



WHITE PAPER

Protect your investment

- Preventive maintenance of SLR tape drives. Why and how.

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Daily care and maintenance.....

Every day each and every one of us perform simple maintenance tasks without giving these actions second thought. We wash ourselves or take a shower to remove dirt or debris from our body in order to protect our skin from ageing and the whole body from infection and disease. We brush our teeth to prevent caries and keep them strong and healthy, avoiding the cost and unpleasantness of visiting the dentist.

Likewise we wash the car frequently to protect its paint, preventing damage to the cars protective layer, which preserves the cars value. Should it start to rain while we are out driving we wipe the windshield, enabling us to see better, avoiding accidents or dangerous situations.

What about your tape drive ?

Few will argue these common everyday activities are unnecessary. But strangely, most people using a tape drive for backing up and securing their vital business data ignore simple preventative maintenance for their tape drive.

Although the modern tape drive has become increasingly reliable, its susceptibility to airborne contaminants are greater than for the hard disks they back up. The tape drive of today is asked to perform in challenging environments from manufacturing operations to lumber yards , exposing tape drives to new types of contaminants. Unlike the hard disk, which is hermetically sealed, a tape drive is open to airborne contaminants. The tape itself can become contaminated if it is not stored correctly, adding to possible data storage or retrieval problems.

Failure mechanisms

What can go wrong if we fail to maintain our tape drive?

What kind of maintenance can the everyday user of a tape drive perform? The only maintenance the end user should perform is to clean the write/read head (w/r head) of the drive and remove any contaminants on the outside of the drive. Modern tape drives are delicate and complex devices and should be serviced / maintained by qualified personnel.

The first and obvious failure which can occur is the drive is unable to write data to the tape, or even worse, it is unable to read the data back from the tape. This type of failure can be intermittent, but if the situation is not dealt with, the contaminants caught on the w/r head can solidify, making them impossible to remove unless serviced by trained personnel.

Contaminated w/r heads may cause write and read errors. While these minor occurrences are not fatal errors, they lead to poor performance (low data throughput). This means the backup might fail to meet the designated time window, or being a plain nuisance when the operator has to wait for the back-up to finish. The role of maintenance at regular intervals is critical, since these type of problems can go undetected by the user for a while until the problem turns into failed backup or restore situation which is solved by only by using factory authorized technical service personnel.

So what are the options for cleaning a tape drive's write/read heads ?

Cleaning methods

- ✓ Manual cleaning using a cotton swab like Q-tip or similar in combination with a chemical fluid is not in any way recommended for modern, complex backup devices. If absolutely

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necessary, this procedure should be left to trained, competent service personnel, not the end user.

- ✓ Automatic by means of built in cleaner: Convenient, but what cleans the cleaner? When the cleaner becomes contaminated. it can re-deposit the contamination on the write / read heads and/or other parts of the mechanics. And being built into a back-up device there is little or no possibility for the end user to monitor the status of the cleaning device.

Automatic by means of cleaning cartridge

- ✓ Wet process cleaning cartridges: This method involves applying a chemical solution onto the cleaning device before operating it in the drive. A complicated and messy procedure for the user! Cleaning solvents may change their properties over time. During storage they may loose the cleaning effectiveness. Stringent governmental requirements for non-hazardous and environmentally friendly chemicals means this type of cleaning cartridge does not pose a threat to the user, but are not the desired or recommended method of maintaining modern tape drives.
- ✓ Abrasive tape: Some tape technologies rely on using an ordinary unpolished data cartridge to 'rub' the contamination off the w/r head. Along with obvious increased wear on the head, these cartridges do not contain any means or mechanism for containing the removed contaminants. Also, this type of cartridge can be used several times, posing a possibility of re-depositing the contaminants onto the w/r head
- ✓ Dry cleaning cartridges: These relies on cleaning the w/r head by removing the debris by mechanically capturing it and moving it away from the w/r head. This can be done either by one or more brushes that wipe the w/r head clean or by a cleaning band passing across the w/r head. While the first method is simple to implement, this method usually have no control over where the debris ends up after being wiped of the w/r head.
- ✓ Dry Process Cleaning Cartridges: *The DPCC™ cleaning cartridge is the preferred method of cleaning Tandberg drives and is based, in part, on the use of a specially designed cleaning tape which offers the convenience of the debris being "captured" by the tape and contained on the take up reel of the cleaning cartridge.* What is important here is that the cleaning cartridge must be designed in such a way that the cleaning tape is not re-used. Reuse of the cleaning element poses the danger of re-depositing the debris onto the w/r head.

