

# **TASCAM**

**TEAC Professional Division**

## **MX-2424**

**24-Bit 24-Track Hard Disk Recorder**

**MX-2424 Version 2.1  
SCSI Instructions**

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## ***SCSI Terminology***

It is important to understand some SCSI basics before adding drives to an MX-2424. The first step in this understanding is familiarity with a few simple terms.

### **SCSI**

Stands for Small Computer System Interface. This is the data transfer method and physical connection used by the MX-2424 for connection to hard drives and backup solutions.

### **Throughput**

This is the amount of data transferred from one device/component to another in a specified time period.

### **8-Bit Data Transfer**

This refers to data transfer between a SCSI device and the MX-2424's processors and supports throughput of up to 20Mbytes/second. This should not be confused with the term "24-bit audio" which refers to the resolution of recorded audio.

### **16-Bit Data Transfer**

This refers to data transfer between a SCSI device and the MX-2424's processors and supports throughput of up to 80Mbytes/second. This should not be confused with the term "24-bit audio" which refers to the resolution of recorded audio.

### **Ultra SCSI (Narrow)**

This type of SCSI device uses 8-bit data transfers and generally employs a 50-pin connector. An example of such a device would be the **DVD-GF2050** DVD-RAM drive, offered by TASCAM as a backup solution for the MX-2424.

### **Ultra Wide SCSI**

This type of SCSI device uses 16-bit data transfers and generally employs a 68-pin connector.

### **LVD (Wide Ultra2 SCSI)**

Stands for Low Voltage Differential (also known as **Ultra2 SCSI**). This is the particular type of SCSI protocol used by the MX-2424. **LVD SCSI** uses 16-bit data transfers and employs a High Density or Very High Density 68-pin connector. This allows throughput of 80 Mbytes/second.

Low Voltage Differential (LVD) works by sending simultaneous pairs of data in a balanced configuration. Just like a balanced audio signal, the noise is rejected when the signals are summed. Because of noise rejection, the bus can operate at higher speeds and longer cable lengths. The MX provides Ultra2/LVD performance on the internal and external bus.

### **SCSI Terminator**

This is a special device that must be attached to the last device in a SCSI chain for the system to function.

### **SCSI ID**

This is a number that is set on each SCSI device in a SCSI chain, which identifies that device to the MX-2424.

## **SCSI Cables/Terminators**

There is a considerable difference in quality and performance of cables used to connect SCSI devices. Low quality cables may cause data transmission errors, file corruption and system malfunctions. It is important to always use high quality SCSI cables & terminators such as those available from TASCAM listed below for use with TASCAM distributed external drive enclosures.

**SCSI-MX2:** 3' 68-pin High Density to 68-pin Very High Density SCSI cable for connecting the MX-2424 to an External Drive Case.

**SCSI-MX3:** 1.5' 68-pin Very High Density SCSI cable for connecting External Drive Cases to each other.

**SCSI-MXT:** 68-pin Very High Density LVD/SE terminator for use with an External Drive Case.

### **Additional Recommended Sources for SCSI Cables, Terminators and Adapters:**

CS Electronics

[www.scsi-cables.com](http://www.scsi-cables.com)

17500 Gillette Ave.

Irvine, California 92614

(949)-475-9100

Supported Internal Adapters:

- 68-pin to 50-Pin Internal Adapter for attaching a narrow back up device (DVD-RAM or Travan Tape) to the internal bay on the MX-2424.  
P/N: ADP-9053

Supported External SCSI Cables:

- High Density 68-Pin to 68-Pin SCSI cable with Thumbscrews, 3 ft.  
P/N: HD68T-HD68T/3ft-132U
- High Density 68-Pin to 68-Pin SCSI cable with Clip Locks, 3 ft.  
P/N: HD68C-HD68C/3ft-132U
- High Density 68-Pin to Centronix 50-Pin SCSI cable with High 9 Active Termination, 3 ft.  
P/N: T68A-C50/3ft
- High Density 68-Pin to High Density 50-Pin SCSI cable with High 9 Active Termination, 3 ft.  
P/N: T68A-HD50/3ft

Supported Terminators:

- Centronix Active Negation Terminator  
P/N: TRM-8511
- HD50 Active Negation Terminator:  
P/N: TRM-8527
- 68-Pin High Density LVD/SE Terminator  
P/N: TRM-8900L
- 68-Pin Very High Density LVD Terminator  
P/N: TRM-8920

