

# Installation and Operating Guide

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**AIT-70D/100D**



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## EMI/RFI Compliance

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**WARNING:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception (which can be determined by turning the equipment off and on) the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You may find the following booklet prepared by the Federal Communications Commission helpful: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00354-04.

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## Canada – Department of Communications

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Class B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le ministre des Communications.

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## Shielded Cables

Shielded data cables are required in order to meet FCC emissions limits. The ADIC data cable meets this requirement. If you need a replacement cable, be sure to use an ADIC-approved shielded cable (to assure acceptability to FCC requirements).

# Declaration of Conformity

according to EN 45014

**Manufacturer's Name:** Advanced Digital Information Corporation

**Manufacturer's Address:** 11431 Willows Road NE      ZAC des Basses Auges  
Redmond, WA 98052      1, rue Alfred de Vigny  
USA      78112 – Fourqueux,  
France

**Type of equipment:** External Digital Linear Tape Drive

**Model No.:** SDX 300D/70D/100D

**Year of Manufacture:** 1997, 1998, 1999

**conforms to the following international specifications, as required by 89/336/EEC & 92/31/EEC:**

**EMI:** EN 50081-1, EN-55022 Class B

**EMC:** EN 50082-1, IEC 801-2, IEC 801-3, IEC 801-4

**Safety:** EN 60950

Redmond, Washington USA

1-March-1997



Project Engineering Mgr.

**Location**

**Date**

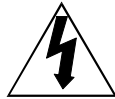
**Signature/Title**

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# Safety

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## Warnings



This symbol should alert the user to the presence of "dangerous voltage" inside the product that might cause harm or electric shock.

### CAUTION

**RISK OF ELECTRIC SHOCK  
DO NOT OPEN**

**CAUTION : TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

### *Caution*

All safety and operating instructions should be read before this product is operated, and should be retained for future reference. This unit has been engineered and manufactured to assure your personal safety. Improper use can result in potential electrical shock or fire hazards. In order not to defeat the safeguards, observe the following basic rules for its installation, use and servicing.

- Heed Warnings - All warnings on the product and in the operating instructions should be adhered to.
- Follow Instructions - All operating and use instructions should be followed.
- Ventilation - The product should be situated so that its location or position does not interfere with proper ventilation.
- Heat - The product should be situated away from heat sources such as radiators, heat registers, furnaces, or other heat producing appliances.
- Power Sources - The product should be connected to a power source only of the type directed in the operating instructions or as marked on the product.
- Power Cord Protection - The AC line cord should be routed so that it is not likely to be walked on or pinched by items placed upon or against it, paying particular attention to the cord at the wall receptacle, and the point where the cord exits from the product.
- Object and Liquid Entry - Care should be taken to insure that objects do not fall and liquids are not spilled into the product's enclosure through openings.
- Servicing - The user should not attempt to service the product beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

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## Precautions

- Do not use oil, solvents, paint thinners, gasoline, or insecticides on the unit.
- Do not expose the unit to moisture, to temperatures higher than 60°C (140°F) or to extreme low temperatures.
- Keep the unit away from direct sunlight, strong magnetic fields, excessive dust, humidity and electronic/electrical equipment that generates electrical noise.
- Hold the AC power plug by the head when removing it from the AC source outlet; pulling the cord can damage the internal wires.
- Use the unit on a firm level surface free from vibration, and do not place anything on top of unit.

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# Chapter 1

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## Introduction

This Chapter . . .

- ❑ provides a physical description of the switches, indicators and connectors on the front and rear panels of the AIT-70D/100D.
- ❑ describes other requirements (additional hardware and/or software) needed to utilize the AIT-70D/100D.

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## Equipment Description

The ADIC 70D and 100D are SCSI-2 compatible and economical data storage devices. The 70D and 100D both feature high-speed file access, high reliability, easy maintenance, and are designed for storage of near-line and off-line data. The 70D and 100D both feature a 2-line by 16-character LCD that is used to display drive status, operational messages, and error messages.

The AIT-70D, equipped with the 3.5" form factor Sony AIT-1 drive (SDX-300C), provides up to 70 GB of removable, highly reliable data storage on a low cost, pocket-sized, 170-meter data cassette (SDX1-35C, assuming 2:1 data compression). The Fast Wide SCSI drive provides a sustained data transfer rate of over 360 MB per minute (assuming 2:1 data compression). The AIT-100D, equipped with the 3.5" form factor AIT-2 drive (SDX-500C) provides up to 100 GB of removable, highly reliable data storage on a low cost, pocket-sized, 230-meter data cassette (SDX2-50C, assuming 2:1 data compression). The Wide Ultra SCSI drive provides a sustained data transfer rate of over 360 MB per minute (assuming 2:1 data compression).

The AIT-1 and AIT-2 drives do not require periodic head cleaning as often as conventional tape drives. Both of the drives constantly monitor head output to check for possible contamination. If present, the drives will invoke a built-in Active Head Cleaner. Under extreme environmental conditions, a cleaning cassette may be required and the drives will indicate this by displaying a Cleaning Request message on the front panel Status LED.

The removable data cassettes (SDX1-25C, SDX1-35C, SDX2-36C, and SDX2-50C) support the Advanced Intelligent Tape (AIT™) format. The cassettes use a new recording format, Adaptive Lossless Data Compression (ALDC™), Memory In Cassette (MIC™) technology capabilities, and the exclusive use of Sony's Advanced-Metal Evaporated (AME™) media. The AME media incorporates dual cobalt magnetic layers, the absence of binder material to prevent tape head contamination and a super-durable "diamond-like"™ protective coating for extreme durability.

The AIT-70D and AIT-100D are compatible with all operating systems and environments supporting the Fast Wide SCSI or Wide Ultra SCSI interface, but requires either direct support of the operating system or a suitable application program to take advantage of their features. Hosting environments that do not directly support SCSI interfaces, like most personal computers, require the addition of a SCSI Host Adapter card. The fast search capabilities of the Sony SDX-300C or SDX-500C drives, in conjunction with supporting application software allows users to quickly locate and retrieve any stored file, with an average file access time of less than 130 seconds.

**Note**

Exabyte® (and other manufacturers) 8mm data cassettes are not compatible with the AIT drive. **Do not** attempt to use 8mm cassettes in the 70D or 100D.

