linear Tape (DLT) MiniLibraries and hardware configuration information for preparing the TL881 or TL891 DLT MiniLibrary for use on a shared SCSI bus with the TruCluster Production Server Software Version 1.6 or TruCluster Available Server Software Version 1.6 products.

2.1 TL881 and TL891 DLT MiniLibrary Overview

The Compaq StorageWorks TL881 and TL891 DLT MiniLibraries were recently qualified for use with the TruCluster Production Server Software Version 1.6 and TruCluster Available Server Software Version 1.6 products with Tru64 UNIX Version 4.0F.

For more information on the TL881 or TL891 DLT MiniLibraries, see the following Compaq documentation:

- TL881 MiniLibrary System *User's Guide*
- TL891 MiniLibrary System *User's Guide*
- TL881 MiniLibrary *Drive Upgrade Procedure*
- *Pass-Through Expansion Kit Installation Instructions*

The TL881 and TL891 Digital Linear Tape (DLT) MiniLibraries are offered as standalone tabletop units or as expandable rackmount units.

The following sections describe these units in more detail.

2.1.1 TL881 and TL891 DLT MiniLibrary Tabletop Model

The TL881 and TL891 DLT MiniLibrary tabletop model consists of one unit with a removable 10 cartridge magazine, integral bar code reader, and either one or two DLT 20/40 (TL881) or DLT 35/70 (TL891) drives.

The TL881 DLT MiniLibrary tabletop model is available as either fast, wide differential or fast, wide single-ended. The single-ended model is not supported in a TruCluster configuration.

The TL891 DLT MiniLibrary tabletop model is only available as fast, wide differential.

2.1.2 TL881 and TL891 MiniLibrary Rackmount Components

A TL881 or TL891 base unit (which contains the tape drive(s)) can operate as an independent, standalone unit, or in concert with an expansion unit and multiple data units.

A rackmount multiple-module configuration is expandable to up to six modules in a configuration. The configuration must contain at least one expansion unit and one base unit. The TL881 and TL891 DLT MiniLibraries may include various combinations of:

- MiniLibrary Expansion unit — the MiniLibrary expansion unit enables multiple TL881 or TL891 modules to share data cartridges and work as a single virtual library. The expansion unit also includes a 16-cartridge magazine.

  The expansion unit integrates the robotics in the individual modules into a single coordinated library robotics system. The expansion unit assumes control of the media, maintaining an inventory of all media present in the system, and controls movement of all media. The tape cartridges can move freely between the expansion unit and any of the base units or data units via the system's robotically controlled pass-through mechanism.

  The expansion unit can control up to five additional attached modules (base units and data units) to create a multimodule rackmount configuration. The expansion unit must be enabled to control the base unit by setting the base unit to slave mode. The data unit is a passive device and only works as a slave to the expansion unit. To create a multimodule rackmount system, there must be one expansion unit and at least one base unit. The expansion unit has to be the top module in the configuration.

  The expansion unit works with either the TL881 or TL891 base unit.

- TL881 or TL891 base unit — includes library robotics, bar code reader, a removable 10-cartridge magazine, and one or two tape drives:
  - TL881 — DLT 20/40 (TZ88N-AV) drives
  - TL891 — DLT 35/70 (TZ89N-AV) drives

  To participate in a MiniLibrary configuration, each base unit must be set up as a slave unit to pass control to the expansion unit. Once the expansion unit has control over the base unit, the expansion unit controls tape-cartridge movement between the magazines and tape drives.

Note

You cannot mix TL881 and TL891 base units in a rackmount configuration as the tape drives use different formats.

- Data unit — This rackmount module contains a 16-cartridge magazine to provide additional capacity in a multi-module configuration. The data unit robotics works in conjunction with the robotics of the expansion unit and base units. It is under control of the expansion unit.

  The data unit works with either the TL881 or TL891 base unit.

