



THE 142ND SMPTE TECHNICAL CONFERENCE AND EXHIBITION

October 18-21, 2000
Pasadena Center,
Pasadena, CA

Content Acquisition, Processing, and Distribution in the Digital Millennium

With just over a month to go, the program for the 142nd Technical Conference and Exhibition is close to complete. This pre-eminent event, which attracts motion imaging professionals from the U.S. and around the world, is scheduled to be held on October 18-21, 2000 in Pasadena, CA. The program includes an all-day seminar on Wednesday, October 18, followed by three days of paper sessions, which will be presented by some of the most proficient experts in the industry.

ALL-DAY SEMINAR

WEDNESDAY, OCTOBER 18

Digital Archive and Asset Management—Technology and Application

Co-Chair: *Suzanne Donino*, Turner Broadcasting

Co-Chair: *Bob Schwartz*, EMC Corp.

The all-day seminar will focus on all aspects of media and asset management. Issues and case studies will

be presented by industry experts who will discuss the various elements of a successful media asset management implementation, including developing business case studies of successful applications.

It is intended to give participants the opportunity to understand the perspectives of media asset management and application today, and provide a vision of what these systems will look like in the future.

The program has been designed in two parts. The morning session includes presentations by element experts on asset management applications and the afternoon session includes discussions of the criteria for adopting these applications; case studies for actual implementation; and perspectives on European activities and standards.

Seminar presentations include the following topics:

The Need for Digital Archive and Asset Management, *Gail Glesson*, Turner Entertainment Networks, Atlanta, GA; and *Wendy Aylsworth*, Warner Bros., Burbank, CA

Introductory Overview of Architectural Elements, *Duane Shugars*, DSMC, Inc., Beltsville, MD

Ingest, Data, and Metadata, *Brad Gilmer*, Atlanta, GA

Logging, Annotation, Virage, Inc., San Mateo, CA

Media Asset Management Database, *Jim Mains*, EMC Corp., Hopkinton, MA

Search and Browse Tools, *Avi Bender*, QB, Inc., McLean, VA

Media Inventory Management, *Anthony Dubois*, IMMAD, Markham, Ont., Canada

Criteria for Adopting a Media Asset Management System, *Janet Gardner*, eMotion Inc., Los Angeles, CA

The Smithsonian Without Walls Case Study, *Judith Gradwohl*, Smithsonian Institute, Washington, DC

Paramount's Entertainment Tonight Initiative Case Study

European Case Study SAT.1 and ProSieben, *Rainer Kellerhals*, Kaiserslautern, Germany

The Case for Efficient Data Management in Broadcast, *Carole B. Hogan*, Avalon Consulting Group, Denver, CO

System Security for Cable Operators Entering the Digital Domain, *Julius Adams*, Ifsec, New York, NY

Panel Discussion and Q & A Session with the day's presenters

TECHNICAL PROGRAM

(Sessions run concurrently)

OCTOBER 19

THURSDAY MORNING

Broadband Distribution for Broadcast and Cable

Co-Chair: *Peter Smith*, NBC
Co-Chair: *Craig Cuttner*, HBO

Advanced Television Broadcasting in a Digital Broadband Distribution Environment

Brian Holmes, The IBI Group, Toronto, Ont., Canada

This paper will discuss current state-of-the-art and future trends of various multichannel techniques, available or becoming available to broadcasters. Specific attention will

focus on the cable television distribution model because it presently represents the largest opportunity for broadcasters and the greatest number of challenges.

How ATM Networks Ensure a Transparent Transport of Realtime Professional Broadcast Services

J. Chatel, D. M. Makoua, B. Guilbaud, P. Gendron, and *L. Thebault*, Thomson Broadcast Systems, Rennes, France

Key elements of ATM technology will be addressed, with a focus on realtime performance aspects. An explanation of the commitment to meet a given level of performance will be provided. The mechanisms used by gateways to adapt the network performance to end-user performance requirements will be discussed.

"Cable-Compatible" Digital Television Receivers and "Receiver-Compatible" Digital Cable Television Systems

Bernard J. Lechner, Consultant, Princeton, NJ

Describes the technical details of the signal formats and interface specifications required to achieve interoperability between "receiver-compatible" digital cable television systems and "cable-compatible" digital television receivers that were presented to the FCC by CEA and NCTA. New work to define two-way capable "cable-compatible" digital consumer electronics products will be discussed.

Distribution of Video/Audio/Data via a Paradigm IP Network Using QoS, High Bandwidth Efficiency, and Low Latency

Carsten Baumann, Leitch, Burbank, CA; and *Yendo Hu*, Path 1 Network Technology, Inc., San Diego, CA

Multichannel Serial Digital Video Transmission, Distribution, and Reception

Raj Chandra, Honeywell Technology Center, Phoenix, AZ

Shares the author's hands-on experience, from concept through testing, on a hardware video transmission project, a subset of a much larger research and development project that creates a seamlessly tiled display system. Techniques used, standards embraced, challenges overcome, and lessons learned will be addressed.

Time Division Multiplexing, Multiple Video, and Data Streams into a 1.5 Gbit/sec Stream

Keping Chen and *Randy Conrod*, Leitch Technology, Inc., Toronto, Ont., Canada

A proposed SMPTE standard defines the TDM of various standard-definition digital video and generic 8-bit data signals over a high-definition serial digital interface. A comparison of SDTI and TDM is made, pointing out the advantages and disadvantages of each type and application are discussed.