The AIT-70D/100D drives can be connected to existing SCSI channels using a common transport protocol like ASPI, or they can be connected to a dedicated SCSI channel. A maximum of 16 SCSI devices can be interconnected on a single Fast Wide SCSI channel, or a Wide Ultra SCSI channel running in either High Voltage Differential (HVD) or Low Voltage Differential (LVD) mode, not including the hosting environment. A maximum of 8 SCSI devices can be interconnected on a single Wide Ultra SCSI channel running in Single-ended/LVD mode (SE/LVD) providing the SCSI bus length is no longer than 1.5 meters. A maximum of 4 SCSI devices can be interconnected on a single Wide Ultra SCSI channel running in SE/LVD

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mode providing the SCSI bus length is no longer than 3.0 meters. Connecting 16 AIT-70D or AIT-100D units to a single SCSI channel will provide a maximum of 1.6 TB (average 2:1 compression) of data storage.

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## Switches and Indicators

Figures 1 and 2 show the switches and indicators located on the front and rear panels of the AIT-70D. The AIT-100D front and rear panels are similar.

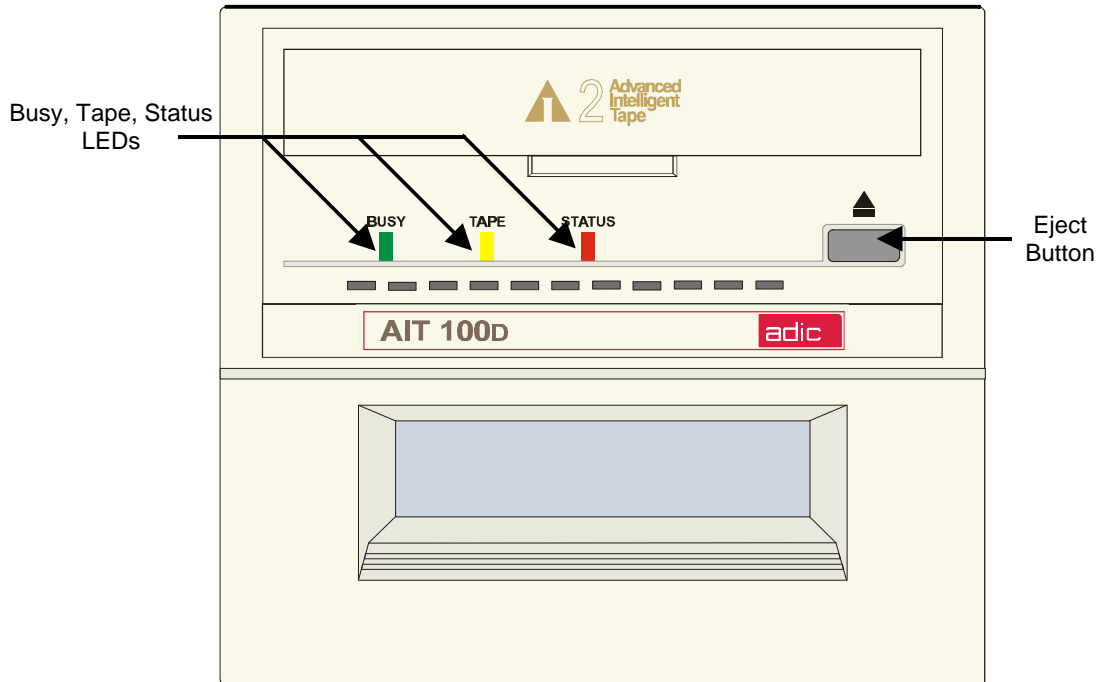


Figure 1. AIT-70D Front Panel

### Front Panel Switches and Indicators

- |                                |   |
|--------------------------------|---|
| <b>Busy, Tape, Status LEDs</b> | Indicates current status of the drive, whether cartridge is loaded or not and if there is drive activity. LEDs are also used to indicate drive errors. See Appendix C for a listing of error messages for the AIT-70D/100D. |
| <b>Eject Button</b>            | Ejects data cartridge when button is pressed. This may take up to 30 seconds during which the drive rewinds the cartridge. The Tape LED will flash during this time.  |
| <b>LCD</b>                     | 2-line by 16-character Liquid Crystal Display. Displays information about drive status, operational messages, and error messages.   |

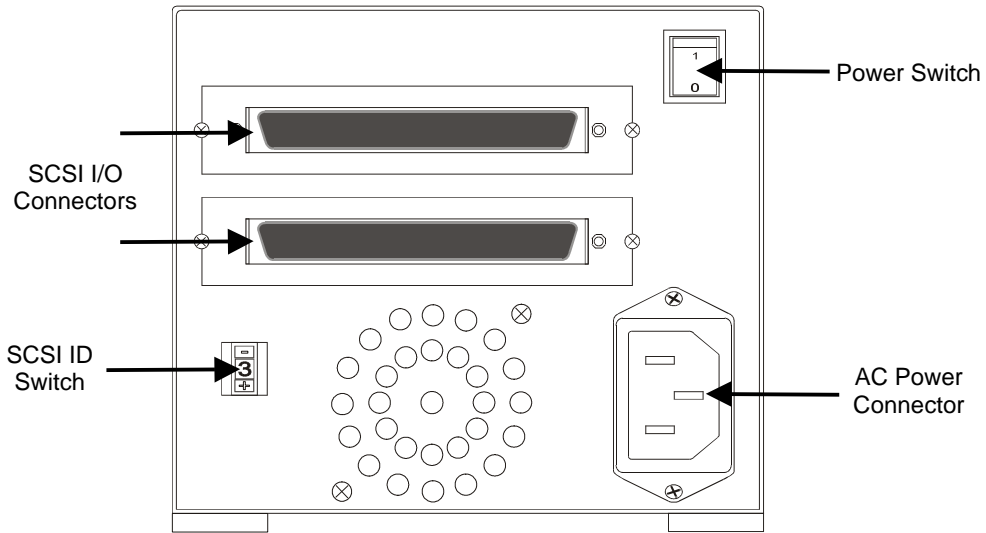


Figure 2. AIT-70D/100D Rear Panel

### Rear Panel Switches and Connectors

<b>Power Switch</b>	Turns power to the unit on and off.
<b>AC Power Connector</b>	Receptacle for AC power cord.
<b>SCSI I/O Connectors</b>	68-pin SCSI connectors for the interface cable that connects the unit with the host computer and/or to other devices on the SCSI channel (including additional AIT-70D/100D units). The interface cable can be attached to either connector.
<b>SCSI ID Switch</b>	Used to select the SCSI ID for the AIT-70D/100D. Factory set at 0.

