SECTION MEETINGS

Atlanta August 2008

Nearly 70 professionals in film and television gathered on August 11 at the Regal Cinemas Hollywood Cinema 24 @ I-85 for a presentation, "Digital Cinema and SMPTE," by Matt Basford of Regal Entertainment Group, a SMPTE member, and 2007 recipient of the Louis F. Wolf Jr. Memorial Scholarship Award.

Basford provided a brief history behind D-Cinema technology, current implementation, and SMPTE involvement throughout the process. The Hollywood Cinema 24 @ I-85 uses a NEC NC2500S 2K DLP D-Cinema projector coupled with a Doremi DCP-2000 cinema playback server. Movies arrive on portable hard drives by standard courier. The encrypted content (i.e., the movie) is then transferred from the portable hard drive to the cinema playback server and stored on the internal RAID. During playback, the content is decrypted and uncompressed, re-encrypted, and sent to the projector via SMPTE 372M (i.e., dual SMPTE 292M). This re-encrypted link between the playback server and projector is known as "Link Encryption." The projector decrypts the link encrypted content and presents the 24 frame/sec video essence to the screen.

A brief overview of Sony 4K SXRD technology was presented, in contrast to Texas Instruments 2K DLP. Based on LCoS technology, the issue of heat dissipation and color uniformity remain a concern.

Basford gave a brief tutorial on 3-D digital cinema technology. The Hollywood Cinema 24 @ I-85 is equipped with Real-D 3-D equipment. 3-D presentation involves playback of two discrete 24 frame/sec tracks—left-eye/right-eye. The projector, through means of frame-rate-multiplication, presents each 24 frame/sec track at 96 frames/sec, otherwise known as "triple flash." The combined frame rate from the projector is 144 frames/sec. The Real-D equipment places a liquid crystal polarizing filter just beyond the projection lens. Combined with matching 3-D glasses, the Real-D device ensures that the left eye receives only left-eye images and your right eye receives only right-eye images. Attendees also viewed excerpts from *Journey to the Center of the Earth 3-D*, to demonstrate 3-D presentation.

Basford also highlighted the continued work in SMPTE to standardize D-Cinema as the motion picture industry transitions. SMPTE DC28, recently renamed 21DC, has published nearly 28 documents with more than 11 currently in progress. The meeting concluded with a Q & A session and a tour of the projection booth.

Report written by Carl Marxer, adjunct Professor of Broadcast Design and Motion Graphics at the Savannah College of Art and Design and owner of Video Production Services in Atlanta.—T.J. Scott, Section Chair

Hollywood September 2008

In September 2007, Hollywood Section meeting attendees received a presentation on David Fincher's *The Curious Case of Benjamin Button*, in which acquisition workflow and some of the differences learned from *Zodiac* were discussed and updates were given on *Benjamin Button*. For the meeting on September 25, program organizers again brought together a group of the *Buttons* workflow team to discuss Part 2 of the project. The movie is due for release on December 25.

Moderators for the event included Section Manager Mark Chiolis, post-production supervisor Peter Mavromates, and co-ordinator of digital photography workflow Steve Roach. The panel included cinematographer Claudio Miranda, VFX specialist Craig Barron, imaging specialist Patrick Cooper, and colorist Jan Yarborough.

The presentation began with a clip from the 1938 Technicolor feature *The Goldwyn Follies*, using a new print made from the 70-year-old three-strip camera negatives. This gave a graphic demonstration of the best in motion picture imaging at that time, compared with today's technology.

The panel discussed their relationship with the working methods of director David Fincher, and his affinity for using digital capture for his recent features. Each panelist reviewed his individual contribution to the project. A digital projection of the teaser trailer was also presented, as well as several examples of work in progress.

The meeting concluded with a Q & A session.—Richard P. May, Past Chair

Hong Kong September 2008

SMPTE Asia/Australia Region Governor John Maizels, accompanied Hong Kong

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John Maizels and Tony Ngai met the Student Chapter Chairs and the Faculty Advisor inside the Dolby Screening room.

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John Maizels visits the projection room equipped with a traditional film projector and a 2K digital projector.

Section Chair Tony Ngai on a visit to the Student Chapter at the Kwun Tong campus of the Hong Kong Institute of Vocational Education on September 8.

