

# VIDEOGRAPHY'S OPEN STUDIO ROUNDTABLE: METADATA IS THE REVOLUTION

BY CHRIS ALLAIN

It was Tuesday night during NAB '97. Approximately 200 of the digital media industry's best and brightest had just finished a buffet dinner and began filing in to the Rotunda Room of the Las Vegas Country Club to take their seats. The crowd packed in, settled down, and another VIDEOGRAPHY Open Studio Roundtable was underway.

The Roundtable and the industry it serves have come a long way in the past several years, although the issues discussed in these periodic gatherings continue to be both daunting and energizing. The video production industry's increasing integration of computer-based digital media tools has brought with it a corresponding need for solutions to myriad technical challenges. And the greater the progress of computers in digital media production, the greater these challenges have become. No one expected a personal computer to provide sophisticated media-asset management when such assets were neither produced nor stored there; nevertheless, this is one of the many solutions the Roundtable addressed that night. Ideally, the Roundtable will awaken all digital media developers to the magnitude and gravity of the tasks at hand. If the Open Studio effort's history is any indication, it also will light the path to some revolutionary new solutions.

After the Open Studio Roundtable at SIGGRAPH '96, in New Orleans, two things became clear. First, the Roundtable should never become a soapbox for vendors. Instead, it should continue as an open forum with a high level of interaction among participants. Second, New



**Chris Allain, VIDEOGRAPHY Contributing Editor and Roundtable co-organizer**

Orleans knows how to throw a party.

Once again VIDEOGRAPHY thanks the co-sponsors who support the latest Open Studio Roundtable. For NAB '97 they include: Adobe Systems, Apple Computer, Cinebase, Informix Software, MacroMedia, Matrox, MicroSoft, Panasonic, Pathlight Technology, Scitex Digital Video, Silicon Graphics, and Truevision.

Participants heard from VIDEOGRAPHY Contributing Editor Craig Birkmaier—my partner in organizing the Open Studio events—about the successes of the recent Open Studio Developers' Conference, in Monterey CA this past December and late February. Several alliances were announced at NAB '97 and elsewhere were a direct result of relationships built through Open Studio Developers' Conferences and Roundtables. But this is just the beginning.

To facilitate the discussion we asked to hear from four professionals

selected to represent different segments of the video media-authoring industry. Consultant S. Meryl Weiss co-chairs the EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Television Material as Bit Streams. He also serves as engineering director, television, for SMPTE. Much of the focus of this task force dovetails with the work of the Open Studio participants.

Chuck Garsha directs multimedia engineering at Paramount Pictures. As a large content producer now expanding from linear film and video, his company is looking to capitalize on new opportunities in media. Garsha presented

some of the most urgent requirements of the large media producer.

Clyde Smith works in Advanced Network Operations at Turner Entertainment Networks, in Atlanta. Smith deals with many complex problems facing Turner's numerous cable networks, and he works on related SMPTE issues. He described the problems and the requirements of a large content distributor.

Chris Meyer of CyberMotion in Los Angeles, provided the perspective of the small professional video project studio. The problems and requirements Meyers described were typical of a hands-on producer who uses digital-media video authoring tools. The issues he discussed were also typical of those discussed in earlier VIDEOGRAPHY Roundtables.

## The SMPTE/EBU Report

After introductory remarks by Birkmaier and VIDEOGRAPHY Editor Brian McKernan, Weiss kicked off





**The Open Studio Roundtable at the Las Vegas Country Club brought together representatives from the many different segments of the video media-authoring industry.**

to be new things coming along and that's what enables innovation. And what we need ... [are] systems that expect that kind of chaos and can work with it in a meaningful way."

Agile decoders, software- or firmware-based decoders that translate between compression "formats," were displayed in several places on the NAB exhibit floor. But Weiss believes that it is important "to provide the ability for those decoders to recognize what it is they're receiving so they can automatically decode the material appropriately. And in order to do that, you need to carry along appropriate identification information."

