Broadcasting & Cable's
Digital Television™
Technology for the Digital Age
NOVEMBER 1998 VOL. 1 NO. 9

COOL STUFF

Dolby Laboratories

Dolby is introducing a new 5.1-channel Dolby Digital reference encoder that sells for only $5,000, just one-quarter the cost of its predecessor. The DP569 supports encoded bit rates from 56 to 640 kbps and channel configurations from mono to 5.1-channel surround sound. Fault-monitoring circuits warn of system failure and bypass connections for hot-standby operation in broadcast operations is included, and the unit also lets broadcasters use timecode to trigger configuration changes automatically. Contact Dolby at (415) 558-0200 or visit www.dolby.com.

■ For more information circle Reader Service 200

SporTVision Systems

Viewers of ESPN's NFL telecasts have been able to see one of the cooler new technologies to hit the airwaves—SporTVision Systems' "1st and Ten." The system displays a yellow line that appears to be painted across the football field at the first down marker. The

location of the first down yard line is entered into the system's computer, which also gathers data on the cameras' pan, tilt, zoom and focus functions. Using this information, the system can tell where in the frame of video the line should appear. The computer then analyzes the line 30 times per second and determines whether the images in the frame of video are field, a player, the ball or something else. Contact SporTVision at (212) 245-5800 or visit www.sportvision.com.

■ For more information circle Reader Service 201

For more products see page 26

DTV: Real at Last

Networks Begin Providing Stations With DTV Signal

By Edmond M. Rosenthal

NBC is transmitting its HDTV feed from a facility in its Rockefeller Center-based Genesis plant.

The first transmissions of HDTV may have been strictly "voluntary," but the Big Four networks took it as seriously as the absolute requirement to deliver the signal to the top 10 markets by May 1 and the top 30 by November, 1999.

With DTV transmissions on a national scale underway, all the networks indicated that they were both ready and willing to begin the DTV era.

Typical of the general attitude is a comment from Andy Setos, executive vice president of The News Corporation's News Technology Group: "It's a tall order and it will change everything, but we're up to the challenge and enthusiastic about it."

Voluntary or not, the networks have a significant number of affiliates receiving their transmissions. At ABC, Preston Davis, president, broadcasting, operations and engineering, estimates some 15 stations are on the receive end, including ABC owned-and-operated (O&O) stations KABC-TV Los Angeles, WPVI-TV Philadelphia and KGO-TV San Francisco. He indicates KGO could be delayed until the middle of November or later while the station deals with a neighbor-

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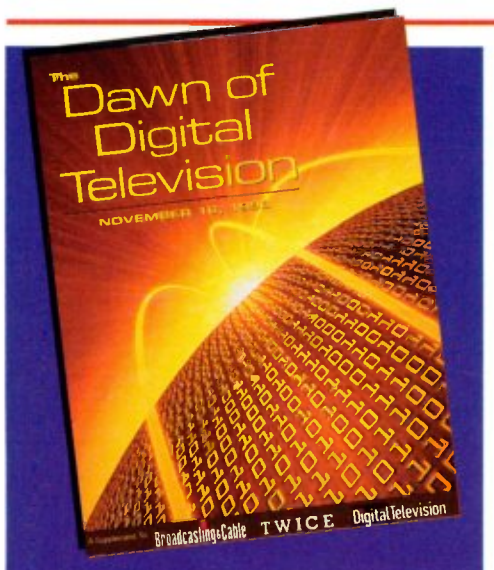

EXTRA ADDED ATTRACTION

A definitive special report that captures a new medium as it is on Day One and as it will be going forward.

Many Technical Issues Remained Unsolved

Work and discussions are underway to make DTV all it can be

By Matthew Goldman

So, you've heard the news: 42 stations will be broadcasting digital television signals this month, far exceeding the voluntary commitment made by 26 stations, and the signals will reach over one-third of television-viewing households. Note that the first "official" FCC date for DTV operation (the Fifth Order) is not until May 1, 1999, for the top four networks in the top 10 market.

The good news is that these volunteer stations demonstrate that the networks, station operators and equipment vendors are committed to making terrestrial DTV a reality.

With all these stations on the air you'd reason all the open technical issues have been resolved, right? Not true, and that's where the bad news is. There are many issues remaining to be resolved before even some of the basic elements that are taken for granted in today's analog/uncompressed plant can be imple-

Continues on page 40

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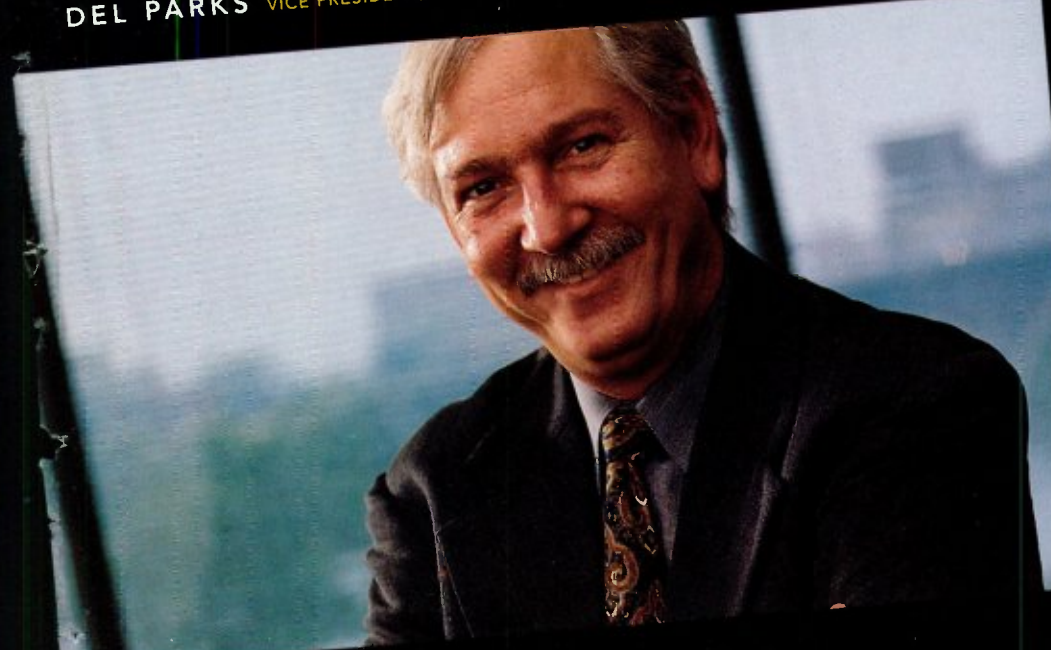
DEL PARKS VICE PRESIDENT, ENGINEERING & OPERATIONS, SINCLAIR BROADCASTING



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We have 18 months of experience with an extensive amount of DVCPRO equipment, some 60 camcorders, 250 decks. The cost of ownership has been very reasonable. A DVCPRO tape costs $20, but we get 350 passes! We're very pleased.

KEITH BLAND SENIOR VICE PRESIDENT, TECHNOLOGY, BENEDEK BROADCASTING

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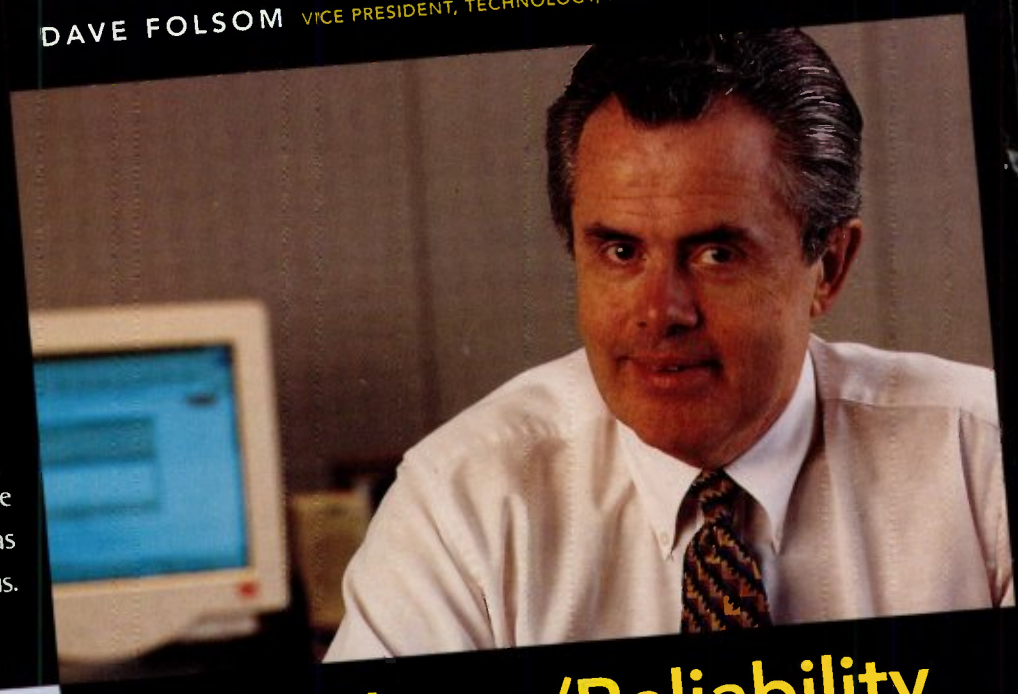
DAVE FOLSOM VICE PRESIDENT, TECHNOLOGY, RAYCOM MEDIA



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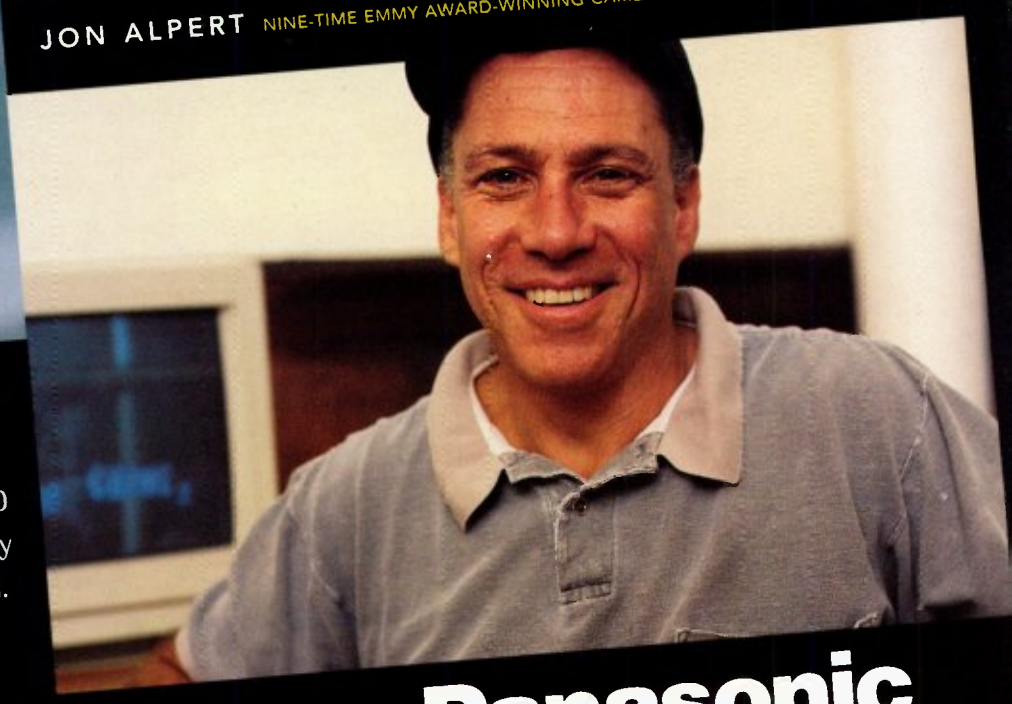

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News

NATAS Honors Innovators With Technical Emmys

The National Academy of Television Arts and Sciences awarded Technical Emmys to a number of industry manufacturers on October 12 at the Marriott Marquis Hotel in New York City.

The technologies honored this year covered everything from film to ENG products, with each recipient honored for "Outstanding Achievement in Engineering Development." This years honorees were:

Panasonic Broadcast and Television Systems Company and NHK-Japan Broadcasting Corp. for High Definition Intra-Field Compression Adapter Technology (Full Bit Rate 4:2:2, 10-bit, half-inch, component digital recorders).

Piclear and Filmtreat International for Pioneering Development of Film Scratch Removal System for Telecines.

Seven Network Limited, Australia, for Technology to Enable "Point-of-Action" Video.

Philips Digital Video Systems, Sony Pictures HD Center and Eastman Kodak, Company for Development of a High Resolution Digital Film Scanner.

Scitex Digital Video and Quantel Limited for Development and Implementation of Digital Uncompressed Tapeless Recording and Playback Technology for Television Broadcast and Post Production Operations.

Dolby Laboratories for Pioneering Development of a Multichannel Digital Audio Bit Rate Reduction System, Standardized for the ATSC High Definition and Standard Definition Television Systems, and Worldwide Digital Versatile Discs.

Panasonic Broadcast and Television Systems Company for Broadcast-Quality, 6.35 mm, Component Digital ENG/EFP Recording Technology. ■

HOT SALES

Harris Corp. has received orders to provide three **SigmaCD UHF DTV transmitters** to three Fox O&O stations: **KTVI-TV St. Louis, WFLD-TV Chicago** and **KRIV-TV Houston**. The three stations currently have Harris NTSC transmitters and plan to begin broadcasting digitally in 1999.

Time Warner Cable has selected **Scientific-Atlanta's PowerVu System** to deliver up to 100 channels of AthenaTV programming this fall. AthenaTV will provide numerous multiplexes of digital programs to cable headends which will seamlessly pass it through to digital set-tops.

WAAY-TV Huntsville, AL, has purchased $2.4 million of **Sony Betacam SX equipment**, including 21 DNW-A100 digital hybrid recorders, 21 DNE-700 nonlinear editing systems, 16 DNW-9WS 4:3/16:9 switchable camcorders, six DNW-7 camcorders and four DNW-A225 portable field editors.

NuWorld Editorial of Chicago has purchased a **Jaleo post production system** from Jaleo North America. The Jaleo system NuWorld purchased is currently the only one to offer complete HDTV and multi-stream CCIR-601 compatibility with realtime effects.

New River Communications, Atlanta, has purchased **Panasonic DVCPRO50** equipment for acquisition and playback. The sale includes an AJ-D900W camcorder and AJ-D950 VTR.

Avid has taken its first U.S. order for the **Symphony uncompressed nonlinear editing system**. Atlanta-based Post Modern Editorial is expected to receive delivery of the system this month.

National Teleconsultants has been tapped by **ESPN** to provide design and systems integration for a new digital production facility in Bristol, CT. The new digital facility will serve ESPNEWS 24-hour sports news network.

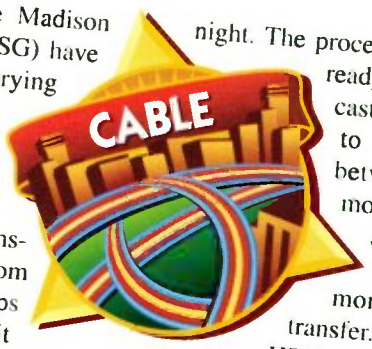
Cable Programmers Begin Looking At Potential Of HDTV

HBO, Discovery, MSG and Martha Stewart Living all hard at work readying content for HDTV viewers

By Peter J. Brown

Whenever someone breaks the sound barrier, there is a tremendous boom. But the only sound you are likely to hear in 1999 when, and if, cable programmers start breaking the 100-hour per week threshold for HD programming will be a collective sigh of relief from manufacturers of HDTV sets, and maybe from Capitol Hill as well.

With HDTV sets now for sale and signals on the air in a number of markets the challenge is now to provide programming to attract customers. And there are currently three cable networks that seem more than enthusiastic to tackle the challenges and opportunities of HDTV. HBO, The Discovery Channel and the Madison Square Garden Network (MSG) have all announced plans to varying degrees to offer an HDTV programming channel.



At HBO's production studio on 23rd St. in Manhattan, a Philips Spirit DataCine is transferring movie after movie from 35mm to HD D-5 tape. A Philips 16x16 GS-400 Venus Gigabit router which handles bit rates up to 1.5 Gb/s is also part of the hardware mix.

According to Bob Zitter, HBO's senior vice president for technology operations, approximately 45% of HBO's titles will be available in HDTV beginning on March 6, with at least one HDTV movie airing every night. The process of getting a program ready for an HDTV broadcast is not fast—according to Zitter HBO offers between 850 and 870 motion pictures per year and it takes anywhere from 2-1/2 days to a month to complete a transfer.

HBO currently has no plans for its own HDTV-originated productions. "We're building an island. We're not acquiring any cameras and we're not getting into any mezzanine compression," Zitter says.

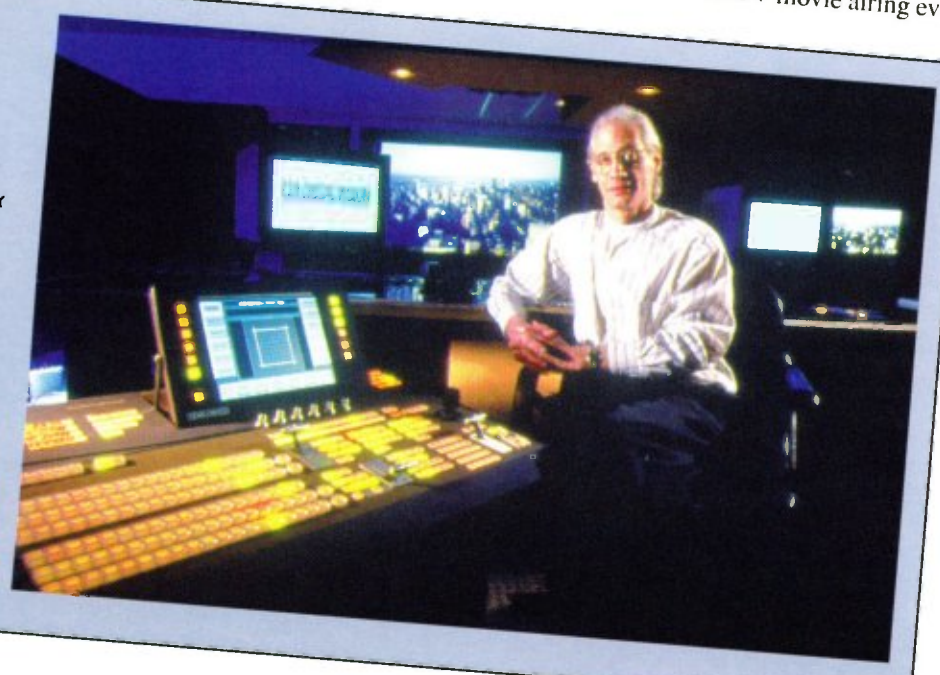
As the introduction of digital TV programming gets underway in November, a substantial and constant flow of HDTV programming will play a key role in driving the purchase of DTV and HDTV sets. But the major network plans for HDTV content are minimal and seem unlikely to be a true drawing card.

HBO, however, could be different. HBO's HD demo tape for retailers is close to completion. And only HBO looks as if it is prepared to break through the 100-hour barrier next year in terms of the amount of HD content available in a given week. HBO will transmit in 1080i in early 1999 using East/West feeds on an as-yet-unidentified satellite, according to Zitter. Upconverted NTSC material will constitute the remainder of this simulcast of HBO's primary feed. The line between HDTV upconverted and HDTV transferred material is a simple one: "We'll be showing

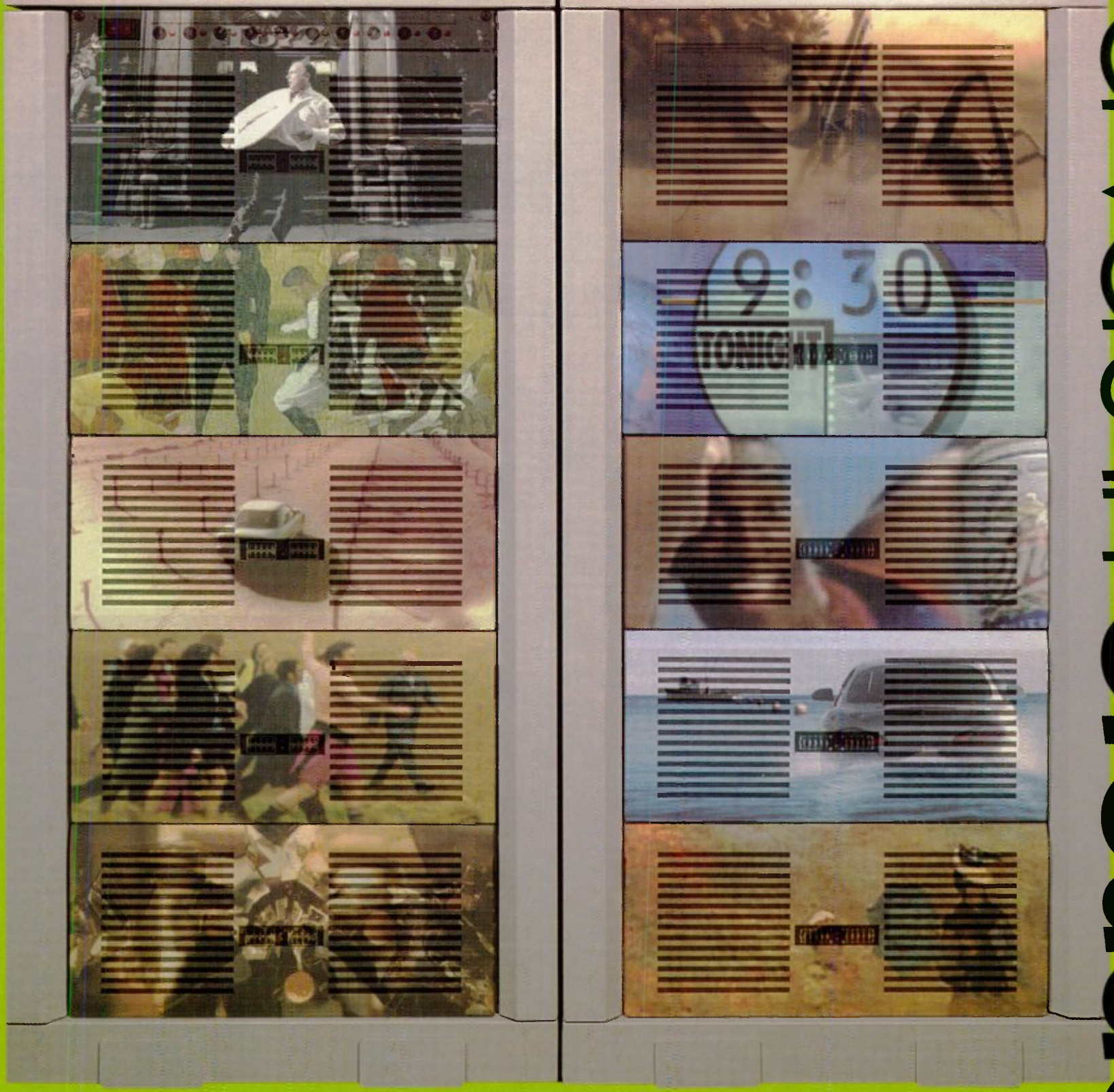
Continues on page 36

A Colossal Success in New York

New York City-based HDTV production facility Colossalvision has purchased a Snell & Wilcox HD1012 HDTV production switcher after five weeks of beta testing. The facility is actively shooting and editing HDTV commercials, programming, music videos, infomercials and industrial videos. One area that Colossalvision's David Niles says the switcher comes in handy is color touchup. "When you are putting together HD shots from different days, hours and minutes color correction becomes essential," he adds, saying that the memory capability of the HD1012 allows editors to set-up several different color correction schemes for the same camera and just switch through them.



