

**Overview of 2.2GB Tape Drives****LAN Services Tutorial #2****Contents**

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**Summary**

This tutorial provides an overview of the 2.2GB (8-mm video cartridge) tape products available for Banyan and COMPAQ platforms; some background about the manufacturing process and how it can affect tape reliability; cleaning recommendations; configuration notes for Banyan internal drives; configuration notes for Banyan external drives with Adaptec SCSI controller; and troubleshooting notes.

**Background**

Banyan VINES 4.00 and above support the 8-mm tape drive, also referred to as the 2.2GB tape drive: 8-mm is the width of the tape, while 2.2GB is the maximum storage capacity. That's enough room for a complete system backup for most servers on a single tape, which means you can run a complete backup each night.

All 8-mm tape drives are manufactured by the Exabyte Corporation; vendors such as Banyan provide the controller card, power supply, airflow system, cable, housing, and software. Banyan sells internal 8-mm tape drives for both the CNS and CNS/486, as well as external 8-mm tape drives for the VINES Unlimited platforms. Banyan's 8-mm tape drive is a SCSI device (small computer system interface) that attaches to the CNS platforms' internal SCSI bus. A VINES Unlimited platform, such as the SYSTEMPRO, has no SCSI bus, so the external 8-mm tape drive ships with an Adaptec 1542B SCSI controller card.

**Reliability of the Drive**

As with any backup device, reliability of 8-mm tape drives is of special concern. Exabyte has made a number of microcode changes designed to increase reliability since they introduced the 8-mm tape drive in 1989; drives returned for repair are automatically upgraded to the current microcode levels. Another factor that affects performance is the manner in which data is written to and read from the tape. Streaming data to the tape causes less wear-and-tear on the drive heads, while writing or reading in short bursts stresses the mechanical components of the drives

and contributes considerably to head wear. Such factors are a product of the backup software; the VINES backup and restore programs are designed to stream data to tape.

The tape itself can also affect the life of the drive. Environmental conditions or improper handling can leave debris along the exposed edges of the tape. And new tapes contain debris as a by-product of the manufacturing process: 8-mm tape starts as a 1-meter wide sheet, which is cut and spooled to size. It's the cutting process that leaves debris along the edges of the tape. Most of this debris will be deposited on the tape heads during the first few tape passes. One reason that data-grade tape costs so much more than consumer-grade tape is because quality control for data-grade is much more stringent. In addition, Exabyte's own data-grade tape formulation has been designed to provide consistent quality, minimize head wear, maximize tape life, and optimize performance, which is why LAN Services recommends always using Exabyte data-grade tape.

### **Cleaning**

Exabyte strongly recommends cleaning 8-mm tape drives every 30 tape-motion hours. Unfortunately, there's no handy tape motion counter in a 2.2-Gb drive to indicate when 30 hours is up. It's a good idea to estimate the number of hours per day a drive is used and setup a cleaning schedule that comes close to this 30-hour mark. Cleaning cartridges are designed to remove moderate -- not excessive -- levels of debris. Using a cleaning cartridge irregularly will essentially do nothing for a drive.

The type of cleaning cartridge used is also critical. Video cleaning tapes, for example, are highly abrasive and can damage the drive; using a video cleaning tape will also void the warranty. When it comes to cleaning, Exabyte is adamant: Use only Exabyte's dry cloth cleaning tape and only for the specified number of passes. Never rewind the tape -- doing so will redeposit the debris.

Exabyte products can be found in the C&TS Products and Services catalog, page B-292 (May 1, 1992 edition):

|                                 |         |
|---------------------------------|---------|
| Exabyte 8mm data cartridges     | 03-6742 |
| Exabyte 8mm cleaning cartridges | 03-3639 |

## Configuration Notes and Caveats

### Banyan External 2.2GB Tape Drive with Adaptec 1542B

The Banyan 2.2GB external tape drive comes with an Adaptec 1542B, a SCSI controller. When you install cards in the SYSTEMPRO's EISA-style bus, you normally use the COMPAQ configuration utility to set a card's interrupt levels and other addresses. But the Adaptec is an ISA-bus card that uses jumper blocks and jumpers for configuration, rather than software.

