

film, will expand its scope to include audio aspects of television. Ron Uhlig, Eastman Kodak Co., will continue to chair this committee.

Cooperative efforts with other standards organizations such as ANSI, ATSC, EBU, and the ITU continue to be critical to the success of SMPTE engineering efforts.

As I start my term as Engineering

Vice-President, I am extremely optimistic about the future engineering efforts of the Society. I am always impressed by the energy, talent, and commitment of those individuals who support the engineering efforts of SMPTE. With the leadership of Ioan Allen as Engineering Director-Motion Pictures and S. Merrill Weiss as Engineering Director-Television, as

well as the continuing support of SMPTE Director of Engineering Carl Girod and SMPTE Staff Engineer Mark Hyman, I am confident that the 80th anniversary year of SMPTE will be one of great success.

Mark S. Richer
SMPTE Engineering
Vice-President

Motion Pictures

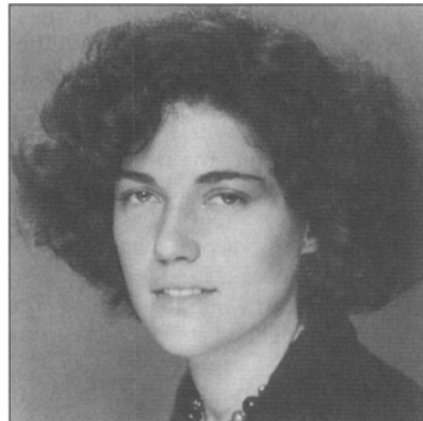
There was a wide range of advancements in film-related technologies in 1995, some reflecting the impact of computers directly, such as visual effects, remote camera control, non-linear editing and others indirectly, such as computer-aided lens design.

1995 saw the release of *Wings of Courage*, directed by Academy Award-winner Jean-Jacques Annaud, the first dramatic film shot in Imax 3D and featuring Imax's new "3-D sound" system, the Personal Sound Environment (PSE).

To create 3-D, paired Imax 3D cameras were synchronized to expose dual horizontal frames of 15-perf 65mm negative at 24 frames/sec, with lenses spaced apart to simulate in 3-D what the viewer's eyes would see from the same vantage point. Some scenes in *Wings of Courage* were filmed with a newly developed Imax 3D camera containing two camera movements in a single housing.

Wings of Courage premiered in April at the Sony Imax Theater in New York, itself a groundbreaker when opened in November 1994. Its screen measures 80 feet high and 100 feet wide and is the world's largest showcase of Imax's dual-projector 3-D technology.

Wings of Courage is also the first in the world to feature Imax's PSE system, incorporated into Imax's lightweight, cordless 3-D headsets. The headsets — with left-eye and right-eye LCD lenses synchronized to projection by infrared signals to act as alternating shutters to enable the stereoscopic effect — also contain miniature personal speakers which move sound from front to side to



Linda Young

back. The 6-channel PSE soundtrack originates from a CD player slaved to projection.

Super 16, a popular format in Europe, has gained more currency in the U.S. with the prospect of widescreen TV. For the first time, prime lenses designed specifically for Super 16mm were introduced in 1995 by four different manufacturers. Optex introduced focal lengths of 4mm, 5.5mm and 8mm. Century Precision Optics debuted a 6mm T1.9; Kinoptik offered a new 9mm, T1.7. Optica of St. Petersburg, Russia, introduced the Optar Illumina Super 16mm Series: 8mm, 9.5mm, 12mm, 16mm, 25mm, and 50mm primes — all T1.3. Panavision modified two Canon zooms for Super 16mm.

Three companies — Century Precision Optics, Optex, and Innovision — introduced new periscopes for 35mm. Although this is not a new technology, it is notable that there is new demand by cinematographers to shoot small objects ultra-close for a

different perspective. Panavision introduced the periscope-like Panavision/Frazier Lens System, which stands out for having a depth of field from a magnification of 1:1 to infinity and a "swivel tip" to enable shooting from awkward angles. An internal element linked to an external gear knob permits rotation of the image around its optical axis a full 360° without rotating either camera or lens, enabling instant dynamic Dutch tilts. Special lenses required by the system include a range of seven interchangeable primes, from 12mm through 35mm, including two for perspective control/slant focus and a third for perspective control only.

A new negative film stock, Eastman EXR Primetime 640T teleproduction film, is the first designed specifically for film-to-tape transfer. Its lower contrast is optimized for the transfer characteristics of telecines. Its recommended E.I. of 640 can require less equipment for lighting or permit greater flexibility in available light situations.

Kodak also introduced a new sound recording film, 5378/7378, with a newly added green sensitivity to complement its blue sensitivity, making it faster and endowing it with more exposure latitude to better accommodate digital sound. Its D-min is less sensitive to process variations and its D-max has been raised for higher contrast. It also incorporates the lubricant and scratch resistant coating that Kodak introduced for black-and-white camera negative films in 1994, which is now incorporated into all black-and-white laboratory films.

Fuji added Color Intermediate Film

to the Super F-Series line of motion-picture films introduced last year. Fuji also introduced its resin-backed positive print stock, 8816, a polyester-release print film that incorporates an anti-halation layer between the base and emulsion layers, eliminating static electricity and halation. With no black carbon rem-jet backing to remove, laboratories will require less water and chemicals in processing.

