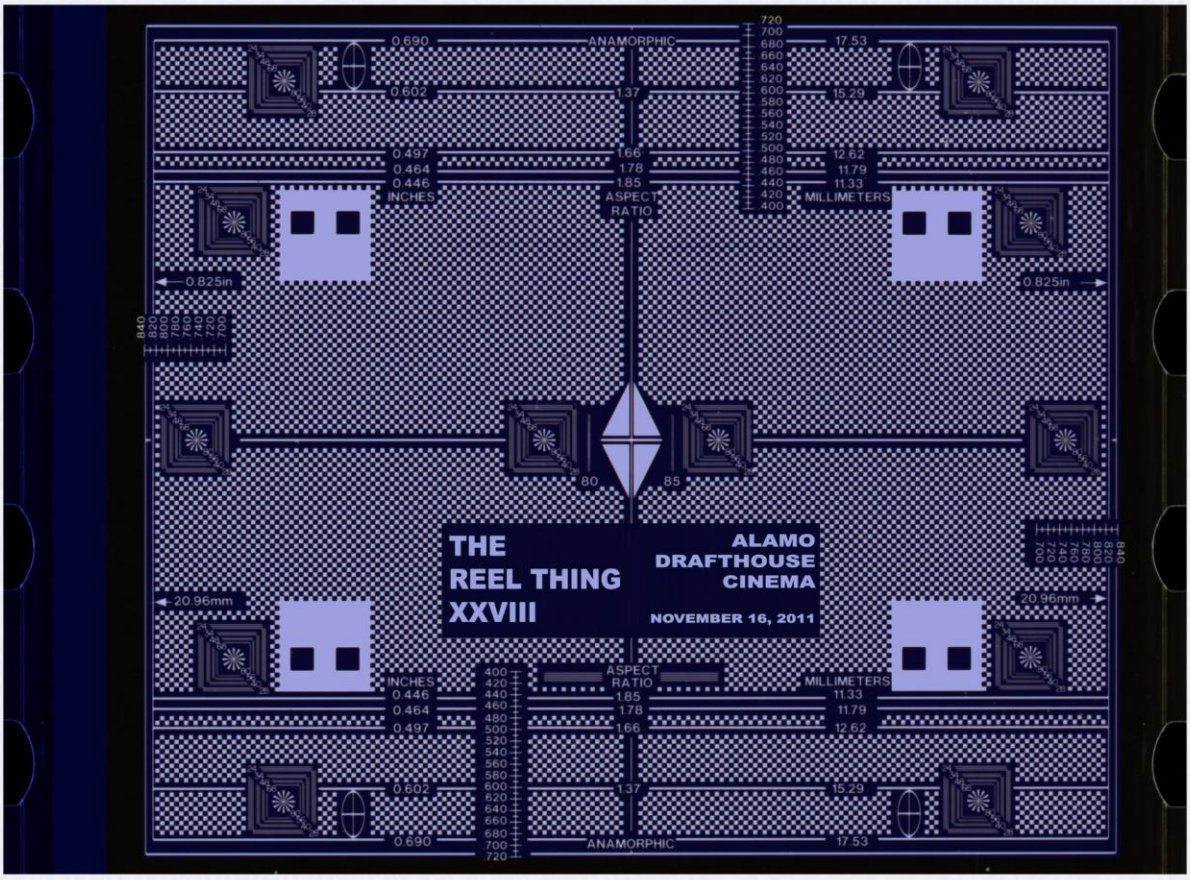
THE
REEL THING
XXVIII
ALAMO
DRAFTHOUSE
CINEMA
NOVEMBER 16, 2011
ANAMORPHIC
0.690
0.602
0.497
0.464
0.446
INCHES
1.37
1.66
1.78
1.85
ASPECT
RATIO
17.53
15.29
12.62
11.79
11.33
MILLIMETERS
0.825in
20.96mm
720
700
680
660
640
620
600
580
560
540
520
500
480
460
440
420
400
840
820
800
780
760
740
720
700
80
85