Servers in broadcast



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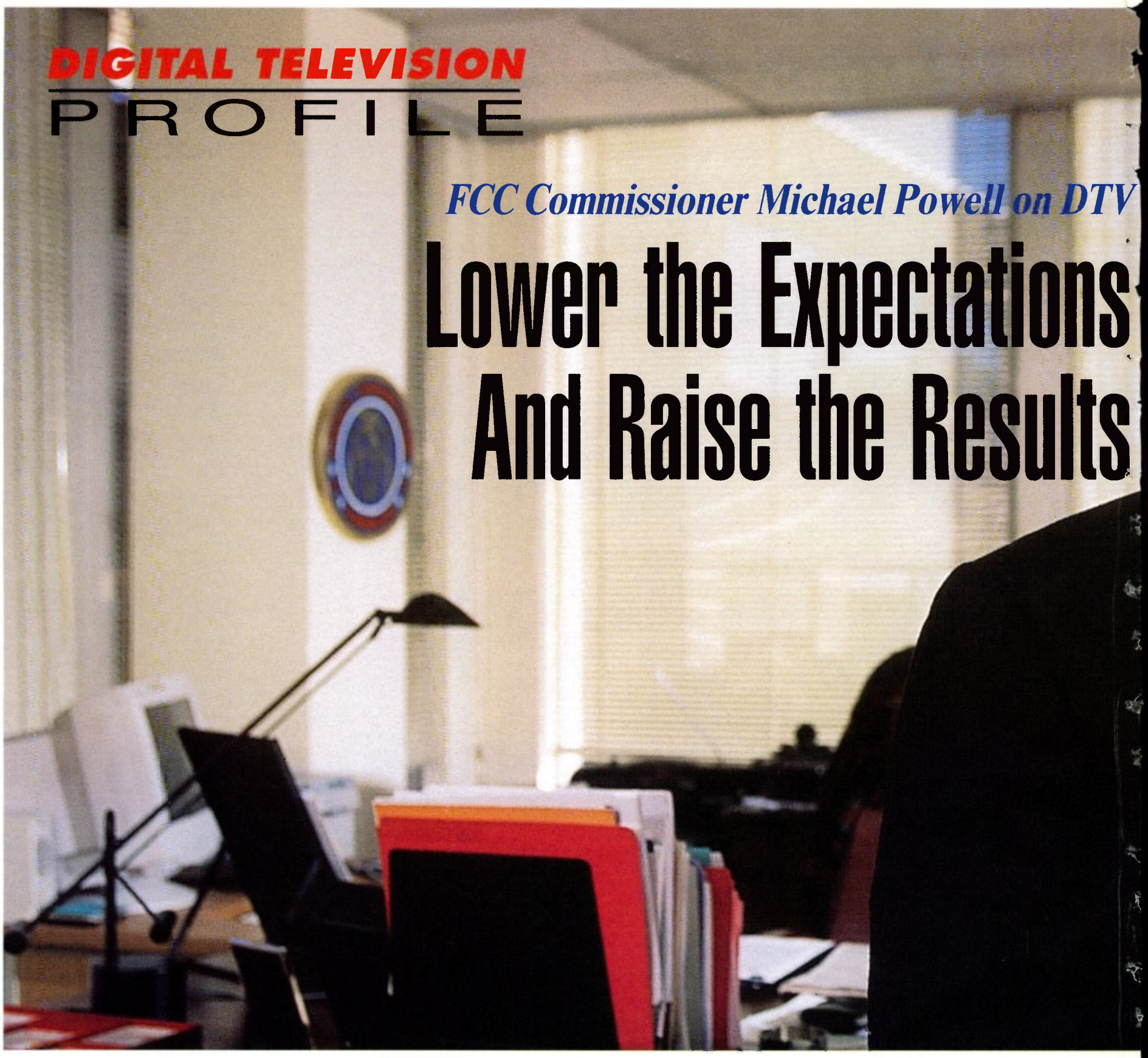

FCC Commissioner Michael Powell on DTV

Lower the Expectations And Raise the Results

Michael Powell is a freshman in the minority on the FCC but is fast making a mark on that agency and the telecommunications world in which it operates. In this interview with Digital Television's Don West he takes his cue for policymaking on digital and HDTV from an old adage: "Take as long as it takes and it won't take so long."

There was a time when you could come to the FCC to do a story, and after six or seven interviews, you'd know what it was all about. But we've been chasing this story–the transition to digital television—for over a year and it's still not totally in focus.

Powell □ It takes a year to try to understand this. I haven't gotten my head completely around it yet. I'm not so sure the industry has gotten around it, either.

DTV ■ **Well, it's complicated. And there are so many industries involved that it becomes exponential when you multiply the possibilities against the realities. We've been early-on advocates of HDTV and digital–in that order, considering that HD came first—but there's been growing concern since the FCC essentially turned them over to the marketplace. Worry that there's going to be a two-year period of such confusion that people will just throw up their hands and say: "Well, forget it. I don't want it. I'll just stick with what I have." So when I heard your remark that digital was a potential train wreck, I thought we should ask you to elaborate on what you see when you envision that train wreck.**

Powell □ Train wreck is a bad metaphor, because it can be misperceived. But let's back up a bit. I look at it as an outsider who didn't make decisions about the times and the dates and what would be done by when and by whom. There's no question that digital television is an industrial policy. It has components that it leaves to the market. But an extraordinary amount of the judgments as to time, schedule and product have been driven very heavily by the government, either formally in the form of rules and regulations or informally in the form of bullying or pressuring or hearings and the like.

And what really has started to concern me in the last year is what will be produced for consumers. I have every confidence in the world that if enough time and resources are dedicated to this, broadcasters will largely meet their obligations. I have no doubts that the consumer electronics industry will produce some products that will go to retail and they'll claim they have dispatched their obligation. Everyone will have claimed to have dispatched their obligation to the government, or their perceived obligation to the government. But I get concerned about what all that then produces for consumers. And I get concerned that there are an extraordinary amount of variables in the hands of consumers as to whether this policy or this transition will succeed.

Dennis Brack/Black Star

And I am concerned that we're not sober enough, or that some folks are not thoughtful enough, about how significant a challenge that is going to be and that we have introduced some extraordinarily optimistic assumptions that I think could potentially lead to some regrettable results.

What kind of results? Whether or not it's a train wreck, I see a lot of blaming going on. Or setting up people for blame. I start from the proposition that this is perhaps the most dramatic change in television ever, more so than color, and it's going to be a complex and difficult transition under any circumstances, with or without government involvement. And I think it's very important for its success in the future of television and in being embraced by consumers to be done right. Not quickly for its own sake. The tail shouldn't wag the dog. We shouldn't, in our haste to do this thing, do it in a way that leads to an inferior product or service, or a premature debut. This is my worry.

DTV ■ **The pressure for speed is the government's, to return the analog spectrum.**

Powell □ Exactly. I admit to that. But I feel it is important to just lower expectations and get a little more sobriety into how we think this transition will go, I think that a lot of people know the truth about this, but God help you if you speak openly about it. You don't have to have a strong historical background to know that a transition of this magnitude in the consumer electronic industry does not occur at the penetration rate that has been identified for DTV. I've gone back to look at some of the more fantastic introductions in the last 20 or 30 years, and you're hard pressed to find 85% penetration levels in some of the most fantastic consumer electronic introductions ever. VCRs aren't at fully 85%. They've been around a long time, and we have this perception that every American household has them, and they're at an absolutely bargain basement price point. They're not there. Another example would be CDs—which I think are an extraordinary improvement over records—because they eliminated all the clicking and the popping. They were more durable and the prices were reasonable in a relatively short period of time, consumers embraced that technology and you still won't find these kinds of penetration rates. Some serious professionals in the industry are declaring before the first set's even gone into the store that digital is going to take off like a rocket barely seven or eight years from now.

Or take the personal computer, which is a device that's probably changed our world in the most fundamental ways of any appliance to ever enter the human experience. You can buy an incredibly powerful microprocessing PC for under a thousand dollars, and penetration rates aren't at 45%. The list goes on and on. Let's be realistic. We're talking about a device that is debuting in the $5,000 to $10,000 range—a device that will debut at a price point that for average consumers is second only to their home and car. The average American family will spend hundreds of thousands on a house, it will spend in the 20s and 30s of thousands on an automobile, and then you're hard-pressed to find another $8,000 or $5,000 or $4,000 or $3,000 or $2,000 device that, on a ubiquitous scale, Americans purchase in large numbers. It's a big number and even if I cut the projections for the initial introductions in half, which would be an astonishing price improvement over five or six or seven years, you're still at a very, very high introductory rate.

And add to that complexity that the television is part of the family in the American home. We're not talking about one television, we're talking about average American families that have three and four television sets per home. While I can see different scenarios by which people rely on one main digital TV, the true scale and scope is probably going to come when consumers begin to fill their homes with kitchen TVs and the other TVs that really begin to approach what we've come to expect in consumer electronics goods.

And I worry about some of the judgments about design and product that people are making. They might be right, but by most standards they'll probably only be about 40% right, because I think consumers—when they begin to interact—will have feedback you never anticipated. They will embrace parts of this technology that no one ever anticipated.

DTV ■ **It seems to me that digital, and HDTV, particularly, will at first be a big-screen phenomenon, with the dividing line at about a 34-inch or 35-inch set. The big news at the outset will be made by sets 50 inches and up. The manufacturers tell me that America's appetite for large screens is evident by the fact that some 20 million homes already have large-screen sets that cost $3,000 or $4,000 or more.**

Powell □ I'm not yet sure that everybody's ready for that. I actually think that's fun for me, who loves consumer electronics, but I'm not sure that is the ubiquity model, because the average American household doesn't have 25-foot open wall spaces for more than one of these things, and a lot of people can't have even one of them. I live in an upper middle-class neighborhood with nice houses, big sizes, and anybody that has a big TV puts it in the basement because it's the only space that will accommodate a device that size. But if the whole digital economic model is built around lots of Americans owning such devices, you need to tour the homes and neighborhoods of Americans to see how many people are living in properties that accommodate 52-inch television sets.

And the set in the family room and the parents' bedroom and the children's playroom are really important to the level of acceptance and embraceability in the introduction we're talking about. I understand there's going to be the set-box alternative, too, so you can receive digital on your analog set. But if you think about it, at some level you're asking consumers to pay additional money for products just to maintain what they have. I think these things can be overcome, but they're going to be difficult marketing challenges.

You put it really well, the permutations of complexity are enormous because it's not even just the hardware world. It's not just the cable companies and the broadcasters and the television set manufacturers. It's Hollywood, it's the major studios and what they're going to produce, it's set designers, costume designers, lighting designers, make-up designers, hair styling. I don't mean to overdo this, but you're talking about an absolutely revolutionary production model. Stations are having to tear down news sets to build new ones because of the aspect ratio changes, and because the digital picture shows so many flaws that analog never picked up. That's all before you begin to have real, tangible, appreciable differences in the watching experience for consumers.

What I'm saying is that I'm a big believer that given time and money, anything is possible. I'm an optimist in that regard. But those two things are critical factors. Time expectations have to be realistic and money expectations

have to be realistic, because if you impose an artificial time constraint too tightly it will become destructive. If you impose capital requirements that are excessive, things can go wrong. And I just have had a nervousness that we have imposed expectations with respect to both of those components that are pretty aggressive.

The other thing that's gotten me worried is that in haste, people make mistakes. I have no doubt whatsoever in the sincerity of every industry group that's working on this, I really don't. But things are going to get missed. We're already seeing it, you know. People are still wringing their hands over how is it that sets are going out this fall that can't work on cable. You know, nobody had to be a rocket scientist from the very beginning to understand that 70% of America is using cable. DBS people have known for a long time that the cable barrier is a problem. This is not something that's just suddenly been realized. It's been evident for a very long time.

Because there are so many industries, and they all have their own interest in this new technology, for whatever reason, it didn't happen. I'm not even in the blame game on this, but it didn't happen. So it means we're going to have a product come to market that is limited in a major dimension. And then it will be up to the early adopters—upon whom all the business people and consumer electronics manufacturers are relying to get things going—to spend $8,000 or $10,000.

You know what? They'd better be wowed. They'd better be impressed. Because early adopters, I have an instinct, can also sink a product. They can reject it, they can be unhappy, they can tell Circuit City, "You ripped me off. I didn't get anything out of this. I paid a lot of money." The write-ups can be bad, and I'm not so sure that you can say, "Oh, all of that will be fixed in the next model," because I think that you can set acceptance back. You can take a step forward but then lose three steps backwards in your progress.

It's a lot like when I drive to work. I can leave at 8 and it will take me an hour and a half to get to work. I can leave 35 or 40 minutes later and actually get to work sooner. It isn't worth leaving an hour earlier because that actually makes the commute longer. So by staying out for a few minutes, I get a better transition.

DTV ■ **I've used that excuse a lot. But if you started 15 minutes earlier, you might beat all the traffic.**

Powell □ That's right. It's just a sober understanding that time is not infinitely malleable and that mistakes are not immediately correctable in a linear way. And that mistakes can have back-setting consequences. I actually predict that even with a transition this complex, in the early part of my lifetime this stuff will take off. I don't believe in my heart of hearts that it will meet the expectations that people are currently anticipating. Because I think the consumer acceptance component and the variables that are in control of users are still very pivotal. I don't even have to say my opinion's right or wrong, only to say that it will be for consumers to decide.

There are a lot of judgments being made about what people want to do on the couch in their homes. Some of them are going to be disastrously wrong. For example, we have made a cultural icon out of the couch potato. In the '80s it was sort of the vogue of the couch potato culture, that says people want to lay on the couch passively, dumbmindedly, almost in an escapist sort of way, and mind-numbingly flow through the TV. There is at least a realistic possibility that the grandeur of interactivity, the notion of some of the sort of techno-gee whiz stuff that people imagine consumers wanting to do, will fall flat.

Dennis Brack /Black Star

I'm not so sure people want to hold a clicker that has 525 buttons on it. I am not so sure that people want to come home and sit in their living room with their families and pull up sports scores and send their e-mail at the same time that they watch. They might. And that might be wonderful. And the truth is, there'll probably be some who do and a lot who don't. But I think we haven't even transitioned yet to the marketing question. Will they sell it? Will consumers be convinced that this is something they enjoy and that improves their lives? That's a huge wild card.

A lot of industries clearly believe so and are betting on it. But because something is techno-cool it's extreme to assume it will be loved by consumers. I could go back in industry as well and show you things that were technologically superior that consumers rejected. I'll never forget being in the fourth grade and being shown the cool new AT&T videophone. I don't know anybody who has a videophone to this day. And by all engineering estimates, Beta was superior to VHS.

I think you can find examples of consumers refusing to embrace technology because sometimes technology is the equivalent of complexity. People don't want complexity. I know a lot of people reject computers, not because they aren't cool, they're too complex. Some people enjoy that aspect of computers. Some people don't. Some people just want to write a letter. When writing a letter requires you to know 452 skill sets, they don't like it. Windows makes a lot of money because a lot of people enjoy the experience. But a lot of people hate it.

Our imaginations can get ahead of ourselves. There are some very difficult issues on the horizon, so when we start to intersect this with converging technologies like cable and DBS and stuff, there are going to be even harder questions. When you begin to get deep into digital must-carry questions there are going to be a whole lot of very, very difficult questions about whether something's burdening or benefitting consumers, and what are the tradeoffs. I think there will be irreconcilable choices. I don't know that the government's going to be very well positioned to make that judgment for people, because I think you're going to be in a damned if you do, damned if you don't kind of situation. You have to step back and say: "All for what?" All for our own imagined importance of having this done by a certain time? What is the intrinsic value of that standing alone. I think it's a good thing for the country to move to all of this, and I think it will, but I don't know that I always understand the independent values to some of the expectations of time.

I don't think we're thinking enough about looking around the world and seeing what the experiences are. There was an article in the September issue of your magazine—an interview with Phillip Laven of the European Broadcast Union—that was an extremely thoughtful recitation of the experience of Europe. Not that ours would be exactly the same because there are certain fundamental differences, but they're further ahead in getting some feedback from the marketplace in certain regards and they're saying some of the things that I'm talking about. The key to my point is that judgments may come out differently, but it doesn't mean you're not going to have that period of interaction and confusion and uncertainty that will conspire to add time to your expectation. I'm just so sure of that.

DTV ■ **You sound like a philosopher king to me. Someone who doesn't have to do anything about this. "Hey, look at this landscape. There's a potential train wreck down there but I don't have anything to do about it." Does the FCC have a responsibility to advance this new medium as quickly as it can, or just let it happen?**

Powell □ Well, in many ways I disagree with that characterization in the sense that I'm cautioning against philosopher kings, not trying to be one. I mean, I'm trying to be more pragmatic about what I think. You can look at substantial evidence and experiences and the way things are likely to unfold and be cautious about your own sort of hyped euphoria. Or we can insist on things solely for fulfilling the preordained purpose at a preordained point in time, rather than for getting it right.

The other thing I would say is that your idea is an intriguing one. I don't know that I embrace it or not at the moment, but it isn't as though we philosopher kings have total freedom of choice. One of the important truths here is that Congress has taken an extremely hands-on approach to the HDTV issue. I don't own all the tools. At the end of the day the 1997 budget reconciliation act says certain things are supposed to happen and they're supposed to happen in a certain way. I have no problem telling senators we have a problem I wouldn't be giving public interviews about the warnings about some of those approaches if I didn't believe them, but at the end of the day. I still have to try to comply substantially with the law as it's written.

DTV ■ **Well, I have a pragmatic approach to the requirement of returning the analog spectrum which says let them put any date they want on it and let's get this medium moving. We couldn't get moving until they put a date on it. It won't happen under an 85% test or anything like it. It's going to take what we all thought at the beginning, 15 years or more.**

Powell □ Well, here's the trick, Don, that has other ramifications that are not even just for HDTV. We have to be extremely careful, and this is something the FCC does con-

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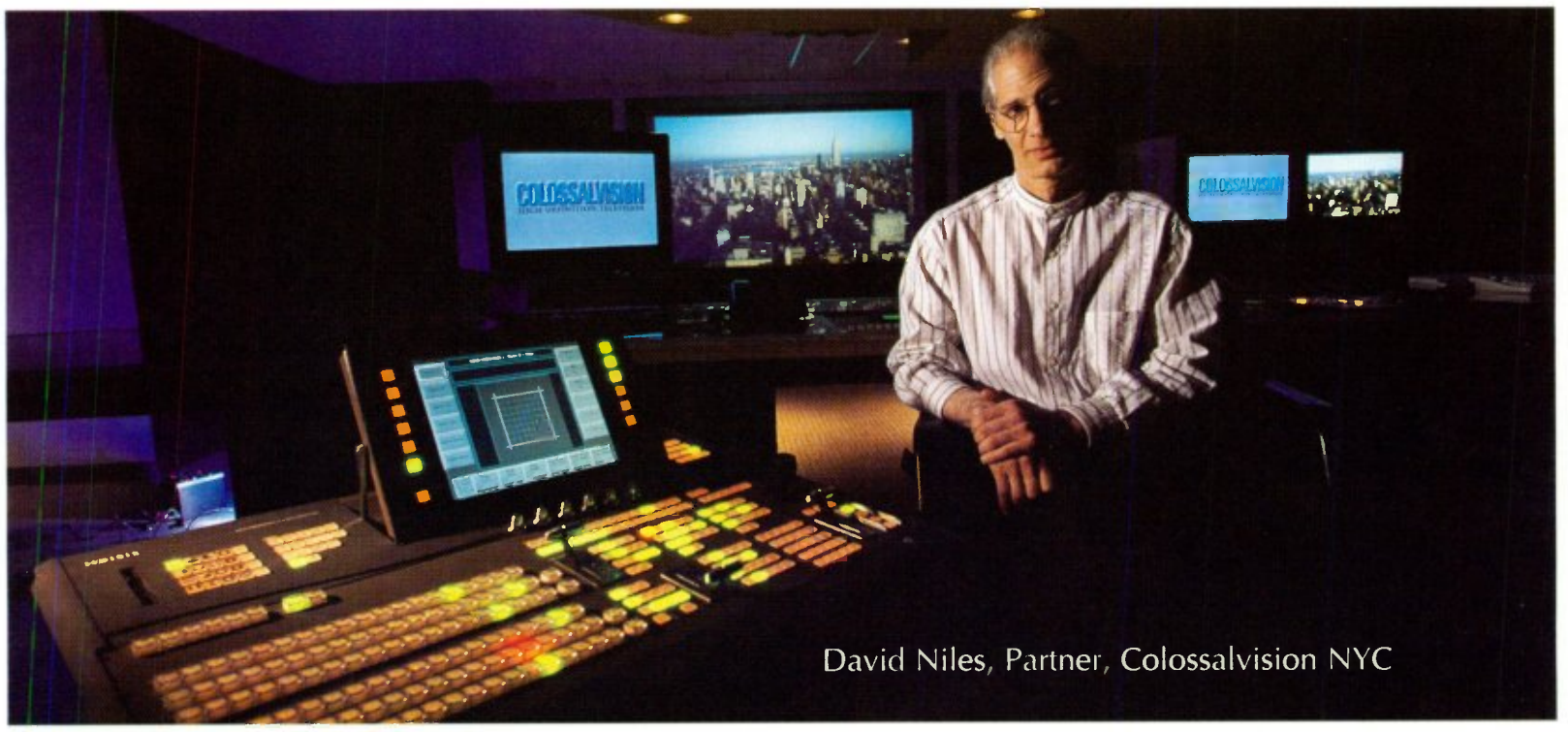

David Niles, Partner, Colossalvision NYC

"In the past thirty years I've worked with just about every switcher on the market," says David Niles. "The new HD1012 is an extraordinarily smart design, from its ergonomics and human interface to its internal architecture."

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trol, not to bank on the assumptions. There are a whole lot of people who will come in here with all kinds of ideas about what to do with the return of spectrum, what to do with the money from the returned spectrum, and various other kind of policy ideas that can be built on the assumptions.

We have to be careful about that, I think, because if you were to conclude in your heart of hearts as you just did that it's 15 years, then you'd better be awful circumspect about putting into motion other possibilities that have as a cornerstone their presumption that this thing will really work the way it's currently imagined. I just think it would be potentially dangerous or irresponsible if you got too far ahead.

DTV ■ **So, shouldn't the FCC or the government do everything within its power to advance that return of spectrum?**

Dennis Brack/Black Star

That means to make the transition move quickly, and the big problem I see with the transition is interoperability. There isn't interoperability among broadcasting and cable and satellites and the new digital TV set. Doesn't that come within the FCC purview to try and effect? Once you've got that, then it should move pretty quickly. But if every one of them creates a digital system within its own sphere, at war with the others and anti-competitively, then it's going to take forever. If ever.

Powell □ I don't have a resolution on what additional steps you might take. One counter to the way you would address this is to revise your time expectations and let the market do it. I do have some confidence that the introduction of innovative products, given time, will produce a result that consumers value. It may not come, however, at the rate of expectation introduced by the government.

There could be two approaches. One would be similar to yours, which is to say time is an important component for whatever reasons and, thus, we need someone to step in and help do things that are going to be necessary to enhance the schedule. If you accept that assumption, that would be absolutely legitimate.

DTV ■ **That's the "time is money" component. As I recall, you have two components in your construct: time and money.**

Powell □ Exactly. But it also matters whose money you're talking about, a little bit.