Digital Cinema

Co-Chair: *Curt Behlmer*, Soundelux
Co-Chair: *Robert Rast*, Dolby Labs

The Future of the Moving Image

Gary Demos, DemoGraFX, Santa Monica, CA

Electronic cameras and projectors are improving at a rapid pace. Computational elements are increasing in power to the point where substantial processing can be applied to the image stream. Compression algorithms have improved to the point where very high quality can be maintained at high compression ratios. The combination of high resolution and high frame rate can bring unprecedented image clarity to an electronic imaging system. With high-quality compression as a central system element, the image capture and presentation systems can realize their full technology potential.

4:4:4 Compression of Moving Pictures for Digital Cinema Using the MPEG-2 Toolkit

Michael W. Bruns and James T. Whittlesey, Grass Valley Group, Beaverton, OR

The application of standards-based MPEG-2 provides several key success factors to digital cinema; mainly a beneficial price/performance ratio. It is part of an evolving family of standards with a path for future enhancement and backward compatibility for legacy works.

Balancing Technology in Digital Cinema Systems

Steve A. Morley, Qualcomm Inc., San Diego, CA

Addresses the proper combination of off-the-shelf high-volume equipment with technology specifically developed for a complete digital cinema system solution. Discusses the requirements of necessary custom functions, and why existing alternatives are not appropriate for digital cinema application.

Digital Cinema Study Group, DC 28 Report

Committee Chairs:

Curt Behlmer, Digital Cinema Steering Group/Systems Liaison, Soundelux Entertainment

Jerry Pierce, SG on Mastering, Universal Studios

Matthew Cowan, SG on Compression, Entertainment Technology

Walter F. Ordway, SG on Conditional

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PR = TV - 14 : V S L D
CC = not present
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Rick Whittemore, SG on Conditional Access/Encryption, Cinea, LLC

Scott Thomas, SG on Audio, Ednet, Inc.

John Wolski, SG on Theater Systems, Loews Cineplex

Al Barton, SG on Projection, Sony

Dave Lund, SG on Projection, Media Technology Source, Inc.

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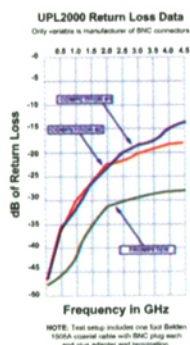
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Discusses methods of adapting successful compositional styles and data transmission standards for creation, transport, and delivery of digital television and interactive television.

An Open Architecture and Realization for the Integration of Broadcast Digital Video and Personalized Online Media

Norbert Gerfelder, Computer Graphics Center (ZGDV) Darmstadt, Germany

DVB offers the prospect of new viewer options for interactive services. New generation sets are now able to access the Internet and present www content, however, most new service concepts and realizations only adapt existing services from the analog broadcast and Internet domain for the presentation. A new architecture is offered that allows the combination of broadcast and Internet content, allowing the creation and use of hyperlink interactive video.

SMPTTE 334M Data—There is a Whole Industry Before Emission

J. F. Carruthers, Norpak Corp., Kanata, Ont., Canada

Covers the concepts of SMPTTE 334/292 data and examines implementation in encoders and storage devices, suggesting a further need for standardization of content formats. Several videotape and video server manufacturers will announce HD products capable of handling SMPTTE 334 data in the SMPTTE 292M signal; encoders will be in place in at least one network headend and at leading affiliates.

Data Broadcasting: The Devil is in the Details

John Abel and Charles Jablonski, Geocast, Menlo Park, CA

Much has been made about the necessities and requirements for a full end-to-end data broadcast system. This paper will describe such a system starting with content capture and collection, national distribution, local data broadcast centers, and end-user hardware and software.

Serving Up Data for Enhanced DTV Programs

Gomer Thomas, Triveni Digital, Princeton Junction, NJ

Analyzes issues that arise in inserting data into the digital broadcast stream to support enhanced DTV programming. The primary focus is on ATVEF (Advanced Television Enhancement Forum) applications, but most of the analysis applies equally well to other enhanced DTV programming technologies in which the data must be synchronized with the audio-video.

THURSDAY AFTERNOON

Webcasting and Enhanced TV—Data Broadcasting and All That's Interactive

In conjunction with ATVEF

Co-Chair: *Michael Dolan*, DirecTV
 Co-Chair: *Dan Zigmund*, Microsoft/WebTV

Digital Television: The Cusp of Convergence

Paul Mitchell, Interactive Television, Microsoft TV Platforms, Redmond, WA

Data Broadcasting Solutions for Broadcasters

Brett Jenkins, Thomcast Communications, Inc., Southwick, MA

With the advent of digital television in the U.S. and worldwide, broadcasters are searching for opportunities to enhance programming. Many in the industry believe that potential new sources of revenue can be enabled by providing consumers with rich digital content. The needs of the network facility and the local station are addressed, and solutions that have been implemented and tested in the field are presented.

A Standards-based Data Broadcasting Network

Pete Ludé, iBlast Networks, Inc., Beverly Hills, CA

Describes the architecture of the iBlast data broadcast network, detailing the design objectives of each of the network segments. Included will be discussion on scheduling, reliable file transfer, IP multicast, security, encryption, data injection, and client receiver requirements, presented in the context of available industry standards.

Content Storage and Management: Tape, Disk, Video, Film, and Virtual Environments

Co-Chair: *Andy Watson*, Network Appliance
Co-Chair: *Al Kovalick*, Pinnacle Systems

Storage Area Networks in Video and Broadcast Environments

Mitch Seigle, LSI Logic Storage Systems, Inc., Wichita, KS

In video and broadcast environments, storage area networks (SANs) provide scalable, high-bandwidth interconnects between storage devices and other equipment such as servers and workstations. This feature enables transmission of blocks of video data for editing and production, and compress streams of video data for video server and broadcast applications. Equipment and tools used to create video content and prepare it for delivery reduce the time to produce and prepare content is an important objective.

The Material Exchange File Format (MXF)

Jim Wilkinson, Sony BPE, Basingstoke, Hants, U.K.