No enterprise in the non-profit world can accomplish much without the enlightened, altruistic cooperation of its benefactors. The Reel Thing has been privileged to enjoy the generous support of the professional community since its inception. The organizers of The Reel Thing would like to recognize and thank all the individuals and organizations who contributed their considerable skills, energy and enthusiasm to the symposium. As always, we thank our presenters, who share their knowledge and experience in this symposium. And we would like to recognize the following individuals and organizations for their support and collaboration:

Gary Adams
Dan Cofer
Beverly Graham
Kristina Kersels
Jessica Nelson
Laura Rooney
Leah Tuttle

The Reel Thing is made possible by the active and engaged support of some of the most important and innovative companies in the archival field. These firms work side by side with archivists and asset managers to constantly raise the standard of preservation and restoration, and to find new ways to ensure that moving images from public collections and the private sector will retain their quality and remain accessible as a resource for future generations. We offer our gratitude for their indispensable sponsorship of The Reel Thing.

Deluxe Entertainment Services Group
Iron Mountain Entertainment Services
Kodak
FotoKem
Thought Equity
Warner Bros. Motion Picture Imaging (MPI)
Cinelicious
Crawford Media Services
Front Porch Digital
Fuji Motion Picture Film
Image Systems
The Media Preserve
MTI Film
Prasad Group
Reto.ch
Audio Mechanics
DJ Audio
YCM Laboratories

T H E

R E E L T H I N G X X V I I I

The Alamo Drafthouse Cinema

Austin, Texas
Wednesday, November 16, 2011 12:30pm – 6:00pm

☯

Sound Restoration for Early Sound Films: New Tools – New Opportunities?

Bob Heiber, Chace by Deluxe and Ken Weisman, Library of Congress

☯

Magenta Dye-Fade Correction for Color Preservation Masters

Russ Suniewick, Colorlab

☯

Digital Wet-Gate Scanner and Film Recorder

Tom Aschenbach, Video and Film Solutions Corporation

☯

The Restoration of Nicholas Ray's *We Can't Go Home Again*

Giovanna Fossati, Anne Gant, EYE Netherlands and Heather Linville, Academy Film Archive

☯

A Report on the Survival of American Silent Features
and
The Media History Digital Library - Digitizing the History of Cinema

David Pierce, Independent archivist and historian, founder Media History Digital Library

☯

BREAK

☯

A case study in the aesthetics of sound restoration:

***The Sun Legend of the End of the Tokugawa Era* (1957)**

John Polito, Audio Mechanics

☯

Travel by train or flying Model-T to the towns of Medfield and Harrington: The digital restorations of *The Absent-Minded Professor* and *Pollyanna*

Jayson Wall and Theo Gluck, The Walt Disney Company

☯

Kodak Update: Asset Protection Films

Diane Carroll-Yacoby and Rick Utley, Eastman Kodak

☯

Dye Tinting in Film Restoration: *Das Rätsel von Bangalore* (1918)

Ulrich Ruedel, Haghefilm

☯

DreamWorks Studios Digital Archive Initiative

Andrew Jackson, Dreamworks and Tyler Leshney and Stuart Baker, Deluxe

☯

P R O G R A M

T H E

R E E L T H I N G X X V I I I

The Alamo Drafthouse Cinema
Austin, Texas
Wednesday, November 16, 2011 12:30pm – 6:00pm

Sound Restoration for Early Sound Films: New Tools – New Opportunities?

Bob Heiber, Chace by Deluxe and Ken Weisman, Library of Congress

Current technology for sound restoration allows audio technicians to wield their tools like a surgeon wields a scalpel. The refined capabilities of the new audio tools are unprecedented, and as a result, we now have the ability to make modifications that were unimaginable only a few years ago. While audio "enhancement" opens up new opportunities for sound modification, these technologies impose an additional responsibility to understand and control the effects of specific changes within the overall context of an audio track. Correct application of restoration methods has a determinative effect on the authenticity and veracity of a sound track.

This presentation illustrates the dilemma facing sound restoration professionals with examples of specific audio defects found in a 1929 sound motion picture. *High Treason*, a silent film converted to a sound motion picture with synchronized dialog, exhibits the full range of sound restoration issues as well as problems characteristic of the earliest synchronized sound films. It provides a case study that reveals areas of sound impairment that were difficult to satisfactorily correct until recently. Other areas demonstrate challenges of early sound films, such as bad edits, modulating noise floors and excessive camera noise that can also be corrected. Through the presentation of

specific problems and processing solutions, the audience will come to understand how the use of these technical possibilities can transcend the concept of sound repair and begin to creatively enhance or improve the sound experience. Armed with this knowledge, archivists and sound restoration professionals will be able to better understand how their decisions will affect the sound experience of the final restored track.