Cleaning method properties		Cleaning method					
		Q-tip	Built in	Wet clean	Dry clean, brush	Dry clean, belt	Abrasive tape
P r o	Easy and convenient for the user		😊		😊	😊	😊
	Prevents re-use of the cleaning device					😊	
	Contains the contaminants in a controlled manner	😊		😊		😊	
	No use of chemicals		😊		😊	😊	😊
C o n	Only for trained service personnel	😞					
	Messy, uses chemicals	😞		😞			
	Danger of re-depositing the contaminants	😞 ¹	😞	😞 ¹	😞		😞
	User not able to monitor the status of the cleaning device.		😞				
	Increased wear on the w/r head						😞

Table 1: Comparison of properties for different types of tape drive cleaning methods
¹ Requires special attention from the operator to avoid reuse of the cleaning element.

The importance of frequent maintenance

All too often what is supposed to be frequent preventative maintenance, becomes occasional maintenance. Even worse; what is supposed to be maintenance, becomes a disaster recovery program attempting to clean the drive after it has failed to operate properly.

It can not be said too often: Drive head cleaning must be made a part of the standard procedure of using the drive for backup, not an occurrence just because the operator happened to remember to clean the tape drive.

Many of the modern tape drives feature a LED indicator which lights up when the drive's pre- set timer activates after a specific usage interval without cleaning or when an error event has occurred. While this is a good reminder or error indicator, it does not replace the need for frequent maintenance.

If cleaning the drive becomes an activity which takes place frequently, is it very likely the operator will never see the cleaning LED switched on. It is just as likely he or she will never experience lost backups or failed restores, prolonged backup times or having to send the drive out for service due to contaminated w/r head.

How frequently should the drive be cleaned ?

There is no simple answer to this question. The product specification for the drive will probably indicate how often the drive needs to be cleaned (i.e. number of operational hours between cleanings) and this corresponds to activating the cleaning LED. While the LED gives a good indication of the cleaning frequency, relying exclusively on the LED indicator may lead to problems. The need for cleaning can be indicated after the back-up job has started and the drive can run for several hours after cleaning is needed.

The pattern of use for each individual tape drive largely dictates how often it should be cleaned. If the drive is used around the clock, a daily cleaning routine should be considered. If the drive is utilized only a few hours a day, a weekly cleaning routine may be appropriate.

<i>i</i>	Rule of thumb: If the drive is used frequently, clean it frequently!
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If the drive is only used with brand new tapes, the need for cleaning increases as brand new media inherently sheds more debris during the first use than with subsequent uses.

<i>i</i>	Rule of thumb: Always clean the drive after first use of a brand new tape!
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Conclusion

Any user of a tape drive should perform frequent preventive maintenance by cleaning the w/r head in order to:

Preserve the tape drive and keep it operating at peak performance levels

- ✓ Preventing failed backup or restore operations.
- ✓ Preventing performance loss
- ✓ Preventing unnecessary and costly service repairs
- ✓ Protecting the tape drive investment and reducing the total cost of ownership.

Secure correct, error free operation of the backup system

- ✓ Reduce the cost of re-doing backup (time /hassle) Reduce the risk of missing the back-up time window.
- ✓ Minimize the risk of losing critical data. In the rare, but not unlikely, event of both back-up and hard disk failure data will be completely lost.

Protect your investment lessening the chance of unplanned service maintenance. Sending the drive for service only to find that the problem has such a trivial cause as a dirty w/r head means:

- ✓ Cost of having the drive serviced

- ✓ Unnecessary time/resources spent on attending to the problem
- ✓ Increased risk of losing vital data due to being left without a functional back-up system

The best solution

Tandberg Data has implemented the solution of a dry process head cleaning cartridge for our Travan and SLR product range. These products incorporate a specially designed cleaning tape featuring the specific properties required for cleaning a modern tape back up system

- ✓ Fully automated. All the user needs to do is insert the cleaning cartridge into the tape drive, wait for the drive to perform the cleaning operation, remove the cleaning cartridge from the drive and properly store it until next time it is needed.
- ✓ No use of chemicals or changing of the cleaning element is required.
- ✓ The contamination is removed from the w/r head and contained within the cleaning cartridge. No guesswork where the contamination went.
- ✓ The cleaning cartridge is designed to eliminate the possibility of re-using the cleaning tape, i.e. no danger of re-depositing the contaminants.

More information on Tandberg Data cleaning cartridges, part numbers and where to buy them can be found on our web-site: <http://www.tandberg.com/products/media.html>

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