- Pass-Through Mechanism — The pass-through mechanism is attached to the back of the expansion unit and each of the other modules and allows the transfer of tape cartridges between the various modules. It is controlled by the expansion unit.

  For each base or data unit added to a configuration, the pass-through mechanism must be extended by seven inches (the height of each module). A seven inch gap may be left between modules (providing there is sufficient space), but additional pass-through mechanism extensions must be used.

2.1.3 TL881 and TL891 Rackmount Scalability

The rackmount version of the TL881 and TL891 MiniLibraries provides a scalable tape library system that you can configure for maximum performance, maximum capacity, or various combinations between the extremes.

Either library uses DLT IV tape cartridges but can also use DLT III or DLT IIIxt tape cartridges. Table 2–1 shows the capacity and performance of a TL881 or TL891 MiniLibrary in configurations set up for either maximum performance or maximum capacity.

Table 2–1: TL881 and TL891 MiniLibrary Performance and Capacity Comparison

			TL881 MiniLibrary		TL891 MiniLibrary	
Configured for Maximum:	**Number of Base Units[a] [b]**	**Number of Data Units[c]**	**Transfer Rate[d]**	**Storage Capacity[e]**	**Transfer Rate[f]**	**Storage Capacity[g]**
Performance	5	0	15 MB/sec (54 GB/hour)	1.32 TB (66 cartridges)	50 MB/sec (180 GB/hour)	2.31 TB (66 cartridges)
Capacity	1	4	3 MB/sec (10.8 GB/hour)	1.8 TB (90 cartridges)	10 MB/sec (36 GB/hour)	3.15 TB (90 cartridges)

[a]Using an expansion unit with a full 16-cartridge magazine.
[b]Each base unit has a full 10-cartridge magazine and two tape drives.
[c]Using a data unit with full 16-cartridge magazine.
[d]Up to 1.5 MB/sec per drive.
[e]Based on 20 GB/cartridge uncompressed. It could be up to 40 GB/cartridge compressed.
[f]Up to 5 MB/sec per drive.
[g]Based on 35 GB/cartridge uncompressed. It could be up to 70 GB/cartridge compressed.

By modifying the combinations of base units and data units, the performance and total capacity can be adjusted to meet the customers' needs.

2.1.4 DLT MiniLibrary Part Numbers

Table 2–2 shows the part numbers for the TL881 and TL891 DLT MiniLibrary systems. Part numbers are only shown for the TL881 fast, wide differential components.

Table 2–2: DLT MiniLibrary Part Numbers

DLT Library Component	Number of Tape Drives	Tabletop/Rackmount	Part Number
TL881 DLT Library	1	Tabletop	128667-B21
TL881 DLT Library	2	Tabletop	128667-B22
TL881 DLT MiniLibrary Base Unit	1	Rackmount	128669-B21
TL881 DLT MiniLibrary Base Unit	2	Rackmount	128669-B22
Add-on DLT 20/40 drive for TL881	1	N/A	128671-B21
TL891 DLT Library	1	Tabletop	120875-B21
TL891 DLT Library	2	Tabletop	120875-B22
TL891 DLT MiniLibrary Base Unit	1	Rackmount	120876-B21

Table 2–2: DLT MiniLibrary Part Numbers (cont.)

DLT Library Component	Number of Tape Drives	Tabletop/Rackmount	Part Number
TL891 DLT MiniLibrary Base Unit	2	Rackmount	120876-B22
Add-on DLT 35/70 drive for TL891	1	N/A	120878-B21
MiniLibrary Expansion Unit	N/A	Rackmount	120877-B21
MiniLibrary Data Unit	N/A	Rackmount	128670-B21

Note

The TL881 DLT MiniLibrary tabletop model is available as fast, wide differential or fast, wide single-ended. The single-ended model is not supported in a cluster configuration. The TL891 DLT MiniLibrary tabletop model is only available as fast, wide differential.