☯

Magenta Dye-Fade Correction for Color Preservation Masters

Russ Suniewick, Colorlab

The correction of magenta dye fading remains one of the most intractable problem faced in the process of photochemical restoration. This problem is characteristic of independent production, where original film materials are often not backed up or stored under ideal conditions, and where unique prints, masters or negatives may constitute the only remaining copy of a film. This problem is sometimes addressed by scanning the problematic copy and correcting the fade using digital tools, after which the element may be distributed digitally or recorded back to film. However, many filmmakers have a commitment to the medium of film and do not want to submit their work to the technical process of digitization, and prefer distribution via the original photochemical process. Since film has a proven longevity that exceeds current digital media, there are economic incentives to maintaining a work on film. As an alternative to the digital solution, advances have been made in light sources and sensors which have enabled a much improved magenta dye-fade correction for the creation of color preservation masters. This presentation will describe the process and equipment which enables a more effective correction for magenta dye fading, and will show examples of this work.

☯

Digital Wet-Gate Scanner and Film Recorder

Tom Aschenbach, Video and Film Solutions Corporation

Two years ago, when we began talking among ourselves about what our preservation clients need most in a liquid-gate, high-resolution, continuous-run data scanner and film recorder, a list of essential features began to emerge. These requirements included the ability to scan and record all gauges of nitrate, diacetate and triacetate motion picture film between 8mm and 35mm. The physical/mechanical transport hardware would have to be a modular, snap-in design that would take less than five minutes to switch from one gauge to another. The device would have to operate at scanning speeds that support our productivity goals, but which would also handle old and distressed film. The transport would have to be able to scan all formats without regard to shrinkage. To help reduce some of the cost of hand work to original film prior to scanning, the scanner transport would also have to be able to move film without sprockets on either side and still maintain picture stability. The same design features that allow scanning without perforations make it possible to handle excessive shrinkage. We mandated the ability to view the images on a high-resolution monitor in real time as they are being scanned, so that a technician could regulate framing or other parameters when necessary.

The device was designed to capture variable density or variable area soundtracks from scans of composite negatives or composite positive prints with sufficient resolution and overscan to produce an archival sound element. The examples shown for this presentation were scanned at sixteen feet per minute, but the sound capture process is effectively independent of film running speed since the sound is captured as data. The captured optical soundtrack in the form of data can be archived by recording to a separate 35mm archival audio source or it can be delivered as a composite computer picture and audio file on a hard drive. The device scans the entire area from one edge of the film to the other, enabling all edge printed information to become part of the scanned data file.

This scanner design has been built and is now in daily operation. The development of additional features continues. As of now, our deliverables for a composite optical film element would be a preservation fine grain master created by filming-out the picture data on our proprietary film recorder, and a data file of uninterrupted in-sync audio on a hard drive. We are in the design stage of a modification which enables the recorder to write the audio data file back to a fine grain preservation master as an optical sound track simultaneously with film-out the preserved picture.

Our ultimate goal is to achieve a workflow that addresses the requirement put to us by clients of having one preservation element returned as completed product from one roll of submitted material to be preserved. Thus, we expect to be able to make a single liquid-gate pass of the composite optical film element which will yield a digital data record of the picture as well as a data record of the optical sound track, and a single recorder output pass that will produce a single roll of preservation master containing both the preserved picture and the variable density optical sound track.

The Restoration of Nicholas Ray's *We Can't Go Home Again*

Giovanna Fossati, Anne Gant, EYE Netherlands; Heather Linville, Academy Film Archive

Created in collaboration with Ray's film class at the State University of New York at Binghamton and featuring Ray and his students, *We Can't Go Home Again* undertakes several tasks: (1) to create and school a community of filmmakers, not only in the techniques of filmmaking, but, as Ray put it, in "how to say hello to each other"; (2) to explore a new genre of moviemaking Ray called the "journalistic film," one that would share the anthropologists' aim of recording the "history, progress, manners, morals, and mores of everyday life"; (3) to explore what Ray termed "the search for self-image" in both himself, no longer able (or willing) to claim the identity of a Hollywood director, and his students; a search he described as being "as dangerous as a riot"; and (4) to reflect these concerns and explorations in a radical visual form that permits the audience to view several narratives unfolding simultaneously.