Describes the progress of work by the Pro-MPEG forum and AAF Association, including its coordination with the EBU and standardization through SMPTE. Key aspects of MXF, including user requirements, technical attributes, and possible applications will be presented.

What is Archival?

Jim Wheeler, Tape Archival & Restoration Services, Oceano, CA

Explores the archival options available today and defines requirements for a truly archival format/medium.

Mastering and Archiving Uncompressed Digital Video Test Materials

Charles Fenimore, NIST, Gaithersburg, MD; and
Arthur Cosgrove, Eastman Kodak Co., Rochester, NY

The SMPTE Ad Hoc Group on Television Evaluation Materials has recently addressed issues related to mastering and disseminating digital video materials for use in assessing the performance of digital processing, principally for video compression. The success of this process for SD materials and the corresponding task for HD materials will require awareness of and adaptation to future recording technologies.

A Very High Bit Rate Image Data Recorder

David J. Bancroft, Philips Broadcast, Film Imaging, Reading, England, U.K.

Describes a new 128 Mbyte/sec image data recorder. Applications, such as mastering for digital cinema, will be used to illustrate interactions between it and its neighboring devices.

Digital Video Recorders: All-in-One Content Recording, Storage, Playback, and Management System

Bentley Nelson, Quantum Corp., Milpitas, CA

As a content recording, storage, playback, and management system, all in one, the DVR encompasses all the basic ingredients of a television broadcast facility in one simple box, which has applications at both the broadcast and reception site. The paper will discuss its history, development, and applications.



FRIDAY MORNING

The Digital Station—Content Acquisition and Broadcast

Co-Chair: *Ira Goldstone*, Tribune Broadcasting
Co-Chair: *Russ Myerson*, WB100+

Considerations for Moving to a Video Server-Based Facility

Roger Crooks, Grass Valley Group, Beaverton, OR

Choosing to move to a video server environment requires analysis of the total workflow of a facility. Without understanding the big picture, it's easy to make a costly decision. This paper will help highlight the right questions to ask and looks at the advantages and disadvantages of different approaches.

The Present and Future of Channel Branding

Richard Brice, Oxtel PLC, Morristown, NJ

Addresses the following: In a multichannel world how do you engineer a station to have a unique look? How do you engineer your master-control and automation to avoid a deathly robotic quality? How do you allow for covering developing news events? Most of all, how do you achieve this at a commercially acceptable price?

DTV in a Box

Jerry Berger and *Terry Smith*, AgileVision, Princeton, NJ

With video originating in either standard or high definition, a new product technology represents a complete rethinking of the DTV transmission chain and the associated equipment requirements.

Content Management and the Importance of Metadata in a Large Multimedia Company

Al Fong, Tribune Broadcasting, Los Angeles, CA

Studies the logistics of an overall content acquisition strategy over a wide area network for multimedia applications and analyzes the problems and solutions that may be encountered when transferring metadata and content information in the compressed digital domain. The study will include the impact of distributing content via satellite as well as over a wide area network.

A Model of ATSC Transmission of Synchronized Broadcast and Internet Content

Fred Kokaska, Logic Innovations, San Diego, CA; and *Rick Tingstrom*, Spyglass, Inc., Los Gatos, CA

The opportunity of utilizing available bandwidth in an ATSC transmission for the insertion of data for broadcasting has emerged. Many enriched services to consumers can now be provided such as financial and sports tickers, news, additional camera angles or even packaged delivery services such

as database/internet cache updates, distribution of software or other push applications.

Film Format and Acquisition Technologies—What's New and Improved?

Co-Chair: *Alan Masson*, Kodak
Co-Chair: *Nolan Murdock*, Panavision

A Multiformat HDTV Camera Head

Peter G. M., Philips, Digital Video Systems, Breda, The Netherlands

The Latest Emulsion Technology in New Super F Series Films

K. Makino, *R. Nishimura*, *Y. Mimaki*, *S. Yamaryo*, and *H. Murakami*, Fuji Photo Film Co., Ltd., Minami-Ashigara, Kanagawa, Japan

The introduction of the New Super F Series F-250 and F-250D Color Negative Films completes the upgrading process of the entire line of Super F Series film stocks and offers cinematographers world-class imaging quality and superior digital manipulation compatibility.

Kodak Ektachrome 100D Color Reversal Film

David Long, Eastman Kodak Co., Rochester, NY

Discusses Kodak's Ektachrome 100D Color Reversal Film: the result of a joint collaboration between the researchers of the company's professional business division and the scientists of its professional motion imaging division. Offering some of the most brilliant colors ever reproduced, the film gives directors of photography a new tool to complement their creative expression.

Images and Formats

David J. Bancroft, Philips Film Imaging, Reading, England, U.K.

It is sometimes said that the television industry has always been divided by formats—NTSC and PAL for example—while the motion picture film industry has been united by the 35mm format, playable anywhere in the world. The paper takes a fundamental approach: which image format and representation is appropriate to which application? What are the performance, logistical, and economic impacts of the decisions?

An Alternative to Chlorinated Solvents for Deep Film Cleaning in Telecine Suites, Archives, and Film Laboratories

Jonathan Banks, Lipsner Smith, Lincolnwood, IL

The post-production community welcomes the ability to move away from less desirable chemicals without sacrificing cleaning performance or safety. The paper will discuss the research projects conducted with 3M, Kodak, and CFL, some of which led to a new technology.

Squeezing Even Higher Quality from 35mm Prints

John P. Pytlak, Eastman Kodak Co., Rochester, NY

The trend to larger, wall-to-wall theater screens has made film's superior image quality all the more important. Movie

audiences expect bright, colorful, sharp, and steady images on these huge screens, but are sometimes disappointed. The recent proliferation of huge screens in "megaplex" theaters has created a renewed interest in an improved 35mm print format.

