

# Older Electronic Records:

Though dated media may be seldom accessed, your duty to preserve it is ongoing.

## Out of Sight, Out of Mind?

by [Chris Muller](#)



Sometimes it's a regulator. It may be the feds who insist that you stop, take a deep breath and revisit the issue. State agencies can be even more demanding.

Sometimes it's internal. The legal department and internal auditors are paid to worry about things like this — so they worry you.

Sometimes it's just your IT instinct. There are many pressing issues confronting you every day, but deep down you know this requires attention. Often there are legal penalties involved. It may even begin to disturb your sleep.

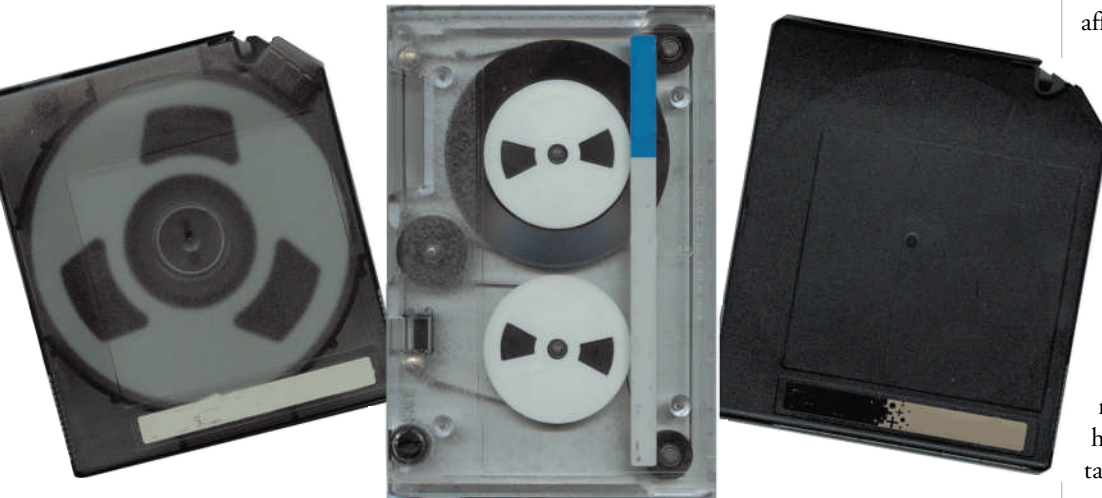
Various industries are required to preserve transactional and other records from six to 20 years, depending on the type of record. Some records — including government files and certain pharmaceutical data — must be preserved virtually forever.

There are those who say, "Sure, sure. We know we have to keep this stuff. It's all on tape in that offsite bunker. What's the big deal?" But many realize that the problems are not just forward-going, but retroactive as well.

Problems with older computer files have been recognized, if not acted upon, for quite some time. Here's what the Associated Press had to say about it in a *Newsday* article called, "Nation's Records Are a Mess:"

*A slice of America's history has become as unreadable as Egyptian hieroglyphics before the discovery of the Rosetta stone. ... Historic, scientific and business data in danger of dissolving into a meaningless jumble, stranded on computer tape — unintelligible or soon to be so.*

The article, whose warning call 12 years ago is as valid as ever, went on to outline many of the reasons why it's important to ensure that those tapes you've been storing for years actually contain what you think they do. They don't last forever.



Unfortunately, *time* is not on our side in this fight.

- *Time* and its minions (gravity, temperature, chemistry, magnetic fields) can cause valuable records to decay on the shelf.
- *Time* and the inevitable migration to new computers, software and media render older electronic records incompatible and unusable on the new systems.
- *Time*, downsizing and job-hopping programmers lead to undocumented programs and files that are difficult to decipher.

### Old Federal Records Get “Back to the Future”

The National Archives and Records Administration (NARA) has a mandate to faithfully preserve many of the federal government’s most important records — permanently!

In response to public pressure as exemplified in that AP article, Congress funded and NARA specified the development and decade-long refinement of an Archival Preservation System to answer the issues brought up in that article.

Other government agencies often take on the responsibility of internally preserving their long-term electronic records. Common threads in such preservation efforts include:

- Preservation on (i.e., migration to) more stable, more widely-compatible media
- Conversion (where practical) to non-proprietary data formats
- Periodic verification and refreshment

### Taking Action

George Kaadi, vice president and manager for Bank of Tokyo-Mitsubishi in Jersey City, N.J., realized that the 30,000-plus tape cartridges archived offsite by the bank could eventually become a nettlesome problem. As a proactive sort of guy, he went in search of a solution. First stop: the company that stored his tapes.

Some offsite storage companies prefer to let sleeping dogs lie. They’d much rather you don’t question the viability of all those tapes on the shelf — just keep on paying that storage fee. The company that Kaadi uses is a refreshing exception. They introduced him to the people who had developed the data preservation systems at NARA. While Kaadi didn’t want such an elaborate setup, he demanded that certain criteria be satisfied:

- Find a means of assured preservation that will satisfy auditors and regulators.
- Provide in-house capability that would enable him to make use of available off-shift operations capacity.
- Keep costs in line without breaking the bank. This in turn implies three things: 1) reasonable hardware, software and training costs; 2) simple procedures that don’t suck up lots of operator time; and 3) keeping the cost of new media to a minimum.

### A Solution

One approach to satisfying these needs involves tape preservation on CD (or DVD). The great majority of the bank’s long-term tape holdings consisted of 3480, 3490 and 3490E cartridges produced through the years by mainframe computers.

Tape to CD/DVD improves archival quality while reducing space. Temperature, humidity, magnetic fields and gravity all affect a tape’s storage reliability to a much greater degree than they would affect a CD or DVD. Since each such disk can hold the contents of several 3480/3490/3490E’s with superior archival characteristics, there is a gain both in reliability and space savings.