The other viewpoint could be that there are an enormous amount of variables as to how this thing comes out that are dependent upon consumers. That are dependent upon a dialogue, if you will, or an interactivity between firms and their customers that has to play out to answer those questions. That is called the market. I think it may be more valuable to extend the time expectations and let this interaction occur so the marketplace can answer some of these variables.

I no doubt agree with you that there are interoperability questions that could be enhanced or improved through government involvement. I'm not so sure I'm convinced, however, that those are necessary pre-conditions or profound barriers to achieving 85%. I think even if you had an efficiently-delivered product you would still have some pretty serious questions, about the timeframe, and you could still not get to 85% by any of the times that they're talking about. If there were complete interoperability it certainly would decrease the time that it takes, but it might still hit only 50%.

There's one last thing I would add. There's another constituency on the periphery that's more important to this than we often give credit, and that is the computer world. The problems of digital TV aren't just with the pretty pictures part. DTV also has the potential to be an additional delivery mechanism for much more robust interactive product.We all know this but we often sort of forget that underlying all of this, is a competing view for that world. That's just another level of complexity. If it were really just video programming at the highest level, it probably would be much simpler. But that isn't really all we're talking about? We're talking about the battle for the next great consumer appliance, which isn't really a TV by itself.

DTV ■ **The PC/TV?**

Powell □ Yes. And this is what cable is into as well. You can't understand cable and QAM and all that, if you don't understand the pursuit of the data worlds as well. Half of that stuff has a lot to do with not just more golf channels, it has a lot more to do with the power and potential of broad band interactivity on the cable plant. It's not about all those goods and products and services that are traditional TV stuff.

DTV ■ **Would it then be a better approach to get a release from the time obligations for the broadcasting industry, rather than pushing cable to catch up to the broadcasting timetable, as it were? And do you think it would be better public policy, and more in the public interest, to just slow the process down?**

Powell □ It's a very hard question. There are very technically compelling reasons cable can offer for its standard, there are very compelling reasons broadcasters can offer for theirs, and I think it's a very, very difficult task to ordain one, because you're not just ordaining a standard, you're ordaining the business models and assumptions that underlie them. I mean, cable is a competitor too. I think cable offers a product to the public that is highly valued by the public, which is in the public interest to continue to grow and exist and provide new goods and services, just as much as is conventional TV. They both have their role. And, you know, there may be places where they have an argument, at least, for parting company with a competitor because they have new goods and services of their own they wish to deliver, using their proprietary plant, that are equally as worthy of consideration as over-the-air digital signals. I could flip and say the same thing, you know, of broadcasters.

The problem that I have sometimes with this sort of standard thing is that it isn't so much the simplicity of "Wouldn't it be better if there was a standard?" Yeah. The standard that people agree they could use. It's always true. The problem is in really sorting through and anointing the business judgments that underlie the choice of standards, that is a really hard decision to make. I don't know how I work through whether what cable wants to bring to the American consumer will be more valued than what a network wants to bring to them. That's where it gets hard for me, and I'm just expressing my own insecurity and lack of confidence about that. Because, to me, the way I'm trained, it is best just to say it is, "Let them both try, we'll see."

The problem is, there are bottleneck problems to making sure that there's some fair shot at that. But then you have to really test some of those propositions. I don't know.

You're not going to get me today to advocate as a formal matter slowing down the process. But I will go so far as to say there should be nothing wrong with opening that up for consideration, if it means doing this thoughtfully and right, or in a way in which the consumer can be brought into it at a more reasonable pace. But I don't think that we should get into the world—which I think can happen in Washington very quickly—that subjects are off the table, things are sacrosanct, decisions are preordained and cannot be altered without getting your political head taken off. If we fall prey to that we're not really doing the public's business—we're doing the bidding of competing private sector interests that are not the public. ■

Errata

In last month's character generator roundup we forgot to mention AVS's latest ManuScript model, the ManuScript 2000. The ManuScript 2000 Series includes the ManuScript Graduate and Cadet. The Series is based on the RISC (Reduced Instruction Set Computer) architecture, allowing for future developments such as font importation. The systems also fit in one rack unit of space. Also available is the ManuScript Diplomat SDI, a digital CG using 4:2:2 technology. For those readers looking into purchasing a character generator, we apologize for not keeping you fully informed of your latest choices.

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CBS Sports Tackles Professional Football In HDTV

New technology leads to new philosophy when it comes to producing and directing the action

By Ken Kerschbaumer

Tom Sobolik / Black Star

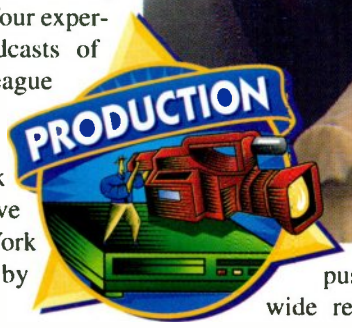
Ken Aagaard, CBS Sports senior vice president, operations and production services (standing), Terry Ewert, CBS Sports executive producer

"Pioneers are the guys with the arrows in their backs but it's kind of fun. I'm excited about the opportunity, and Sony has helped out a lot to make this happen for us, but it's something we need to do and take a look at."

—Ken Aagaard

New York City has had its share of difficulties with regards to station implementation of DTV and HDTV transmission, but its recent success stories with regards to HDTV sports broadcasts is giving the city at least a couple of positive HDTV experiences.

Both the MSG cable network (see related story beginning on page 4) and CBS Sports have begun experimenting with HDTV broadcasts. CBS Sports recently completed the first of four experimental HDTV broadcasts of National Football League games. The game, between the Buffalo Bills and the New York Jets, was carried live throughout the New York City viewing area by WCBS New York.



Terry Ewert, CBS Sports executive producer, says the broadcasts will offer CBS and others a chance to really judge what HDTV brings to the table. "We have to see how these experiments go and then realistically look at the product and see if it's better. We know the picture quality is better and that 16:9 will offer a whole new adventure, but is it a better product at this point? We'll have to go on from there."

Ewert believes the biggest learning opportunity with the broadcasts will actually concern how HDTV will change the philosophy of sports production rather than the technology of sports production.

"The nice thing about HDTV is that everything is very clear and you can get a little wider without any real concern," he explains. "The dilemma is that the lenses allow us to get closer in on the helmets for face shots and things like that, but we'll have a 16:9 picture to shoot those face shots." Ewert says camera angles may be changed to help bring a little more depth to the viewer.

"We'll be doing some experiments with shooting without the high camera and maybe making the line of scrimmage a little more diagonal and showing more of a three dimensional picture. So camera angles, philosophically, will have to change, at least in this experimental stage. Also the lens complement will have to be rethought because, while we'll need tight lenses, we won't need them on every camera."

The beauty of the experimental level of coverage CBS is undertaking is that there are no right or wrong ways of doing things, only innovative ways.

"One of the challenges for doing a game in HDTV is using the different camera angles and different ways of covering things because of 16:9," believes Ewert. "The problem with covering football in HDTV is we're taking something that is very vertical, the line of scrimmage, and we're either going to have to get wider or push in and not worry about the wide receivers. But that's only if we want to keep the players in the same perspective that everyone is used to seeing them in."

Ken Aagaard, CBS Sports senior vice president, operations and production services, has had his hands full enough this season with CBS Sports getting back into NFL coverage. There's already a slew of digital technology being used for the regular NTSC coverage, with Grass Valley 4000 and Sony 7000 switchers being used alongside Scitex Dveous units and six-channel Tektronix Profiles. So the HDTV equipment found in NMT's Sony-based HDTV trucks is just another step up the technological ladder.

"Pioneers are the guys with the arrows in their backs but it's kind of fun. I'm excited about the opportunity, and Sony has helped out a lot to make this happen for us, but it's something we need to do and take a look at. The government says we have to do it so it's time to see how it works. I'm not going to pass any judgment on the experience until after we're done with the four games—and then I might have some interesting things to say," he laughs.

At press time Aagaard was getting all the pieces needed for the first telecast together. "We're working on getting the right codecs and converters inline so we can get the signal from the stadium back to the broadcast center," he says. "It's really starting from scratch."

CBS's typical camera coverage for HDTV (at least for the first game) will consist of Sony cameras on the 20-yard lines joined by a camera that will give a slightly different perspective from the corner of the endzone and then also two low cameras in the endzone. CBS is also taking advantage of the improved clarity HDTV offers with the placement of the 50-yard line camera.

"We decided to place the 50-yard line camera way up in Giants Stadium because we could look out into Jersey and then point it into the stadium, and that would be a nice effect," explains Aagaard. "That camera will be almost 100 yards higher than the regular 50-yard line camera position."

Is Aagaard worried that the higher position will result in less clear shots? Not at all. "I went over to Madison Square Garden to take a look at the truck there and we wanted to see how far we could see with the camera. We turned it around and zoomed it up to shoot the top of the Empire State Building, and I could see the faces of people at the top and that they were grinning. So I said then that we wouldn't have any problems with the Meadowlands and the Jets game."

Getting Graphic

When it comes to HDTV graphics, Aagaard says the equipment currently used by CBS Sports, the SGI Onyx 2 with Peak Everest software, isn't quite HDTV ready. "We're going to have to upconvert the clock and score as well as the Chyron Infinit work being done for lower-thirds. I'm hoping, however, that by the second or third game we'll be able to do the SGI stuff in high definition."

One challenge the new technology poses is that viewers won't get all the usual replays and angles they're accustomed to from an NFL telecast. Ewert says it will be important for broadcasters to develop a strategy for handling sports productions so that the viewer doesn't think technology has taken a step back.

"A new standard in covering football will avail itself because of these experiments," explains Ewert. "I don't think anyone has an idea in mind, and until we work with the cameras some more no one knows what the end result will be. All we know is that some of the angles and shots will be successful while others will fail."

HDTV could also impact the way sports productions are directed, beyond camera angles. "The cut/cut/cut package of any sport is a little more jarring on HDTV then on regular TV," offers Ewert. "I think that's because people aren't accustomed to seeing it in 16:9. But they'll get used to it, and it'll become as acceptable as film cuts are."

Working Wider

Aagaard says the new era of HDTV is one he's looking forward to experimenting with, particularly the 16:9 aspect of it.

"I feel very strongly about the 16:9 format and I've felt that way since the first time I saw it. I knew that this was really unique and it was going to be great, and I think that in most studies people are enamored by the wider aspect ratio rather than by the actual video quality."

Overall, Aagaard is interested in seeing how viewers react to the improved viewing experience. "High definition gives you such unique looks that you can see so much more in the space and it changes the way you view things," he says. "We've got to give it a chance and then people will make up their own minds."

With the Nov. 8 broadcast behind them CBS now looks to its future HDTV experimental telecasts. They'll take place on Dec. 19 from Buffalo, NY, Dec. 26 from Oakland-Alameda County Stadium in Oakland and then on the second weekend in January from an AFC divisional playoff game. ■

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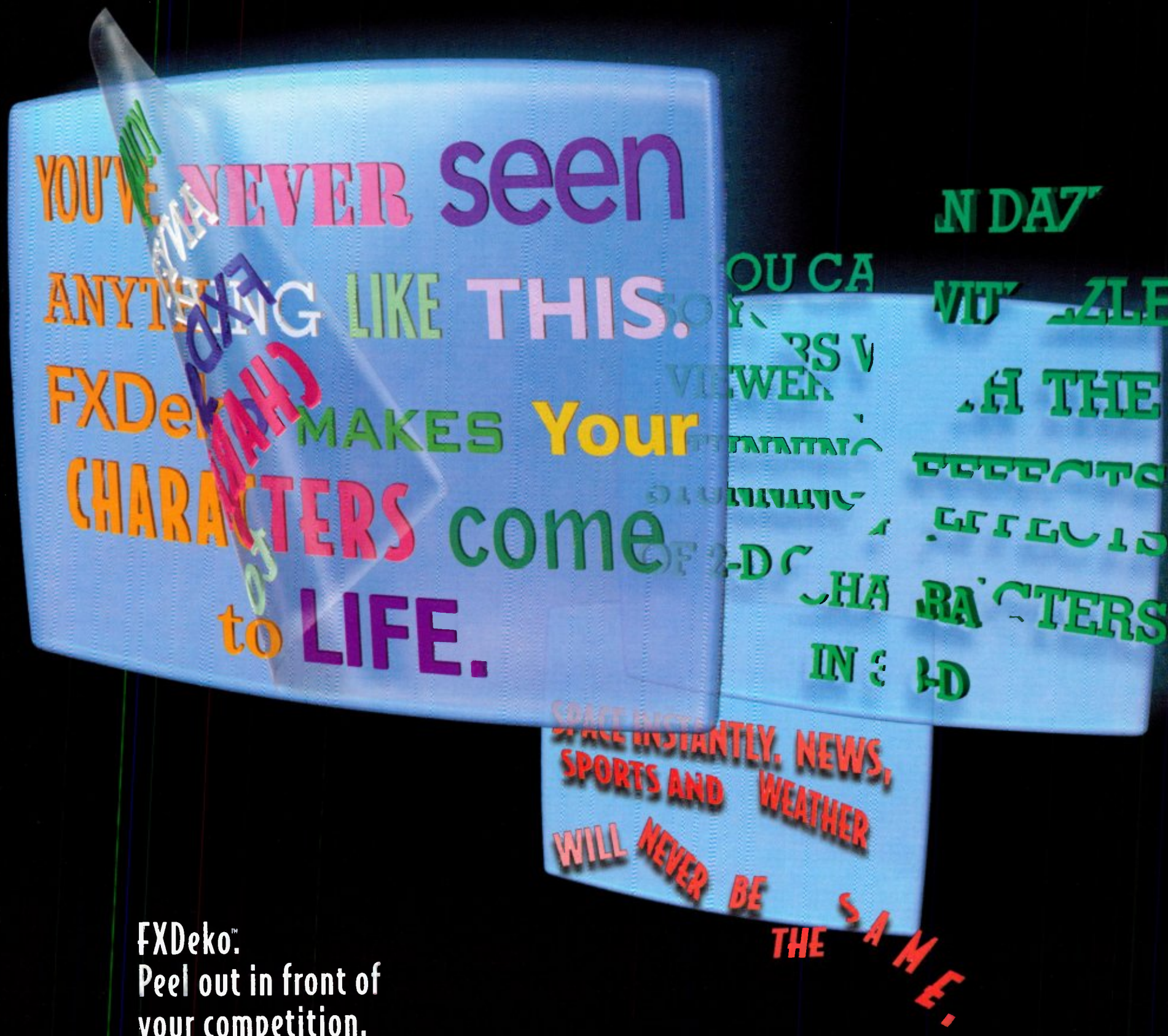

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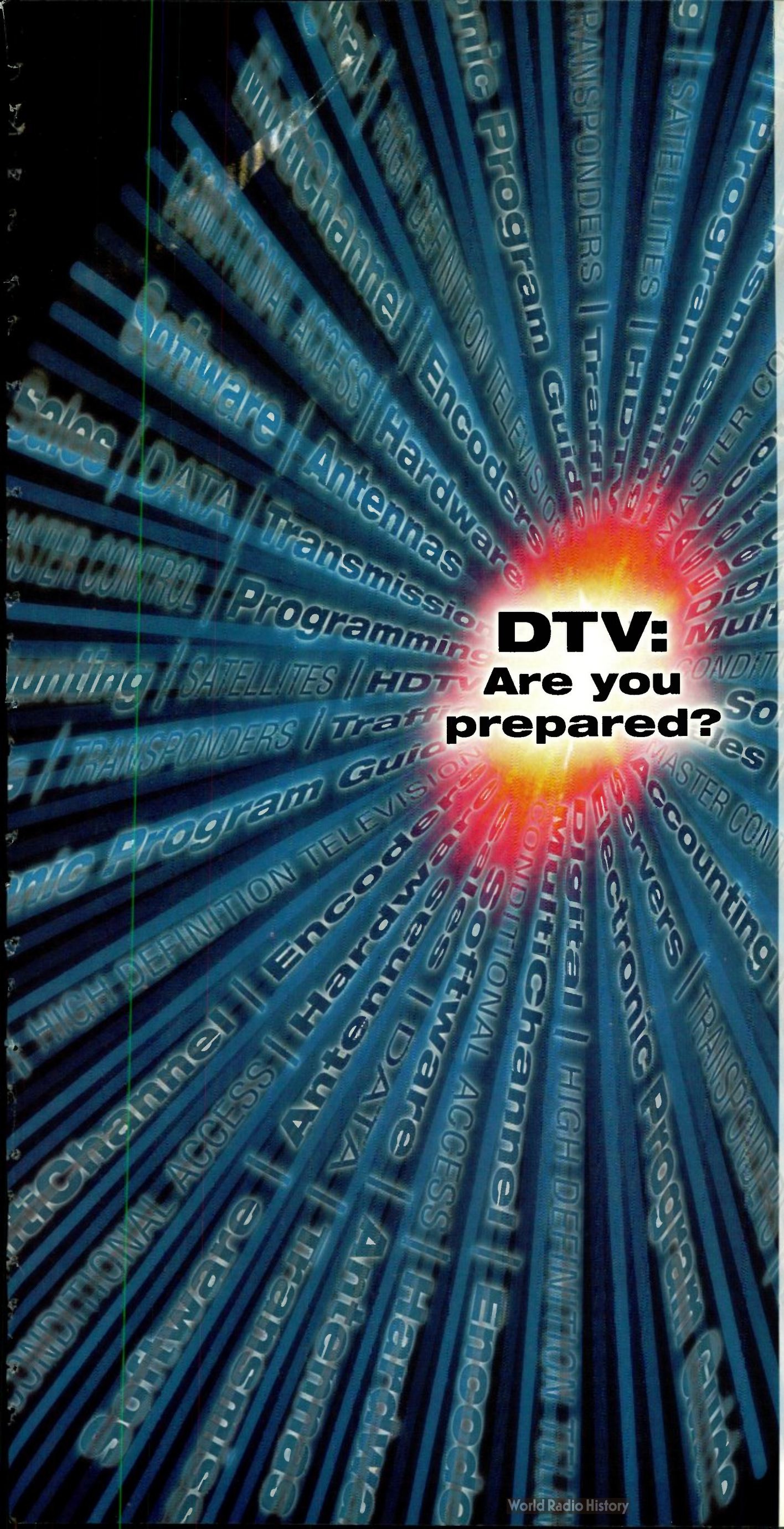

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WTHR HDTV Football Broadcast Splits The Uprights

Station overcomes technical challenges to bring game to Indy

By Ken Kerschbaumer

A Sony HDTV camera in action on the 35-yard line (left).

WTHR Indianapolis recently brought HDTV to viewers in the Indianapolis viewing area courtesy of an HDTV broadcast of a college football game between Notre Dame and Purdue.

The NBC affiliate broadcast an over-the-air HDTV signal from its Sigma transmitter to four local Ovation retail stores. An invitation-only crowd at the Indianapolis Vogue Theater also watched the game on a variety of projection, CRT monitors and plasma screens.

WTHR-TV Director of Engineering Al Grossniklaus says the experience was a success and, more importantly, allowed the station to show that it's possible to do an effective football production with only five cameras and graphics created on existing 601 equipment.

"We talked during the game about how it felt like we were doing a sports production 20 or 25 years ago," recalls Grossniklaus. "There isn't a lot of equipment available yet so we really had to let the pictures tell the story, just like in the old days."

The old-school approach, however, was a hit with some of the viewers. "Those who watched the broadcast said it was great because they actually felt like they were at the game. There were no fancy graphics or bumpers constantly bombarding the viewer and they actually appreciated that."

Working on the project along with the station personnel was HDVision, supplier of the production truck and equipment and Global Broadcasting Corp. who handled transmission from the stadium to the station.

The project started taking shape in midsummer when the station, after talking with several organizations, retailers and Thomson Consumer Electronics (which is located in Indianapolis), decided the game would be the perfect event to show off HDTV's capabilities to the public.

Customers in the Lafayette, IN, Ovation store watch the game 48 miles from the WTHR DTV transmitter (above); and station engineers check out the game at WTHR (right).

WTHR then began working with sister station WBNS Columbus, OH, (who had its own similar HDTV broadcast of the Ohio State/West Virginia football season opener on Sept. 5) on the technical aspects of the broadcast and then brought in HDVision (who provided the HDTV production trucks) and Global Broadcasting (which helped out with transmission) to help fill in the gaps. Next onboard was Ovation, a local retailer, that set up HDTV demonstration areas in four stores to let the public get a glimpse of HDTV. The broadcast also was a perfect opportunity to show off the station's Harris Sigma transmitter and Lucent HDTV encoder.

With the event successfully behind him Grossniklaus has one thing to say regarding HDTV: "It'll sell itself."

The station did as much as it could beforehand to ready the stadium and the station for the broadcast. The station was wired on Tuesday and the decoding equipment arrived on Thursday and Friday, providing what Grossniklaus called "the biggest problem."

On Friday the station did a satellite test and the truck, which was built in Europe, is set to handle video at 60 frames per second. Unfortunately, the Lucent encoders are looking for 59.94 frames per second. "The test went pretty poorly because the video wouldn't lock up to the truck," recalls Grossniklaus. "We realized it was a conversion problem and we used a Snell & Wilcox digital frame synchronizer that would input at 60 frames and output at 59.94. The thing is we didn't get it in hand until Saturday morning at 11:30 and the game started at 1:00."

The crew was a little surprised at the problem because earlier in the month when they were working on the Ohio State game for WBNS the WBNS Lucent encoder worked at the 60 fps rate. Just in case, the WBNS Lucent encoder was brought in as a backup.

Shooting the game itself turned out to be relatively simple according to Grossniklaus. It was a five camera shoot with five tape machines onboard the truck: three Panasonic D5 machines joined by two Sony HD-CAM recorders. A Chyron Scribe was also in the truck, alongside a small Sony switcher.

"The switcher had just a few mix/wipe type effects and a keyer to be used with the Scribe," explains Grossniklaus. "The truck is pretty rudimentary for what it has."

In today's sports broadcast environment graphics often define the telecast but WTHR made use of its existing 601 post and graphics facilities to produce the graphics ahead of time.

"We put baseball-card type graphics of the players on a piece of HDCAM tape before the game," says Grossniklaus. "We have a couple of Sony 550 cameras that can shoot in 16x9, so we did a bit of that and then did the graphics on our DPMax. We edited those on our 601 edit suite that has a Grass Valley 2200 switcher and a Tektronix VIP editing system. The last step was upconverting the graphics to 1080i resolution with a Snell & Wilcox upconverter. The graphics and video upconverted pretty well and we did a couple of bumpers that way also."

Grossniklaus adds that it was obvious when looking at the upconverted material that it wasn't HDTV material, but the station worked around the difference in quality by defocusing the video a bit as an effect. "Defocused video looks the same whether it's HDTV or NTSC, so it was an economical way to get the graphics done."

The transmission part of the equation was also pretty simple, according to Grossniklaus. "We used the Global Broadcasting encoding equipment to feed the 45 Mbps HD signal via 70MHz IF to our satellite truck. The transmission from the stadium to the station was the easy part as we modulated our standard uplink and exciters with the 70 MHz if signal and downlinked it at the transmitter and Vogue theater. The signal was decoded to RGB and then fed it into a YEM analog component to serial digital encoder, then fed to a frame synchronizer and then into the Lucent encoder."

On the reception end things went very smoothly, according to Grossniklaus.

