CASE STUDY

The Courts - Saving Money in the Digital Age

What to Do with Massive Cassette Libraries

Opportunities to save time and money are sometimes right in front of you. They are often so close that you don't even notice them. Old habits and established procedures frequently get in the way. But when a creative thinker is at the helm of an organization, positive change is right around the corner.

Such was the case with the First Judicial District Court of New Mexico located in Santa Fe. Like many District Courts around the country, their daily court proceedings had been recorded on cassette tapes for over 20 years. A cassette library of this nature can be enormous with hundreds of thousands of cassettes - and the First Judicial District Court's cassette library was enormous.

Storing and managing a library of this magnitude creates a number of problems, not the least of which is it takes up valuable space. Over the years these tapes had taken up thousands of cubic feet of valuable office and storage space. For the First Judicial District Court, cassette storage created an additional problem. New Mexico was in the process of building a new court house for the First Judicial District Court, and there was no space available in the new building for storing and managing the cassette library.

But long before the plans were even finalized for the new courthouse, Stephen T. Pacheco, the Court Administrator, was looking for a way to streamline this library of nearly 150,000 cassettes. Recognizing the issues associated with this bulky library, he directed his staff to find a way to convert their giant analog audio library to a compact and manageable digital library. So they approached our company and asked us to assist with the project.

Our company, Thick and Mystic Media, LLC, has a service called AudioMover (www.audiomover.com). This service was created for the purpose of converting large quantities of analog cassette tapes into digital files quickly and inexpensively. At Thick and Mystic Media, LLC, we have been working in the professional audio and video business since 1994. Over the years we have worked with nearly every kind of analog audio tape ever made. We were also involved with digital audio recording years before it was the industry standard.

With our background in professional audio, we developed the AudioMover service to respond to a growing need. Analog cassette tapes at publishing companies, churches and other organizations across the country are deteriorating, so people needed a cost effective solution to archive their information in a digital format. We offer the solution.

Pioneers in New Mexico

As near as we can tell, prior to beginning this project for the First Judicial District Court, no task of this magnitude and nature had ever been untaken in the United States. The First Judicial District Court is a pioneer in this growing need to manage deteriorating and bulky analog tape libraries. They have set an example for courts and government agencies across the country in saving time, money and space. This forward-thinking initiative will certainly be the first of thousands of similar projects around the country.

We are proud to be a part of this creative, cost saving effort.

Archiving Issues with Analog Tape

Unlike a digital file, which can be replicated and reproduced without deterioration, a cassette tape has a relatively short life span. If stored incorrectly, its usable life can be as short as a few years. But even if cassette tapes are stored correctly, they are in a constant state of deterioration. After years of storage, the following often occurs:

- The pressure pad which holds the tape firmly against the play head falls off.
- The tape itself becomes brittle
- The leader tape breaks loose from the magnetic tape
- The cassette housing warps, binding the reels
- The tape warps and stiffens making it almost impossible to move smoothly between the play head and the pressure pad.
- The magnetic signal on the tape transfers from one layer of tape to the next on the reel causing an echo effect.

All of these problems are the enemies of an archivist. And no matter what precautions are taken, cassette tapes deteriorate more every day. Due to differing tape formulas and improper storage some cassettes made in the 90s are completely unusable today. And for those that are still usable, it's only a matter of time before they are not.

Our Findings

As we worked on the First Judicial District Court cassettes, we were pleased to find that they had been stored and managed perfectly. Here are our findings:

- In the cassette tapes from 1999-2005, we found less than .05% that needed any special attention. The problems with the tapes that did need attention were almost always connected to winding issues in which part of the tape was pulled off the reel inside the cassette housing.
- In the cassettes from 1990 - 1999, we found more cassettes that had unattached from the leader tape or that were bound or broken in some way, but the number that needed special attention was still less than 1%.
- The court used two different brands of cassette tapes prior to 1989. One brand had a significantly higher rate of problems than the other. Upon inspection, one brand had more incidences of warped and stiff tape than the other. In every case the two brands were stored side by side in the same boxes which indicates that the brand of tape was the issue, not the way the tapes were stored.

Changing Technology

Analog cassette tapes were the most common audio recording tool used for nearly 30 years. Cassettes were so inexpensive and easy to use that digital recording didn't become economically feasible until after the turn of the century. Today the advantages of using digital audio recording, storage, and management are much greater than using the traditional analog methods.

Like many District Courts around the country, the First Judicial District Court has moved from cassette tapes to hard disc recording in recent years. This has saved the court an enormous amount of time, money and space. Digital audio also has the additional following advantages over traditional analog audio:

1. Hard drives require almost no office space and minimal staff to manage.
2. Digital audio quality never deteriorates.
3. The price of hard drive space has become almost negligible while the price of traditional analog tapes have gone up.
4. Analog recording and playback equipment is becoming harder to find and more difficult to maintain.
5. Digital audio on hard disc is immediately accessible while cassettes require considerable time to access.
6. Cassette tape becomes brittle as it ages and will eventually become unplayable.

