

Appendix B Maintaining Your Tape Drive

Overview

The purpose of this section is to inform you of external factors which can have a negative effect on drive performance and thus interfere with Backup Director operations. This section also tells you how to avoid or minimize these factors and how to care for your storage devices.

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Factors Affecting Drive Performance

Your tape drive, whether it is from Palindrome or another manufacturer, requires proper care and maintenance to function reliably over the lifetime of the unit.

There are many aspects to tape drive maintenance that go beyond the normal cleaning function. You should familiarize yourself with these issues from the outset to ensure reliable operation.

Several operating conditions exist that affect the reliability of the drive including:

- Operating environment
- Temperature and humidity
- Electromagnetic interference (EMI)
- Electrostatic discharge (ESD)
- Shock and vibration
- Air flow requirements
- Power protection

Operating Environment

Usually common sense is all that's needed to ensure the proper operating environment (for example,

keep all liquids away from your drive and media). Nevertheless, Palindrome recommends a quick review of the recommended environmental specifications.

Temperature and Humidity

Maintain a temperature range of +40 to +100 Fahrenheit (+4 to +38 Celsius) and a relative humidity of 20% to 80%. Most offices meet these criteria. Also, the storage device and media should be at the same relative temperature.

TIP: If a tape remained at a temperature lower than 60 degrees Fahrenheit (15 degrees Celsius) overnight, don't use the tape until it has reached room temperature (60 degrees Fahrenheit or greater).

Electromagnetic Interference (EMI)

Tape drives tolerate moderate levels of EMI. To minimize this interference, keep external drives a safe distance away from equipment that is known to generate excess amounts of EMI (computer monitors for example).

Electrostatic Discharge (ESD)

Most computer equipment is susceptible to ESD, including tape cartridges and tape drives. Be sure that you discharge any static that you may have accumulated prior to contacting a tape unit or its tapes.

Shock and Vibration

Like computer hard disks, tape drives are adversely affected by sudden jolts and excessive vibration. To minimize vibration, mount the drive on a stable surface, free from excessive vibration.

Air Flow Requirements

The tape drive requires adequate air flow through its vents to dissipate excess heat. Dust and debris accumulating on the vent or inside the unit can prevent the unit from cooling properly and result in contaminating the unit and media.

To avoid contaminating the storage device and media

- > Be sure to allow sufficient space around the unit to allow air to flow freely.
- > Keep the unit away from paper dust generated from office equipment such as printers and photocopiers.
- > Always operate the tape drive with its cover on.
- > If you must operate the storage device in a dirty environment, such as a warehouse, clean the tape drive more thoroughly and more frequently than recommended.

NOTE: Many drives have a replaceable filter that should be replaced regularly. A dirty filter may reduce the flow of air through the drive. Failing follow the manufacturer's replacement instructions may cause erratic drive behavior, void your warranty, and result in costly repairs.

Power Protection

Most computer equipment is susceptible to power fluctuations. Your Backup Director system is no exception—it can be vulnerable unless it receives clean, uninterrupted power. Palindrome **highly** recommends connecting the tape drive and workstation running Backup Director to a UPS (uninterruptible power supply). Power disturbances can damage the tape drive and the workstation, and will create problems that are unpredictable and difficult to trace.

While LAN managers usually protect their file servers with UPS, the storage devices often have unprotected or under-protected (with only a simple surge suppressor) power supplies.

Studies show that power spikes account for a minority of electrical disturbances. Most often, blackouts, brownouts, voltage sags, or line noise cause the bigger problems. An inexpensive surge suppressor is not the answer. It may not trap power spikes quickly enough, and it does not address the other electrical disturbances mentioned above.

When Do Drives Report a Soft Error?

Different technologies are used when recording on magnetic media. This affects the nature of the soft errors reported. The following paragraphs discuss the meaning of soft errors for the different tape technologies.

8mm Tape Drives

Soft errors are reported on 1024-byte blocks. If a block that was just written fails on a read-after-write test, then the block will be rewritten and a soft error reported. When reading, if the contents of a block must be corrected using its Error Correction Code (ECC), then a soft error is reported.

4mm DDS DAT Tape Drives

DDS DAT drives use a complex three-level error correction scheme. When reading from tape, Backup Director monitors the lowest level, called C1, to detect the earliest signs of problems. When writing, a DDS DAT drive reports the number of frames that are rewritten. A frame is a physical measure of data being transferred to the media; it's the amount of data transferred by a single rotation of two DAT write heads. The soft error report is based on the percentage of frames that must be rewritten.

DC 6000 Tape Drives

QIC 150

Soft errors are reported on 512-byte blocks. If a block that was just written fails on a read-after-write test, then the block is rewritten and a soft error reported. This type of drive does not use an Error Correction Code. It relies on a Cyclical Redundancy Code check (CRC) to detect an error and rereading to correct the error. If a CRC error is detected during a reading operation, the device reports a soft error.

Other DC 6000 Drives

Soft errors are reported on 1,024-byte blocks. These type of drives use Error Correction Code (ECC) to correct errors. Backup Director monitors rewrites and ECC usage.

Maintaining Your Tape Device

Tape drives require regular maintenance. If dust or debris collects at one or more of the tape heads or in the tape path, magnetic media may become unreadable or unwriteable.

To reduce the possibility of hardware or media errors, establish a regular cleaning schedule. Failure to

maintain your drive properly **will void your warranty**.