## AIT Data Cassette

### Note

The AIT data cassette uses 8mm tape, however, Exabyte® (and other manufacturers) 8mm data cassettes are not compatible with the Sony AIT drive. The SDX-300C and SDX-500C drives will sense and eject any non-AIT cassettes. **Do not** attempt to use 8mm cassettes in the AIT-70D/100D.

The AIT data cassette contains 8mm tape designed to be written upon by a helical scan device. The AIT-2 SDX2-50C 230-meter data cassette can store 50 GB of data in an AIT-100D running in native mode. The cassette can store up to 100 GB in compressed mode (assuming average 2:1 compression). The MIC technology, which incorporates a Flash memory IC inside the data cassette, allows the architecture to capture various system and user-related statistics directly within the MIC structure to enhance data reliability, error prediction and success performance.

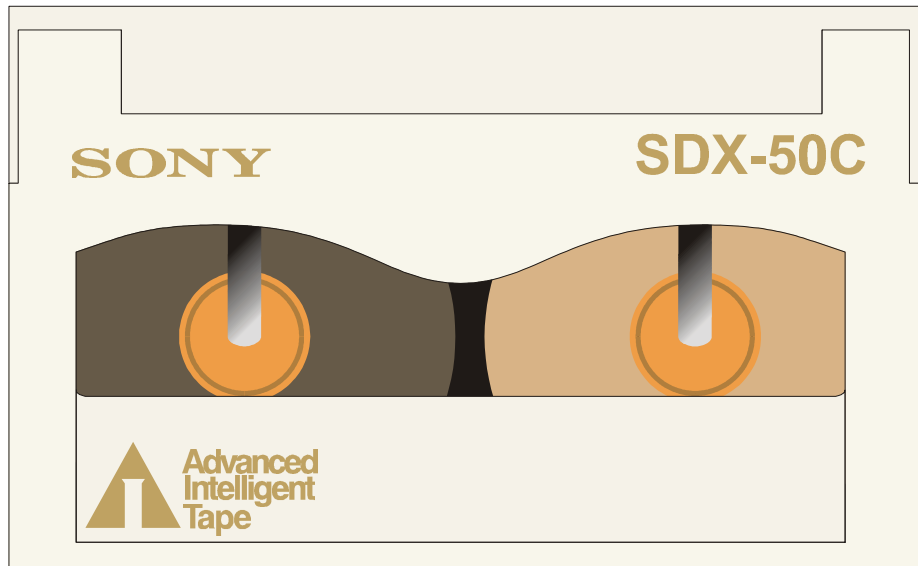


Figure 3. AIT Cassette

The *Write-Protect* tab enables or disables the ability to write or delete files on the data cartridge. If the tab is moved all the way to the right, the drive can write or erase data on the cartridge. If the tab is moved to the left it protects the data cartridge so data cannot be written to or deleted from it. See Figure 4.

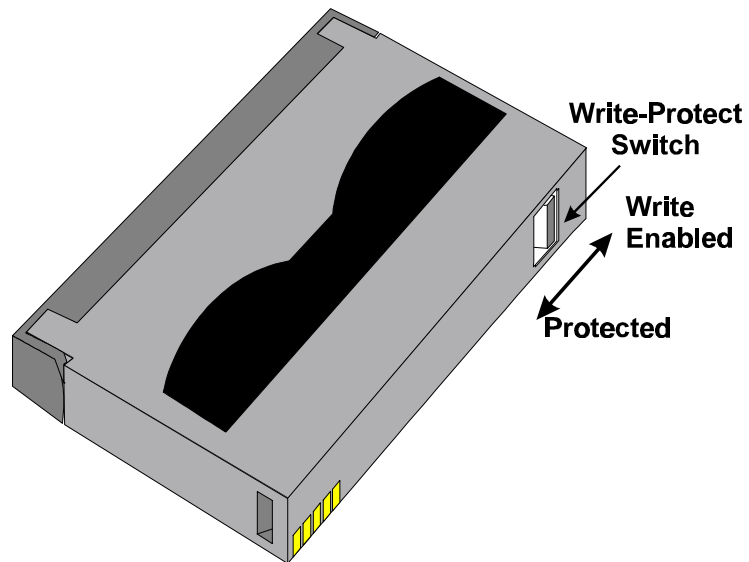


Figure 4. Write-Protect Tab

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## Other Requirements

### SCSI Host Adapter

If your host system does not have an integrated SCSI controller, a SCSI host adapter must be used to connect the host computer with the AIT-70D/100D. The host adapter you choose will depend on your system requirements and your needs. If you are not sure about your host adapter requirements, please call ADIC's Technical Assistance Center (ATAC) and ask for assistance.

#### **Notes**

- The AIT-70D is a Fast Wide SCSI device and is available in SE and HVD configurations. Be sure that your host adapter is Fast Wide SCSI capable.
- The AIT-100D is a Wide Ultra SCSI device and is available in HVD or SE/LVD configurations. Be sure that your host adapter is Wide Ultra SCSI capable.
- SE and HVD SCSI devices, **are not** compatible. **Do not** attempt to connect both types of devices to the same SCSI bus.

#### **Caution**

SE and HVD SCSI devices, **are not** compatible. **Do not** attempt to connect both types of devices to the same SCSI bus.

### Application Software

The software you use will depend upon your storage needs and the system you are using.



# Chapter 2

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## Hardware Installation

This Chapter . . .

- explains the steps necessary to install and test your AIT-70D/100D.
- provides a ✓ symbol on each step that you should verify is correct before continuing.

---

## Unpacking and Inspecting

Unpack all items from the carton. Save the packing materials in case you need to move or ship the system in the future.

- ✓ Unit should not have any damage.

### **Caution**

You must ship the unit in the original or equivalent packing materials or your warranty may be invalidated.

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## Installing the Host Adapter

If your host computer system does not have native SCSI capability and the host adapter you are using is not installed, please install it. Refer to the manual that came with your host adapter for specific directions.

### **Notes**

- The AIT-70D is a Fast Wide SCSI device and is available in SE and HVD configurations. Be sure that your host adapter is Fast Wide SCSI capable.
- The AIT-100D is a Wide Ultra SCSI device and is available in HVD or SE/LVD configurations. Be sure that your host adapter is Wide Ultra SCSI capable.
- SE and HVD SCSI devices, **are not** compatible. **Do not** attempt to connect both types of devices to the same SCSI bus.

### **Caution**

SE and HVD SCSI devices, **are not** compatible. **Do not** attempt to connect both types of devices to the same SCSI bus.

When the host adapter card is installed return to this point of this manual.