*Paralan Corporation*

[www.paralan.com](http://www.paralan.com)  
4655 Ruffner St.  
San Diego, CA 92111  
(858)-560-7266

Supported SCSI Cables:

- 68-Pin to 68-Pin High density SCSI cable for LVD and Wide use, 3 ft.  
P/N: SQ-9-9-3

*StorCase Technology*

[www.storcase.com](http://www.storcase.com)  
17600 Newhope St.  
Fountain Valley, CA 92708  
(800) 435-0642

Supported SCSI Cables

- 68-pin Wide Very High Density to 68-Pin High Density Cable  
P/N: DC-SCSI3/U2-3
- 68-pin Wide Very High Density to 68-Pin Very High Density Cable  
P/N: DC-U2-3

Supported Terminators:

- 50-pin Centronix Active Terminator  
P/N: DX100-S-TA
- 50-pin High Density MM Active Terminator  
P/N: DX100-S2-TA
- 68-pin Wide Very High Density LVD/SE Terminator  
P/N: DX-U2-LVD/SE

## Removable “Hot-Swappable” SCSI Solutions

The following “hot-swappable” StorCase SCSI Carrier/Frame Systems are approved for use with the MX-2424 when configured according to the diagrams on the following pages:

### Rhino Jr. System

Frame & Carrier:	RJR100-SW/B	(Wide)
	RJR100-SWU2X/B	(Ultra 2)
Carrier Only:	RJR100-CSW/B	(Wide)
	RJR100-CSWU2X/B	(Ultra 2)

### Ultra 160 Data Express System

Frame & Carrier:	DE100i-SW160/B	(New Part #: S20A100 includes Isolator Board)
Carrier Only:	DE100i-CSW160/B	
Frame Only:	DE100i-RSW160/B	(New Part #: S20A101 includes Isolator Board)

### Ultra 2 Data Express System

Carrier Only:	DE100i-CSWU2X/B
Frame Only:	DE100i-RSWU2X/B
Isolator Board:	DX1/200-X2/RH

### Wide Data Express System

Carrier Only:	DE100i-CSW/B
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For information on the Storcase Isolator board for the Ultra 2 and Ultra 160 Data Express frames please contact Storcase at (800) 435-0642

### Compatibility Considerations

Systems that use single-ended wide receiving frames will not function reliably with Ultra 2 and Ultra 160 carriers, thus the DE100i-CSW/B carrier should be chosen when the widest possible compatibility is required. The U160 Frame/Repeater board combination will accept SE Wide, Ultra 2 or Ultra 160 carriers.

Ultra 160 Data Express models that include the isolator board on the frame (S20A100 frame & carrier, black, or S20A101 frame, black), should be used for maximum compatibility & reliability. Please refer to the Compatibility Chart below:

Carrier Model	Frame Model	Compatible Combo	
		SE	LMD
DE100i-CSWB	DE100i-RSWB	Yes	NA
DE100i-CSWB	DE100i-RSWU2X/B	Yes	NA
DE100i-CSWB	DE100i-RSW160/B	Yes	NA
DE100i-CSWU2X/B	DE100i-RSWB	Yes	NA
DE100i-CSWU2X/B	DE100i-RSWU2X/B	Yes	Yes
DE100i-CSWU2X/B	DE100i-RSW160/B	Yes	Yes
DE100i-CSW160/B	DE100i-RSWB	No	No
DE100i-CSW160/B	DE100i-RSWU2X/B	No	No
DE100i-CSW160/B	DE100i-RSW160/B	Yes	Yes

### **Mounting/Un-Mounting Drive in Removable Carriers**

When drives are installed in StorCase carrier/frames, the MX-2424 can mount and un-mount removable drives without required a system reboot. Remember to un-mount (SHIFT+MOUNT) before removing any StorCase carriers from the MX-2424 to avoid data corruption and system errors. To re-mount the drive carrier, lock it and press the MOUNT key. Note that Rhino Jr. and Data Express systems are not cross compatible.