The only technical challenge was that the decoders being used were from various manufacturers and that the buffers within the decoders had different audio delay characteristics. But with a little tweaking that problem was smoothed out. ■

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DVE Manufacturers See The Big Picture

16:9 capability, greater integration find larger role in helping DVEs ready for HDTV demands

By Edmond M. Rosenthal

Digital video effects are moving rapidly into their own "more" generation. Observing greater use of DVE systems, manufacturers are offering more of everything—more integration with other devices, more tools and more economy. Additionally, they're beginning to develop products for the HDTV marketplace.

Where digitally transmitted TV is concerned, the move to 16:9 aspect ratio has been a no-brainer. Adolpho Rodriguez, director of marketing for Snell & Wilcox, points out most current standard definition DVEs support 16:9 as well as 4:3. For high-definition, though, the challenge was higher pixel density and faster processing time.

Snell & Wilcox' Magic DaVE offers a switcher and DVE.

"We're now dealing with five times the amount of information," Rodriguez explains. "You've still got to process the video in realtime, so more computational power and higher bandwidths are required. This has been a challenge in the new breed of DVEs but not an insurmountable one."

For Snell & Wilcox, the approach of combining a switcher and DVE, used in its Magic DaVE product, has migrated to its new line of three HD production switchers. Each switcher has a migration path to an internal DVE, with the DVE controls already in place. The two larger switchers each can accommodate two DVEs. While shipment began in October, the DVE plug-in boards that go into the switching mainframes were not yet available. They were to be introduced at the next NAB exhibition and available shortly thereafter, Rodriguez notes.

He holds that the combination of the two technologies simplify overall control and integration of effects. For example, he explains, users deal with only one timeline instead of two. The three HD switchers sell for between $80,000 and $270,000, but Rodriguez says prices will come down as the market becomes more competitive.

A pioneer in the HD area with its introduction of the HDME-7000 high-definition multieffects system at the last NAB exhibition, Sony Electronics also sees a future price reduction. Ron Naumann, marketing manager, production and editing systems, asserts, "Our focus is trying to bring cost of entry down with continued product development. You can now buy a high-definition camcorder for the same price a Digital Betacam cost five years ago. We want to achieve that in both high-definition switchers and effects."

The HDME-7000 was modeled on the DME-3000 and DME-7000 digital effects systems and Naumann says the main challenge was manipulating the 1.5 gigabit data stream in realtime. Also, he notes, the filtering and interpolation had to be faster.

"With switchers, DVEs, cameras and tape machines," he points out, "we're trying to offer customers the same tool set they've been accustomed to in standard definition. In DVEs, this means the same capability to manipulate an image. We're always balancing cost vs. performance and there are some constraints in what the market will bear."

He indicates that most of these cost-based limitations will be subtle. One example is limitation in the degree to which a picture may be warped. The first users of the HDME- 7000 are Laser Pacific, Los Angeles; American Productions, Seattle; and National Mobile Television, which has it in an East Coast mobile unit used for sports coverage.

Meanwhile, other manufacturers are satisfied for now with 16:9 capability. Mark Sanders, CEO of Pinnacle Systems, speculates, "As digital TV takes hold, there may not be enough of a distinction to go to HDTV." He reports his company's half-dozen DVE systems are all capable of 16:9 as well as either progressive or interlace scan.

"We've had very few requests for high definition," Sanders notes, "and it's been mostly for experimentation. People just want to know that we're working on it. All of our next generation architecture will be scalable and resolution-independent. We can do this because all of our products are computer-based, open-architecture systems."

Similarly, Helen Shortal, director of marketing communications for Scitex Digital Video, says current architecture for all products supports 16:9 aspect ratio as well as 4:3 in ITU 601. She indicates Scitex is waiting for the HD marketplace to shake out. Although she declines to specify DVE product plans in HD, she advises, "Look for something at NAB '99."

Greater Integration

While DVE manufacturers have varying views on how quickly they should place their bets on HDTV, there's unanimous agreement that integration with other capabilities will continue to pay off. A recent example at Scitex is the Abekas 8150 switcher, which integrates a twin channel of DVEous effects, allowing either two video streams or video along with a key signal and full bandwidth dropshadow.

"We're very interested in integrating the technologies among our various products," Shortal says. "This includes bringing Abekas-calibre digital effects into workstation solutions." She adds that the Sphere nonlinear editing system has a DVEous board and that the company will continue to develop high-level DVE functionality into workstation products.

At Pinnacle, Sanders says, all video products for broadcast not only interface but have controls that are totally integrated, using standard computer protocols. They are also networkable, he adds, allowing users to call up a DVE from a remote location or vice versa. While Pinnacle sells a range of standalone DVEs, it also sells realtime special effects to manufacturers of nonlinear editing and broadcast production products as well as to systems integrators.

Sanders says the post-production field is clearly moving toward integrated equipment. He adds that more functions are becoming standard in Pinnacle's DVEs, such as touch-up paint, still store, color correction, chromakey, character generation and input routing. While these software options are becoming more popular in post production, he notes, TV stations still prefer dedicated hardware. "If one piece fails, you're still on the air," he explains. He adds that stations tend to have more specialized equipment operators.

As Sony adds new tools to DVEs, many are to handle functions generally performed elsewhere. One example offered by Naumann is six-vector color correction. He notes some switchers also may provide color-correction capability but this keeps the switcher from performing other functions just to feed a signal to the DVE.

As for limiting color correction to the film-to-tape transfer system, he comments, "More people are acquiring electronic cinematography and are processing things that were never done in film. And there's more of a tendency to fix things in post production. If you only have to fix a few things in color correction, you can easily do that in post."

Sony's most recent step toward integration was with the HDS-7100 series of switchers, first shown at the ITS meet. They will have a single channel of HDME built in, with the economy of a single chassis and greater integration of control.

Saving Labor

Another economy concern being addressed by DVEs is economy of labor. Scitex's new OrbitalFX takes this into account by departing from the typically used keyframing approach, which Shortal says can be very intricate when dealing with repetitive motion. She says OrbitalFX automates creation of repetitive effects by attaching an effects parameter, such as a light source, to an oscillating wave so that a form of perpetual motion is established.

OrbitalFX, a feature of Abekas' newest DVEous software, DVEous Version 6, recently finished beta testing and began shipping in October. Shortal says, "New software like this has a wide range of possibilities that animators will discover." She notes editors attending IBC used their hands-on time to come up with texturing approaches and find means of lighting titles quickly.

Progress in 3D effects is reported by Pinnacle's Sanders. He states, "DVEs, up until now, have been 2D devices that artificially make it look like 3D. Our next generation will be true 3D, where you can rotate multiple 3D objects in space, in real-time." Pinnacle's forerunner product, introduced at IBC, is FX Deko, which recently began delivery.

He also forsees a move to smaller, easier-to-use, lower-cost DVEs. While current DVEs are at the board level, he says the next generation will be at the chip level.

"People will be able to use them for activities where you'd never think of tying up a DVE," Sanders asserts, "like having four 3D effects machines on a small switcher." He notes such products could be available in the next 12-24 months. He declines to predict prices, except to say, "Every time we get the size down, the price is halved." ■

DTVQUICKINFO

For more info. on the companies mentioned in this article please call

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DVE ROUNDUP

Fast Electronic

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Video Machine also has more than 50 import filters for anti-aliasing, drop shadows, transparency levels, color correction, keying and more. *Contact Fast Electronic at (800) 249-FAST or visit www.fastmultimedia.com.*

For more information circle Reader Service #222

For.A

The MF-3400 is a modular architecture fully digital DVE designed to be capable of either dual-channel operation (VPS-310T3D option) or performance of preprogrammed advanced 3D effects patterns (VPS-310EX). Two line inputs and outputs, plus two key I/Os are all 10-bit. Internal 4:2:2:4 processing is 10-bit and preprogrammed and ready-to-use effects such as tile, ball, swirl, lens and more are included.

The MF-3300/P offers a wide range of functions. Serial digital component I/O, 4:4:4:4 serial digital component processing and two different control OUs are available along with manual or touch screen operational control. It has two video line inputs/outputs, two key inputs/outputs (all 10 bit), plus 12-bit internal.

The MF-310/MF-300P lets users swiftly access ready made effects presets or program proprietary video effects productions. It has a full range of 3D effects such as 360-degree rotation, perspective, trails, lighting effects and commonly demanded 2D effects. *Contact For.A at (714) 894-3311 or visit www.for-a.co.jp.*

For more information circle Reader Service #223

Pinnacle Systems

First from Pinnacle is AlladinPro with digital video processing on up to two DVE channels. The channels each have an associated key channel and all the standard DVE functions are included: rotation, perspective, placement, sizing, cropping, axis placement, target manipulation, skew, global channel manipulation, edge alignment and solid builder.

Next is DVEXtreme, using an open platform design, to make 3D digital effects production easy, fast and affordable for broadcast and post-production environments.

DVEXtreme's powerful 3D effects engine performs rotation, perspective, placement, sizing, cropping, axis placement, target manipulation, skew, global channel manipulation, edge alignment, and cube/solid builder. *Contact Pinnacle Systems at (800) 4PINNACLE or visit www.pinnaclesys.com.*

For more information circle Reader Service #224

Play

Play's Trinity includes Warp Engine, allowing for the duplication of any visual effect, according to Play. It also offers the ability to map live video onto multiple arbitrarily complex user-defined 3D animating objects, with colored highlights, true video reflections, photo-realistic texture maps, variable transparency and soft shadows. Based on exclusive custom chips invented at Play, the Warp Engine is a parallel video geometry engine capable of manipulating live video streams into stunning visual effects.

Trinity also performs all 2D effects with perspective and creates realtime 3D effects with live video mapping on animating user-defined objects such as logos, products, or even human faces. *Contact Play at (800) 306-PLAY or visit www.play.com.*

For more information circle Reader Service #225

Scitex Digital Video

Scitex DV's Dveous family of digital video effects systems offer a twin-channel architecture that can be used in a dual-video or a video-plus-key configuration—along with a full-bandwidth drop shadow. A second twin-channel can be added, providing four fully independent video or key channels (eight independent video or key channels with Brutus). Dveous features include OrbitalFX, Surface FX, SuperShadow and UltraWarp. SurfaceFX provides textures and light sourcing effects on each channel. SuperShadow provides independent control of all transforms and warps, allowing drop shadows to be transformed independently of the main video image. Other effects include quad splits, cylinders, rings and swirls.

The two newest members of the Abekas Dveous family of digital video effects systems are the Dveous ADVE5000, a mid-range effects system targeted to broadcasters, and Version 6 software for all Dveous effects systems.

The Dveous 5000 is a high-quality 10-bit DVE for broadcasters who want to increase the production values of their sports and local programming. It includes exclusive Dveous features like instant Slab Builder and SurfaceFX textures and 3D light sources, offering cost-conscious broadcasters a new level of creative capabilities, according to Scitex.

Version 6 Software with OrbitalFX is for all Dveous systems. OrbitalFX is a revolutionary new method of effects creation that supports live interactive use. *Contact Scitex Digital Video at (888) 846-7017 or visit www.scitexdv.com.*

For more information circle Reader Service #226

Snell & Wilcox

The Magic DaVE 4 series is a range of compact, powerful, easy-to-use switchers/DVEs. Versions are available for either analog, composite and component or digital input/output. With analog component inputs, both 525 and 625 operations are supported in the same equipment and an option card provides additional inputs as well as extended wipe patterns and trails & sparkle effects. Housed in only 2U of rack space and with a compact user controller, Magic DaVE 4 series are ideal for outside broadcasts, newsrooms and sports applications as well as post-production suites. Features include Dynamic Rounding, two-sided page turns in a single channel, warp effects, shading and lighting effects.

Magic DaVE 8 is an eight digital (8D) or eight analog (8A) input switcher Magic DaVE Digital effects. It has 100 wipe patterns, two chroma keyers, powerful video effects, Dynamic Rounding and two-sided page turns from single source. Effects include dual and slab effects, warp effects, shading and lighting and trail and sparkle. *Contact Snell & Wilcox at (408) 260-1000 or visit www.snellwilcox.com.*

For more information circle Reader Service #227

Sony

The DEP-100 Digital Effects Processor is a compact digital video effects unit offering a mix/effects switcher/Digital Multi Effects and a Downstream Keyer (DSK). It can enhance cut editing by performing A/A roll effects from a single source video and also adds titles, captions and logos with the DSK.

The DFS-500 provides flexibility covering a wide range of applications from simple editing to complex image creation. All internal signals are processed in the digital component domain for high-quality component video editing. More than 300 2D and 3D curvilinear effects are standard and an optional trail, lighting and effects board can be added.

The HDME-7000 Digital Effects Processor is Sony's first high definition DME and is a partner for the HDS-7000 High Definition Production Switcher. The DME-7000 is designed for high-end live production as well as post production applications. It supports multiple standards 1080/1035 line 59.94/60Hz and 16:9/4:3 and has a wide range of 2D and 3D effects, creative light and shadow effects, dual-channel processor and digital effects processor. *Contact Sony Electronics at (800) 686-SONY or visit www.sony.com/professional.*

For more information circle Reader Service #228

Tektronix

The DPM-700 offers an array of transforms to choose from. Standard functions include the ability to change a picture's size and shape, variable expansion and compression, spin, skew, plus location and multi-axis rotation of moving or frozen video images as well as variable motion paths. Non-transform effects include posterization, solarization, mosaic, defocus, freeze frame, freeze field, forced monochrome and false coloring.

The basic system consists of a single channel with an A/B input selector. A second channel can be added to either process video or a key signal associated with the first channel.

Also from Tektronix is the Krystal 4300 Digital Effects System. Powered by Grass Valley 10-bit digital image processing and video enhancement technologies, Krystal 4300 is adaptable to a variety of multi-user, multi-channel configurations. *Contact Tektronix at (800) TEK-WIDE or visit www.tek.com.*

For more information circle Reader Service #229

Videonics

Effeto Pronto is a compositing and effects creation software bundled with a dedicated PCI hardware accelerator card that provide instant feedback and super-fast rendering. It's resolution independent and proprietary image processing pipeline architecture allows users to composite an unlimited number of QuickTime video and graphical elements in any resolution. Central to the Effetto software application is the Composition Editor, a powerful keyframe-based time-line compositing interface. *Contact Videonics at (408) 866-8300 or visit www.videonics.com.*

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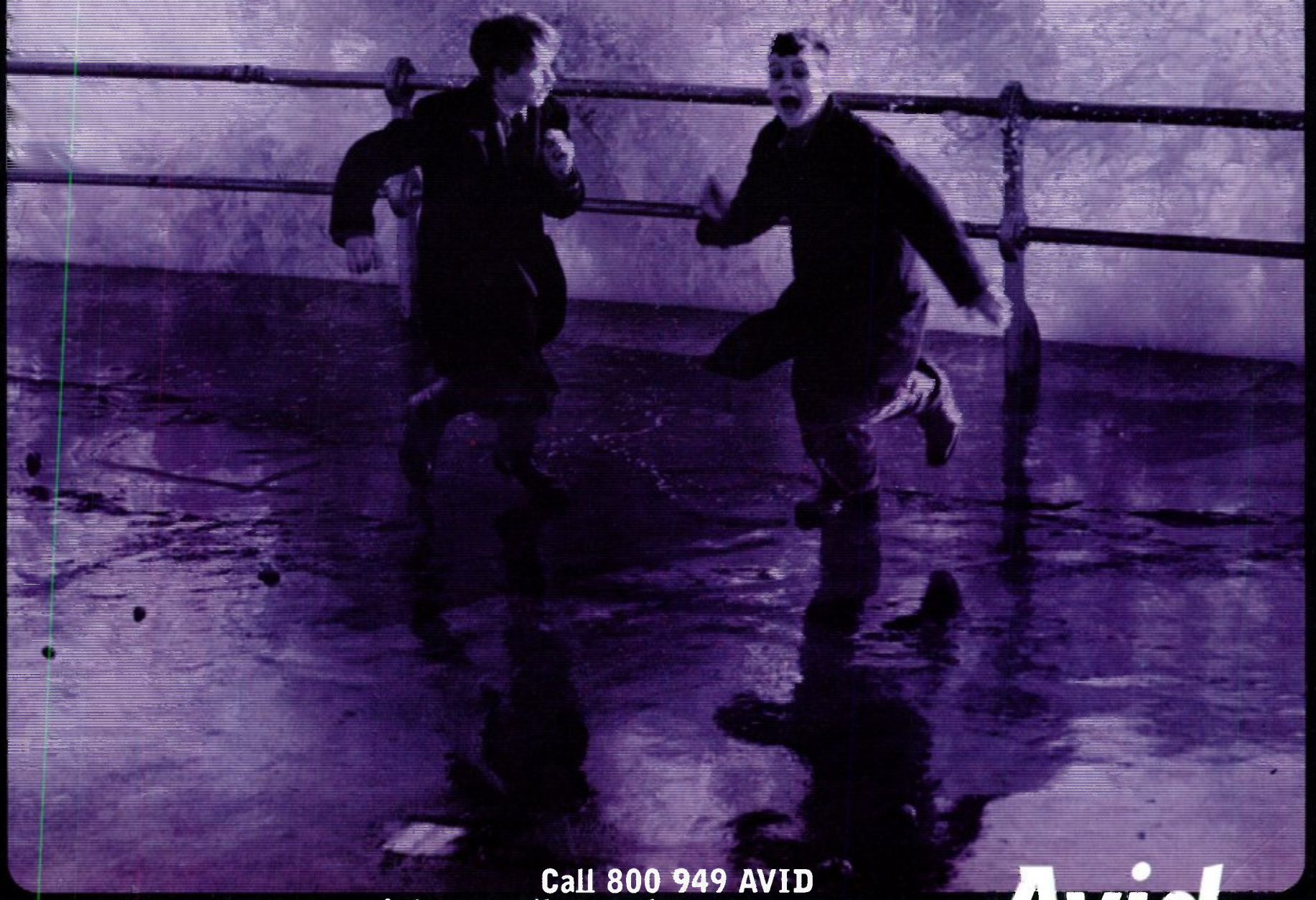

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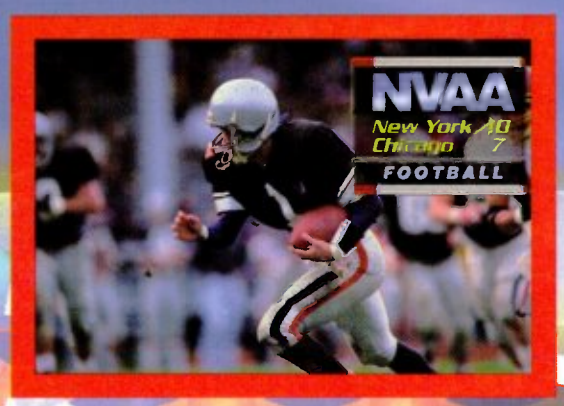

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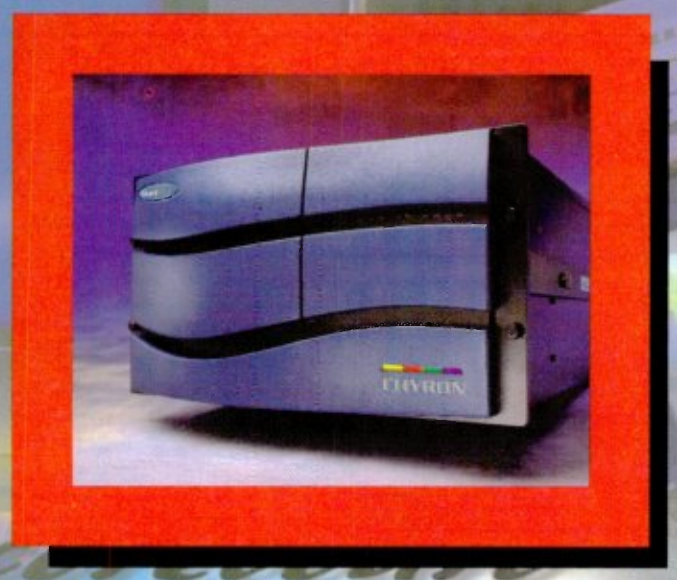

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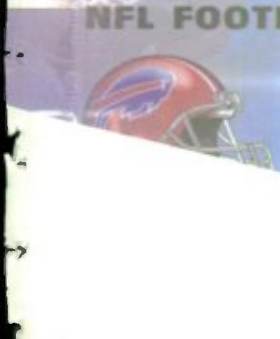

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More Information Circle 102

STILL STORE ROUNDUP

Accom

Axess can record and play realtime clips as well as traditional still graphics. Clips can consist of any combination of realtime video, audio or key elements. Video and keys are stored in full-bandwidth CCIR 601 component digital 4:2:2:4 format, while audio is full resolution AES/EBU digital.

Axess can recall any size clip or still typically within 0.5 seconds, with most operations dedicated to hard keys or soft keys in single-layer menus. Play lists are easy to create and edit, and clips can be played to air in two basic modes. An extended control panel (ECP) allows the user to add titles, keywords and other fields of text information to each still or clip of every node on an Axess network.

The smallest Axess system consists of a single node with storage for 1,000 stills. This basic entry-level system includes one on-air panel and has two video input/output channels for a single user.

Multi-user Axess systems are based on a network of interconnected "nodes." Each local node supports one user and can have up to four video plus key input/output channels with two AES/EBU stereo audio pairs per video channel. Nodes can be added at any time for additional users on the network (up to 32). *Contact Accom at (415) 328-3818 or visit www.accom.com*

For more information circle Reader Service #231

Avica Technology

The Vecta still store incorporates new DTV standards, high-resolution video and HDTV formats. Based on a Windows NT platform, Vecta performs as a standalone or networked workstation. Its search engine accesses images from centralized and distributed storage and the Vecta asset management system server features workload distribution capabilities for multi-room facilities and projects. *Contact Aveca Technology at (818) 846-0589.*

For more information circle Reader Service #232

Chyron

Imagestor provides high-speed recall of stills , DDR control for video backgrounds and sequencing of video clips and static images with playlists. Control of the system is available through the traditional Chyron keyboard, the new Winfinit Windows-based keyboard and user interface and the dedicated Chyron Imagestor remote recall panel. To provide the necessary flexibility of fitting into any production environment, Imagestor operates in a variety of configurations. It can be added as a software option for any Chyron Infinit, Max and Maxine graphics generator systems, as a single-channel standalone version or, for more advanced still store needs, Imagestor II and III dual-channel/dual-user systems that include dedicated key signal per channel.

The Chyron Aprisa 100 still store is an NT-based scalable, realtime playback system for stills with complete database management that offers flexibility and style to compose, catalog and recall still images. The open platform provides fast and easy connectivity via Ethernet to most SGI, MAC, PC workstations, and any Infinit family system on the network.

The Aprisa can control and track clips on a separate, external Chyron Aprisa 200 DDR via Ethernet, or it can even be upgraded to have internally integrated full-motion video clips plus key and eight channels of audio, all with database management.

Contact Chyron at (516) 845-2000 or visit www.chyron.com.

For more information circle Reader Service #233

Digital Processing Systems

The DPS V-Clips system can record realtime, full-frame video and synchronized audio. All of the recorded video clips and still images are instantly accessible through a visual database and keyword search engine. Each V-Clips system includes the rackmountable Windows NT system control unit, a remote shot box, Image North VideoCarte software and an internal video storage drive. Additional external drives can easily be added as storage needs dictate.

Contact DPS at (800) 775-3314 or visit www.dps.com

For more information circle Reader Service #234

Leitch

The Leitch approach to still storage has been to tailor the Still File to suit the area in which it will be used. For example, the DSF-3114-DF dual-format Still File is designed for a mixed NTSC/4:2:2 graphics environment. The 3121FB, a serial 4:2:2 component frame buffer, is for archiving the output from a paint system, while the 3112FB, a composite NTSC/D2 frame buffer, is for the airing of stills for newscasts or station breaks.

