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SEPTEMBER 1998 VOL. 1 NO. 7

NEW PRODUCTS

ViewSonic 21-Inch Monitor

ViewSonic's PT813 is a new 21-inch professional series monitor featuring an aperture grille CRT for vivid colors and bright, sharp images. Its horizontal frequency ranges up to 107 kHz, delivering an industry high refresh rate of 85 Hz at 1600x1200 resolution and 99Hz at 1280x1024. SonicTron technology has a super fine stripe pitch of 0.28 mm for displaying the finest lines in sharp detail. Contact ViewSonic at (909) 869-7976 or visit www.viewsonic.com. ■ **For more information circle Reader Service #200**

Leader HDTV Signal Generator

Leader Instruments Corp. has released a test signal generator that operates in the 1125/59.95 HDTV system and complies with BTA S-004A, S-005A, S-006A and SMPTE 229M, 291M and 292M. Front panel switching permits selection of 1135 or 1180 lines displayed, as well as 1125/60 operations (optional), test tone level and frequency and remote-control baud rate. The generator incorporates serial digital outputs of conventional and dedicated test signals that include the pathological check field and includes embedded four-channel AES/EBU audio-test tones. Contact Leader Instruments at (800) 645-5104. ■ **For more information circle Reader Service #201**

Artel DigiLink 1220

The DigiLink 1220 is a single channel fiber video transport product capable of transmitting both NTSC or digital video with the same device, including SMPTE259M digital D1 video. The product is designed to be fully compatible with industry standard routers as well as the DigiLink and MegaLink product lines from Artel. Cable equalization runs up to 300 meters. Contact Artel at (508) 303-8200. ■ **For more information circle Reader Service #202**

For More Products see page 37

The European Accent On DTV

Digital terrestrial services set for launch

By Jeremy Cavanaugh

The Europeans are holding their own NAB this month in the form of IBC, with more than 30,000 broadcasters and industry professionals descending on RAI Exhibition Centre in Amsterdam.

And like NAB, digital television and digital products will be the topic of discussion as Europe looks to begin digital television services of its own this fall.

As the new kid on the block, digital terrestrial broadcasting is the phrase on everyone's lips. MPEG DVB, in all its various incarnations for cable, satellite, terrestrial and contribution, has been adopted in legislation at the national and European Community level.

Digital terrestrial broadcasting is receiving the attention of the European governments for the same reason it is in the U.S. The eventual goal is to free up analog spectrum space and then auction off this spare spectrum, thus bringing cash into national coffers across the continent.

The plan in the United Kingdom calls for analog services to be phased out during the next 10 years. Meetings involving ITV (Independent Television, the commercial television channel in the UK), the BBC, manufacturers and consumer groups are occurring with this goal.

ON Digital, located in the UK, is claiming to be the world's first commercial terrestrial digital service provider. Stunts like this bungee jump outside London are making headlines for the launch.

From the broadcaster's point-of-view, DVB allows established terrestrial broadcasters to compete with satellite operators in multiple channel offerings and other much-touted services, such as home shopping.

Only Scandinavia and the UK are currently realizing commercial services, and the UK's competitive environment could outline the possible DVB rollout model for the rest of Europe.

ON Digital is the memorable name of the company that has the fran-

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New C-Cube Codec Transcodes DV, MPEG2

Panasonic, Adobe Systems look to be first to support codec

By Ken Kerschbaumer

C-Cube Microsystems has introduced the first codec to allow for the transcoding of DV-compressed material to MPEG2 and MPEG2-compressed material to DV.

The codec, called DVXpress-MX, looks to be a boon for industry professionals who have faced the difficulty of working with both compression technologies.

"We see MPEG2 and DV being the two dominant compressed digital formats," says Joe Sutherland, product marketing manager for C-Cube's PC/Codec Division. "DV is enabling new higher-quality cameras and acquisition while MPEG2 is enabling new distribution methods."

The codec can handle 4:2:2 MPEG2 material as well as DV, DVCPRO and DVCPRO50

Continues on page 4

Advanced

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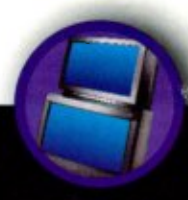

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Panasonic 1080i studio cameras and 480p and 480i camcorders are essential members of the Panasonic ADTV family, offering extensible, scaleable and affordable solutions. Solutions like the new AK-HC880 1080i studio camera, and its companion, the AK-HC830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

For more information on the latest Panasonic ADTV products, call:
1-800-528-8601 (Upon request enter product code 03)

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News

CODEC

Continued from page 1

material, making it well-suited for professional broadcast needs.

Since the introduction of professional products based on the consumer DV compression technology three years ago there has been much lobbying by manufacturers over which compression scheme, MPEG2 or DV, is better (for more information on the differences between the compression technologies turn to page 14 of the June/July 1998 issue of Digital Television). The reason is that incompatibilities of the compression schemes made a purchasing decision a major commitment. But the C-Cube codec

The DVXpress-MC codec from C-Cube Microsystems will transcode DV and MPEG2 compressed material.

will offer the end-user more options and allow them to more easily use the compression scheme they feel is best for a given task.

Phil Livingston, Panasonic vice president, engineering support and training, says, "This is very good news because we heard customers were concerned with having to make a choice between compression technologies that should be able to coexist. MPEG2 saves bandwidth, so it's good for transmission but you can't edit with it too easily. And if the needs are for production or post production then DV is the answer. What C-Cube has done is offer a solution for living in those dual worlds."

Adds Sutherland, "We've targeted this codec for nonlinear editing because it offers the ability to seamlessly work with both DV and MPEG2 formats. We've built in some functionality like multiple stream processing and realtime special effects that make it ideal for nonlinear applications."

The codec also offers variable bit rate conversion from one format to another. "For example, we've looked at going from 25Mbps DV to 8Mbps MPEG2 with no loss in quality," says Sutherland. "You can adjust that so you get whatever quality you want on the desired output."

Bruce Chizen, senior vice president and general manager of Adobe Systems' Graphics Products Division, says the chip holds much promise. "Mixed format editing and DV-to-MPEG transcoding offer the most significant advancement we've seen for enabling all-digital video production on the desktop."

Products using DVXpress-MX should be available sometime around NAB99. ■

HOT SALES

Divicom has signed an agreement with **DIRECTV** to provide compression equipment for its Los Angeles Broadcast Center. DiviCom and DIRECTV are working together to develop a complete uplink signal processing system to support the DIRECTV programming service. DiviCom will provide products from its MediaView family of program encoders, the MediaNode multiplexer and the MPEG Media Toolkit. DIRECTV will also use DiviTrack, the multiplexing feature of the MediaView MV40 encoder.

LaserPacific in Hollywood has purchased a **Quadra Vision CCD** telecine from Philips Digital Video Systems. The Quadra telecine will become the fifth Quadra in operation at the facility. It is part of a sale that will eventually include a total of seven Quadras and a Spirit DataCine.

WAAY-TV Huntsville, AL, (NBC affiliate) has purchased $2.4 million of **Sony Betacam SX** gear. The order includes 21 DNW-A100 hybrid recorders, 21 DNE-700 editing systems, and a DNW-A220 portable editing system. Sony DNW-A30 playback machines and DNW-7 and DNW-90 cameras are also part of the order.

Performance Post in Studio City, CA, has purchased a **Jaleo HDTV** post-production system. The system will be used for effects, compositing and editing of HDTV and NTSC programs, including the upcoming season of Wonderful World of Disney.

PBS has purchased over 500 products from **Miranda** for use in its digital multi-channel headquarters in Alexandria, VA. The purchase includes Miranda's Symphonie 4RU housing frame, which can mix and match up to 16 digital video and/or audio Imaging Series modules.

HD VISION, Irving, TX, has added two **Snell & Wilcox HD 1024** digital production switchers, with one slated for use in the company's facility and the other in a mobile production truck. The company is also adding three HD cameras to the truck.