### **External Drive Cases**

The following StorCase external drive cases are approved for use with the MX-2424:

#### **Data Silo DS-100**

Single Bay: DS100-1-160/B

Dual Bay: DS100-2-160/B

#### **Additional recommended sources for external drive enclosures:**

*Glyph Technology*

[www.glyphtech.com](http://www.glyphtech.com)

#### **Note on High Density and Very High Density 68-Pin External Connectors**

There are two types of 68-Pin SCSI cables and terminators available for use with LVD devices: High Density (HD) and Very High Density 68-Pin (VHDCI). The MX-2424 has a standard HD connector located on the back of the unit. However, by using a HD to VHDCI SCSI cable, it may attach to external devices with VHDCI connectors. Before configuring your system, verify the type of 68-Pin devices you wish to connect to.

## SCSI Connection Matrix

MX-2424 Approved SCSI Configurations												
Internal Drive						External Drive						Notes
Int HD	Front DVD	Front Tape	Front HD Rhino Jr	Front HD Data Express Ultra 2	Front HD Data Express 160	Ext DVD	Ext Tape	Ext HD Rhino Jr	Ext HD Data Express Ultra 2	Ext HD Data Express 160	Ext Orb	
1												
1						1						
1							1					
1											1	
1	1											
1	1							2				
1	1								2			*
1	1									2		*
1	1										1	
1		1										
1		1						2				
1		1							2			*
1		1								2		*
1		1									1	
1			1									
1			1			1						
1			1				1					
1			1								1	
1				1								
1				1		1						
1				1			1					
1				1					2			*
1				1							1	
1					1							
1					1	1						*
1					1		1					*
1					1					2		*
1								3				
1									3			*
								4				#
									4			* #
				1					3			*

\* Each Storage device in this configuration MUST use an Isolator Board

# Each external SCSI cable may not exceed 1.5 ft. each in length.

Numerals indicate the maximum number of a specific device that can be connected in that position.

## SCSI Rules

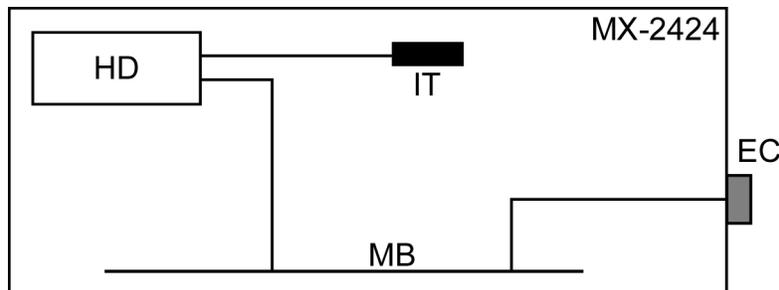
There are a few rules that must be considered when connecting SCSI devices to the MX-2424:

1. Narrow (8-bit) devices connected externally to the MX-2424 must be connected at the end of the SCSI chain.
2. Narrow (8-bit) devices may be installed in the front panel bay of the MX-2424 with the proper adapter (ADP-9053).
3. Only Approved SCSI devices should be connected to the MX-2424 in approved configurations. For a list of currently approved SCSI devices check the TASCAM web site at <http://www.tascam.com>. This list will be updated as needed.
4. A SCSI chain must always be properly terminated.
5. Each device in a SCSI chain must have its own unique SCSI ID number.

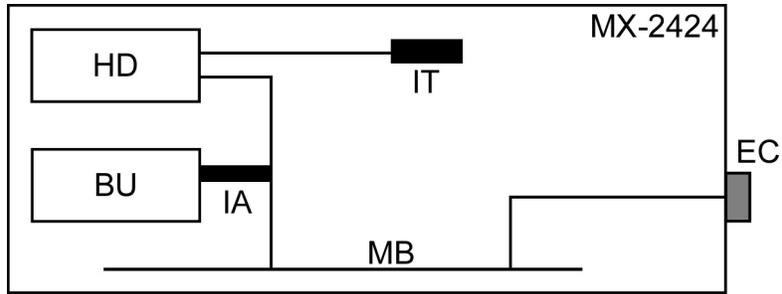
## Examples of Correct SCSI Configurations

