Broadcasting&Cable's

Digital Television™

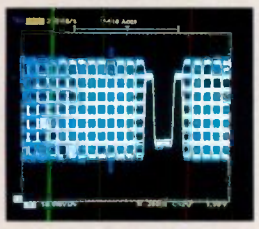
Technology For The Digital Age

VOLUME 1 ISSUE 6 AUGUST 1998

COOL STUFF

Digital Phosphor Oscilloscope

Tektronix has introduced a new class of digital phosphor oscilloscopes (DPO) that display, store, and analyze in realtime, using three dimensions of signal information: amplitude, time, and the distribution of amplitude over time. The benefit of the third dimension is an interpretation of the signal dynamics, including the instantaneous changes in the signal and the frequency of occurrence. Pictured here is the DPO showing the distribution of digital video trace between the eight 8VSB levels using gray scaling.



■ **For more information circle Reader Service #500**

Sony's Latest HD Switcher

The HDS-7100 high definition digital video switcher from Sony is designed for use in telecine transfer, small post production applications, or small mobile applications. It provides 10 HD-SDI inputs as well as program, clean, and two auxiliary bus outputs conforming to SMPTE 292M high definition serial digital format. Chromakey, frame store, and single channel digital multi-effects (DME) can be installed to provide high-quality effects layering and compositing.

■ **For more information circle Reader Service #501**

Abekas Replay Twice As Nice

Scitex Digital Video has added redundancy to Replay 1.0, a system that provides more than 40 minutes of video and audio storage or can hold more than 72,000 stills. Replay 1.0 can replace still stores and tape machines in a broad range of applications, from editing to on-air replay, that require recording, storage, manipulation, transfer, or playback of video.

■ **For more information circle Reader Service #502**

For More Products see page 43

COMING ATTRACTION

THE DTV-READY PC

PC chip makers look to offer products to fuel lift off

By Peter E. Brown

SPECIAL REPORT
Convergence '98

Convergence seems to have run its course as a buzzword. It was burnt out before it ever had a chance to become anything more than a buzz.

In the early '90s convergence was most closely associated with interactive television, and following the "failure" of a number of interactive experiments, most notably Time Warner's Full Service Network, many wrote off convergence.

But today, particularly with the explosion of Internet-related activities like shopping and surfing it appears that interactive experiments may have just been a couple of years ahead of their time. The blurring of communications, consumer electronics, and computers has taken the electronics industry by storm, and it's hard to find an area in the electronics community that isn't talking about some kind of integration or combining multiple functions on a single piece of silicon.

So now the electronics industry sits on the verge of the DTV era, and television signals seem poised to extend beyond the television set and into computers.

The idea of bringing DTV to computers is drawing a lot of attention at the current time, thanks in part to two electronic Goliaths—Microsoft and Intel.

The move to the broadcasting space may seem like a bold move on their part, but both companies have significant weight and influence to push around, and they're banking on

Continues on page 14

DTVPOST for PC

Digital Television kicks off the first of its new series focusing on DTV post production with a look at the PC platform. Its strengths, weaknesses, and info on some of the tools available can be found beginning on page 23.

The Odd-Stations-Out in Digital TV

Out of core could be double jeopardy for stations orphaned by allocations shortfall

By William R. Meintel

In February of this year, the FCC finalized most of the regulations required to convert television broadcasting in the United States from analog to digital.

Part of these regulations called for the amount of spectrum used for television to be reduced by 18 channels at the end of the conversion, now set for December 31, 2006. The new digital television band, referred to as the "core," will consist of channels 2 to 51.

But the FCC's DTV channel assignment plan contains 188 (including 11 in Puerto Rico) DTV assignments that fall outside of this "core." In most cases, this was caused by the need to assign a DTV channel for every existing broadcaster colliding with a shortage of DTV spectrum in congested markets.

Some broadcasters have already made it clear to the FCC that they are not happy being located outside of the core. Why? Because the 188 stations with DTV assignments outside the core will begin DTV operation on one channel and then have to change to another channel as core channels become available from phased out analog operations. This implementation scenario will likely add considerable cost to the transition for these stations.

The availability of a core channel for these stations after the transition is not an issue since only a few stations have both their analog and digital channels outside the core, and many would be able to use their existing analog channel for DTV. In addition, the other

Continues on page 40

Advanced

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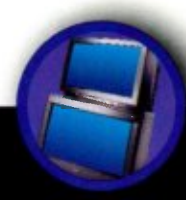
[SWITCHERS]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DVCPRO 50

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Panasonic 1080i studio cameras and 480p and 480i camcorders are essential members of the Panasonic ADTV family, offering extensible, scaleable and affordable solutions. Solutions like the new AK-HC880 1080i studio camera, and its companion, the AK-HC830 1080i portable, for high definition acquisition.

Whatever your path to digital television, Panasonic has the tools for today and tomorrow. High Definition VTRs like the AJ-HD2700 switchable 1080i/720p, AJ-HD2000 1080i models and AJ-HD580/ HDP500 combination VTR, all offer full bandwidth, 10-bit HD recording. And, they're available now for production and archiving in the industry standard D-5 HD format. For DTV recording, the AJ-PD950 studio VTR offers 480p recording and playback. For your next generation of television and video, rely on Panasonic quality and support.

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News

Inside The Business

Avid Acquires SoftImage

A little over one month ago Avid announced that it would acquire Microsoft's SoftImage subsidiary, a leading developer of 3D animation, 2D cel animation, and compositing software solutions.

Speculation and rumors began circulating quickly as to the motivations of both Avid and Microsoft. Was Microsoft selling SoftImage because it was tired of different styles of management? Was the acquisition a reflection on Avid's existing graphics product line? One television report even stated that Microsoft sold SoftImage because the NT platform wasn't taking off the way it thought it would.

Nearly two months later the rumors

Continues on page 33

HOT SALES

The CNN News Group will upgrade more than 1 300 existing newsroom workstations throughout its operation to **Avid's AvidNews** Newsroom Computer System. The upgrade is already underway at Headline News, and following that upgrade, domestic and international CNN News Group networks and bureaus will be converted. The transition period is expected to last for two years.

Complete Post in Los Angeles has purchased a complete **Panasonic HDTV** post production editing and effects system. The system includes six AJ-HD2700 1080i/720p switchable D-5 HD VTRs with AJ-DFC2000 480p down converters; an AV-HS3100 1080i post-production switcher; one AT-H3015W 30-inch master HD monitor; and three DT-M3050W 30-inch 16:9 multi-format monitors.

The NFL pre-season has just begun, and CBS is in its preseason as well, adding eight **Pro-Bel TX 320** master control switchers for use during the upcoming season. The CBS units include 20 audio-follow-video inputs, eight independent audio channels, audio breakaway, two linear keyers, full-function DVE, machine control, bypass switch, and an internal 32x32 matrix.

DirecTV has chosen **National TeleConsultants** to provide baseband system design and integration services for the new, all-digital DirecTV Los Angeles Broadcast Center in the Marina del Ray section of Los Angeles. The facility will initially encompass more than 100,000 square feet., and will include one of the largest television routing switchers in the world, and more than 700 broadcast equipment racks and 1,000 monitors.

POP (Pacific Ocean Post), located in Santa Monica, Calif., recently purchased a **ProntoVision** uncompressed realtime HD digital disk recorder from DVS Digital Video. POP will use the system for its import-and-file HD conversion program and to get HD video in and out of its Discreet Logic Inferno system.

WCNC-TV Charlotte, N.C. (PBS), owned and operated by A.H. Belo Corporation, purchased more than $1 million of **Sony Betacam SX** equipment. The purchase includes 14 DNW-9WS switchable camcorders; 14 DNW-A75 digital VTRs; five DNW-A225 digital portable editors; and four DNW-A22 players. WCNC is the eighth Belo station to add Sony Betacam SX gear.

WSB Atlanta (ABC) and KTVU Oakland (Fox) both recently signed contracts with **NDS Americas** for the purchase of ATSC encoders. Both stations are owned by Cox Broadcasting, and both encoders are expected to be delivered in time for November broadcasts. The complete system includes the NDS E5810 HDTV encoder, StreamServer PCpro management system, an E5610 standard definition encoder for the existing analog channel, and a microwave DS-3 interface for STL.

GloboSat of Rio de Janeiro, Brazil, has added **SeaChange International's SPOT** system to manage digital advertising insertion. With the system installed in six of its 55 local cable systems, GloboSat will be able to offer localized spot placement.

HOT TECH

Pushing Digital Broadcast Audio Through The Pipeline

Audio formats compete, compliment as DTV sound develops

By Dan Daley

The trouble with the future is that it gets here too fast. The concepts are often ready before the tools are. One might think that with nearly a decade's worth of wrangling about DTV and HDTV that the tool chest would have been overflowing already and digital carpenters would be chomping at the bit. Well, the tools are getting here slowly — during that decade there have been lots of other developments in digital audio that have understandably sidetracked things while the government dragged its feet — but those tools are not lined up perfectly quite yet.

Long before the DTV issue was settled conceptually or legally, multichannel 5.1 digital audio has become the norm in film and new optical disc formats like DVD. New playback systems were devised for theaters to accommodate 5.1, and DVD has plenty of storage space for multichannel audio. Broadcasting, however, continues for the moment to be limited to the two- and four-channel VTRs, DDRs and routers.

The infrastructure to handle multichannel sound for broadcast is simply not here yet. And that means compression, a word often used in conjunction with "scheme," which tends to give it a somewhat sinister connotation. That's certainly been the case in the competition between Dolby and DTS for the next generation of optical disc audio-only standards. But that competition is more consumer marketplace-driven, with the winner being determined by wh has the most chips in consumer hom receivers.

Muting Competition

In the broadcast world, the competition i more muted, a bit more collegial. That's cer tainly the case with Dolby and NVision, bot of whom are offering approaches to multi channel audio which span the signal pat from post production to final transmissio They both regard their respective systems be more complimentary than competitive.

"We're looking at this issue from an over all systems point of view," explains Ken Terry, a senior project engineer working o the Dolby E format that the compan demonstrated at this year's NAB Show i Las Vegas. While its formal introduction not expected until next year's NAB (an thus missing the fall intro of DTV itself), it' meant to provide a presence for Dolby o the other side of the broadcast wall. Dolb Digital (AC-3) was always intended as delivery medium, compressing the data ra from 6 Mbps (six channels, 20 bits, 48 kHz down to 384 kps (a 15:1 reduction). But thi was never intended for post production an broadcast processing, where higher dat rates are preferable. Thus, Dolby E, whic aims to keep audio considerably closer full bandwidth up to the emission point.

"The concept that's driving Dolby E i that we want to allow the content provide to keep control of how the audio sound for as long as possible and as far into th broadcast chain as possible," explain Terry. "We see final encoding being don ideally at the local television station, a close to the end of the chain as possible."

Dolby

The issue for Dolby is to keep the digita metadata—gain level, word length, numbe of channels, channel ID, channel align

Continues on page 3

ESPN Xcited Over HDTV

ESPN's recently completed X Games, which were held in San Diego, made use of Sony high-definition production equipment for some of the athlete profile pieces. ESPN used two HDCAM HDW-700 camcorders and two HDW-500 VTRs to produce the features, and then downconverted the material for air to NTSC. Other Sony equipment used for coverage included the DVCAM DSR-PD1 camcorder on skysurfer's helmets, along with DSR-200A camcorders, and DSR-20 and DSR-30 VTRs. Sony's Travel Edit System, which includes two channels DME, a DVS-7250, four Digital Betacam DVW-A500 decks, monitors, and the HDW-500 VTR was also used. A variety of Scitex gear was also used, including the Abekas Brutus DVE, four Clipstore DDRs, two 8150 switchers with internal and external Dveous DVEs, and three additional twin-channel Dveous DVEs.

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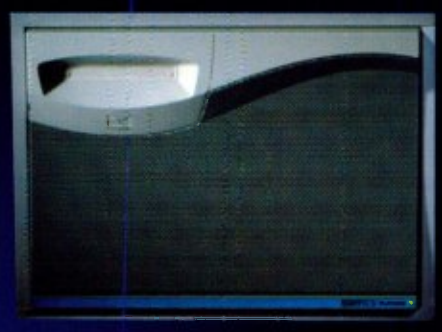

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More information circle number 4[illegible]

DTV PROFILE

What are you doing at Fox to prepare for DTV and HDTV?

Setos □ We don't distinguish between DTV and HDTV. Digital television is here, and we're getting ready for digital television.

We find it curious that the industry is interested in what we're going to do. You know, Ford doesn't tell GM what the new features of its new models are going to be until the consumers find out—and this is a very consumer-driven product. Our audience is [our consumer], and we're not going to be revealing prematurely the precise nature of what we're doing. One thing I can say is we look at this as a very consumer-oriented thing, and we're going to make sure that we don't confuse our consumers, and that we entertain and inform them because that's what our business is.

I guess we look at it this way because we grew out of a movie studio. Here in Hollywood, it's not like people advertise and tell the media "I'm gonna produce this movie in 35 millimeter or super 35." You know, that's not the point. The point is, there's a consummate product up there of a certain aspect ratio, a certain picture quality, with content, scripts, acting, you know, spectacle. And that's how we look at it. You can't keep this top secret, like a military project, but we don't put a lot of emphasis on, you know, beating our chests over what particular things we're going to do.

DTV ■ **What was your decision making process regarding interlace versus progressive?**

Setos □ Well, again, it was consumer-oriented and business-oriented. First, interlace is a bandwidth hog—it uses more bandwidth than progressive for a given picture quality. Second, the entire imaging community, national defense, medicine, the motion-picture special-effects business, archiving, is progressive, and that sends a message. It's an obvious message to us—progressive makes better pictures for a given bandwidth. There are no artifacts built in, and it's as smooth as an image can be—in an electronics sense—because there's no line structure.

The fact is that interlace is a pattern, and it's an artifact in the image, that is visible under typical viewing conditions.

Further, we're in the business of owning product. This is where, again, we're a little different, because we grew out of a studio. We have archives. Most broadcast networks don't own much or, at least, they haven't for quite a while. We are very sensitive about what we archive, and we're not going to be archiving interlace. Interlace is a handicap to the picture quality of the future.

Look at old product, like *M*A*S*H* or *I Love Lucy*. Shot on film, edited on film, so they're very lucky. We can repurpose those for progressive DTV very inexpensively, and at very high quality.

All in the Family could also be thought of as a very high-quality content show. Unfortunately, it was captured in interlace, so you're stuck. It's over. Interlace artifacts are very visible, and as screen sizes get larger—which they are—and as displays get better—which they are—interlace becomes more and more obvious.

Being locked into one format is a cultural thing with television. And we don't understand that at all because of all the work with different film formats. I mean, why would you shoot a talk show in the format you would use for the Super Bowl?

So there are three choices in progressive—at least, in terms of spatial resolution—480, 720 and 1080, with 1080 being the highest, way beyond 1080i. That feels good to us.

DTV ■ **So what are the plans as far as 720 progressive?**

Setos □ Well, we have not announced specific plans about 480p and 720p. And 1080p is sort of like an annuity. Until displays get there there's no point in beating your chest about one standard.

The wonderful thing about DTV is that it's not a glacier. It's changing every month. It's wonderful—it keeps you alert, and we love that sort of thing. This is not a retirement job here. So we have not announced our plans for 480p or 720p.

DTV ■ **What about the number of frame rates per second?**

Setos □ Well, obviously, we turn quite a nice buck at 24. You know, motion pictures, and virtually every primetime show, are shot at 24. Some people think wouldn't it be great to be released from this huge albatross of 24-frame-per-second shooting? Well, I have shown producers who are used to 24 fps some 30-frame capture, and they say it looks horrible.

DTV ■ **What don't they like about it?**

Setos □ I'll use all the words they use: Oh, that's too immediate, that looks live. And you show them 24 and they love it. And, you know, this is all about creativity, this is not about engineering. This is about art, and about perception. Perception is everything. And we have trained our society, in their minds, at least, that 24 means not real. So we will stick with 24 for film primetime drama, and, obviously, movies aren't changing.


Craig Mathew

Fox Looks To Be Progressive

For all the interlace/progressive debate, Setos looks to consumers to decide the real winner

News Technology Group's Executive Vice President Andy Setos has helped transform the Fox network from its fledgling "Does-the-world-really-need-another-network?" reputation to one that has changed the phrase "Big Three" to "Big Four."

With a dedication to technical innovation, most easily seen in its sports programming, the Fox network has always been keen on keeping on the edge—and has been known to cause its share of debate with developments like the "Fox Box" and the "Fox Puck."

When it comes to the move to DTV Fox has been no exception to making for interesting conversation. Which way is the network headed? Editor Ken Kerschbaumer sat down with Setos in Los Angeles to find out what the network has in store for the digital age.

We have evaluated 30-frame shooting. As you know, Philips is working with us very closely with a production 480p 30fps camera, the LDK-2000, and we're buying a whole bunch. And we're perfectly happy with that for all other activities.

DTV ■ **So it sounds like Fox is pretty much on its way.**

Setos □ Well, we've been working very hard over the past 12 months on this whole issue of DTV. We geared up. We have a dedicated group of individuals, and they're uniquely DTV ready, as well as accomplished in their own right.

First there's Evan Whetmore, whom I met in television when he was in PBS, and I was in PBS back in the '70s. He designed the first satellite system for broadcasting, when PBS was first, before the broadcast networks. He collaborated with me on the Movietone conservation project, where we archived the 50,000 hours of Fox Movietone newsreels in 1K by 1K progressive scan at 24 or 16 fps depending on whether it was silent or sound. We also built the Phoenix animation facility which released "Anastasia." And he was also heavily involved in the Advanced Television Test Center, as a consultant and designed the RF test bed for it.

Next is Jim DiFilippas, who was director of engineering at the Advanced Television Test Center, and was previously at ABC and other places. Right before he came here he was director of engineering for the host broadcast of the Atlanta Olympics.

And, finally, there's Scott Hamilton, who was in charge of computing science at the test center. We're not in the television business anymore—we're in the data-transmission business. And he is a digital-transmission expert, and worked on the standards that are in the ATSC standards that have to do with PSIP.

We're not in the streaming business anymore—we're in the bit business. And he's our guy on that. Plus, we all collaborate because we're all at each other's throats all the time about new ideas. And we're having a grand time, because we're inventing it as we go along.

DTV ■ **Do you see a lot of opportunities here? What are the opportunities regarding improving operations?**

Setos □ We're having a good time, because there's invention. You know, our industry is one built on content. It's not about technology, it's not about engineering stuff. It's about content, information and entertainment.

But the enabler is the technology and engineering is the business of technology. You know, technology is a science-fair project: Look at this cute gizmo, it does fun things. But you have to make money with it, too. It has to be practical, has to be affordable, has to work and has to be fieldable. So that's where we come in. We take the technology and we apply it to help the producers, help the distributors, and help the broadcast stations get it together.

This transition is not easy, but there are benefits here. The people who've been managing the normal process of content, creation and distribution have something new added. Until that learning process gets discounted there are going to be a lot of headaches. It's not going to be easy. But, you know, no pain, no gain.

DTV ■ **The ultimate goal of this process is that viewers will have a better viewing experience. Therefore, creatives will have more opportunities to apply things, and content will be better perceived.**

Setos □ Well, you know, you can look at it from two perspectives—I'm just pointing this out—not my own personal perspective. You can look at it as an unfortunate cost of doing business or you can look at it as another competitive arena in which you can distinguish yourself. I mean, will someone watch, Newt Gingrich being interviewed on *Fox News Sunday* because there are more lines in the picture, or the aspect ratio is wider? I don't think so. Will people get really excited because they can watch *Ally McBeal* with much more realistic picture quality, and depth, and they can hear the music in five channels of digital sound? Possibly.

Those decisions are not for me to decide—I'm just an engineer. It's for the producer or the director to decide. There's a whole new array of tools for the producer and the director to make the show successful—not better, successful. It's not important if it's better or not, it's only important that it's successful. And we have to be careful to make sure we don't try to corner creatives into doing it one way or the other.

Like if Woody Allen wants to do a show in black and white that'll be a decision made in the gestalt, not by a standard: "Oh, look, it says we have to do RGB." That's not the way the world works. And if people try to force it into the world like that, it will fail.

DTV ■ **I guess you could say the post-production community has been DTV for a few years now.**

Setos □ You mean component digital.

DTV ■ **Right.**

Setos □ Well, component digital running 480i, in 3x4 aspect ratio. I guess you're right in that context—we have had that.

DTV PROFILE

Craig Mathew

sticks with interlace—it's not progressive. And it has a 4x3 aspect ratio and more or less the same resolution. And the producer always has a little 17-inch color TV in the room, with an NTSC spigot, to make sure he knows what it's going to look like at home.

So, you know, he's not producing something in DTV, he's archiving, if you want to put it in the broader sense. And the tools allow for him to go generations and not worry about generation loss. So, yes, it has released the producer as a tool, but it's not really doing anything for the viewer.

DTV ■ **It seems at this point that the progressive-interlace argument is moot.**

Setos □ Exactly. I mean, you asked me why we made our decision. I'm not preaching—I don't ever want to be accused of preaching. I simply state the facts as we see them, and why we chose what we did.

Ultimately, I want other people to fail and make the wrong decision. I want to be able to have the better product, or the most appropriate product, you know, for people to watch. I don't care what other people do. The standard allows for those differences and that's the great strength of the standard. There are 18 formats in the standard. There are, you know, one, two, three, four, five spatial resolutions in the standard. Let the producers pick the one they think will be most successful for their product.

There are tradeoffs to be made. You can't produce a documentary in 55-millimeter film because it's impractical. The camera weighs 80 pounds and you only get five minutes on a load. I mean, how do you do that? How do you take that down the streets of a city and show people partying in a Mardi Gras? You don't—you use 16mm. So would shooting in 55mm be successful because you've got virtually no footage but it's really sharp?

I'm making simplistic visions of what goes on all the time in a producer's mind. It's all about what you produce. Each frame rate has a distinctly different perceptual value to the viewer—at least, that's what the producers tell me. And as a viewer I can agree with them.

Aspect ratio's another important one. There may be shows that aren't good in 16x9. Or, put another way, there may be shows that can't be produced in both aspect ratios simultaneously.

DTV ■ **Like newscasts?**

Setos □ I won't go there. My point is that these are questions. So a show might be in 4x3 with graphics on the side panel. That's the beauty of it all, you know? Be creative.

We've, as I say, sort of abandoned interlace now. We will not transmit interlace on DTV, period. But, other than that, it's a real wonderful, competitive, creative arena, that we expect to treat as such. We'll collaborate with the producers and tell them what the tradeoffs are. They don't know because they're not engineers, or there's no instinctive understanding because it's the new thing. And there's a lot of collaboration. But, you know, this is not dictation time.

DTV ■ **So looking at progressive, what are you finding regarding progressive equipment?**

Setos □ Well, first of all, for 480p there's all the equipment you need, to do anything, and that puts it in a distinctively different category than either 720p, 1080i or 1080p. We're heartened to know that all the manufacturers that we've spoken to have told us that the equipment will be AC/DC, my shorthand in this company for 720p/1080i. And that was always the case, it's just that no one ever said it. In fact, in our lab we have a pair of Panasonic tape machines that do either. We've ordered 720p cameras that will be available to be used in the fall. So we're not concerned about availability.

Once you leave the 480p regime, or 480i, for that matter, you're in a totally new world of limitations. The important aspect of our schedule is there's not enough equipment in any of those formats to do something complex, like a football game. No matter what the format is, no matter who says they're fielding a truck with all the digital doodads, you can't do it. Yes, you can field five cameras and see the players on the field, but that's not a football game for us. I think we've distinguished ourselves there. There's no super slo-mo, you know, and the layers of DVE and graphics doesn't exist yet. Will it? I'm not so sure. For example, for super slo-mo you're talking about 5-to-10-gigabit devices. It stretches the imagination.

So in terms of equipment availability I think there is a balance in the higher resolutions. There is a balance, but it's limited.

There's also a misconception that film takes care of all that. Wrong. Every film show seen on television is electronically post-produced, so if you don't have all the tools, you can't do it. Even a motion picture has a heavy electronic post-production. There are lots of details that go into making a motion picture ready for free television, like removing content. Not just editing content, but fixing it so it's suitable for content for air. And that's not a straightforward issue, in any format.

So while there's a balance at the higher resolutions starting at 720 and going to 1080, there are limits. And it's putting a large strain on being able to produce effectively. At 480p, there isn't a strain. There are industrial process changes, but the equipment's all there.