Assessing the Quality of Motion Picture Cinema Systems

Christopher L. DuMont, Roger A. Morton, and Kenneth J. Repich, Eastman Kodak Co., Rochester, NY

Numerous factors contribute to perceived on-screen image quality including dynamic range, flare, color gamut, sharpness, grain, and steadiness. New measurement techniques measure the system image quality as well as the contribution of each element in the system-to-image quality. This paper describes measurement, modeling, and analysis techniques, as well as examples from the application of the techniques to current systems and subsystems.

FRIDAY AFTERNOON

Format Transitions and Conversions: Techniques and Technologies

Co-Chair: *Alan Hart, Modern VideoFilm*
Co-Chair: *Tad Marburg, Warner Bros.*

Removal of Spatial and Temporal Alias Artifacts in Format Conversion and Display

William Glenn, Florida Atlantic University, Boca Raton, FL

Scan conversion from interlace to progressive usually brings with it the temporal alias that causes interline flicker. This paper will describe ways to prevent aliases from becoming visible without sacrificing resolution or motion rendition.

Format Conversion Design Challenges for Realtime Software Implementations

Rick Post and Michael Isnardi, AgileVision/Sarnoff Corp., Princeton, NJ

Examines design challenges to implement realtime video format conversion on an array of general-purpose processors. Software-based realtime platforms offer challenging constraints in terms of peak computational and bandwidth limits, but also offer the possibility of trading off quality and complexity and reconfiguring the placement of the video format converter within the system.

Trials and Tribulations of Universal Format Conversion

Jeff Harris, Panasonic AVC American Labs, Inc., Westampton, NJ

Discusses critical issues in the development of a universal format converter, going beyond the details of the fundamental image-scaling engine to the following key issues:

•Filtering • Timecode • I/O issues • Delay • Frame rate • Gen Lock • Audio • Color matrices •Software over hardware.

Film Sequence Detection and Removal in DTV Format and Standards Conversion

Scott Ackerman, TeraNex, Inc., Fair Lawn, NJ

One of the more challenging tasks in DTV format and standards conversion is the handling of material that was originated on 24-frame film and then converted to a 30-frame video format. This paper will discuss the challenges faced in dealing with this type of material and some of the methods used to detect and correct these problems.

Experiments in Multipipe HD—Beyond HDTV

M. Poinboeuf, T. S. Stock, and Eric Bloch, Silicon Graphics, SGI, Mountain View, CA

Resolutions beyond HDTV are investigated, with a focus on coordinated realtime processing or multipipe and multilink HD streams. Conclusions will focus on symmetric scalable solutions and recommendations for realizable formats.

Management of the Aspect Ratio Transition

Peter Symes, Grass Valley Group, Nevada City, CA

Television's standard aspect ratio of 4 x 3 (1.33:1) was chosen to match the then current standard for film. When HDTV was first developed, the movie industry had moved on to a standard aspect ratio of 1.85:1, and to CinemaScope and other formats commonly up to 2.4:1. Most television systems worldwide are moving to digital television standards. This paper examines the issues and some possible ways to approach the problems, and presents a framework within which broadcasters will be able to select strategies appropriate to a particular situation.

Visual Effects and Animation: New Tools and Techniques

In conjunction with the Visual Effects Society

Co-Chair: *Ray Feeney, RFX*
Co-Chair: *Jonathan Erland, Composite Components Co.*

Cine-Photogrammetry: An Overview of Tracking, Motion Capture, and Spatial Analysis from the Moving Image

Jonathan Erland, Composite Components Co., Los Angeles, CA

A Monocular Approach to Z Axis Data Acquisition,

Jonathan Erland, Composite Components Co., Los Angeles, CA

Z Axis Data Acquisition of the Planets

Eric Dejong, JPL/NASA

Achieving Reality Through Image-based Modeling, Rendering, and Lighting

Paul Debevec, USC, Berkeley, CA

3-D Tracking and Scene Reconstruction Problems and Potentials

Douglas Roble, Digital Domain, Venice, CA

This presentation includes a history of 3-D tracking and reconstruction software and examples of what is possible and what can go right and wrong! The information an artist can and cannot extract from a scene using photographs will be discussed, as well as possibilities for the future. Different techniques are being explored by researchers, which should make tracking and scene reconstruction more accurate and automated. The session will also explore the possibilities that will be open to filmmakers as these new abilities mature.

From Depth Map to Stereo

Phil Harmon, Dynamic Digital Depth Inc., Santa Monica, CA

Blue-Screen Matting Using Curved Separating Surfaces

Yashushi Mahima, Imagica Corp., Tokyo, Japan

OCTOBER 21

SATURDAY MORNING

Audio Production and Post-Production: The Multichannel Process and Its Challenges

Co-Chair: *Alan Falk*, Chace Productions
Co-Chair: *Chris Jenkins*, Todd AO

Diamond Audio—Explained

Neil Karsh, Leitch Inc., Holmdel, NJ

Concentrates on a new audio compression technology from Leitch Inc., based on the enhanced apt-xtm compression algorithm from APT Inc.

Seamless Audio Splicing for ISO/IEC 13818 Transport Streams

Seyfullah Halit Oguz and *Sorin Faibish*, EMC Corp., Hopkinton, MA

The work reported in this paper addresses the processing of the packetized audio elementary streams (ES) during the splicing of ISO/IEC 13818 (MPEG-2) transport streams (TS).

Is Your Plant Infrastructure up to Handling Multichannel Digital Audio?