Pappas Telecasting has made a $2.7 million second-round purchase of **Panasonic DVCPRO** camcorders, laptop editing systems and VTRs to convert three of its stations (KMPH-TV Fresno, CA; KPTM-TV Omaha, NE; and KHGI-TV Lincoln, NE) to digital newsgathering. Thirteen Postbox "elite" nonlinear editing systems were also included in the sale. In all, 99 DVCPRO units, 18 AG-A850 multi-event edit controllers, a number of monitors, DAT machines and related cameras and NLE accessories were purchased.

WNET Signs On Sony, Tektronix For New Facility

A.F. Associates is currently constructing a new state-of-the-art facility for PBS station Thirteen/WNET in Manhattan, and recent agreements with Sony and Tektronix will ensure that those companies play a major part in the PBS station's future.

The new facility will include two studios, a studio control room, a master control room which will serve as the core of the multi-channel facility, with an adjacent air/record room and library, a technical operations center, several nonlinear editing rooms networked to file servers and two full-time linear high-end online rooms.

PBS station Thirteen/WNET in New York City is moving to a new facility this fall.

The agreement with Sony covers a number of products, including camcorders, video tape recorders, switchers and effects generators for digital field and studio production and post production. Sony equipment will also be used to create an advanced HDTV post-production suite, allowing producers to edit programs in Sony's HDCam 1080i in-house format.

Tektronix has also been tapped for the station's HDTV needs, including Grass Valley switchers and routers for master control. Tektronix will also build a digital editing training center and install three Lightworks editing systems on-site.

Understand Your DTV Assignment

By William R. Meintel

Decisions made today will have to be lived with for many tomorrows

DTV TECH TALK

With all of the talk concerning the transition period, and with the large degree of uncertainty concerning when DTV services will be embraced by consumers, it might be easy to forget that decisions made today concerning the creation of a DTV facility may very well impact the service your station will provide for the next 50 years and beyond.

Needless to say, making the wrong decision and then having to live with it for the next 50 years is not something that fits well into a business plan. So how can you best ensure your station makes a smart move early on? To begin with, there are some basic questions to consider.

1) Is the FCC-assigned facility adequate?

2) Can the facility be implemented within the limits specified by the FCC?

3) Is the use of the analog channel for DTV a reasonable future option?

4) Are there alternatives?

The above questions should be answered by every facility. And as written about in last month's issue, stations whose DTV channel assignments are outside the core (52-69) have to decide whether they should implement the assigned channel and then move to another channel at the end of the transition, or find an in-core DTV assignment at the outset.

When implementing a DTV assignment there are two basic options: Implement, if possible, exactly what was assigned by the FCC or take the opportunity to design a facility that will best serve the station and its viewers for the long term.

What did the FCC give you?

The answer to this question depends to a large extent on what type of NTSC service you are currently providing to your viewers. The FCC's goal was to duplicate the service provided by the current analog station (with two exceptions that will be addressed later). The parameters of the DTV facilities assigned by the FCC were based on the assumption that the DTV station would operate from the exact location and height of the paired NTSC station. From this assumption a power was determined that would produce a DTV noise-limited contour at the same exact location as the NTSC grade B contour.

This determination was made in the same manner used by the FCC to determine the location of NTSC grade B contours with two exceptions. The first exception is the value of the field strength level to be determined and the second is the propagation curves used to predict the service contour.

The field strength values were determined based on technical planning factors and laboratory tests conducted by the FCC

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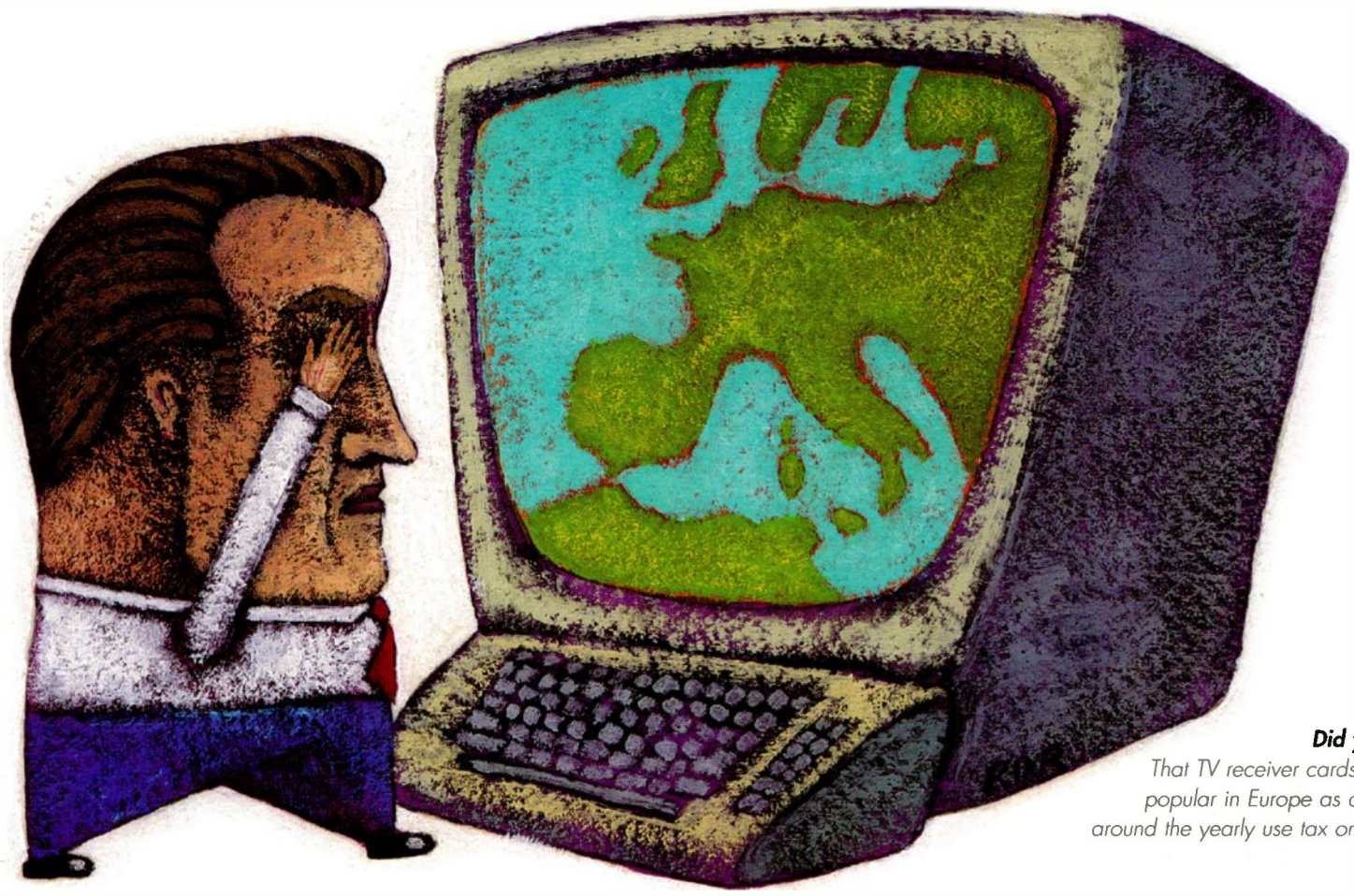
DTV PROFILE

Greetings From Europe



Did you Know...
That TV receiver cards for PCs are popular in Europe as a way to get around the yearly use tax on televisions?

While broadcasters in the U.S. grapple with issues concerning digital televison, the European community is coming to grips with its own. The lack of HDTV broadcasts may mean that European broadcasters and viewers alike will move more quickly into Digital Television, but it's not necessarily a slam dunk (or, for those of the European persuasion, an open-net goal).

Phillip Laven, director of the European Broadcast Union's technical department, is one of the people at the center of the move to DTV, tracking the progress of broadcasters, cable operators, satellite providers and governments alike. Previous to his position at the EBU Laven was controller of engineering policy at the BBC. Jeremy Cavanaugh caught up with him in Geneva, Switzerland, to discuss the latest trends and movements in Europe.

Where is digital in Europe at this point in time?

Laven □ That's quite a difficult question because Europe isn't homogeneous. There are great differences among the individual countries in Europe. For example, if you look around at the countries you have, say, Belgium and Holland where cable penetration rates are around 90% of households while other countries, such as France and the UK, have cable penetration rates of around 10%.