The DSF-3112N composite Still File offers both analog NTSC and digital D2 inputs and outputs. For highest quality, stills may be recorded as four-field color frames. An effects package adds many powerful presentation features.

The DSF-3120 component Still File is ideally suited for general purpose storage and management of digital component images in areas such as graphics suites. It can be configured for 4:2:2 or 4:2:2:4 operation and both 525 and 625 line standards.

To create a powerful still sharing environment, all members of the Still File family, regardless of video standard, may be connected with a high-speed Ethernet data link. *Contact Leitch at (800) 231-9673 or visit www.leitch.com*

For more information circle Reader Service #235

Pinnacle Systems

Pinnacle's Lightning still store lineup offers up to three independent hardware channels, each providing video and key, and is offered in Digital (601) and Digital plus Analog configurations. Supported analog formats are composite, Y/C, YUV and RGB. Analog inputs and outputs can even be different formats, and component digital video and key outputs are provided simultaneously with the analog outputs.

The Lightning system uses non-compressed 4:2:2:4 digital video to deliver broadcast-quality images. Lightning lets you recall and play video images in less than half a second, plus you can instantly place and size the image, add borders, a drop shadow, and rotate it with 3D perspective. There are three products in the lineup:

The Lightning 100 family gives you all the features of the Lightning 500, with high-end image management, image import and cataloging, and still image playback.

The Lightning 500 can hold up to 3,000 stills internally, with additional capacity available across your network. The Lightning 500 family has up to two active hardware channels, with independent multi-channel operation. Each of these channels gives you video and key I/O, along with independent transitions.

Lightning 1000 offers recall and play of video images in less than half a second locally and in less than one second over external servers on an idle 100BaseT network. It also has support for over 40 different file formats.

Contact Pinnacle Systems at (800) 4-PINNACLE or visit www.pinnaclesys.com

For more information circle Reader Service #236

Quantel

Picturebox 2 can operate either as a standalone, single-user, two-output still store, or as a building block in a multi-user, multi-output environment. It offers versatile picture search routines from its online 4,000 picture store and any other connected storage, with super-fast recall and uncommitted stack building. Preview/main outputs give on-air confidence and Picturebox 2's ability to amend running orders right up to the moment of going to air means that broadcasters can respond to rapidly changing events on-the-fly. Picturenet Plus offers seamless background networking with Paintbox, producing an unbeatable stills and graphics combination for every aspect of on-air presentation.

Pictureframe is an intelligent framework within which broadcasters can configure custom, but highly cost-effective, stills and graphics systems based on Quantel's industry-leading Picturebox still store.

Contact Quantel at (203) 656-3100 or visit www.Quantel.com

For more information circle Reader Service #237

Scitex Digital Video

Clipstore offers video recording and replay in uncompressed 10-bit CCIR 601 quality, Shot Box for single button record and playback of stills and clips, a GUI using standard Macintosh, multiple frame store outputs and mix effects and video and key sizing and positioning. Clipstore captures each still and every frame of a video clip and has enough storage capacity for up to 1,800 stills in 525/60 or 1,580 stills in 625/50, and up to 32 categories can be defined by the user.

The QuickStore database software manages all the clips and stills, and offers media capture, search, archiving and browse capabilities. A combination of stills and clips can be added to a transmission playlist for presentation from either the Shot Box or the graphical interface. The playlist screen displays the current playlist together with information about the item, transition type, duration and sizing. *Contact Scitex Digital Video at (888) 846-7017 or visit www.scitexdv.com*

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Audio Post Consoles Getting Smaller, Faster, Better, Cheaper

By Dan Daley

The mantra of smaller, faster, better, cheaper has become endemic to any high-tech industry in recent years. But audio consoles have felt this philosophy's impact considerably, especially since the beginning of the 1990s, when a revolution in music-recording technology transformed professional audio from a cottage industry into a consumable commodity.

In the mid-'90s, cost-effective yet powerful recording, editing and mixing systems became available at a tenth of the price or less of the digital audio workstations that characterized post production in the mid-'80s. In addition, audio post itself was propelled by the proliferation of cable and satellite channels, which were omnivorously consuming new and refurbished content at an ever-increasing rate.

The television broadcast industry could not remain immune from this phenomenon for long, and cost-effective consoles from a plethora of manufacturers and of a huge variety of types, capabilities and configurations have become commonplace in broadcast facilities that do their own editing. The common factor these less expensive systems share is that they are either digital or digitally controlled consoles, a demand partially based on the impending arrival of digital television broadcasts and its concomitant 5.1 surround audio components. It is also a reflection of the fact that digitally based technology tends to be inherently less expensive than its large-scale analog counterparts.

A Good Example

CBS Cable in Nashville (formerly Opryland/TNN Productions prior to its acquisition by CBS earlier this year) is a good illustration of how studios have used post production audio console choices as the basis for transitioning operations from a completely linear, analog domain to what most expect will be a completely nonlinear, digital mode in the next decade. In the intervening years, there will exist a hybrid of the two.

At CBS Cable, the spectrum seems completely covered: Fully digital Neve Capricorn consoles are in the company's remote truck and digital online bay. Digitally controlled Harrison 10-B consoles handle linear analog work. And fully digital Yamaha O/2R mixers—which at around $10,000 cost less than 5 percent of the Capricorns—are interfaced with Sonic Solutions workstation systems.

"The dilemma we faced a few years ago was that we knew that our workload was escalating, that the industry was moving towards digital, but that we would have to work with linear analog media and equipment for a long time to come," recalls Tom Edwards, CBS Cable's post production supervisor. "We also knew later, after the sale to CBS, that we would be in this facility for another five years, then move onto another facility. So the answer was to build a hybrid facility. We feel this positions us well for what's going to be a very interesting and probably difficult transition."

The line between console capabilities for TV post production and audio post continues to get smaller.

Edwards says the advantages to the multi-million-dollar investments that the company made in the last few years in consoles and other gear were worth it, particularly in terms of keeping both its post production and on-air engineering staff ahead of the learning curve, as well as ahead of the FCC's own specifications for DTV, including surround audio.

"A lot of consoles that are being marketed as broadcast consoles are more correctly regarded as music-mixing consoles that are adapted to either post production or even on-air work," says Edwards, agreeing that the Capricorn fits that description rather well. "Not all of them were designed to handle the kind of 24-hour pace in terms of operations that broadcast demands. Even in post production, broadcasters need things turned around much faster, with changes and edits in the same programming on the same day. When the O/2R came through here the first time about 18 months ago, it was pitched to us as a post-production console that would work for broadcast. But it wasn't really a post console of any sort at the time."

The result, he says, is a cost-effective console that Edwards and other facility audio supervisors expect will increasingly become a part of the broadcast post landscape.

"There'll always be a need and a place for large, dedicated consoles," he adds. "But small digital ones will be a big transition trend in broadcast in coming years."

Large Consoles

"Transition" is an often-heard term in the console business these days, says GLW/Harrison Marketing Director Steve Turley, and it serves as a euphemism for a range of emotions and ideas.

"People are mostly scared to death of what's coming, because they don't know how far, how fast or how much they'll need to do when," he says. The digitally controlled Harrison Series 12 continues to be the company's flagship for both on-air and post production applications, with the TV-950 covering mid-sized and smaller analoge applications.

The Series 12 offers instant recall of setups as well as a interconfigurable, automated IFB matrix. It was originally developed as a music console but has undergone considerable revamping as a platform, something that other large-scale consoles are also experiencing—including the latest from Solid State Logic, the Axiom MT, which has part of its heritage in the post domain (the Axiom part). It's actively being marketed to music applications, yet the first sale was to ABC television.

Manufacturers will also bring to video post production increasing levels of experience in surround audio editing and mixing. What manufacturers will continue to need is feedback that will allow products and features to address the specific needs of broadcast post. Thus, an element of caveat emptor will increasingly apply.

"Things broadcasters are looking for is the ability to be able to matrix all your communications between everyone in the field and in the station any way you want with instant isolation of any source," says Turley. "That kind of flexibility is becoming increasingly important for broadcast, as is the integration of digital control of analog signals, which is something you'll be seeing more of now that DTV is finally here.

John Sanborn, product manager for Euphonix's broadcast-dedicated CS3100B (a version of the music/post CS3000B console), notes one trend that will affect decisions about consoles for broadcast is not really technical in nature at all—educating clients.

Agreeing that transition is a word that inspires as much trepidation as challenge, he's found that networks may remain on the fence for a long time as they wait for their clients—the advertising community—to decide what it wants in digital audio. Thus, the issue becomes, how will console makers educate the clients of their clients? "You'd think that it would be a dialogue between us and the networks, but the networks tell us that it will be their advertisers that will ultimately drive them into discrete surround audio," he says. "The trouble is, the advertisers think that the only people who can do 5.1 surround audio are the larger [Hollywood] studios."

With expertise being developed by many post facilities (and thus consoles) via DVD, the talent and expertise will likely migrate to broadcast. But manufacturers need to keep in mind that broadcast clients will want their own feature sets along with 5.1 capability.

"The real demand is still for functionality, for which we've added things like electronic switching and router interface capability, full recall of settings and an option for moving faders," explains Jim Peck, applications engineer at Wheatstone.

Convergence

But we may be looking at a convergence of domains in the near future.

"DTV has had little or no effect on our thinking," observes Joe Bean, Studer's national sales manager. "The film and post industries are the ones that use the most resources on a console, and we've found that whatever they require eventually trickles back to broadcast."

Amplifying that, Alan Martin MacLeod, SSL manager for broadcast and post production, adds that a significant trend has been an accelerated movement towards integrated broadcast facilities, where post production and on-air operations can be handled in the same rooms using the same technology platforms.

"That has exploded in recent months," he explains. "I'm spending much more time creating schematics for broadcast that address that type of integration, especially since the imminent advent of digital television in the States. DTV is coming up much faster than many people realize. And once it's here, the trend will be for shared resources and networking. And that means digital solutions."

Martin adds that a secondary trend will be multi-application consoles that can do not only on-air and post production jobs but also are designed so that engineers of different disciplines can use them easily.

"The console is going to be part of the total project management trend," he says. ■

DTVQUICKINFO

For more info. on the companies mentioned in this article please call

800-637-6072

AMS Neve ■ RS#239
Yamaha ■ RS#240
Sony Solutions ■ RS#241
GLW/Harrison ■ RS#242
Solid State Logic ■ RS#243
Euphonix ■ RS#244
Studer ■ RS#245

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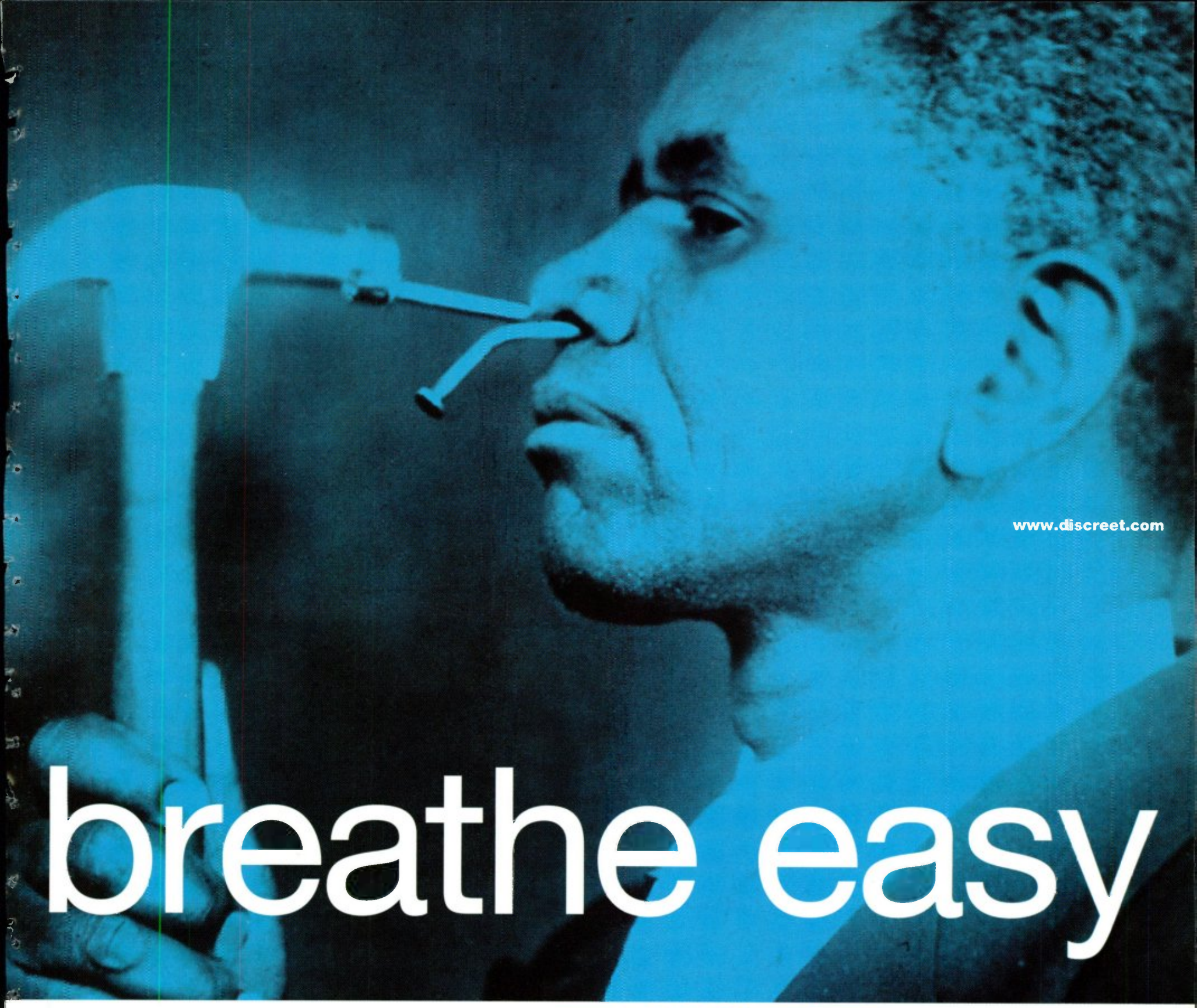

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circle number 106

AUDIO CONSOLE ROUNDUP

AMS/Neve

AMS Neve has just introduced a 48-fader version of its Libra digital mixing console. The console has an additional control sub-layer enabling up to 144 fully-featured audio inputs to be accommodated in a compact 48-fader frame. This new capability makes Libra ideal for large scale audio production of all kinds, but especially those where space is at a premium. The latest Version 2.0 software for Libra features several major feature upgrades including new defaults manager, control screens launched from dedicated hot keys, control screen access via dedicated hot keys and collect touch for "Scene Change" automation. *Contact AMS/Neve at (818) 753-8789.*

For more information circle Reader Service #246

Fairlight

FAME, the Fairlight Audio Mixer Editor, is an integrated system for audio production, combining the functions of a 24-track recorder, a Digital Audio Workstation with full graphical editing and a totally automated digital mixer. FAME is well suited to surround sound mixing for film and television, ADR and Foley recording applications. All signals in the FAME system are digital; the FAME DSP engine is contained

within the MFX3plus hardware to provide complete integration with its digital signal routing capability. Analog inputs and outputs are at 18-bit resolution, disk storage is at 24-bit and equalization and dynamics are performed in 40-bit floating point arithmetic. *Contact Fairlight USA at (800) 4-FAIRLIGHT or visit www.fairlightesp.com.au.*

For more information circle Reader Service #247

Euphonix

The CS3000 is available in a number of configurations for post production. Factory options include dynamics processors, surround sound busses, aux/cue/multitrack/mix bus expansion and master facilities expansion to augment the base system which is scalable from eight to 104 faders. A software package known as MixView operates the hardware in tandem with the engineer. Other features include a color graphics screen, assignable rotary control set, assignable keys and TrackPanner, allowing for track ball control of panning across a surround sound field. *Contact Euphonix at (650) 855-0400 or visit www.euphonix.com.*

For more information circle Reader Service #248

Harrison by GLW

The Series Twelve/MPC console, regardless of frame size, presents a common work surface and user interface. It's available in any configuration of analog or digital I/O, including hybrid configurations. Automation files and setups are compatible between desks and are fully interchangeable. The console is also controlled in traditional input channel-strip format, while allowing maximum interface flexibility. *Contact Harrison by GLW at (615) 370-9001 or visit www.glw.com.*

For more information circle Reader Service #249

Panasonic

The WR-DA7 console from Panasonic offers users 32 inputs with eight busses (with moving faders) along with 24-bit analog-to-digital and digital-to-analog converters. It has a full, four-band parametric equalizer and dynamics located on every channel. The 5.1 surround is also included, as is an automation packages for both Macintosh and PC plus MIDI machine control. It also offers 21 moving faders and 50-scene memory. *Contact Panasonic at (800) 528-8601 or visit www.panasonic.com*

For more information circle Reader Service #250

Sony

Sony's OXFR3 console accommodates up to 120 input sources for mixdown and has full dynamic automation of all parameters. It has multitrack routing to 48 busses, 24 cue/auxiliary send buses, one master and eight independent stereo subgroup outputs and three stereo control room outputs, plus one stereo studio output. Dynamic automation for all controls and modular control surface are also included. *Contact Sony at (800) 686-SONY or visit www.sony.com.*

For more information circle Reader Service #251

Otari

Otari's Advanta is a large-format digital console that offers users two types of modular input selections. First is a fully dedicated module with 96 motorized Whisper-pots or a mapped input section

providing an intuitive control surface with 16 motorized channel faders and 24 rotary controllers. Each input section has a large, quality LCD display for the graphical user interface. One input section can also access the console's 256 input paths. *Contact Otari at (800) 877-0577 or visit www.otari.com.*

For more information circle Reader Service #252

Solid State Logic

Solid State Logic's Axiom-MT is a further development of the highly successful Axiom digital production console originally introduced in 1994. The Axiom-MT has up to 96 channels providing all the traditional SSL in-line features, with every control dynamically automated-including the surround panning on both large and small faders. Users have access to 48 multi-track buses, 12 main mix buses, 12 aux buses and more than 200 mix returns. *Contact Solid State Logic at +44 (0) 1865 842300 or visit www.solid-state-logic.com.*

For more information circle Reader Service #253

Studer

In creating the D950 console Studer has departed from a channel-orientated DSP structure and developed a totally new 'DSP core' which forms the heart of the D950. This allows for greater flexibility in console design and function . The console is fitted with 72 mic/line inputs, 8 AES/EBU stereo inputs, 6 AES/EBU stereo inputs with SFC and 48 channels in MADI optical input link. The operating desk has 24 channel strips with motorized faders and 20 assignable keys for stereo CR monitor source selection. *Contact Studer at (615) 360-0465 or visit www.studer.ch.*

For more information circle Reader Service #254

Yamaha

The 02R features 40 input channels (24 analog and 16 digital), 8 output busses (analog/digital), 16 direct outputs and 8 auxiliary sends. All input channels feature independent 4-band parametric equalization and dynamics for module functionality on a par with top-line professional consoles and the console offers realtime SMPTE or MIDI time-code based recording and mixdown automation without the need for add-ons or modification. In addition all console settings can be stored in snapshots, for instant re-set of every mix parameter. *Contact Yamaha at (714) 522-9011 or visit www.yamaha.com.*

For more information circle Reader Service #255

Sunshine State Cable Execs Keep Eye on Horizon for HDTV

With three markets due on-air next November, cable systems face statewide implementation challenge

By Peter J. Brown

In the next year, the state of Florida will become one of the leading states when it comes to the number of markets beginning digital television broadcasts. Broadcasters in three markets—Miami, Tampa and Orlando—will fire up services by next November.

The large number of broadcasters that will be required to offer DTV services won't be the only ones challenged by DTV technology—so will the state's cable industry.

Anthony Bello, general manager of CableVision Communications, which is part of Denver-based Rifkin & Associates, makes no attempt to hide that he is awaiting more information from broadcasters and regulators alike before he can chart a course through the choppy digital TV waters that lie ahead.

Bello is certain that the key to maintaining his status as a relatively small, independent systems operator is to do whatever it takes to maintain his current growth rate. At present, CableVision in greater Miami consists of 180 miles of plant passing 120,000 households with 62,000 customers. Overall, Rifkin & Associates/CableVision Communications serves 330,000 customers, according to Bello.

"After a two-year upgrade that was completed in June, all of our CableVision plant here is 750 MHz, two-way interactive," Bello says. "Our system is in the best shape of any system in the state. It's incumbent on us to grow the value for our customers, and that's my mission."

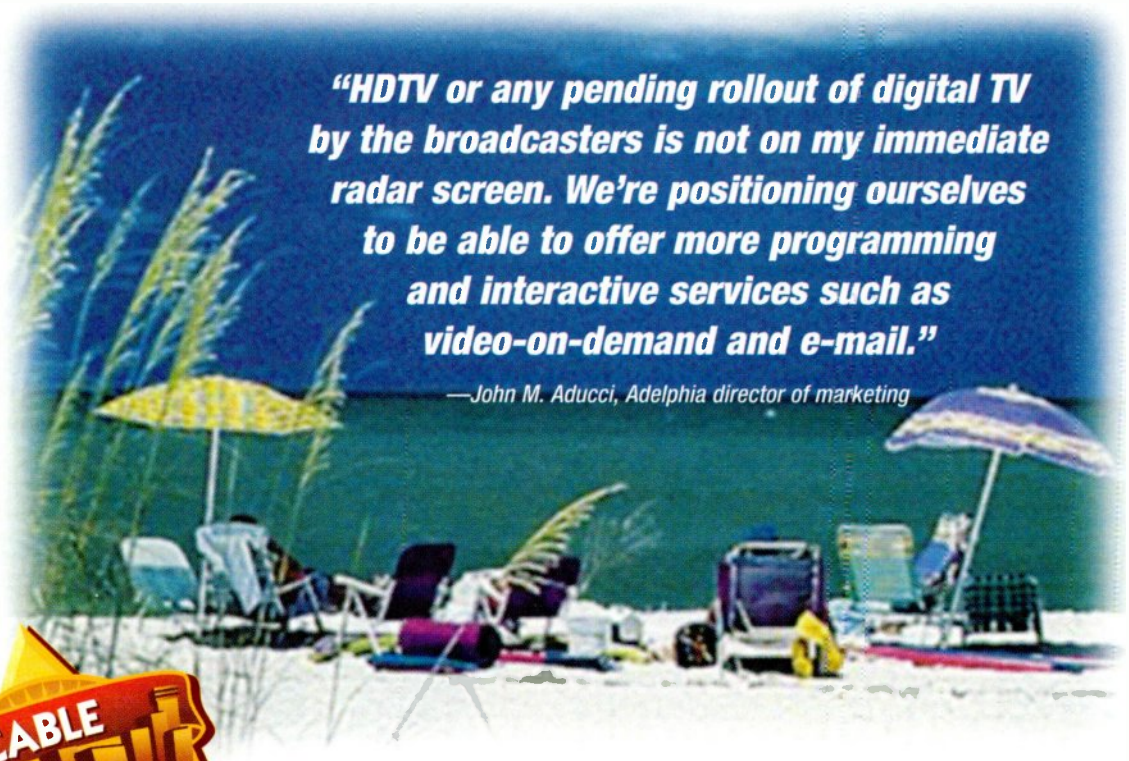
Bello's mission is clear, but the lack of firm details is not making his job any easier.