DTV ■ **So you're happy right now with where things stand regarding equipment availability?**

Setos □ I wouldn't put it that way. I'm very happy. I think the manufacturing community, and I don't want to pick favorites here, but, obviously, we work with Philips and Matsushita, Tektronix, Faroudja, Ampex, and JVC. Those guys really rose to the occasion over the last 12 months, culminating at the NAB.

That's what's amazing. The FCC voted on DTV the week before last NAB so we all went to the NAB dumbfounded, right? Manufacturers had nothing; we didn't even have anything to think about.

And in the course of one calendar year there were real products on the NAB floor that could do this stuff. There weren't many 1080i products, because there's still 1035i, but there were 720p cameras and recorders. All the switchers were declared AC/DC, in my parlance. And there was the Philips film scanner, Datacine, which runs at any format you need, including 1080p. So, actually, I give the manufacturing sector credit—they're really with it.

DTV ■ **And I guess the price points aren't as**

THINK outside THE BOX

For Hotel Movie Systems

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DTV PROFILE

astronomical as three years.

Setos □ No, I don't agree with that. The price points are just as bad as we thought they were going to be. It's called tradeoffs.

DTV ■ **It's interesting hearing the name Ampex again.**

Setos □ Well, Ampex has a core technology, which they have everyone beat on, by a factor of maybe three or four times. They can make magnetic data recordings of a density and a speed actually three to five times faster than any other technology out there.

We have to get away from this thought that we're in television. The movie industry recognizes that. They don't have any television equipment. They make images, with rendering and stuff. They're all using, you know, special-purpose scanners, not telecines, and film recorders, not kinescope machines, and SGI workstations with software. And that's where we are. We don't use videotape much anymore. We use it for Sneakernet, because there are no standards. We get videotape in. We accept most digital component formats, and we use DVCPRO, Digital Betacam, and Digital S. But, after that, we don't use videotape. We produce all our promos online, as well as all playout for commercials, promos and long form, off of a file servers.

We don't store things on videotape anymore. We store it on data files. And, you know, the DST drive is our choice for data storage because it's fast. I think they're now at 20 megabytes a second, and I think they're talking about going to 40 in a couple of years. That's an amazing rate. And the density is huge. On one cartridge I get 20 episodes of prime time. My whole tape library is on one wall, right across from the servers. We don't have a working tape library for long-form anymore.

As for all our editing for promos, we have four online Discreet Logic bays, which, by the way, can scale to any resolution we want just by buying more hardware. But all their algorithms and software scale, without changing.

We're cutting everything as files—we don't have video anymore. We only have video to send up to the satellite. That's the last analog step, and we have to change our satellite transmissions from analog to digital, which we're looking to do in the next year or two.

But the ability of pulling up a file and not having to buy a warehouse to store it helps anyone moving a lot of information—and television moves more information than anybody.

DTV ■ **Your thoughts on the cable industry?**

Setos □ Cable? You mean the other competitors?

DTV ■ **Yes. Carrying HD signals and...**

Setos □ That's more of a business discussion. Obviously, cable is a closed system. They can choose to do whatever they like, and so they have a lot more flexibility than I do, as a broadcaster. As a cable programmer, which we also are, we have the choice of all these formats. I don't think cable is going to try to invent new scanning formats—that would be sort of counterproductive. And there really isn't any advantage to doing so. You want some convergence.

You know, a lot of people say this is a headache, we have so many choices. I would agree that, going beyond that, and having even more flavors, is sort of counter-productive. So, you know, they have all the same scanning formats available to us, they can buy all the same equipment we buy, and they can produce. They can use the same satellites we do. And we have interests in both cable programming and television programming, whether it's for kids or for sporting events, or for news, or for general entertainment.

So I think that the more appropriate discussion is "What will the cable operators do?" I believe that the reason broadcasting went so aggressively into DTV was because they were concerned about cable, being a closed system, arbitrarily being better than broadcast. Some people might disagree, but I don't think anyone could say that was not the reason at all. And I think that the cable operators have a competitive issue now. What are they going to do? We've heard a variety of things from them. You know, let the best man win, it's a matter of competition.

"The consumer doesn't give a hoot about how many lines are in the picture. They're watching the picture and they like Ally McBeal. We focus on fundamental picture quality."

DTV ■ **So where will the consumer stand this fall?**

Setos □ Well, if I've learned anything from my colleagues in television-set manufacturing it's that consumers notice two things—size and price. If they go into a store and see a $10,000 item they aren't going to buy it in any mainstream quantity. So that's not confusing—it's real simple. Size, price. And I think that they will see HDTV and DTV, it'll look good, and that'll be nice. But it's not going to change the size-price quotient. Aspect ratio will make a difference, however. But as with anything, we need to see prices come down, and I don't think anyone expects they won't.

So a lot of people have talked about this confusion thing. I'm not so sure. Consumers are pretty sharp. They know what they have to do: They have to put that thing in their home, use it in a certain way, and it costs a certain amount of money. That's not confusion—that's simply a decision. They do that every day.

People have said that there is confusion because of the formats. I don't see that at all. I mean, what you see is what you get. Do we say, "Shot in Super 35," in our movie advertising? In the old days we used to say 70 millimeter. No one ever says that anymore.

DTV ■ **They don't care whether it's progressive or interlaced.**

Setos □ That's right, they don't. That is what allows us to distinguish ourselves. It's size and price, and what you see. It's not confusion.

The big hope for showing off 480p, 720p, 1080i, or 1080p is plasma screen. As much as I'm embarrassed to tell people with a straight face that you can buy a DTV set for $7,000 a plasma screen at $10,000 does not make me upset. That doesn't change the furniture, and that is big. It's very exciting. So plasma-screen technology is now practical. We've seen it, and we will have it in certain offices here. It can operate at 720p. It will be flat, meaning four or five inches. It will go on a wall, and it will not disturb the furniture. And I think it will come down fast in price, to the few-thousand-dollar range. And that's a breakout product. Not today, but in some time period, when manufacturers figure out the problems. And they always do.

I think, from the standpoint of seeing the quality that we're transmitting, most of the people will see 480p, and more of them will see it next year; 720p will come into its own in the next generation of sets primarily in the plasma screens.

So, anyway, I think I echo ABC's Preston Davis's comment about plasma. I'm telling you—it's going to be exciting.

DTV ■ **Do you have concerns that the move to DTV and HDTV isn't really consumer-driven at this point?**

Setos □ No, quite the contrary. I mean, the government didn't tell us to spend years working on it. And for an industry that doesn't spend much money on hardware, to commission the Advanced Television Test Center and kill ourselves trying to figure out how this all works—I mean, the government mandate goes to the schedule, not to the issue. This is what broadcasting was all behind for such a long time. I take exception to how you put it.

Yes, the schedule's been mandated. But the government has an agenda about getting the analog spectrum back. We can't argue with that. We appreciate that, and we'll do the best we can, and we're committed to meeting their schedule.

DTV ■ **Do you think consumers might be happy with only a 480p picture and not look to spend the extra money needed for HDTV?**

Setos □ 480p? That's a very high-resolution image.

DTV ■ **Although 480p isn't HDTV.**

Setos □ So? Let's not get hung up in semantics. We are totally consumer-driven. We look at what these numbers mean to the consumer. The consumer doesn't give a hoot about how many lines are in the picture. They're watching the picture and they like *Ally McBeal*. We focus on fundamental picture quality. Is 1080p sharper than 720p? Yes. Is 720p sharper than 480p? You bet. Is 480p sharper than what we transmit today in NTSC? Absolutely.

DTV ■ **How about audio?**

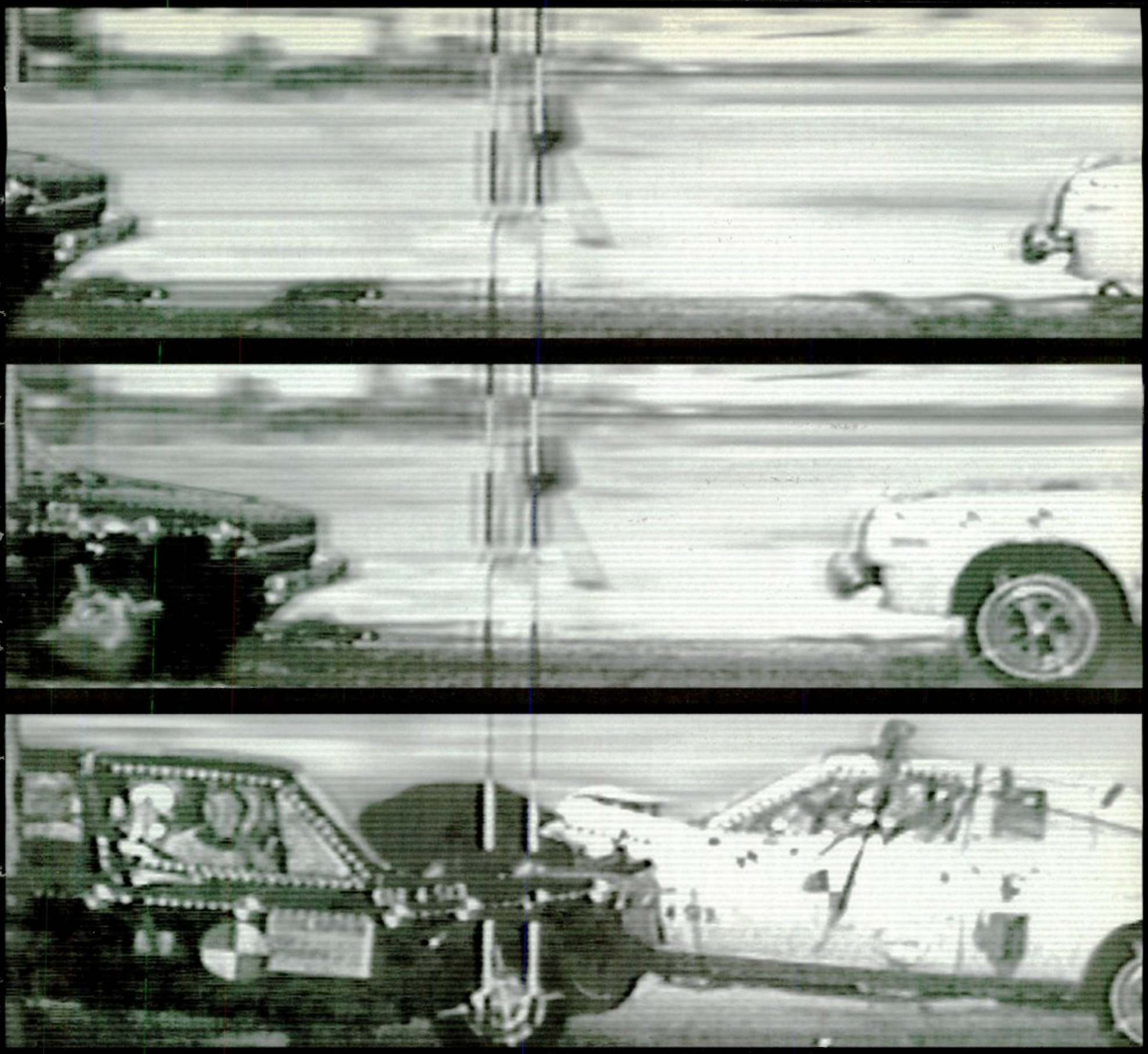
Setos □ Well, you know, audio is exciting. And, again, it provides us a lot more flexibility. You know, we can go from two channels to real discrete five or, actually, 5.1, if you think about the bass channel. I think that's going to be harder to implement, because, you know, we're behind the power curve from a hardware standpoint, in terms of availability. We can transmit the format, but we can't easily produce and distribute in it. And it will have to catch up. That's a challenge.

The good news there is that it's focused—because there's only one technology—you know, essentially, six-channel discrete sound. But it's going to take time for us to get there. And since no one's focused on sound, in let's call it the "high-profile areas" of discussion, that is happening in a much more organic pace. There are issues that have to be resolved; we have to get hardware. We'll move forward. And it will be competitive. When we perceive a competitive advantage in sending out and producing in and distributing and transmitting—the full 5.1 channels in multi-language—we'll do it. But, you know, that will take some time—it's not a slam dunk.

DTV ■ **So what are your general thoughts on DTV, and what it means to you—personally and professionally.**

Setos □ Well, continued employment. (Laughs) But I think that I've always been in a competitive arena, especially when I helped start MTV—we were dealing in stone knives and bearskins. Television wasn't even stereo, and we had to do it in stereo, and it was a real challenge.

It's an opportunity—definitely an opportunity. It may not be the same opportunity people thought of it as 10 years ago, but we look at it as competitive. Some people look at it as chaotic—too many choices, too many this, too many that. We look at all these choices and relish that we now can make a good choice, and perhaps have an edge over the other guys. That's how we're looking at it. Very exciting, very busy. Not much grumbling, just a lot of hard work. □



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CONVERGENCE '98

Clash of the Titans

The PC industry challenges consumer electronics makers as digital ups the ante on interactive television

By Karen Jones

If watching the Super Bowl on a personal computer, and accessing an array of data simultaneously, while effortlessly downloading numerous advertising incentives sounds a little farfetched, it won't for long.

At least that's what Microsoft, Intel and many PC manufacturers hope, as the advent of the digital age raises the bar on interactive television's capabilities and appeal to consumers, broadcasters, and advertisers.

Until now, viewing TV through the PC entailed the installation of software, such as Intel's Intercast, which allows a broadcaster to simultaneously transmit data along with the video, and hardware, in the form of a TV tuner card, plus a means to receive a signal. Its appeal has not been broad for two reasons.

1) Most PC users do not like add-ons (only 10% of the installed PC base have tuner cards).

2) The broadcast content available today is not widespread.

That should all begin to change later this year.

"What we see happening with digital broadcasts is a lot of bandwidth and a lot of airspace that will give broadcasters new opportunities for business and consumers more opportunities for entertainment," says Barbara Lopez, marketing development manager for digital broadcast at Intel. "Some people call TV the idiot box, but now we're looking at a future that will have a smart box, with information and entertainment opportunities, not just additional news."

The possibilities do seem endless. An advertiser could, for example, give an interested consumer additional product information instantly, and that consumer could also view added information, videos, statistics, interviews, etc., from whatever program they are watching. Broadcasters could charge more to transmit the additional advertising data, especially if viewers received incentives (discounts, freebies) downloaded directly into their hard drives, just for staying tuned.

Microsoft has already taken care of the software add-on problem by integrating Intercast 2.0 into its Windows 98 operating system, and according to Richard Doherty, director of Envisioneering Group, a market research firm, "Windows 98 fully supports TV tuner cards—it actually hungers for them." He theorizes that Microsoft would like to see half of all the new PCs sold for Christmas 1998 with TV tuner cards installed, but places the actual figure closer to 25%.

Doherty suggests that Microsoft's apparent fixation on interactive TV is based on potential profits from both the consumer end with the purchase of Windows 98, and the backend, by providing the necessary tools to broadcasters and cable companies to create and transmit content. Microsoft already owns WebTV offering users access to the Internet through their TVs with a set-top box /computer.

Steve Guggenheimer, group product manager for digital TV at Microsoft, thinks computers will play a key role in the move to DTV. "One of the things we'd like to do is make DTV a reality in a few years, versus 10-30 years, and we think in order to do that you have to have two things—a high volume of low-cost receivers, and business opportunities for everyone involved—broadcasters, cable satellites, advertisers, etc."

He adds that the computer should find plenty of users who want to use them as DTV receivers because "It offers functionality, not only digital TV, but high-quality video and audio in interactive programming, and it can play your DVD, (computer) games plus do computing."

What Guggenheimer is describing is not so much the PC as we know it today, but what many in the computer industry describe as a high-tech hybrid PC/TV, combining the best of both, and eventually functioning as a full-service living room entertainment system.

"We believe that TV will no longer be a dumb, passive device. It will be essentially computer-like," adds Steve Goldberg, director of technology and corporate development at Compaq Computers. "The interesting thing is if you pry open one of these (current) set-top boxes or one of the new DTV sets, you see a micro-processor, a lot of RAM, something like a network interface, and that's a computer—what we know how to do."

Goldberg is quick to add that few users would be interested in working on programs like Excel on a wide screen in their living room, so an extra productivity PC would probably be necessary elsewhere.

Though there is still debate regarding interlace versus progressive for DTV, Doherty won't lend credence to the PC industry's protests about 1080i. He explains that interactive TV "is above the fray" and currently converting interlaced into progressive scan through the analog system, and will continue to do so with DTV. He offers that this does require an added cost to the PC manufacturer, and a slight reduction of quality, so it's natural that many in the PC industry are pushing for progressive. He also believes that though interlace and progressive will coexist for a time, in approximately five years progressive will be the standard.

The Hybrid PC/TV

As far as a PC/TV hybrid, Bill Graber, destination marketing manager at Gateway, is interested in many possibilities, particularly what could be termed "browser-based TV," where, following an Internet model, users could theoretically click on whatever they want to watch exactly when they want to, without channels or scheduled programming.

Gateway's Destination DMC is billed as a Digital Media Computer that could classify as a hybrid by offering a PC, TV, DVD and Internet access, but with a $5,000 price tag. Other Destination systems start at $2,500.

Tim Chin, director of product planning at Packard Bell/NEC, takes a conservative approach by stating that Packard Bell/NEC is very excited about digital, but will be judging the volume and consumer acceptance of broadcasts, especially in the next year before jumping in. "One of the things we try to do is provide a product that is applicable across the entire country. As the broadcasts become pervasive and widely available, then that's the time to enter that space."

He adds, "I think we all have somewhat different visions of how we get there, and certainly the TV industry believes they're going to be putting technology in TVs and the PC companies believe they are going to create a device to put on top of a TV."

Graber is more blunt: "Fundamentally, it's the computer industry trying to swallow up the consumer electronics industry or vice versa."

When asked if it is looking over its shoulders at the advancing PC juggernaut, Linda Schumann, director of product planning TV at Philips Electronics replies, "Oh sure, and we talk to them as well. The one thing that the computer has not done well is large screens at affordable prices, and that's a big draw for TVs."

She offers that, according to Philips' research, the primary set of the household is devoted mostly to entertainment, and consumers like ease of use, not complicated interfaces. "The TV is a marvelous display and marvelous in its simplicity and functionality."

That's not to say that Philips isn't exploring interactive TV. Its products include a Philips Magnavox WebTV Plus Receiver ($199) and the DVX8000, described as a "Multimedia Home Theater" ($5,000). Schumann also believes the field is big enough to support many participants. "While there may be some crossover and convergence and probably a lot of alliances and partnerships, I think there's still room for quite a few players and our challenge is to try to keep it simple and understandable while meeting the consumer applications."

Content Rules

No matter what type of receiver, content is king, and will eventually drive consumer interest in digital and interactive TV beyond the early adopters, and competitive pricing will put buyers in the retail stores. Whether this happens in the next year or, more likely, early in the first decade of the next millennium, there is no doubt that the television set is primed for a makeover.

John C. Hollar of PBS Learning Ventures, which recently announced collaboration with Intel to create digital programming, thinks users will really embrace the enhancements. "Our expectation is that November '98 is the time when the green flag will drop on DTV. Broadcasters have long believed that once people see the pictures, hear the sound, and experience all the other capabilities of DTV, they'll want it." □

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The DTV-Ready PC

Continued from page 1

that influence making DTV on the PC a reality. And most important for broadcasters is that the ability to view DTV signals on a PC may actually mean the ability to offer advertisers more viewers.

There are other chip manufacturers and computer companies beyond Microsoft and Intel who see a potential for profit from the ability to receive DTV signals on the PC. And even discussions with traditional video manufacturers points to the reality that without computer technology

SPECIAL REPORT
Convergence '98

the move to DTV wouldn't be possible.

Tim Malone, Sierra Design Labs marketing operations manager, says, "The reason this move is happening is because of computers, and right now DTV means different things to different people."

Beyond Microsoft and Intel there are numerous heavyweight consumer electronics hardware vendors in Silicon Valley that are creating PC chips in order to move this convergence to DTV signals on the PC along.

The list includes C-Cube Microsystems, ST-Microelectronics consumer division, LSI Logic and VLSI Technology, not to mention semiconductor start-ups TeraLogic and Telecruz. This is just in Silicon Valley, and there are dozens of companies worldwide creating chips for this market, according to Dataquest, a market research firm based in San Jose.

Others Move Forward

SGS-Thomson Microelectronics (ST), based in St. Genis Pouilly, France but with design houses in Silicon Valley, says that its Sti7000 MPEG2 decoder may be available before the end of this year but will definitely be available in 1999. The chip can decode any HDTV signal and display

it at any other resolution, says John Rossi, market development manager for consumer business unit at ST.

"Next year DTV on a PC is a slam dunk for ST," Rossi says. ST has been approached by numerous computer manufacturers about the Sti7000 chip and integrating it into next generation PCs for broadcasting DTV signals in the future.

For ST, it doesn't matter whether a customer uses the chip for a consumer application or as an integral part of a PC for DTV signals. Rossi says ST is staying "politically correct" in most of its designs by complying with all ATSC formats and supporting both the open cable and DVB satellite standards.

"By supplying the PC OEMs with chips to enable DTV signals doesn't mean they're going to win. The real question comes when and if someone is willing to boot up their PC to watch some broadcast show," Rossi offers.

Waiting Patiently

C-Cube Microsystems is in the same boat as ST, not conforming to any particular standard and having a wait-and-see attitude toward who uses its chips.

C-Cube is offering the 2Real single chip MPEG2 code in the fall that will enable PCs to receive analog television signals. Chris Day, director of marketing for the PC products division at C-Cube, says enabling DTV signals is not far behind but would more than likely take place sometime in 1999.

TeraLogic, a semiconductor start-up based in Mountain View, CA, plans to roll out its initial DTV chip by the end of this year that will be ported into an add-in card for PCs, or into DTV sets or set-top boxes.

"DTV is not intended to be pure programming. The claim is that there will be powerful rich multimedia data services as well as the programming," says Peng Ang, president and CEO of TeraLogic. "So for some of these data services it might be easier to generate them on a PC rather than a TV. However, I think TVs will evolve as well to support the same data functions."

Some of these data services include 3D-enabled graphics, gaming, Internet access, interactive advertising and up-to-date weather and traffic information.

Getting Logical

LSI Logic is making a strong move toward digital television for the consumer and PC space by creating a separate business unit for DTV. The company has not come to market with any products as of yet but plans to do so in the next six months, says Simon Dolan, vice president of marketing for the consumer electronics division.

LSI says it actually sees DTV as a large part of the future for the company, whether it's on a PC or viewed on a regular television.

With all of these hardware vendors from Silicon Valley (and numerous other areas) pushing this convergence, as well as with the backing of Microsoft and Intel, the likelihood of DTV signals being generated on a PC is very good. However, the big question now is will a consumer watch TV broadcasts on a PC? And will a consumer wait for their PC to boot up before being able to watch the screen? Will the quality be as good as a television? And how does the Internet factor into this equation? Time will tell. □

Beyond Signals

Video manufacturers thrive under the Valley's sun

Silicon Valley's importance to the broadcast industry also extends beyond the ability to be able to receive DTV signals on a PC.

Major video manufacturers like Sony, Pinnacle Systems, Scitex Digital Video Systems (to name just a few) and other computer vendors like Hewlett-Packard are all able to tap into the Valley's tremendous talent pool to push product development.

A visit to Louth Automation probably offers the best evidence of the increasing reliance upon computer-based equipment in a video-based world. Numerous video servers are being tested and setup to be used with Louth Automation equipment, with video tape cart machines relegated to almost dinosaur status.

Greg Lowitz of Louth says that the multi-channel universe and multi-channel playback systems seems to be in the future, and video servers will play an important role.

"If you don't have a video server you should really look to budget for one soon," is Lowitz' advice.

Speaking with regards to the Silicon Valley area, Lowitz says that manufacturers simply draw off of a natural talent base.

"With Stanford and Berkeley nearby there's a lot of bright people here," he explains. "This area is definitely unique—if it wasn't the housing prices wouldn't be what they are."

He adds that the innovation found in the Valley tends to feed on itself. "That sort of thinking is indemic of high-tech work," he says.

Helen Shortal of Scitex Digital Video echoes Lowitz' sentiments on innovation in the area. "The American business culture sort of lends itself to getting in the garage and fooling around with things."

One of the companies dominating the Valley area is Intel, growing so large that it currently has three parking garages with plans to soon add a fourth. It probably also best exemplifies the word convergence.

Barbara Lopez, marketing development manager for digital broadcast at Intel, says, "The conversion to DTV is creating a new convergence that opens up a whole new series of opportunities to roll microprocessors into the home, and that means new types of services. Today you're watching football and you have to wait for the scores to come up. Soon you'll be able to call them up."