Student Chapter Chair K. M. Cheng, Past Chair Joyce Lam, and Faculty Advisor Y. K. Poon, welcomed the visitors. Maizels was presented with the details of the establishment, activities, and the development of the Chapter. Terence Yung, the Apply Learning (ApL) program coordinator, conducted a brief presentation on the recent growth and development regarding the Hong Kong Government-conducted ApL program, which provides a potential source of approximately 300 student memberships yearly.

Maizels and Ngai were also given a guided tour of the campus. Maizels was impressed with the technical facilities of the Institute, as well as the effort of the Hong Kong Section and Student Chapter in promoting SMPTE among students. He also expressed his concurrence regarding the direction of media-related technical education with that of the Institute and shared his view and experiences.—Tony Ngai, Section Chair

San Francisco July 2008

With the intriguing program, "Ever Gotten a Red Light Ticket? Video Imaging in Automated Law Enforcement," video engineer and former San Francisco Section Officer Charles Hintz presented some technical aspects of video surveillance in general and red-light cameras in particular. Hintz has testified as an expert witness on video compression and transmission for the defense in court cases. He stated, "There are two kinds of automated video-enforcement systems: those that have lost class-action lawsuits and those that, in time, will lose class action lawsuits." The reason being that much video enforcement in America uses entertainment technology, literally spoiling the evidence (spoliation) and invalidating convictions, leaving those falsely accused with ample reason to sue governments for false arrest (www.californiadiscovery.findlaw.com/spoliation.pdf).

Hintz described the uses of MPEG-1 for motion images and JPEG for still images of alleged violators. Red-light systems use lossy MPEG-1 compression because the transmission pipeline back to headquarters has such limited data capacity. The video evidence is damaged by the extreme compression of data, the key to understanding the controversy surrounding this use of video technology in law enforcement (www.videohelp.com/vcd).

Although the CCD camera at a street intersection may shoot at a standard resolution of 768 x 480 pixels, only 352 x 240 (Common Interface Format (CIF)) or one-fourth of full resolution (ITU-B 601), or 25 Mbits/sec are processed. A T-1 line carries only 1.5366 Mbits/sec from the intersection back to the red-light-camera company for further processing—technical and administrative—before submission of the evidence to local authorities for prosecution.

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The compression and transmission process of the original footage reduces the motion image data rate to less than 1 Mbit/sec. The system uses the remaining approximately 400 Kbits/sec of T-1 capacity to carry high-resolution still images that purport to clearly show a car's license plate and the face of its driver. The motion video, with a total running time of usually 12 to 20 sec, purports to depict faithfully and accurately the traffic incident (www.crimevision.net/Manuals/LEVA_BestPractices.pdf).

Hintz pointed out that "Stream-based codecs are sometimes considered inappropriate for forensic purposes because they have the characteristic of combining information from different frames and different points in time to build an interim frame that represents only what should be happening at that point, not what's necessarily happening." (www.broadware.com/files/ACodecMoment.pdf)

Other weak points limit automated video law enforcement. SMPTE Time Code (the source time code) and the time/day stamp on the video are sometimes not maintained correctly (chain-of-custody). Use of SMPTE Absolute Time Code (ATC) or the SMPTE Epoch (time zero) based on the time (00:00 on January 1, 1958, in New York) when the code was officially standardized, would resolve this issue (www.smpte.org/standards/tf_home/S404M_DRAFT.pdf).

Hintz explained the weakness of using entertainment technology for law enforcement: "MPEG compression is just another layer of deception, created and refined to bring a theater-like experience onto the home screen. Although viewers have the impression they are viewing the high-resolution film, 97.5% of the original camera information has been discarded during compression. The injury to the quality of the film resolution is masked by an intentional layer of perceptual deception."

Despite its current technical limitations, video surveillance in the U.S. by the police and other government authorities is becoming commonplace. Chicago has 2,250 cameras in its "Homeland Security Grid." In New Orleans, 1,000 digital-camera streams are sent to a main server archive for monitoring, creating an internet-based video archive that can be accessed from any location, including police cars. Although cities such as Detroit, Miami, and Oakland have largely abandoned the use of public video surveillance systems because they had little effect on crime prevention, other American cities are gearing up, some looking to Great Britain's surveillance system as a model. London alone has 200,000 cameras and more than 4 million cameras have been deployed throughout the U.K., one for every 14 people. The average Briton is watched by 300 cameras per day, according to some estimates.