On the other hand, this difference gives you a feeling for what the opportunities might be for digital because in those countries with low cable penetration analog satellite operators have used this opportunity to introduce digital via satellite. Examples of this are Canal+ in France and BSkyB in the UK. They saw a significant opportunity to introduce pay TV and, in the case of Canal+, they also built their own analog terrestrial network.

The first roll-out of digital in Europe was by satellite, but the next wave will be in terrestrial because many people recognize there are many fits with Digital Terrestrail Transmission (DTT). The leaders are most probably the UK, Spain and France. So if you ask what is the pattern across Europe then you need to ask what is a particular country's satellite take up rate, what is its cable penetration. In Germany, for example, 50% of households have cable while 39% are analog satellite. And apparently there is not much hope seen for digital pay TV because the Germans are used to having many services, all of which are free and over the air.

So it's a complicated picture in Europe and digital terrestrial is affected further by such things as frequency availability. There hasn't been a significant problem in the UK where frequencies for up to six multiplexes have been identified that will cover 90% of the population while in Spain I think they have identified frequencies for up to 11 multiplexes. But in Germany they are saying, "We don't have the frequencies for digital terrestrial and we don't think there is a market anyway." They are looking at mobile services, a slightly different market. So there is no uniformity that I can spot—but maybe others can.

DTV ■ **So there's no uniformity in either infrastructure or programming?**

That's right.

DTV ■ **Perhaps MTV is the only true pan European channel.**

Yes, but even there they have different language versions. Oh, and there's CNN of course.

DTV ■ **So what is the EBU's role in all of this?**

The EBU represents the national broadcasters in all the

European countries. We've got 49 countries, and we go beyond Western Europe into the former eastern bloc, Russia and North Africa. So we represent a very diverse membership. Our technical role is to provide guidance, advice and a forum for exchanging technical information on new technology for our members. We are particularly interested in frequency planning, system choices and technologies used and as a result we've been heavily involved with helping broadcasters make the right sort of choices about new technology.

DTV ■ **So who has been pushing digital in Europe and who is going to benefit?**

The push comes primarily from broadcasters. A lot of broadcasters welcome digital as an opportunity because many of them have been restricted in what they can do. They only have one channel and they may have ambitions to deliver more services which digital terrestrial allows them to do.

The way most broadcasters in Europe intend to use DTT is not for high definition, as it's being used in the U.S., but for multiple programming. You take the digital multiplexes which can carry between 18 and 24 megabits per second and what broadcasters are thinking of doing is transmitting three or four services in an 8 MHz channel. They can then vary the mix contained in that channel day by day, hour by hour, or even minute by minute. This would be to vary the content in that channel, add new services etc., to make it more attractive to consumers.

DTV ■ **Is there any significance in governments using the move to digital to sell off spare spectrum space?**

This is certainly a trigger for interest by governments, as it is over in the U.S. The governments think, "Hey, we can sell this [spectrum] off and it's potentially worth a great deal of money." The answer to that thinking is yes, it is worth money if you can persuade people to move to digital—but it's a long, slow haul. As soon as you start thinking about it you realize it's going to be very hard for politicians to persuade the public, i.e. their voters, to go out and get rid of their TV sets and buy new digital ones just because the politicians have made a decision and analog services are going to stop in 2005 or whenever. And by that time most of the population will have converted to digital by their own free will, as it were, so it does essentially become achievable. The problem is essentially a political one. To put it crudely, there are no votes in telling people that they have lost their television services.

DTV ■ **In the UK the government has muttered about closing down analog TV sometime between 2005 and 2008, and the Spanish are voicing something similar.**

Look at it this way. Not many broadcasters have experienced switching a TV service off. It's a rarity. One country that did this was the UK with its original 405-line TV service from 1936. Europe introduced the 625-line service some 15 years later, and the UK had a problem in that it wanted to move to a 625-line service and had to switch off its 405-line service. Now, interestingly enough, the UK 625-line service started duplicating the 405-line service in 1969, I think, and the last 405-line transmitter wasn't turned off until 1986, meaning more than 15 years of simulcasting.

Technology moves a lot quicker today and so forth, but I'm not sure that applies here. The last 405-line sets were manufactured in the late '60s using tubes. Television sets then had an expected life of around eight years before it became just too expensive and difficult to replace the tubes. With this sort of life expectancy it was quite surprising that a number of these sets were still going over 15 years later.

The situation is much different now. TV sets last much longer, I believe the average life is around 15 years now, and therefore we have the problem that people will buy a new digital set and put it in their main living room. But they still have other sets. Many people have sets in other rooms in the house, such as the kitchen or a bedroom. Are people going to buy set-top boxes for all the analog TVs they may have floating around their home? I don't believe we can rely on the natural cycle of people replacing consumer goods such as TVs. We're talking about the replacement of every TV set in the house, every VHS recorder, or buying lots of set-top boxes. Now if the set-top boxes are cheap and cheerful, then fine. But you'll find, I believe, a significant problem with a significant proportion of the population who are not terribly interested in new services. They're not interested in digital this and digital that. They're the proverbial grandmother, and their point, quite legitimately, is: "I like what I've got, why should I change?" That's why I think withdrawal of an analog TV service becomes a political problem. If those left out turn out to be the old and the poor then that doesn't seem to be a vote winner.

DTV ■ **What about TV and set-top-box manufacturers? Don't they see this as an opportunity, indeed a bonanza?**

There are outstanding issues. The biggest is that of the conditional access systems because many broadcasters intend to run their services as pay TV.

There is certainly an opportunity, and people have suggested that an analog TV set in a retail store should come with a consumer warning saying something like: "This is an analog TV and analog services will close down soon." The only problem from the retailers' perspective is that this is a terrible deal because they, or the manufacturers, are going to be stuck with a significant quantity of analog TV sets and you've got to manage that transition quite well.

So you've got a start up problem where you make bold statements such as those made in the U.S. about the closure of analog services by 2006. But if you talk to manufacturers they say the industry will be lucky to reach 50% penetration by digital sets by then. It's a great thing to aim for, but you almost certainly know that the date will most probably have to be revised. Even if you have 50% take up by the turn off of analog services you still have a problem because no one is going to disenfranchise 50% of the population.

DTV ■ **Are all the technical issues to do with digital ironed out, such as interoperability and access?**

Yes, in terms of technical standards because all of the systems we are using in Europe have been developed by the same group of people. The DVB project at the core of that is the MPEG2 specification, and that is clearly a well-defined standard. In terms of transmission standards and modulation schemes a whole variety have been standardized. For example, there's the DVB satellite spec which runs at about 30 to 40 Mbps. Then you've got the equivalent cable specification which is meant to operate in a standard 8 MHz channel which makes it possible to take the whole DVB transport stream off the satellite at say 30 Mbps and remodulate it onto a system which fits in an 8 MHz channel. So it's all compatible and there is DTT which has a different modulation scheme but which can deliver 18 to 24 Mbps.

All these things have great commonality because effectively they all come from the same family of standards. There are people working on plug-in modules for DVB receivers. For example, you might have a DVB satellite receiver and it has a plug-in module, a standard PC MCIA card that fits into a laptop to allow the reception of DVB terrestrial on the same box. Effectively, because all of the decompression, demultiplexing and so forth is common to all the DVB systems, the only difference is the modulation scheme. So we have been very fortunate in being able to solve those interoperability problems.

There are outstanding issues. The biggest is that of the conditional access systems because many broadcasters intend to run their services as pay TV which requires scrambling. At the time when the DVB standards were being settled there were several pay TV operators who were closely aligned to particular conditional access systems, and none of them would think of sharing them for security reasons. Although we have ended up with a coherent family of transmission standards, we have not yet achieved a common conditional access system. And that is something I regret as most conditional access systems on the air at the moment are broken down into national markets.

Now, to some extent, if you are a pay TV operator showing something like movies, either as a single channel or as Near Video On Demand (NVOD), you've probably only got the rights to show that material in a particular country, so even if people wanted to subscribe across borders they wouldn't be able to. So Europe hasn't solved the problem of allowing easy access across borders.