Before installing the Adaptec 1542B in a SYSTEMPRO, remove pin 12 from jumper block J5, leaving jumpers on pins 8 and 10. This slows the DMA (direct memory access) transfer rate from 5.7 to 5.0 MB/seconds: at 5.7 MB/second, the server hangs while booting. (Jumper block J5 is the large, horizontally-oriented block of jumpers located under the internal 50-pin connector J2; pin 1 is the leftmost pair of pins.) Other jumper blocks should be configured as follows (these are the default settings, except for the DMA adjustment):

J5 Jumpers on 8 and 10

J6 No jumpers

J7 Jumpers on 2

J8 Jumpers on 2, 4, 6

J9 Jumpers on 2, 6, 11

These factory-settings result in the following configuration:

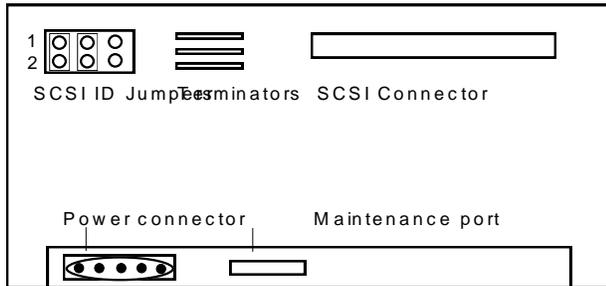
|           |             |
|-----------|-------------|
| Interrupt | 11          |
| I/O       | 300-330     |
| DMA       | 5           |
| ROM       | DC000 (16k) |

These settings should work on most servers. If they conflict with existing settings, reconfigure your other card(s): it'll be easier to reconfigure an existing card in your EISA bus, through software, than to adjust jumpers on the Adaptec. You don't need to identify the Adaptec card to the EISA configuration, though any time you add or delete cards, you should update the EISA configuration. However, since the Adaptec card doesn't have a .CFG file, you must build your own. You can do this using EISA version 2.0 and above, but not with version 1.15. LAN Services can supply you with the appropriate .CFG file if you cannot create your own.

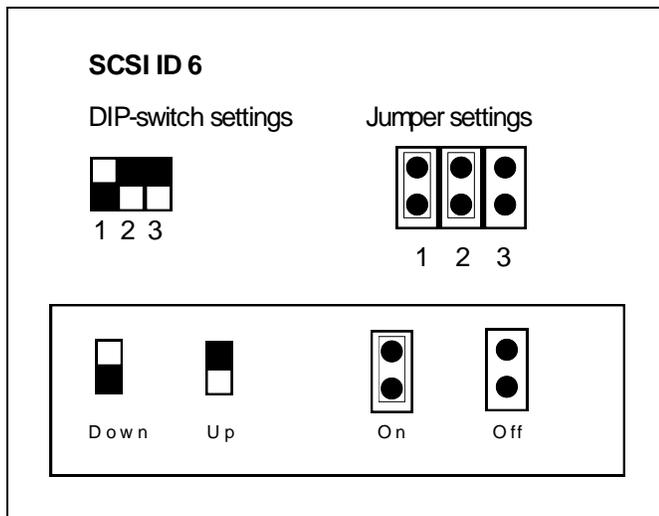
Although it's not necessary, it's also a good idea to add the card via Banyan Add-a-Card: this enables you to keep track of all the cards installed in your server. Select "Other Card" as card type, and then enter the resource settings and change the name to Adaptec 1542B; this will then display on the Add/Change card screen. Whether or not you update the Banyan Add-a-Card screen or the EISA configuration, be sure to record the Adaptec card's resource settings (DMA, interrupt, I/O, and ROM addresses) for future reference.

**Banyan Internal 2.2-GB Tape Drive; Banyan CNS or CNS/486**

Banyan's CNS and CNS/486 have an internal SCSI bus so they don't need a separate SCSI host adapter. However, the SCSI bus will only recognize the 2.2-GB tape drive at SCSI ID 6, so before installing the drive you must ensure that the SCSI ID is set to 6. Ensure also that terminators have been removed. Both terminators, internal SCSI connector, and SCSI ID settings are located on the tape drive back panel:



The tape drive may be shipped with either a DIP-switch style SCSI ID selector or a jumper-pin style selector. Settings for both the DIP-switch and jumper-pin styles are:



**Troubleshooting**

Symptoms of drive problems include messages like "tape media I/O error", or "unable to initialize tape drive." In some cases, the server won't access the tape drive at all, that is, the light never comes on. LAN Services often suggests cleaning the tape drive as the first step in trying to solve a variety of tape-related problems. If the tape drive is an external SCSI device, you can also readily check:

1. The SCSI cable: is it connected?
2. The SCSI ID: is there a conflict with another SCSI device?
3. SCSI termination: is there a terminator on the drive? Should there be one?