Each year camera equipment and accessories grow more intelligent and lighter in weight. This is evidenced by the redevelopment of the Louma Crane, Louma II. The Louma II's arm is built of lighter carbon fiber and has a new microprocessor control, enabling the camera to track horizontally or vertically in a perfectly straight line for up to 40 feet.

Arri introduced its RCU-1 remote control unit for the new generation of Arriflex cameras, from the Arriflex 16SR-3 through the new 35mm Arri 435, 535, and 535-B. The RCU-1 adapts automatically to the range of functions of each camera type, but generally features variable crystal speed control in increments of 0.001 frames/sec, adjustable mirror shutter control to 0.1° accuracy, an automatic mode setting for easy synchronization of camera speed and mirror shutter angle, and an illuminated liquid crystal display for settings values, camera status, and warning indications.

To facilitate the use of field-gathered data during the post-production process, Aaton introduced ScriptLink. Using a laptop computer, notes and comments are entered into ScriptLink by the script supervisor. The entry of data is correlated by timecode to the "Time of Day" of film-timecode cameras and sound recorders running on the set. It can also be correlated with SMPTE timecode delivered by an audio playback deck in multicamera shoots. The floppy disk extracted from ScriptLink at the end of the day is later loaded into an Aaton Keylink (AatonCode and Keycode reader for telecines) which automatically burns into the Virtual Slate window on the first frame of each take the script supervisor's comments, plus title, scene and take numbers, and film and audio roll IDs.

Computer-based nonlinear editing

technology continues to improve and proliferate. For Windows NT, D-Vision Systems debuted FilmCut board and software featuring 24 frames/sec capture and 48 tracks of audio mixing. At the inexpensive end of its product line Avid introduced Film Cutter, another 24 frames/sec system.

Two companies, Avid and Discreet Logic, unveiled high-end, nonlinear, on-line edit systems for the Silicon Graphics Onyx platform. Discreet Logic's Fire and Avid's Media Spectrum boasted full, uncompressed CCIR 601 D-1 resolution and an open-systems approach for use of third-party programs to extend capabilities of sound mixing, layering and compositing, paint and special effects, and media management. Bundled with Media Spectrum, for instance, were Parallax's 2-D animation and compositing software and Elastic Reality's morphing and warping software. For full, uncompressed CCIR 601 D-1 resolution on the Macintosh platform, Avid also unveiled its on-line editing suite.

Digital film imaging continues to expand. Rank Cintel introduced its Klone, a 4K/2K, 14 bit/color, 35/16mm film scanner featuring a Bell & Howell clapper gate and Nikkor lens. Each frame is scanned in three passes through red, green, and blue narrow-band filters at about 10 sec/frame. ALT Systems introduced the Cine-IN, an ultra low cost 2K scanner with a tri-linear CCD image sensor for 12 or 8 bits/color. Imagica's new IDS 3000 Film Scanner is switch-selectable to 1K, 2K, 3K, and 4K resolution. Kodak released its lower-cost Cineon Genesis 35SE Digital Film Scanner, which supports 2K resolution and can be later upgraded to the full 4K resolution of the Cineon Genesis 35 Digital Film Scanner. Kodak also released significant hardware and software upgrades for the full-fledged Genesis 35.

In the area of CRT-based film recorders, Management Graphics introduced a Cine FLX camera module for the Solitaire Cine III Image Recorder which features an enhanced optical path for improvements in sharpness, clarity and contrast. Celco introduced a new film recorder model,

the Extreme fx MPX, which boasts improvements in resolution and imaging speed over their earlier Extreme fx MPR. ALT Systems introduced the Cine-OUT, a low-cost, entry-level film recorder.

Wide area networking (WAN) is also a growing part of the post-production process. With the proliferation of ISDN lines, transmission costs have been lowered sufficiently to make transmission of low-resolution video viable for some post-production applications. At NAB, the Sprint Drums network and Avid announced their intention to collaborate and integrate their technologies. Currently on an SGI platform, Sprint Drums plans to adapt their software to the Macintosh platform.

In the last few months, Ednet has introduced FFD (fast file delivery), a new hardware, software, and interconnect service that is more economical than their earlier "video fax" service. FFD runs on a Macintosh and is delivered with Adobe Premiere. The production of the TV series "American Gothic" has been using this service for the delivery and approval of special effects from North West Imaging in Vancouver, British Columbia, to the editorial staff in Burbank, California. A minute of JPEG-compressed video occupying 5 Mbytes can be transmitted in less than one hour.

In the last two years, there has been a remarkable resurgence in feature animation production by the studios. DreamWorks SKG, Warner Brothers Feature Animation, Fox Animation Studios, and Disney are all currently in different stages of production of animated features.

The first fully computer-animated feature film, *Toy Story*, was released by Disney in November to both critical and popular acclaim. *Toy Story's* 3-D imagery was staggeringly complex, generating 1,000 Gbytes of data, with an overall rendering time of 800,000 machine-hours. Pixar's creation of *Toy Story* was a monumental achievement both creatively and technically.

So ends my *toy story*.

Linda Young
1995 Editorial Director
Motion Pictures