The next issue to be resolved is that of the Applications Programming Interface, the API, which we believe will be very important for the delivery of multimedia services and more advanced services. There are significant discussions going on about that at the moment. I think most people look forward to a universal solution that will have something like Java in it that will be future proof because people will be able to download software on the fly.

That will solve our problem, however there are already services that have started or are about to start that have had to make a choice of which API they have had to adopt. Some have not bothered with an API because they've said they aren't that keen on interactive services just yet. Others are saying, "Well, we need an API now because we are offering on-demand services or pay-per-view services, so we need to be able to allow people to surf through icons and so forth. So in this first generation of set-top boxes in Europe there is a divergence of APIs. The next generation of APIs hopefully will use Java on which it will be possible to emulate the previous systems so people will be able to move from service to service without great difficulty.

DTV ■ **Do you think there might be a difference between the video side and the multimedia side where the video might stay with a national market but the multimedia side goes anywhere?**

I think it's possible. A Japanese manufacturer said to me some years ago that in his view DVB was a failure because it had failed to achieve the economy of scale across Europe by having an identical set-top box. I said, "No, DVB has been a tremendous success," and he replied, "Well, yes, but if you go to our production lines we've got different production lines destined for different countries." I now think that is a failure, and as more and more broadcasters such as Canal+ in France uses their expertise in different countries it is acutely aware of the problem of different APIs, different conditional access systems, different set-top box capabilities. People will say that in hindsight we should have moved harder to get a common conditional access system and overturn

DTV PROFILE

the prejudices that people had a few years ago. But the work was being done in a difficult environment where people said, "No, we know what conditional access system we are going to use and we are going to use it, end of story."

DTV ■ **Wasn't that due to fears about gatekeeping?**

Yes, and some pay TV operators did not want to give the keys to the revenue stream to a third party who might say "I've developed this wonderful conditional access system," only to find hackers break into it very quickly. A European-wide conditional access system would be something that hackers would work hard to break into, but these days people with their own conditional access system move quickly when something like this arises because it's in their own interest to do so. If conditional access resided with some standards institute then it might become difficult to change if needed, so that's a legitimate concern.

DTV ■ **Do you think the API or the multimedia platform might become like the Internet and so diverge from the digital video side?**

I hope that what will happen is that we will converge to a long-term common solution across Europe, and at the same time we embed conditional access systems so that we have a freer trade across countries.

DTV ■ **So if I was someone like Amazon.com in the states I could think long term in about 15 years to open my bookshop selling across Europe through the API.**

For services that are not scrambled and are interactive then I would hope it will be a lot sooner than 15 years. All businesses will see this as an opportunity in Europe, whether they are in the states, Asia, or wherever.

DTV ■ **Where does the European commission fit in all this?**

They were there to make sure that Europe didn't miss out on the digital opportunity. They encouraged the setting up of the DVB Project and then sat back and said, "We will not interfere, we will not mandate."

I think they made a mistake in the late '80s when they were looking at high definition and at that time every one thought HD was just around the corner and we were all rushing towards it and the EC mandated some technical choices. They said anybody who transmits HD in Europe must use the high definition MAC system and this all began to go quite wrong.

Since then the EC has said, "OK, we will stand back and let the competent groups such as the DVB Project (which is made up of manufacturers, broadcasters, network operators and anyone else who is interested) make the decisions and we will endorse their decisions. So the EC stood back and the only legislation they have carried out is that if you are going to run digital television services in Europe it must use standards that have been recognized by an appropriate European standards body.

It also didn't want the terrible problem of the early '80s when there was a multiplicity of home video recording standards and the market was confused by differing standards. So it learned the lesson of not telling the industry what those standards should be.

If you compare it with the U.S. where the FCC has taken a key role in setting the time tables and pushing the introduction of digital governments over here, the EC hasn't done that. Instead they've let the market place make the decision which is appropriate because of the varied and diverse conditions across Europe. I'm suspicious of politicians making such decisions as different countries have different time tables and things change, so you may need to change your thinking in the light of changes either in the marketplace or elsewhere. You know, five-year plans will most probably be torn up in three years time and people will do something different.

DTV ■ **Despite that approach, aren't there really a plethora of organizations in Europe looking after digital? You have DVB, then there's ETSI, the EBU, DIGITAG and national regulators.**

The interesting thing is that where all these groups meet is in the DVB Project. The DVB Project has all the market players: the broadcasters, the manufacturers, the network operators, the regulators. They are all there and they all throw in their ideas so consensus emerges and specs are adopted which then go though ETSI as the European standards body and so forth. The really key decisions have been made within the DVB Project. What is really interesting is that because the governments and regulators have been present and have early warning of what the market is doing they stand back because they have seen what is going on. And the reverse is true—members see what regulatory framework each individual country has.

EBU's Phillip Laven

DTV ■ **How is digital changing the EBU?**

Probably for the past five years everything the EBU has done has been tied up with digital. If you look outside the delivery arena and go back to the early '80s when the EBU and SMPTE set up a task force to define production standards for production which became recs' 601 and 656. They were set in the early '80s and at that time most people didn't recognize the importance of that work. Nowadays if you go buy digital equipment it's all 601, 565 and in the same way the EBU has been cooperating with SMPTE on another taskforce. The taskforce is on bit rate reducing interconnection of digital equipment. We've been looking at how all the different pieces of production equipment, editing boxes, etc. communicate, and we standardize the protocols jointly.

A couple of years ago I was saying how important this work would turn out to be to a guy who runs a facility and he said "Well, I'm not too sure." So I asked him what type of equipment did he use in his studio and he said 601. When I told him that 601 was the result of the first EBU/SMPTE taskforce in 1981 he was surprised. Then I asked him how long it was before his facility moved to 601 and he said 11 to 12 years. My reply was, "I can guarantee you'll be using the recommendations of the latest SMPTE EBU taskforce within two years." So I think the EBU is connecting everywhere the word digital appears.

DTV ■ **Do you think the EBU and broadcasters have a good understanding of the multimedia opportunities offered by digital television?**

Yes, but a qualified yes. I think many people think of digital television as either television of a better picture quality or more pictures of the same quality and that it doesn't change the essential make up of television.

Now, that is essentially true, however we would be fairly foolish to ignore the opportunities offered by digital delivery for new types of services. We've got to get the balance right and accept that the proverbial granny will take many years before she will change the channel by using a mouse. But the experience of the World Wide Web shows us that many TV programs in Europe direct you to the web if you want more information. I then rush around the room looking for a pen and paper to write down the web address and if I don't lose it I have to wait until I've finished watching before I turn to my computer.

Now imagine you were able to do this all at once through the API when you wanted to especially if the broadcaster transmit the data alongside the digital program. In Europe we have had significant experience of teletext which for a variety of reasons never took off in the U.S. For example, I think 10% of holidays booked in the UK have been done after people used teletext.

DTV ■ **HDTV has a continuing interest in America and Europe diverges from this. Where is high definition going in Europe?**

Well, it's interesting, isn't it. If you look at North America the primary impetus for going digital is high definition television. In Japan HD has been pioneered, first in analog and now there are plans for digital and it's deemed to be very important. Come into Europe and despite the introduction of digital television HD it has been firmly dismissed as a non-starter. You could say that Europe is firmly out of step and you've got to honestly ask the question, "Is Europe wrong?" Two big markets, Japan and the U.S., are out of step with Europe so is one side wrong or are they both right and the markets are different? To my knowledge no broadcaster in Europe has expressed any real interest in delivering HD services to the public. They've experimented with HD, some are making HD programs as they have a long shelf life and are prestigious, but I know of no plans for offering it despite the interest in digital.

DTV ■ **Some people in Europe say better screen displays and processing will meet any desire for HD in the medium term. Do you have any thoughts on that?**

I and many others have done lots of demonstrations of HD to the public and there is no question people are stunned by the quality. However if you do side-by-side comparisons with standard definition and high definition television sets under controlled conditions, using wide screen, and you don't give them any hint which is which quite often they will not be able to tell the difference unless you guide them. This even applies to television producers. You have to point out there is extra detail before they latch on to the difference.