---

## Connecting the Interface Cable

### Note

The jack screws at both ends of the SCSI interface cable must be securely fastened to insure that the AIT-70D/100D communicates properly with the host computer.

Attach a shielded interface cable between the host adapter and your AIT-70D/100D. The kind of cable you will need depends on the kind of SCSI bus connector on your host adapter. The AIT-70D/100D has a 68-contact, shielded, high-density SCSI device connector.

- ✓ Make sure that the SCSI cable between the host adapter and the AIT-70D/100D is secure and the connections are fastened correctly.

## Connecting More than One AIT-70D/100D

If you are connecting more than one AIT-70D/100D on the same SCSI channel, simply connect each unit to the previous unit with an additional shielded interface cable. It doesn't matter which SCSI connector on each AIT-70D/100D you connect the interface cable to. Figure 5 shows a sample configuration.

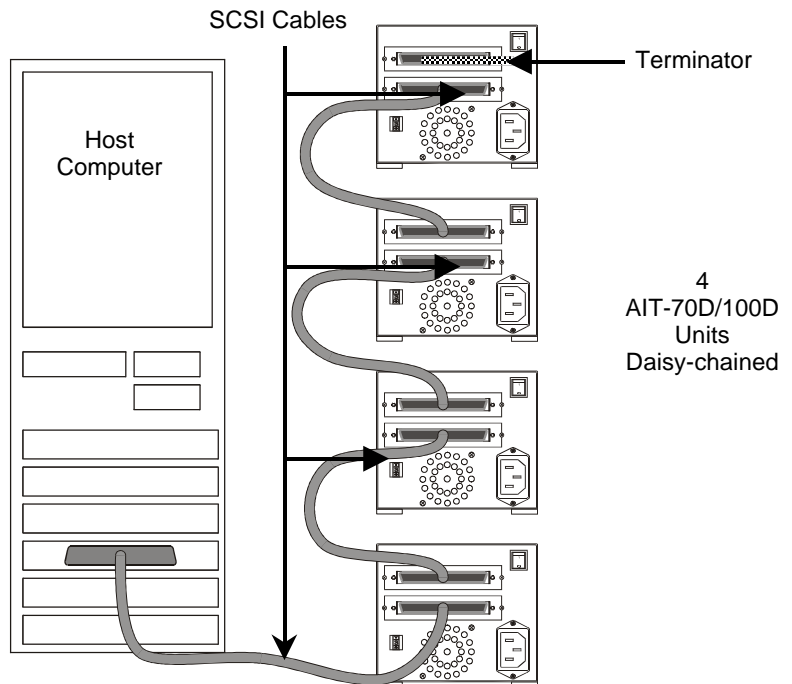


Figure 5. 4 AIT-70D/100D Units Daisy-chained

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## Setting the SCSI ID

Depending upon your setup, operating system and number of SCSI devices on the bus, you may have to change the SCSI address of the AIT-70D/100D. Each device on the bus must have its own unique address. See Figure 6.

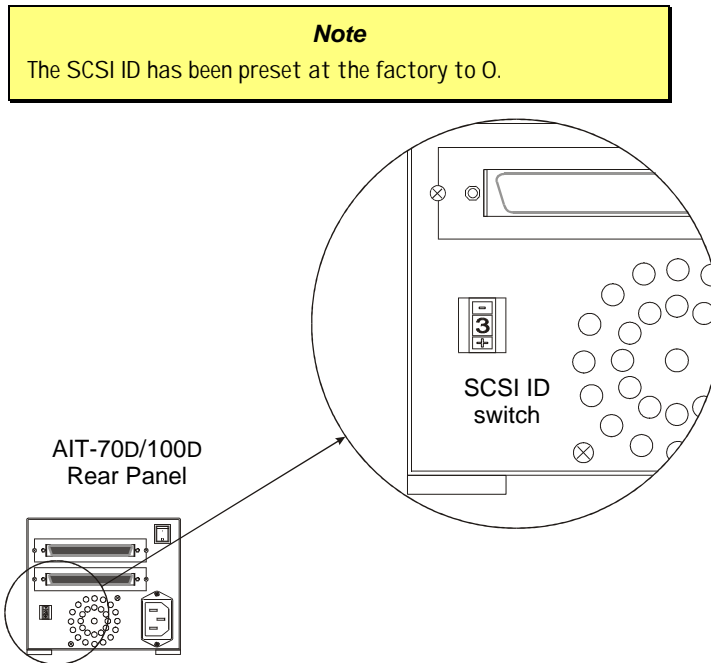
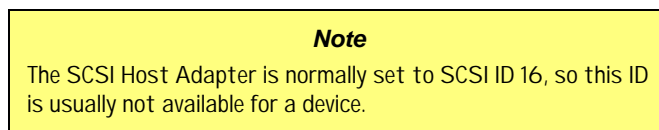


Figure 6. Setting the SCSI ID

The SCSI ID switch is located on the rear of the AIT-70D/100D. Using a small pointed object, depress either the + or the - button to select the proper ID.

- ✓ Count each device's SCSI ID in sequence 0 to 15 on each SCSI bus to confirm that no two SCSI devices have the same ID.



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## Check the Terminating Resistor

SCSI buses require termination at each end for proper operation. A typical external subsystem installation would be terminated at the SCSI host adapter and at the last device in the chain.

If an external device were being used with an internal device (on the same channel), the SCSI host adapter would be in the middle of the bus rather than at the end. In this case, the termination would be at the internal

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device and the last drive in the external chain. The terminators on the SCSI host adapter would be removed. See your SCSI host adapter manual for directions on removing the terminators on the board.

- ✓ Is there a terminator installed on each end of the SCSI bus?

**Note**

Single-ended termination can be active or passive. ADIC recommends using only active termination on a single-ended bus.

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## Installing the Backup Software

At this point, please refer to your backup software installation guide and install the backup software.

- ✓ After you have completed installation of your AIT-70D/100D and the backup software, you should run a small backup/restore and compare to confirm that your unit is operating correctly. See your software installation guide for further information.

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# Chapter 3

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## Operation

This Chapter . . .

- explains how to operate the AIT-70D/100D.

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## Connecting Power and Turning On

- Plug the power cord into the back of the AIT-70D/100D.
- Plug the power cord from the AIT-70D/100D into a GROUNDED electrical outlet.
- Plug the power cord from your host system into the same GROUNDED electrical circuit if possible. Computers and peripherals should always share the same grounds.
- Turn on the power to your host system.