### KEY:

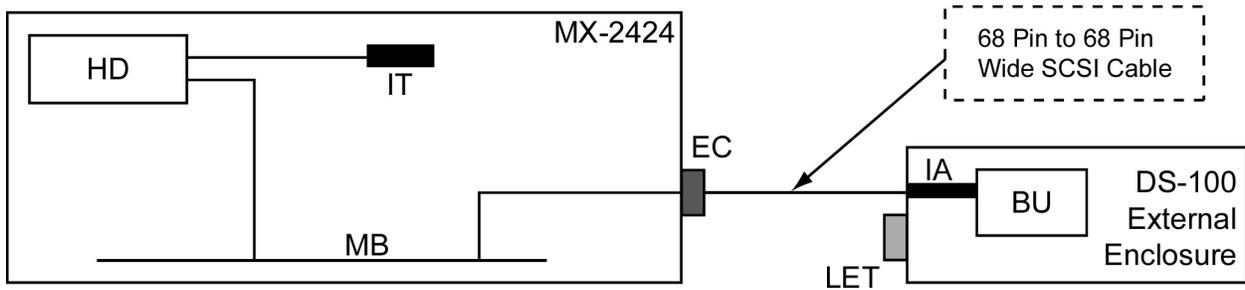
<b>HD</b>	Approved Hard Drive
<b>ORB</b>	Orb Drive w/ Built-In Active Termination
<b>IT</b>	LVD/SE Internal Terminator (Included with the MX-2424)
<b>MB</b>	MX-2424 Motherboard
<b>EC</b>	External SCSI Connector (On MX-2424)
<b>BU</b>	Single Ended Backup Solution (DVD-RAM or Travan)
<b>IA</b>	68 Pin to 50 Pin Internal Adapter (ADP-9053)
<b>LET</b>	LVD/SE External Terminator
<b>AET</b>	Active External Terminator



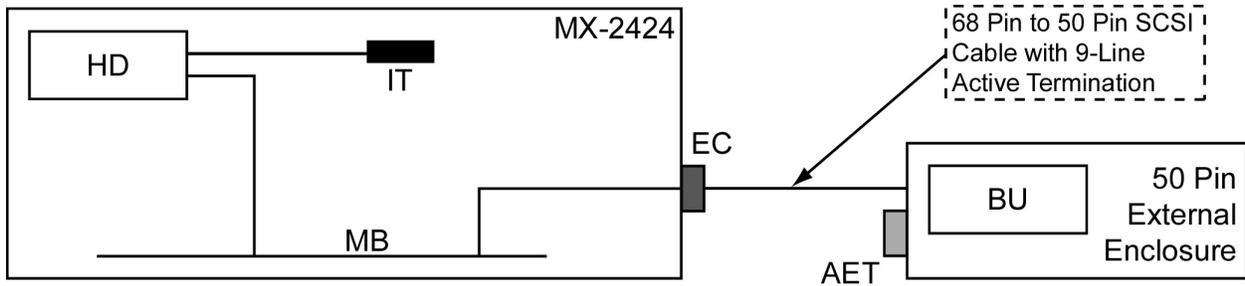
MX-2424 with standard internal hard drive.



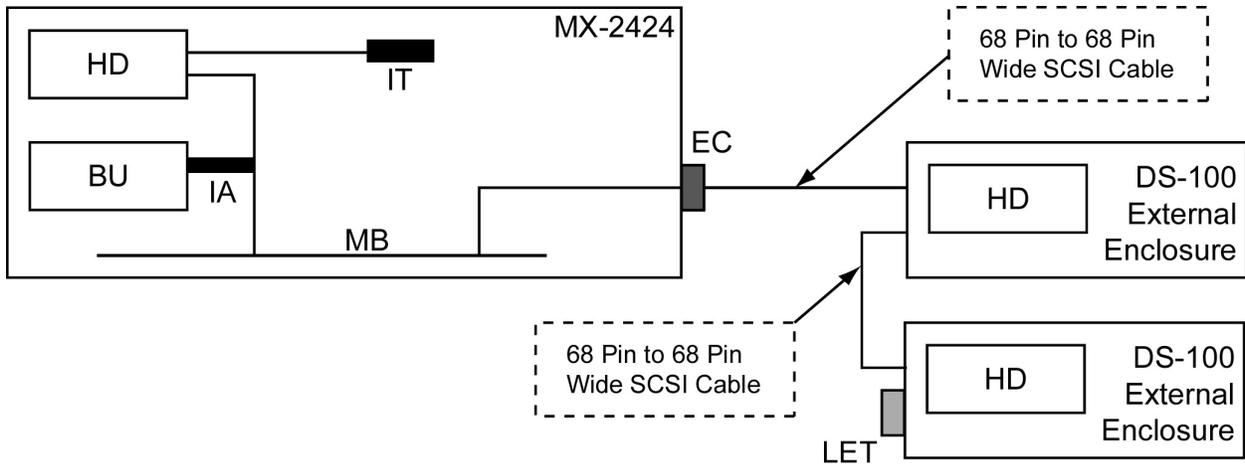
MX-2424 with standard internal hard drive and single ended backup device (DVD-RAM or Travan) in the front bay.