The second part of the EBU/SMPTE report deals with metadata, or information about media that extends its usefulness. As a project moves through the production process, valuable information accumulates about the media used in that project. This identifying and descriptive information becomes especially useful when you need to repurpose content.

Franklin Davis, Avid's primary point man for Open Media Framework (OMF) initiative, described metadata issues they've considered in the OMF context:

"What's really valuable in the

computer is that once you have logged something, once you have identified sync relationships, built up an edit of something, started attaching comments, attaching references to scripts, references to other production information, file format information, all of the metadata...you need to maintain it with the [media] as you move it around. So containers that hold all that are critical to the process."

Davis further points out that the ability to strip things out when you move from a media-rich environment to an efficiency-oriented environment is also important. In postproduction you require more information than you do when streaming a program out for broadcast, where you want a lean, simple, efficient format.

Birkmaier describes a scenario where a system might use metadata stored with media on a file server. "It has metadata associated with it that says what compression was used, whether the original was 4:2:2 or 4:2:0, how the color coding's done, what's the bit rate, what's the raster format like for the uncompressed material," Birkmaier explained. "You send all of that metadata to an agile software-based decoder along with the material. That decoder decodes

it back to that original raster."

For these reasons, the report has a substantial section on metadata wrappers. The third part of the task force report deals with file formats and physical links. The task force document can be found on SMPTE's website at [http://www.smppte.org/engr/tfhs\\_out.pdf](http://www.smppte.org/engr/tfhs_out.pdf).

In the next phase, according to Weiss, the task force will look at what's necessary to implement standards on an industry-wide basis. He cautions that a very lengthy standards-development process will follow as we continue to learn about new standards that we need. "We've been doing NTSC television for 50 years, and even now we're still writing new standards for it," he observed. "Things come up."

### Standards for Filmmakers

Paramount's Garsha stressed the need for standards in the production of entertainment. He held up a piece of 35mm film to illustrate that the industry has independent, interoperable format for roughly a century. This format plays everywhere in the world with limited problems. The sooner we have standards-based interchange of files and formats, the sooner everyone will benefit, he opined.



Film editor Rob Kobrin disagreed, pointing out that we don't have a single film format, that the standard was decided by Kodak when they became a de facto monopoly. He ticked off a list of over a dozen incompatible film formats and variations on formats. Incompatibility is not a new issue, he insisted. An evolving industry long ago created SMPTE to deal with just such problems.

Both Garsha and Kobrin actually



**S. Merrill Weiss, co-chair of the EBU/SMPTE Task Force for Harmonized Standards for the Exchange of Television Material as Bit Streams**

have valid points. Of course, there is no one film format, and compatibility problems aren't new, but there's enough standardization to allow predictability. Also, the point Garsha stressed was that he can't reliably or economically move media between nonlinear workstations, either physically or via a network. Even if you manage to move the huge data files successfully, you still may not be able to use them if the workstations use different compression. Even if translation is possible, it may not be practical from a time-on-project stand point. All of these issues tie in brilliantly with the work of the SMPTE task force.

Garsha implements network solutions, at Paramount, from ATM to Internet, to tie together all the studio's various production facilities and edit stations. But the network, he says, is the easy part. Everything falls apart when they try to interchange files. "And because of this, I've been unable to justify the millions of dollars to buy the infrastructure to hook up the computers and the systems because I cannot demonstrate that it will work when I plug it all together," Garsha explained. Because of holes in the technology, Paramount won't move forward with the purchase of network gear, switches, and more edit platforms.

Kobrin, meanwhile, says the

revolution is in the metadata. He wants to see a standard for the exchange—as well as media—among platforms. Representing the same content in different forms is revolutionary. "I carry, on data base, five or six, or seven forms of media representing the same content simultaneously," Garsha said. "And it's all tracked automatically in my system." Bar-code readers help to track negative, positive, video, digitized video, audio, and scans. All of this is handled with a data base and all of it correlates. An editor then derives a mathematical model used to manufacture a feature film by the most efficient means available. In Kobrin's view the digital revolution lets computers track all of these media assets while he works with the most malleable tools possible.