David L. Bytheway, Philips Broadcast, Salt Lake City, UT

The emergence of digital broadcasting has presented some formidable challenges for the production and distribution of multichannel digital audio material. Making a plant infra-

structure that is capable of handling multiple channels of digital audio streams while maintaining audio phasing and signal integrity requires new techniques and equipment. These issues are discussed, and working solutions are presented.

Audio in Broadcast, Satellite, and Cable Television: Issues and Solutions for the Digital Transition via Audio Metadata

Tom du Breuil, Motorola; and *Jeffrey Riedmiller*, Dolby Labs, San Francisco, CA

Covers the audio content delivery processes currently used throughout the broadcast industry. Its specific focus is cable distribution, which now offers the capability of delivering high-quality digital audio services/programming to subscriber homes. Examples will be used to demonstrate the effects of both proper and improper digital audio carriage from the point of origin through the cable distribution infrastructure to the subscriber's home.

Dailies and Content Review Technologies

Co-Chair: *Chuck Garsha*, Paramount Pictures
Co-Chair: *Tom Scott*, EDNet

Large-screen Review and Preview Techniques

Steve Cohen, Sony Pictures, Culver City, CA

This presentation will detail the problems and solutions encountered in the utilization of digital playback and projection of both NTSC and HD materials for preview and review screenings for motion picture post production. Cohen has developed these techniques and has employed them on numerous productions for digital theatrical test screenings and previews.

Digital Dailies from Canada

Doug Mielke, International Image, Santa Monica, CA

This presentation will describe the technologies and methods employed by International Image (Santa Monica, CA) and their collaborating partners, Rainmaker (Vancouver, BC) to expedite delivery of digital dailies and other production materials between Canada and the U.S.

Review of Dailies: Streaming Video on the LAN

Charles Mitchell and *Norman Haddamen*, Three Point Digital

This presentation will discuss the local distribution (streaming) of review dailies using Vsoft products and discuss the interface with Telestream hardware, and using ftp to include both wide and local distribution of review dailies.

Electronic Review and Dailies, A Post House's View

Leon Silverman, Laser Pacific, Los Angeles, CA

This presentation will describe delivery and review technologies in use at Laser Pacific, for use with both television series and motion picture productions. Quicktime movies, MPEG-1 and 2, FTP store and forward, and Internet review are all techniques employed by this post-production service provider.

Dailies in Hours—Streaming the Intercontinental Creative Process

James Toten, Tribune Entertainment, Hollywood, CA

This presentation will detail the dailies delivery between three countries in support of television series production. "Beastmaster" (now shooting it's third season in Australia) and "Andromeda" (shooting in Vancouver, B.C.) have implemented the shipping of review dailies and cuts utilizing store-and-forward technologies via the Internet. Both shows are using various FTP products and technologies.

Panel Discussion covering the delivery of dailies, editorial review, preview screenings, and other tasks implemented over LAN, MAN, and WAN connections.

SATURDAY AFTERNOON

Metadata Applications and Options for Production and Transmission

Co-Chair: *Merrill Weiss*, Merrill Weiss Group
Co-Chair: *Oliver Morgan*, Avid Technology

Enhanced PSIP for Enhanced Electronic Program Guides

Gomer Thomas, Triveni Digital, Inc., Princeton Junction, NJ

Real-World Implementations and Benefits of the SMPTE KLV Metadata Protocol

Stephen W. Long and *Michael F. Vetter*, National Imagery and Mapping Agency, Reston, VA

Presents implementations of the metadata protocol standard and the Metadata Dictionary standard and recommended practice. The benefits of KLV metadata, including continuous knowledge of dynamic parameters, frame-specific snapshots of parameters for detailed spatial analysis, cataloging and indexing of parameters, transmission of small motion imagery clips are discussed with recommendations for improving future systems.

Intelligent Television Through the Use of Metadata

David Richardson, NDS, Jerusalem, Israel

An in-depth overview of how broadcasters benefit from using metadata in broadcasting production and transmission. Draws examples from how XTV uses metadata to offer broadcasters and viewers an enhanced broadcasting system and the benefits of using metadata-based broadcasting application.

Metadata and Tagging: Standards, Systems, and Solutions

Mark Grossman, Geocast, Menlo Park, CA

Examines the issues and requirements for a metadata tagging schema and system for content purposing in the broadband world. In addition to the metadata standards, a system

for purposing (grab bag and tagging) content for a personalized broadcast broadband service will be described.

A Common Language for Data Exchange in Media Asset Management Systems

Steven C. Bilow, Grass Valley Group, Beaverton, OR

Ready access to a wide variety of digital assets, and the ability to rapidly repurpose them, is vital to the television industry's ability to fully embrace digital technology and the associated new business models, such as the Internet and Interactive TV. Because assets exist and are described in myriad forms, the ability to manage various resolutions of video and other types of assets in a comprehensive facility-wide asset management system, is becoming a critical success factor.

24P Production and Post-Production

Co-Chair: *Leon Silverman*, Laser Pacific
Co-Chair: *Marker Karahadian*, Plus 8 Video

Tools for 1080p/24 Film-to-Tape Transfer

David Strachan, Evertz Microsystems Ltd., Burlington, Ont., Canada

As the transition to HDTV gathers momentum, the shortage of high-quality video source material, becomes increasingly apparent. Fortunately, the world has a huge stock of film material, which simply needs to be converted to video. But in which format? What is needed is a high-quality common image format (CIF) from which all other formats may be derived. 1080p/24 is this new format.

Working With 24P in a 60-Field Environment

Michael Phillips, Avid Technology, Tewksbury, MA

With HDTV and video formats that work in a 24P format, 24-frame post-production will increase and need to be dealt with deeper into the process. Distribution channels are increasing and viewers are watching programming on home television sets that are interlace as well as on computer monitors that are progressive. Examples of downstream processes are discussed that can take advantage of the increased metadata.