My question is, if you do this in a retail situation and then tell them that it's going to be four times the price will they buy the set? I'm not confident they will. However, they do say they "really like the shape." That is, they like the widescreen aspect ratio. You don't need HD to go to

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ontinued from page 1

ise to operate 30 channels in the UK rawn from the BBC, Granada Television in Manchester and Carlton Television in Lonon, plus specialist providers. The company gearing up for a fourth-quarter launch proiding tiers of basic and pay-per-view serices laying down more than $130 million ollars for marketing. ON Digital is claimng to be the world's first commercial digital errestrial broadcaster with 22 transmitter ites across the UK offering what is called ultiplex D (achieving 69% coverage with-12 months) and multiplexes BBC and 3 & (achieving 95% coverage).

lsewhere In Europe

Other countries across Europe have plans nderway as well, with Spain and Sweden laiming the most ambitious projects. Both ountries are aiming to weave national, egional and local or community services nto a number of multiplexes. Beginning in eptember, 1999, Spain is planning for digal services to run simultaneously alongside xisting analog services for 10 years, while weden has had huge interest from local and oreign broadcasters, universities and pubshers to run a variety of services, including nteractive services.

Germany, by contrast, is taking a more autious approach with a DVB-T transmitter ransmitting nine channels in Berlin. Plans all for Northern Germany to be covered ith 40 transmitters while Munich, Cologne nd Chemnitz plan local metropolitan coverge exploring both DVB-T and 8k DVB-T.

Elsewhere, TDF and Canal+ are active in rance with TDF experimenting with three ultiplex transmission sites at Rennes, annes and Lorient. Ireland is also planning n ambitious rollout for 2000 involving up to ix multiplexes and interactivity using a eturn circuit via a radio channel.

In the rest of Western Europe Portugal, aly, Finland, Norway and the Netherlands ll have pilot projects. The Netherlands tands out as an interesting case study as 0% of the population receive television via able and only 5% via terrestrial analogue. s a result, DTT is not seen as a mass market proposition.

Perhaps the strangest part of all this activy have been experiments to test out mobile ervices. Groups in Spain have been fixing a eceiver in a fast car and driving at over 100 iph on an autobahn to see if a consistent gnal could be seen. Meanwhile, standards roups such as ETSI (European Technical tandards Institute) are working in conjuncon with local authorities, and special interst groups such as DIGITAG have taken ver the task of ensuring that DVB MPEG treams going into homes are compliant ith DVB specs. For example, the streams ust be completely transparent so that a serice now or in the future can be transferred om one delivery channel to another, crossng multiplexes on the way, with no hiccups decoding picture and sound.

So what about the much heralded forms f advanced television, widescreen and or IDTV? Widescreen is being worked on in a uted fashion with about 10 hours a week f programming from BBC 2 planned for e ON Digital multiplexing in the UK with similar plans for Canal+.

With regards to HDTV, the DVB Project continues to point out that the various levels of DVB allow a graded step to HDTV MPEG while across Europe there is an ambiguity over who actually wants HDTV. This means widescreen and HD are taking a back seat for implementation at a later date.

Mediaguard, the Canal+/SECA digital conditional access system, allows different payment means, including credit card. A credit card slot is standard on all Canal+ digital set-top boxes.

Digital Satellite

While digital terrestrial transmission (DTT) has been receiving lots of attention, digital by satellite has continued its rollout across Europe. The rollout is well advanced with Canal+ in France and Spain providing a lot of impetus followed by BSkyB in the UK, the Bertlesman group in Germany and Berlesconi in Italy. BSkyB is currently running trials on the Astra 1 satellite, although its service will eventually be offered on Astra 2, which is not yet in orbit.

On the contribution side, service operators such as BT, Globecast, Eutelsat, Intelsat, Panamsat and Orion have all reached a level of service maturity with MPEG2 for backhaul and contribution circuits, an essential precursor to getting new digital services distributed either nationally or across borders, whether for cable headends, DTT or direct to home.

To see how DTT and digital satellite are shaping up against each other in Europe the UK again could provide the model for the way the rollout could occur. BSkyB, controlled by News International, is rolling out a digital service by satellite where more than 140 channels are being trialed, including Near Video On Demand (NVOD). BSkyB is expert at spoiling competitor launches and it won't allow ON Digital to forge a hold on the market place without a marketing firefight.

ON Digital claims that DTT will reach the 60% of the UK population who have not bothered with satellite while BSkyB is aggressively pushing new programming packages and revamped pricing structures.

At the heart of all this activity is, of course, how the viewer gets the signal. This is seen as an opportunity by consumer manufacturers in Europe, but it also creates the need for constructive refereeing by national regulators. For now it appears viewers will either use set-top boxes for existing receivers or all-in-one DTV receivers with the DVB receiving cards built in. Set-top boxes for existing sets are being manufactured by Toshiba, Pace, Philips, Grundig, Matsushita, Sony, Amstrad, Samsung and others, while a smaller number of manufacturers are bringing receivers to market.

The Independent Television Commission (ITC) in the UK is acting as the referee for bringing BSkyB and ON Digital together to negotiate over interoperability of the different set-top boxes each company has chosen. ON Digital plans to use the Canal + 'SECA' decoder while BSkyB is using the News International NDS system as operated by British Interactive Broadcasting (BIB, owned by BSkyB, BT, the Midland Bank and Matsushita). Both have to be able to receive and decode each others signals, and the solution has been to specify a side-car card that plugs into the set-top box.

The next level is the development of the API as the platform for building in applications into the set-top box such as the Electronic Program Guide (EPG) or internet access. ON Digital is using the Canal+ Media Highway Platform (MHP). This is the launching point for interactive and multimedia services, an area of intense competition in Europe. The result has been open access forced by regulatory bodies and the appointment of two groups to develop API under the auspices of the DVB Project. These groups are DVB-MHP to define enhanced and interactive services and DVB-TAM to specify the API (application programming interface). DVB-TAM is looking at MHEG 1 and 5 (multimedia home experts group), Java and the Canal+ media highway for the API.

The API has got to be platform independent while supporting different levels of service so that the viewer can send commands back to different service providers down the phone line or, in the case of Ireland, on a dedicated radio link. Such return channels are specified by ETSI as well as the Network Independent Protocols (NIP).

Digital in Europe is made up of a number of groups with complex relationships and interaction, a 10-year experiment to sell new services alongside the pastime of watching TV. But digital is making for a vastly more complex broadcast universe than the simple days of rolling out an NTSC, SECAM or PAL analog service and, in the end, no one country will be exactly the same as its neighbors. ■

SPECIAL REPORT • DTV IN THE NEWSROOM

The Changing Newsroom

Video servers, asset management, automation and newsroom system companies work together to leverage strengths

By Edmond M. Rosenthal

Suppliers of newsroom computer hardware and software are working hard to keep up with the fast pace of today's TV news delivery. Newscasters have moved from a Vietnam War era in which day-old footage was considered immediate to a Gulf War environment in which CNN solidified its reputation with hours-or minutes-old clips of the action.

In today's newsroom technologies and products continue to merge and reshape one another. And vendors of video servers, newsroom systems and digital asset management and automation systems are working closer together to take full advantage of digital technologies.

Today's television newscasters are sometimes dealing with 50 simultaneous feeds, and they want large staffs to work on them simultaneously, even combining them with archival footage, for virtually instantaneous airing.

Ralph King, president of Comprompter, points out that while some of the larger TV stations have their own server networks, many midsized stations have video servers in limited form in use as playback devices.

He explains, "They'll have two or three digital video computers linked together with a central controller. These computers can be virtual recorders or those that have had cards inserted so that they can run MPEG2. One computer will be the control computer, which will do all the timing and the playback and run the software that does the automation for all the information that's out there.

(Above) The AvidNews newsroom system is playing a major role at CNN's various news organizations. (Left) Comprompter is looking to take advantage of Windows NT capabilities and popularity by deciding to move all of its software to the PC platform. Both Avid and Comprompter point to the user-friendliness of computers as a newsroom influence.

"Ultimately, newsrooms will be tapeless because the cost will reach a point where hard drive technology will cost the same as tape."
—Ralph King, Comprompter

Serving News

"There are many definitions of a video server," King points out. "Some people think of a server as a huge single central box, like the mainframe that we know and love from our old Unix days—one huge computer that does all. The video servers that we have these days are typically not strong enough to be a central mainframe. The editing is done on individual workstations; then the files are transferred to the server for playback."