"So changing file formats is going from three-quarter to half-inch. It's going from 16-millimeter to 35. There's nothing new about that and there are service bureaus that are changing over from film to video. I mean you look at the companies that are film labs that are becoming video labs that will become data labs. There's nothing new about this. What SMPTE has done is guide us through these changes. What SMPTE has to do, is go faster."

Others pointed out in defense of the pace of SMPTE's response that SMPTE

is an all-volunteer organization. It has certain obligations under the American National Standards Institute and the law of the United States. Competitors are allowed to work together in SMPTE without violating antitrust laws, but they must follow due process. This structure necessitates some delays. SMPTE knows, however, that the process needs to move faster and is trying to improve its response time.

**Advanced Network Operations at Turner Entertainment**

Clyde Smith came to Turner's Advanced Network Operations from NASA, where he shot film of 45 missions with up to 200 cameras and digitized all of it at high resolution. Turner Entertainment feeds multiple networks in North and South America in multiple languages. Smith says that organizations such as Turner are having to serve increasingly more specific and smaller audiences all the time, and that digital TV will allow even more "personalization." Considering the scale of Turner's operation, one begins to understand the importance of efficiency. Smith described a jaw-dropping scenario of programming for several thousand broadcast days each year that also entails several hundred-thousand commercial and promotional elements across all of the networks. Their library contains 250,000 titles.

Smith works with such technologies as the V-chip, closed captioning and subtitling, and the fully digital server cluster used to program Cartoon Brazil.



**Chuck Garsha, Paramount Pictures**

The Oz project at Turner involves building a data base of their library so that people can browse it over HTML to avoid copying and moving tapes around. They now move 900 tapes per day throughout their facility; it's done using pwople pushing carts. Turner has digitized 65,000 titles, so far, with the highlights and key scenes selected. It allows browsing of the script and other descriptive elements. Each day programming and promotions executives, editors, and others must get a copy of a program, find a tape machine, and view it. Someone must decide how the program must be edited for commercial breaks and for sensorship purposes (currently a must for South America). On one film alone—*The*

*Beastmaster*— they've had to create 12 different versions edited for different markets, in different languages, and tailored to the time of day the title will be telecast.

The notion of carrying metadata along with a program can be promising if you're dealing with kid-vid regulations. The Cartoon Network runs cartoons 24 hours a day, seven days a week. Government regulations cover something called host selling. Smith provides an example:

"If you run Fruity Pebbles during a *Flintstones* program, kids think that Fred Flintstone is selling the Fruity Pebbles and the whole half-hour show becomes a paid commercial. You're only allowed ten minutes maximum of advertising time, and if this 30 minutes becomes a paid commercial, you've violated that rule, too."

Such an oversight could lead to a fine of anywhere from \$20,000 to \$40,000. Turner wants to use metadata to track the use of cartoon characters and more subtle things like the audio in commercials. For instance, the *Jetsons'* theme song, when aired in the background of a commercial (such as a sot currently running from America Online), disqualifies that spot from running in a *Jetsons* cartoon. Once identified and included with the media as metadata, computers can track these elements more efficiently. At present, it's a huge undertaking to have people watch and clear every spot.

The task of editing finished  
*(continued on page 144)*

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(continued from page 96)

programs provides another great opportunity for improved technology. At a simple level, programs must be edited for commercial breaks. These breaks will occur at different times, depending on the network that runs them. Each network is a customer that tolerates different levels of sex and violence, for instance, or that broadcasts in different languages. Today, importing a three-hour movie into an Avid to shorten it to two-and-one-half hours would require a real time transfer from tape into a server.

After five hours of editing and five-and-half hours of transfer you've invested quite a bit of time. Imagine keeping one copy of that file always with a series of EDLs—recipes that specify how to play it back from the server. You could achieve tremendous savings.