**Note**

Turning on the host computer first ensures that the SCSI bus terminators stabilize the bus signals before the AIT-70D/100D is turned on.

- Turn the AIT-70D/100D power on.
- ✓ If your external SCSI bus terminator has a Term Power LED it should also be illuminated.
- ✓ The AIT-70D/100D LCD will light up.
- All three front panel LEDs will illuminate together for 0.25 seconds, then go off together for 0.25 seconds. This will repeat once.
- The Busy LED will illuminate for 0.25 seconds, then go off.
- The Tape LED will illuminate for 0.25 seconds, then go off.
- The Status LED will illuminate for 0.25 seconds, then go off.
- The last three steps above will repeat until the power-on diagnostics completes.



## LCD Messages

The following table describes the messages displayed on the LCD immediately after power-up:

Drive State	LCD Message
At power-up.	<pre> ADIC AIT Series </pre> <p>Will be displayed for 3 to 5 seconds, followed by:</p> <pre> Self Test In Process </pre>
If the self-test fails.	<pre> Self Test Failed </pre>
Self-test passed, firmware sign-on message.	<pre> LCD Ux.xx DRU Ux.xx ID xx </pre>
The drive is ready to have a tape loaded.	<pre> ADIC AIT Series </pre>
When loading a tape.	<pre> Loading -&gt;&gt;&gt; </pre> <p>The arrows will scroll left to right indicating movement.</p>
When unloading a tape.	<pre> Unloading &lt;&lt;&lt;- </pre> <p>The arrows will scroll right to left indicating movement.</p>

The following table describes the messages displayed on the LCD during normal operations.

Drive State	LCD Message
<p>When tape is loaded (if a write-protected tape is loaded, a write protected message will be displayed, see below).</p>	<pre>Ready Mode      PX AIT IDnn WRT</pre> <p>or,</p> <pre>Ready Mode      PX AIT IDnn WPT</pre> <p>Ready Mode — indicates that the drive is ready for compression mode or standard mode operation.  PX — indicates the actual partition (X = 0 or 1) currently being used.  WRT — indicates that the tape is write-enabled.  WPT — indicates that the tape is write-protected.</p>
<p>Tape loaded, Write Protected.</p>	<pre>Write Protected Tape in Drive</pre> <p>will be displayed, along with the ready screen, while the beeper sounds an alarm for fifteen seconds. The alarm will then stop and the ready screen will remain on the LCD. Any attempt to write to the tape will cause the alarm to sound and the following message to appear:</p> <pre>ERROR! Write Protected</pre>
<p>Whenever a tape is in motion.</p>	<pre>Motion Msg -▶▶▶</pre> <p>Motion Message = Loading, Unloading, Positioning, Erasing, Verifying, Cleaning Tape, and Rewinding.</p> <p>3 arrows = ▶, or ◀. The arrows will scroll to the left or right.</p>

Continued on next page.

Drive Operating Condition	LCD Message
<p>Whenever the system is writing to a tape, this message will alternate with the ready screen.</p>	<pre> Writing XX.XGB          PX </pre> <p>Writing — indicates the system is writing to the tape.  P — indicates the actual partition currently being used (X = 0 or 1).  XX.X GB — indicates the amount of tape available to be written to within a partition.</p>
<p>Whenever the system is reading a tape, this message will alternate with the ready screen.</p>	<pre> Reading XX.XGB          PX </pre> <p>Reading — indicates the system is reading from the tape.  XX.XGB — indicates the amount of tape used within a partition.  P — indicates the actual partition currently being used (X = 0 or 1).</p>
<p>Whenever the system is creating a partition on the tape.</p>	<pre> Create Partition ###  ###  ### </pre> <p>indicates the drive is creating a partition.  # — indicates tape motion.</p>
<p>Whenever the system is changing to another partition on the tape.</p>	<pre> Change Partition ###  ###  ### </pre> <p>occurs whenever an application stores files on more than one partition.  # — indicates tape motion.</p>

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## Loading the Data Cassette

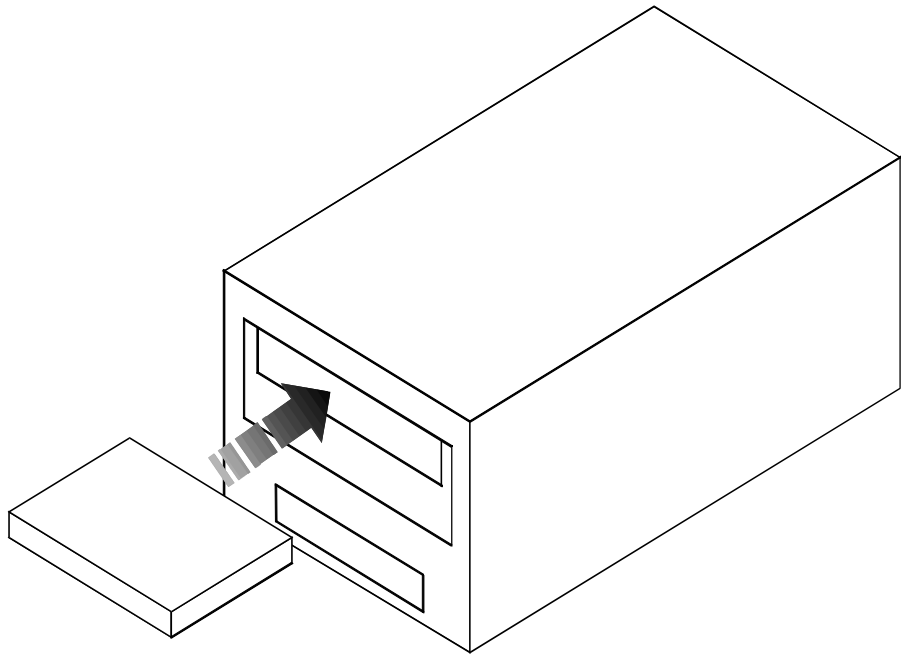
### **Cautions**

- Attempting to insert a cassette into the drive with the power off will result in damage to the drive.
- Never insert a cassette into the drive up side down or backwards.
- Never install more than one label in the place provided on the cassette, there is a strong possibility that the tape will jam on eject.

- Turn on the power to your host system.
- Turn the AIT-70D/100D power on.
- ✓ If your external SCSI bus terminator has a Term Power LED, it should also be illuminated.
- ✓ The AIT-70D/100D LCD backlight will illuminate.
- Make sure the *Write-Protect Tab* on the data cassette is in the record position (all the way to the right). See figure 4 in *Chapter 1: Introduction*.
- Insert the data cassette halfway into the slot on the front of the AIT-70D/100D (see Figure 7).