He adds, "In many cases, there is no central server, but there is a shared server technology in which the material is stored on a number of computer harddrives and one computer simply controls the playback."

King notes that a large video server that's basically going to run the entire station can cost $350,000-$500,000, but that it costs about $150,000-$300,000 to put together a consortium server or a non-dedicated server. "What you lose in this option," he counsels, "is that your files are not in a central place. They're somewhat fragmented, and you have to have a much better database tracking system to keep track of where everything is so that you will know where it is for playback. It's also subject to more failure because there is more distribution going on during live playback as opposed to everything coming off of one central server. Of course, you also have greater redundancy. When a central server goes down, it's down. No video comes out of it."

Most central servers, King points out, have been built using RAID technology, Level 5 or better, in which they have hot swappable drives so that a portion of each video is duplicated on a variety of different hard drives. If a single drive fails, you still have a complete video that can be reassembled automatically by the playback device, which keeps pointers to everything that is stored."

Despite all of this redundancy, there's an analogy to station transmission in the server's central CPU: "If your transmitter crashes, it doesn't matter how good your tower is." Meanwhile, database/tracking software in a consortium server keeps track of content location and length.

The central server concept becomes more important in making the archiving easier, King points out, explaining, "A number of companies have developed DAT backup systems on which you can download completed commercials or news stories, and you can take them offline so that you don't have to keep them with the ready-to-air material when you're less likely to use them but don't want to get rid of them. Each tape has a code that indicates what's on it," creating a large database that can be accessed automatically from the chamber in which the tapes are stored.

"This takes up a lot of room, and it's very expensive," King points out. "Ultimately, newsrooms will be tapeless because the cost will reach a point where hard drive technology will cost the same as tape. Currently, these cartridges are about three times as expensive as tape. We're probably about three years away [from cost parity]. Even if there's a slight differential in favor of tape it would be made up by the speed with which you can retrieve data from hard disk."

For now, King believes linear storage makes more sense because of cost. "It's one-quarter the price of comparable nonlinear storage. Probably three to four years from now, we'll be able to enlarge disk capacity because of compression. The algorithms are getting better and better so that you can probably do 40:1 compression and still have on-air-quality playback. Now we're only talking 7:1."

Windows NT

Comprompter is moving all of its software into Windows NT, utilizing a Microsoft SQL database. Regardless of the digital audio or video system used, King says, "we'll be able to track their files—whether they're audio, video, online, text or archive files."

Dave Cobosco, product manager for Avid newsroom computer systems, says the newsroom environment is approaching the user-friendliness of the home computer. He notes journalist workstations are moving slowly from terminals to PCs, enabling such tasks as media browsing via desktop. As more power becomes available on desktops, he adds, more video and more editing will be done there. He's also recommending an Internet-based approach to saving text and story rundowns. This is an inexpensive and easy-to-use approach to searching archival material. This can be in the form of an "Intranet" within the newsroom, using a larger pipeline than provided by modems.

The next step for newsroom systems is to differentiate between the new and the old. Comprompter's King predicts, "In the future, servers will be able to watch video and automatically age it so that when it hasn't been used for a certain amount of time, it will automatically be compressed and moved off to a storage area on the server or onto something connected to the server. Human intervention in taking it offline will be nonessential. That video will be stored in about 10 percent of the space that it takes to play it back. This is where the cross-formatting becomes really important. You're able to switch it, for example, from MPEG to JPEG or to AVI files and the content doesn't suffer."

One of the current barriers to this newsroom utopia is a bottleneck in the sifting and sorting process. Mark Juliano, president and CEO of Islip Media, points out that newsrooms are still working with paper-based systems, with news staffs merely watching the feeds and taking notes. He says the speed isn't there for a

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quick search of tapes and the feeding of them into a nonlinear editing system. Quick retrieval and addition of archival footage are also prohibited because newsroom and archival systems aren't integrated, he says.

But digital asset archiving and retrieval systems are addressing those problems. One interesting trend in the product area is that there are a range of vendors who are willing to work together, with many already cooperating in pilot programs for the TV networks. The reason for this joint work is that a complete system requires several layers of hardware and software. This includes servers and storage systems, database management, asset management, the input engine, the search and retrieval engine and the streaming engine.

Islip Digital Library competes with such vendors as IBM Digital Library and Bulldog in asset management software, in which retrieval of transcripts or images is interrelated and organized toward news programs. But its bread-and-butter area is the input engine, in which media is digitized. Virage is the other major player in this area.

In a proposal to a broadcaster, Islip can see itself partnering with, for example, IBM, Silicon Graphics, Informix and Oracle. The company already is involved in trials with the BBC and ABC.

"When this is solved, you'll be able to take video coming over satellite and it will go directly into a videotape machine," Juliano predicts. "It will simultaneously be digitized, cataloged and put into a database. All that will happen in realtime, and by the time you're finished with an hour of satellite feed, all that stuff will be in the database. So within seconds, a producer will be able to say, 'What's new with Monica today?' and that can come from five different feeds, and they'll get clips from all these feeds on their computers at the same time. Then they'll change databases, but still using the same PC, and ask for stuff from two years ago or stories about summer interns.

"You might see 10-15 pictures on the computer screen, each representing the frame of a video. You sort them to create a playlist. Then you send that information directly into a nonlinear editor. So they have all the tape you need and all the times."

Technology is keeping pace with the ever-quickening newsroom environment.

"I see the day not far off where a tape or video feed is captured into a computer. Once you're in the hard drive of a disk, there's no degradation anymore. Once it's on disk, then multiple people can access it and work on a project without degradation."

—Dave Cobosco, Avid Product Manager for Newsroom Computer Systems

With the ability to find footage easily and bring a high picture quality into nonlinear editing, the on-air product can be created that much more easily. "Most networks have that whole thing as a goal, but they can't come close to that today," he adds.

Another emerging trend is simplified searches, according to Islip's Juliano. His company's MediaKey Logger allows use of speech recognition to identify key spoken words in news clips, even aided by sophisticated weighting in terms of relevance. For example, more weight is given to the first 10-15 seconds of a clip, in which the subject matter is best identified. Skimming of video has also been made easier, allowing the skipping to keywords or scene changes. In the MediaKey Builder, capabilities include a face-matching search and the recognition of on-screen text.

Merging Worlds

Michael Abrams, chief operating officer of Cinebase Software, which develops software to manage digital media, also is concerned with the separate worlds of archival and newsroom systems. A member of the Avid Open Media Framework, it's working with Avid and other partners to bridge the gap from the videotape to the digital world.

The pieces of newsroom and archival systems will be coming together by the end of this year, he predicts, and then the organizational implications will need to be addressed. For instance, he notes that getting 15 years of archives into the system will involve "a lot of work" and millions of tapes. But he believes the digitizing of tapes will be story-driven in an archive-as-you-go approach, rather than as "a big process that never ends."

He points out that only recently are newsrooms seeing the ability of computers to handle video as well as they handle text and audio. This is crucial, he adds, with the prospect of HDTV, which handles substantially more data in storage and calls for sophisticated compression schemes. And with the need to transmit digitally, he says, "now is the right time to begin connecting the output and the input with a digital infrastructure, getting away from such boundaries of tape as generational loss.

"As we look at the emergence of large-scale servers from companies like Silicon Graphics," he notes, "and the emergence of Windows NT-based servers that can be clustered, the ability of servers to enter into the environment and perform at the speed necessary, with the reliability necessary, makes a digital backbone a reality."

To store a growing amount of digital content, he says, companies such as Louth and Sony are developing server and shared-disk architectures to allow devices to connect in realtime and share information. To make the video search process more efficient, he adds, software companies are emerging to provide video cataloging tools. These include Islip, Virage, Excalibur and Mate, he says, with products that are able to take video streams, segment them into stories, capture various types of information about them and get them into a system like Cinebase "so that people can get to them when they need them in production."

Abrams says, "We're moving now into a world that needs to become totally nonlinear. We need to be able to edit, access, catalog and manage all data in a digital nonlinear manner if we want to get full value out of the content." He holds his company's mission is to provide software to manage the content and work flow involved.