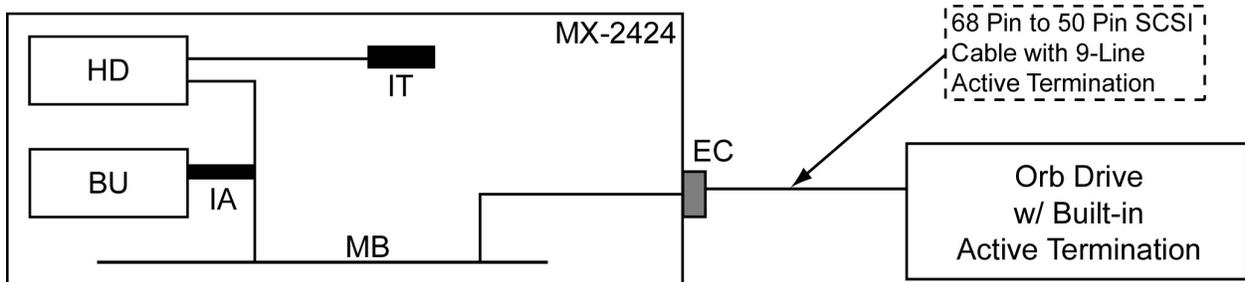
MX-2424 with standard internal hard drive and single ended backup device (DVD-RAM or Travan) in external 68-pin case.



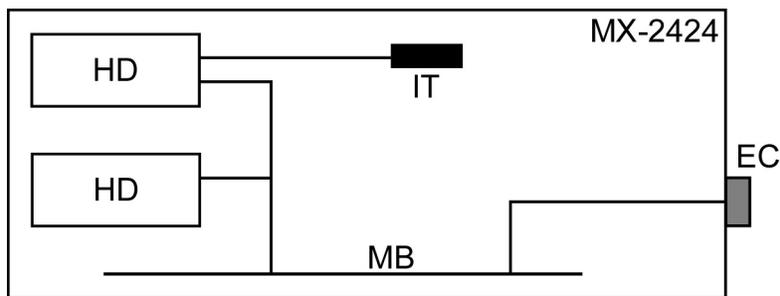
MX-2424 with standard internal hard drive and single ended backup device (DVD-RAM or Travan) in external 50-pin case.



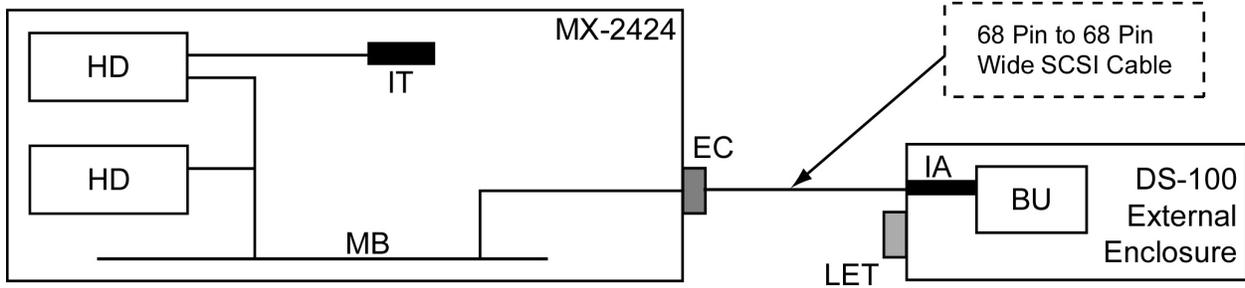
MX-2424 with standard internal hard drive, single ended backup device (DVD-RAM or Travan) in the front bay and two external hard drives.