### **Note**

Inserting a write-protected cassette will cause the LCD to display a "Write Protected Tape In Drive" message and the AIT-70D/100D will sound an alarm for approximately 15 seconds. The message will not be displayed again unless a write command is issued by the host; if this occurs, the write-protected message will again be displayed. The message will remain until the host issues another valid command or the cartridge is ejected.



*Figure 7. Inserting a Data Cartridge*

- Gently push the cassette into the drive opening until you feel a resistance. The drive will pull the cassette the rest of the way in.
- A load sequence will initiate and the drive will go on-line. The Status LED may flash, signifying that the cartridge is being loaded (refer to Appendix C for specific drive LED status codes).
- ✓ When the Status LED is steady, the unit is ready.

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## Removing the Data Cassette

Premature removal of the data cassette (i.e., while the Status LED is on and data is being written to the tape) can cause the entire tape directory to be lost.

- ✓ Make sure that the Status LED *is not* flashing and the tape is not moving.
- Push the eject button on the front of the AIT-70D/100D.

---

**Note**

Many application software packages have the capability of locking the cartridge into the drive via a MEDIA REMOVAL PROHIBITED command. If you must remove the cartridge, even when the application is preventing you from doing so, press the Eject button 3 times consecutively, or hold the eject button depressed for 30 seconds.

- ✓ The Status LED may begin flashing while the tape is being returned to the cassette. This can take up to a minute. Then the cassette will be ejected from the drive and can be removed.
- Remove the cassette from the drive.
- ✓ The drive Status LED should be out.

# Chapter 4

---

## Maintenance

### This Chapter . . .

- describes the LCD messages displayed during the drive firmware upgrade process.
- explains how to clean the tape head.
- describes how to clean the enclosure.

---

The AIT-70D/100D is a highly sophisticated unit. No routine maintenance is required apart from cleaning the heads whenever the Cleaning Request message is displayed by the front panel Status LED (see *Media Warning Message* in Chapter 4 of this manual).

The drive firmware is subject to being upgraded by the manufacturer. If the manufacturer upgrades the drive firmware, specific instructions on how to perform the upgrade will be included with the upgrade tape.

If your AIT-70D/100D fails to operate correctly, immediately call the ATAC (see *When You Need Assistance* in Chapter 5 of this manual).

---

## Cleaning the Tape Heads

You should clean the tape heads whenever the Cleaning Request message is displayed on the Status LED. Cleaning the heads is also a sensible first step if the *Error Rate Warning* appears on the Tape LED. The following messages will also be displayed on the LCD:



Excessive Data  
Retry Occurred



Clean Heads Or  
Use New Tape

### Caution

Using cloth swabs, cotton swabs, cleaning agents, or **unapproved** cleaning cassettes will void your warranty. Use **only** a Sony SDX-TCL cleaning cassette.

To clean the heads, insert the cleaning cassette in the drive. The drive will automatically load it and clean the heads. After the cleaning operation, the cassette is ejected.

### Caution

Do not remove the cleaning cassette before the drive completely ejects it.

Write the date on the label of the cleaning cassette, so that there is a record of how many times it has been used. After 70 uses, discard the cleaning cassette.

### Note

If you load the cleaning cassette into the drive after it has been used 70 times, it will go through the motions but it will not clean the head (the cycle is noticeably shorter). Be sure to discard the cleaning cartridge after 70 uses.



---

## **Cleaning the Enclosure**

The outside of the enclosure can be cleaned with a damp towel. If you use a liquid all-purpose cleaner, apply it to the towel. Do not spray the enclosure.

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# Chapter

# 5

---

## Troubleshooting and Diagnostics

This Chapter . . .

- provides information on drive warning lights and the Media Warning message.
- describes the effects of high humidity on the AIT-70D/100D.
- explains what to do when you need technical support.

---

## Warning Signals

The drive used in the AIT-70D/100D employs three LEDs on the front panel to indicate SCSI activity, cassette status, and drive fault conditions through a pattern of codes. The LCD also displays error messages as described in the following section.

### LCD Error Messages

Whenever an error occurs, perform the actions listed in the following table. If the error message reappears, call the ATAC or you reseller for assistance.

LCD Error Message	Actions to Take
<pre>Error# aabbcc Cartridge Fault</pre> <p>aa = error status 0, reported by drive bb = error status 1, reported by drive cc = error status 2, reported by drive</p>	<p>Data Cartridge Problem:</p> <ul style="list-style-type: none"><li>• Clean the Drive Head using new cleaning cartridge.</li><li>• Use new data cartridge and retry operation.</li><li>• Power-cycle the AIT-70D/100D and retry operation.</li></ul>
<pre>Error# aabbcc Hardware Fault</pre> <p>aa = error status 0, reported by drive bb = error status 1, reported by drive cc = error status 2, reported by drive</p>	<p>Hardware Problem:</p> <ul style="list-style-type: none"><li>• Use new data cartridge and retry operation.</li></ul> <p>Power-cycle the AIT-70D/100D and retry operation.</p>

### Drive LED Status

The drive in the AIT-70D/100D employs its front panel LEDs to indicate SCSI activity, drive fault conditions, and cassette status. Refer to the following tables and figures for locations of the LEDs and descriptions of the status and error codes displayed by the drive.

### Media Warning Message

If an excessive number of read-after-write errors are detected during normal operation of the AIT-70D/100D, a *Media Warning* message will be displayed by the Tape LED.

Usually, the *Media Warning* message is displayed by the drive because of dirty heads, so the heads should be cleaned (see *Cleaning the Tape Head* in Chapter 4 of this manual) and the operation tried again.

If the *Media Warning* message reappears, repeat the operation with a different (preferably new) tape. If this clears the *Media Warning* message, the first tape is nearing the end of its life. Copy all the data on that cassette to a new cassette and discard the old one.

If it does not clear the *Media Warning* message, and you are unsure of the problem source, call the ATAC (for more information see *When You Need Assistance* later in this chapter).

The *Media Warning* message is also cleared from the drive by loading a new tape, or by cycling power to the AIT-70D/100D.