2.2 Preparing a TL881 or TL891 MiniLibrary for Shared SCSI Bus Use

The following sections describe how to prepare the TL881 and TL891 DLT MiniLibraries for shared SCSI bus use in more detail.

2.2.1 Preparing a Tabletop Model or Base Unit for Standalone Shared SCSI Bus Usage

A TL881 or TL891 DLT MiniLibrary tabletop model or a rackmount base unit may be used standalone. A customer may wish to purchase a rackmount base unit with plans for later expansion.

Note

To achieve system performance capabilities, we recommend placing no more than two tape drives on a SCSI bus, and also recommend that no shared storage be placed on the same SCSI bus with a tape library.

The topics in this section provide information on preparing the TL881 or TL891 DLT MiniLibrary tabletop model or rackmount base unit for use on a shared SCSI bus.

For complete hardware installation instructions, see the TL881 MiniLibrary System *User's Guide* or TL891 MiniLibrary System *User's Guide*.

2.2.1.1 Setting the Standalone MiniLibrary Tape Drive SCSI ID

The control panel on the front of the TL891 and TL892 MiniLibraries is used to display power-on self-test (POST) status, display messages, and to set up MiniLibrary functions.

When power is first applied to a MiniLibrary, a series of POST diagnostics are performed. During POST execution, the MiniLibrary model number, current date and time, firmware revision, and the status of each test is displayed on the control panel.

After the POST diagnostics have completed, the default screen is shown:

```
DLT0 Idle
DLT1 Idle
Loader Idle
0> _ _ _ _ _ _ _ _ _ _ <9
```

The first and second lines of the default screen show the status of the two (if present) drives. The third line shows the status of the library robotics, and the fourth line is a map of the magazine, with the numbers from 0 to 9 representing the cartridge slots. Rectangles present on this line indicate cartridges present in the corresponding slot of the magazine.

For example, this fourth line (`0> X X _ _ _ _ _ _ _ _ <9`, where an X represents a rectangle) indicates that cartridges are installed in slots 0 and 1.

Note

There are no switches for setting a mechanical SCSI ID for the tape drives. The SCSI IDs default to five. The MiniLibrary sets the electronic SCSI ID very quickly, before any device can probe the MiniLibrary, so the lack of a mechanical SCSI ID does not cause any problems on the SCSI bus.

To set the SCSI ID, follow these steps:

1. From the Default Screen, press the Enter button to enter the Menu Mode, displaying the Main Menu.

Note

When you enter the Menu Mode, the Ready light goes out, an indication that the module is off line, and all medium changer commands from the host return a SCSI "not ready"

status until you exit the Menu Mode and the Ready light comes on once again.

2. Depress the down arrow button until the Configure Menu item is selected, then press the Enter button to display the Configure submenu.

Note

The control panel up and down arrows have an auto-repeat feature. When you press either button for more than one-half second, the control panel behaves as if you were pressing the button about four times per second. The effect stops when you release the button.

3. Press the down arrow button until the Set SCSI item is selected and press the Enter button.
4. Select the tape drive (DLT0 Bus ID: or DLT1 Bus ID:) or library robotics (LIB Bus ID:) for which you wish to change the SCSI bus ID. The default SCSI IDs are as follows:
   - Lib Bus ID: 0
   - DLT0 Bus ID: 4
   - DLT1 Bus ID: 5

   Use the up or down arrow button to select the item for which you need to change the SCSI ID. Press the Enter button.
5. Use the up or down arrow button to scroll through the possible SCSI ID settings. Press the Enter button when the desired SCSI ID is displayed.
6. Repeat steps 4 and 5 to set other SCSI bus IDs as necessary.
7. Press the Escape button repeatedly until the default menu is displayed.

2.2.1.2 Cabling the TL881 or TL891 DLT MiniLibrary

There are six 68-pin, high-density SCSI connectors on the back of the TL881 or TL891 DLT MiniLibrary standalone model or rackmount base unit. The two leftmost connectors are for the library robotics controller. The middle two are for tape drive 1. The two on the right are for tape drive 2 (if the second tape drive is installed).