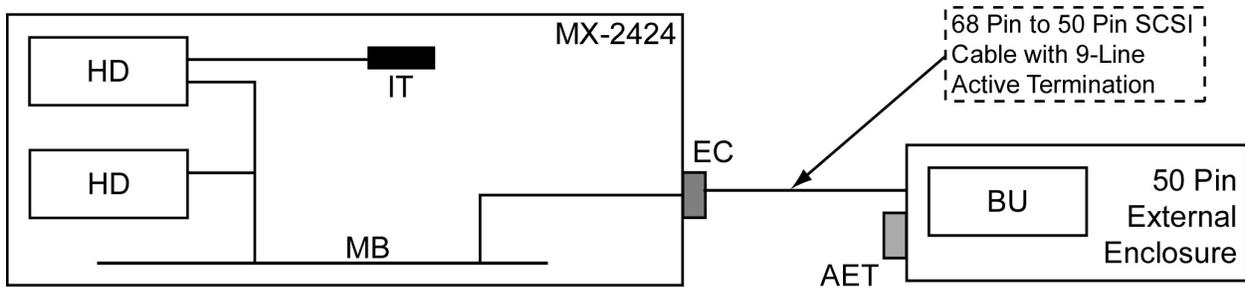
MX-2424 with standard internal hard drive, single ended backup device (DVD-RAM or Travan) in the front bay and external Orb Drive.



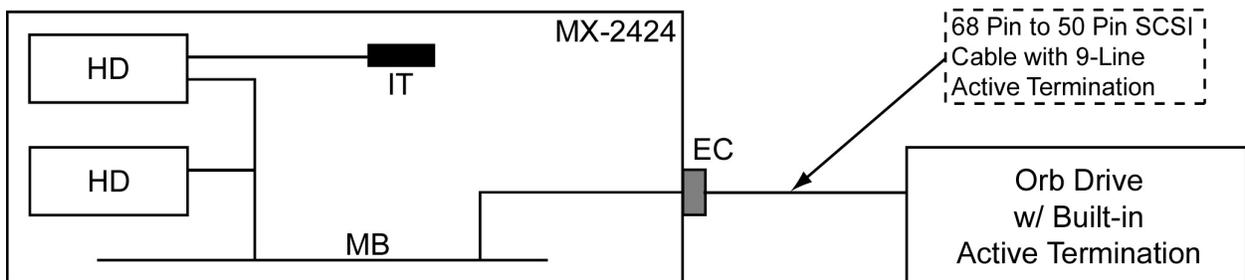
MX-2424 with standard internal hard drive and second hard drive in the front bay.



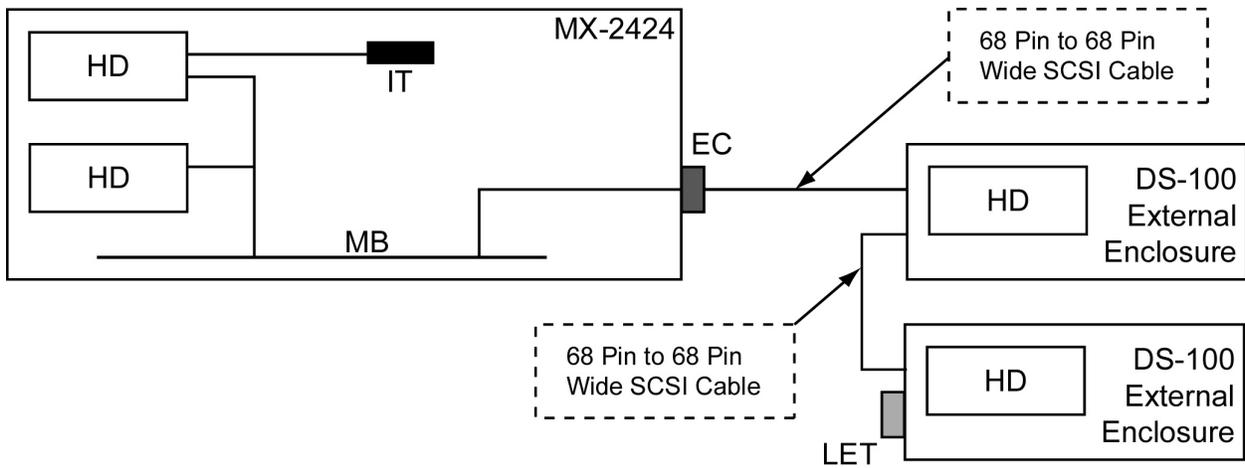
MX-2424 with standard internal hard drive, second hard drive in the front bay and a single-ended backup device (DVD-RAM or Travan) in an external 68-pin case.