All of these factors, combined with space limitations and state archiving requirements, motivated the First Judicial District Court to pursue space-saving, cost-saving and time-saving measures. These measures could be achieved by converting this bulky cassette library to digital.

Objectives

As we prepared for the first phase of this project we identified four areas that needed to be addressed.

1. **Security** - Ensure the security of sensitive court records.
2. **Responsibility** - Identify cost and time savings.
3. **Organization** - Organize the files to work with the court's current management structure.
4. **Accuracy** - Ensure the accuracy of the resulting files.

Security

Ensure the security of sensitive court records.

Security is one of the biggest problems in the world today. With information housed by giant banks, credit card companies and government agencies being compromised on a regular basis, security was a significant hurdle to overcome. Although audio on these cassette tapes are considered public court records, they can be highly sensitive. In fact, a significant number of the tapes are sealed by the court and are not available for public access.

We took the following steps to ensure the integrity of the cassettes and the resulting digital files:

1. **Chain of custody** - We sent a representative to the court to pick up the cassettes. The cassettes moved directly from the court to our hands with no third party involvement. And because of the shear number of cassettes, we found that this procedure was less expensive than shipping the tapes via a third party vendor.

2. **Secured facility** - While being stored, all the cassettes were kept in an alarmed office or storage area. For extra security we used a wireless alarm system with a battery backup. So even if the power, phone and cable lines went out, the cassettes were still in a secure environment. Alerts from the alarm were set to go directly to company managers and law enforcement agencies.

3. **Internet isolation** - All of the audio capture machines were operated on an internet-isolated network. In other words, none of the machines on the digitizing network had any connection to the internet. As a result, it was impossible for people outside our organization to gain unauthorized access to any machine on our digitizing network. In order to move files from this network to another network a person would literally have to plug in an external hard drive, copy the files onto the drive and physically move them.

4. **No wireless access points** - Along with internet isolation, the network did not use any wireless connections. All of the machines were hard-wired together through a central switch. Once again this made it impossible to access any of the audio files without physically plugging into the network.

All of these steps helped ensure the integrity of the audio cassettes and the resulting digital files.

Responsibility

Identify cost and time savings

There are many direct, indirect and hidden costs associated with managing a large cassette library. Understanding these costs makes digitizing more inviting from a fiscal standpoint.

• **Office Space** - The cost of office space can range from $20 - $25 a sq/ft. Because of the large amount of space needed to manage an on-site cassette library, it was costing the First Judicial District Court over $20,000 a year to store and manage its on-site cassette library. In a single decade this adds up to $200,000!

What we accomplished *- By completing this project, the poorly utilized office space became available for more productive uses. For the typical district court, the space recovery would be equivalent to building several new offices. In the case of the First Judicial District Court, it enabled them to prepare for the move to their new facility without acquiring any extra space.*

• **File Access/Filling Requests** - Although the First District Court stopped using cassette tapes to record hearings in 2005, there is still a significant demand to access those tapes. Whether it is a judge, an attorney, the press or an individual making these requests, they always require an employee's time.

Previously, when the court received a request for a cassette tape, a court worker would have to go through several steps to fill the request. To begin, the worker had to physically locate the appropriate box in the records room. The box, which could weigh as much as 30 pounds, would then need to be removed from a shelf and opened. The worker would then pour through the box to locate the tape(s) in the request. After finding the tape, the worker would then make a real-time copy of the recording. After completing the request, the tape had to be put in the box and returned to the records room.

In cases where the request included multiple tapes from multiple boxes, the process could take several hours if not days. Converting the desired cassettes to digital often required the full time effort of at least one employee. Over a decade this could cost the court up to $400,000.

Although it cannot be measured monetarily, it is important to consider the costs associated with requests from judges. Waiting for copies of tapes can waste a great deal of time and energy in the courtroom. This can potentially impact many individuals as well as scheduling hearings.

What we accomplished *- Today when someone requests a cassette recording there is virtually no wait. The audio from any cassette can be accessed and/or copied from the network server in seconds. There is no need for an additional employee to be involved in managing or accessing the cassettes. And now judges have instant access to the digital versions of the cassette recordings via the private network in the court.*

• **Mechanical Costs** - Cassette players are scarce and becoming more expensive to purchase and maintain. The play head in a cassette player should be cleaned after every 20-30 hours of use. It should also be demagnetized on a regular basis. There are also numerous issues that must be addressed when dealing with aging cassette tapes. The tapes can break, the tapes can get bound in the pinch rolling mechanism, the pressure pads can fall off, the cassette housing can warp, etc. All of these mechanical issues have an associated cost.

