# Eternal Recurrence: Tape Still Rules

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   Is what you do at the computer important? If so, a tape drive had better be   part of your system. Tape remains the most cost-efficient backup and short- to   mid-term archival medium around. Rumors of its demise, as the saying goes, are greatly exaggerated.

   The only real issues are which tape technology do you buy, at what price, and   what software is used to drive the backup process. Four solutions, at different price-points and with different features are bidding for attention.

   Tecmar sells two of these solutions: The company's new higher end line uses the new Travan-NS technology. Tecmar also now owns the Ditto line of drives, hitherto an Iomega brand.

   Ditto drives have been around for awhile. They are relatively low-cost devices, effectively the current generation of desktop-standard tape backup drives. Tecmar took a line that Iomega clearly had shown little interest in, and is reviving it in important ways. Most significant: the Ditto Max Pro models for workstations and small networks. Tecmar promises these 20gb drives for later in the year. At US$299 and US$399 (MSRPs)for workstation- and network-oriented models, these will be serious options for purchasers of even low-cost systems with the super-sized hard drives that seem commonplace, and for small-office workgroups.

   [Special good news for Ditto drive owners: Tecmar wants you happy. For US$20, you get a software fix for the Ditto's Y2K problem. For US$50, you get an upgrade from 7gb to the recently introduced Tecmar-built 10gb model (list price: US$199). For US$250, the Ditto owner can trade up to one of the new 20gb models. Caveat: There is lots of the older, lower-capacity product "in the channel" and in the Iomega warehouse; buy this only if it's really cheap - effectively,disposable. If the cost of the 7gb model, plus the US$50 upgrade, isn't a lot less than US$200, it's not a bargain.]

        Tecmar TRAVAN 20 GB

        The real buzz is about Tecmar's Travan-NS drives. "NS" stands for "Network Series" and is a licensed technology from Imation. The idea is to create a price-effective competitor to mid-range DAT and 8mm tape technologies. Coupling some changes in the medium and its packaging with a read-while-write head and built-in hardware compression, Travan-NS drives achieve comparable performance in a less-costly-to-manufacture - and generally more reliable - system. [Read

white papers from both Tecmar and Imation at www.techmar.com. While these papers clearly favor the Travan-NS approach, they offer a very good summary of the technology differences and related issues.]

Several companies have introduced Travan-NS drives. They range in price from US$400 (Aiwa) to US$770 (Tecmar) for the 20mb model. There are feature differences, and all require SCSI.

Tecmar's NS20 features a motorized cassette bay, not unlike that in a VCR; the less costly models (about US$100-US$150 less) have the more conventional stick-in-'til-it-clicks manual mechanism. This Tecmar feature, dubbed "Nsync", seems a good idea, since the tape is entirely within the drive when in use (there is an emergency ejection procedure, naturally). The mechanism is responsible for positioning the cartridge correctly, and for extracting it. Especially in workgroup settings, this should make for less trouble than the old-style manual mechanism. In any case, in our tests the mechanism worked without a hitch.

The Tecmar drive used in tests here came with Seagate backup software, version 2.0j, in an OEM version which included the requisite drivers for Wintel systems. I am a fan of this software, have used it since before Seagate bought the company. I found it easy to configure both local and workgroup-wide backups. I did not test this drive in a Unix environment; reports of such tests are available and indicate the Travan NS drive is a champ regardless of which Unix (or even Linux) tape utility one chooses.

The Tecmar drive also delivered. That nasty, time-consuming verification - taking longer than the actual backup - was history. Data was read from the computer, written to tape and verified in a single pass (the Seagate software allows for a second pass, though).

Obviously, how long a backup takes depends on a number of factors: Compression is generally a good thing, since this shortens the write-time (uncompressed backups take up to twice as long); since Travan-NS drives use hardware, drive-based compression, it is safe enough that one should use it. Backup of a server's drive is generally not dependent on whether the server is idle or in use; test times reported for both scenarios show no significant difference.

Interestingly, there didn't seem to be a lot of difference in performance when using an older machine with a slower processor. Backing up a comparable amount of data through a similar SCSI interface on the older system yielded time-differences as easily attributable to system integration as anything else. The beauty of all this is clear: The tape technology is remarkably consistent, and fast enough that the overnight, unsupervised backup can become a thing of the past.