Note

The tape drive SCSI connectors are labeled DLT1 (tape drive 1) and DLT2 (tape drive 2). The control panel designation for the drives is DLT0 (tape drive 1) and DLT1 (tape drive 2).

The default for the TL881 or TL891 DLT MiniLibrary is to place the robotics controller and tape drive 1 on the same SCSI bus (Figure 2–1). A 0.3-meter SCSI jumper cable is provided with the unit. Plug this cable into the second connector (from the left) and the third connector. If the MiniLibrary has two drives, place the second drive on the same SCSI bus with another 0.3-meter SCSI bus jumper cable, or place it on its own SCSI bus.

Notes

The internal cabling of the TL881 and TL891 is too long to allow external termination with a trilink/terminator combination. Therefore, the TL881 or TL891 must be the last device on the shared SCSI bus. They may not be removed from the shared SCSI bus without stopping all ASE services that generate activity on the bus.

To achieve system performance capabilities, we recommend placing no more than two tape drives on a SCSI bus.

We recommend that tape devices be placed on separate shared SCSI buses, and that there be no storage devices on the SCSI bus.

The cabling depends on whether or not there are one or two drives, and for the two-drive configuration, if each drive is on a separate SCSI bus.

Note

It is assumed that the library robotics is on the same SCSI bus as tape drive 1.

To connect the library robotics and one drive to a single shared SCSI bus, follow these steps:

1. Connect a 328215-00X, BN21K, or BN21L between the last Y cable or trilink connector on the bus to the leftmost connector (as viewed from the rear) of the MiniLibrary. The 328215-004 is a 20-meter cable.
2. Install a 0.3-meter SCSI bus jumper between the rightmost robotics connector (second connector from the left) and the left DLT1 connector (the third connector from the left).

3. Install an HD68 differential terminator (such as an H879-AA) on the right DLT1 connector (the fourth connector from the left).

To connect the drive robotics and two drives to a single shared SCSI bus, follow these steps:

1. Connect a 328215-00X, BN21K, or BN21L between the last trilink connector on the bus to the leftmost connector (as viewed from the rear) of the MiniLibrary.
2. Install a 0.3-meter SCSI bus jumper between the rightmost robotics connector (the second connector from the left) and the left DLT1 connector (the third connector from the left).
3. Install a 0.3-meter SCSI bus jumper between the rightmost DLT1 connector (the fourth connector from the left) and the left DLT2 connector (the fifth connector from the left).
4. Install an HD68 differential (H879-AA) terminator on the right DLT2 connector (the rightmost connector).

To connect the drive robotics and one drive to one shared SCSI bus and the second drive to a second shared SCSI bus, follow these steps:

1. Connect a 328215-00X, BN21K, or BN21L between the last trilink connector on one shared SCSI bus to the leftmost connector (as viewed from the rear) of the MiniLibrary.
2. Connect a 328215-00X, BN21K, or BN21L between the last trilink connector on the second shared SCSI bus to the left DLT2 connector (the fifth connector from the left).
3. Install a 0.3-meter SCSI bus jumper between the rightmost robotics connector (the second connector from the left) and the left DLT1 connector (the third connector from the left).
4. Install an HD68 differential (H879-AA) terminator on the right DLT1 connector (the fourth connector from the left) and install another HD68 differential terminator on the right DLT2 connector (the rightmost connector).

Figure 2–1 shows an example of a TruCluster configuration with a TL891 standalone MiniLibrary connected to two shared SCSI buses.