Using the available supplies and equipment, Ray and his crew shot the film in 8mm, 16mm, 35mm and video. Then, keeping each of the smaller gauges in its own ratio, he projected two, three, four, five, and sometimes six segments of film against a 35mm matte and integrated them all into one image through rear projection photography. Thus in 90 minutes of screening time, the view sees close to three or four hours of film. The images themselves are frequently altered through Nam June Paik's video synthesizer, thus creating a kind of abstract expressionism in moving pictures.

As Ray described it at his press conference at Cannes in 1973: it was an effort to make "what in our minds is a *Guernica*" out of such tools as a "broken down Bolex," "a Mitchell that cost $25 out of Navy Surplus," and a lot of untrained, youthful energy. Ultimately, the film was a reflection of Ray's credo that "film is a way of life." For him it was the medium through which he could best express his discoveries of himself and of the world around him. *We Can't Go Home Again* was an experiment, if a flawed one and one unresolved in Ray's lifetime; and yet even in its lack of resolution, it is, as Spanish film director Victor Erice put it, profoundly "alive."

The restoration of *We Can't Go Home Again* was a collaboration between The Nicholas Ray Foundation, EYE Film Institute Netherlands, and the Academy of Motion Picture Arts and Sciences' Academy Film Archive, and took place in 2010 and 2011.

We Can't Go Home Again is not only a film with multiple images within a single frame, it is also a film with multiple versions, endings and edits. Upon inspection of the available film elements and consultation with members of the crew involved in the shooting and editing process, it was agreed to take the 1973 version as the reference print for the restoration. This version, which premiered at Cannes that same year, is also the first, most-complete, public-screened version. The basis for the image restoration is the 35mm image negative of the 1973 version, created through a unique production process, involving a multiple back projection of 16mm and video images on a background 35mm matte which was then re-photographed on 35mm.

The image restoration work was performed at Cineric, Inc., in New York. The initial step in the restoration process was to test three separate restoration options: (a) photochemical restoration starting from the 35mm negative from Academy (with digital inserts when parts need to be digitally corrected); (b) digital restoration starting from 35mm negative (with inserts from 16mm and other source material when parts need to be substituted). In this case there would be a scan of the whole 35mm negative carried out at Cineric on the 4K wetgate Oxberry; and (c) digital composite reconstruction starting from original formats (S8, 16mm and video) with inserts from 35mm negative when parts are missing.

Our concern with all these processes was to be able to maintain the handcrafted, collaborative, experimental, 1970s homemade feeling. We wanted to be sure not to give it too much digital work so that the film would maintain its original spontaneous qualities, and that the film would continue to "breathe." After reviewing the results of the first three tests, it was determined that starting from the 35mm negative was the best solution, because it was in good condition, and was the most true to the original format, and that it would be scanned at 4K for digital restoration where necessary.

The decision was always based on a balancing act between cleaning up defects and damage, while maintaining the original "craft processes." We attempted to clear up visual interruptions in rare spots where it obscured the context of a scene, while leaving the marks of the original film-making approach. For instance, most of the tears, line scratches and cue dots were removed, whereas grease pencil marks, finger prints and tape splices in the original 16mm were left in the film. Also, a large recurring white flash at the bottom of the screen (due to the splice in the back projection loop) was digitally removed.

Following a similar approach in grading, we restored the faded colors of the original negative but we did not correct the characteristics of the original photography, including imbalance in the color grading of the multiple images, the exposures, and the focus.

The primary source for the audio restoration was a 35mm three-channel magnetic track, representing the final mixed version of the sound for *We Can't Go Home Again*. The audio restoration was performed at Audio Mechanics of Burbank, California. The excellent quality of the magnetic track called for a limited amount of intervention during the restoration process. Minor distortions such as crackle, static and hiss were removed. Additionally, given that a majority of the final audio mix was found in only one of the three channels of the magnetic track, minor cross-talk or audio bleed through onto the two unused channels was also removed as this distortion was

audible during playback. With these distortions eliminated, the sound track reveals the best qualities of the original mix.