"At this time, we don't know what the rules are. Besides the fact that we are awaiting how the FCC is going to define must-carry, standards are also a work in progress at the FCC," he explains. "Obviously, we're going to abide by the rules, but as we sit here making plans for 1999, we are in the dark. There are lots of big holes that we're contending with. We're at the mercy of the rule-makers and the legislators."

Bello makes it clear that he sees a need for more dialogue between broadcasters and cable—negotiations that he hopes take place before the FCC makes a decision regarding must-carry.

"We want digital television to benefit everyone: the broadcasters, the cable system operators and, most importantly, the customers," he offers.

There has been some discussion of cable systems offering a digital tier that would include DTV and HDTV services. Customers would pay extra for access to this tier of services, with broadcasters getting a financial share of the profits.



Bello believes that the digital tier approach makes sense, but again, without knowing how the broadcasters intend to proceed, Bello sees his company just sitting on the sidelines and waiting.

"I haven't really heard anything from the broadcasters at the local level, and what little I have heard at the national level is insufficient to make a conclusion," he contends. "The question I face is is the digital tier going to create value for the customer? Or it this merely a moneymaking opportunity for the broadcasters? As a rule, the cable industry tends to react to things rather than get out ahead of anything."

CableVision has engaged in discussions with both Headend-In-The-Sky, a TCI source of digital programming, including PPV and also known as HITS and TVN Entertainment, an L.A.-based facility offering similar services for cable TV operators. But Bello indicates that the lack of support for HITS he detects from cable systems operators is creating some difficulties. He acknowledges that HITS could be encountering the expected headaches associated with the giant task of launching several markets simultaneously.

"We've launched HITS in Tennessee on several smaller systems with 30,000 to 40,000 customers. Our experience has not been good with HITS from the customer-support side thus far," Bello says.

What's the Difference?

As a cable operator, Bello indicates that he simply does not see any huge difference between DTV and HDTV. All CableVision needs to know before it configures the 100 MHz that he has set aside for digital service is how much bandwidth the digital channels will require. As far as set-top issues are concerned, Bello indicates that an evaluation of hardware is under way.

"We're currently looking at Scientific-Atlanta and General Instrument product. With an excellent return path in place, we definitely want to use this return capability as opposed to any telephone return, which has proven to be quite troublesome on the analog side of our pay-per-view business," Bello says.

At the head end, the implementation of digital technology is proceeding at full speed. While Bello reports that no automation-related activity is under way at CableVision, he indicates that a new 26-network digital ad-insertion system is taking shape. Using a SeaChange International Spot System, this fiber-based hard interconnect will be in place in six months. Not only does this greatly expand the previously existing statewide ad infrastructure, but it also opens the door to new regional and national accounts, according to Bello.

CableVision already provides a digital fiber-based transport service for local broadcasters, such as WAMI-TV Miami, and a local point-to-point transmission network for sports and special events venues, such as the Miami Arena. CableVision recently created a virtual private network for a large local hospital as well, according to Bello.

Starting in 1995, Bello spent a year in Spain handling cable start-ups for U.S. West. All this licensing and franchising-related activity abroad has given Bello further insights into what is unfolding in the U.S market as far as competing services are concerned.

Adelphia: Digital Reality

Digital at Adelphia is first and foremost a defensive play intended to stop the out-migration of high-end customers from Adelphia to DBS, according to John M. Adduci, director of marketing and sales, who sees it as an opportunity to grow premium and pay-per-view revenues as well.

"Approximately 31 head ends are digital, and that represents 70 percent of the company's current subscribers, although not all of these head ends tap into seven or eight transponders of HITS. Several are accessing six HITS pods at this time. With the addition of two more HITS pods, we add digital channels, like three more Discoveries and Romance Classics, along with an increase in our total pay-per-view offering from 18 to 27 channels," says Adduci.

When you talk to Adduci about a "digital tier," his first reaction is to see it in terms of the practical advantages of embracing more HITS-based programming, such as History International, A&E's 24-hour version of "Biography" and added music feeds from services such as The Box.

"My role is to go out and market the product today. I work with others here at Adelphia to find the right strategy, tactics and marketing techniques," Adduci says. "Adelphia has 25,000 digital subscribers, which represents about 2 to 2-1/2 percent penetration in Adelphia's systems that offer digital. Our goal is to reach 5 percent penetration by March."

Adduci doesn't currently see the carriage of DTV or HDTV signals as a critical issue.

"HDTV or any pending rollout of digital TV by the broadcasters is not on my immediate radar screen," Adduci says. "We're positioning ourselves to be able to offer more programming and interactive services such as video-on-demand and e-mail. We're proceeding with the installation of a 750 MHz, two-way plant wherever possible. Our rebuilding and upgrading is happening because we know we have to get sufficient capacity for uses yet to be determined."

Adduci underscores the complexity of day-to-day operations in the cable TV environment. In addition to any digital technology-related priorities, Adelphia's clustering philosophy is resulting in the addition of new systems in places like Fort Myers. With the addition of each new system, the growing roster of system managers and other new employees must be integrated into the company or "Adelphia-ized," according to Adduci, and, each new system must be rebranded. ■

Product Review

Telex UR-700 UHF Wireless Mic System

The UR-700 UHF wireless microphone system includes the Model UR-700 receiver and associated transmitters, the HT-700 and WT-700, offering a full diversity system in the 690 to 725 MHz UHF frequency range. Up to 10 systems can be used

simultaneously using specific pre-set frequencies. It employs Telex's patented Posi Phase auto diversity circuit allowing the unit to use both antennas at all times, resulting in stronger signal reception. Two BNC-type antenna connectors are on the unit's rear panel with quarter-wave antennas supplied for normal use or an optional antenna accessory kit is available for rack-mounting. The transmitter features a power output of 10 mW and offers an array of dynamic electret elements. It has a frequency response of 50 to 15000 Hz and will operate from eight to 12 hours on a single 9-volt alkaline battery. *Contact Telex at (612) 884-4051 or visit www.telex.com.*

For more information circle Reader Service #256

Yamaha D24 Multitrack Recorder

Yamaha has introduced an affordable 24-bit, 96 kHz digital multitrack recorder for use in post audio applications for television and film. It's based on 3.5-inch magneto-optical disks, and offers 16, 20 and 24-bit, eight-track simultaneous record and play capability at 44.1 and 48 kHz sampling rates and four-track record/play at 96 kHz. The recorder is designed as an alternative to tape-based modular digital multitrack recorders and it will become the perfect companion for use with Yamaha O2R, O3D and O1V digital mixers, as well as mixers and equipment from other manufacturers. Benefits include digital I/O in a variety of formats, editing capabilities and a range of special features. *Contact Yamaha at (714) 522-9011 or visit www.yamaha.com.*

For more information circle Reader Service #257

Symetrix Mic Preamp

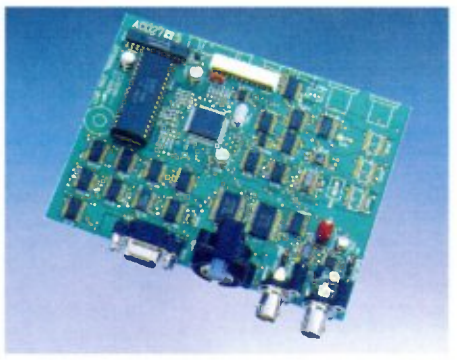
The 302 dual microphone preamplifier is a two-channel dual mono preamp featuring 20-60 dB of variable gain. Each channel offers a 15 dB pad, allowing the 302 to

handle microphone levels up to +14 dBV. A polarity reversal switch on both channels corrects the effects of improperly wired cables and mic placement problems. Phantom power of +48V is available at both inputs. Rear panel connections are XLR jacks for microphone inputs and Euroblock terminal strips and quarter-inch TRS jacks for line outputs. *Contact Symetrix at (425) 787-3222 or visit www.symetrixaudio.com.*

For more information circle Reader Service #258

Denon ACD-27 Card

Users of Denon's DN-C680 professional CD player or DN-M1050R professional MiniDisc recorder/player can now use VTR control, as well as sync their machines to SMPTE timecode, thanks to the new ACD-27 accessory card. The ACD-27 allows either machine to emulate the industry-standard Sony VTR control



protocol used by the popular BVW-75 Betacam. With the card the player can respond to standard VTR commands such as play, stop, shuttle, jog and cue. The card is easy to install and provides a nine-pin RS-422 connector, a BNC video reference input, an XLR timecode input and an additional BNC for Word clock synchronization. *Contact Denon Electronics at (973) 575-7810.*

For more information circle Reader Service #259

Electro-Voice ENG 618

The ENG 618 consists of an integrated shotgun microphone and a six-foot boom pole with headphone amp, providing a faster, more convenient method of distance miking. Weighing just over two pounds, the ENG 618 is a perfectly balanced system which is lightweight and easy to hold during long interviews. The rugged and fully repairable six-foot metal boom quickly and easily collapses down to fit into an 18-inch utility belt pouch. The microphone on the ENG 618 is a highly directional, high sensitivity condenser microphone with a remarkable voice-contoured frequency shaping design requiring little or no EQ. A low-end rolloff switch is provided for use in high-wind situations. The condenser mic may be phantom powered or battery powered. For on-site monitoring an internal headphone amp circuit with volume control and low-battery warning light are also included. Other standard accessories include a replaceable windscreen and vinyl utility pouch with belt loop. *Contact Electro-Voice at www.electrovoice.com or call (800) 234-6831.*

For more information circle Reader Service #260

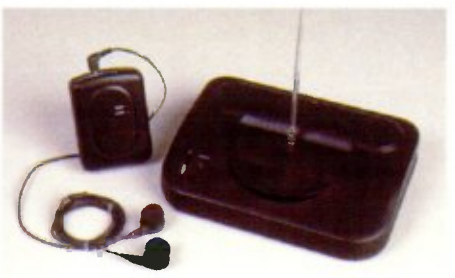
Gepco 5524EZ Audio Cable

The 5524EZ cable is a replacement for the Gepco's 5524 cable. The 110-ohm AES/EBU single-pair cable features two, 24-gage conductors and a high-speed foam dielectric, with the lowest available transmission loss of its type. This allows the cable to be used for runs of up to and beyond 650 feet. The cable is completely shielded by a bonded 100 percent aluminum/polyester tape with a 24-gage drain wire. The outer jacket is an easy-to-strip, gray PVC compound that is UL-listed type CM. The new pressurized jacket keeps the physical spacing between the pairs and the shield consistent, allowing the 110-ohm impedance to be maintained when the cable is stressed. *Contact Gepco International at (800) 966-0069 or visit www.gepco.com.*

For more information circle Reader Service #261

Jensen In-Ear Monitor

Jensen Music Industries has introduced the PM TX transmitter to broadcast a UHF signal on either of two separate stereo channels. This allows the user to establish



combinations of transmitters and receivers so that there are two stereo mixes available to anyone wearing a receiver. *Contact Jensen Music Industries at (425) 744-1053.*

For more information circle Reader Service #262

Evertz HDTV Logo Inserter

The HD9525LG HDTV logo inserter is a complete package that will key one or many static/animated "bugs" over full-bandwidth HDTV program video signal. It features fade-in and fade-out control, capability of keying multiple simultaneous

logos with independent fade control, stores and inserts static or animated logos and incorporates a high-quality variable transparency mixer, fade-to-black of program video and is capable of storing 50 1/16th screen-size logos. It consists of a one RU frame with front panel control and also has an available remote control panel. A standard Windows 95 application is also included to provide full control and configuration capability. *Contact Evertz at (905) 335-3700 or visit www.evertz.com.*

For more information circle Reader Service #263

Vela Broadcast RapidAccess

RapidAccess is a new distributed video server solution that combines sophisticated encoding capabilities, powerful control software and compatibility with off-the-shelf disk storage. The system is used to record, store and playback audio and video using MPEG-2 compression in broadcast, production, news playback and post-production environments. It's file structure for content management, known as the RapidAccess Media Management System handles clip content in an easy-to-maintain, user-friendly, flexible manner. A powerful relational database handles all content management, playlist management and hardware asset management. Inputs include serial digital, component, composite, S-video and two analog or digital audio channels. Compression rates are adjustable from 1.5 Mb/s up to 50 Mb/s. Each clip can also have a different data rate because the decoders automatically adjust to the incoming data rate. *Contact Vela Broadcast at (801) 464-1600 or visit www.vela.com.*

For more information circle Reader Service #264

Leitch AES Reference and Tone Generator

The DAR-6880 is an inexpensive AES reference and tone generator that can be installed in the 6800, 7000 and 700C MIXBOX Series frames. The DAR-6880 provides the high-quality AES digital audio reference signal required by most A to D converters, rate converters, mixers and other AES devices. It can be locked to a house reference or self-clocked and meets the synchronization and test needs of any facility by generating both a digital silence signal and a digital tone signal. The tone level can be set from 0 to -31 dBFS and each channel's frequency can be set separately to 1 KHz or 500 Hz. *Contact Leitch at (800) 387-0233 or visit www.leitch.com*

For more information circle Reader Service #265

VAC Distribution Amplifiers

Three new distribution amplifiers for video production, editing and systems integration applications were released today by Video Accessory Corp. Designed for space-savings, the new products encase the circuit boards in epoxy (with external BNC connections), providing a low-cost solution that uses a wall transformer as its power source. The RGBVB/VDA enables

Product Review

users to drive two component video devices from a single NTSC, PAL or SECAM component source, producing an RGB, Y/R-Y/B-Y or YUV signal. Frequency response is up to 400 MHz. The YCVB/VDA provides a low-cost, high-performance solution for distributing an S-video signal without noticeable degradation. Frequency response is 60 MHz. The SDI/DA-LT is for production studio applications, a one-in, two-out loop through distribution amplifier that allows users to pass serial digital through and take two unity gain taps to monitor or process the signal. *Contact VAC at (800) 821-0426.*

■ **For more information circle Reader Service #266**

Scitex Digital Video Sport

Sport is new software for the Sphere family of nonlinear editing systems. It's designed expressly for broadcasters, facilitating recording and management of multiple feeds and providing for fast creation of news and sports highlight packages. The "Live Loop Record" feature enables a Sphere system to record feeds and mark selected footage from satellite or other live sources. The Sport operator can set a mark for a clip during the event and Sport will create the clip with user-designated handles before and after the mark, to capture the beginning and the end of the desired sequence. *Contact Scitex Digital Video at (888) 846-7017 or visit www.scitexdv.com.*

■ **For more information circle Reader Service #267**

Maxell One-Inch Metal Tape

Maxell has a new family of metal one-inch videotapes that are available in 33, 48 and 64-minute recording capacities. The tapes are designed for use with digital VTRs that conform to BTA Hi-Vision Studio Signal

Standard VTA S-001, which specifies a frequency bandwidth of 30 MHz for full Hi-Vision signal recording at a bit rate of 1.88 Gb/s. The tapes have Maxell's proprietary Ceramic Armor Metal Particles that achieve a 9500 Gauss magnetic field, which dramatically enhances image definition and reduces noise. The armor also protects the particles from oxidation, which can reduce a particle's magnetic energy. *Contact Maxell at (201) 794-5922 or visit www.maxell.com.*

■ **For more information circle Reader Service #268**

Tektronix LVS Event Management System Upgrade

An upgrade to the Tektronix LVS Event Management System will now be enhanced by integrating the LVS system into the studio production process via Fibre Channel and/or data tape transfers of material. The version 3.0 software provides interoperability with other Profile applications, building on the Tektronix Digital Media Foundation (DMF) initiative. A major feature of v3.0 is the ability to import and export clips from other Profiles to its database. Material created on another Profile-based system editor can be uploaded from data tape or sent via Fibre Channel and then played back during a live event directly from the LVS controller. Similarly, material recorded in the LVS system can be exported to a Profile editor to be used as source material—all without leaving the Profile native format and incurring extra generation losses. Other features include voice-over in the timeline editor to add a new channel of audio to an existing edit; internal audio crossfades under playlist control; scrub audio. *Contact Tektronix at (800) TEK-WIDE or visit www.tek.com.*

■ **For more information circle Reader Service #269**

NDS Store and Forward System

The NDS store and forward system is a new cost-effective solution for the capture, transfer and playout of high and standard definition content. It's ideal for the contribution/distribution of material, enabling content to be moved between studios reliably and without loss of quality over all digital broadcast networks, including low-bandwidth telecomm networks. The system features controlled local material capture, transfer at faster or slower-than-real-time to maximize the use of available bandwidth and playout into any digital network. MPEG 4:2:2 or 4:2:0 encoding is available at a wide range of bits and it is ATSC or DVB compliant. *Contact NDS at (714) 725-2548 or visit www.ndsworld.com*

■ **For more information circle Reader Service #270**

Video Data Systems LogoSTAR

The LogoSTAR system for keying logos over incoming video from Video Data Systems is shipping with free Windows-compatible conversion and remote control software. LogoSTAR can be used to store and

insert on-air standby slides, channel identification logos, copyright warnings and other images. In addition to its 32-level logo keying function it also allows for logo or color palette animation. Users can create the effect of motion by controlling the timing, placement and quantity of logo appearances, or by sequencing colors within a logo through a selected color range. It also occupies only 1RU and an extensive array of contact-closure controls allows up to seven different logos to be selected and displayed in realtime. *Contact Video Data Systems at (516) 231-4400 or visit www.videodatasys.com.*

■ **For more information circle Reader Service #271**

Acoustic-XLT Software

Acoustic-XLT software is designed to make advanced acoustic optimizations accessible to a wider range of users, including video professionals setting up audio monitoring. It will still perform all

of the basic functions of the original Acoustic-X software, with the exception of advanced editing and Ray-tracing. Capabilities include fully editable surround sound speaker placement, and automatic comparison of speaker responses from every room position. Main speaker and sub-woofer locations are automatically processed by separate optimization routines and LT also features an advanced speaker database that can handle virtually any type of speaker configuration or sub-woofer. The software costs $99. *Contact Pilchner Schoustal at (416) 868-0809 or visit www.pilschner-schoustal.com.*

■ **For more information circle Reader Service #272**

Belden 9180 AES/EBU Install Cable

Belden 9180 is a miniature 26 AWG 110 ohm AES/EBU twisted pair that is ideal for digital audio installations where size, weight or space are at a premium. With Datalene insulation and very low capacitance (13.5 pF/ft.) it can also be used for analog installations where its low capacitance makes it a top performer, according to Belden. *Contact Belden at (800) BELDEN1 or visit www.belden.com.*

■ **For more information circle Reader Service #273**

Nemal Electronics Triax Cable

Nemal Electronics has introduced an extremely flexible 3/8-inch triaxial video cable for use with broadcast cameras. It carries a UL CM Rating and meets the FT-4 flame test requirements. Part number

1835F features a solid center conductor and dual 95 percent braids for minimum DC resistance and is available in 10 colors. Jacketing material is a high-performance thermoplastic elastomer, rated at 105C and resistant to oil, gas, sunlight and abrasion. *Contact Nemal Electronics at (800) 522-2253 or visit www.nemal.com.*

■ **For more information circle Reader Service #274**

Fairlight 14.3 Revision Software

Fairlight has introduced Revision 14.3, providing MFX3Plus and Fame audio systems with significant improvements in audio resolution and connectivity while offering enhanced recording and editing

functions. It also supports wide world audio in 20 and 24-bit formats, in any combination within a project. Mixed bit-width clips can now be freely mixed within a project, allowing the use of existing 16-bit library material with any combination of higher bit-rate clips in 20 or 24-bit formats. The new overwrite recording mode of MFX3Plus and Fame provides destructive multi-channel recording (up to all 24 channels) with completely seamless drop-in/drop-out capability. Additional editing functions include "Fade Across Clips, "Solo Follows Edit" and "Wave Menu."

■ **For more information circle Reader Service #275**

Digidesign ProTools 24 MIX

Digidesign's ProTools 24 MIX is a single-card digital audio workstation core system that provides 64 tracks and extensive mixing and processing capabilities. It has six

Product Review

Motorola 56301-series DSP chips that provide two to three times on-demand mixing and processing power than Pro Tools 24. It's also available in a configuration that features an additional PCI card with six chips dedicated to effects processing. It's designed to address the three-slot limitation of Apple's G3 Power Macintosh and will also be available on the Windows NT platform. Each Pro Tools 24 Mix CORE and Mix Farm card provides support for 16 channels of I/O using optional Digidesign audio interfaces and up to six Mix Farm cards can be added to the system as needed to provide connections of up to 72 channels of I/O. *Contact Digidesign at (650) 842-7900 or visit www.digidesign.com.*

For more information circle Reader Service #276

AKG WMS 60 VHF Wireless Microphone System

The AKG WMS 60 system offers a choice of eight AKG microphone capsules and as many as 15 separate channels of intermodulation-free wireless operation. The SR 60 receiver operates in a sub-band up to 4 MHz wide between 138 MHz and 250 MHz. It features both balanced and unbalanced outputs and line/mic switchability. The HT 60 hand-held transmitter and PT 60 bodypack transmitter also offer a multitude of features, including a low battery indicator, a sensitivity control and a protective cover that keeps those controls set even during the most active performances. There is also a choice of three handheld transducer capsules, the dynamic D 880, D 3800 and the condenser C 535EB, each identical acoustically and mechanically to the hard-wired versions of those microphones. *Contact AKG Acoustics at (615) 360-0499 or visit www.akgacoustics.com.*

For more information circle Reader Service #277

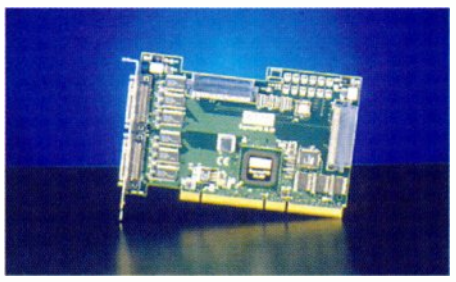
GT Electronics AM Series Mics

GT Electronics, a new division of Alesis, has introduced its first new product, the AM Series of microphones, four large-diaphragm studio condenser microphones. The AM51 and the AM-52 has solid-state field effect transistor circuitry to provide an extremely transparent representation of the acoustic signal, with no coloration and extremely low distortion and self-noise. Both microphones offer high sound pressure level handling and a switchable low frequency roll-off at 80 Hz. The AM61 and AM62 tube condenser mics offer an extra-large capsule that protects its super-thin gold evaporated mylar diaphragm. Each diaphragm is tensioned to ensure an extremely close matching of capsule response. *Contact GT Electronics at (31) 255-3400 or visit www.gtelectronics.com*

For more information circle Reader Service #278

Atto SCSI Host Adaptor

The ExpressPCI Ultra2/Wide dual channel SCSI host adaptor (UL2D) with Advanced Data Streaming technology is a 64-bit/32-bit compatible host adapter providing two



independent SCSI channels, each delivering up to 80 Mbytes/sec. of data throughput for high-end digital video, imaging, database and fileserver applications. Advanced Low Voltage Differential technology doubles throughput of UltraSCSI performance and allows users to connect up to 16 SCSI device IDs over a distance of 12 meters per channel. It also has backward compatibility with existing single-ended SCSI devices and features firmware that supports both Macintosh and PC-based systems straight out of the box. The Adaptor enables users to attach one channel to their single-ended devices and one to their low-voltage differential devices. *Contact Atto Technologies at (716) 691-1999 or visit www.attotech.com.*