A visit to Intel offers an opportunity to get a look at what promises to be some interesting business and programming opportunities for broadcasters across the country, especially when Internet services are utilized.

Lopez adds that many of the developments in computers over the years are responsible for creating the new business opportunities that broadcasters will be able to take advantage of.

"People today are used to computer games, and they're used to getting information when they want it over the Internet," she explains. "They want more choice and they want it to be convenient."

From a video standpoint, no company dominates the Valley like Sony. Hugo Gaggioni says that there is a tremendous talent pool when it comes to programmers or for semiconductor work. But he laughs at the notion of making too much out of the computer/video convergence.

"Airports use computers all the time now too, but you don't hear people making a big deal about it. Computers are simply elements we use constantly in the progress of television," he offers. —*Ken Kerschbaumer*

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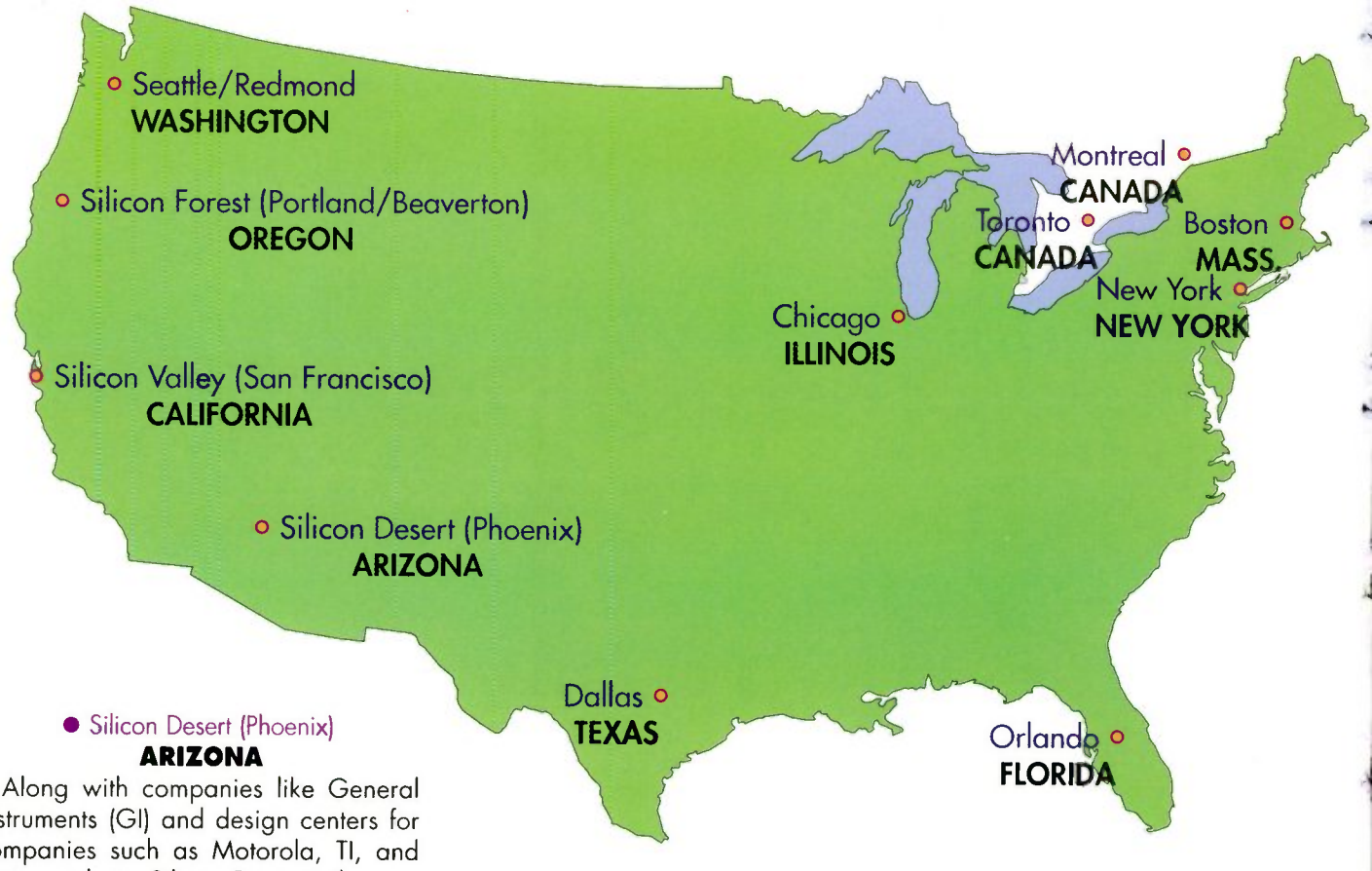
Other Places To Lay Your Chips

Silicon Valley isn't the only place making noise in the digital television (DTV) chip arena. Here is a partial list of some other hot spots in the U.S.



● Seattle and Redmond
WASHINGTON

Microsoft could be one of the single biggest factors in enabling digital television functionality on PCs. The software giant has gone to great efforts so that DTV will be on the PC this fall, including buying WebTV and integrating a version of it into Microsoft Windows 98. Microsoft is the company to watch outside of Silicon Valley with the most power and impact for the industry. Another company to watch from this area is Equator Technology, a start-up who is also heavily in the DTV chip game.

● Silicon Forest (Portland and Beaverton)
OREGON

Having broadcast powerhouse Tektronix in the area has spawned numerous start-ups and consumer electronics companies. Also, the state of Oregon has said it plans to invest heavily in bringing more semiconductor companies to the Silicon Forest. This could mean new opportunities for even more DTV-related start-ups.

● Silicon Desert (Phoenix)
ARIZONA

Along with companies like General Instruments (GI) and design centers for companies such as Motorola, TI, and various others, Silicon Desert is becoming a hot area for more than just analyst houses these days. Companies are spawning there to compete in every facet of the semiconductor industry including GI, who is working on DTV, as are others.

● Dallas
TEXAS

One can never count out Texas Instruments (TI) when talking about new emerging consumer electronics markets. TI, having divested itself of every business except digital signal processors (DSPs), will no doubt be looking for new opportunities to expand its DSP business. DTV could be a good way to do it.

● Chicago
ILLINOIS

Motorola has already signed a long-term agreement with Sarnoff, Corp. to create an HDTV chip for the mass market. Despite numerous problems in the semiconductor market, Motorola is still a force to be reckoned with and could sell some impressive numbers of chips if the technology is right.

● Orlando
FLORIDA

Harris, Corp. has taken a seeded interest in digital television and is throwing multiple resources from its semiconductor, consumer and wireless divisions into DTV. Harris is certainly one to watch from all sides of the market.

● New York
NEW YORK

The big boys on the East Coast are already making moves to enter DTV with a huge impact. Lucent Technologies has already partnered with Harris on a number of DTV-related items, and the same can be said about Sarnoff. Now the question is—will Big Blue, IBM, join the fray?

● Boston
MASSACHUSETTS

ST Microelectronics (ST) corporate headquarters is in St. Genis Pouilly, France. But its U.S. headquarters is in Boston and it's where a lot of the consumer electronics activity takes place. ST has the manufacturing muscle and marketing to dominate any business it gets into. Consequently, ST is heavily involved in DTV chips for consumer use and the PC.

● Toronto
CANADA

Little known to those outside the PC industry is that the Canadians have taken the graphics industry by storm. ATI Technologies has taken up the lead in high-performance graphics chips. Now the company is expanding and wants to enable DTV on its graphics chips. ATI conquered one industry—can it do it to another?

● Montreal
CANADA

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X^plus				32x4 ≥ 64x4	32x4 ≥ 64x4
		16x16	16x16	16x16	16x16
		8x8	8x8	16x8	16x8
		16x2	16x1 ≥ 4096x1	16x1 ≥ 4096x1	16x1 ≥ 4096x1
		16x1 ≥ 204	8x1	8x8	8x8
				4x4	4x4
				4x1	4x1
				2x1	2x1
XPRESS		12x1	12x1	12x1	12x1
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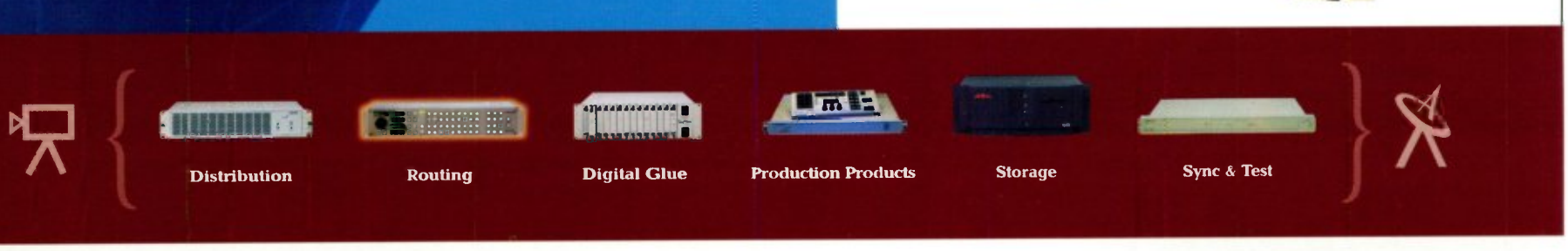

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HDTV MONITOR ROUNDUP

New Monitors For New Demands

Looking for a new monitor? If you are, you may be taking a look at some of the HDTV monitors that are available for professional use.

The world of HDTV production won't change how picture monitoring is done. If you're involved in the production process you'll still want to have one HDTV monitor per HDTV source. The problem is, at this point the choices in HDTV monitors are limited, but there are still choices.

In addition, the majority of station needs over the next year or so will not require monitors for critical viewing. Instead, monitors will be needed to check the quality of the broadcast signals, meaning that less-expensive DTV monitors can be useful.

Here's a look at some of the latest monitors you might want to consider for your facility.

Ikegami's PM-9050 nine-inch monitor offers 16:9/4:3 switchability.

Barco

The HDM 5049 HD monitor from Barco is a $7,000 high-resolution monitor capable of displaying all current HD formats, including the 1920x1080 non-interlaced standard. It's equipped with a super high-resolution CRT and a dark and flat face plate, and resolution is maintained in part due to an ultra fine pitch of .26 mm. It fits into a 19-inch rack space, and offers a 17-inch screen size, plus a small spot size over the entire screen area. It automatically adjusts to different HD input formats and has a horizontal scanning frequency range of 30-82 kHz. Vertical scanning frequency range is 48-150 Hz.

Contact Barco at 770-218-3200 or visit www.barco.com.

■ For more information circle Reader Service #503

Ikegami

Ikegami's HDTV monitor lineup includes a 32-inch model (HTM3203), a 20-inch model (HTM2003D), and a 10-inch model (HTM1003). The 32-inch offers 1000 TV lines, the 20-inch 900 TV lines, and the 10-inch 500 TV lines or more at center. They offer in-line gun with a dot-type Shadow Mask and low distortion. The monitors automatically support 1050 interlaced and non-interlaced signals (the HTM2003D) and auto setup probe is available as an option.

Ikegami's NTSC auto set-up color monitors include the TM20/30 series, offering a 14-inch and 20-inch model with 900 TV lines and 700 TV lines horizontal resolution respectively. Ikegami's non-auto color monitors (the TM20-17RA/TM14-17R/and TM10-17RA) are available in 10-, 14-, and 20-inch models, and offer 4:3 and 16:9 switchability.

Also available is the PM-9050 9-inch broadcast monochrome monitor, featuring a high-resolution monochrome CRT delivering over 800 lines of horizontal resolution. It can be combined with a WFM monitor and/or vectorscope, and can also be mounted in a 19-inch rack with a two-monitor configuration. It also offers 16:9/4:3 scan function and switching power supply circuitry providing a wider range of power supply voltages.

Contact Ikegami at 201-368-9171 or visit www.ikegami.com

■ For more information circle Reader Service #504

JVC

JVC's BM-H1300SU (13-inch) and BM-H1900SU (19-inch) monitors feature SMPTE-C phosphors and 750 lines of horizontal resolution. They both offer multi-format input capability and make use of a beam current feedback system for long-term stability. They are switchable between 4:3 and 16:9 aspect ratios, and offer CPU control for set-up, plus on-screen menu control. Other features include selectable color temperature, and professional functions including blue check, color off, pulse cross and under-scan.

Also from JVC is the TM-A9U nine-inch monitor, offering a horizontal resolution of 300 TV lines. Two of the units are mountable in one standard rack unit. Features include comb filter, built-in audio speaker, and a metal cabinet. The TM-910SU is another nine-inch monitor, offering S-input and dual composite inputs, plus 16:9 and 4:3 switchability.

Contact JVC at 800-526-5308 or visit www.jvcpro.com

■ For more information circle Reader Service #505

Panasonic

The DT-M3050W features a new super-flat picture tube for high horizontal resolution of 640 TV lines. It has automatic tracking for horizontal scanning frequency of 115 to 50 kHz and vertical scanning frequency of 50 to 120 Hz. It is equipped with multi-terminal, enabling external control of input switching, and is equipped with ID assignment function and system control terminal. Suggested list price is $3,995.

The AT-H1906DP is designed as a master monitor offering 900 TV lines of horizontal resolution. Remote operational controls provide horizontal delay, vertical delay, 16:9 aspect ratio switching, split screen capability and matrix function that permits evaluation of color imagery as displayed on different phosphors. It also features complete digital signal processing for both composite analog and digital signals to maintain high-quality images, black-and-white tracking and low cross-color noise. Pulse-cross function displays horizontal and vertical blanking even from digital signal sources and serial interface features an Error Detection and Handling check function.

Also from Panasonic is the BT-M1950Y, a 19-inch SMPTE Type C phosphor monitor offering 750 lines horizontal resolution. It's switchable from the 4:3 and 16:9 aspect ratio, and has four video inputs/outputs—composite video, Y/C, analog RGB and Y, R-Y and B-Y component. On-screen menu allows adjustment of volume, phase, chroma, brightness, contrast, underscan, pulse cross, color off and memory mode. Color temperature is selectable.

And the BT-S901Y offers 300 horizontal resolution lines and is S-VHS compatible. It is rack-mountable, and offers 90 degree deflection angle, underscan, pulse cross and blue signal. It has a comb filter for color resolution, and external sync input/output for noncomposite video signals.

Contact Panasonic at 800-528-8601 or visit www.panasonic.com/PBDS

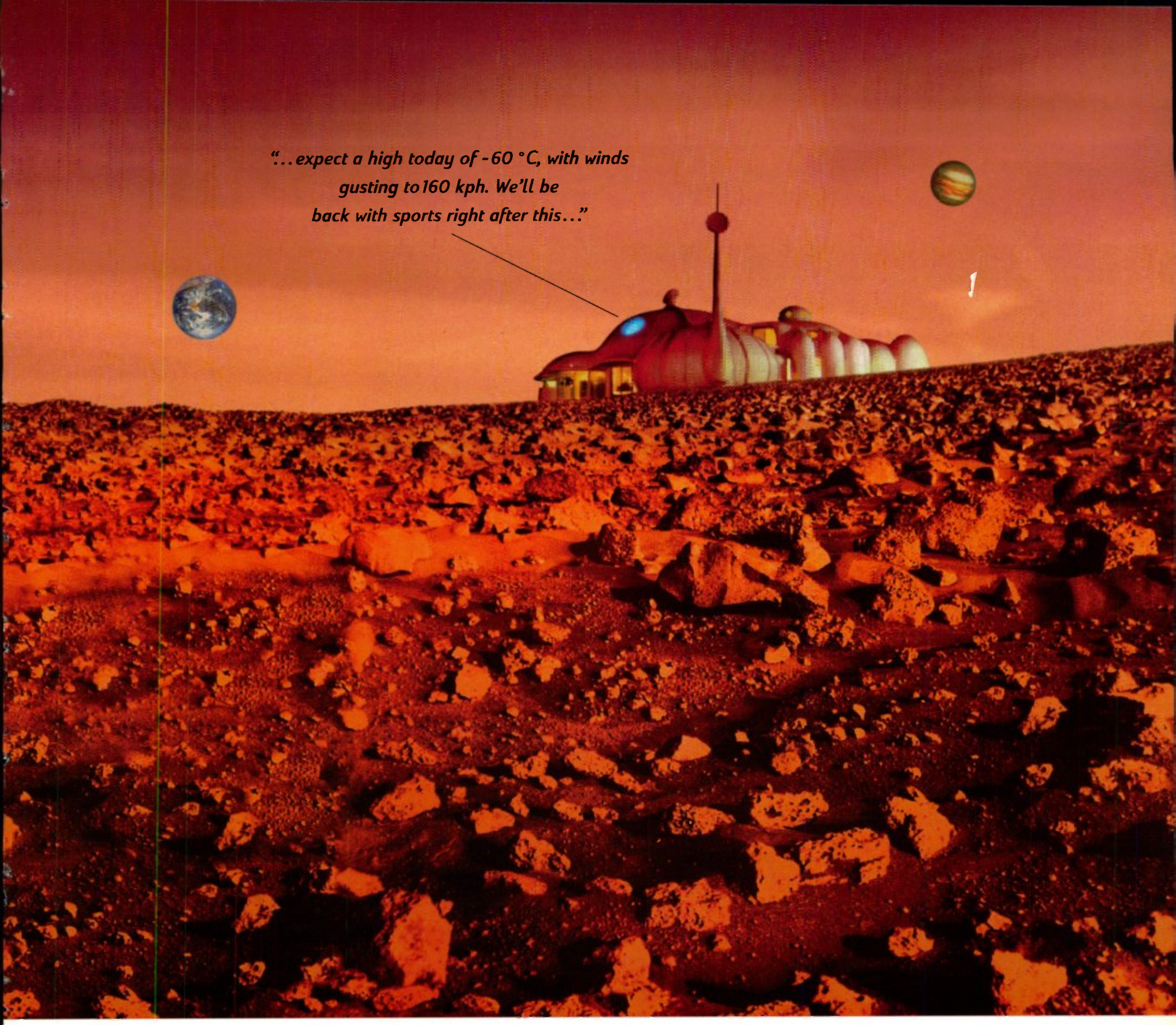
Sony

Sony's HDTV evaluation monitors include the HDM1230 and the HDM1730, the first 12-inches diagonal and the second 17-inches diagonal. Both are 16:9 with adjustable color temperature, have a tri-level sync system, and offer G, G, R/Y, PB, and PR inputs. There are nine independent sections of the screen for convergence adjustment, and seven types of test signals are incorporated.

The BVM2811 is a large size master monitor that uses a 16:9 aspect ratio CRT that is switchable between 16:9 and 4:3. Resolution is approximately 750 TV lines in 16:9 operation and 1000 TV lines in 4:3. It has a highly stable white balance, and optional comb filter for NTSC.

Also from Sony are the BVM14E1U (14-inch) and the BVM20E1U (20-inch) 16:9/4:3 switchable monitors, offering a new operating concept—divided type with separate display and control unit. They both have a newly developed Super HR Trinitron, with the 20E1U offering a resolution of 1000 lines and the 14E1U offering a resolution of 900 TV lines. Both are equipped with the color temperature alignment system for easy set-up, and they accept various signals by inserting optional input boards directly into the monitor.

Contact Sony at 800-686-SONY or visit www.sony.com/broadcast



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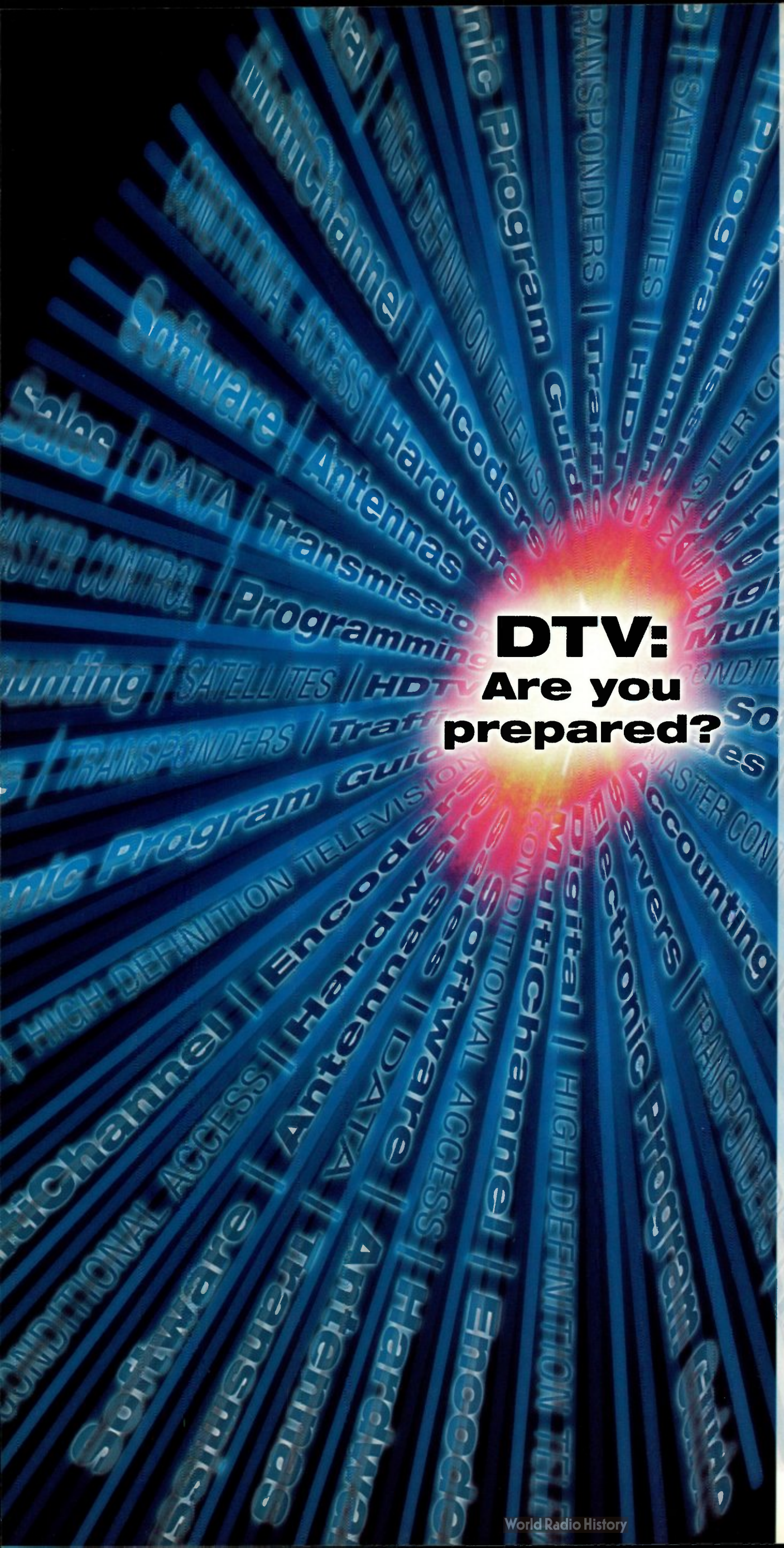

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DTVPOST for PC

NT Turning Heads Of Post Professionals

Platform competing with mid-level SGI systems in facilities across the country

By Edmond M. Rosenthal

If you can get the same software on a lower-cost platform, why not?

This thinking is central in the attitudes of post-production facilities migrating to the Windows NT platform. The availability of such programs as SoftImage 3D, Adobe PhotoShop and Illustrator, Avid software and Alias Wavefront MAYA on NT are making it a much more viable platform for those who used to have little or no use for it.

Crawford Digital has started using NT systems to create graphics like the one pictured here (left). Below is a graphic created with SoftImage 3D on NT by Splash in New York.

While many still have reservations about the capabilities of NT, there are those who predict a landslide move to the platform. "NT will probably dominate unless something large happens, such as a graphics card or a CPU breakthrough," asserts Maury Rosenfeld, president of Planet Blue, Los Angeles.

Those who prefer to work on NT point to its shorter learning curve and broader talent base. Meanwhile, those who don't are concerned there will be a problem getting 3D software for other platforms in the future.

At present, some facilities heavily invested in Macintosh, SGI or dedicated platforms see no present need to make the investment in NT. While NT is now seen as competitive with mid-level SGI machines, post-production people comment that it has yet to achieve the horsepower of an O2 or match the speed of dedicated platforms.

Rosenfeld no longer regards NT as a low-end platform and states, "It's now a case of what our artists prefer working on. We have two guys who prefer SGI equipment and do a lot of work on Discreet Logic Flame and Inferno."