24-Frame and Multiple Frame Rate Post System and Equipment Design Considerations

David Wiswell, Panasonic Broadcast & Television Systems Co., Los Angeles, CA

Implementation of multiple image format and frame rate systems creates a new set of design problems for image and control systems used in a post-production environment. Among engineering considerations addressed will be the need for multiple time codes, internal and external image format conversion requirements, and remote control and system requirements.

High Performance Electro-optic Camera Prototype

S. A. Stough, Lockheed Martin; *V. Bahnemann*, Arriflex U.S.; *William Hill*, Lockheed Martin; and *S. Nicholson*, Stargate Films, Burbank, CA

A prototype camera was built to determine if the exposure range, exposure latitude, and alias-free resolution of an electronic capture system could exceed that of a film camera. A brief history of alternative technologies is given, and areas of future research are outlined.

Acquisition in Digital 24P and 35mm Film: A Technical Enquiry

Laurence J. Thorpe, Sony Electronics, San Jose, CA

High-definition digital acquisition recently made the leap to both 1080-line progressive scanning and a 24-frame capture rate. The combination has thrust digital imaging capabilities into the realm of high-end program origination—for both prime time television production and major moviemaking. This was a final step in the arduous digital pursuit of 35mm motion picture film. This paper will review what has been achieved to date in 24P acquisition with respect to each of the multiple dimensions of overall picture quality.

A New Platform for Co-operative Content Assembly

Bob Pank, Quantel, Newbury, Berkshire, U.K.

Rapid changes in television are affecting all levels of operation—not least editing and post production. This paper describes the architecture of a new platform designed to preserve the benefits of immediacy and flexibility traditionally associated with television operations, while fitting with the greatly expanded demands of editing and post production.

Social Events

The Conference includes a number of events where attendees can socialize and network with peers.

The *Fellows Luncheon*, scheduled for Thursday, October 19, honors those members distinguished as Fellows. (You must be a SMPTE Fellow to attend.) The *Welcome Reception*, also being held on Thursday, offers attendees the opportunity to socialize over cocktails and hors d'oeuvre.

The *Industry Luncheon*, which features guest speaker Jack Valenti, Chairman/CEO, Motion Picture Association of America, will be held on Friday, October 20. The *Honors and Awards Reception*, also slated for Friday, acknowledges individuals for their outstanding contributions to the industry.

This year's Conference also includes the *Partner's Program*, which provides a morning gathering place and continental breakfast for guests of conference attendees.

Registration Information

Attendees may preregister for the Conference by mail, fax, or online. To register by mail, please complete the registration form in the *Journal* and return it with your payment no later than October 4, to SMPTE at the address on the form. You can also register by faxing the form (with credit card information) to (914) 761-3115. If you wish to register online, please visit www.smpte.org.

You can register at the Conference, however, to avoid long lines, we encourage registration by mail, fax, or online prior to Oct. 4.

In order to take advantage of the Early Bird prices, all forms and payments must be received at SMPTE by September 15. No forms will be processed without payment.

After October 4, you must register on site at the Pasadena Center. Name badges will be available for pickup at the registration desk.

Press Registration

SMPTE invites accredited members of the Press to participate in the technical sessions and walk the trade show floor on a complimentary basis. If you attended the SMPTE conference last year, please submit a copy of last year's write-up with a press registration form. If this is your first SMPTE conference, you must submit a signed letter from your editor stating your intention to cover the 142nd SMPTE Technical Conference and Exhibition in an upcoming issue of your publication. If you are unable to obtain either a letter or past article you must register and pay the attendee price for the conference. For press registration forms or other inquiries, please call Linda Alexander, at (914) 761-1100 ext. 115 or register online at www.smpte.org.

Cancellations and Refunds

SMPTE's policy for Conference registration refunds prior to the Conference is as follows:

- All cancellations must be made in writing to SMPTE Headquarters.
- A \$50 administration fee will be incurred on all transactions.
- No refunds or cancellations will be accepted if post-marked after October 4, 2000.

Substitutions are allowed and encouraged.

Hotel Information

To make hotel reservations, please complete the hotel reservation form in the *Journal* and mail it to the Housing Bureau at the address on the form. You may also fax it to (626) 844-0790.

Demo Rooms

A limited number of demonstration rooms are available for companies wishing to offer a private showing of their products. Hold an invitation-only event in a demonstration room for all of your key customers.

6 at \$2,000 (\$3,000 nonmembers)
1 at \$4,000 (\$5,000 nonmembers)

Nonmember rates include a one-year Sustaining Membership in SMPTE for \$1,000.

Sponsorships

Sponsorships are a great way to promote your company's products and services while supporting SMPTE's educational activities. Eastman Kodak Co., Bexel Corp., and Plus 8 Video, are among the companies that will be participating. A number of options are still available.

Please contact Linda Alexander at (914) 761-1100 ext. 115 or lalexander@smpte.org for inquiries regarding demo rooms, sponsorships and the Exhibition.

Exhibition

The Exhibition is a main conference attraction. Very limited floor space is still available, so, if you're interested in participating, please contact Steven Antolick, Exhibits Coordinator at (202) 367-231; fax: (202) 429-511; e-mail: steven_antolick@dc.sba.com.

The exhibit hall will be open on Thursday and Friday, October 19 and 20, from 10 a.m. to 6 p.m. and Saturday, October 21, from 10 a.m. to 2 p.m.

As of August 16, the following companies will be participating:

ADC Telecommunications
AgileVision LLC
AJA Video Systems
Alcatel
Astro Systems, Inc.
Audio Accessories, Inc.
Avica Technology Corp.
Axon Digital Design B.V.
Barco Communication Systems
BBC Resources
Belden Electronics Division
Bittree
Broadcast Store, Inc.
Chyron Corp.
Columbine JDS
CommScope, Inc.
Creative Planet
Data Check
Digital Audio & Video
DNF Controls
Dolby Laboratories, Inc.
DVS Digital Video, Inc.
Evertz Microsystems Ltd.
Force, Inc.
Forefront Graphics Corp.
Gepco International, Inc.
Grass Valley Group
Hotronic Inc.