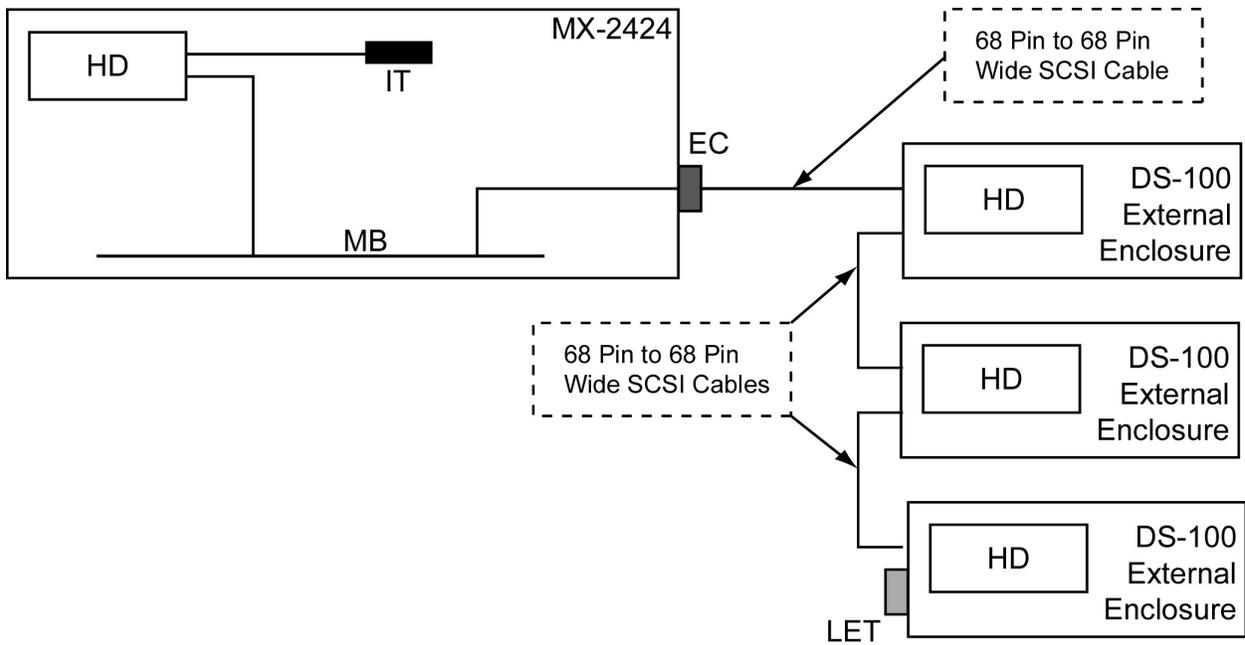
MX-2424 with standard internal hard drive, second hard drive in the front bay and a single-ended backup device (DVD-RAM or Travan) in an external 68-pin case.