The Right Mix

Planet Blue operates with a mix of tape decks, 15 NT machines and six SGI platforms including Onyx, Indigo2Extreme, 02 and Max Impact. While the facility has a copy of MAYA, it's for SGI and NT. Meanwhile, Lightwave licenses run on NT and house-developed software is split about half-and-half between NT and SGI.

"Very few things aren't available on NT now," Rosenfeld says. "There are some Discreet Logic products that aren't, but they also have some specifically for NT. I'd expect Pixar Renderman to show up on NT pretty soon." He observes that a recent NT addition is Eye On Software's Digital Fusion compositing program.

"We don't make buying decisions based on the platforms," he adds. "They are based on the artists. The real commodity is the talent, and the platforms are secondary. A good artist's annual salary is more costly than the platform by a factor of 3-10 times."

He notes that some of Planet Blue's artists prefer the Unix operating system because it's more programmable than NT. While he surmises that the icon-based NT system has a shorter learning curve than the command-line-based Unix, he qualifies, "Once you learn Unix, you can do elaborate things more quickly. That's important because when you're dealing with animation, you're dealing with thousands of files." But he sees the growing talent base for NT providing a greater pool of artists from which to choose.

At Crawford Digital, Atlanta, the attitude toward NT of Trevor Mincher, chief engineer, has changed appreciably in the past year. With 10-15 NT machines, the facility had been using them as Internet and engineering servers. "NT hadn't arrived in our environment as of last year. Most of the stuff we've been dealing with was in SGI, and neither the hardware nor software for NT was at SGI level."

Some Parity With SGI

While NT still isn't as powerful a platform as SGI O2, Mincher notes it's reached parity with mid-level SGI machines. In the past, he comments, "When SGIs were tasking they had a better way of dealing with memory and moving data around their machines, and the I/O with the outside world was much faster. SGI graphics language was also better."

But now, he adds, open graphics language (GL) cards have matured on the NT platform. For example, he points out, texture mapping can now be done much faster. He notes, "As we go forward and look at offline editors like those from Avid and Discreet Logic's Edit!, they've become more powerful on NT platforms, and this is something we'll have to seriously evaluate."

Conversely, Discreet Logic's Fire and Flame are still wedded to SGI, and Mincher doesn't see this changing. "As we approach high-definition TV," he holds, "it requires more horsepower for these programs than NT can provide. The only platform that I know of that's developed to do this is O2. But as things migrate toward nonlinear editing, the availability of more software on NT gives us more choices because so much is being developed for that platform."

Broadway Video, New York, operates in Macintosh, Unix, SGI, Windows 95, and NT. The migration of software to NT doesn't bother Jonathan Applebaum, vice president of engineering, so long as user maintenance is kept to a minimum and applications are written in a user-friendly manner "so that the operator doesn't have to go out in the NT environment to do file manipulations.

"It makes little difference whether I have a 15-rack piece of equipment or a PC sitting in a rack," he adds, "as long as the process works. Of course, NT has never been as fast as we've wanted it to be. Only the dedicated platforms are that fast. But if the product is there to solve a need and it's cost-efficient to do it on NT, we'd be crazy not to use it. If it runs slower, however, it may not be as interactive as we'd like." The year-old Accom Axial 3000 editor is one of the programs Broadway Video has running off of NT.

A Big Difference

The availability of SoftImage 3D on NT has made a big difference to Splash, New York, according to chief engineer Scott Holmgren. "We're a SoftImage house," he

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Inside The PC Platform: Weighing Its Strengths And Weaknesses

By Ed Eberle

No matter where you stand on the seemingly endless PC vs. Mac controversy, PC-based post-production technologies in the Windows NT environment are becoming an increasingly common part of both the graphic and nonlinear editing toolset. While most facility-housed NLE editing systems are Mac based, full PC-based editing systems made an impressive showing at this year's NAB, while other companies pushed the leading edge of PC graphics at Siggraph.

As it stands today, Mac-based video editing systems are considered more mature, reliable, and tend to offer advanced and total solutions options not found on all their PC counterparts. Some critics say that Apple, while remaining strong in 2D, has not been able to keep up 3D applications, and the few 3D apps available are not responding quickly enough to the demands and changes in their user base.

But Mac leader Avid's agreements with Intel to develop NT-based products and its recent acquisition of SoftImage puts Avid more squarely in the 3D arena and the Windows NT environment then ever before, and would seem to indicate that Windows products are gaining a stronger foothold.

Brand recognition is another factor standing between Mac and PC tools. Some post facilities dealing with agency clients who recognize high-end, Mac-based brand name systems like Avid are reluctant to market PC boxes out front. They add that even with some PC systems offering 90% of the functionality of a Mac system, at 10% of the cost, they often prefer to use PCs in a more transparent way to avoid the impression they are offering clients less than the best.

Some in the PC camp point to concerns about Apple's future,

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DTVPOST for PC

NT Turning Heads

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notes, "and this benefits us with a more cost-effective way of putting in more SoftImage seats."

Splash opted for NT over SGI recently when it put in its most recent workstation for this purpose. Holmgren points out that cost was not the only issue. The arrival of software like Adobe PhotoShop and Illustrator was another factor. He notes they are more robust for NT, which takes Version 5.0 while SGI doesn't.

"It's easier to find operators who are versed in NT," he adds. "On the engineering and administration side, it doesn't cost as much in time spent by the engineer to set up and maintain NT. I'd be hard-pressed to find any disadvantages with NT. We've been slowly making a transition from Macintosh to NT because we opted for SoftImage's Digital Studio, which is available only on NT. It can do uncompressed editing and finishing and has a rich tool set."

He adds that NT is easier to navigate and administer than SGI. "It's probably not that easy for a Macintosh person to sit down on it," he concludes, "but it doesn't take that long."

The change in platform capabilities is yet to be a concern for Fred Miles, owner of Cartoon Tycoon, Harrisburg, PA. His operation is still founded on Macintosh Quadra and G3 and he prefers not to think about the cost of changing over.

Fortunately, the 2D animation work Cartoon Tycoon is doing doesn't call for a changeover. This consists of short form work—commercials, TV program opens, network promotions and bumpers. "We can do all of this in-house on a Macintosh using Media 100 and Adobe AfterEffects," Miles says. "NT doesn't offer any improvement in the ability to do what we're doing. If we were doing a half-hour TV show, we wouldn't be able to do it in-house. It doesn't matter whether it's NT or Macintosh. It would still require a big staff and a number of workstations."

Miles is content with the Linker Animation Stand from Linker Systems Co., running on the Macintosh. But he sees some restrictions forthcoming if he decides to expand into other capabilities. For example, the literature he has been receiving on ink-and-paint software has all specified SGI or NT.

"We're now only in 2D animation," he concludes. "If we went into 3D, we could have a problem in getting software." □

PC Platform

Continued from page 23

predicting the familiar Apple crash that's been expected for more than 20 years. While that doesn't seem likely anytime soon, industry insiders say there is a definite platform migration. And as more post users desert the Mac platform, they bring a wealth of post experience to PC product developers who will use that functionality and feature information to create stronger Windows-based products.

Complaint Window

But it's not all peaches and cream for Windows users and you can hear more than a few complaints. For one, NT code is notorious as a spaghetti-like ribbon that doesn't take kindly to tinkering, so for those who like to fool around under the hood to spin source code, NT systems can be frustrating to the extreme.

Some NT users say the NT interface is clumsy and that efforts to port certain post software to the platform have been bug infested. Others complain that NT has no real time rendering capability.

In addition, the competition for bandwidth in the Windows environment makes the installation of some drivers tentative, and when pressed to perform in concert with other, even simple Windows applications, some video drivers can create mind-bending conflicts and bottlenecks.

Another Option?

While most agree that NT is still a product in its infancy and it will continue to improve, one voice suggests that full functionality in PC post production would be better achieved if Windows NT could be tossed overboard altogether and have software developers move onto the more user friendly LINUX operating system. But he cautions that, for now, it makes sense to stick with Mac-based hardware until the market untangles, and a PC solution that runs as reliably as Macintosh can be developed.

In a world where even home computers have become visual image processors, the idea that serious animation or effects can only be produced on a high-end workstation is fading quickly into the past as falling hardware prices, increased memory, and enhanced computing power have joined to level the playing field. Most users believe that hardware purchase will be led by software, and that the more high-end brain power has turned its attention toward developing for NT. Thus the greatest changes in software will come not from Microsoft but from independent software developers who will see the light and move quickly to fill the task-and-solution void in PC post.

Growing Dominance

Trends indicate that the NT platform's dominance will grow because of a number of factors. First there is a functional familiarity with Windows-based product and an installed user base that may experience low-level fears about learning a Mac-based system.

Windows, open architecture also makes for lower entry costs for creatives while software developers see more opportunities in creating new software or porting existing tools to NT. Apple Macintosh is said by some to be at the wrong end of the curve as its market share continues to dwindle. The installed base for all applications is higher in Windows, and by default Mac could become less of a player in the marketplace.

With users slowly migrating to NT systems, NT developers reap the benefits of the post-production brain drain and the resulting post-production function and feature input that ports to NT. At the moment there is no massive shift, but as the Mac user base continues to jump ship, will software developers continue to write new code for that platform?

The economics of post production have also shifted radically in recent years, with computer graphics and other post-production capabilities becoming more cost effective on the NT platforms. Today, a graphics workstation can be put together for under $6,000. In terms of applications, a one-function brand name black box that might have cost $500,000 three years ago can be had for as little as $100,000 today and it can do a lot more for a growing facility without becoming obsolete.

As the tools get cheaper more creatives, designers, graphic artists and boutique editorial houses are willing to do more work at a lower price point, and that has had a significant effect on the post-production industry. An industry without tool envy increases competition and the winners are those with the creative edge. It means that not as many clients care what you use to achieve results, as long as the job gets done, and it accurately reflects their vision.

Working Advantages

While the benefits of lower entry costs and more frame processing power of PCs in graphics production are an obvious plus, professional offline video editing on a $6,000 workstation has another significant advantage. A lower price means more hands-on work and it maintains or re-establishes the editor and assistant editor relationship. Most mid-sized facilities with expensive offline workstations can't afford to provide separate stations for assistant editors to work loading in material. So the editor and assistant cannot really work together. Putting aside more mundane issues, like overtime hours for assistants, high-priced post technologies have, to some degree, broken the chain of technical apprenticeship and upset the subtle visual legacies usually passed from editor to assistant throughout the course of a project.

There are a greater number of applications for PC now. And with hardware players fully committed to post production workstation technology the competition is heating up. These are not off-the-shelf PCs but dedicated workstations with robust networking capability designed to have features more suited to graphics and post production.

With Sony, Discreet Logic, Avid, and even SGI making NT products and Softimage Digital Studio considered top notch, nonlinear editing on NT platforms is thought by many to be the wave of the future. Other PC systems require hot new boards from Targa and Matrox to tweak up their video capabilities, but with the right software and enough disk arrays the only thing missing are broadcast-quality decks to capture and output video.

As for the online environment, another industry expert says that if ones and zeros remain as they are, and continue to be poured in and out of boxes, then there is no reason to suspect we won't someday soon be on-lining without qualification on the PC platform.

As more resolution-independent work is completed in post, industry visionaries are looking toward being resolution bulletproof, and they know that closed architectures can be out of date quickly. Equipment that becomes obsolete overnight cannot be amortized easily, and that is as much a concern for a one-man band as it is for a full-service post house. The PC's open architecture has a built-in flexibility and a longer life than costly closed-end black boxes. A PC system, when no longer useful in a high-end suite, can be re-purposed to another suite or put to work in a different application altogether. And as it moves down the facility chain its useful life as an asset is extended.

Today's post-production industry has become more energized, fragmented, and democratized thanks to advances in technology that have made the process less cumbersome and creativity the coin of the realm. What we see is an industry like many others with a single-minded determination to be freed from the tyranny of tools, technology, and the built-to-fail mechanical models of the industrial age.

The game has changed. Networked open systems, interoperability, transparency, and flexibility are the pillars of the new work environment. In that environment the primary interface is human and seamless, and it allows the artist to be in control of interacting technologies rather than be restrained by the limits of his tools.

Some say the war between systems is over. Others say it was never a war at all, just one more speed bump on the road to a fully open future in an all-digital world. □

PC-Based Nonlinear Editing Systems Continue To Mature

The Mac no longer stands alone when it comes to offering editing capabilities

By Adam Matthews

Until recently, nonlinear editing systems were mostly found running on Apple's Macintosh platform. The rest of the graphics industry has been shifting to the Windows platform for a number of years, but it seems that NLE systems have only recently made a big push into this area.

One of the first PC-based nonlinear systems was developed by Bill Ferster, who also developed one of the first PC-based 3D animation systems. His company, Editing Machines Corporation, couldn't compete effectively with Avid Technology. For a number of years, nobody could, as Avid completely dominated the market with their Mac-based systems.

Today, all the old Mac-based NLE companies, including Avid, sell systems that run under Windows NT. The old D/Vision system, which has always been a PC product (and suffered second-tier status because of it), has been swallowed up by Discreet Logic and re-introduced as edit. In addition, new products like Softimage Digital Studio and Play's Trinity offer nonlinear editing as part of a more complete production system.

Even the lower end of the market has shifted to the PC. Compression card technology has advanced to the point that many people can now successfully build their own systems and integrate a capture card with editing software like Adobe Premiere or Ulead MediaStudio Pro. The number of systems available is easily over 100 and the prices range from just a few thousand dollars to over $100,000.

Making a choice in this complex environment is a difficult thing to do, but we'll try to make your job a little easier by helping to identify where the market it going. Whichever product(s) you look at, it's clear that the nonlinear editing systems market is evolving very rapidly and what you see today is not necessarily what you'll see tomorrow. The hope, of course, is that anything you purchase now can be upgraded to include the features that are introduced tomorrow.

With that in mind, we spoke with a number of nonlinear suppliers and asked them to tell us about the trends they see in the industry. As part of this process, we promised to leave out the names of the people, products and companies in this report. This way, they could relate the trends without having to tailor them to fit existing, announced or future products.

Media 100 is now offering the media 100 qx and qxc for Windows NT.

QuickTime 3.0

The first trend that was mentioned frequently is the latest version of QuickTime. QuickTime 3.0 brings together standard QuickTime and QuickTime VR into a single package. It also allows movies to be created at any resolution and frame rate, which means it can be used for broadcast applications.

At least one executive pointed out that it was interesting that as Apple continues to falter, QuickTime is thriving. And one of the keys to using it successfully is to use a system that is "QuickTime Native." This means that movies can be loaded and saved without having to be converted from one format to another.

With QuickTime 3.0, Apple has a system that works well in both the Windows and Macintosh environments. At the same time, Microsoft has announced its own "standard" for video that competes directly with QuickTime. Given the wide acceptance that QuickTime has garnered over the years, it isn't clear that Microsoft can muscle Apple aside in this case.

Interoperability

Another trend is NLEs that move away from completely proprietary solutions and toward a system that is compatible with other equipment. At one level, this results in nonlinear systems that incorporate more functionality. Instead of using a separate DVE, for example, DVE functions are built into the system. Instead of a separate audio system, the audio can be manipulated within the nonlinear system. In many cases, this means opening up the architecture of systems to support "plug-in" technology that is supplied by other companies.

At the recent Siggraph show, plug-in technology for nonlinear editing systems was all over the place. In fact, one company is working on an upgrade to its current plug-in product that will actually allow plug-ins for other products to work under it. A plug-in that accepts other plug-ins—what's wrong with that picture?

At another level, open systems mean that the data can be moved from one place to another. For example, you may be able to edit the audio for some projects, but if you absolutely need to utilize a separate audio system due to the requirements of a project, you want it to be compatible with your system.

At a third level, there is interoperability of video formats. Composite Y/C, Component, Serial Digital and DV formats are being used at all levels of production. Few, if any, products can easily work with all of them. On the DV side, suppliers are looking at ways to incorporate this affordable digital format into nonlinear systems.

Higher Quality Images

Advances in technology at all levels are allowing nonlinear systems today to achieve quality levels that were unheard of a few years ago. We asked the people we interviewed whether the trend was to uncompressed video, but they usually answered that it wasn't. Although nobody can argue that uncompressed video provides outstanding quality, there are ways to compress video that still create a very high-quality result. The term "visually lossless" was used by more than one person to describe a signal that is compressed but doesn't look like it.

In some cases, it was suggested that 2:1 or 3:1 compression can achieve this result, but the actual number is less relevant than the look of the result. Combined with lower prices for storage, using some compression allows affordable systems to be created with room for many hours of source material.

This doesn't mean that nothing is uncompressed, however. At least one manufacturer recently announced an uncompressed video system for delivery next year. Another, lesser-known company is currently delivering uncompressed video on both the Mac and PC platforms.

NonLinear Online

When NLE systems were first introduced, the goal was to output an edit decision list (EDL) that would let a "real" editing system bring together the results. Technology has brought us to the point where today's systems can very often be used for everything from initial capture through the creation of the final result. The industry has started to refer to many products as "finishing systems" instead of "editing systems" to reflect their ability to create the finished product. One company has even incorporated this concept into its new PC-based product line.

Multi-Stream Video

If NLE systems are truly to be used for finishing, they often need to have access to multiple streams of video at once. Many companies are using the term "multi-stream," but the implementation of this concept varies from one product to another. The goal, however, is certainly becoming more attainable as systems become more powerful and communications between the various pieces happens more quickly.

More Power, Lower Prices

This is a trend in the computer industry in general. However, it is worth mentioning that nonlinear editing systems take advantage of it as much as other applications. Entry level systems are being introduced at lower and lower price points. At the same time, the configuration of tomorrow's entry level system is often more powerful than yesterday's mid-level product. This trend is certain to expand the market significantly. As with many other applications, people will gain more knowledge about the process and deal more intelligently with those of us who do this for a living.

The trends we've discussed here were not the only ones mentioned, but they're certainly the ones that kept coming up in our discussions. The result is that new products being introduced now and throughout the year should make it easier than ever to afford and use a PC-based nonlinear system. □

NONLINEAR ROUNDUP

Manufacturers Expand Nonlinear Options For NT

Adobe Systems

Adobe Systems has released Adobe Premiere 5.0, available on the Windows 95, NT, and the Power Macintosh platforms. This latest version is designed to meet the demanding needs of broadcast, industrial, Web, and multimedia authors. It is part of Adobe's integrated, professional video solution to help users easily and affordably put ideas in motion. Key new features include History Palette, Editable Text Layers, Spot-Color Channels, and Color Management support, make it easier for users to focus their creativity on their designs. The History Palette allows users to undo multiple steps with a single click, and Magnetic Selection Tools add timesaving capability. Users also have complete control to flow text horizontally or vertically, to mix multiple typefaces, and to adjust size, kerning, baseline, and tracking. *Visit Adobe Systems at www.Adobe.com.*

■ **For more information circle Reader Service #506**

ASC Audio Video Corp.

ASC Audio Video Corporation has introduced POSTFlash, a Windows NT-based digital video editing system that enables multiple users to have simultaneous access to shared Fibre Channel storage. POSTFlash is ideally suited for digitally editing and finishing national commercials and promos—as well as primetime, syndicated, and cable television programs.

ASC has also launched NEWSFlash, a full-featured news editing solution for broadcast news operations. NEWSFlash is the only news editing system with FibreDrive. NEWSFlash also features 2:1 compression, real time effects, and Windows NT operating system. It's priced at $49,500; Fibre Channel is priced separately. *Contact ASC at 818-843-7004.*

■ **For more information circle Reader Service #507**

Avid

Avid's Symphony high-end uncompressed finishing system also makes use of the NT platform. Three uncompressed streams (two ITU-R 601 video streams and a downstream keyer for titles and graphics) make it well suited for finishing demanding program types. Tools include audio finishing to color correction, from keying to scratch removal to complex matte creation. It also includes strong links to Avid's family of products as well as third-party applications.

The Avid Symphony user interface is based on the Media Composer interface and is optimized for online finishing. It also fully implements OMF 2.0, the open interchange format for media and compositions, and can import and export 25 different file formats using Avid's Image Independence technology. It also includes a separate rack-mountable audio/video I/O box for easy access to all of your audio and video connections.

Avid is also releasing MCXpress Version 1.6 this summer. New features for this Windows NT-based solution include color correction, zoom and crop on PIP, media consolidation, batch support of a list of files, support for Control-L devices through third-party controllers, EDL Import, and track locking and sync break indicators. *Contact Avid 800-949-AVID or visit www.avid.com.*

■ **For more information circle Reader Service #508**

Digital Processing Systems

Perception RT is a new, totally integrated, dual stream video editing system from DPS. The dedicated onboard SCSI controller allows two streams of video to be played back at any compression level with minimal CPU and PCI overhead. Realtime transitions are performed in hardware which is CPU independent. The DPS virtual file system gives third party applications access to the media on the drives in multiple graphic file formats. R3DX, an optional realtime 3D effects processor, is also available. *Contact DPS at www.dps.com or call 606-371-5533.*

■ **For more information circle Reader Service #509**

Discreet Logic

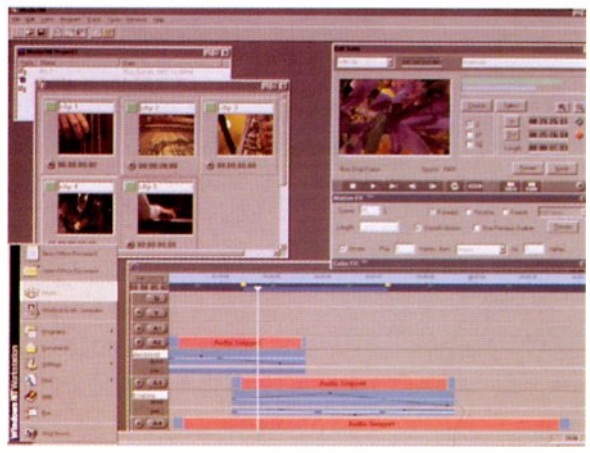
Discreet Logic is now shipping edit Version 4.0 with an extended feature set. Discreet Logic's Windows NT-based realtime, nonlinear editing software offers content creators more flexibility and power as well as previously unannounced new features. They include a new trim window with slip-and-slide capability, offering greater control and flexibility in the editing process; a new keyframe/channel editor; and user definable columns for bin and database management. Edit's trim window is now capable of displaying head and tail images of both the incoming and outgoing edit. This display works with the new slip-and-slide feature, providing the editor frame accurate control of edits with good visual feedback of all trimming operations.

V4.0 of edit also offers an expanded level of integration with Discreet Logic paint and effect, which in turn offer 2D-3D integration with Kinetix's 3D Studio MAX. *Contact Discreet Logic at 514-393-1616 or visit www.discreet.com.*

■ **For more information circle Reader Service #510**

Media 100

Media 100 Inc., now offers FINISH, a new line of high-performance digital video systems for Windows NT. FINISH provides a completely integrated online



finishing system with support of 601, direct realtime processing of DV-formatted data, and support for IEEE 1394 connectivity. According to Media 100, FINISH brings image quality, realtime performance, and other standards normally associated with more expensive broadcast equipment to its price point. When shipped in October, FINISH is expected to sell for less than $30,000.