## Sony SDX-300C/SDX-500C Drive

Busy LED (Top)	Tape LED (Middle)	Status LED (Bottom)	MEANING
Off	Off	Off	No cartridge present/no activity
On	Off	Off	SCSI activity
Fast flashing	Fast flashing	Off	Drive loading/unloading
Fast flashing	Fast flashing	On	Drive loading/unloading, cassette write protected
Off	On	Fast flashing	Cleaning cartridge at end of media (no cleaning cycles remaining)
Off	On	Off	Cartridge loaded/no activity
On	On	Off	Cartridge loaded/SCSI activity
Fast flashing	On	Off	Cartridge loaded/SCSI and drive activity
*	On	On	Cartridge loaded/write protected
*	Slow flashing	*	Media Warning Message — excessive errors detected
Slow flashing	*	*	High humidity detected
*	*	Slow flashing	Cleaning request
*	*	Flash code 2	Drive self-test failure detected
Flash code 1	*	*	Waiting for reset
*	Flash code 1	*	Waiting for eject

Table 4. Sony SDX-300C/SDX-500C Front Panel LEDs

**Key:**

Fast flashing = ON for 0.25 sec., OFF for 0.25 sec.

Slow flashing = ON for 3.5 sec., OFF for 0.5 sec.

Flash code 1 = ON for 0.25 sec., OFF for 1 sec.

Flash code 2 = ON for 0.25 sec., OFF for 0.25 sec., ON for 0.25 sec. OFF for 0.05 sec.

---

## Causes of the Media Warning Message

The *Media Warning* message appears whenever the drive has determined that low level error performance has degraded to a point where drive head cleaning is absolutely required. It does this by counting the number of C3 (soft) errors as well as the RAW (Read After Write) errors over a number of Mbytes. When a predetermined error rate threshold is reached, the drive displays the warning. When a tape is loaded, it may take several minutes for the indication to come on because the drive will wait for a specific number of bytes to be written. A hard (non-recoverable) error will cause the warning to be displayed immediately.

The most common causes of the *Media Warning Message*, in order of highest rate of occurrence, is listed below:

- Dirty ("Stained") heads.
- A cleaning cycle *must* be executed to clear this indication.
- Bad environment.
- Data errors result from a number of factors, each of which subtract from the margin between good data recovery and an error. Electrical or magnetic interference can decrease this margin. High levels of dust contamination, high humidity, and heat can also be significant factors.
- Worn heads.
- The tape heads will eventually wear out causing the time between cleanings to get shorter and shorter. Tape head failure is usually predicted at about 12% of the 200,000-hour MTBF rating.
- Defective drive.

Drive amplifier settings could be off, causing error rate degradation. The drive could simply have failed.

---

## High Humidity

If the drive detects high humidity, a warning is displayed by the drive LEDs. Any commands that are currently being executed are aborted, and any commands that access the tape are rejected with a CHECK CONDITION. In addition, the tape is unthreaded to prevent tape and head damage. As soon as the drive detects that humidity is at an acceptable level, it will once again respond to commands that access the tape.

To minimize the chance of condensation, please observe the following guidelines:

- If you expose cartridges to temperatures outside the operating limits (5-40°C/40-113°F), stabilize them before you use them. To do this, leave the cartridges in the operating temperature for a minimum of two hours.
- Avoid temperature problems by ensuring that the ventilator slots at the front of the drive and the grille on the side of the chassis are not obstructed so that the drive has adequate ventilation.
- Position the drive where the temperature is relatively stable, for example, away from open windows, fan heaters, and doors.
- Avoid leaving cartridges in severe temperature conditions, for example, in a car standing in bright sunlight.
- Avoid transferring data (reading from and writing to cartridges) when the temperature is changing by more than 10°C per hour.

---

## When You Need Assistance

### When Calling ATAC

Technical support is provided free of charge to all ADIC customers' 24 hours a day. Customers must provide serial numbers to qualify for this support.

Warranty exchange service is available to all customers who have validated their warranty by returning the warranty card shipped with their unit, in accordance with the terms of the warranty.

The following steps will help you take full advantage of your call to ADIC:

- Make certain that you have reviewed the documentation to solve any problems. Most questions are answered in your documentation.
- Identify whether the software or hardware has worked properly at anytime before this call. Have you changed anything recently?
- Pinpoint the exact location of your problem, if possible. Note the steps you took which led to the problem. Are you able to duplicate the same problem or is it a one-time occurrence?
- Note any error messages displayed on your PC screen or file server. Write down the exact error message.
- If at all possible, call while at your computer with your ADIC system installed and turned on.
- If running on a network, have all information available (i.e., type, version #, network hardware, etc.).
- Be prepared to provide the following information:
  - Your name
  - Company name
  - ADIC model number
  - Serial number of ADIC unit
  - Hardware configuration
  - Software configuration
  - A brief description of your problem
  - Where you purchased your ADIC system

Having this information available when you call for customer support will enable ADIC to resolve your problem in the most efficient manner possible.

- In the United States and Canada, call ADIC's Technical Assistance Center at: (800) 827-3822
- In Europe, call ADIC's Technical Assistance Center at: 00.800.9999.3822

**Note**

ADIC's telephone support services are not provided as a substitute for proper review and use of applicable ADIC user manuals.

---

## RMA (Return Material Authorization)

When it has been determined that there is a hardware problem with an ADIC system, the ATAC will provide you with an RMA number. The warranty card must be completed and returned to ADIC before the warranty is valid. (Customers who have not completed warranty registration can fax the warranty card to ADIC. Call the ADIC Sales Department at (206) 881-8004 for details.)

Warranty exchange service is provided at no charge to customers with validated warranties. If the item is NOT in warranty, the repairs will be billable. Therefore, we will need a PO number at the time the RMA number is issued. However, with first-time customers, it may be necessary to ship the system back C.O.D. for the first repair until credit information can be obtained by the accounting department.

- Be sure all procedures in the ADIC user's manual have been checked and tried.
- When calling for an RMA number have the exact ADIC model number, serial number, and a brief, descriptive explanation of the problem found. Be sure you give complete address information (e.g., any mail stops or special codes) at the time the RMA is issued.
- Please send the complete ADIC system, i.e., interface cables, and the unit, if possible. A defective component such as a cable, or the unit, may be the cause of problems.
- The RMA number should be kept as a reference for calling to check on the status of an open RMA. It must also be written on the outside of the package for identification purposes.



# Appendix

# A

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## Specifications

This Appendix . . .

- contains specification information on the AIT-70D/100D.