Think of the efficiency that Turner could achieve using these and related technologies in log management, library services, program edit, promotion planning, kid vid, and broadcast operations, Smith urges. And this doesn't even get into HTML or other new media.

It's a big area and Turner has launched a major initiative to deal with it. They're looking for dialogue with both the computer and the video industries. Smith believes he was talking to the right people at the Open Studio Roundtable: "That's why we're here, because you are critical to our progress in the future and we realize that."

### The Professional Project Studio

Chris Meyers, with his wife Trish, operates CyberMotion, a small motion-graphics facility in Los Angeles. They belong to a group of users who entered the business four or five years ago based on the promise of QuickTime 1.0. Many small project studio-style "boutiques" either started such businesses or adopted the new technology at about the same time and for the same reason. Although the first versions of QuickTime tools were hardly professional by the standards of such august bodies as SMPTE, many believed the "hype" and were soon rewarded for their faith. Early on, they suffered through huge,



Clyde Smith, Turner Broadcasting

gaping holes in otherwise amazing tools, believing that eventually vendors would fill the gaps. But QuickTime tool developers were slowly patching the fundamental flaws in their "production tools" while simultaneously imbuing them with features comparable to the most sophisticated production solutions.

QuickTime's evolution compares to the experience of a professional who crosses over from one field to another. At first he or she is attracted by the glamorous and exotic features but pays little attention to the fundamentals. Eventually, if he or she is to succeed in the field, he or she must master those fundamentals. This precise situation gave rise to the Open Studio Roundtable, of which Chris and Trish Meyers are charter members.

Meyer rightly points out to developers that the big "Turners" who can pay well to have their challenges answered are the exception in the industry, not the rule. There are far more users with smaller problems who will gladly pay—although not a king's ransom—to solve them. The economics of the small shop differs from that of big facilities, but the industry has probably grown fastest around the small shop model.

Meyer described his studio's work flow, the media types they use, and where he needs audio—and other—solutions. The Meyers' two-person facility

uses four computers plus a digital audio workstation. Both Chris and Trish have primary workstation and a rendering engine. They also have two people to whom they occasionally sublet jobs. He differentiates his work from that of video editors, who have different requirements. The Meyers produce 3D animation, compositing, film titles, bumpers, promos, and other content. Their asset-management and archival issues differ greatly from a large facility such as Turner's.

"We keep all the client stuff," Meyer explained. "They never ask for the old stuff. We have to move data either three feet behind us or across town." Meyers says that hot swappable, fixed hard drives have solved many of their media-handling problems.

Meyers expressed frustration with the move by some vendors away from the standard Macintosh logical display where the display, where the display behaves as a normal, contiguous Mac desktop unless it's playing motion video. With solutions such as Truevision's NuVista, Radius'VideoVision, and the Intelligent Resources Video Explorer, a user could simply drag a window to that display and view the image on an NTSC monitor. The new counter-intuitive approach has frustrated many other users as well. One wonders if Truevision could take some of the great technology they bring to the Targa 2000 line and build a solution that uses a more straightforward approach that conforms to the logical Mac desktop model.

Apple's brilliantly simple implementation of multiple-monitor configurations has been one of the great advantages of the Mac OS. QuickTime 3.0 addresses this issue with extensions that should fix some of the more annoying problems associated with this approach, but it's doubtful that alternatives will ever provide as intuitive and broadly functional an environment as the basic Mac logical display. Meyers also would like a display that offers convolution filtering to prevent NTSC flicker.

Meyers insists that vendors offer software codecs along with their hardware compression cards. Input and output stations must have the hardware, but it is unnecessary to put a card in every machine that renders graphics. They want to bring a subcontractor's

work back to their shop, load the file, and hit PLAY. They don't want to perform recompression to view material just rendered. That means more time and trouble.

Meyer also insists that vendors' products offer resolution independence. In addition to cable and broadcast, their projects include film titles, IMAX-format work, multiscreen work, and location based entertainment, such as Las Vegas' Fremont Street attraction. These alternative media all have resolution requirements other than 720 by 486, so their tools must offer flexibility in resolution as well as frame rates.