"As an example today," he elaborates, "a newsroom might get content from a producer in the field on DVCPRO tape and content from another producer on Betacam SP and also have some archive content on film. All of these formats get converted as they arrive—either through a telecine, digital video or video digitizers—into a digital network environment. A producer, on a PC or Macintosh, can look through stories, choose the content and, with just a mouse click, direct the system to automatically convert the content from whatever format it was in and put it onto a play-to-air system or a tape or video server."

Parallel Work

The ability of newsroom people to work in parallel on a story has been a concern at Avid Technology, according to Cobosco. A step in that direction has been taken with Version 1.0 of Avid's Media Browse System, an optional element of the Avid Newsroom Computer System. This allows about 20 journalists to look simultaneously at video feeds on their desktops. While browsing a low-resolution copy, they can create shot lists, saving time at the editing bay.

This isn't actually simultaneous editing, but Cobosco envisions further advances: "I see the day not that far off where a tape or video feed is captured into a computer. Once you're in the hard drive of a disk, there's no degradation anymore. Once it's on disk, then multiple people can access it and work on a project without degradation."

Another step in this direction is development of a version of the Avid NewsCutter nonlinear news-editing product that uses the Panasonic DVCPRO format. By the end of the year, he adds, a playback device called NewsPlayer will enable newsrooms to play back from disk directly to air.

Changes in server technology, Cobosco notes, are working toward both simultaneous access and lower cost.

He reports, "We have found that, instead of having one server be the central point where everyone connects, technology has enabled us to have multiple smaller servers connected, enabling us to scale the number of users up to a larger number. People want to connect up more and they want the cost to come down. By using more of a distributed server approach, we can add more simultaneous users over time.

"Most of the server products that have been on the market for several years have used a larger server as a central control device," he adds. "One of the drawbacks beside the price is the ability to hook in more than 10-15 simultaneous users. As we move forward, server technology will enable us to bring the price down and also increase the number of simultaneous users." ■

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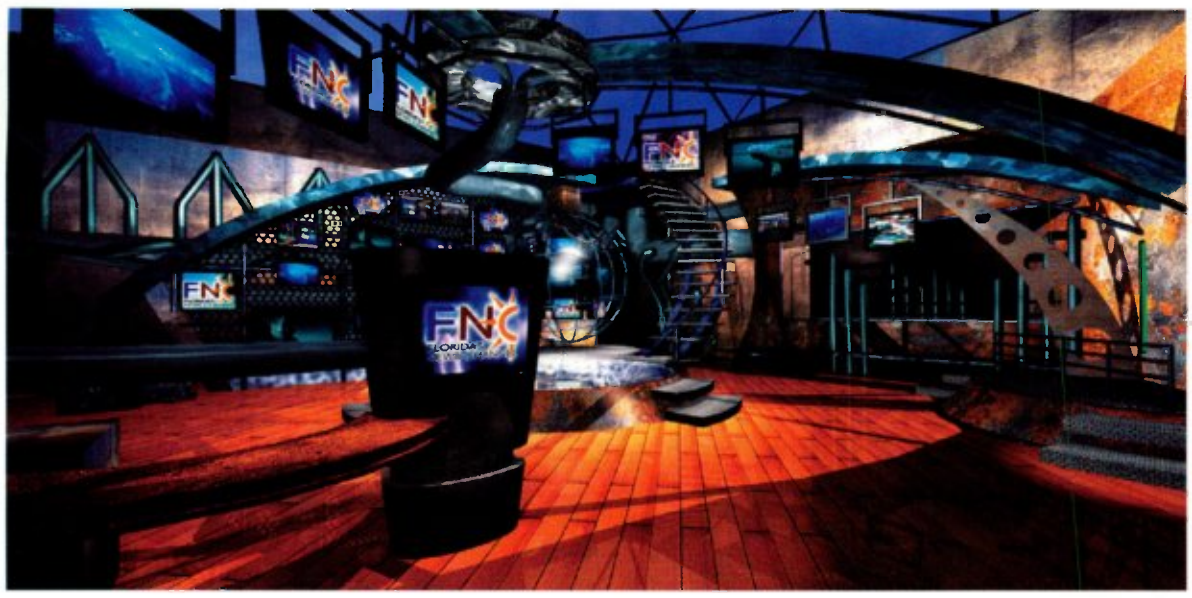
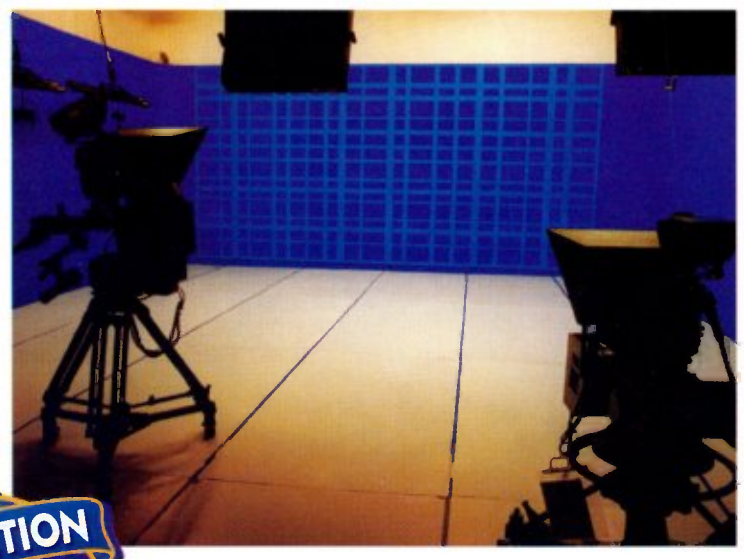
FNC Takes Full Advantage Of Fiber, Virtual Studio Technologies For Launch

In 1994, Bob Brillante, managing partner at Florida's News Channel (FNC) in Tallahassee, began the process of creating an innovative statewide newsgathering and distribution venture. Now, after four years, FNC is getting its formal launch. More than two million subscribers will be able to watch FNC when it begins operation this month, and Brillante projects that 3.8 million TV viewers will have access to FNC by the end of this year.

"We've worked hard to perfect our look, which is very visually appealing," Brillante says. "I believe that we are the first in the country to deploy an ATM-based broadband fiber network for the purpose of providing seamless statewide interconnection in terms of both newsgathering and distribution."



FNC is using virtual set technology to generate several custom newscasts. Below is the actual set.



Brillante says that FNC is taking a different approach to its newscasts, generating several custom newscasts for different areas of the state simultaneously.

"Each is branded for a cable affiliate in a specific market using our virtual-reality-based studio facilities," Brillante adds. "Saying it was a balancing act to put all this together is an understatement. Fortunately, we have the backing of the entire industry, including broadcasters."

"Saying it was a balancing act to put all this together is an understatement."

—Bob Brillante, FNC managing partner

Seven local NBC stations serve as broadcast affiliates, sharing news bureaus and assignment desks with FNC staff members. FNC will launch with 23 local news bureaus across Florida, with plans to grow to 32 news bureaus, according to Brillante. FNC's cable TV affiliates include MediaOne, Comcast and GTE. FNC has an off-air outlet in Orlando.

FNC's cutting-edge use of multiple virtual sets has resulted in a decision to tap into a team of top design and virtual-reality systems vendors. Israel-based Orad is providing a SoftSet/CyberSet technology solution running through a Silicon Graphics Onyx2 engine. The virtual-reality set design is being handled by San Diego-based Devlin Design Group, while Dallas-based Electronic Graphics and Design (EGAD!) will provide all on-screen graphics and logos. Original music for the network is being produced by The Stephen Arnold Group of Dallas.

"What you see unfolding at FNC is the financial model that will justify virtual studios with multiple feeds, and with each branded differently," says R. Mathew Straeb, vice president of Orad. "The U.S. market has been slow to adopt this technology. It's profit-driven. Here we're demonstrating, among other things, that virtual reality has a place in the U.S. broadcast and production markets."

Tampa-based Professional Communications Systems (PCS), a division of Media General in Richmond, VA, is performing the integration process for FNC at its serial digital 601-based facility.