---

## Specifications

### Drive

Approved Types: Sony model SDX-300C  
Sony model SDX-500C

### Enclosure

Media Type: A-ME  
Indicators/Controls: Busy, Tape, and Status LEDs  
Electrical Interface: Fast Wide SCSI  
Wide Ultra SCSI  
Physical Interface: 68-contact shielded high-density device connector

### Reliability

Maintenance: Use cleaning cassette whenever the Status LED displays the Cleaning Request message  
MTBF: More than 200,000 power-on hours  
MTTR: Within 30 minutes

### Physical

Dimensions: 3.9375"(h) x 4.5625" (w) x 8.75 (d)  
Weight: 5.5 lbs.  
Power Consumption: less than 40 watts

### Environment

Electrical: 100-240 Vac, 50-60 Hz, 0.6 - 0.3A  
Temperature: 5 °C to 40° C (Operating)  
-40° C to 70° C (Storage/Shipping)  
Humidity: 20% to 80% (Operating)  
5% to 95% (Storage/Shipping)  
Vibration: 0.25G (5-500 Hz) (Operating)  
0.5G (5-500 Hz) (Storage/Shipping)  
Shock: 2G Operating  
30G Storage/Shipping

# Appendix

# B

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## Glossary

This Appendix . . .

- contains terms and definitions of expressions commonly used with the AIT-70D/100D and AIT drives.

---

<b>AIT</b>	Advanced Intelligence Tape is a new tape technology developed by Sony. It incorporates a new recording format, MIC (Memory In Cassette) capabilities, and uses AME (Advanced Metal Evaporated) media.
<b>A-ME</b>	A-ME (Advanced Metal Evaporated) is the tape formulation used by AIT. Key characteristics include 100% pure cobalt magnetic layer, dual magnetic layer design, the absence of binder material to prevent head contamination, and DLC (Diamond Like Carbon) protective coating for extreme durability.
<b>byte</b>	8 bits of digital data
<b>C</b>	Celsius (Centigrade)
<b>cassette</b>	A storage medium item. A cassette is sometimes called a tape or cartridge and is capable of storing vast amounts of magnetically written data. Some cassettes can store more than 50 gigabytes of data.
<b>cleaning cassette</b>	Media used to clean the drive heads and tape path. Use only a Sony SDX-TCL cleaning cassette in the SDX-300C drive.
<b>cm</b>	centimeter (0.3937 inches)
<b>FCC</b>	Federal Communications Commission
<b>ferrite bead</b>	A device used to suppress radio noise in certain conditions to meet specifications.
<b>GB</b>	gigabyte (1 GB = 1,024 Megabytes)
<b>HSM</b>	Hierarchical Storage Management – a system where different types of storage media are used based on cost and time efficiency. For example, for fastest access, data is usually stored on a local hard drive. If you have a very large file that is needed occasionally, you may store it on a tape or on an optical drive. In an HSM system, the data source should be transparent to the user.
<b>HVD</b>	High Voltage Differential. A type of SCSI interface that employs differential signal lines at high-voltage levels. Also commonly referred to as Differential.
<b>Hz</b>	Hertz (replacement for "cycles-per-second").
<b>initiator</b>	A host computer system that requests an operation to be performed by a target device.
<b>KB</b>	kilobyte (1 KB = 1,024 bytes)
<b>LCD</b>	Liquid Crystal Display. A commonly used alphanumeric display that responds to specific input voltages and signals.
<b>LED</b>	Light Emitting Diode, a commonly used semiconductor device that glows when supplied with a specified voltage.
<b>Loaded</b>	The tape is loaded after the drive has performed identification and verification tests, positioned the tape at its beginning, and is ready for access commands.
<b>LVD</b>	Low Voltage Differential. A type of Ultra SCSI interface that uses low- voltage differential signal lines.
<b>MB</b>	megabyte (1 MB = 1,024 Kilobytes)

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<b>MIC</b>	Memory In Cassette is a design innovation developed by Sony. Incorporating a Flash memory IC inside the AIT media cassette allows the architecture to capture various system and user-related statistics directly within the MIC structure to enhance data reliability, error prediction and success performance.
<b>mm</b>	millimeter (0.03937 inches)
<b>Off-line</b>	When the drive is off-line, all commands that access the tape will report check condition status. Generally operations that would cause tape motion, that is; write, read, and space commands cannot be performed.
<b>On-line</b>	The drive is on-line when a tape is loaded in the drive and the load sequence has finished. All commands can be executed, including those that set configurations or run diagnostic tests.
<b>RMA</b>	Return Merchandise Authorization.
<b>RMA number</b>	An identifying number given to a customer who needs to return equipment for repair, whether under warranty or not.
<b>SCSI</b>	Small Computer System Interface. An industry standard for connecting peripheral devices and their controllers to a microprocessor. The SCSI specification defines both hardware and software standards for communication between a host computer and a peripheral.
<b>SCSI bus</b>	Signal path or line shared by the devices on the same SCSI channel. Information is sent to all devices throughout the same bus; only the device to which it is addressed will accept or respond to it.
<b>SCSI ID</b>	The octal representation of the unique address (0 to 15 for SCSI-2 Fast/Wide buses) assigned to a SCSI device.
<b>SDX</b>	The series name of the media and hardware associated with the AIT format incorporated in a 3.5 inch form factor.
<b>AIT-70D/100D</b>	An ADIC digital tape system that uses helical-scan technology to back up networks or stand-alone units.
<b>SDX-300C drive</b>	A Sony AIT-1 drive used in the 100D. It is an enhanced Wide SCSI digital helical-scan cassette tape subsystem.
<b>SDX-500C drive</b>	A Sony AIT-2 drive used in the 70D. It is an enhanced Wide Ultra SCSI digital helical-scan cassette tape subsystem.
<b>terminator</b>	A resistor network that absorbs the signal energy at the ends of the SCSI bus in order to prevent reflections of the signal. Reflections can lead to data errors thereby causing SCSI devices to retransmit information. This can slow down the bus speed. A terminator is required at both ends of a SCSI bus. A bus may be terminated internally (on a device inside the host system) or externally on a peripheral device.
<b>Off-line</b>	When the drive is off-line, all commands, which access the tape, will report check condition status. Generally operations that cause tape motion, that is; write, read, and space commands cannot be performed.

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<b>On-line</b>	The drive is on-line when a tape is loaded in the drive and the load sequence has completed. All commands can be executed, including those that set configurations or run diagnostic tests.
<b>Semi-loaded</b>	A cartridge is semi-loaded when the cartridge is in the drive mechanism but the tape is not threaded around the head.
<b>Threaded</b>	The tape is threaded when it is physically taken onto the reels and positioned on the head.
<b>Unloaded</b>	A cartridge is unloaded when it is physically ejected from the drive.

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