The San Francisco Section plans to revisit periodically, the issue of video in surveillance. "Advanced imaging"—or sometimes, not so advanced—no longer remains the exclusive province of broadcasters, program distributors, and videographers!—Peter Hammar, Section Chair

San Francisco August 2008

The Section meeting on August 21, hosted by Wohler Technologies, presented the requirements of audio monitoring in the age of DTV. Speakers Jim Hilson, Dolby Laboratory's application engineer for live sound and broadcast, and John Hartwell, Wohler's chief technology officer, addressed the subject from both the theoretical and best-practice points of view.

Hilson discussed in-depth dialog normalization (dialnorm) and his recent assignment of monitoring NBC's audio coverage of the 2008 Olympics. He noted that Dolby Digital audio is not simply passed through distribution networks as is the traditional practice of analog audio. Some of the practices at these nodes can have an impact on the viewers' aural experience.

John Hartwell discussed the ITU B.S. 1770 and 1771 loudness algorithms and their relation to dialnorm, the importance of monitoring the audio's metadata, and the audio presence of the different speaker layouts that viewers may use.

For most of U.S. television history, audio has played second fiddle to video, the sound an afterthought to the picture. Twenty-five years ago, two-channel stereo was introduced, the first real audio advance since TV's commercial inception here in 1946. Screens have slowly gotten bigger, although just three years ago, the average diagonal picture size in America was still 27 in. Lately, picture size has been increasing, due to aggressive marketing of 16:9 sets in "big box" stores; but the norm for broadcast television remains: "big picture, little speaker." In some cases, "little" does not mean "little sound-pressure level" but rather "cheap and noisy."

Now, with the looming deadline, next February, of the end of NTSC analog TV transmission, along with its limited two-channel audio, we are quickly moving to the universal transmission of 5.1 multichannel sound, for the first time putting audio at center stage of the viewing experience.

With digital audio's greater dynamic range, broadcasters and cablecasters do not need the extreme compression and expansion (companion) that analog forced them to use. NTSC audio's lack of dynamic range, combined with companion, caused some audio tracks (e.g., commercials) to sound louder than the rest of the programming. Ad agencies certainly have always loved this, but viewers have been irritated by this for 60 years. Public outcry has now become organized, with the U.S. Congress wading into the middle of the fray.

ATSC digital means huge dynamic range, about which people may complain more—or less!—depending on what the producer and the caster do in their audio chains.

Many past analog practices will haunt us as we move forward into digital:

Locally produced audio, mostly two-channel, needs to match the network audio that has become mostly 5.1, AKA the "Keep the 5.1 red light lit" syndrome.

Producers and advertisers—programming and spots—still think they have to compete for viewers' eyes and ears with "We need to be louder than the competition."

The current loudness of commercial spots compared to the programs has prompted the U.S. Congress to consider the "Commercial Advertisement Loudness Mitigation Act" (CALM Act, HR 6209) that would require the FCC to enforce commercial loudness limits. But what are those limits in digital, if any? —Peter Hammar, Section Chair

Wendy Aylsworth to Deliver Keynote at Storage Visions 2009

SMPTE Engineering Vice President Wendy Aylsworth will deliver a keynote address at the pre-Consumer Electronics Show (CES) Storage Visions 2009, being held in Las Vegas, NV, January 6 & 7, 2009. The speech, titled "2X Storage + 2X Bandwidth = 3-D Production," will discuss requirements and technologies for 3-D production and their impact on digital storage.

To Submit a Section Meeting Report

If you would like to submit a Section meeting report, please e-mail to Dianne Purrier, Managing Editor (dpurrier@smpte.org), and copy to Sally-Ann D'Amato, SMPTE Director of Operations (sdamato@smpte.org). Section Meeting report forms are available online at www.smpte.org under Section/Resources/.

Please provide a complete, yet informal description and pertinent details of the Section meeting or event, elaborating on topics, audience reaction, discussion period, etc. Limit your report to less than 500 words, if possible. Photos are welcomed (jpeg files at 300 dpi resolution at least 6 inches wide). Section reports have to be received at headquarters at least one month prior to publication, so please try to send your reports within five days after the meeting.