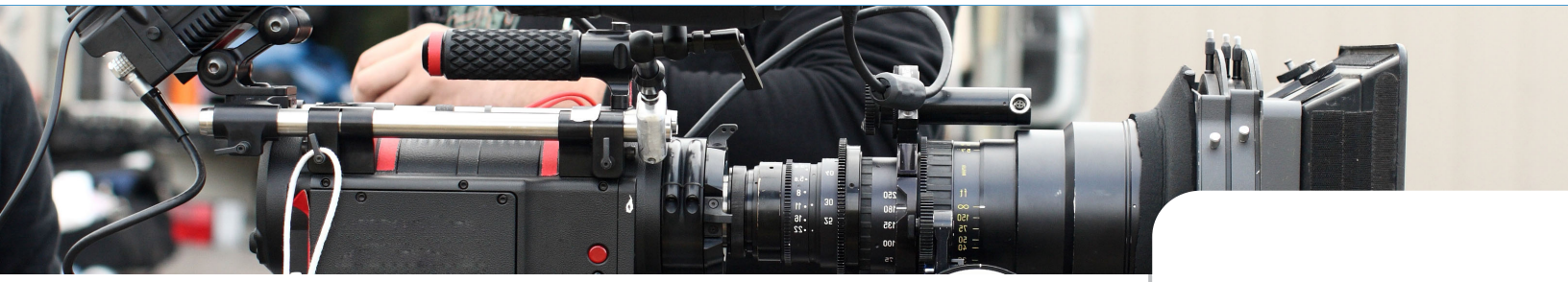
Quantum

CASE STUDY



LTO and LTFS

The Biggest Blockbuster Films Rely on Codex and Quantum for Storage & Protection

Digital acquisition is fast becoming the norm in the movie industry, with many of the biggest blockbusters never actually touching film. Getting that media off digital cameras and safely recorded, transported, and stored for editing is the job of Codex, which relies on Quantum's LTO tape drives and LTFS software for the utmost efficiency and protection.

DIGITAL FOOTAGE IS BOTH PRECIOUS AND VORACIOUS

Codex has built a name as the industry standard when it comes to capturing digital movie footage direct from camera, with the company's products used on such blockbusters as *Skyfall, Zero Dark Thirty, Life of Pi, The Avengers,* and many more. Given the industry's massive shift from traditional film to direct digital capture for its highest-profile movies, that puts Codex squarely at the center of efforts to safely record, transport, and store this data. This presents a challenge, as digital footage is both exceptionally precious and notoriously voracious in terms of storage requirements.

"A typical shoot costs $100,000 to $200,000 per day and generates 3TB-5TB of content—and there may be multiple locations all shooting simultaneously for months," says Ben Perry, Operations Manager at Codex. "That's a huge cost and a tremendous amount of content, so it makes us quite nervous when we hear people say 'oh, we'll just put it on the hard drive.' It's our job to get that data protected on LTO tape as soon as possible."

In fact, industry insurance policies used to bond films often specify LTO by name for the safe archiving of raw video, thanks to the technology's well-recognized longevity and reliability. Yet with recent films such as *World War Z* routinely requiring 300-400 tapes for storage on Codex systems, efficiency can be a major concern.

Codex historically used tar-based archives to store the digital footage, which inherently created problems both at ingest and during restores.

For tar-based ingest, the industry's standard practice is to dedicate specific tapes to each daily shoot, and those tapes are then verified and locked at the end of the day. Yet it's also common during filming to need to append small amounts of footage to the previous day's shoot, which is impossible with a locked tar archive. And that means tremendous inefficiency as a new multi-terabyte tape is used for just a few seconds of appended footage.

Moreover, the need to constantly restore archives during the editing process can create an asset management nightmare. A typical final editing cut will call for two seconds from this clip, three from that one, etc. And when each clip is found on a separate tape, and each tape needs to be restored from tar to access the clip, assembling footage can be laborious.

Given these issues—and the massive industry growth in digital capture—Codex was eager to find a better and more efficient archiving solution, and quickly embraced Quantum's Linear Tape File System (LTFS) technology solution.

QUANTUM: THE DE FACTO CHOICE FOR DIGITAL FILM CAPTURE

Quantum has long been the de facto choice for tape technology in Codex products.

"We've tried other brands, but Quantum always outperformed and has become our default platform," says Perry.

So when Quantum introduced its LTFS solution, Codex was quick to try it out. LTFS allows the use of tape

codex™

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SOLUTION OVERVIEW

- Quantum LTO tape drives
- Quantum LTFS software
- Codex Vault Archive

KEY BENEFITS

- Protects blockbuster movies through highly reliable LTO technology
- Cuts tape costs and increases efficiency by allowing simple file appending
- Eliminates need to restore archives before accessing footage
- Saves time by giving users direct access to clips
- Safe portable LTFS storage facilitates mobile and portable workflow

almost as if it were a hard disk, making it easy for Codex to allow footage to be appended to any tape as needed. And files can be accessed directly using a simple point and click, eliminating the need to rebuild or restore an archive during the editing process.

"LTFS is clearly a much, much better solution for managing digital tape archives," notes Perry. "It's simple to append data or directly access specific files at any time."

LTFS DRAMATICALLY IMPROVES TAPE EFFICIENCY

By replacing a basic tar command with LTFS, Codex has been able to deliver several key benefits to customers. The first comes during the ingest process, where LTFS allows for easy appending of footage—i.e., content—to any tape at any time using a simple file transfer. That not only improves data storage efficiency and decreases capital expenditures on tape cartridges but also makes it transparent and painless to store footage to tape, thereby increasing overall data protection by encouraging archival storage.

LTO AND LTFS PROVIDE "SAFE STORAGE" TO PROTECT DATA

"We strongly emphasize the safe storage and archiving of digital footage as part of our value proposition," explains Perry. "Every hard drive dies eventually, and as a result it's possible to lose major portions of filming, or even an entire movie. We build two Quantum LTO drives into every one of our media management appliances to save time on simultaneous archiving, and anything we can do to facilitate the process of getting footage onto tape helps in that regard. So LTFS is a great fit."

Quantum's LTFS products also help Codex customers during the editing process by making it possible to easily grab individual clips without the need to restore an entire archive to an attached storage area network. That further lowers costs and speeds up editing—an important consideration as digital production gets more complex.

"As movies have increasingly embraced digital effects, they require ever more frequent access during post-production to the raw footage that's stored on tape," explains Perry. "While our system makes it easy to locate individual frames as needed, it's the LTFS technology that allows the editing crew to quickly grab the specific bits they need."

Codex Digital has been extremely pleased with its use of Quantum LTO drives and LTFS software.

"Quantum always treats us well, and we have a great relationship with the company," says Perry. "Our systems get pulled into some pretty rugged environments when crews are shooting on remote location, and it's great to have the rock-solid reliability of Quantum LTO and the simplicity of Quantum LTFS to rely on whether we're deployed in the field or back at the main office. There's a reason that Quantum is our de facto tape storage choice."

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ABOUT CODEX

Codex, who are based in London, England, design and manufacture high-performance workflow tools for feature film, television, and commercials production. These integrated systems, designed by filmmakers for filmmakers, manage digital files and images from camera through to post production, visual effects, and archiving, and include tools for color, dailies creation, archiving, review, and digital asset management. Codex continues to raise the bar for digital production by combining great electronics and industrial design with cutting-edge tools.

To contact your local sales office, please visit www.quantum.com

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