IFsec

Ikegami Electronics
Innovations TK Ltd.
JVC Professional Products Co.
K-5600, Inc.
Leader Instruments Corp.
Leitch, Inc.
Lipsner-Smith Co.
Logic Innovations
LSI Logic Storage Systems
Miranda Technologies, Inc.
Mohawk/CDT
MRC Broadcast
Newpoint Technologies, Inc.
Odetics
Omneon Video Networks
OmniBus Systems Inc
Oxtel, Inc.
Panasonic Broadcast
Pesa Switching Systems
Philips Broadcast
Quantel
Quartz Electronics Ltd.
RGB Spectrum
Rohde & Schwarz, Inc.
Ross Video Inc.
RTI-Lipsner Smith
SeaChange International
Snell & Wilcox
Sony Electronics Inc.
SyntheSys Research, Inc.
Tadiran Scopus, Inc.
Tandberg Television Inc.
Tektronix, Inc.
Telestream, Inc.
TeraNex
Thomson Broadcast, Inc.
Tiernan Communications Inc.
Trompeter Electronics
VDP, Inc.
Vidbid.net c/o Ace Video
Video Products Group, Inc.
Videotek, Inc.
Wavetek Wandel Goltermann
Wohler Technologies
WolfVision, Inc.
Zack Electronics

142ND SMPTE TECHNICAL CONFERENCE AND EXHIBITION

October 18-21, 2000
Pasadena Center • Pasadena, CA

"Content Acquisition, Processing, and Distribution in the Digital Millennium"

REGISTRATION SELECTION:

Please use one form per person.

Registration Credentials will be available for pickup on site.

(Please check appropriate box) Please mark the package and tickets desired.

	Early Bird:		
	On or before 9/15/00		After 9/15/00
Full Conference: Member	\$600 <input type="checkbox"/>		\$700 <input type="checkbox"/>
Full Conference: Nonmember	\$800 <input type="checkbox"/>		\$900 <input type="checkbox"/>
Life Member/Life Fellow	\$ 50 <input type="checkbox"/>		\$ 50 <input type="checkbox"/>
Sessions Only: Member	\$400 <input type="checkbox"/>		\$500 <input type="checkbox"/>
Sessions Only: Nonmember	\$600 <input type="checkbox"/>		\$700 <input type="checkbox"/>
Seminar Only: Member	\$300 <input type="checkbox"/>		\$400 <input type="checkbox"/>
Seminar Only: Nonmember	\$500 <input type="checkbox"/>		\$600 <input type="checkbox"/>
Student Member	\$ 50 <input type="checkbox"/>		\$ 50 <input type="checkbox"/>
Student Nonmember	\$ 75 <input type="checkbox"/>		\$ 75 <input type="checkbox"/>
Speaker	\$450 <input type="checkbox"/>		\$450 <input type="checkbox"/>
One Day (Please indicate day below.)	\$300 <input type="checkbox"/>		\$300 <input type="checkbox"/>
	<input type="checkbox"/> Thursday <input type="checkbox"/> Friday <input type="checkbox"/> Saturday		

Deadline for pre-registration is October 4, 2000

ADDITIONAL TICKETS: (only needed for additional people)

Welcome Reception	\$ 75 <input type="checkbox"/>
Industry Luncheon	\$ 50 <input type="checkbox"/>
Fellows Luncheon (Fellows/Life Fellows only)	\$ 50 <input type="checkbox"/>
Honors and Awards Reception	\$ 75 <input type="checkbox"/>
Exhibits Only	\$ 25 <input type="checkbox"/>

ATTENTION NON-MEMBERS!

Avoid paying \$200 more than members by joining SMPTE now at \$95 annually, and receive the SMPTE Journal, monthly. Check the "New Member" option below and add \$95 to the "Full Conference Member" rate.

Please check one. A membership application will be sent to you.

- New Membership \$95
 Renewal \$95
 New Student Membership \$25

Name of School: _____

Date of Graduation: _____

Faculty Advisor: _____

Total Amount Due (U.S. Dollars) \$

Special Needs: Please check here if you have a disability and may require special accommodation. We will contact you.

PAYMENT METHOD (U.S. DOLLARS)

Check (payable to SMPTE) MC Visa AmEx

Card # _____ Exp. Date: ____/____

Print name as it appears on Card: _____

Signature: _____

CONFERENCE REGISTRATION FORM

Name: _____
of attendee

Name: _____
as you want it to appear on badge

Name: _____
of person completing this form if not the attendee

Company: _____

Title: _____

Address: (company or home) _____

City: _____ State: _____

Zip/Postal Code: _____ Country: _____

Phone: _____ Fax: _____

E-mail: _____ Web site: _____

SMPTE Member? Yes No Membership Number: _____

REGISTRATION PACKAGES

• **Full Conference Registration:** Includes admission to the all-day seminar on Wednesday, October 18 (box lunch), all of the technical sessions, admission to the exhibit hall, the Welcome Reception, the Industry Luncheon, and the Honors and Awards Reception.

• **Sessions Only:** Includes admission to all of the technical sessions, the exhibit hall, the Welcome Reception, the Industry Luncheon, and the Honors and Awards Reception.

• **Seminar Only:** Includes admission to the all-day seminar on Wednesday, October 18, and a box lunch.