### Eliminating Uncertainty About Tapes

Not only is important data copied to a more compact and stable medium, but also, as a byproduct, one confirms the readability of the original tapes. What happens if you need that data back on tape again?

A PC equipped with a CD/DVD reader, a tape drive and appropriate software can reproduce any original tape, bit for bit. Even better, the output need not be the same as the original medium. It can be LTO or DLT, for example, as required.

If the information is not needed back on the same platform that created it, it may not be necessary to write it back to tape at all. The software that copied the tapes to CD/DVD originally can also read these “tape images” directly, as if they were the actual tapes.

What Kaadi implemented was a system consisting of two fairly ordinary PCs. One PC has two 3490E-style tape drives, each with a seven-tape stacker. The software is capable of running both drives simultaneously to capture the content of up to 14 tapes with little operator intervention. At the same time, the captured data is “zipped” in order to reduce the space required on disk.

The second PC is used for burning the CD or DVD disks. A separate system is used for this purpose because of the sensitivity of the disk writing process

### Verification and Logging

By its nature, this archival data is unlikely to be referenced frequently in the future. However, the faithfulness and reliability of the preservation process must be maintained. This means that every step must be verified and logged.

One must be certain that the files are exact copies of the tape, that the zip compression is valid, that the disks are readable and that any given tape’s content can be located when needed.

At the same time, the process needs to be economical enough to fit the cost/benefit

profile of this type of archival data. In many instances, preservation on CD/DVD meets these requirements.

### “Multi-Layered” Preservation

Often, it’s useful to preserve various renderings of one’s older tape-based data on CD/DVD.

Tape image files contain an exact snapshot of a given tape volume, making it possible to be able to exactly reconstruct any original tape on the same or a different tape medium. This is appropriate when the tape

is in a proprietary format and a system like the originating system may be needed to access the information.

Raw data files can be extracted if the tape is in a well-defined format such as IBM or ANSI standard, or TAR, or is in a proprietary format for which conversion utilities exist (e.g., Wang or DEC Backup, etc.). Individual files and folder structure can be extracted and saved separately on CD/DVD. Doing both could be a good idea if the users weren’t sure whether they wanted future access to the files on a legacy system, on a PC or both.

Converted files, which mean peeling back the final layer of the onion, and producing files that are useful in a totally different environment, may be what’s really needed. For instance, mainframe data files can be converted to Access, Excel or delimited ASCII. Legacy word-processing files may be converted to RTF or Word.

**H**ow far one wants to take things depends on one’s budget and the likelihood of the need for future access. Capture and preservation, of course, is the *sine qua non*.

However, if the file layouts had changed through the years, and the documentation was thought to be unreliable, one might want to keep both the raw and converted data in case reconversion of some files is required in the future.

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This general approach is not appropriate for all circumstances, of course. Newer tapes’ capacities are much greater than CD and DVD, and so would not fall into the “sweet spot” currently occupied by open reel, 3480-3490E, and the older 4mm, 8mm and QIC formats.

However, new DVD formats of 20GB and greater are on the horizon, and so the profile moves forward with us in time. For the foreseeable future, CD, DVD and their successors will be a logical choice for the preservation of much of the older but important data currently stored on fragile tape media. ●

**Chris Muller** is founder of Muller Media Conversions, which is celebrating its 25th anniversary this year. MMC is particularly strong in deciphering data and media formats on a wide variety of tapes and disks. MMC software permits many kinds of mainframe and minicomputer tapes to be read directly on a PC. That’s why the National Archives hired it to develop the software NARA uses to preserve data coming in from all over the federal government. See [www.mullermedia.com](http://www.mullermedia.com).

## Compliance, Regulations, and Auditors ...Oh My!



### What about all those old tapes?

Sure, there are dozens of great backup and archiving packages for future needs, but...

### What about all those old tapes?

Even under the best conditions, they can degrade over time or become incompatible with your new systems.

### What about all those old tapes?

With tape preservation systems based on those developed for the U.S. National Archives, with onsite or offsite services, we can help that problem go away. Call

## Muller Media Conversions

[www.mullermedia.com](http://www.mullermedia.com)



Thanks for taking the time to review the preceding article. Though it focused on a tape-to-DVD project, please remember that we provide migration to all sorts of media, depending on your needs. I'd guess that your media is stored much better than shown below. But even under the best conditions, problems can develop with tapes stored for long periods.



**TIME** and its minions are a “Phantom Menace” to your data.

**TIME** and fragile storage media can cause valuable records to “decay” on the shelf.

**TIME** and the inevitable migration to new computers, software and media render older electronic records incompatible and unusable on the new systems.

**TIME**, down-sizing and job-hopping programmers lead to undocumented programs and files that are difficult to decipher.

**FACT:** A greater portion of our national information resources is threatened by these factors than by terrorists and hackers.

### What to do? Let us help you be proactive.

[Less hassle, less costly than you may think.]

Reasons to Keep That Legacy Data include:

- Legal Mandates
- Historical Research
- Litigation

We've helped the National Archives and many firms and institutions around the world—and we'd like to be a resource to you as well.

Sincerely,  
Chris Muller  
President  
516-833-3067  
chris.muller@mullermedia.com

# Treat!

✓  
Verify the readability of your tapes.

✓  
Preserve your data on more modern media.

Preserve virtual tape snapshots on DVD or hard-drives, or migrate to other tape media such as LTO.

**Muller Media Conversions** provides refresh, verification and preservation services—as well as in-house systems.  
(Compliance, migration, litigation defense needs satisfied.)

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