Figure 2–1: TL891 Standalone Cluster Configuration

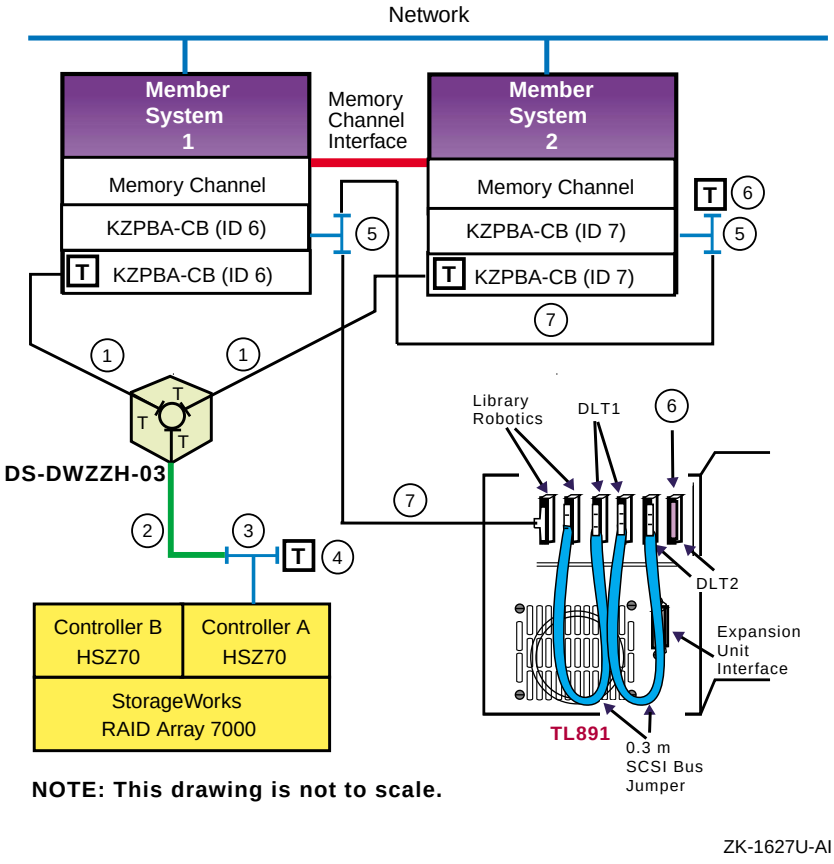


Table 2–3 shows the components used to create the cluster shown in Figure 2–1.

Table 2–3: Hardware Components Used to Create the Configuration Shown in Figure 2-1

Callout Number	Description
1	BN38C or BN38D cable[a]
2	BN37A cable[b]
3	H8861-AA VHDCI trilink connector
4	H8863-AA VHDCI terminator
5	BN21W-0B Y cable

Table 2–3: Hardware Components Used to Create the Configuration Shown in Figure 2-1 (cont.)

Callout Number	Description
6	H879-AA terminator
7	328215-00X, BN21K, or BN21L cable[c]

[a]The maximum length of the BN38C (or BN38D) cable on one SCSI bus segment must not exceed 25 meters.
[b]The maximum length of the BN37A cable must not exceed 25 meters.
[c]The maximum combined length of these cables must not exceed 25 meters.

2.2.2 Preparing a TL881 or TL891 Rackmount MiniLibrary for Shared SCSI Bus Usage

A TL881 or TL891 MiniLibrary base unit may also be used in a rackmount configuration with an expansion unit, data unit(s), and other base units, to add tape drive and/or cartridge capacity to the configuration.

The expansion unit is installed above the TL881 or TL891 DLT MiniLibrary base or data units in a SW500, SW800, or RETMA cabinet.

For complete hardware installation instructions, see the TL881 MiniLibrary System *User's Guide* or TL891 MiniLibrary System *User's Guide*.

The topics in this section provide information on preparing the rackmount TL881 or TL891 DLT MiniLibrary for use on a shared SCSI bus.

It is assumed that the expansion unit, base modules, and pass-through and motor mechanism have been installed.

2.2.2.1 Cabling the Rackmount TL881 or TL891 DLT MiniLibrary

You must make the following connections to render the DLT MiniLibrary system operational:

- Expansion unit to the pass-through motor mechanism: The motor mechanism cable is about 1 meter long and has a DB-15 connector on each end. Connect it between the connector labeled Motor on the expansion unit to the motor on the pass-through mechanism.