Also from Media 100 is Media 100 qx and qxc for Windows NT featuring the image quality of Media 100's VINCENT hardware integrated with Quicktime 3 and Adobe Premiere 5.0. *Contact Media 100, www.media100.com, 508-460-1600.*

■ **For more information circle Reader Service #511**

Panasonic

Panasonic's DVEdit for Windows NT is a fully integrated digital DVCPRO-based realtime nonlinear editing system. It features dual-codec DVCPRO Targa video engine, Panasonic's Postbox elite editing software, Jog Pad edit controller, and RS-422 VTR control card. Editing features include full drag-and drop timeline editing, four channels of audio editing, and a full-featured titling package supporting True-Type fonts. Realtime transitions such as wipes, fades, and dissolves are supported, and after editing finished sequences can be exported AVI files. *Contact Panasonic at 800-528-8601 or visit www.panasonic.com/PBDS.*

Pinnacle

Pinnacle's MiroVideo DC50 is a professional nonlinear video and audio editing solution including a professional breakout box that supports high-quality video and audio connection to Betacam decks and other component video sources. It feature component, composite, and S-Video connections, balanced and unbalanced audio input and output, data rate up to 7 Mb.sec., and full field and frame resolution of 720x486 NTSC. Selectable compression ratio can be from 2.5:1 for NTSC up to 20:1. It includes Adobe Premiere video editing software. *Contact Pinnacle Systems at 650-526-1600.*

■ **For more information circle Reader Service #512**

Scitex Digital Video

Scitex Digital Video has introduced Windows-NT codec for its Sphere family of digital nonlinear video editing systems. This codec adds cross-platform support to all Sphere systems, enabling users to share media files between the Sphere editing environment and the increasingly popular Windows NT platform. Once saved as a Sphere QuickTime file on NT, these files can be instantly played back on any Sphere system. *The codec is available free of charge on Scitex Digital Video's service Web site, www.sdv-service.com.*

■ **For more information circle Reader Service #513**

Tektronix

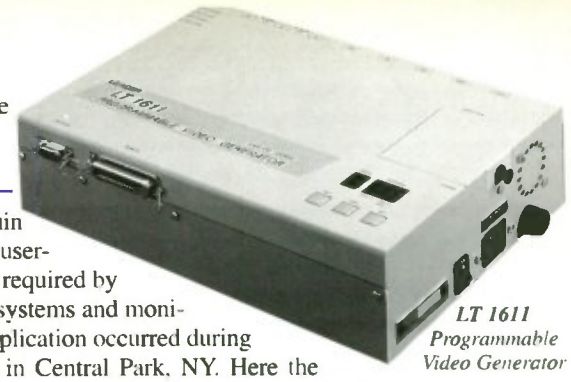
The Lightworks V.I.P 4500 online editing system is based on Windows NT. The system marries the Lightworks user interface with the Tektronix Profile digital disk recorder. The Profile provides the capability to simultaneously access up to four independent channels of broadcast-quality video and 16 channels of audio.

With 72 gigabytes of internal storage standard, the system can store approximately 200 minutes of broadcast-quality video and audio on disk at 3 minutes per gigabyte quality. It can also control existing external devices in an online suite with an RS422 serial control engine, including the GVG1200 vision mixer, DPM700 DVE, and Pinnacle Alladin. Contact Tektronix at 800-TEK-WIDE or visit www.tektronix.com.

■ **For more information circle Reader Service #514**

Leader Instruments Supports HDTV

Broadcast networks, production houses and suppliers now actively engaged in HDTV applications are currently using Leader Instruments' award winning products for both signal sources (Model LT 440D) and monitoring (Model LV 5150D). Among these are ABC, Bexel, CBS, Crawford Communications, DaVinci, Foto-Kern, Laser Pacific, Lighthouse Digital, N-Vision, Pacific Video, PESA, Sony Pictures (HD), Tapehouse Editorial, Universal Studios, Utah Scientific, Warner Bros. ...



LT 1611 Programmable Video Generator

Models LT 1611 and LT 1608 Combination of Programmable RGB Generator and NTSC/PAL/HDTV Encoder

A unique combination of Models LT 1611 and LT 1608 expand the far-ranging attributes of a fully programmable RGB generator, the LT 1611, with an NTSC/PAL/HDTV encoder, the LT 1608. The encoder accepts RGB, sync and clock signals from the RGB generator and outputs fully encoded NTSC, PAL or HDTV component three-wire. Both NTSC and PAL outputs are full composite with encoded color subcarrier. The HDTV feeds are in YPbPr form and include standard tri-level sync.

LT 1608 Video Encoder

The combination of RGB generator and encoder puts the programming features of the RGB generator, in terms of raster architecture (within specified limits) and both stock and user-designed test patterns, into the form required by NTSC, PAL or HDTV component systems and monitors. An example of a very useful application occurred during setup of the Garth Brooks concert in Central Park, NY. Here the combo was pressed into service to provide crosshatch patterns in the HDTV format to drive the projection monitors during setup. Model LT 1611 provides analog RGB feeds with a maximum dot clock frequency of 150 MHz. It operates as a stand-alone generator using a supplied ROM, but is fully controlled and programmed from a PC connection in the Windows® format using supplied software. PC control sets up raster/timing parameters, stock and custom-design test patterns and output signal conditions. For more information, contact Leader Instruments Corporation, 380 Oser Avenue, Hauppauge, NY 11788. 1-800-645-5104 or 516-231-6900.

LT 425D Digital Component Test Signal Generator

A precision test source for digital-component facilities, the LT 425D offers one parallel and four serial outputs (one digital black.) AES/EBU digital audio may be embedded in the serial data stream, but is also available as a separate output. Test signals are tailored to digital operations and include the SDI checkfield and a programmable moving marker and switched stills for compression tests. A programmable 20-character source ID, calendar and clock rounds out the full list of operating options. For more information, contact Leader Instruments Corporation, 380 Oser Avenue, Hauppauge, NY 11788. 1-800-645-5104 or 516-231-6900.

LV 5100D - Digital/Analog Component Waveform Monitor

Able to work in component digital as well as component analog facilities (and mixed operations), the LV 5100D provides comprehensive waveform, vector, timing and picture monitoring capabilities. Menu-driven control functions extend familiar waveform observations into highly specialized areas and include local calibration control, the ability to show or blank SAV/EAV signals in both the waveform and picture to monitor digital signals in GBR or YCbCr form, line select (with an adjustable widow), memory storage of test setups with capabilities such as on-screen labels, flexible cursor measurements, automatic 525/60 and 625/50 operation and much more. For more information, contact Leader Instruments Corporation, 380 Oser Avenue, Hauppauge, NY 11788. 1-800-645-5104 or 516-231-6900.

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DTVPOST for PC

PC Animation Choices Grow As Prices Shrink

Latest intros a testament to the platform's power and popularity with graphic professionals

By Adam Matthews

Five or 10 years ago, animation software was very expensive to purchase, was extremely difficult to learn and use, required heavy duty computing power and was amazingly slow. As a result, many people stayed away from it. Those people that did take the plunge were also looking at a significant investment in video-compatible hardware so the results could be recorded onto videotape or film.

Today, the situation is very different. In many cases, software products are available for under $5000 and even under $1000. One new product, recently introduced at Siggraph, even carries a price tag under $100.

Advances in usability and third party content have made it easier to get started with a lot of the packages. And even the cost of the PC hardware has become amazingly low, with computers that can handle animation now available for less than $2000. And the speed of rendering 2D and 3D images has improved to the point that instead of leaving for the day while a project renders, you may not even have time to get a cup of coffee.

Adding equipment to make your system "broadcast quality" is still significant, but even those prices have come down a lot. With the latest DV compatible products, prices are coming down even further.

Picking the Right Resolution

When animation is created for standard NTSC television, it is usually rendered at either 640x480 or 720x480 resolution. With the introduction of the new digital television formats, it's important to know what resolution and aspect ratio to use. Thankfully, almost all animation products support arbitrary resolution and many support both 4:3 and 16:9 aspect ratios.

For the smoothest playback, it's also necessary to know whether the ultimate output is destined for interlace or progressive scan. For many years, companies have rendered half-height images for each field of an animation. In a progressive scan environment, this won't work.

Tools You Can Use

There are a lot of companies that offer products for animation and a few more were added last month when the animation industry gathered in Orlando, FL for the 25th anniversary of Siggraph. At this point, virtually all products are available on the PC, usually under Windows NT. It isn't possible for us to cover all the companies and all the products that exist, but we'll talk about a representative sample here to give you an idea of what's available.

The high end of the PC field is very well represented by 3D Studio Max R2 from Kinetix, a division of Autodesk. When the original 3D Studio was released, it quickly became the top selling program for PC-based 3D animation. Max R2, which runs under Windows NT, is priced at $3995 and features support from a very large number of third party companies.

Liquid Light Studios used Kinetix 3D Studio Max R2 to get the famed dancing baby dancing in primetime on Ally McBeal

Even though the price is high compared to some of the other choices we'll cover here, Kinetix claims that many people purchase this product to take advantage of the third party support. This support includes pre-created models, plug-ins for special effects and a variety of training programs. It also includes a lot of trained animators, which can help a company get up to speed quickly rather than trying to learn the software from scratch.

Another high-end product may be getting ready to join 3D Studio Max. At Siggraph it was strongly hinted that a Windows NT version of the ElectricImage Animation System is very close to being finished. ElectricImage was recently purchased by Play, whose Trinity product already runs under Windows NT. When that sale was announced, speculation on ElectricImage for NT began and appears now to be correct.

If the price of these two products is too high, there are a lot of other choices that have a lower price tag. In some cases, these are less capable versions of higher—end products. In others, they are full-blown products that are aimed at a wider audience.

Avid Elastic Reality

Elastic Reality is a powerful special effects system that combines the advanced warping and morphing technology with sophisticated 2D animation, color correction, matte generation and compositing tools. It is currently available in Mac, PC and SGI versions with support for over 25 different file formats. Because it's from Avid, Elastic Reality also integrates well with the company's Media Xpress and Media Composer systems.

Crater Software CTP

You've got to believe that a company has something special when they invest in a 20x20 booth at a major trade show to demonstrate a product for which there is no distribution channel. That's exactly what happened as Crater introduced its CTP product to the United States. CTP is a 2D-animation program that seems to be well thought out and appears to work very well. If Crater can find a way to sell it in the U.S., it could give some other products a serious run for their money.

Linker Systems Animation Stand

For over 10 years, Linker Systems has been selling the Animation Stand to animation houses around the world. It was the first 2D animation product available for all three major platforms—Mac, PC and SGI. The latest version of the product runs under both Windows NT and Windows 95/98.

Newtek Inspire 3D

Newtek has a habit of lowering the cost of entry for the product categories it goes after. When it first introduced the Video Toaster, people didn't think it was possible to do everything it said it would for the price it was charging. The Lightwave 3D product, currently priced at $1995, is regularly used on television shows like *Babylon 5* and in feature films like *Men in Black*.

Even though Lightwave 3D is already priced pretty aggressively, this month the company is introducing a lower-cost version of the product that supports most of the Lightwave features. Inspire 3D is limited on the video side to 640x480 resolution, although it supports up to 8K x 8K rendering of still images. Also missing are features like field rendering, which isn't necessary when animation is being created for a progressive scan environment. Anything created in Inspire 3D can be imported into Lightwave 3D, but you can't go the other way. Newtek plans to sell this product directly over the Internet and through major retail chains like CompUSA and Computer City.

Nichimen Graphics Nendo

If you've been in the computer graphics industry for more than six or seven years, you may remember a company called Symbolics and its Los Angeles-based Symbolics Graphics Division. Using the company's strength in artificial intelligence, the Symbolics Graphics Division developed very high-end tools for animated 2D and 3D graphics. After a few intermediate stops along the way, this technology was acquired by Nichimen Graphics and has been used to create its latest product, which debuted at Siggraph. Nendo has virtually all the power of the old Symbolics products and is priced at an amazing $99.

Sony PaZoo

The biggest name in broadcast television is looking seriously at the 2D-animation market with a product it has been developing in Japan for the past two years. Running on a loaded Windows NT workstation with D1 input and output capabilities, PaZoo looks very interesting, although Sony won't commit to either a price or an introduction date. Sony hinted that it might be introduced at NAB '99, so we'll just have to wait a little longer to see what develops.

Strata MediaPaint and StudioPro

Although Strata products generally run in the Mac environment, the company is moving aggressively into Windows NT with recently ported versions of these two products. StudioPro is Strata's highest end 3D product, with features like deformation and inverse kinematics. MediaPaint is a special effects program that allows you to paint on top of QuickTime movies with effects like fire and lightning. □

GRAPHICS ROUNDUP

Siggraph Sees New Changes To Old PC Graphics Favorites

Alias/Wavefront

Maya is Alias/Wavefront's character animation software, providing a number of higher-level 3D character animation features. They include deformers that are stackable, reorderable, and animatable, a suite of Inverse Kinematics tools for precise control over movement, and facial animation control from a number of blend shapes. A complete set of skinning tools, built-in motion capture support, and integrated sound synchronization is also available.

Advanced modules for Maya include Maya Artisan (traditional artist brushes and sculpting tools), Maya F/X (for soft body objects and complex particle systems), and Maya PowerModeler (for creating mechanical designs where adherence to specific values are critical). *Contact Alias/Wavefront at 416-362-9181 or visit www.aw.sgi.com.*

For more information circle Reader Service #515

Animation Science

Outburst 1.5 is a particle animation system that allows animators and programmers to create special effects that react to the animated world around them by conforming to the laws of physics. Outburst 1.5 is a true particle simulation system that brings real world physics to animation, allowing animators to generate sophisticated effects, such as complex explosions, chemical reactions, or raindripping off an umbrella by utilizing particle interactions like collisions and transformations. Outburst 1.5 is also the first product on the market to define targets for objects and provide "soft landing" ability.

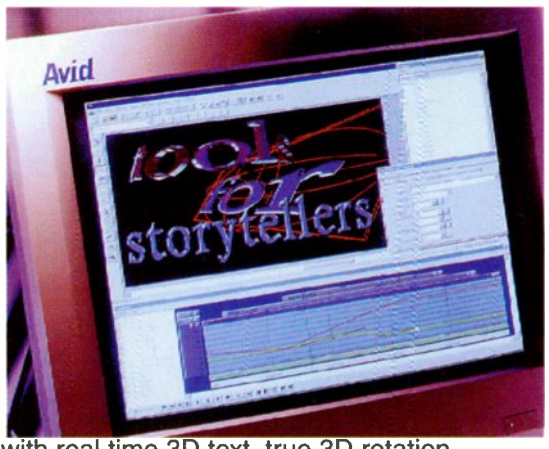
Outburst 1.5 is available both as a software development kit, allowing maximum power and flexibility to create specific special effects, and as a plug-in to Kinetix's 3D Studio Max. The suggested retail price for Outburst version 1.5 for 3D Studio Max is $495. *Contact Animation Science at 408-752-1444 or on the World Wide Web at www.animationscience.com.*

For more information circle Reader Service #516

Avid

Avid Technology's Masquerade is a paint and 2D animation system for Windows NT workstations. Masquerade builds on the Avid's Matador paint software, bringing many of its high-end capabilities to Windows NT workstations. Masquerade features include powerful paint capabilities; SmartLayers hierarchy; filters, masks, and cutouts features; and rotoscoping.

Also available is Avid Marquee, a new resolution-independent 3D title animation software for Silicon Graphics and Windows NT Workstations, has been released. The software combines the best aspects of word processing



with real time 3D text, true 3D rotation, and texture mapping. Other features include Avid-style Timeline for precise animation control, real time playback and previews, access to thousands of fonts, ability to step into layers and animate character. The suggested retail price is $7,495. *Contact Avid at www.avid.com or call 800 949-AVID.*

For more information circle Reader Service #517

Chyron

Concerto, a full-featured compositing and special effects software package that supports unlimited layers of video and audio for Windows 95 and NT workstations, has been launched by Chyron. Concerto is a self-contained graphics system developed to meet the ever-changing needs of the television production environment. Concerto allows everyone from high-end film and broadcast digital artists to create 2D and 3D video compositing, including HDTV.

Liberty version 6.5 Paint and Animation System provides cross platform support for SGI workstations and Windows NT platforms. The system features a choice of 32- or 64-bit color, up to 8K x 8K resolutions, infinite layers with 2D/3D warp, extensive brush and filter effects as well as unlimited animation timeline layering. *Contact Chyron at 516-845-2000.*

For more information circle Reader Service #518

Crystal Graphics

Crystal Graphics has released TOPAS Professional, a fully integrated solution for the production of broadcast-quality 3D animations on the PC. Crystal TOPAS Professional offers ease of use and productivity, as well as quality and speed. It has been used by professional animators to create commercials for products such as M&Ms, Certs and McDonald's, animated logos for HBO and nationally syndicated sports shows, feature length animated TV shows, and CD-ROM titles. *Contact Crystal Graphics at www.crystalgraphics.com.*

For more information circle Reader Service #519

GRAPHICS ROUNDUP

Kinetix

Kinetix has introduced Character Studio R2, a new version of the extension to 3D Studio MAX software that delivers high performance and realism for 3D character animation in film, broadcast, video, games, and interactive entertainment. The technology behind the Dancing Baby phenomenon, Character R2 combines motion capture, editing, and blending technology with traditional key frame animation, comprehensive new skin deformation tools, and Character Studio's patented footstep-driven technique. A newer version, 3D Studio Max R2.5, has added features targeted specifically at entertainment content creators for film, broadcast television, and interactive games.

Kinetix has also made new plug-ins available which enable interoperability between 3D StudioMAX R2.5 software from Kinetix and Discreet Logic's paint and effect. The plug-ins are available www.ktx.com and www.discreet.com. The new Kinetix/Discreet plug-ins allow 3D Studio MAX artists to use the vector-based, animated Discreet Logic paint project file format (.ipp) anywhere they can use a bitmap file: as a texture map, background, or displacement map. The 3D Studio MAX Materials Editor also has a new maptype, called Paint, that allows users to apply resolution-independent textures to scene geometry.

Discreet Logic paint and effect can also be used to add 3D post effects directly onto a 3D Studio MAX rendered .rla bitmap sequence. Effects found in the 3D Studio MAX Video Post can all now be added interactively within the paint and effect program. *Contact Kinetix at www.ktx.com or 415-547-2000.*

For more information circle Reader Service #500

Linker Systems

Animation Stand delivers advanced cel-based animation system. Created for use by animators, not computer technicians, Linker Systems designed the Animation Stand with an interface natural to the artist, and delivers it at a affordable price. Cel animators can draw, ink & paint, auto-paint cels, animate, create special effects, edit multiple audio tracks, and output to film, video, HDTV, and CD-ROM, with full frame accuracy, at any display resolution; and it is compatible with all display hardware. Animatic or pencil test can be created at any point. Animators can work with unlimited layers and a wide-array of colors. There are versions for Macintosh, SGI, and Windows NT platforms. *Contact Linker Systems at www.linker.com.*

For more information circle Reader Service #521

Matrox

Matrox Video Products Group has unveiled its video/graphics frame buffer and mixer, a graphics subsystem of Matrox DigiSuite. The DigiMix frame buffer card can be used in stand alone mode with broadcast CG, and still store from Inscriber Technology. Features include ultra high-speed 32-bit graphics, realtime dissolves, transitions and effects, and flexible upstream and downstream operation. *Contact Matrox via phone 800-361-4903 or via e-mail at video.info@matrox.com.*

For more information circle Reader Service #522

NewTek

Newtek's recently released LightWave 3D helps users create sophisticated 3D animation. Its intuitive layout and modeling system delivers creative control and flexibility. Features for modeling, surfacing, lighting, and animating are included. Raytracing, motion blur, MetaMation, inverse kinematics (IK), Bones, field rendering, lens flares, and compositing are all possible.

New from NewTek is a specialFX toolset for Aura. The SpecialFX toolset gives professional video and animation artists all the tools they need to create stunning visual special effects and produce high-quality output. Users can create a multitude of special effects over time including particles, explosions and digital transitions.

At Siggraph NewTek also announced it plans to establish a leadership role in the DTV market by introducing Resolution Studio, a suite of DTV-compliant software for digital content creation, animation, modeling, video paint and realtime High HDTV playback. Resolution Studio combines DTV versions of LightWave 3D, Aura, NewTek's paint and compositing software, and RamPage, a software-only player allowing for realtime DTV preview and playback including HDTV resolutions. NewTek's Resolution Studio will be available in the fourth quarter. *Contact NewTek at 913-228-8000 or visit www.newtek.com.*

For more information circle Reader Service #523

Side Effects Software

Houdini 2.5 on Windows NT, released by Side Effects Software, brings new capabilities to the world of high-end 3D animation on Windows NT. Houdini 2.5 delivers a package designed for film, broadcast and games, and incorporates a new set of character animation and special effects tools. Houdini's flexible procedural animation system has been chosen in feature films including "Godzilla," "Dr. Doolittle," and "Contact." *Contact Side Effects at www.sidefx.com or at 416-504-9876.*

For more information circle Reader Service #524

Strata

STRATA StudioPro v2.5 and Power Module 1 for Power Macintosh and Windows NT provide 3D modeling, rendering, and animation package for creative professionals. Features include inverse kinematics, deformation, in-context modeling, very fast scanline rendering, texture compositing, and particle effects with collision detection.

Strata's MediaPaint allows users to add the Hollywood-style effects seen on TV programs such as "American Gothic," "Hercules," and "Xena." MediaPaint is available for Macintosh, Power Macintosh and Windows 95/NT. *Contact Strata at www.strata.com or call 801 652-5293.*

For more information circle Reader Service #525

Tops

TOPS has released ProVideo, a vector-based videographics application that offers a full range of professional features combined with a simplified user interface. TOPS ProVideo uses advanced vector-based objects for full, unlimited editing of the graphic elements in an image. The product also includes an exclusive 4:3 edit mode that automatically maintains proper image aspect ratios regardless of the output resolution or video frame buffer used.

For more information circle Reader Service #526

Haptic Technologies

The PenCAT/Pro is a 3D pen with force feedback that enables animators, and 3D modelers to "feel" objects on the computer screen. Priced at $689, the PenCAT/Pro is positioned to dramatically change the way design professionals use their applications. 3D designers and artists will now be able to actually feel curves, edges, and surface textures of the objects they are designing, achieving significant boosts in comfort, speed, and interactivity. The PenCAT/Pro can even be used to replay motions directly to the user's hand. *Contact Haptic Technologies at 514-987-9800 or visit www.haptech.com.*

For more information circle Reader Service #527

SoftImage

SoftImage's next-generation rendering system, code-named "Twister," is entering the beta test cycle with delivery to customers scheduled for the fourth quarter of 1998. "Twister" is the first module of the soon-to-be-released 3D animation platform, code-named "Sumatra," which provides a revolutionary new approach to character animation and introduces the concept of non-linear animation (NLA).

"Twister" is well-suited for use in combination with SoftImage 3D version 3.8, now shipping to customers, which allows users to perform interactive rendering in a next-generation environment.

SoftImage also announced at Siggraph the final beta of the SoftImage DS version 2.0 software developers kit (SDK), an advanced toolkit for building cutting-edge effects plug-ins for SoftImage DS 2.0. Using the open, extensible architecture of SoftImage DS, the SDK provides access to the interface and programming tools used by SoftImage DS developers and allows third-party programmers to efficiently create plug-ins that integrate seamlessly into the SoftImage DS environment.

Contact Softimage at 514-845-1636 or visit www.softimage.com.

For more information circle Reader Service #528

Avid Acquires SoftImage

Continued from page 4

have begun to settle down, particularly after Avid and SoftImage had a chance to talk with both users and the press at last month's Siggraph convention in Orlando.

Paul Henderson, Avid Technology vice president of product marketing, says Avid feels the acquisition is a good fit for both companies.

"The view at Avid is that the addition of SoftImage will allow for a rapid expansion into the 3D effects and gaming markets, as well as augmenting our leadership solutions in the television editing and finishing markets."

Henderson quickly dispells with the rumor concerning Microsoft's "giving up" on Softimage.

"We initially approached Microsoft about acquiring SoftImage because of its strong offerings in 3D, recognizing the key role that 3D technology plays in the development of integrated digital nonlinear environments," he explains. "And as we looked deeper into the separate company's market focuses and strategies we recognized that the combination of technology and people could offer a great deal more."

As a result of the deal Microsoft owns approximately 9.1 percent of Avid outstanding common stock, excluding the unexercised warrant. Henderson adds that this only furthers Avid's strategic alliance with Microsoft, supporting initiatives already underway in the digital television, interactive television, and multimedia file format areas.

At Siggraph there was concern from some customers at both the Avid and SoftImage booth of the acquisition, but Henderson says existing customers shouldn't be concerned.

"Combining SoftImage's strength in effects with Avid's leadership in editing delivers what we believe to be the industry's most powerful, comprehensive integrated solution available," he offers. "We also believe this transaction will greatly benefit both sets of customers by enabling Avid to bring even stronger integrated editing and effects solutions to market."

He adds, however, that existing customers shouldn't be concerned with seeing products vanish or lose their present independence.

"Because the products provide unique technological advantages, both we and SoftImage plan to continue offering existing Avid and SoftImage products while working on how to best integrate the two sets of solutions. Over time we will look for opportunities to cross-pollinate all of our products with the best technologies developed by both of us."

Paul Sinclair, SoftImage marcom group manager, says the ability to bring all the tools for editing and graphics into one environment could change the face of post production.

"A whole different artist will emerge because they'll be able to finish an entire spot in one system," he explains. "This brings the costs down and means there is no need to go from one room to another in order to complete a project."

Henderson also sees benefits from Softimage's strengths on the SGI and NT platforms. "We're dedicated to building solutions that address the creative and business requirements of our customers as well as continued development of tools for the job on a range of platforms that include Macintosh, Windows NT and SGI."