The restoration source, the 35mm magnetic track, represents the version of *We Can't Go Home Again* that premiered at Cannes in 1973. As a result, this original release has always had missing audio that was recorded and intended for the 1973 release, including an opening monologue delivered by Ray himself. With the assistance and expertise of Susan Ray and one of Ray's former students, Richard Bock, this restoration includes the once missing material for the first time ever, including the director's narration. Bock was one of several students of Nicholas Ray's who not only appear in the film but was also deeply involved in the production process. He has digitized the entire library of audio recorded for the film and assisted in the restoration to insert the missing audio. The results of this work provide a clearer and more intimate connection between Ray's four panel image collage and sound.

☯

A Report on the Survival of American Silent Features
and
The Media History Digital Library - Digitizing the History of Cinema

David Pierce, Independent archivist and historian, founder Media History Digital Library

The processes of film preservation continue to evolve and improve. Whether restoration is based on entirely photochemical methods, or on more contemporary digital tools, there are aspects of this work that depend on a profound understanding of the historical production context and a thorough knowledge of surviving film elements. Archivist and historian David Pierce has been conducting

important research into extant elements of silent era features for the National Film Preservation Board, and directing a project to digitize resources for the study and understanding of the historical eras of film production. In this presentation, he will update the archival community on the work he has done for the NFPB, and present the Media History Digital Library, a document scanning project which is available on the Internet Archive site. These projects will contribute to the transformation of historical work on the cinema and on the next phase of cinema restoration.

☯

BREAK

☯

A case study in the aesthetics of sound restoration:

***The Sun Legend of the End of the Tokugawa Era* (1957)**

John Polito, Audio Mechanics

Aesthetic decisions in sound are best made in an organic and collaborative way, ideally with the mastering engineer and clients together in the same acoustical space. With the clients in Japan and the mastering engineer in Los Angeles, the sound remastering of *The Sun Legend of the End of the Tokugawa Era* (1957) could not be carried out in such an optimal setting. Thanks to technological advances of the last decade, however, collaborating on a film restoration from both sides of the planet is now a very practical reality. Whereas ten years ago we had to ship tapes back and forth with lag times of several days, we can now upload and download audio and video files on demand, enabling key decisions to happen quickly and organically.

John Polito from Audio Mechanics will discuss the collaborative process, and will play examples of the various stages of development that were used to finalize the aesthetic sound of this important Japanese film.

☯

Travel by train or flying Model-T to the towns of Medfield and Harrington: The digital restorations of *The Absent-Minded Professor* and *Pollyanna*

Jayson Wall and Theo Gluck, The Walt Disney Company

The Walt Disney Company continues to restore and preserve the rich legacy of films produced by the studio, which includes not only animated classics but also some of the most beloved live-action features ever produced. Titles such as *20,000 Leagues Under The Sea, The Parent Trap, Old Yeller, Swiss Family Robinson, Treasure Island* and *The Love Bug* have been digitally restored from the original camera negatives in 4k resolution. Recently, *The Absent-Minded Professor* and *Pollyanna* have been added to this list of restored classics.

The Absent Minded Professor, released in March of 1961, was only the second black-and-white live-action feature film produced by Walt Disney after 1959's *The Shaggy Dog;* however this wasn't due to budgetary restraints. Co-producer Bill Walsh wanted to capture the same "low budget" feel as those "atomic" teenage monster films of the late 50's, and somehow convinced Walt to do the same for these comedies. *The Shaggy Dog* turned out to be the surprise hit of 1959, which convinced Disney to keep the same formula in place for *Professor*, which was going into production in mid-1960.

Director of photography Edward Colman shot *The Absent-Minded Professor* on Kodak 5222 with a date code of 1960, hard matted in-camera at 1.66:1. Colman, who also shot many episodes of Jack Webb's *Dragnet* throughout the 1950s, received his first of two Oscar nominations for his work on *Professor*. The film grossed over $11 million in its original release, and was re-issued in 1967 and 1974 with all release prints struck from the original black & white camera negative.