Note

This cable is not shown in Figure 2–2 as the pass-through mechanism is not shown in the figure.

- Robotics control cables from the expansion unit to each base unit or data unit: These cables have a DB-9 male connector on one end and a DB-9 female connector on the other end. Connect the male end to the Expansion Unit Interface connector on the base unit or Diagnostic

connector on the data unit and the female end to any Expansion Modules connector on the expansion unit.

Note

It does not matter which interface connector a base unit or data unit is connected to.

- SCSI bus connection to the expansion unit robotics: Connect the shared SCSI bus that will control the robotics to one of the SCSI connectors on the expansion unit with a 328215-00X, BN21K, or BN21L cable. Terminate the SCSI bus with an HD68 terminator (such as an H879-AA) on the other expansion unit SCSI connector.
- SCSI bus connection to each of the base module tape drives: Connect a shared SCSI bus to one of the DLT1 or DLT2 SCSI connectors on each of the base modules with 328215-00X, BN21K, or BN21L cables. Terminate the other DLT1 or DLT2 SCSI bus connection with an HD68 terminator (H879-AA).

  You can daisy chain between DLT1 and DLT2 (if present) with a 0.3-meter SCSI bus jumper (supplied with the TL881 or TL891). Terminate the SCSI bus at the tape drive on the end of the shared SCSI bus with an HD68 terminator (H879-AA).

Notes

Do not connect a SCSI bus to the SCSI connectors for the library connectors on the base modules.

We recommend that no more than two tape drives be on a SCSI bus.

Figure 2–2 shows a TL891 DLT MiniLibrary configuration with an expansion unit, a base units, and a data unit. The library robotics expansion unit is on one shared SCSI bus and the two tape drives in the base unit are on separate, shared SCSI buses. The data unit is not on a shared SCSI bus as it does not contain any tape drives but tape cartridges only. Note that the pass-through mechanism and cable to the library robotics motor is not shown in this figure.

For more information on cabling the units, see Section 2.2.1.2. With the exception of the robotics control on the expansion module, a rackmount TL881 or TL891 DLT MiniLibrary is cabled in the same manner as a tabletop unit.