What we accomplished *- Cassette players in the court have become virtually unnecessary. All costs associated with maintenance and repair of the cassettes and/or the cassette players have been eliminated.*

Organization

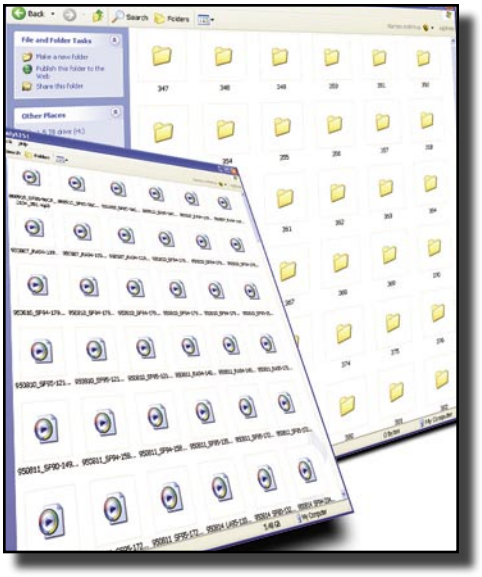
Organize the files to work with the court's current management structure.

The First Judicial District Court had an established system for organizing the audio cassettes. Therefore, it seemed unnecessary to create an entire database and a management tool for these digital audio files.
We developed a simple process that enabled the Court to apply the existing organizational structure to the new digital library.

We used two steps to tie the new digital files to the traditional organizational structure:

1. **Digital Boxes** - All of the cassettes were originally located in numbered boxes. The First Judicial District Court used the individual box number as the foundation of their organizational structure. So we created a "Digital Box" that represented each physical box. After digitization, all of the digital audio files were placed in their respective digital box.

2. **Naming Conventions** - The First Judicial District Court used the date, the case number and cassette number for higher level organization. So we created a naming convention for each digital audio file that would incorporate each element. Today, using the simple tools found in any operating system, the digital files can be sorted by date and quickly identified.



After implementing these simple organizational steps, the entire process of accessing digital files became almost instant. Today a court worker simply locates the virtual box on the server, locates the file inside the virtual box and, if necessary, burns the file to a CD. The process of locating cassettes and fulfilling cassette requests, which may have taken hours or days before, now takes a matter of seconds, and the court worker doesn't even need to stand up!

Accuracy

Ensure the accuracy of the resulting files.

Because the ultimate goal of this project was to destroy the physical cassette tapes, ensuring the accuracy of the audio files was an important consideration. As with any project, we have procedures in place that address areas of potential error.

Digitizing

Following are some of the steps we took to ensure accuracy during digitizing:

- Each cassette was forwarded to the end then rewound to the beginning. This ensured that the tape was loose and playable.
- The digitizing software was set to automatically stop at for 47 minutes and 30 seconds. This ensured that minor inconsistencies were accounted for in the capturing process, such as an aging and warped audio tape that may play slightly slower due to the additional drag on the play head and pressure pad.
- After the capture, the machine operator visually inspected the audio waveform for each captured file and ensured that the audio on the cassette had completed playing before the software stopped capturing. If any tape did not complete, the corresponding audio file was deleted, the cassette tape was fixed (if necessary) and re-digitized.
- Each cassette player and capture machine was numbered. During the capture process, both of those numbers were embedded into the naming structure of each audio file. This ensured that if any anomalies were identified on a specific cassette player during the QC process or during routine maintenance (a misaligned head, a damaged motor, etc.) all of the specific cassettes that may have been impacted could be identified and addressed. A permanent record of this information was kept for each digital audio file.

Back-End Quality Control

Following are several steps involved in the quality control and review process:

- Once all of the cassettes in a box have been completely digitized, the digital audio files for that box were moved across the network to a quality control machine.
- A quality control operator then verified, one by one, that each cassette tape in the box has a corresponding digital audio file.
- The quality control operator addressed anomalies or inaccuracies in file naming.
- The quality control operator listened to the beginning of a number of random tapes in the box and compared them with the digital audio files to ensure accuracy.

During the course of this project, several boxes of tapes went through a 100% QC process. This involved the quality control operator listening to the beginning of every cassette in the box and comparing them one by one to the corresponding digital audio files.

Conclusion

The First Judicial District Court of New Mexico was able to accomplish their goal of streamlining their cassette library to prepare for their move. In doing so they set an example for courts and government archivists around the country.

- They have preserved critical audio that would have eventually become unusable.
- They have built a resource to streamline processes in their court.
- They have recovered a significant amount of valuable office space and effectively prepared for their move to a new location.
- They have created a new environment in which long waits for requests have been eliminated. Instant access is now the norm for judges and request fulfillment time has been greatly reduced.

The people in the First Judicial District Court of New Mexico have become pioneers in modernization.