Digital Preservation at the Packard Campus for Audio Visual Conservation

In the Motion Picture and Recorded Sound research centers at the Library of Congress in Washington DC, anyone can enjoy digital motion pictures or sound recordings from the nearly five million collection items.

But the items aren't played from anywhere in the building. They are served over a fiber optic cable from a facility 75 miles away in Culpeper VA.

The Library of Congress's Packard Campus for Audio-Visual Conservation sits on 45 acres near the foothills of the Blue Ridge Mountains.

This state-of-the-art facility – spread over 415,000 square feet – houses the world's largest and most comprehensive collection of motion pictures, audio recordings and radio and television programs.

Within the center, over 150 climate-controlled vaults protect flammable nitrate film, modern safety film, sound and video collections on scores of obsolete formats, as well computer servers and data tape libraries.

The Packard Campus is the largest facility of its kind, a state-of-the-art center incorporating new capabilities and capacities that are unprecedented within the global audio-visual preservation community.
The campus has acquired over 120 years of audio visual history…over 3.4 million sound recordings and 1.3 million film, television and video items, including video games.

The Packard Campus is designed from top to bottom to optimize preservation production for all media formats.

And it is designed to transition from analog preservation to digital preservation for all audiovisual materials.

Each digital item gets assigned metadata – technical, descriptive and administrative metadata – before it enters production, to help quickly locate the file once it's digitized and archived.

Some digital files are created from a broad range of analog media, including nitrate and safety film; sound recordings on cylinder, disc and magnetic media formats; videotapes in dozens of open reel and cassette formats; as well as recordable CD and DVD media.

The center has three preservation laboratories for film, video and sound recordings that are undertaking ground-breaking work in digital conversion, as well as an extensive born-digital acquisitions infrastructure.

A number of preservation technologies—including new digital scanning and imagines systems and robotic reformatting technologies – were specifically invented for the Culpeper facility.

Custom-built film scanners preserve the more than 3,000 titles in the Library's "Paper Print" collection of the earliest surviving American films that exist only on reels of photographic contact paper.

The SAMMA system uses robotic videocassette reformatting technologies to digitize over 500,000 television and video items in the collections.

This use of robotic production is part of the Packard Campus's design for greater efficiency, to preserve more materials faster and at higher standards of quality.

The IRENE system, developed by scientists at Lawrence Berkeley Labs, uses digital imaging technologies to generate high-resolution digital maps of grooved recordings, allowing preservationists to reconstruct sound from deteriorating or broken discs.

Digitization is not only an end to itself, it also a preservation strategy…a way to rescue works off of decaying media.

In addition to digitizing analog media, we also transfer audio and video content off CDs and DVDs, using systems that create ISO images that replicate the exact structure of contents on such media.

Library acquisitions include born digital content…. content that was digital from its inception, never analog. Our born-digital technical infrastructure achieves this in three ways: through intake of digital files coming in on physical media, through direct file submission via high-bandwidth Internet or satellite receivers, and through live-capture systems. This latter approach will dramatically increase the acquisition of unpublished audiovisual transmissions through off-air, off-satellite, and Internet web capture in a room designed for a the concurrent capture of 264 total program channels.

The destination for all digital files is the data center.

Every night an interface utility in the data center servers reaches into over 40 computers and encoders affiliated in the preservation production rooms and pulls down all of the digital files created during that day.

The files pass through the data center in a series of processing steps to final storage on enterprise-level robotic data tape storage libraries.

Each file is constantly checked for errors and its integrity is verified.

When all analog collection items are digitized, access copies are created from the originals. Each copy of a digital file can be duplicated with no loss of quality.

The original version of each file -- the preservation master file – is preserved and stored securely away so that it cannot be altered.

For access files, in time, as standards change, the center can generate new, up-to-date copies – in any format – from the high-quality original master files.

It was created to expand with the volume of new collections and meet the unforeseeable needs of emerging technologies.

By keeping current with technology, the Packard Campus will continue to store and preserve its expanding digital collections for future generations to appreciate.