Figure 2–2: TL881 DLT MiniLibrary Rackmount Configuration

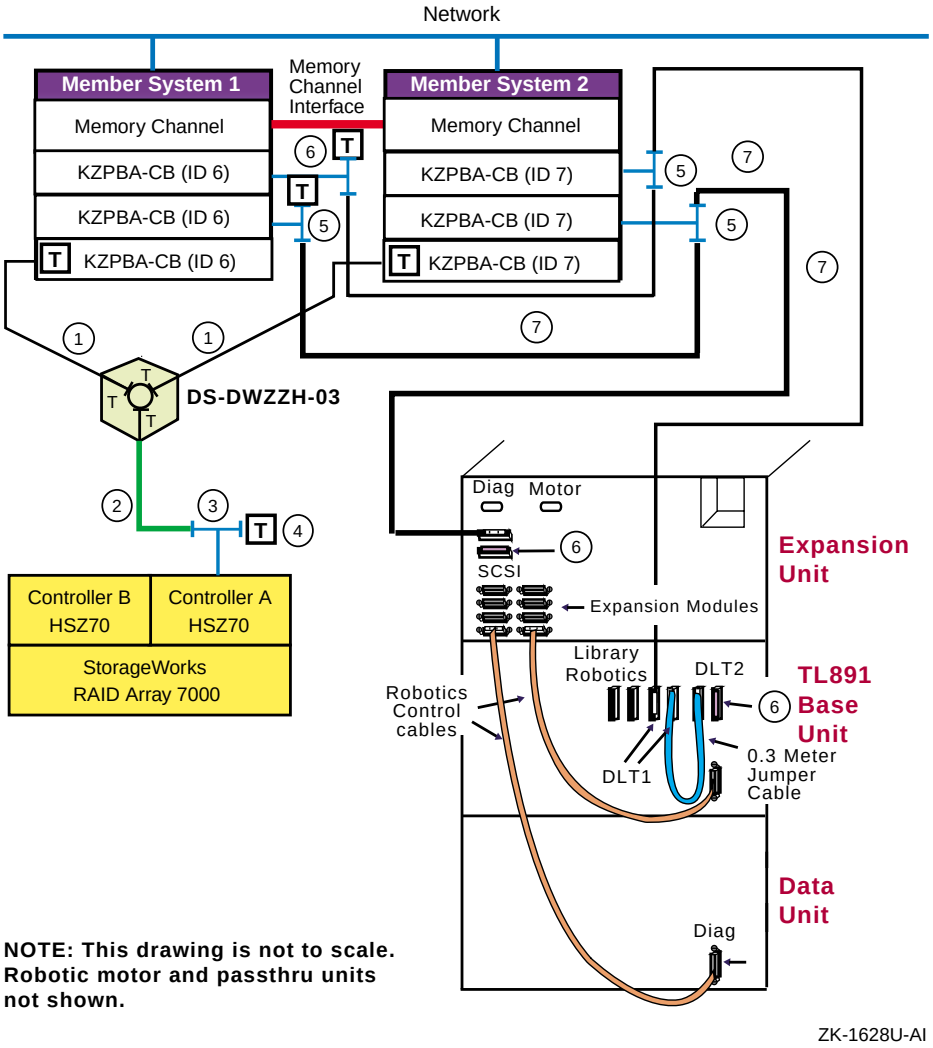


Table 2–4 shows the components used to create the cluster shown in Figure 2–2.

Table 2–4: Hardware Components Used to Create the Configuration Shown in Figure 2-2

Callout Number	Description
1	BN38C or BN38D cable[a]
2	BN37A cable[b]
3	H8861-AA VHDCI trilink connector
4	H8863-AA VHDCI terminator
5	BN21W-0B Y cable
6	H879-AA terminator
7	328215-00X, BN21K, or BN21L cable[c]

[a]The maximum length of the BN38C (or BN38D) cable on one SCSI bus segment must not exceed 25 meters.
[b]The maximum length of the BN37A cable must not exceed 25 meters.
[c]The maximum combined length of these cables must not exceed 25 meters.

2.2.2.2 Configuring a Base Unit as a Slave to the Expansion Unit

The TL891/TL892 base units are shipped configured as standalone systems. When they are used in conjunction with the MiniLibrary expansion unit, the expansion unit must control the robotics of each of the base units. Therefore, the base units must be configured as slaves to the expansion unit.

After the hardware and cables are installed, but before you power up the expansion unit in a MiniLibrary system for the first time, you must reconfigure each of the base units in the system as a slave. The expansion unit will not have control over the base unit robotics when you power up the MiniLibrary system, if you do not reconfigure the base unit as a slave.

To reconfigure a TL891/TL892 base unit as a slave to the MiniLibrary expansion unit, perform the following procedure on each base unit in the system:

1. Turn on the power switch on the TL891/TL892 base unit to be reconfigured.

Note

Do not power on the expansion unit. Leave it powered off until all base units have been reconfigured as slaves.

After a series of self-tests have executed, the default screen will be displayed on the base module control panel:

```
DLT0 Idle
DLT1 Idle
Loader Idle
0> _ _ _ _ _ _ _ _ _ _ <9
```

The default screen shows the state of the tape drives, loader, and number of cartridges present for this base unit. A rectangle in place of the underscore indicates that a cartridge is present in that location.

2. Press the Enter button to enter the Menu Mode, displaying the Main Menu.
3. Depress the down arrow button until the Configure Menu item is selected, then press the Enter button.