Meyer also addressed tape-machine control and on-line support as issues. They find it unacceptable that many editing solutions can't put segments of video and audio accurately back onto tape. Some solutions offer deck control but can't deal with audio-only files. He stressed that customers should use online support and that vendors should provide it. Vendors should make customers happy online by letting their tech-support people respond to, and speak frankly with, users.

Meyers finished by mildly chiding vendors, "Work with us. We'll buy more of your stuff—really!"

### More QuickTime and SMPTE

Videography: Various points came up in the discussions between speakers. Apple's Peter Hoddie pointed out that many companies have adopted QuickTime as a standard file format, and as a container. SGI, Scitex, and Media 100 are among those that use the QuickTime file format. Even Microsoft built support for it into Active Movie.

"We don't actually think there'll ever



Peter Hoddie, Apple Computer

be a single container," says Hoddie. "It doesn't matter how good it is, there's reason for doing something else. There's always a good reason. And so what we've done in QuickTime to try to solve that is to have made sort of a layer between the application and the file that allows almost any file format to work." As you'll read elsewhere in this issue, Apple demonstrated QuickTime 3.0 at NAB. It adds support for a broad range of file formats.

Both Weiss and Birkmaier talked about using an organization such as SMPTE as a registry where codec manufacturers could send information identifying their particular scheme. Apple has provided a way for vendors to let their users share media through QuickTime 2.5 and Motion JPEG A and B, but companies have been slow to adopt it. The message is clear: the industry is demanding that vendors stop holding their media hostage. They should work with organizations to come up with a simple way to register what they're doing. Anyone who understands that registry, and knows what the key is, should be able to get the media out of the proprietary form.

SMPTE developed what they call a universal label and is now working on setting up a registration authority to provide an online Internet-connected data base of this information. The technique allows anyone to tie into an internationally recognized name space and independently and uniquely identify their data objects and imbed them to be recognized from the outside.

"Any time you want to

know what a particular data type is that's new—or what a particular entry in an EDL is, for example—you can link automatically to that site and extract the definition of it within a very short period of time after it's been developed," Weiss explained, describing the use of the registration authority.

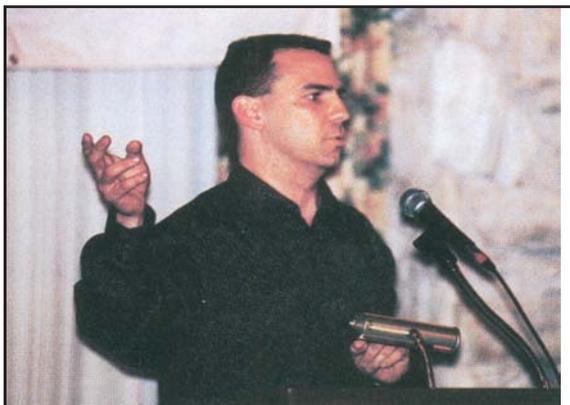
Everyone recognized that changes are happening rapidly. It's important that we respond in a standardized and open way. Systems such as QuickTime, which are designed to deal with these changes, offer distinct advantages.

The quality of service issue came up again as someone compared the situation to a fax machine, which provides good compatibility but poor quality of service. We need service and rate negotiation as well as negotiation for quality of service parameters.

Birkmaier mentioned that a significant new sustaining member organization, MicroSoft, had joined SMPTE just prior to NAB. He encouraged others to get involved with the SMPTE process. Weiss reminded us that SMPTE is an open volunteer organization and membership is not required to participate.

### Conclusion

What was most striking about the Roundtable was not how much we differ but how much we agree. The concerns of the group confirmed what task force participants have come to understand about the challenges before us. The users gained a better view of the obstacles standing between them and the solutions they seek. Consensus forms quickly at the Open Studio Roundtables and it provides us with our best hope that the digital-media authoring industry will rapidly mature. And that, of course, will bring satisfaction and prosperity to all.



Chris Meyer, CyberMotion