What did make a difference was when we tested backing up workstations across the network. This crawled - apparently more a matter of the network's limitations than of the Tecmar Travan NS drive. Even so, this worked well as a background process, while all the systems being backed up were in use. There was no inconvenience involved, so no special reason not to perform a cross-network backup even during business hours. [You'd think there could be issues of file access. We had all the stations in use when doing the cross-network backup, and this must have entailed some file access. There were no noticeable problems.]

Current plans for Travan-NS suggest that the current 8gb and 20gb models will shortly be joined by 35gb and 50gb models.

Ditto Max

The main competition to Travan-NS from Tecmar and others lies in enhanced variations of 8mm tape with helical-scanning heads.

Essentially, this is technology developed for the recording industry, and is not unlike the technology in a VCR. Where Travan devices (like earlier tape-drive technologies) lay down a linear track using a more or less static head ("less" meaning the head is moved for subsequent tracks), in helical-drives, a spinning drum carries the heads, which lay down diagonal stripes as the tape moves along. The resulting image is very accurate, and very dense; these drives commonly store 50gb-70gb compressed. The trade-off is in a more complex mechanism (more motors, more stuff to be done positioning the tape correctly, and so on). This translates into more expensive mechanisms with shorter MTBFs ("mean times before failure"). The tape medium itself is commonly more costly; Sony's AIT tapes add to the cost by including a microchip-based catalogue in the cassette.

Exabyte appears to have bet the company on its variation on the theme.

Using the format dubbed "Mammoth", Exabyte claims its design approach has eliminated many of the problems with earlier products based on 8mm tape. As this is being written, the company is close to launching its second generation of drive in the category; the bugs that went along with the early versions of the machine are not likely to be repeated - not least because of continuity in the design team. These folks are perfecting, not reinventing.

Looking at a cutaway of the drive, the innards are familiar to anyone who's pried into the innards of a VCR. Like video tape, Exabyte's carrier draws the tape cassette into the drive and seats it. The mechanism then draws the tape back and around the spinning drum carrying the head. The deck itself is die-cast aluminum, with a more ruggedly built loader. The unit seals better; the result is less trouble from dust and other airborne contaminants.

Current Mammoth models support 14gb (Mammoth LT) and 20gb (Mammoth) (uncompressed - normal compression effectively doubles the capacity; I have not been able to determine if the performance enhancement associated with compression in Travan-NS is as dramatic in helical drives). The second generation Mammoth drives, currently targeted for third quarter, should deliver three times the capacity of the current top-of-the-line.

Sony's Advanced Intelligent Tape (AIT) systems with its Memory-in-Cassette (MIC) media, has been on the market for about a year and a half. Effectively, this is Sony's answer to the search for a better 8mm tape product. Sony's tapes start with a native capacity of 25gb or 35gb (uncompressed), depending on tape length. As is the case for most advanced tape systems, Sony uses IBM's hardware based Advanced Lempel-Ziv Data Compression (ALDC), which delivers superior compression - commonly better than 2:1.

What's really special about the Sony AIT system is its onboard memory. This chip-in-the-cassette stores a catalogue of the tape, accessed by the drive and controlling software. The result is faster access, since the catalogue is referenced directly and simultaneously with the tape contents, rather than sequentially, as in ordinary tape

systems.

	The question remains, what to buy? Travan and Travan-NS drives are vastly less expensive than comparable 8mm Mammoth or AIT drives. A Mammoth-LT costs around three times as much; the - admittedly more capacious - Mammoth and AIT drives start at closer to seven times the cost of a Travan-NS drive. For normal CAD workstations, and small workgroup networks, the current Travan-NS technology clearly offers real value, combining high-end features with modest price.

	Mammoth drives - especially the second generation model, when it arrives - and Sony's larger AIT models are better suited to larger shops, where the larger networks can justify the higher cost of these more capacious drives.

	Where tape is used for online archives, standalone or in jukebox configurations, the call is harder to make. Tecmar's automated Nsync cassette handling is robot-friendly, which means these drives are as suited to automated systems as are the autoload drives from Exabyte and Sony.