• **Life Members & Life Fellows:** Includes admission to the all-day seminar on Wednesday, October 18 (box lunch), all of the technical sessions, and the exhibit hall. Additional tickets are required for admission to the Welcome Reception, Industry Luncheon, and the Honors and Awards Reception.

• **Students:** Includes admission to the all-day seminar on Wednesday, October 18 (box lunch), all of the technical sessions, admission to the exhibit hall, the Welcome Reception, the Industry Luncheon, and the Honors and Awards Reception.

• **Speakers:** Includes admission to the all-day seminar on Wednesday, October 18 (box lunch), all of the technical sessions, admission to the exhibit hall, the Welcome Reception, the Industry Luncheon, and the Honors and Awards Reception.

CHANGES & CANCELLATIONS

- Cancellations must be requested in writing and sent to SMPTE via mail or fax.
- A \$50 administrative fee will be incurred on all cancellations.
- No REFUNDS or CANCELLATIONS will be accepted if postmarked after October 4, 2000.

RETURN COMPLETED FORM TO SMPTE:

Via fax: (914) 761-3115

or via mail to: 595 West Hartsdale Ave.
White Plains, NY 10607

For more information contact SMPTE at (914) 761-1100.

To register on the web and for the most updated conference information, visit our web site at www.smpete.org.

No Registrations will be accepted at Headquarters after Wednesday, October 4, 2000.
All registrations after that date must be purchased on site.

HOTEL RESERVATION FORM

142nd SMPTE Technical Conference and Exhibiton Pasadena, California • October 18 - 21, 2000

HOTEL REQUEST FORM MUST BE RECEIVED BY: September 20, 2000

(All reservations will be accepted on a first come, first served basis)

Read the information below before completing the form.

The Pasadena Convention and Visitors Bureau will make hotel assignments upon receipt of this official hotel reservation form. Reservations must be made through the Housing Bureau to receive the conference-discounted rates. Reservations will be assigned with consideration of date received and your expressed hotel preference. Please print or type all information and return promptly via fax (626) 844-0790 or mail to the Pasadena Convention & Visitors Bureau offices at the address below. Absolutely no telephone reservations. Thank you.

HOTEL	SINGLE	DOUBLE	DOUBLE/DOUBLE	TRIPLE	QUAD
Holiday Inn 303 E. Cordova [Parking for overnight guests is currently \$5.00 (self-park) per day.]	\$115.00	\$115.00	\$115.00	\$130.00	\$145.00
Hilton Pasadena 168 S. Los Robles Ave. [Parking for overnight guests is currently \$10.00 (self-park) and \$12 (Valet) per day.]	\$135.00	\$135.00	\$135.00	\$160.00	\$185.00
Doubletree 191 N. Los Robles Ave. [Parking for overnight guests is currently \$6.00 (self-park) and \$11 (Valet) per day.]	\$149.00	\$159.00	\$159.00	\$169.00	\$179.00

142ND SMPTE TECHNICAL CONFERENCE AND EXHIBITION OCTOBER 18-21, 2000

IMPORTANT: Fill in all information and fax or mail immediately.
Use only one form per room (Deadline: September 20, 2000).

Name _____
(first name) (last name)

Daytime Phone# (____) _____ Fax# (____) _____

Home Address: _____

City: _____ State: _____ Zip Code: _____

Arrival Date: _____ Departure Date: _____

Room Occupied by: _____

(California State Law requires all occupants to be registered)

Accommodations Desired:

Single (one person) Double (1bed/2 people) Triple (2 beds/3 people)
 Double/Double (2beds/2 people) Quad (2 beds/4 people) Other (specify) _____

Hotel Preference: 1st _____ 2nd _____ 3rd _____

Special Request(s) (Based on availability): _____

A deposit for the first night's lodging must accompany this request. The deposit will be credited to your account and will assure reservations being held. Cancellation or alteration of this reservation must be made 3 days prior to arrival; or deposit could be forfeited. Room rate does not include Bed Tax of 12.11%.

Visa Mastercard American Express

Card No: _____ Exxp. Date: _____/_____/_____

Signature (required): _____

Print Cardholders Name: _____

Credit Card Billing Address Zip Code: _____

IMPORTANT HOUSING NOTES

- Reservations cannot be accepted by phone.
- Maximum of three (3) reservations per person. Occupants' names must be received by deadline, no exceptions.
- Housing request must be received by September 20, 2000 in order to obtain the discounted rate.
- Please submit one form per room. Forms may be duplicated if necessary.
- If two or more individuals occupy the same room, submit one form listing all additional names.
- No reservations can be accepted without a check or credit card guarantee.
- Credit cards are preferred, but checks are also acceptable. Please make checks payable to THE HOUSING BUREAU.
- Alteration or cancellation of this registration after September 20, 2000 must be made directly through the hotel 3 days prior to arrival or deposit will be forfeited.
- Please contact the Housing Bureau at (626) 795-9311 if you have not received an acknowledgment within 30 days of submitting your application.
- Once acknowledgment letters have been received please call the hotel directly for a confirmation number.
- Room rates are subject to room tax of 12.11%.
- Hotel check-in is 3:00 p.m. Hotel check-out is noon. A credit card may be required.
- If a rooming list is being used, all information must be accurate and received by the deadline. A credit card guarantee must be used when submitting a room list.
- The Housing Bureau cannot be responsible for requests received after the cut-off date (September 20, 2000) or for room reservations made directly with hotels.

Fax or Mail your housing request with your deposit guarantee no later than **September 20, 2000** to:

PASADENA CONVENTION AND VISITORS BUREAU, Housing Department 171 S. Los Robles, Pasadena, CA 91101.
(626) 795-9311 FAX: (626) 844-0790

Please make your check payable to THE HOUSING BUREAU. The Pasadena Convention & Visitors Bureau will send out an acknowledgement once reservations are received.