One product that brings interesting new capabilities to the Avid product line will be Softimage's Digital Studio (DS). With DS now in the fold, Avid believes it offers a complete solution to those working on long-form projects where media management is of utmost importance, according to Henderson.

"Digital Studio is a powerful video finishing tool, ideally suited for effects-intensive projects, such as commercials and music videos, and when combined with Avid's Media Composer and Symphony systems plus the effects and audio tools from both companies we'll give customers a range of best-of-breed choices for television for television/video post production."

The Future

So what of the future? Henderson says the acquisition doesn't change Avid's vision for an integrated nonlinear production environment where media and metadata move seamlessly from one part of the post-production process to another, whether within one system or even across many systems separated geographically. But he does believe it may make it easier to reach that goal.

"Although it's too early to know with certainty what the final result of the combination of Avid and SoftImage will be, we now have even more tools and talent to bring stronger integrated editing, effects, audio, and finishing solutions to the digital content provider world." □

—Ken Kerschbaumer

Digital Audio For Digital TV

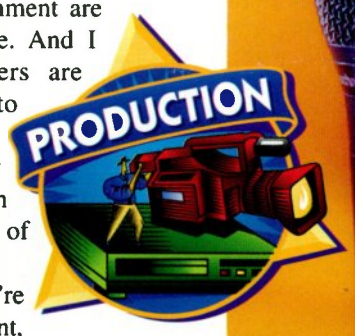
The microphones are ready for the needs of DTV but frequency allocation will become an issue

By Dan Daley

Everyone is looking forward to the great sound of digital audio as DTV becomes a reality. But there are definitely issues of technology and technique that need to be addressed to make this transition as smooth as possible.

Fortunately, for the most part the microphone technology—which is going to remain the one analog link in the chain (at least until there's such a thing as a digital transducer)—is ready.

As Ken Reichel, executive vice president and COO at Audio-Technica points out, "The [pro audio] industry has been doing digital sound now for more than 10 years. The microphones that have the kind of dynamic range and noise floors necessary in a digital environment are already here and in use. And I think many broadcasters are going to be turning to recording studio-quality microphones for many more applications than they do now as a result of digital television audio."



For instance, If you're broadcasting a live event, like the Macy's Thanksgiving Day parade, you'll want full bandwidth in stereo for the bands and the music, which will sound great. But then you can't have your voice talent coming in over the center channel sounding reed-thin using a limited-dynamic/limited-frequency range microphone. Stations and networks will have to start using better microphones across the board."

So are the studios themselves, adds Reichel. As noise floors fall and gain is able to increase in a digital audio environment, audio engineers and producers will have to become more aware of ambient noises in the studio, such as air conditioning system rumbling.

"The same sorts of considerations that people who work in recording studios now have to address," he says, noting that *The Late Show With David Letterman* is already using hand-held versions of A-T's 4055 and 4054 studio microphones.

Wireless

Another major consideration is the wireless environment. "The RF environment is about to become a heck of a lot more cluttered," observes Joe Ciaudelli, director of marketing at Sennheiser.

In response to the advent of DTV, Sennheiser modified its wireless systems to allow 32 individual frequencies available in a movable 24 MHz window. "Let's say you've been operating in the 584 MHz to 608 MHz range, and the digital television co-channel pops up in the same range," he explains. "Our wireless systems can be adjusted up or down between 574 MHz and 702 MHz, with a constant range of 24 MHz. From a station's point of view, that means that the investment that they're making in wireless now will be adaptable to the era of digital television audio."

A-T's Reichel agrees that frequency allocations and awareness will become an issue as never before as the digital transmission channel co-exists with the analog channel. Reichel notes the experience of WFAA Dallas in January in testing its digital co-channel, inadvertently interfering with telemetry signals between hospitals and ambulances in the field. A-T has downbanded one of its UHF wireless systems and is in the process of adjusting the other system so that its frequencies operate either below 800 MHz or above 900 MHz. And it has implemented a purchase system that will automatically register the correct frequencies for customers based on their zip codes.

Audio-Technica's 4055 and 4054 mics are being used on The Late Show With David Letterman

"The microphones are pretty much ready for digital," says Reichel. "But the industry has to be proactive in a lot of other ways to prepare for DTV."

Tracy Cranton, director of marketing & sales at AKG Acoustics, is candid when he says that much of the microphone industry is still trying to figure out the best solutions for each wireless system.

"It could be as simple as frequency readjustments, or it could require complete redesigns in some instances, with the FCC testing and approval that comes with it. It's kind of a mess right now. We technically have until the year 2000, but not everyone is going to wait that long. I think they'll start looking to manufacturers who provide the earliest solutions. And everyone is scrambling out there to be just that."

Techniques

There are still techniques to consider, although most that worked in the analog age will translate to the digital era. However, Sony Electronics sees new techniques evolving in the wake of an increased number of 5.1 home theaters and broadcasts.

"We're in discussions now with a number of broadcasters with respect to microphone techniques for surround sound," observes Courtney Spencer, vice president, pro audio at Sony. "It's still a big question that remains to be fully answered."

Spencer did acknowledge that the rise of digital television could raise the bar in terms of bringing higher-end microphones further into broadcast environments. "Our sales staff will take the opportunity to bring to [broadcasters'] attention any microphones that may not have been relevant in an analog domain but which will now help significantly in digital," he says.

Interestingly, the fundamental decision as to whether to go wireless or wired is a matter of personality, say many audio technicians. "To a large degree, it's a personality thing," observes Todd Hemleb, owner of Pyramid Recording Studios and a 25-year veteran of live and studio A-V productions. "For some people, a wired microphone provides a sense of security; on the other hand, business executives will almost always want a wireless. So the type of talent you're working with provides the first clue as to which type of system to go with."

He also expects that, since most lavalier applications are for voice work, and since the human voice has a fairly limited frequency range (generally between 1.5 kHz and 3 kHz), most wireless lavalier microphones on the market provide more than sufficient frequency coverage but will likely have to broaden their ranges as consumers get used to wider dynamic ranges.

In addition, wireless transmitters will remain vulnerable to the same hazards as any other low-powered radio devices, including metal, which can absorb or deflect radio waves, and moisture, which is often detectable by tell-tale crackling. Hemleb cautions that, when placing small wireless microphones, make sure there is no conductive material in contact with them. And conductive material can take some surprising forms.

"I had a dancer/singer once who was wearing an angel costume," he recalls. "The signal was weak and I couldn't figure out why until I realized that the transmitter was touching the metal brace that was holding up her halo, siphoning off signal strength." Other metallic items to watch out for, especially when placing transmitters into pockets, are heavy pens, cigarette cases, and pocket change.

Mario Porporino, a freelance audio technician based in the New York metro area, recently had the challenge of pinning a wireless mike on basketball star Michael Jordan for the NBA All-Star game. He affixed a Sony diversity microphone to Jordan's jersey using hospital tape, which he said was softer than duct tape and less apt to irritate the wearer's skin.

But perspiration generated in circumstances like sports contests calls for ingenuity, and Porporino has at times used a perforated condom as a windscreen to both reject wind noise and moisture. "Using a regular windscreen, what I do is position the mike sideways to keep the moisture from dripping into the diaphragm," he explains.

Most field processing, such as comp/limiters, will remain analog for the foreseeable future, thus requiring putting them into the loop before the signal goes to the digital deck. Once in the post production studio, however, the entire processing chain—from signal routing to processing to mixing—can then become digital. Thus, there will be a high priority on making the analog components of audio signals—basically starting at the microphone—as noiseless as possible. That will include improvements in handling noise characteristics for hand-held, and noise rejection for lavaliers.

But most manufacturers indicate that the primary qualities on most high-quality microphones are already there, and that attempts to further reduce self-noise, for instance, will only produce trade-offs in the sensitivity department. As many say, it's a matter of broadcast audio quality catching up to existing microphone quality.

Experiments

The move to HDTV also means moving further up the frequency spectrum, and Kent Peterson, a technical services staffer at Telex, reveals an interesting potential scenario:

"With analog wireless, if you were running a lot of devices at the same time and needed more bandwidth, it was always possible to sort of sneak onto the side of an operational band that was in the same area, or use itinerant frequencies. But HDTV is wall-to-wall transmission, so that's not going to be possible anymore. And with HDTV everything is moving more and more to UHF because of its shorter bandwidth, and at the same time the VHF channels, like 7, 9 and 11 in L.A., will be moving up into UHF, as well. I wouldn't be surprised if, as the big networks like ABC and Fox move further up the spectrum, that 10 years from now, more people will be doing wireless back in VHF because there'll be so much room there." □

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More Information circle number 443

MICROPHONES ROUNDUP

Azden

Azden's 422UDR dual-channel rack-mount UHF receiver will make its debut this fall at AES. It allows the user to use two wireless microphones simultaneously, and it has 63 user-selectable frequencies within the 794-806 MHz range, external squelch, mic/line switching and antenna attenuation. It also has a cascading feature that eliminates the need for an antenna distribution device.

For more information contact Azden at 516-328-7500 or visit www.azden-corp.com.

For more information circle Reader Service #529

beyerdynamic

The MCE 7 is the world's smallest lavalier microphone. It features a gold foil diaphragm for greater sensitivity and a carbon-reinforced cable reduce sweat corrosion and strain relief problems that arise in use.

Also available is the MCE 58, employing an electret condenser element rather than the customary dynamic element. The condenser element is more sensitive, possesses a wider frequency response and has lower self-noise. It's powered by a single double A battery.

For more information contact beyerdynamic at 516-293-3200.

For more information circle Reader Service #530

Crown

The Crown CM-10 is a professional-quality, omni-directional electret condenser microphone designed for lavalier use in professional broadcasting applications. Two models are available--the CM-10, supplied with a tubular power module and powered by phantom power, and the CM-10/E, supplied without a connector, for connection to a wireless mic transmitter of the users choice. The CM-10 also has balanced, low impedance, which allows for long cable runs without hum pickup or high-frequency loss. The CM-10E output is unbalanced, medium impedance.

For more information contact Crown at 219-284-8000.

For more information circle Reader Service #531

Electro-Voice

The Electro-Voice 635N/D and 625N/D-B dynamic omnidirectional microphones are offspring of the 635A microphone. They offer a new neodymium N/DYM magnet structure for greater sensitivity. The Acoustalloy diaphragm permits a very smooth response over a wide frequency range, according to Electro-Voice, yet it withstands high humidity and temperature extremes, corrosive effects of salt, and mechanical shocks. The mic has wide-range response uniform from 80 to 13,000 Hz, and is available in nonreflecting fawn beige (the 635N/D) or semi-gloss black (the 635N/D-B).

Also from Electro-Voice is the CO100 miniature electret condenser omnidirectional microphone.

For more information contact Electro-Voice at 616-695-6831.

For more information circle Reader Service #532

Neumann

Neumann's RSM 191 A-S is a stereo microphone system consisting of the microphone and the MTX 191 A matrix amplifier. It has two separate capsule systems, a hypercardioid element and a figure-8, both in a short shotgun, and together they generate the mid and side signals.

The matrix amplifier controls the width of the stereo image by changing the gain of the side signal relative to the middle signal in six 3dB steps. The output signals of the matrix amplifier are either mid-side (MS) or left/right (X/Y), and they are converted through transformerless sum-

and-difference circuitry.

For more information contact Neumann at 860-434-5220.

For more information circle Reader Service #533

Sennheiser

Sennheiser's SKM 3072-U is a handheld transmitter with super-cardioid condenser microphone head. It offers 32 switchable transmission frequencies in the UHF range, ensuring transmission reliability. It also has the "HiDyn plus" noise reduction system with 110 dB signal-to-noise ratio and sensitivity adjustable in four steps. An LC display is available for frequency/channel, sensitivity, low battery, and lock mode (which prevents the mic from being accidentally turned off).

And for users of the latest digital ENG camcorders Sennheiser has introduced the EK 3041-U, a miniature true diversity camera receiver. It has a signal-to-noise ratio greater than 105 dB and has 32 switchable UHF receiver frequencies.

For more information contact Sennheiser at 860-434-9190.

For more information circle Reader Service #534

Shure Brothers

Shure Brothers has two microphones expressly for the broadcast market—the VP64AL and the SM63LB.

The SM63LB is a handheld, omnidi-

rectional dynamic microphone with extremely low handling noise, according to Shure Brothers. It is a black version of the SM63L measuring 9-3/16-inches long, and features a dent-resistant Veraflex frille and a humbucking coil which helps eliminate extraneous noise stemming from studio lights and other electromagnetic fields. It is also equipped with an internal wind/pop filter.

The VP64AL is identical to the Shure VP64A with the exception of its longer handle length. Measuring 9-5/8-inches it provides for extended reach, and, like the VP64A, is outfitted with a high-output neodymium cartridge which is protected by a water-resistant mesh grille and is finished in black.

For more information contact Shure Brothers at 800-25-SHURE.

For more information circle Reader Service #535

Sony

The Sony WRT-800A68 Freedom Series UHF wireless handheld microphone features wide cardioid electret condenser capsule, up to 12 hours continuous operation with a single AA battery, and RF output power of 5mW. Carrier frequency is 794 MHz to 806 MHz, 94 channels selectable, and frequency response is 100 Hz to 15,000 Hz. Signal-to-noise ratio is 57 dB.

For more information contact Sony at 800-686-SONY.

Telex

The USR-100 UHF wireless microphone system from Telex is a microprocessor controlled system that is

designed for the broadcaster involved with roving production situations and news gathering.

According to Telex, the USR-100 maintains frequency specific accuracy, thereby minimizing interference. Dual squelch is performed by a tone coded squelch on a little-used tone frequency of 31.250kHz coupled with an RSSI amplitude squelch. The USR-100 works in the 668.1 to 679.9 and 734.1 to 745.9 MHZ frequency range (equivalent to TV channels 47 and 48, 58 and 59), offering 100 transmission channels.

The SH-100 handheld version of the USR-100 uses a Telex condenser element or the Audix OM3 dynamic element. A lapel mic is also available.

For more information contact Telex at 612-884-4051.

For more information circle Reader Service #536

Digital Broadcast Audio

Continued from page 4

ment, etc.—to flow synchronously with the actual audio data through the pinched pipelines of contemporary post and broadcast. Dolby E would allow for up to eight discrete audio channels (six-channel audio and stereo second language tracks) to be compressed down to a single AES pair in between processing steps. For processing, the audio signal would be decoded to baseband LPCM and then re-encoded to Dolby E. Prior to final transmission, Dolby E would be converted to Dolby Digital (AC-3) for ATSC broadcasting.

The synchronous transmission of the metadata throughout this process up until final broadcast is critical, says Terry. "Right now, a lot of that data is generated manually along the way," he says. "But that means that those instructions can differ from what the content producer had in mind originally. In multichannel sound, every problem is magnified and compounded. For instance, once you're beyond two-channel stereo you run the risk of swapping channels. That happens today, but it's rarely even noticed in stereo. But in 5.1, there's major problems with the misalignment of channels. You could have the voice-over coming out of a surround channel instead of the center channel. [Dolby] E identifies the channels as well as the individual levels. It's all contingent on accurate delivery of the metadata along with the audio data."

Dolby contends that E-encoded PCM data can survive between eight and 10 encode/decode cycles with a data rate from a 20-bit digital VTR of 1.92 Mbps of bandwidth and 2.3 Mbps from a 24-bit environment. Terry acknowledges, however, that even in the digital age there are many analog points along the way where audio data and metadata could become asynchronous or lose some data. That's where some of the other algorithm schemes come into play from other manufacturers and the competition begins. "We're still working on that," says Terry. "It's not an ideal world out there yet."

No Compression

The approach taken by NVision, whose main business is manufacturing video and audio routers and terminals, is to not compress at all prior to emission. "We feel any compression is unwieldy in production," observes Chuck Meyer, senior vice president for NVision. "We feel better working in a full-bandwidth environment for the production and post production of news, sound-for-film, commercials, etc. Broadcast audio already has enough signal processing applied to it."

NVision's tack is a 12-channel approach with a six-channel compressed mix available, as well as a L/R mix, all traveling through a fully-digital environment enabled by fiber optically (or copper) linked routers which can handle up to 96kHz/24-bit audio and synchronous AES information.

The main benefit to this approach is that it does not require multiple encoding and decoding stages as the audio is changed or processed along the way, such as a change in voice-over. The only compression takes place at the end of the post production stages and is done via a lossless 2:1 or 4:1 compression rate.

"Today's AES standard requires four layers of router for six to eight channels of audio," says Meyer. "We use a single layer and can put all the data into a single twisted pair, though that happens preferably at the terminal point."

Meyer acknowledges the need for compression at the broadcast stage, but questions its effectiveness earlier in the chain. One nagging problem in analog audio has been the asynchronous arrival of audio and video (see last month's column). This issue could become magnified in a compressed digital environment, Meyer asserts.

"The more compression that exists in the audio and video signal paths, the worse the synchronization of sound to picture becomes," he says. "Depending upon how much information is in either domain, the entropy of the two signals can change constantly relative to each other. If the video has a lot of data and the audio is simple, the audio arrives first; but if it's a simple video image accompanied by a symphony which takes longer to encode, the video arrives first."

Both Dolby and NVision are presenting their approaches to SMPTE in hopes of establishing a standard. And both companies maintain that their systems are not incompatible, though at different stages of the production and post-production process. The sense of competition remains muted at this point in the game. Meyer says that NVision's approach is compatible with other formats coming to market; Dolby's Terry says that "E is just a piece of the puzzle.

"It's going to be possible for different types of systems to co-exist, Terry believes." It's likely that a variety of solutions will evolve. We're all working with SMPTE to try to get compatibility. But Dolby's bottom line is that we want to see a system solution and broadcasters getting proactive about carrying data along with the audio, which the other systems don't do." □

Solid State Transmitters: What Role In DTV?

Developing technology like silicon carbide holds key to future use

By Edmond M. Rosenthal

For the foreseeable future, the limitations of solid-state transmitters are likely to remain. Although manufacturers vary in defining the transmitter output levels where tube transmitters become more efficient, few recommend the use of solid state beyond 10 kW. At this point, they generally recommend tube transmitters because they offer lower cost and lower power consumption.

The greatest hope for extending transmitter output in solid state is a technology being developed, but yet to be perfected, by Westinghouse, calling for silicon carbide transistors. Beyond this, the best thing to happen to solid state recently is the LDMOS (laterally diffused metal oxide semiconductor), which is said to offer greater linearity.

Nevertheless, solid-state transmitters are expected to play an important role in digital transmission. Bob Weirather, director of business relations for Harris Broadcast, estimates half of the UHF transmitters for digital will be solid state.

"In UHF," he asserts, "you have an ERP (effective radiated power) of 50 kW to 1 mW. At the lowest power, solid state will prevail. IOTs (inductive output tubes) will be more effective for high power because one tube can produce high power in one device, while a transistor can't produce anywhere near that power." Pointing out that transistors last hundreds of thousands of hours, he adds that built-in redundancy is a key advantage of solid state.

Weirather notes there are more than 800 DTV assignments calling for ERP of 200 kW or below, and this antenna output makes solid state a logical choice. He adds, "Stations may go back to their VHF assignments in 2006, after the transitional period, because they already have an antenna in place, but UHF stations may consider that they already have their brand name set up on the DTV assignment and stay put."

The Harris executive sees solid state as efficient up to 10 kW at the transmitter and 500 kW at the antenna. He notes that some stations push beyond this for solid state benefits such as redundancy. "Also, it's air-cooled," he points out, "so you don't have to worry about freezing up in the winter. Personal safety is a factor because you're working in lower voltage. And you don't have to go off the air for maintenance."

Transistors Vs. Tubes

But the cost of transistors is still very high, Weirather comments, precluding the option of using many transistors in one amplifier. The prospect of making transistors less costly is still a good two years away, he notes.

He says Harris is working with Westinghouse to address this by building a low-power transmitter using silicon carbide instead of regular silicon as a semiconductor. "The performance is excellent," Weirather states. "We just need to get the overall cost down by getting the yield up."

Tim Hulick, vice president of engineering at Acrodyne, says 5 kW is about the crossover point in transmitter output where transmitter price and operating cost are about the same in solid state or tube transmitters.

"Everybody seems to think that solid state is more efficient," he contends, "but it really isn't. The amplifiers are all in the AB class of operation, which offers both efficiency and good linearity. I think the state-of-the-art pretty much limits solid state at about 150 watts per transistor on UHF and 250 watts in VHF. There doesn't seem to be anyone striving to make higher-power transistors. You get to a point where you just can't get any more heat out of them because they won't work if you make them bigger."

Harris' HT 30HSP VHF transmitter

He notes, however that there will always be a market for solid state—"certainly in low power TV, and in general the power required for DTV [by the FCC] is a lot less for the same coverage. Proportionately, there should be more solid-state transmitters than tube for DTV."

He also points to the new advantages of LDMOS for solid state. "It's just now coming out at power levels competitive with bi-polar power transistors," he explains. "It's far more linear than the bi-polars, allowing less distortion to the signal and decreasing the cost of the transmitter by maybe 10 percent."

Beyond 5 kW, solid-state power consumption becomes inefficient and expensive, according to Jim Zaroda, marketing product manager at EMCEE Broadcast Products. "I don't know of anyone building at over 10 kW in solid state," he reports.

Smaller Markets

For the smaller markets EMCEE is promoting a transition strategy for HDTV that calls for starting out with low-power transmission and not going to higher power until the market is well-established. This strategy is aimed at countering the reactions the company has received, for example, from the operations manager of a station in Denver.

"He said that gearing up a station for high-definition makes no sense because there are no receivers in the market and no way of getting advertisers to pay more to cover the costs," Zaroda recalls. "But you can start a UHF station with 125 w and that allows an early and economical way for a station to meet its FCC mandate and promote HDTV. Future power upgrades can be added as the market matures."

Zaroda believes there will be higher-power solid-state transmitters in the future. Key advantages, he notes, are that there are no tubes to replace and that overall maintenance is lower. Properly maintained transmitters of both types have a lifetime of about 20 years, he adds.

The DTV line of solid-state transmitters at Itelco USA Inc. is identical to the analog line except for the exciter, according to Jack McKain, sales manager, high-power television. The exciter includes an 8-VSB modulator, designed and owned by Itelco.

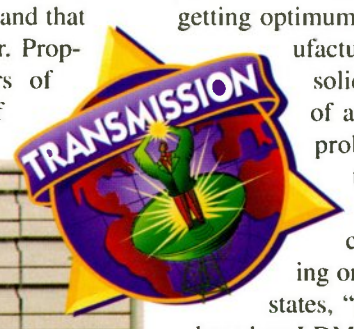
Itelco is selling its solid-state transmitters for 1 kW through 30 kW. McKain says the higher wattage is made possible by building in stages with one control cabinet, which houses the control logic and the exciter. The additional cabinets are in 5 kW levels, conforming to any customer's power requirement by adding more RF cabinetry.

"Each cabinet has its own power distribution," McKain says, "and as a result, they're essentially self-contained so that you can easily add on more RF cabinets. And each cabinet has its own RF combiner so that we can easily combine the output of each RF cabinet. Our solid state is liquid-cooled vs. air-cooled, allowing the junction temperature of the RF device to maintain a much lower temperature. Another advantage of liquid cooling is that you can place our transmitters anywhere from sea level to 14,000 feet without any degradation of operation."

He notes analog solid-state transmitters can be upgraded to digital within a day for an average of $30,000 by changing out the analog modules for digital, recalibrating the RF power meters from peak to RMS, accommodating a new channel in the exciter, and retuning the band pass filter.

At Larcan, Jim Adamson, president, doesn't currently recommend solid state for power levels above 15 kW but he's anxiously awaiting silicon carbide technology. He asserts, "This could offer performance at higher power levels per transistor and also allow higher operating temperatures."

He also is high on LDMOS, stating, "We like the looks of that technology in that it's quite an improvement in linearity vs. bi-polar semiconductors in allowing operation at higher power levels and still getting optimum performance. Most manufacturers who are speaking of solid-state digital transmitters of any appreciable power are probably employing that technology."



Commenting on silicon carbide possibly arriving on the heels of LDMOS, he states, "Some transmitters will be based on LDMOS and, as silicon carbide matures, it will be an alternative because of the higher power per transistor and higher operating temperatures."

Mark Aitken, director of marketing at Comark, says the crossover point between solid state and tube transmitters is between 2.5 and 4 kW where capital, operating and long-term maintenance costs are concerned. "In many cases," he adds, "the decision is very clear-cut because most stations have ERP levels where it doesn't make sense to go solid state. An ERP level between 50 and 100 kW is the balancing point, but most stations are above 100 kW." He also notes that most stations that had 50 kW allocations are now allowed, under the DTV rollout rules, to go to 200 kW so long as no interference is caused to other transmissions.