Note

The control panel up and down arrows have an auto-repeat feature. When you press either button for more than one-half second, the control panel behaves as if you were pressing the button about four times per second. The effect stops when you release the button.

4. Press the down arrow button until the Set Special Config menu is selected and press the Enter button.
5. Press the down arrow button repeatedly until the Alternate Config item is selected and press the Enter button.
6. Press the down arrow button to change the alternate configuration from the default (Standalone) to Slave. Press the Enter button.
7. After the selection stops flashing and the control panel indicates that the change is not effective until a reboot, press the Enter button.
8. When the Special Configuration menu reappears, turn the power switch off and then on to cycle the power. The base unit is now reconfigured as a slave to the expansion unit.
9. Repeat the steps for each TL891/TL892 base unit present that is to be a slave to the expansion unit.

2.2.2.3 Powering Up the TL881/TL891 DLT MiniLibrary

When turning on power to the TL881 or TL891 DLT MiniLibrary, power must be applied to the expansion unit simultaneously or after power is applied to the the base units and data units. If the expansion unit is powered on first, its inventory of modules may be incorrect and the contents of some or all of the modules will be inaccessible to the system and to the host.

When the expansion unit comes up, it will communicate with each base and data unit through the expansion unit interface and inventory the number of base units, tape drives, data units, and cartridges present in each base and data unit. After the MiniLibrary configuration has been determined, the expansion unit will communicate with each base and data unit and indicate to the modules which cartridge group that base or data unit contains.

When all initialization communication between the expansion module and each base and data unit has completed, the base and data units will display their cartridge numbers according to the remapped cartridge inventory.

2.2.2.4 Setting the SCSI IDs for a Rackmount TL881 or TL891 DLT MiniLibrary

After the base units have been reconfigured as slaves, each base unit control panel still provides tape drive status and error information, but all control functions are carried out from the expansion unit control panel. This includes setting the SCSI ID for each of the tape drives present.

To set the SCSI IDs for the tape drives in a TL881 or TL891 DLT MiniLibrary rackmount configuration, follow these steps:

1. Apply power to the MiniLibrary, ensuring that you power up the expansion unit after or at the same time as the base and data units.
2. Wait until power-on self-tests (POST) have terminated and the expansion unit and each base and data unit display the default screen.
3. At the expansion unit control panel, press the Enter button to display the Main Menu.
4. Press the down arrow button until the Configure Menu item is selected, and then press the Enter button to display the Configure submenu.
5. Press the down arrow button until the Set SCSI item is selected and press the Enter button.
6. Press the up or down arrow button to select the appropriate tape drive (DLT0 Bus ID:, DLT1 Bus ID:, DLT2 Bus ID:, and so on) or library robotics (Library Bus ID:) for which you wish to change the SCSI bus ID. In a configuration with three base units, and assuming that each base unit has two tape drives, the top base unit contains DLT0 and DLT1. The next base unit down contains DLT2 and DLT3. The next base unit contains DLT4 and DLT5. The default SCSI IDs, after being reconfigured by the expansion unit, are as follows:
   - Library Bus ID: 0
   - DLT0 Bus ID: 1
   - DLT1 Bus ID: 2
   - DLT2 Bus ID: 3

- DLT3 Bus ID: 4
- DLT4 Bus ID: 5
- DLT5 Bus ID: 6

7. Press Enter when you have the item selected for which you wish to change the SCSI ID.
8. Use the up and down arrows to select the desired SCSI ID. Press the Enter button to save the new selection.
9. Press the Escape button once to return to the Set SCSI Submenu to select another tape drive or the library robotics, and then repeat steps 6, 7, and 8 to set the SCSI ID.
10. If there are other items you wish to configure, press the Escape button until the Configure submenu is displayed, then select the item to be configured. Repeat this procedure for each item you wish to configure.
11. If there are no more items to be configured, press the Escape button until the Default window is displayed.

Note

You do not have to cycle power to set the SCSI IDs.