For more information circle Reader Service #279

Hotronic Serial Digital Converter

The Hotronic serial digital converter is technologically sophisticated yet simple to use. The SMPTE 259M compliance equipment require no adjustments other than plugging in the input and output cables. The SDI-to-analog converter features automatic input cable equalization and simultaneous analog outputs, while the analog-to-SDI converter features low jitters encoding and selectable analog inputs. Available in NTSC or PAL version, both converters incorporate advanced 10-bit digital signal processing and the latest technology in one half-size rack chassis. The Hotronic serial digital converters are available in a wide variety of models with different analog composite, SDI, Y/C and YUV I/O combinations. *Contact Hotronic at (408) 378-3883 or visit www.hotronic.com.*

For more information circle Reader Service #280

NDS MediaStorm II

The MediaStorm II is a cost-effective way to deliver multimedia, TV and data throughout a corporate PC network and to standard TVs with set-top boxes. MediaStorm offers business TV operators and small-to-medium sized broadcasters an out-of-box integrated solution and can simultaneously provide secure transmission of TV, multimedia and data to a mixed environment of PC networks using a low-cost PC card and normal TVs with an attached STB. It includes a compression and multiplexing engine using NDS's System 3000 solution, advanced, reliable IP multicasting protocol for streaming, file and pipe data broadcasting, a choice of MPEG-2 receivers for television and a PC board for data reception. *Contact NDS at (714) 725-2548 or visit www.ndsworld.com.*

For more information circle Reader Service #281

Sadie De-Esser Plug-In

Sadie has introduced a De-Esser plug-in, available as an optional module for their latest V3 software upgrade. Although it is primarily designed to remove sibilance from vocals or voice signals, the plug-in is a frequency-conscious compressor that can be used to attenuate any troublesome frequency in an audio signal. It has both ducking and phase-reverse algorithms available and its filter can be set to either shelf or bandpass, the latter filter has a variable bandwidth control allowing the reduction of very narrow bands of the audio frequency spectrum. The unit presents a different set of dynamic controls depending on the de-essing algorithm selected. *Contact SADIE at +44 (0) 1353-648-888 or visit www.sadie.com.*

For more information circle Reader Service #282

Radamec BBC Free-D System

Radamec Broadcast Systems will manufacture and sell the BBC's free-d System under a license agreement. Free-D is a revolutionary new camera tracking system designed at the BBC's Research and Development Center for use in 3D virtual studios where complete freedom of camera movement is required. Free-D can be used in conjunction with the majority of proprietary 3D virtual studio systems and it provides complete flexibility of camera movement, supporting hand-held cameras and 360-degree pans. *Contact Radamec at (908) 518-0685 or visit www.radamec.com.*

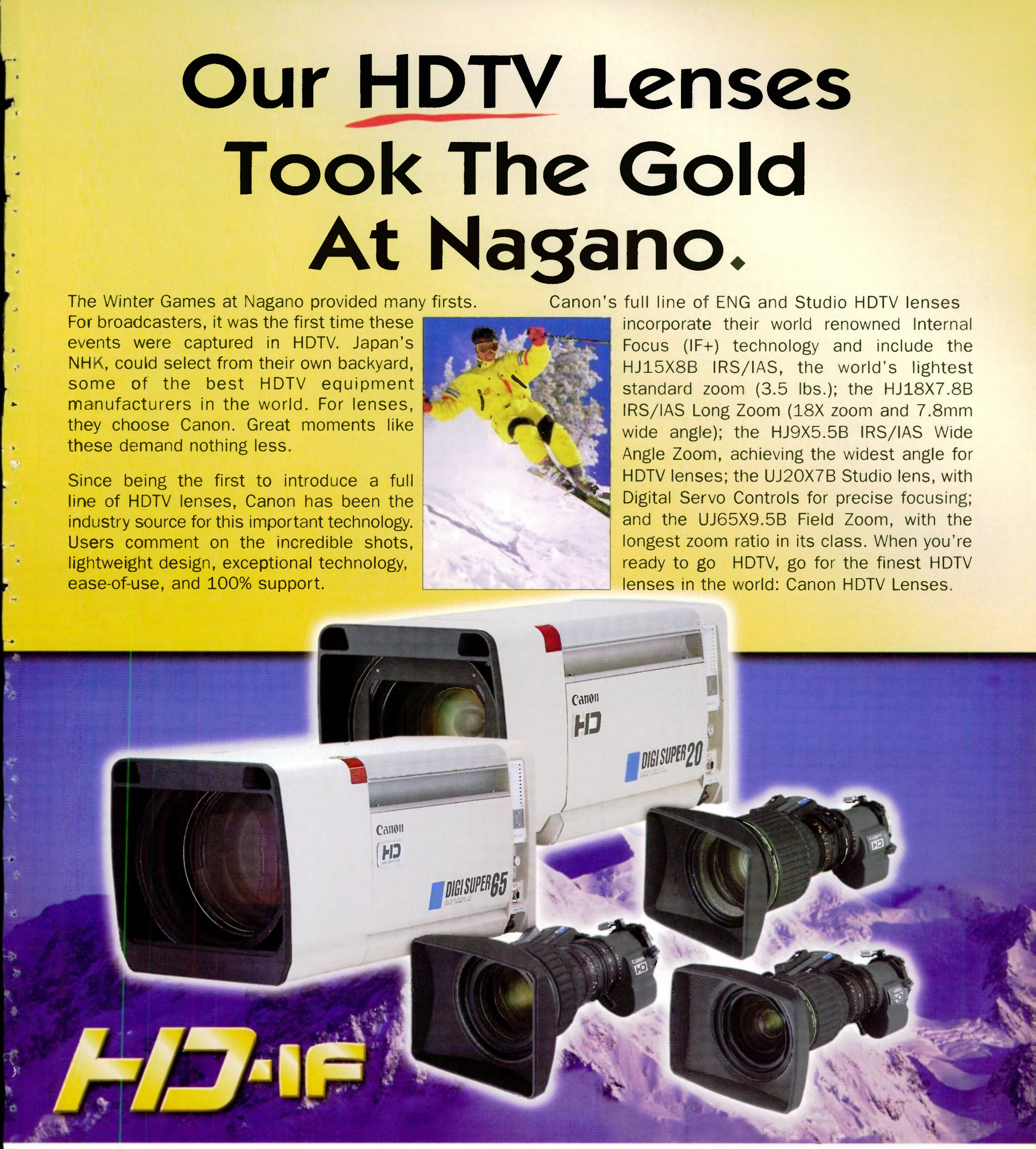
For more information circle Reader Service #283

Our HDTV Lenses Took The Gold At Nagano.

The Winter Games at Nagano provided many firsts. For broadcasters, it was the first time these events were captured in HDTV. Japan's NHK, could select from their own backyard, some of the best HDTV equipment manufacturers in the world. For lenses, they choose Canon. Great moments like these demand nothing less.

Since being the first to introduce a full line of HDTV lenses, Canon has been the industry source for this important technology. Users comment on the incredible shots, lightweight design, exceptional technology, ease-of-use, and 100% support.

Canon's full line of ENG and Studio HDTV lenses incorporate their world renowned Internal Focus (IF+) technology and include the HJ15X8B IRS/IAS, the world's lightest standard zoom (3.5 lbs.); the HJ18X7.8B IRS/IAS Long Zoom (18X zoom and 7.8mm wide angle); the HJ9X5.5B IRS/IAS Wide Angle Zoom, achieving the widest angle for HDTV lenses; the UJ20X7B Studio lens, with Digital Servo Controls for precise focusing; and the UJ65X9.5B Field Zoom, with the longest zoom ratio in its class. When you're ready to go HDTV, go for the finest HDTV lenses in the world: Canon HDTV Lenses.



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DTV: Real at Last

Continued from page 1

hood association concerned with the structural stability of the tower.

CBS has four O&O stations and eight other affiliates ready, according to Bob Seidel, vice president, engineering and advanced technology. Charles Jablonski, vice president, broadcast and network engineering at NBC, says a total of 10-15 stations, including O&Os in Washington, Dallas, Philadelphia and Los Angeles. Fox Network is starting up with affiliates in Dallas, Detroit, Philadelphia and San Francisco, according to Setos.

Earlier this year there was some discussion among the networks of delivering the digital signal to stations this fall at more than 45 Megabits per second, but for the time being all four will deliver programming at 45 Mbps, necessitated by the large number of affiliates who do not have satellite receivers co-located with the station.

As Davis explains, "We can push up to 68 Mbps into one transponder but the microwave limitation is 45 Mbps. We have about 188 affiliates that are co-located, but about 50 are not. Our plan is to migrate to a higher bit rate as we solve the microwave co-location problem. We also expect that some manufacturer will create a microwave system that can accommodate a higher bit rate."

Via Fiber

Fox is taking a different approach to delivery from the other networks, opting to use the fiber/coaxial telephony system of Williams Vyvx Services rather than satellite. Explains Setos, "We could purchase a higher data rate than 45 Mbps. The fundamental fiber strand limitation is slightly more than 2 gigabits and we can buy all sorts of packages other than 45, but we don't need them."

Setos says Fox expects to begin digital satellite transmission when the number of affiliates receiving it is economically viable, probably in the first quarter of the year 2000.

"In the meantime," he asserts, "we're the only ones with an all-digital network connecting our DTV stations."

While the still-analog stations continue to receive NTSC analog, digital affiliates will receive transmissions in 480i, 480p or 720p, depending upon how the programming is produced.

Setos reports Fox is supplying Wegener satellite receive terminals and AFC antennas to stations. On the terrestrial side, it's furnishing NDS decoders to receive the video signal.

"We're also providing them with a basic plan for transition to digital," he reports. "Most importantly, it covers how to pass the digital signal from the network to the station's transmitter economically, working within their analog master control, and passing the signal faithfully through a side chain to their digital transmitter."

On The "Air"

The other networks all had to concern themselves with satellite transponder capacity, but all report that this was a problem easily resolved. Davis says ABC's own fleet of seven C-band transponders are compressing the signal to 45 Mbps. He states, "Our compression is very mild compression but the signal is still robust." He notes his systems were tested in October with transmission to an AT&T satellite and everything was working.

ABC's biggest challenge was completing its new origination center at New York's 47 West 66th St. headquarters in time for the launch. Davis reports late equipment deliveries delayed the process. While the high-definition origination facility was built by Panasonic Systems Group, ABC did master control work and uplink modifications in-house.

ABC is recommending packages to the stations and coordinating through systems integrator Andrew Corp., according to Davis. Tiernan equipment is being used for encoding and decoding at the network and stations, he notes.

While NBC typically will be transmitting at 1080i, 1920 pixels and 60 fields per second, initial programming that was to be transmitted is entirely theatrical films, all transferred at 1080i.

The Genesis Of HDTV

Meanwhile, NBC was to transmit a separate HD signal from New York using its Genesis broadcast center. Jablonski comments, "We built a center capable of doing the normal stuff as well as high-definition origination. It's completed and we're in the process of transitioning the NTSC network. Because we're able to use this existing facility in Rockefeller Center, we don't have to spend $5-10 million to build a new origination center."

With all of its news collection and program distribution transponders on Ku-band, Jablonski says NBC was able to easily accommodate the HDTV feeds. With the HD network only in use a few hours a week, typically in low news hours, he finds it easy to accomodate on the eight GE Americom and 10 PanAmSat transponders.

While NBC typically will be transmitting at 1080i, 1920 pixels and 60 fields per second, initial programming that was to be transmitted is entirely theatrical films, all transferred at 1080i.

As for encoding and decoding equipment, NBC will use Tiernan HDTV encoders and decoders. The Tiernan THE-1 and THE-10 modular DTV encoders and the TDR6 modular integrated receiver/decoders are in place, and can be used for both HDTV or SDTV programming. Jablonski adds that the Tiernan encoder automatically transmits at 24 fps when film material is involved.

Jablonski also says that when HDTV programming is increased the network will probably send out a second receiver to stations. He notes that next spring NBC will transmit five hours a week of *Tonight Show with Jay Leno* in HD. Otherwise, he notes, NBC doesn't prescribe or coordinate equipment. He says each station will need to buy, in addition to a new transmitter and antenna, $2-3 million worth of pass-through equipment.

Eye On CBS

CBS, using the same 1080i standard as NBC, also has automatic switching to 24 fps within the Mitsubishi/Tektronix MH-1100E encoder. The MH-1100E will be used for return of contribution programming from CBS Television City in Los Angeles to New York. Four CBS O&O stations will use the MH-1100EL encoders.

Regarding transponder capacity, CBS has turned to compressing the analog broadcast signals to free up the needed space for the digital signal. Seidel notes, "Our analog FM equipment was about 12 to 13 years old, so we're replacing that with digitally compressed signals. We now have one analog signal on a given C-band, 36 MHz transponder with FM modulation. On the same transponder, we'll be able to fit a 45 Mbps signal. That signal will contain either one high-definition program or three digitized NTSC signals for the regular network so that we can have an East Coast, West Coast and regional feed on that one transponder."

The regional feeds typically would be used for sports programming. Seidel notes that CBS has 10 transponders across two C-band satellites, so freeing up space for HDTV transmission is strictly a matter of condensing them 3:1.

To enable its affiliates to receive the transmissions, CBS has a highly coordinated program. Seidel says each of the 200 affiliates is being provided with two satellite dishes by the network—a seven-meter steerable dish and a four-meter stationary one.

"The two dishes will provide the backup as well as the main signal," he notes. "These dishes will remain and we'll provide an additional digital rack of satellite equipment. The receivers will decompress the signal from 45 megabits to 1.5 gigabits and it will have embedded audio so that, on one wire, they will have both the video and audio. That makes routing easier and less costly."

Among the equipment being put to use by CBS stations are Harris transmitters, NuComm and California Microwave equipment and Artel/Utah Scientific master control switchers and routers. At the network, he adds, NVision routers and Grass Valley master control switchers are employed along with Panasonic D-5 tape machines. Pluto digital disk recorders and Chyron Duet character generators are being used at both the network and the stations. ■

In Search Of...HD-0

Whatever became of the computer industry's HDTV display format?

By Peter E. Brown

When the idea of broadcasting television signals on a computer became more than just an idea, Microsoft and Intel started to look at the formats that were available to broadcast DTV on PCs. With 18 formats available from the American Television Standards Committee (ATSC), both companies, along with Compaq, came up with an idea to generate 720 progressive scanning on the PC, figuring it would be easy to generate and cost effective.

The idea came to be known as HD-0. With backing of PC heavyweights Compaq Computer and the Wintel contingent it looked as if 720p was a shoe-in as the format of choice for the PC. But today, as broadcasters ramp up and start to figure out the necessary requirements to broadcast DTV signals, HD-0 is nowhere to be found, only mentioned here or there as a passing reference to an idea gone by.

What happened? Why did this idea that had the support of three of the largest players in the PC industry falter and go by the wayside? Considering that PCs are already progressive display devices wouldn't the move to a 720p format be a natural?

Craig Tanner, executive director at the ATSC says HD-0 was never a formal proposal to the ATSC and that the idea was more of a concept lightly discussed but never reached anywhere near the status of being a standard. The idea just didn't catch on because it encouraged broadcasters to use lower forms of digital video and the decoding would have been less of a challenge for the PC in terms of processing power and software-only decoding.

Intel's Reason

Of course, wouldn't a standard that requires less out of a PC in terms of processing power and software be the most attractive? Not necessarily, especially when the realities of the computer industry are weighed in the decision.

This might be part of the reason that Intel has shied away from HD-0. Intel is pushing for DTV to be generated using only software for the decoding and other features and a Pentium II processor. Make that a big Pentium II processor—one in the range of 300MHz or more. More processing power needed means more sales of Pentium II chips and more revenue for Intel.

According to Tom Galvin, director of market development for TV and broadband at Intel, this was not the only reason. The original thinking was that HD-0 would be economically generated at first and then the other formats would be adopted once DTV was off the ground. Then everyone would need some sort of an upgrade to generate these broadcast signals.

"We later realized that pushing HD-0 was not beneficial to our customers and in no way benefit the broadcasters," Mr. Galvin explains.

If Intel implemented everything in HD-0 format than anything transmitted in another format would show up as nothing and that is not what the company wanted with DTV in its infancy. Intel also determined that PCs running on a high-performance Pentium II could generate all 18 formats with software being used as the decoding engine so it would be flexible and switch between different formats.

"HD-0 was almost like telling the broadcaster how to run their business and we realized that we can't do that," he says. Intel still believes in progressive scan technology and that it will probably enable a faster market transition than interlaced scanning formats, but the company determined it had to support all 18 formats because that's what the entire DTV marketplace will support.

Microsoft's Reason

Another company that also believes in the strengths of progressive formats is Microsoft, although its efforts with HD-0 have also been sidestepped for more of a broad-based format solution. Microsoft has a business philosophy along the same lines as Intel in that it promotes all 18 formats rather than just a single one. Although Microsoft would like the transmission of the signals to be in progressive it really does not have a preference as to what broadcasting format it is then decoded.

"HD-0 is moving forward in the sense that most broadcasters have chosen to use progressive formats," says Steven Guggenheimer, group product manager for Digital TV Strategy at Microsoft. Mr. Guggenheimer adds that the original intent of HD-0 was to have the transmission pipe be done in progressive rather than interlace. Also it was used more as a starting point than anything else and to get broadcasters to think hard about the formats they want to use.

Microsoft may not build hardware but it does have significant impact, if not the final word, on what software is implemented on PCs. This gives them leverage to "encourage" broadcasters or other chip vendors to move in certain directions.

"We believe in progressive formats because it's cheaper and easier to transmit the signals than interlaced," Mr. Guggenheimer says.

Microsoft believes that to get DTV off the ground it needs to start simple and cheap. If there are cheap ways to enable this quickly and easily on a PC in whatever format then Microsoft sees that being more realistic than a whole slew of consumers buying $8,000 to $10,000 DTVs. So Microsoft chose to enable all 18 formats not knowing which way the broadcaster will eventually go.

Will a progressive format still be the choice of most broadcasts and consumers? With TCI and most major network broadcasters adopting progressive formats (480p seems to be leading the list), the industry appears to be moving in that direction.

Underlying Reasons

There might be more to the HD-0 story than meets the eye at first glance. There is a possibility beyond these format concerns. It might have also boiled down to a plain old disagreement in the HD-0 camp. Disagreements have been known to hold back initiatives and emerging markets in the past, just look at the DVD player market that is still suffering from disagreements.

According to Jonathan Cassell, analyst at Dataquest, a market research firm based in San Jose, CA, there were indeed some disagreements among some of the heavy pushers of HD-0—notably Compaq, Intel and Microsoft. These disagreements stemmed from how exactly these digital signals would be generated.

All three agreed it should be a progressive format but they apparently disagreed as to whether it should be 720p, 480p, or even a higher resolution.

This disagreement more than likely put the initiative over the edge. With everyone involved pulling in every direction, with the broadcasters complaining about being limited to one format and the fact most PCs will be able to handle 18 ATSC formats, HD-0 failed as the PC DTV format of choice. This is not to say that a 720p format has failed, just the notion of having one and only format for the PC was not successful.

HD-0's Legacy

While the HD-0 format may not longer be a reality as the one and only DTV format for PCs it is still a goal set by some companies as they try to expand and capitalize on this potential DTV marketplace.

Graphics accelerator leader ATI Technologies last month introduced what it claims will be the first graphics chip to enable graphics on monitor resolutions up to HD-0 formats. ATI plans to cross market its latest graphics chip, dubbed the Rage 128 GL, across multiple segments of the graphics market. In addition, the company plans to use the same technology to enable high-resolution set-top boxes and other graphics-related applications.

ATI is banking on having a standard digital interface available so its Rage 128 GL will be able to seamless connect with the monitor at these high 720p resolutions. ATI is also going to start rolling out a series of tuner cards that will support HD-0 as well as the other 17 ATSC formats in PCs. However, ATI is not the only graphics company predicting a need to move to these high definition formats. Other graphics companies are gearing up for high-resolution monitors as well.

Today the question is will technology advance fast enough and be capable to handle these chips? More importantly will the broadcasters be ready in time and be able to afford it? The answers to those questions might be at hand sooner rather than later. ■

Cable and HDTV

Continued from page 4

titles in HD that are new to pay TV," Zitter says. "Everything else will be upconverted to 1080i."

Zitter indicates that HBO will be offering the HDTV feed on the same basis as HBO's other multiplex feeds, which will soon represent 10 brands in 24 SD feeds. HBO's emphasis on quality and on being a driving, innovative force in TV entertainment is what shapes HBO's decision making when it comes to HDTV, and Zitter sees HBO's most loyal customers as making up a large percentage of the early adopters of HDTV.

MSG leases a 53-foot National Mobile Television production truck with Sony gear to produce the Rangers in HDTV.

Timing Is Important

One of Zitter's primary concerns was that HBO wanted to find a codec vendor which could offer encryption and HD encoding simultaneously. In early October, HBO announced that General Instrument Corp. had been selected to provide a single integrated MPEG-2 HDTV transmission system. GI has been a familiar presence in HBO's operations since the mid-1980s. While encryption and addressability were key concerns, Zitter emphasizes that besides the ability to multiplex SD and HD feeds together, DigiCipher II offered immediate logistical advantages for HBO's affiliates.

"Timing is important. Did we want to bet on a totally new product? No. Besides, there is a large quantity of GI's IRT's out there, and it is an off-the-shelf item. We're looking at 24 SDTV feeds as well," Zitter says. "With DigiCipher, the whole infrastructure existed already."

HBO's uplink in Hauppauge, Long Island will be home to the HDTV uplink, and it is also the designated uplink for the new AthenaTV digital video service from Time Warner Cable. AthenaTV is proceeding with Scientific-Atlanta's PowerVu video compression system.

One decision that HBO grappled with was what HDTV format to use—1080i or 720p. For one thing, Zitter points to the lack of video production equipment. And then there is the issue of what formats are being considered by everyone who handles HBO's HD content downstream, including the DBS providers. 1080i was the choice, but Zitter is not passionate about the format.

"We've selected 1080i, but it is not religion with us. We agonized over 1080i versus 720p. From the start we knew that we were not going to do 480p," Zitter says.

"Everyone says that HBO is only starting with 35mm film, and that's easy to get ready for HDTV, but I beg to differ. The video production equipment doesn't exist. Vendors will start selling this hardware in 1999, with more coming in 2000," he adds. "It has taken us a year of advance work to prepare for the transferring of our movies. We built a facility here in New York for that very purpose."

And what if HBO's DBS distributors, EchoStar and USSB, elect to proceed with another format besides 1080i?

"If they decide to change the format, doing something other than 1080i x1920 because it takes a lot of bandwidth—we understand that—but they need to do it with HBO's agreement. All of our distributors need to find a way to make it work, and manage bandwidth," Zitter says.

He indicates that HBO is not charging affiliates any additional licensing fee as long as customers are not charged for HD services. Both of the DBS service providers which have indicated that they will be offering HDTV next year indicate that any pricing details are yet to be determined.

A spokesperson for Echostar commenting on the situation says, "No, HBO has not indicated what programs nor how many they will provide in HD. Also, we will not release the rates due to competition, proprietary information, etc., even if we had them set."

USSB says it has no pricing agreement yet but will announce it prior to offering the programming which is scheduled for early 1999, according to a USSB spokesperson.

Will copyright protection-related issues emerge as a last minute snag? Zitter would not rule that out entirely, but he seems encouraged by recent developments, and seems to see it being in place sometime in 1999.

"Copy protection needs to be solidified. It is on the verge of being completed, and as long as the copy protection equipment allows for only one copy to be recorded, than it will serve to support premium network TV," Zitter says.

Right now, it is difficult to say when the first syndicated HD show will air, but it will probably not happen until the marketplace embraces the HDTV sets. When it does we will be ready to take advantage of the opportunity."