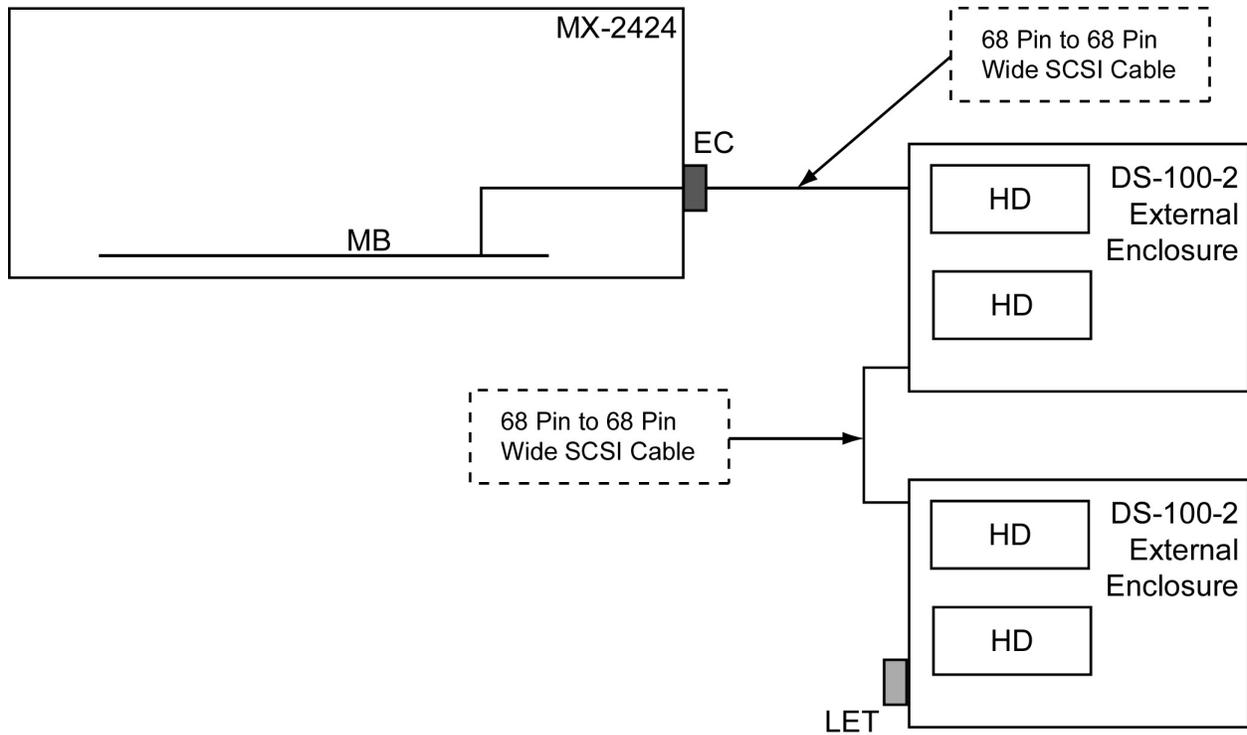
MX-2424 with standard internal hard drive, second hard drive in the front bay and an external Orb drive.



MX-2424 with standard internal hard drive, second hard drive installed in the front bay and two hard drives connected in external 68-pin cases.



MX-2424 with standard internal hard drive and three hard drives connected in external 68-pin cases.



MX-2424 with internal hard drive removed/disconnected and four hard drives connected externally in 68-pin cases.

## SCSI Cable Length

The total cable length of a SCSI chain includes the internal cabling in the MX-2424 itself, all carriers and drive bays connected and the cable used to connect between any external drive cases. The MX-2424 supports a maximum cable length of 6 feet. This **maximum length**, however, **is dependent on the quality of the SCSI cables in a chain.**

## Number of SCSI Devices

The MX-2424 is capable of supporting up to seven SCSI device IDs. However, the total number of SCSI devices is dependent on a number of factors. The MX-2424 will function reliably with up to a maximum of four SCSI devices connected at one time as shown in the preceding diagrams.

\*The MX-2424 has its own SCSI ID assigned to it. The Max Number of SCSI Devices refers to internal devices, external devices and the MX-2424 itself. The internal drive in the MX-2424 is assigned at the factory to use ID 0.

Note: **A different SCSI ID number (1-6 on a device connected externally or in the front bay of the MX-2424) must be assigned to each device.** Improper ID setting will cause the MX-2424 to freeze while mounting devices. Please refer to drive documentation for directions on setting the device ID.

## ***Proper Termination***

A terminator provides electrical circuitry at the end of a SCSI chain to prevent the reflection of electrical signals when they reach the end of the chain. The SCSI bus requires termination only at the end of the SCSI chain. The MX-2424 includes an internal terminator as standard, which should not be removed. There are several types of SCSI Termination for use with external devices. Only the specified types of terminators described below should be used with the MX-2424.

When a SCSI chain consists of LVD devices The MX-2424 must use an LVD/SE Terminator on the last device. When a SCSI chain contains single ended wide or narrow SCSI devices, the MX-2424 must use an active terminator on the last device.

All 16-bit drives should be configured to supply Term Power to the bus (usually default setting). This configuration is usually a jumper setting. Please refer to drive documentation for directions on installing this jumper setting.

All connection and disconnection of SCSI devices/cables/terminators must be done with all power off.