The restoration team supervised by Theo Gluck and Jayson Wall evaluated the negative in late 2010 and discovered severe damage. Replacement footage had been cut in throughout all reels and the last three reels of the feature were third generation dupes from 1961. These three reels were listed as

"original production dupes" and it was assumed that they were used since day one of release. After reviewing the production files, the team, acting on a hunch, performed a worldwide search of the Disney vaults that led to some surprising and different findings for reels 4b, 5a, and 5b.

The earliest generation elements were selected for each scene, and moved to Warner Brothers MPI to be scanned at 4K resolution on a Northlight. Reels of a 1961 release print were located and used as the guide for maintaining the original look of the feature. Each reel of *The Absent Minded Professor* was rebuilt and reconstructed digitally by the restoration team and MPI colorist Ray Grabowski for this 50th anniversary restoration.

Pollyanna, released in May of 1960 marked the American debut of Hayley Mills, and the feature film directorial debut of David Swift. Swift started his career with Disney in the late 1930's as an office boy and worked his way up as an assistant animator under Ward Kimball. By 1952, Swift moved to NBC and created one of the classic sitcoms of early television, *Mr. Peepers*. As for Mills, she was awarded the last juvenile Academy Award for her work on *Pollyanna*, and went on to make five additional films for Disney between 1961 and 1965.

Based on the novel by Eleanor H. Porter, *Pollyanna* featured a first-rate cast not seen in a Disney production since *20,000 Leagues Under the Sea*. The film received positive reviews, yet it failed at the box office in 1960 and was never re-released in theaters. *Pollyanna* first aired on *Walt Disney's The Wonderful World of Color* in 1963, and it quickly became a dependable television ratings powerhouse. By the time the film was released to video in 1983, it had become a beloved classic in the Disney library.

Original release prints on *Pollyanna* were in dye transfer Technicolor, and the film was photographed full aperture center on Eastman Kodak 5248, date code 1959 by director of photography Russell Harlan. Upon inspection both the yellow and cyan layers exhibited significant color dye loss, uneven fading across the image, color breathing and flickering. The original YCM elements proved to be unusable; they were produced incorrectly with one yellow record and two cyan records which had all shrunk unevenly.

As in the case of *The Absent-Minded Professor, Pollyanna*'s restoration was supervised by Gluck and Wall. It was decided to first test sections of various reels of the negative at Laser Pacific to analyze the viability of using modern digital tools for correction of the remaining color. This test proved successful, and the entire seven reels of auto-select negative were scanned at 4k resolution on a Northlight. Working with Disney's resident color consultant Bruce Tauscher and Laser Pacific colorist Lou Levinson, the team referenced David Swift's approved HD video master (made from a photochemical IP), and the studio's 1960 dye transfer Technicolor print as color guides for this restoration. Warner Brothers MPI handled the flicker correction.

New digital servicing files and DCPs for theatrical screenings were produced from the restorations, and plans have been made for future production of long-term 35mm preservation elements for both *Pollyanna* and *The Absent-Minded Professor*. The Walt Disney Company continues to ensure that the studio's classic live-action features will always remain available in "first day of release" quality, true to the filmmakers' vision for generations to come. The entire restoration team feels that Walt and the residents of Medfield and Harrington would be proud of these results.

Kodak Update: Asset Protection Films

Diane Carroll-Yacoby and Rick Utley, Eastman Kodak

Kodak's long history of providing film for the motion picture industry dates back to the late 19th century. With every major development in the industry's workflow – from the introduction of electric lighting to the development of sound, the introduction of color and the emergence of electronic media in distribution and production - film manufacturers have responded with innovative emulsions that supported the aesthetic aspirations of filmmakers and the economic constraints of the producers. Today, both production and preservation are oriented towards data-centric workflows that require the migration of the image between digital and photochemical media. In the digital intermediate production process, data is recorded to negative for printing in theatrical distribution. This data is also recorded to color separations for long-term asset protection. Increasingly, legacy film elements are being scanned and processed digitally, and then recorded back to film elements for the archive. Eastman Kodak has developed a family of emulsions designed for optimal performance in a hybrid media environment. This presentation will detail current research and development of archivally-stable black-and-white separation, color internegative and interpositive films specifically designed to be used with film recorders.