In Device Manager, if the **Cleaning Required** check box is turned on, you should clean your drive. If you have an autoloader, this parameter indicates that your cleaning cartridge is either full or defective. If you have a standalone tape drive, this parameter prompts you to perform a cleaning operation.

TIP: For tape drives that support cleaning detection through motion tracking (for example, Exabyte 4mm and 8mm drives), Backup Director will also record a message in System Messages database if a drive needs to be cleaned.

If you have configured an autoloader and installed AutoLoader Software, Backup Director automatically schedules the cleaning of the device's drive and loads the cleaning cartridge.

NOTE: For instructions on maintaining optical drives, please refer to the manufacturer's documentation.

Palindrome provides a list of recommended cleaning practices for each tape drive below. Use only manufacturer-approved cleaning cartridges available from Palindrome or your authorized dealer. Palindrome specifies use of its cleaning cartridges because some cleaning cartridges are very abrasive and may damage the tape heads and void your warranty.

Do not exceed the recommended maximum number of cleaning passes with a single cartridge. Refer to the documentation supplied with the cleaning cartridge for specific instructions on cleaning procedures.

DC 6000 Tape Drives

Palindrome recommends cleaning the recording head after each initial pass with a new tape cartridge, in addition to cleaning after every eight hours of read, write or erase activity.

Clean the sensor openings and tape cartridge cavity whenever you can see dust or debris inside the cartridge cavity.

NOTE: Do not over-clean DC 6000 tape drives. Excessive cleaning will reduce tape head life.

4mm DDS DAT and DDS-DC DAT Tape Drives

Clean the tape head/path of 4mm tape drives after each initial pass with a new tape cartridge, as well as every 25 hours of data transfer, whichever comes first.

Whenever the Cassette In Place Status LED flashes (the green light at the front of the drive), you should clean the drive heads with a data grade cleaning cassette (do not use cleaning cartridges designed for audio DAT machines).

8mm, 2.2GB Tape Drive

8mm, 2.2GB tape drives require cleaning of the tape head/path once a month or after 30 hours of data transfer, whichever comes first.

Cleaning as often as once a week may be necessary. Do NOT use video machine cleaning tapes. They often consist of only plastic tape, which can abrade tape heads. Use only a data grade dry cloth cleaning cartridge.

8mm, 5.0GB Tape Drive

8mm, 5.0GB tape drives require cleaning of the tape head/path once a month or after 30 hours of data

transfer, whichever comes first.

Cleaning as often as once a week may be necessary. Do NOT use video machine cleaning tapes. They often consist of only plastic tape, which can abrade tape heads. Use only a data grade dry cloth cleaning cartridge.

NOTE: Run the cleaning tape immediately after a new blank tape is placed into service. New tapes carry debris along their edges due to the manufacturing process.

8mm Tape Drive Replaceable Air Filter

8mm tape drives have a replaceable air filter. This should be inspected (and replaced if necessary) every 30 days or during normal cleaning intervals. If dust or dark and light patterns are visible on the filter, or if the filter is torn, discard it and replace it (contact your Palindrome Authorized Reseller for replacements).

To replace the air filter

1. Power off your tape drive.
2. Grasp the top of the filter retainer and gently pry it from the fan guard.
3. Remove the old filter from the filter retainer.
4. Place the new filter inside the filter retainer.
5. Replace the filter retainer. First, be sure the "hinge" is facing downward. Then put the hinge in place on the fan guard and snap the top of the retainer in place.

Maintenance Summary

The following table summarizes tape drive cleaning procedures discussed in this section.

NOTE: Failure to follow the prescribed cleaning practices, or meet the recommended environmental specifications, may void your warranty.

<u>Tape Drive</u>	<u>Cleaning Frequency/Special Instructions</u>
DC 6000	Clean the tape head/path every eight hours of read, write, or erase activity. Clean the sensor openings and tape cartridge cavity whenever you can see dust or debris inside the cartridge cavity.*
DLT	Does not require periodic maintenance. Use a cleaning tape only if <i>Use Cleaning Tape</i> light is on or if drive indicates excessive read/write errors.
4mm DAT	Clean the tape head/path every 25 hours of data transfer. If the Cassette In Place Status LED flashes**(the green light at the front of the drive), you should clean the drive heads with a Palindrome-approved cleaning cassette (do not use cleaning cartridges designed for audio DAT machines).
8mm, 2.2GB	Clean the tape head/path once a month or every 30 hours of data transfer. Cleaning as often as once a week may be necessary.***
8mm, 5.0GB	Clean the tape head/path once a month or every 30 hours of data transfer. Cleaning as often as once a week may be necessary.***

*Do not over-clean DC 6000 tape drives. Excessive cleaning will reduce tape head life.

**The slowly flashing green LED may indicate a damaged tape or a tape nearing the end of its life. If cleaning the head does not correct the flashing LED condition, replace the cassette and, if applicable, retire the tape using the Operations/*Retire* option available through Media Manager.

The slowly flashing LED does not indicate a loss of data, nor does it affect operation.

***Do NOT use video machine cleaning tapes. They often consist of only plastic tape, which can abrade tape heads. Use only a data grade, dry cloth cleaning cartridge.

Failure to perform these simple preventive maintenance procedures results in excessive wear and tear on the unit. This wear and tear could result in failures during backup or restoration.