—Michael R. Starobin, vice president and director of technical operations and post production at Martha Stewart Living Omnimedia

Discovery: HDCAM Is More Like Reality

Discovery Communications, Inc. (DCI) is viewed as a key player in the emerging ranks of HD programmers. On the heels of its announcement of "Discovery HD" earlier this year, Discovery is ensuring new productions will be HD ready.

"HDTV really does make a substantial difference with our type of product. You see things that you were never able to see before," says Charles Humbard, vice president and general manager of Discovery Digital Networks and Advanced Television. "Another benefit for Discovery Communications is that our business model as a broad media company requires us to sell our programming and imagery across many consumer platforms. The higher the resolution of the initial image, the greater the potential for exploitation of those images by the multiple divisions at DCI."

Humbard currently sees film as the most attractive format for Discovery HD. But with refinements to lenses, the move to a 4:2:2 standard and customized camera chip sets emerging, Sony's HDCAM will become mainstream, according to Humbard.

"Our goal in adapting HDTV is to provide the viewer with a closer to reality experience of the world around them. Our eyes see more like a well shot and managed HDCAM image, than the learned standard of film. Additionally, the ease-of-use and the long-term cost reduction for our production companies will allow us to capture more images to enhance the story while saving on the bottom line," Humbard says.

Discovery is not rushing into transferring all of its film library as it watches the emerging transmission standards.

"We're not doing a full channel in 1999 unless a revenue opportunity becomes available. We are looking at retail opportunities to get Discovery HD in front of consumers and potential syndication opportunities for branded programming," Humbard says.

"We've done a lot of different evaluations involving source material, encoding processes and display architecture, and over the next two years, we are going to see a phenomenal rate of development," says Jay Schneider, DCI's vice president of engineering and technology development. "We won't lock ourselves into one approach. We will attempt to make maximum use of our own content, and our strategy is one that is synergistic with the complete and total use of our material."

As part of the Digital Networks, Discovery is developing enhanced viewing applications for SDTV, Broadband and the Internet.

"One of our goals is to create information enhancement via push and two-way technologies allowing viewers to use search and link features without leaving the channel programming. Further, if they have a cable modem or an advanced digital set top or WebTV Plus, they will be able to receive simulcast from the channel accompanied by advanced interactive capabilities," Humbard says.

"You cannot say enough about the possibilities and excitement that digital television brings to our type of product," he adds.

MSG: Bumps But No Mountains

Madison Square Garden Network (MSG) has been taping everything in HD for months—everything but the Westminster Dog Show—according to David L. Shaw, MSG's vice president for technical operations. MSG has embraced Sony HD hardware, including a BVE-9100 editing package, HDS-7000 video switchers, and, four HDW-700 camcorders and HDW-500 studio VTRs.

The situation at MSG is well worth watching because the New York-based sports network's parent company is Cablevision, providing a natural outlet for any HDTV programming. The plan is to distribute the HDTV programming via Cablevision's fiber system once the set-top issues are resolved. This fiber grid reaches 40% of MSG's audience, according to Shaw.

"We looked around at a couple of different integrators, and we selected Sony to do the edit rooms. We concluded the deal in May and we got our Sony HD camcorders in June," Shaw says. "We wanted to keep production solid and we didn't want to step back. From a production standpoint, we have a real good handle on it. For example, we've taped almost everything including all the Yankees games and their ticker tape parade in HD. There have been a few bumps, but no mountains, and most of these have to with all the conversions taking place."

Shaw indicates that everything is being shot in 1080i/59.24. MSG is using Chyron's Infinit graphics and animation sys-

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tem along with Leitch converters, an upconverted Tektronix Profile server-used primarily for slow-motion playback-and Solid State Logic Aysis and Yamaha audio boards. Shaw indicates that a final decision regarding encoders is still pending.

"We're not committed to HD encoders yet. We've looked at five so far, and each of the last three hockey games was shot in HD using different encoders," Shaw says. "We have no problems when we downconvert HD to 4:3, but we are seeing bits of artifacts when we do the compression to 19.3 Mbps."

"One of our goals is to create information enhancement via push and two-way technologies allowing viewers to use search and link features without leaving the channel programming."

—Charles Humbard, vice president and general manager of Discovery Digital Networks and Advanced Television

Madison Square Garden going HD is not the only reason why industry observers are watching the MSG team closely. This emerging HD showcase for sports and special events has a mobile component as well. MSG started using its HD truck in early September.

"We have the first full-blown HD truck in the U.S. CBS used it on November 8 for its NFL broadcast in HD," says Shaw who indicates that among other things, the National Mobile Television truck is equipped with two switchers, a Sony HD-7000 and a sub-switcher for the 4x3 show.

Digital disc recorders and graphics are the two areas that Shaw designates as production gaps. He indicates that he is awaiting an HD digital disk recorder from Tektronix which should be available at NAB. He admits that the production team at MSG is not quite at "full throttle" in terms of the audio side and, among other things, he looks forward to more inputs-12 or 16-on switchers, for example. Otherwise, Shaw's enthusiasm for HD is quite noticeable.

Syndicated HDTV

Michael R. Starobin, vice president and director of technical operations and post production at Martha Stewart Living Omnimedia in Westport, CT, indicates that an upconverted 16x9 version of *Martha Stewart Living* is all ready to go.

"We're looking to embrace HD. Our content and brand lends itself very well to it. We also designed our full serial 601 production and post production facility here to be HD ready," Starobin says. "We release on Digital Betacam. We also have a GVG 7000 routing switcher with four channels of AES audio, and Hitachi 2600P digital cameras. And we have Avids with SDI in and out to offline and finish video while we mix and sweeten audio on Digidesign Protools 24 with Procontrol."

MSG's HDTV production and control rooms will be at the center of the networks HDTV coverage of New York Ranger hockey and New You Nick basketball (once the NBA strike ends) home games.

One of the issues facing all programs done in HDTV is set and stage material, something Starobin believes *Martha Stewart Living* is ready for.

"I believe our sets and stage materials will hold up very well in HD," he explains. "After all, our sets are that only in name. All the rooms, dressings, and equipment are real and functioning. The brand is all about reality and integrity. HD will allow us to present it more spectacularly and beautifully."

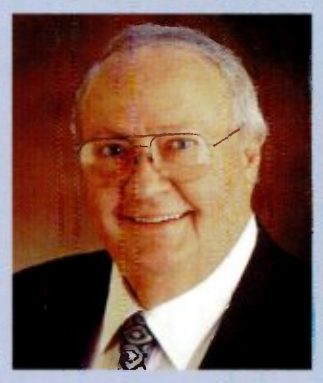
Starobin indicates that new cameras would be required. Last summer, Sony provided Martha Stewart Omnimedia with HDCAM's and monitors, and the response was overwhelming.

"We loved it. We shot on Martha's property in Westport, and it was beautiful," Starobin says. "Still, there are a lot of unanswered questions in terms of distributing a syndicated show in HD. We like to stay on the cutting edge, not the bleeding edge. Right now, it is difficult to say when the first syndicated HD show will air, but it will probably not happen until the marketplace embraces the HDTV sets. When it does we will be ready to take advantage of the opportunity."

HDTV is ideal for *Martha Stewart Living* because the show is awash in so-called "evergreen" content, according to Starobin. This is the term used to describe readily available content which has infinite shelf-life, and applicable secondary uses.

"Evergreen is the name of the game here. We believe that if we prepare and produce the programming with great quality initially, we will have the opportunity to re-use it, not only in conventional TV but in new emerging media," Starobin says. "Besides, the visual excitement and quality of imagery in HD will further allow us to match aesthetically what we do in print and on the Internet."

Joe Flaherty Named To Chyron's Board Of Directors



Joe Flaherty, CBS senior vice president, technology, has been named to Chyron's Board of Directors, his first election to a corporate board of directors.

Ed Grebow, Chyron president and CEO, says, "Joe Flaherty is without a doubt America's foremost living television engineer. "The inventor of electronic news gathering and a pioneer in the development of HDTV, Joe has guided the development of TV technology since the beginning of the medium. We are pleased that he is affording us a unique opportunity to tap into his inestimable wealth of knowledge at this historic time in our industry. He brings tremendous technical strength to Chyron's board."

Flaherty has led a distinguished career spanning over four decades in the television industry. In more than 40 years at CBS, including 23 as vice president of the Engineering and Development Department, he developed revolutionary innovations in TV technology, among them electronic news gathering (ENG), electronic cinematography, the introduction of off-line videotape editing, one-inch videotape, Plumbicon cameras, and miniature color cameras.

Flaherty is a member of the Executive Committees of the Advanced Television Systems Committee (ATSC), the Montreux International Television Symposium and the Board of Directors of the Advanced Television Technology Center. He is also chairman of the Technical Committees of the North American National Broadcasters Association (NANBA) and the World Broadcasting Unions, he also serves as vice president of the International Academy of Broadcasting. Formerly, he held the post of chairman of the Planning Subcommittee of the FCC's Advisory Committee on Advanced Television Service.

An honorary member of SMPTE, he was inducted as one of the first 60 charter members of the Broadcasting & Cable Magazine Hall of Fame.

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Technical Issues

Continued from page 1

mented or at least defined for the terrestrial DTV operation.

Let's take a quick look at some of the biggest issues still facing technical uncertainty and definition.

Uncompressed vs. Compressed Routing

The central point for passing information around the broadcast plant is the station router. Typically all incoming signals (external to the plant or off of tape machines) are connected to the router, along with all the special effects or in-plant signal processing equipment. Signals are routed to/from the appropriate pieces of equipment, possibly passing through the central router's matrix several times and then eventually exiting the plant via the appropriate output device.

In today's broadcast facilities the router's format is either analog or uncompressed digital, the latter conforming to the serial digital interface (SDI) standard, SMPTE 259M. The signal processing equipment in the end-to-end signal chain have long existed and interoperate well.

But with the advent of compressed digital video/audio and the new data services possible with the FCC-mandated DTV standard, ATSC A/53, this scenario becomes quite complicated. Although MPEG-2 transport streams, MPEG-2 video and Dolby AC-3 audio are part of the emissions standard, many compressed formats could exist within the plant (e.g., DV, Betacam SX, Motion JPEG). There are a number of questions facing today's facility. Should the different formats all be converted to one format in the facility? Should compressed streams be routed around the studio? Should all signals be brought back to the baseband, uncompressed format? What happens to signal quality if several generations of cascading (i.e., several decode/encode cycles) are performed? How is seamless stream splicing performed? How are high-definition (HD) signals intermixed with standard definition (SD) signals?

Each possible solution to these questions presents its own set of issues and those that have chosen to implement early are proceeding with solution "islands." In other words, part of their plant may not interconnect well with another part, or a set of "one off" proprietary interfaces may have been created in order to get all signals interconnected.

As an example to show how complex the uncompressed vs. compressed signal issue is, a joint task force of world experts sponsored by the European Broadcasting Union (EBU) and Society of Motion Picture and Television Engineers (SMPTE) was not able to come to agreement on a so-called mezzanine level compressed video format. There are simply too many established vendor-specific formats used in tape decks or tape deck "replacements" (e.g., video server type equipment), as well as different applications for the use of compressed video, among others.

That being said, another EBU/SMPTE joint task force recently published recommendations for the digital studio. Although the choice of compressed vs. uncompressed signal routing was not within its scope, the task force made clear recommendations for the use of a common encapsulation format for sending compressed digital signals throughout the plant, known as serial data transport interface (SDTI, SMPTE 305M). Although SDTI enables the carriage of compressed digital signals in SDI routers, additional specifications are still in development for specific mappings of the various formats (e.g., MPEG-2 transport streams, MPEG-2 elementary streams, DV and DV-based) and it will be some time before equipment which supports these standards becomes available. And because there is still a choice of formats, some interoperability issues will still occur in practice.

Another related concern is that today SDTI is not widely available. It is typically only available on tape decks. The major MPEG encoder and multiplexing vendors have already standardized on another serial data interface from the Digital Video Broadcasting organization, the asynchronous serial interface, DVB-ASI.

DVB-ASI uses the same basic encapsulation format and data rate as SDI, but does not use the timing reference signals. DVB-ASI can be switched through almost every SDI router available and is also commonly used as the standard interface between an emissions multiplexer and a modulator. SMPTE developed an alternative interface for the ATSC emissions stream to 8-VSB modulator, SMPTE 310M. Given the lack of SDTI today, some early implementers have opted for DVB-ASI.

What about HD? There is an analogous uncompressed signal standard to SDI for HD known as SMPTE 292M (the so-called "HD-SDI"). SMPTE 305M SDTI addressed the transport of compressed video/audio and other digital data into SDI routers, but there is no equivalent yet for compressed HD or other digital data over HD-SDI. There are several SMPTE activities developing the equivalent of SMPTE 305M for HD (the so-called "HD-SDTI"), as well as the mappings of various formats into the HD-SDTI proposed standard.

Transcoding between Compressed Formats

Another issue is the conversion of picture structure when "transcoding" to and from the studio or mezzanine coding format and the ATSC A/53 emissions coding format. Even if MPEG-2 video is the assumed mezzanine format, the picture structure within the studio will almost certainly differ from the emissions format. In the studio plant environment, a preferred format would consist of all intra-coded pictures (known as I-frames in MPEG terminology) in order to simplify editing and processing functions. This is referred to as a "short GOP."

In MPEG terminology, a GOP is a group of picture frames which includes the set of pictures starting at an I-frame and ending at the frame before the next I-frame occurs; in this case the GOP size is "one" since all pictures are I-frames. However, the emissions format uses an intra-coded, predictive-coded (P-frame), and bidirectionally predictive-coded (B-frame) structure in order to reduce the bit rate. This is referred to as a "long GOP." Converting or transcoding between the type of GOP structures can be complicated and may introduce picture artifacts (visible "mistakes") due to picture type mismatches and other processing effects.

The signals may also need to be transcoded when being received from a remote production or distribution site due to limitations on the delivery media, such as satellite transponder bandwidth or telecom service bandwidth.

In a compressed infrastructure, bandwidth will not be available for all I-frame HD between the central distribution point and local distribution (e.g., network to affiliate), so a transcoding step will be required at the interface points. There are two methods to complete this step—a decode/encode operation in front of a compressed infrastructure for editing and effects or a decode-to-baseband operation in front of an uncompressed infrastructure. Both still require a transcoding step to convert to the emissions format at the back-end. Which of the two is the most cost-effective? Due to the variance in compressed formats used within the studio and the cost of a codec when compared to an HD-SDI router, the baseband infrastructure seems to have the lead at the moment.

Audio

The above discussion centered on video, but what about audio? All the same issues of uncompressed vs. compressed still exist, and with audio there are even more issues to resolve. Will studios master six-channel sound? How will multiple languages be transported since there is limited space for audio? SD tape decks typically support two uncompressed stereo pairs per SMPTE 272M, and HD tape decks following 299M support three pairs.

Another issue is how streams are seamlessly spliced in the compressed domain since compressed audio frames (whether they are AC-3 or MPEG-2 audio) do not align with MPEG-2 video access units.

One proposal which solves this issue is to use a new proposed format known as Dolby E. Dolby E provides alignment with video access units and addresses the encode/decode latency issue. Unfortunately, it is not compatible with AC-3, so it requires the use of decode-to-baseband and re-encode components, which are not otherwise needed.

In the near term, a number of local stations creating content will use two-channel audio only and six-channel surround will be "passed-through."

Closed Captioning

Closed captions for the hearing impaired are mandated by previous FCC rulings. The mechanisms for generating captions, transporting them within a studio, and placing them within NTSC TV signals are well known. But what about for DTV?

NTSC closed captions are defined in the Electronics Industry Alliance standard EIA-608. They are placed in the emissions signal, on active video line 21. Line 21, by industry default, does not really carry video information any more and many treat line 21 as part of the vertical blanking interval (VBI). The VBI is now used to carry a plethora of data information unrelated to the video. Similarly, the so-called V-Chip or content advisory information is also carried here. DTV—specifically HD—does not offer the concept of a VBI. In addition, given the DTV standard's extended capabilities, EIA-608 was considered overly restrictive.

To address the industry needs the EIA published a new standard for DTV closed captioning—EIA-708. A large number of captioned streams are defined and at an overall bit rate of up to 10 times higher than EIA-608. The standard also integrates content advisory and closed captioning transport with ATSC standard A/65, program and system information protocol (PSIP). The problem is that to date there isn't much equipment that supports the standard.

Closed captioning as part of an end-to-end DTV "food chain" is not that simple. Some EIA-608 to EIA-708 bridges are starting to appear, but they use proprietary interfaces. Also, the control protocol between an emissions multiplex and the caption generator is not defined by any standard. It is not clear which format to use under certain DTV operation scenarios either—pass-through EIA-608, embed EIA-608 formatted data in EIA-708 data stream, or translate EIA-608 to EIA-708.

Also, the standard studio interface and data flow protocol for the PSIP portion of the information has not been defined. Furthermore, a DTV-to-NTSC converter—to allow an NTSC television to receive and display DTV signals—will have to convert EIA-708 formatted streams to line 21 data.

HD creates additional issues for handling closed captions and related ancillary data. Although the VBI and horizontal blanking intervals do not exist in HDTV, there are still horizontal and vertical ancillary data areas in the bit stream.

One proposal is to place all of the EIA-708 data into the embedded audio stream (according to the Audio Engineering Society "AES" standard) and then use the existing SMPTE embedded audio standards (272M and 299M, for SD and HD respectively) to carry the ancillary data in the horizontal ancillary data space. The problem with this approach is that this reduces the number of audio signal pairs supported and many consider this unacceptable.

There is another proposal to place the ancillary data into the vertical ancillary data region, but current equipment does not support this. Dolby E may solve the problem of using the embedded AES approach since up to eight encoded channels occupy the space of a single uncompressed stereo pair, but some opponents to this approach want to route uncompressed audio only.

Logo Insertion, Special Effects and Stream Splicing

Bug insertion and similar special effects are also complicated in the compressed domain. Should the pictures be fully decompressed? If the pictures are uncompressed, an HD effects suite will be required. Alternatively, the signal can be down-converted to SD, use the existing ITU-R Recommendation 601 suite and then be up-converted back to HD; however, there may be image quality degradations with this approach.

If the pictures are compressed, an MPEG splicing or special effects engine will be needed. Most station branding logos are transparent, not solid, so a simple overlay of graphics can't be done; the motion in the underlying picture still must be tracked. Again, many issues remain.

As mentioned under audio issues, the non-alignment of video and audio in the compressed emissions stream format (which is needed for efficient bandwidth utilization) creates a difficult problem when trying to switch streams in a seamless fashion. Although SMPTE has produced a standard for long GOP splicing (SMPTE 312M), they are now working on several proposed standards for seamless splicing which do not have as many restrictions in their use. One set is the MPEG Re-Coding Information and Information Bus and is based on research done by the Atlantic Project, a European-funded group. The other set defines stream transport over the SDTI standard—SDTI-CP for a common packaging format for data, video, and audio; and SDTI-TS for MPEG transport streams.

For seamless stream switching, the question is whether or not a fully integrated structure is needed or if a downstream splicing island is acceptable. The latter would not do logo insertion, but would handle compressed domain stream switching, such as that needed for ad insertion of stored compressed streams.

Centralized Control

In today's systems, there are no standards for centralized control. Instead, there are multiple, proprietary solutions. With the advent of more computer-based intelligent peripheral devices, the traditional method of having an "omnipotent," centralized system issue real-time triggers to remote "dumb" devices no longer holds. In addition, the new ATSC PSIP protocol for stream management and program guide use needs to be integrated into an end-to-end control model.

Standards have been slow to be created in this area, but they need to be. A model which takes advantage of computer-based standards, advanced element management and delineates control plane from management plane will more closely match future needs. So in the near term there will still be point solutions, but RS-232/422 interfaces and closed systems will most likely migrate to IP/Ethernet, SNMP and management information bases and advanced scheduling with distributed time and local triggers.

Summary

None of the above issues are insurmountable. In fact, most—if not all—are being addressed right now. The point is that the DTV standard is very flexible and powerful and, hence, many aspects are still in development. This will not prevent DTV from becoming a reality; it just complicates the end-to-end implementations of early adopters. ■

Matthew Goldman is director of engineering for advanced systems development at DiviCom Inc., in Milpitas, California. Matthew was active in developing the MPEG-2 systems standard (ISO/IEC 13818-1), the baseline for terrestrial DTV, DVD, direct-to-home satellite, digital cable television, and other DTV-related systems. He was also project editor for MPEG-2 part 6, digital storage media command and control (DSM-CC), which includes the data broadcasting protocol used by the ATSC, Digital Video Broadcasting, and the Digital Audio-Visual Council standards organizations. He is currently participating in the ATSC, SMPTE, and MPEG committees.

Zeros and Ones

Commentary from the Editors of Digital Television

In The Beginning...

This month marks the beginning of a new era in television broadcasting, the era of digital television.

What will this new era mean in the long run? That's still to be decided, but if one had to hazard a guess it will ultimately mean increased choice, services and picture quality for television viewers. Of course, if one hazarded a guess 10 years ago the answer would have been a beautiful 16:9 picture with 1,125 lines of resolution, so there's a good chance we could be wrong.

How we got to today's varied and amorphous definition of digital television from the original goal of 1,125 lines of resolution is a story that could fill up its share of magazine or book pages (and has), so we'll save that for the historians. But to us, above all, the story is an example of the realities of technology, business and politics coming together and actually resulting in something that allows for growth, big thinkers and, above all, dreamers.

Everyone in the industry, no matter what facet, understands the deeper realities that face our industry at this defining moment. As we laid out in last month's editorial there is still much work to be done to finalize standards and bring different sides of the industry together.

But today, right now, might be a good chance to reflect on how much has already been accomplished by those in the industry.

□ Volunteer broadcasters are on the air—and the number of volunteer stations on air today is almost double the number originally anticipated. Two years ago who would have predicted that?

□ It's possible to buy a high definition camcorder from Sony for $70,000. Five years ago who would have predicted that?

□ Broadcasters have a varied choice of transmission formats, allowing them to select the format they believe is best for the business model they wish to pursue. Ten years ago who would have predicted that?

If the move to DTV and HDTV has shown anything it's that our industry often defies predictions. So for now, let's leave the predictions for another day. Forget the arguments over progressive vs. interlace, the numerous technical issues that are still on the table, the lack of programming and the issue of must-carry.

If you can, just take a second to sit back and enjoy the dawn of digital.

New Opportunities

Ok, that's enough relaxing. Now it's time to get down to business. In recent months we've heard manufacturers and broadcasters say that the true business opportunities of digital television lie not in the pretty pictures but rather in the ability to best use the digital bandwidth to offer the public a variety of services, ranging from alternate programming, datacasting, Internet services, radio broadcasts—we've heard a lot of interesting ideas.

If there's one thing that is going to be truly fascinating in the age of digital it's going to be watching which services catch on and which don't. But our bet (dare we say prediction?) is that at the end of the day one philosophy will win out: better pictures. The other services may well provide a calling card for extra revenue, but those who are most successful in using their digital bandwidth to generate extra revenue will also be the ones offering the highest perceived visual and audio quality for a given market.

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212-337-6995
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e-mail to:srice@cahners.com

Peggy Conlon
Vice President/Group Publisher

Donald V. West
Editor-in-Chief

Ken Kerschbaumer
Editor
212-337-7011
Fax: 212-337-6970
e-mail:
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David R. Borucki
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Fax: 317-815-0883

Angelina Martins
Executive Assistant
245 West 17th Street
New York, NY 10011-5300
212-337-6980
Fax: 212-337-7066
e-mail to:amartins@cahners.com

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