☯

Dye Tinting in Film Restoration: *Das Rätsel von Bangalore* (1918)

Ulrich Ruedel, Haghefilm

In 2009, a very brief (12.4 meter), orange tinted fragment from the collections of the Deutsche Kinemathek (SdK) Berlin was identified via the website of the Lost Films initiative. Originating from *Das Rätsel von Bangalor* (co-directed by Paul Leni in 1918), it represents the only knows surviving moving images of 'the muse of Dr. Caligari,' charismatic actress Gilda Langer.

In 2010/2011, the fragment was restored through a donation by Haghefilm and the Haghefilm Foundation, in a project co-curated with SdK's Oliver Hanley and Haghefilm's Daniela Currò. The

fragment was submitted to several methods of restoration. In addition to elaborate hand-tinting using either historical tinting chemistry or modern food dye, the fragment was restored by a variety of analog methods as well as via digital intermediate for comparison. The resulting spectrum of results serves as a powerful reminder of the vastly different physico-chemical makeup of tinted black-and-white silver gelatin and chromogenic color emulsions, a difference typically neglected in an era preoccupied with the imminent change from analog to digital.

In this presentation, the ethical and practical implications of tinting in film restoration will be discussed. Photochemical and digital methods will be explained, and the visible and measurable differences between six restoration techniques will be demonstrated by screening 35mm prints.

☯

DreamWorks Studios Digital Archive Initiative

Andrew Jackson, Dreamworks, and Tyler Leshney and Stuart Baker, Deluxe

As the feature film industry makes its increasingly rapid march towards an "all digital capture" future, the ability to manage the myriad assets resulting from a production is becoming increasingly complex. Where once the finished feature and its constituent parts – trims and outs, music elements, script supervisor's notes, lined scripts, etc. – existed in film or physical form, today only files, proxies and scans exist in their place. The luxury provided by film's ability to store and forget no longer exists in a world of digital rot, short technology lifecycles and proprietary file formats. Paradoxically, in order to effectively archive digital content in this new environment, a heightened level of "safe access" must be created so that such material never moves out of sight and out of mind.

Archivists and studio library managers, especially those from smaller, "mid-major studios" have been seeking new tools that are both technologically robust and financially viable. Whether a summer blockbuster or an indie production, the challenge for these individuals remains the same: ensure that digital productions stand the test of time. In that light, executives from DreamWorks Studios have been working with Deluxe to implement a platform that stores master quality, digitally-born content on spinning disk while creating timecode-based associations that relate assets to one another at the proxy level. The result is an interactive digital archive that not only safely stores file-based material, but also provides a much-needed roadmap to archived elements – their provenance, how they were created, and where they fit in the context of the production timeline. The platform deploys a hybrid solution combining offline LTO's with online spinning disc to achieve the desired archival goals.

We will discuss an approach featuring a MAID-based spinning disk environment coupled with LTO disaster backups, a web-based interface to review proxies, harvest stock footage and cull data, and the implementation of a "virtual film inspector" that executes an on-going program of habitual data checking, grooming and maintenance. A demonstration of the platform featuring assets from a recent release from DreamWorks Studios will be presented and platform functionality and future development initiatives will be discussed.

☯

The Reel Thing Technical Symposium is organized and coordinated by Grover Crisp and Michael Friend

The Reel Thing regularly video-records these proceedings. These recordings are the official record of the event and are the sole property of The Reel Thing. The intended use of these recordings is to produce publicly available programs which may appear on AMIA or other websites, and which may also be made available in other commercial and non-commercial contexts at the discretion of The Reel Thing. Attendance at this event constitutes your consent to appear without compensation in these recordings and in any versions of this event produced or authorized by The Reel Thing. The organizers of The Reel Thing are always interested in new and important developments in conservation, preservation, restoration and digital asset management. If you have a project or a technology that you would like to share with the community, please contact us at any time during the year. We are also interested in feedback, criticism, and suggestions for future presentations. Let us know how we can make The Reel Thing better and more useful for you.

Grover Crisp
grover_crisp@spe.sony.com
(310) 244- 7416

Michael Friend
michael_friend@spe.sony.com
(310) 244 -7426