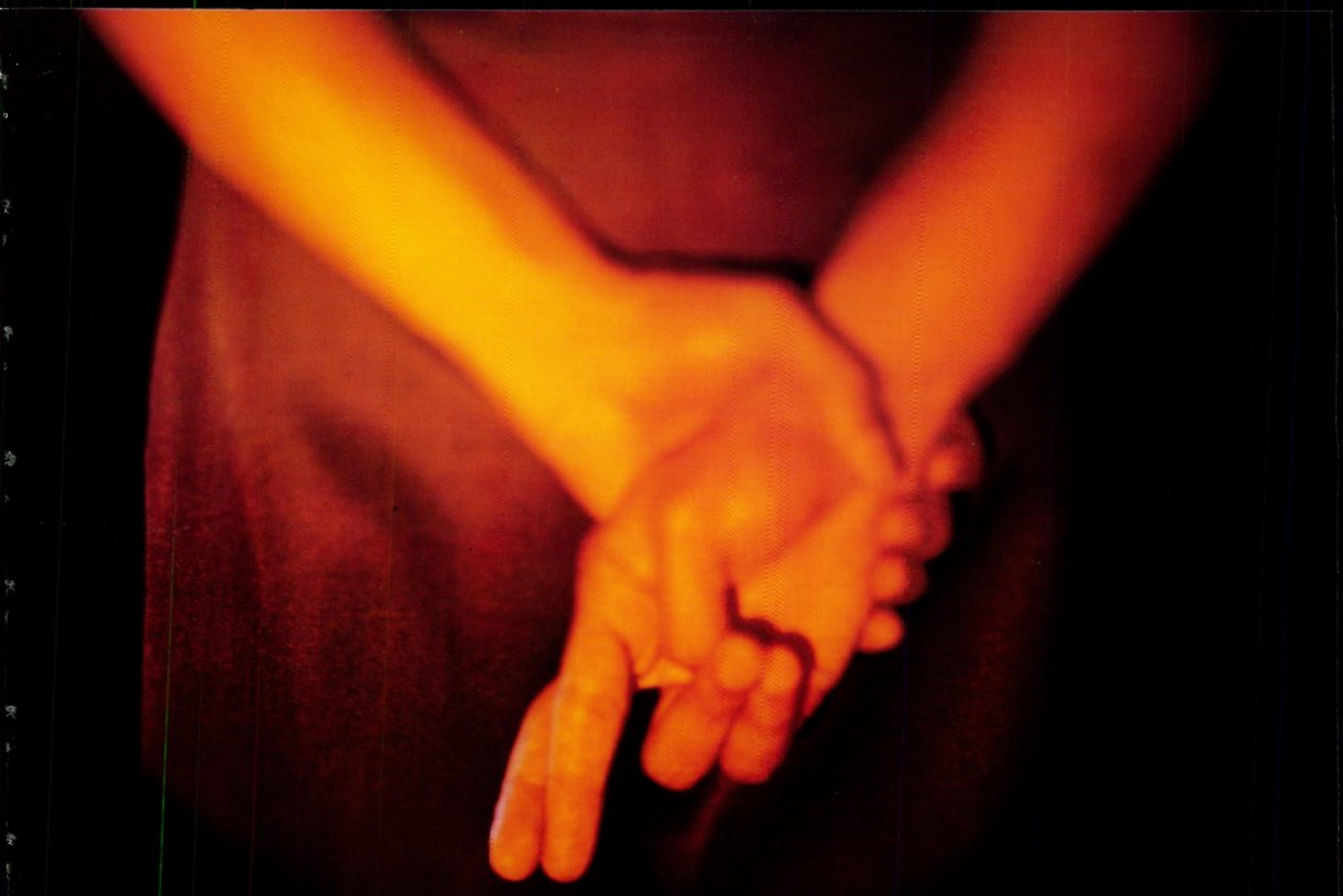
Proof of the pudding for Comark is the fact that it recently had 14 digital transmitters on order and in process. All were tube transmitters. Aitken notes that the cost of solid-state transmitters is not so much in the transistors but in all the support equipment, such as power supplies and cooling systems.

"Even if you get exceptionally high power levels out of the transistors," he asserts, "the next stumbling block is that the transistor has half the operating efficiency of a tube device. New technologies need to be developed that close the gap on operating efficiency. We used to think it was silicon carbide, but little has happened there over the past four years."

Aitken sees the overseas market as the best venue for solid state because of the lower power levels outside the U.S.

At ITS Corp., Rich Dell, product manager, broadcast systems, states 10 kW as the cutoff for solid state performance. "You can make solid state above that level," he holds, "but the multiple transistors will be too costly. I don't see the cost of transistors coming down in the near future."

He concludes, "There's a place in the industry for solid state, but at higher power levels, the tube transmitter is the overall best choice today because of lower initial cost and lower power consumption." □



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Odd-Stations-Out

Continued from page 4

newly vacated analog channels would also be available.

But stations can't get there (DTV) from here (NTSC) without first getting through the transition period. And if your station finds itself in this potentially tricky "out-of-core" spot, it's important that you investigate the possibility of finding a core channel prior to constructing DTV facilities.

What To Do?

The process of finding a new DTV channel comes down to meeting the regulatory and technical requirements specified by the FCC. Specifically, the FCC requires that a petition for rule making be filed to modify a DTV channel assignment in the Table of Allotments before an application can be filed for a construction permit. However, stations can select either their assigned DTV channel or their NTSC channel as their final DTV assignment, and currently there is no requirement that they make that decision until the end of the transition. Therefore, stations seeking a new channel inside the core have no way of determining which channels will be available at the end of the transition period.

When filing a petition to amend the Table of Allotments it must be shown that the proposed change meets the *de minimis* interference criteria set forth in Section 73.623(c) of the FCC Rules. This section details the amount of additional interference that may be caused to other analog and digital stations. In cases where the proposal does not meet the interference requirements it might still be possible to have the petition granted if other compelling arguments could be

presented.

Such arguments might be that any interference in excess of that permitted by Section 73.623(c) would be less than that which would be caused by the use of any other in-core channel including the petitioner's NTSC channel. It should further be noted that when a petition is filed other parties are permitted to file comments opposing the proposal, and that other mutually exclusive petitions might also be filed. In view of this, the petitioner runs the risk of having the petition denied even if it meets the interference requirements if others can convince the commission that granting the petition is not in the public interest.

In some cases there may be no reasonable alternative other than to construct on the assigned channel and then switch at the end of the transition. However, for a number of stations there may very likely be a better solution—if they are willing to go through the process of changing their assignment.

There are several alternatives, some more complicated, costly, or otherwise less attractive than others, but they may be a way to avoid the even greater cost of having to make a major frequency shift after a relatively period. The following are some possible courses of action beginning with the best possible scenario.

As Good as It Gets

It may be possible to find a core channel that fully meets the *de minimis* interference criteria specified in the FCC's Rules. Although many of the out-of-core assignments are in areas of the country where this may not be feasible due to the concentration of stations, there are some situations where this appears to be possible.

Some Now, More Later

If you are unable to find an alternative channel that fully meets the FCC's interference criteria then you may want to consider a temporary operation at reduced power. Under this scenario you would find a channel that is restricted by an existing analog station that would only need to be protected during the transition. In pursuing this option there are some concerns that will need to be addressed.

- Will the protection required toward the analog station still permit you to have a reasonable service area?
- Confirm that the analog station does not intend to switch to the analog channel for its DTV operation.
- Confirm that the FCC will permit a power increase once the analog station ceases operation. This assurance could take the form of a DTV station license that states the after-transition power with a restriction that the power be reduced to a specified lower level until such time as the analog station ceases operation.
- Assure the FCC that you do intend to increase power when allowed to satisfy any concern on the part of the Commission that a permanent loss of service would occur if the DTV facility permanently operated the lower power. Such a move could be a reasonable interim solution since it may be possible to reach a significant portion of viewers using lower power and then just increase the power at the end of the transition to reach the entire area now served by your analog signal.

Buy Your Way In

If the above options are not feasible then try for a channel where you can negotiate interference rights with any affected station(s). This is an option that the FCC has provided, and there may be situations where the interference is very insignificant or in an area where the affected station does not have a significant number of viewers. Even if some compensation is required, it may be less costly than a channel change because the interference will most likely be to an analog station that will be phased out, and so the compensation period would be limited (Due to the nature of the signals, the protection criteria are more stringent toward analog stations).

A Directional Antenna

Consider using a directional antenna to provide any needed protection to other stations. It may be that only a minimal reduction in signal in a specific direction would be required to meet the interference criteria.

How About A New Site?

Another option is to move from your current location to a different site. In some cases a channel that cannot be used at one location may be viable at a nearby site.

Although this could prove to be more expensive than a channel change, it shouldn't be ruled out, and may be a very good idea if your current tower does not have the capacity for another antenna. It may even be possible that a suitable facility already exists at an alternative site. Furthermore, it may be possible to offset the cost of the second location by sale or lease of your current location for other communications purposes at the conclusion of the transition.

Come Together

Consolidation of DTV facilities at a common site can also sometimes alleviate the out-of-core situation. A channel that may not be useable when stations serving the same market operate from different locations could become so if the stations consolidate at a common site. Although such a project requires the commitment of other stations, individual broadcasters should consider if such a move might be mutually beneficial not only for solving out-of-core problems but for general improvement of their service and the cost effectiveness of sharing facilities.

Each of the above would require an engineering analysis to first locate an appropriate channel and then to provide the necessary documentation to support the petition for the change in channel assignment and subsequent application for a construction permit. In addition, some of the scenarios would require various types of negotiations and agreements with other affected stations and possibly the FCC.

It should also be noted that the criteria the FCC will apply to requests for alternative DTV channels is still under consideration at the time this is being written. In view of this, it is possible that there may be some changes in the requirements that might make it easier to change channels.

Bill Meintel has been involved in DTV spectrum planning for almost 10 years. During that period he developed a highly sophisticated computer model that was used by the Broadcaster's Caucus to produce and analyze numerous DTV plans. In addition, he also developed the software used by the FCC to produce the service data contained in the FCC's DTV plan and is currently providing computer modeling and technical consulting for development of a DTV plan for Brazil. Prior to entering private practice he held various engineering positions at the FCC during a 20-year period. He can be contacted by email at wmeintel@computer.org. □

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A. Which best describes the primary business activity at this location?

1 ❑ TV Broadcast Station
2 ❑ TV Broadcast Network
3 ❑ TV Cable Network
4 ❑ Cable System/Satellite/Telcom
5 ❑ Production/Post-Production Facility
6 ❑ Corporate/Industrial TV
7 ❑ Government/Military TV
8 ❑ TV Engineering Consulting Firm
9 ❑ Hardware/Software Distributor/Manufacturer
10 ❑ Other (please describe)
11/_____

B. Which best describes your primary job function? (check only one)

15 ☐ Engineering Management
16 ☐ Engineering Staff
17 ☐ Operations Management/Staff
18 ☐ Production/Programming Management/Staff
19 ☐ News Management/Staff
20 ☐ IT Management/Staff
21 ☐ Corporate/General Management
22 ☐ Other (please describe)
23/_____

C. I recommend, specify or approve the purchase of the following products: (check all that apply)

25 ☐ Amplifiers
26 ☐ Animation Software/Hardware
27 ☐ Audio Equipment
28 ☐ Audio Workstations, Digital
29 ☐ Cable (Fiberoptic, Coaxial)
30 ☐ Cameras
31 ☐ Camera Lenses/Accessories
32 ☐ Character Generators
33 ☐ Compression Equipment
34 ☐ Digital Disk Recorders, Video
35 ☐ Digital Video Effects
36 ☐ Digital VTRs
37 ☐ Encoders/Decoders
38 ☐ Editing Systems
39 ☐ Graphics Software
40 ☐ Lighting Equipment
41 ☐ Multiplexers
42 ☐ Production Switchers
43 ☐ Routing Switchers
44 ☐ Scan Converters
45 ☐ Still Stores
46 ☐ Test Equipment
47 ☐ Time Base Equipment
48 ☐ Transmitters
49 ☐ Video Effects
50 ☐ Video Monitors/Filters
51 ☐ Video Servers
55 ☐ None of the Above

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E. Do you have access to:

63 ☐ CD-ROM 64 ☐ Internet 65 ☐ Neither

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Please help us with our market research. Over the next 12 months, which of the following types of digital television equipment do you anticipate purchasing (check all that apply)

1001 ❑ Amplifiers
1002 ❑ Animation Software
1003 ❑ Audio Equipment, Consoles/Mixers
1004 ❑ Audio Equipment, Digital Recorders
1005 ❑ Audio Equipment, Monitors
1006 ❑ Audio Equipment, Tape And Other Accessories
1007 ❑ Audio Workstations, Digital
1008 ❑ Cable, Coaxial
1009 ❑ Cable, Fiberoptic
1010 ❑ Cameras
1011 ❑ Camera Accessories (other than lenses and mounts)
1012 ❑ Camera Lenses
1013 ❑ Camera Mounts (tripods, pedestals, etc.)
1014 ❑ Character Generators
1015 ❑ Compression Equipment
1016 ❑ Digital Disk Recorders, Video
1017 ❑ Digital Video Effects
1018 ❑ Digital VTRs
1019 ❑ Editing Systems, Linear
1020 ❑ Editing Systems, Non-Linear
1021 ❑ Encoders/Decoders
1022 ❑ Graphics Software
1023 ❑ Lighting Equipment
1024 ❑ Multiplexers
1025 ❑ Production Switchers
1026 ❑ Routing Switchers
1027 ❑ Scan Converters
1028 ❑ Still Stores
1029 ❑ Test Equipment
1030 ❑ Time Base Equipment
1031 ❑ Transmitters
1032 ❑ Video Effects, Digital
1033 ❑ Video Filters
1034 ❑ Video Monitors
1035 ❑ Video Servers

During the next 12 months, how large do you anticipate your budget will be for such equipment?

1036 ❑ More Than $1,000,000
1037 ❑ $500,001 - $1,000,000
1038 ❑ $300,001 - $500,000
1039 ❑ $200,001 - $300,000
1040 ❑ $100,001 - $200,000
1041 ❑ $80,001 - $100,000
1042 ❑ $60,001 - $80,000
1043 ❑ $40,001 - $60,000
1044 ❑ $30,001 - $40,000
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1046 ❑ $10,000 - $20,000
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Studio-To-Transmitter Links Face New Challenge With DTV Signals

RC demos transmission of ATSC and NTSC signals over a single microwave STL at WHD-TV

PART ONE

here is much discussion going on concerning DTV studio-to-transmitter links (see sidebar). But WHD-TV, the Model HDTV Station in Washton, DC, went beyond discussion and cently demonstrated the industry's first multaneous transmission of ATSC and mpressed legacy NTSC gnals over a single icrowave studio-to-transtter link (STL).

Microwave Radio Communications ayed a major role in the demonstration, oviding equipment for the dual-channel TSC/digitized NTSC demonstration tween the Model HDTV Station, WHD-, Washington, DC and Public Broadsting Service (PBS), Alexandria, Virnia.

The STL is only one part of the icrowave infrastructure in most broadst stations. Some stations face the need upgrade equipment for satellite backuls, cable systems feeds, and various her intercity applications, including eding sister stations and LMAs. Much of hat this article will discuss is applicable any of these fixed radio applications.

stem Engineering Considerations

Looking at the specifics of the digital deo microwave environment, the key eas that station engineering needs to derstand are equipment design for digi- operation, the interface environment, transmission line and antenna requireents, and the proper approaches to anazing existing microwave paths.

For some stations, the programming on e HDTV channel will consist first of a ass-through" HDTV service from their work operations delivered by satellite. Depending upon the studio setup and witching methodology, this "passrough" stage will require at minimum a w STL to handle the HDTV. Most digi- microwave systems that are appropriate the STL applications in the U.S. have a S3 interface, yet many of the video decs do not output a G.703 compatible S3 signal. At a minimum, you may need digital service unit to format the NTSC PEG data stream to DS3. Or you may d a multiplexer to take the ATSC transrt stream and the NTSC data stream, mbine them and output a 44.736 Mbps ta stream with DS3 framing.

tegration

At the Model HDTV Station, General strument's modulator/multiplexer interce (MMI) unit functioned as a digital serce unit, interfacing with the DS3 multiexer from World Access, Inc. The MMI ceived the MPEG data packets from the Magnitude NTSC broadcast encoder and then regenerated and supplied its own clock with data to support a differential ECL interface (two-pin clock/data). This two-pin clock and data then provided a 9 MHz clock for the channel card of the DS3 multiplexer.

In the DS3 multiplexer, a second channel card with an ECL interface received the ATSC (19.39 Mbps) transport stream. The multiplexer then combined the two signals and supplied the required DS3 frame format with B8ZS line coding to meet the G.703 compliant output interface at 44.736 Mbps. The DS3 signal was then ready for transmission over the MRC DAR45 radios.

During demodulation a similar process was used. The 44.736 Mbps signal was delivered to the World Access de-multiplexer where the two signals were extracted from the DS3 frame format. Two independent channel interface cards outputted the clock and data for each channel. The ATSC card supplied serial clock and data (19.39 Mbps) to a serial to parallel converter and then to the HDTV decoder. The NTSC card supplied clock (9 MHz) and data to a receiver MMI.

The receiver MMI then used the 9 MHz reference clock to extract the MPEG2 compliant packets. The MPEG2 stream fed an integrated receiver decoded (IRD) which decoded the signal into an NTSC video format.

The SMPTE 310M Interface

With the new SMPTE 310M interface, the interconnections between many of these pieces of equipment would have been simplified. The SMPTE 310M interface specifies that clock and data are biphased onto a 75-ohm connector. As digital television equipment suppliers introduce the 310M interface, many of the interconnection issues we faced with this initial Model Station demonstration project should be reduced or eliminated.

Transmission Line, Antennas and the Microwave Path

As part of engineering the microwave path from the Model HDTV station to PBS Braddock Place, it was critical to look at the transmission line, the antennas, and the characteristics of the microwave path itself. For replacement applications, it may not be possible to merely replace the analog microwave system with a new digital video microwave system.

Some longer paths that worked just fine in analog mode, with perhaps occasional near threshold dips from multipath fades, may need additional system engineering efforts, including higher RF output radios, larger antennas, or adaptive filtering in the digital demodulator. Failing that, it may be necessary to install a dual-channel receiver system with diversity switching to handle multipath fading.

An additional area of concern will be multiple hop systems. In digital systems, however, system timing is critical and to minimize jitter problems, it will often be necessary to demodulate and remodulate at each repeater site.

In engineering the digital video link, proper consideration of fade margin is critical. Interference fade margin, and in particular the multipath fading consideration of dispersive fade margin, are key parts of this system engineering effort. The end result will be an effective fade margin calculation that combines the effects of all three types of fades on the received signal level.

Fade Margin Considerations

Thermal fade margin: Received signal level minus receiver threshold level. Interference fade margin: Amount of attenuation to the received signal required to produce an outage from interference, independent of thermal noise.

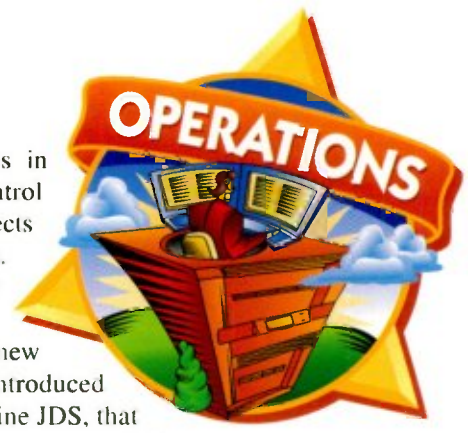
Dispersive fade margin: The average depth of multipath fade that causes an outage, independent of thermal noise and interference.

Coming next month—Part Two: Planning Thorough Digital Path Profiling.

DTV Tech Talk

Automation Needs Not So Automatic With Digital Multicasting

By Michael Ledwich



The move to digital television in the U.S. presents stations with a whole range of new possibilities for broadcasting. But it also challenges the existing paradigms of the broadcast operation.

In the consumer media, any DTV coverage has concerned the beautiful pictures of HDTV. But just as potentially important will be the ability for broadcasters to, if they choose, divide the digital bandwidth into multiple channels and even make the channel quality variable. In addition, there are a whole number of ancillary services that can be provided, such as electronic program guides, selectable audio tracks and subtitles, conditional access programming, and more.

While it's a given that broadcasters will have to make a very considerable investment in new equipment to offer digital broadcasting, very few people have examined the business aspect of digital broadcasting. That is, how is the broadcaster going to recoup the investment and run a profitable operation down the road? Because while digital broadcasting will clearly offer the viewer a much better product in terms of quality and variety of services, it also is a much more complex operation, and the improved services do not necessarily translate into additional revenue for the broadcaster.

The key to making sure that complex operation runs as smoothly as possible lies in the automation and control systems that link all aspects of the broadcast operation.

I've been asked by Digital Television to offer an inside look at a new concept in automation introduced by my company, Columbine JDS, that offers a glimpse at one way station automation equipment manufacturers may look to address future needs. The product we introduced is called Transmission Manager.

At the center of Transmission Manager is the transmission planning database module. Standard integrated subsystems are the MCAS automation system, the Synchronizer, managed encoders and multiplexers, and the PSIP generator. The system can be expanded to include Conditional Access for subscriptions and pay-per-view (PPV) and Subtitle subsystems. Automation systems will need to be designed to be both the detailed forward operations plan and the realtime operator control point for all components of a dynamic digital transmission service.

For example, the Synchronizer ensures that all digital services are aligned to the video events so that the appropriate event infor-

mation, encoding quality, and Conditional Access apply precisely when the video event starts.

Central Control

With the potential for a number of broadcasts to be offered at one time there's an increased need for a central control system at the heart of the new digital broadcast facility. Handling schedules and logs becomes more important, and complex, than ever. Schedules and logs prepared in traffic are received by the transmission database which is then responsible for allocating bandwidth for proper transmission of all programming and services.

In assembling the schedules, all special parameters associated with programs and spots must be identified, including resolution and quality of the source material, resolution and bit rate for broadcast, number of audio channels, secondary audio or subtitles, pay-per-view or subscription, etc.

A very important function of the transmission database will be to flag potential transmission problems and missing material information. Transmission issues must be identified before a schedule is committed for broadcast, so that operators will have time to rearrange material and address these problems before they become on-air issues.

To illustrate the importance of this, consider the following example. One channel is scheduled to broadcast a major sporting event at high quality (high-bandwidth requirement) while two other channels are scheduled to broadcast local-interest programming at lower quality (low-bandwidth requirements). This schedule would appear to be valid. But what happens when the sports broadcast runs over (as they tend to do) and overlaps with a premiere movie presentation (another high-quality, high-bandwidth requirement) that was scheduled on another channel and exceeds th total bandwidth available? Any syste must not only identify the obvious pro lems, it must be "smart" enough to iden fy potential problems in advance.

Automation, Synchronization, and Encoding

Once the transmission plan "approved" by the transmission databas an automation interface passes the playli to the MCAS Automation module. MCA controls all video servers, tape decks, ar other video and audio devices to constru the complete video streams. It also gene ates the synchronization pre-roll messag for all other components to ensure eve synchronization.

This is an important point in digit broadcasting. Since the digital vid streams may have a host of other ancilla information and services associated wi them, such as bit-rate, audio in alternati languages, subtitles, and PSIP, these se vices need to be synchronized to the vide content in realtime. Following transmi sion, the as-run log is captured back to th Digital Manager database for reconcili tion.

Transmission source material will b provided in many formats and resolutio and then must be encoded at transmissio time to the appropriate resolution f broadcast. Thus the encoding system mu also be linked to the central transmissio database from which it receives inform tion on the resolution of the source mate ial and instructions as to the resolution which it must be transmitted.

Also important is an encoding and mu tiplexing subsystem that directly manag the encoders and multiplexers and responsible for setting the planned tran mission quality for all video streams. F example, on the Transmission Manager th subsystem receives the planned quali parameters from Digital Manager an changes the configuration upon receipt the event pre-roll synchronization me sage.

Summary

Digital video transmission is a ver young art and the technology concerned changing rapidly. Right now, statio would do well to concentrate on buildi digital facilities that integrate all oper tions, that are highly automated, and d not require additional staffing. The facil ties should also have the flexibility allow the operations to be modified, i.e., add additional channels and services lat as the market evolves.

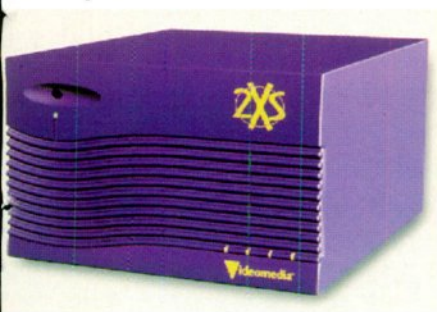
With the proper equipment and contro stations will have opportunities to gene ate additional revenue through pay-pe view services, demographically targete advertising, charging a premium f HDTV ads, data casting, additional te and more. And you can be sure that ma ufacturers of equipment will look to mak sure you have the tools you need to mo ahead.

Michael Ledwich, BSc. BE. Ph.D. director of research for Columbine JDS.

Product Review

Videomedia's Digital Disk Recorder

Videomedia has released 2XS, a cost-competitive Windows NT-based dual-stream DDR that offers high performance, large storage capacity and mathematically lossless compression that will allow two times



the storage of uncompressed video with the same visual quality as the original video. Based on the company's newly designed PCI-based M2X board, 2XS features user-selectable mathematically lossless Motion JPEG coding to cover the range of image quality required in today's production and post markets. *Contact Videomedia at 408-727-9977 or at www.videomedia.com.*

■ For more information circle Reader Service #537

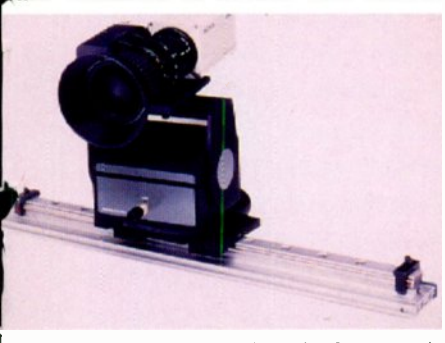
Largest Catalog Yet From Winsted

Winsted Corp. has published its largest catalog ever. The 164-page book features extensive additions to its broadcast, video, tape storage, and security product lines. New LAN and file server products with versatile mobile LRx Stations featuring L-Frame architecture have been added to the product line. Several new mobile producer desks are also available. *A free catalog is available by contacting the company at 800-59-6691 or via e-mail at racks@winsted.com or via the website: www.winsted.com.*

■ For more information circle Reader Service #538

Emcor Electronic Enclosure Accessory

EMCOR Products has introduced a new accessory for its line of electronic enclosures designed to increase an enclosure's internal capacity for cabling. EMCOR's "Panel Width Adapter Kits" solve space and wiring problems associated with conventional 19-inch racks. When assembled in 24-inch wide EMCOR



enclosures, the adapters reduce the frame equipment mounting down to standard 19-inch EIA requirements. The new system provides an additional 2 1/2-inches on either side of the mounted equipment for easier cabling and wireway management. *Contact EMCOR at 507-287-3418.*

■ For more information circle Reader Service #539

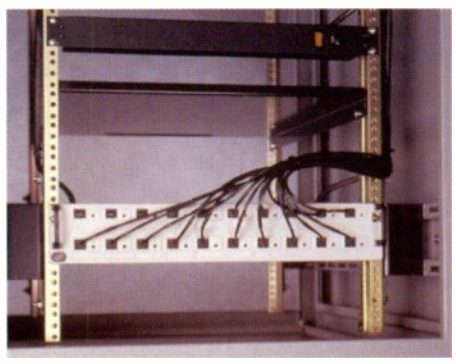
Prime Image Adds Two To Multi-II And Pick-2

The choices available to fill Prime Image's Multi-II and Pick-2 video processing mainframes just increased with the addition of two new boards: a D1-to-Analog video converter and a D1 processing amplifier. Input serial digital video and the converter outputs a re-clocked signal—either composite, Y/C, component RGB (YRB), also are re-clocked. The board also includes a clock stabilizer to reduce jitter and adjustable horizontal timing. An optional frame synchronizer is also available. *Contact Prime Image at www.primeimageinc.com or at 408-867-6519.*

■ For more information circle Reader Service #540

Enhanced Robotic Camera Trolley System

Telemetrics has enhanced the operation of its robotic camera trolley systems with the addition of programmable presets. The trolley systems, which are available in linear, "H" track and vertical configurations,



are ideal for remote broadcasting applications such as MSNBC's *Imus in the Morning Show* and for studio applications where space is at a premium. *Contact Telemetrics at 201-848-9818 or at www.telemetricsinc.com.*

■ For more information circle Reader Service #541

Cost-Effective Crawling EAS Messages

A new baseband audio and video messaging system that gives cable operators an economical way to display crawling EAS messages with no disruption of regular programming has been released by FrontLine/Vela Broadcast. A new ACM-8 all-channel message system provides eight-character generator channels from a compact 19-inch rackmount housing of one rack-unit in height. Like FrontLine's full-featured ACM-3 and ACM-3L, the ACM-8 can address an individual channel or groups of channels. By comparison, the cost per channel in this new application-focused system has been reduced by half, while twice the number of channels can be controlled from the same rack space. *Contact at www.frontlinecom.com or at 800-231-1349.*

■ For more information circle Reader Service #542

Integrated Impairment System For Satellite Channel Testing

Noise Com has released its satellite channel simulator (SCS250), a complete testing solution for full-duplex communications between satellites and ground transceivers, including earth stations and subscriber units. The SCS250 emulates the channel characteristics experienced by satellites operating in low earth orbit, medium orbit, or geostationary orbit, enabling engineers to measure system performance before actually launching the satellite. *Contact Noise Com at www.noisecom.com or at 201-261-8797.*

■ For more information circle Reader Service #543

Multimedia Connector Series From Edac

A multimedia, multi-function connector series has been released by Edac. The 521 series of connectors are available with many different contact combinations: 28 hermaphroditic Edacon contacts along with up to six 75 or 50 coax contacts or six

power contacts each capable of up to 40 amps. This design allows for mixing of different types of connector requirements. *For more information, contact Edac at edac@edac.net or at 416-754-3322.*

■ For more information circle Reader Service #544

Fiber Optic Link From Force

The Model 2653 digital video/serial data fiber optic link from Force, presents new capability in high-speed digital video fiber optic links. It offers a reliable means of transporting digitized video, audio, and control signals over optical fiber. The Model 2653 can carry signals up to 40 km using single-mode fiber and 1550 nm optics. Force also provides a board-mount version—the Model 2666 high-speed fiber optic modules. The 2666 allows for a high-quality system for transferring high-speed, asynchronous NRZ digital data via fiber optics at speeds from 40 Mb/s to 1.5Gb/s. *Contact Force, Inc. at 703-382-0462.*

■ For more information circle Reader Service #545

Digital Video Compression For Quicktime 3.0

Eidos Technologies has released ESCAPE VideoStudio Version 2.1 with Quicktime 3.0 support. ESCAPE VideoStudio enables multimedia and CD-ROM game developers to compress digital video, animation, and graphical effects for full-motion and full-screen playback on PCs. VideoStudio is a software-based video compression/decompression (codec) tool that allows content developers to produce production-quality video sequences that can be played back on PCs without the need for dedicated, specialized hardware. *Contact Eidos in London at 011-44-181-636-3000 or via e-mail at justice@eidos.co.uk.*

■ For more information circle Reader Service #546

Chrosziel's Wide-Angle Solutions

Chrosziel has released a wide-angle mattebox system and sunshade designed especially for the Fujinon 10x4.8mm lens. The new mattebox is available in two versions, 4:3 or 16:9. The filterstage incorporates two combination filterholders: one for use

with 4x4 or 4x5.65 horizontal filters and a second rotating filterholder for use with 5x5 or 4x5.65 filters. The 95mm rubber bellows ring allows a third round filter to be used for all but the extreme 4.8mm wide-angle position. Features include a bracket that allows sliding +/- 3mm for precise fitting at the lens. *Contact Band Pro Film/Video at 818-841-9655 or e-mail at bandprovid@aol.com.*

■ For more information circle Reader Service #547

New Fibervision SDI Transmission System

Communications Specialties, Inc., has introduced its Fibervision serial digital (SDI) video transmission system. Ideal for large range of applications, including broadcasting, videoconferencing and

Product Review

video production, the Fibervision system equalizes SDI input and provides two reclocked SDI outputs at the receiver, in accordance with SMPTE 259M, 293M and other similar digital video standards, with speeds of up to more than 360 Mb/s. Consisting of a transmitter and receiver, each priced at $995, this system is designed for use with multimode optical fiber. *Contact Communications Specialties, Inc., at 516-273-0404, via e-mail at info@commspecial.com, or on its website at www.commspecial.com.*

■ **For more information circle Reader Service #548**

Sound Effects Software

The partnership between Gefen Systems and mSoft has resulted in the new Internet-based sound effects software, M&E Pro Intranet. This upgrade to M&E Pro offers online sound effects and music searching, auditioning and transferring using Internet

browsers. M&E Pro Intranet is a client-server software/hardware package based on Microsoft NT server technology for the server side, with ethernet network connection and Netscape Navigator or Microsoft Explorer browsers. *Contact Gefen at 818-884-6294, via e-mail at gsinfo@gefen.com or visit the website at www.gefen.com.*

■ **For more information circle Reader Service #549**

1998 TV Products Catalog From Tektronix

Tektronix' new 1998 television products catalog spotlights more than 150 products covering a broad range of television applications, including equipment for monitoring, testing, and manufacturing. The 300-page, full-color, soft cover catalog includes products for digital television and cable TV applications. The book highlights products manufactured in Tektronix' ISO 9001-certified facilities. *Contact Tektronix at 800-426-2200, or via the web at www.tek.com/Measurement.*

■ **For more information circle Reader Service #550**

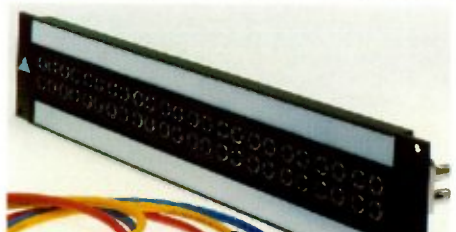
SSL Launches Axiom-MT Console

Solid State Logic has launched its new Axiom-MT digital multi-track console. The Axiom-MT combines SSL's digital expertise with a control surface. It has up to 96 channels providing all the traditional SSL in-line features, with every control automated, including the surround panning on both large and small faders. With 48 multi-track buses, 12 main mix buses, 12 aux buses and more than 200 mix returns, the Axiom-MT is the ideal console for mixing to any format. *Contact SSL at 011-44 (1) 865-842300 or via e-mail at johna@solid-state-logic.com.*

■ **For more information circle Reader Service #551**

Trompeter's Phenolic Patch Panels

Trompeter Electronics has added low-cost JSIB phenolic patch panels to its line of broadcast telecommunications products. The new panels offer an alternative approach to aluminum panels at a 30 percent savings. The panels offer full insulation of the patch field, eliminating "cross talk" and shared noise between jacks, in a



black phenolic face. Improved, wider designation strips offer more space for labeling jack locations. The JSIB line is available in standard 19-inch lengths, alone or pre-loaded with jacks and various jack spacing configurations. The JSIB-48 sells for $65.34 for 100. *Call 818-707-2020 or visit the website at www.trompeter.com.*

■ **For more information circle Reader Service #552**

Certifiber From Jensen Tools

Jensen has introduced the CertiFiber certification tool, which quickly and easily tests multi-mode fiber cable. CertiFiber

will automatically run the length, propagation delay and dual fiber loss measurement for both 850nm and 1300nm, and provide a pass/fail analysis based on the fiber standards along with the amount of headroom available over and above the pass/fail margin. Up to 1,000 time-and-date-stamped autotests can be stored and then downloaded to a PC with the included ScanLink software. *Contact Jensen Tools at 800-426-1194 or at www.jensentools.com.*

■ **For more information circle Reader Service #553**

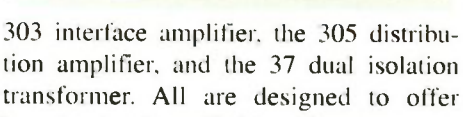
Signal Manager From Scientific-Atlanta

Scientific-Atlanta has unveiled the Series 9900 RF Signal Manager, designed to simplify the RF networks that support narrowcasting, network management, reverse path signal routing and a variety of interactive services. The product family sorts and routes reverse path signals from the home to their appropriate destinations within the headend or hub. The company has also launched the Model 6385 Stereo encoder, which provides superior audio fidelity for home theater applications; and the Series 6320 Subcarrier Demodulator to streamline an operator's ability to manage audio signals in the headend. *Contact Scientific-Atlanta at www.sci-atl.com. or call (770) 903-6057.*

■ **For more information circle Reader Service #554**

Symetrix Debuts 300 Series Audio Tools

Symetrix, Inc. has released a new series of flexible, affordable half-rack audio tools for contractors and broadcast engineers. The Symetrix 300 series offers four models that address specific audio applications: the 301 low distortion comp/limiter, the



303 interface amplifier, the 305 distribution amplifier, and the 37 dual isolation transformer. All are designed to offer broadcast and installed sound system engineers the flexibility to solve a wide range of audio design and interface problems. *Contact Symetrix at 425-787-3222 or online at www.symetrixaudio.com.*

■ **For more information circle Reader Service #555**

Broadcast Argus MPEG2 Encoder

Vela Research LP has introduced Broadcast Argus, its Windows NT-based MPEG2 encoder system designed for a broad range of professional applications needing 4:2:2 Profile digital video encoding. Broadcast Argus has a range of encoding capabilities for broadcast and post-production applications like contribution quality encoding and editing. New features include pause and resume encoding, dual stereo audio and enhanced encode decision list features. *Contact Vela Research at 813-572-1230.*

■ **For more information circle Reader Service #556**

Brooks Harris Updated MCXEDL

Brooks Harris Film & Tape's new MCXEDL 1.6 application will support OMF and EDL project import into the upcoming release, Version 1.6, of Avid's MCXpress digital video system for Windows NT. The new application significantly improves the MCXpress system's import capabilities adding EDL import and enhancing OMF export. *For more information, contact Brooks Harris at 212-967-7508 or at www.avid.com.*

■ **For more information circle Reader Service #557**

Wideband Triax Repeater

Telecast Fiber Systems has introduced the Mongoose, a wideband triaxial repeater. The device is capable of bringing new life to old triax cable, and possibly doubling the allowable distance between most cameras and their base stations. The company believes the Mongoose will make outside broadcasting more mobile, as a 3/8-inch triax could now be used instead of a half-inch. The Mongoose list price starts at $9,000. Telecast will initially offer five models of the Mongoose, based on camera/base station compatibility. *For information, contact Telecast at 508-754-4858.*

■ **For more information circle Reader Service #558**

Editware's Super Edit Version 8.1

Editware has released Version 8.1 of the Super Edit software for the VPE editing system. Features of the new software include EDL display filters, selectable field switching of switchers and mixers, storage/retrieval of color corrector data and Zaxcom DMX-1000 audio memory store and recall. *Contact Editware at 530-477-4200 or at www.editware.com.*

■ **For more information circle Reader Service #559**

Lowel-Light's Portable Dimmer

Lowel-Light Manufacturing has introduced the portable Lowel Dimmer. Offered in two models, the LD-10 and LD-20, features include four storable, variable light

level settings; a storable, variable rate & intensity "flicker" function for special effects; an optional wireless remote that can control up to 10 dimmer units; and no filament hum during dimming. The product lists for $345 for the LD-10 and $375 for the LD-20. *Contact Lowel-Light at 718-921-0600 or at info@lowel.com.*

■ **For more information circle Reader Service #560**

MPEG2 Nonlinear Editor

Applied Digital Technology has launched ADedit system, bringing non linear editing

capability to MPEG-2 environments. The ADedit system is available in three versions: ADedit 1 for simple cuts only, ADedit FX Level 2 for more advanced editing functions and ADedit FX+ Level 3 for reprocessing edit transitions to produce MPEG files. Unlike JPEG editors, ADedit can import MPEG files, so there is no loading time in an MPEG environment. It can be a stand-alone system or a client to an ADnet fileserver system. *For information, contact Richard Crosoer at Applied Digital's distributor, Greenway, in the U.K. at +44 1635 528700 or at rcrosoer@greenway.co.uk.*

■ **For more information circle Reader Service #561**

Seachange's Mediacluster System

SeaChange International is launching the Broadcast MediaCluster for its play-to-air applications for broadcast television. The instrument provides MPEG 4:2:2 quality

performance with a high level of resiliency and efficiency. Broadcast MediaCluster delivers a complete and highly integrated digital "on-air" system for play-to-air applications including program origination, commercial playback and time shift/delay. *For information, contact SeaChange at 978-897-0100.*

■ **For more information circle Reader Service #562**

Yahama Upgrades 03D Software

Yahama has a software upgrade for the 03D audio mixer, which makes the 03D compatible with video edit controllers through the ESAM II protocol. Using ESAM II protocol, the 03D can interface with edit controllers and automatically perform audio transitions in sync with video edits. This allows the audio channels of video source decks to be automatically routed by the 03D to the record VTR, all the while remaining in the digital domain. The software upgrade lists for $999, and the Yamaha 03D retails for $3,699. *Contact Yamaha Corp., at 714-522-901 or at www.yamaha.com.*

■ **For more information circle Reader Service #563**

Compression Pre-Processor

Snell & Wilcox has added to its MPEG product range with the new Prefix CPP200, a high-performance compression pre-processor with audio insertion capability and a choice of decoding options. As a one-box solution to MPEG pre-processing, the Prefix CPP200 ensures the lowest level of picture impairment in any MPEG source signal. It benefits the viewer with improved picture quality and the broadcaster with a greatly reduced bandwidth requirement per channel. *Contact Snell & Wilcox at 408-260-1000 or at www.snell-wilcox.com.*

■ **For more information circle Reader Service #564**

Digital Microphone Cable From Gepco

Gepco International has introduced a new digital audio microphone cable, the 5522M, to accommodate the need for cables that are sonically transparent in remote applications. The new microphone cable is designed for high-performance analog applications in addition to being a flexible and rugged digital audio cable. *For information, contact Gepco at 312-733-9555 or at www. gepco.com.*

■ **For more information circle Reader Service #565**

New Link System From Leitch

Leitch's new compression and multiplexing system allows broadcasters to send 45 Mb/s ATSC program signals along with analog signals over DS3 studio-to-transmitter links (STLs). Using Leitch's DigiBus STL compression and multiplexing system, broadcasters can compress their NTSC audio and video, then multiplex that signal with an ATSC 19.4 Mb/s feed. The resultant signal is small enough to travel over widely available DS-3 STLs, which carry 45 Mb/s streams. *Contact Leitch Technology at 800-387-0233 or at www.leitch.com*

■ **For more information circle Reader Service #566**

Miranda Technologies Imaging Series Audio Interfaces

Miranda Technologies has launched five new imaging series audio interfaces. The new audio line is part of the company's commitment to providing a total, integrated video/audio signal processing solution with its imaging series of modular board-level products. The products include the analog audio multiplexer, the analog audio demultiplexer, the dual digital audio distribution amplifier, the digital audio monitoring distribution amplifier and the dual AES/EBU Monitoring DAC. *For more information, contact Miranda at 514-333-1772 or at www.miranda.com*

■ **For more information circle Reader Service #567**

Videotek's Rackmount SVGA Monitors

Videotek's new series of SVGA rackmount monitors, the SVGA-15RK and SVGA-17RK, complement the VTM-180, VTM-183, VTM-200 and VTM-203 multiformat on-screen monitors. Features include multi-scanning from 30 kHz to 70 kHz horizontal and from 50 Hz to 120 Hz vertical; 0.28mm fine dot pitch; and auto-synchronization and auto-sizing with 13 preprogrammed settings. These monitors may be used in any application where VGA, SVGA or XGA monitors are required. *Contact Videotek at 800-800-5719 or at www.videotek.com.*

■ **For more information circle Reader Service #568**

Scitex Adds TextFX And Digital I/O

Scitex Digital Video has launched the serial digital I/O and the TextFX PCI board for its MicroSphere nonlinear finishing system. TextFX adds a third realtime image tract to MicroSphere, making MicroSphere a desktop nonlinear editing system with the power and flexibility of three realtime video tracks. The U.S. list price for the TextFX board is $4,995. *Contact Scitex at 650-599-3093 or at www.scitexdv.com.*

■ **For more information circle Reader Service #569**

Serial Digital Synchronizers

Digital Processing Systems is offering the DPS-470 and DPS-470AV serial digital component synchronizers, as part of its line of affordable digital video processing equipment. The DPS-470 component digital video synchronizer provides component, composite, S-Video and SDI video inputs and outputs. The DPS-470-AV provides both audio and video synchronization in a single rack unit package. All audio outputs are active simultaneously, enabling analog and digital devices to be connected at the same time.

Contact Digital Processing Systems at 606-371-5533 or at www.dps.com.

■ **For more information circle Reader Service #570**

Cinema Products' Telescanner

Cinema Products has introduced a new film transfer system, dubbed the TeleScanner. It combines the slew-speed flexibility of a telecine machine with the pin-registered accuracy of a traditional film scanner. The result is a film transfer system that configures for different functions, very accurately, in realtime. Utilizing magnetostrictive pin actuation technology, the TeleScanner achieves optical printer film registration accuracy of plus-minus 0.0002-inches at speeds ranging from 0 to 60fps. *Contact Cinema Products at 310-836-7991.*

■ **For more information circle Reader Service #571**

Zeros and Ones

Commentary from the Editors of Digital Television

Out Of Core, Out Of Mind

The 188 broadcasters who were given "out-of-core" DTV channel assignments face some tricky decisions in the next few months, and it seems to us that the FCC should do everything it can to help these stations find a better channel assignment before investments are made. Our cover story lays out some of the options these stations can undertake today, but better options need to be available. Hopefully the FCC will change its criteria for requests for alternative DTV channel assignments sooner rather than later. The financial burden of the move to DTV is expensive enough as it stands. By making them purchase equipment today that might not be fully amortized in the future seems a bit cruel.

Post For PC

The recent Siggraph convention in Orlando, FL, was a blast for anyone interested in seeing where the graphics industry is heading, and the talk concerning DTV was impressive. Manufacturers in the graphics community seem to be ready for HDTV work, as many of the tools are resolution independent, and thus prime for use in DTV applications.

More importantly, as shown in this month's DTVPOST for PC section, much of the equipment is affordable. Many broadcast stations still rely on outside facilities when it comes to creating 3D graphics packages, but it seems that the price point of much of the software and hardware makes it worth a closer look for in-house use. Who knows, the person designing your station's web page may be chomping at the bit to take a shot at designing 3D graphics.

We're Not In Television Anymore...

Without showing his network's hand, Andy Setos offers some interesting thoughts on how digital television will require new ways of thinking for broadcasters. At the top of the list, from our standpoint, is his comment that "We have to get away from this thought that we're in television." We couldn't agree more.

The 18 DTV formats offer the industry's creative community a new set of tools and opportunities that extend well beyond the current limitations of NTSC. The drive to DTV and HDTV began with the desire to bring the cinematic experience to the viewer. But it also will allow creatives to expand their creative thinking, and to use the standard that best suits the program.

Granted, the majority of television programmers won't see drastic changes in the way they tell stories. But the ability to use different frame rates and spatial resolutions will only heighten the viewing experience. It will be fun to see how producers at networks like Fox look to take advantage of the DTV medium and offer viewers truly new viewing experiences. It seems to us that the best way to make viewers want to buy a new DTV or HDTV set is to take full advantage of the freedoms DTV affords in production and post production, not just transmission.

Advertisers' Index

The Advertisers' Index is provided as a reader service. Although every attempt has been made to make this index as complete as possible, the accuracy of all listings cannot be guaranteed.

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Digital Television
Technology For The Digital

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Broadcasting & Cable's Digital Television (ISSN# 1099-7679) (GST 123397457) (C.P.C. Int'l Publication Mail # 1251651) is published monthly by Cahners Business Information. 8773 South Ridgeline Blvd., Highlands Ranch, CO 80126-2329. Cahners Business Information is a division of Reed Elsevier Inc., 275 Washington Street, Newton, NA 02158-1630. Circulation records are maintained at Cahners Business Information, 8773 South Ridgeline Blvd., Highlands Ranch, CO 80126-2329. Application to mail at Periodicals Postage Rates is pending at Littleton, CO 80126 and at additional mailing offices. POSTMASTER: Send address changes to Broadcasting and Cable's Digital Television, P.O. Box 7500, Highlands Ranch, CO 80126-7500.

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