"The conversion process is one key concern. A lot of different conversions are taking place as we move from analog to digital 601 to ATM. Of course, our emphasis is on the best possible quality, in and out," says Fran Fehr, president of PCS. "We've done TV stations before, but this project is much different. Here we're dealing with six output channels, all on a single virtual platform, and that number soon will be eight."

DVCPRO for ENG

The digital ENG activity at the local bureau level is driven by Panasonic DVCPRO AJ-D700 cameras and AJ-LT75 laptop editors hooked to DVCPRO editing VTRs and recorder/players. All ENG traffic is transmitted first in DS-3 and then via ATM through FNC-owned fiber back to FNC's studios in Tallahassee, where it is decompressed by Tektronix codecs. Incoming news traffic is tagged and stored within the domain of the Newsmaker Systems Stardrive automation system. At the same time, FNC maintains eight satellite downlinks and is planning to erect two uplinks. Sony BVP-550 studio cameras mounted on Vinten robotic heads are used for both live-to-tape and breaking news events in the FNC studios in Tallahassee. Both control rooms are equipped with Tektronix GVG 2200 switchers.

The NewsMaker Systems Stardrive automation system controls, among other things, 16 ASC VR channels, six Link-AVS 16X1 routing switchers, six Channelmatic audio signal tone generators, two 360 Systems DigiCart audio cart machines, one Pro-Bel America 128x128 routing switcher, five DVCPRO VTRs in the edit suites, one DVCPRO VTR in the master control for digitizing, two Pinnacle Systems Lightning still stores, one SeaChange International traffic system interface and two Chyron Max systems. Weather graphics and data are generated on a Kavouras unit.

Nonlinear editing is performed on a Scitex StrataSphere. What attracted Fehr to the StrataSphere was the ability to affordably do realtime nonlinear editing.

"Being able to perform realtime nonlinear editing functions with multiple video layering without any degradation means we save lots of time because we don't have to render anything," says Fehr. "Video editors can do some effective operations with this hardware in just a couple of hours and be right up to speed on this unit in about a week or so."

FNC is on its way to redefining what local TV news is all about in Florida. How fast the rest of the country catches on remains to be seen. ■

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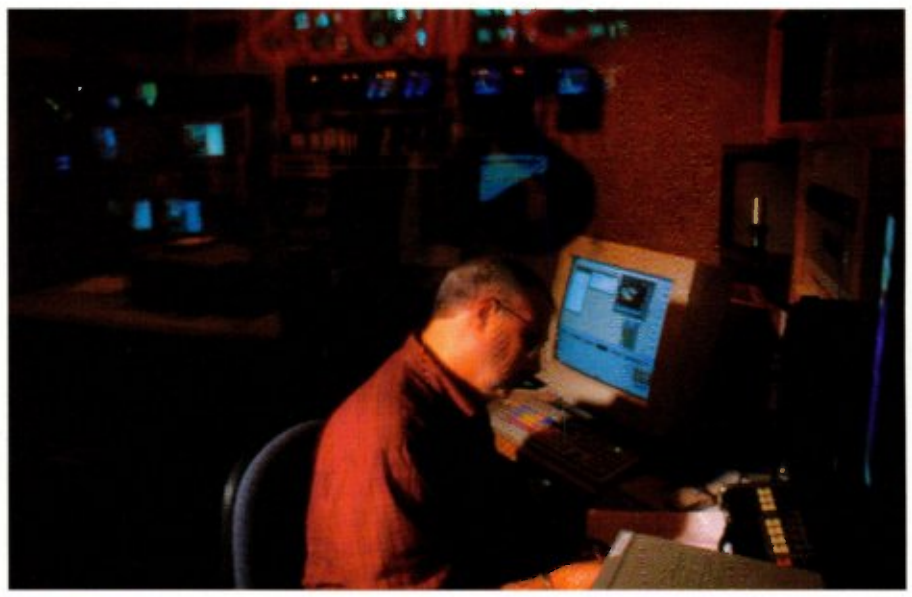
SPECIAL REPORT • DTV IN THE NEWSROOM

This Is Digital

Triage process allows CNN organizations to manage content on servers more effectively



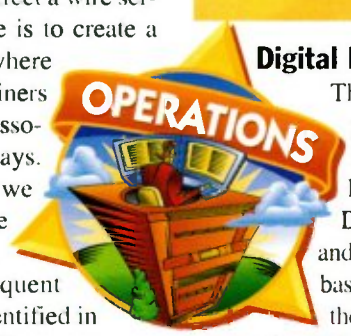
CNN's "Triage" is a PC-based application that was developed by the CNN News Group to control the flow of video material. Quantel Clipbox servers and Hewlett-Packard PCs are used at CNNSI for its "Triage" system.

Beyond the numerous anchors and reporters who work for the CNN News Group is a group of technologists that is overseeing development activities on a wide range of new digital tools and techniques for the entire CNN family of networks.

Kevin T. Ivey is vice president for research and development of basic technology at the CNN News Group, one part of CNN's diverse R&D group that brings together a mix of expertise in television production, engineering and traditional information management systems.

Top on this group's list of objectives is the creation of an industrywide non-serial MPEG2 format. This group is also focused on further refinements to CNN's capabilities when it comes to digital content management. CNN and Sony are presently working together on MPEG2-related issues, according to Ivey.

"A non-serial MPEG2 format is still elusive. We're bullish that we can acquire on it, produce on it and transmit it. As far as content management is concerned, we're seeking what is in effect a wire service model. Our objective is to create a database environment where we can wrap media containers around material and its associated meta-data," Ivey says. "Among other things, we want to be able to create containers that bind material with its subsequent versions and have it all identified in the same media container."



"Triage" is a PC-based application developed by CNN News Group that controls the flow of video material. At CNNSI, four production and two air—main and backup—Quantel Clipbox video servers are accessed by editors using 10 Quantel Newsbox nonlinear news-editing systems. Hewlett-Packard PCs with either Windows 95 or NT software equipped with VTR boards are linked to the Clipboxes through a Philips BTS 601 router. These PCs are the drivers for CNNSI's content management system.

The scope of the Triage system devised by Ivey and Bill Galvin for CNNSI is being broadened so that it can possibly assist producers and editors as they look for ways to limit the flood of raw material that initially flows into the video file servers.

"Triage is one of the most important things we've done in terms of content management. The Triage process allows [us] to control what goes on the video file server," Ivey says. "Triage allows us to preselect items before they are committed to the video file server, while at the same time, we record the whole event on Betacam SX tape as a backup."

Digital News

The CNNSI digital news processing system has been in place since the launch of CNNSI in December 1996. Quantel and Memex—a unit of UK-based IBIS, Ltd.—developed the initial digital newsroom concept for CNNSI, based on CNN's specifications. Ivey indicates that the decision to use the Memex software was based on the fact that IBIS had created a number of the record and play utility modules bundled with Quantel's ClipBox. These modules formed the basic functionality required for Triage. This Quantel and Memex system is deployed not only at CNNSI but also at CNN en Espanol, along with Quantel ClipBoxes. Other networks in the CNN News Groups, such as CNN Headline News and CNNfn, are using Avid technology.

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"We are evaluating capabilities and how we will be going forward from a cost and performance standpoint," Ivey says, indicating that, for example, an RFP has gone out to Nexus/Newsmaker.

"Memex worked with us to create the proprietary concept of software-driven templates. We believed that Triage was the right solution in terms of addressing the limited capacity of the servers. We knew that Triage worked well as a model," Ivey adds. "We took delivery of the first prototype in October 1996."

While a NEXUS informatics Newswire-2000 desktop new production system is included in the mix, Ivey indicates that Newsmaker Systems' Stardrive unit may be added in order to give producers more flexibility. Munich-based NEXUS informatics recently acquired Newsmaker Systems. The search is also on for a loading process that is more dynamic than the one-way or static system now in place. One advantage would be to avoid or eliminate the need to reload the entire playlist after editing changes are made to the rundown. This is aimed at enhancing the overall timing of the show, according to Ivey.

"We will be able to make changes easier. We're focused on the full-time rundown between the ClipBox and the playlist," Ivey adds.

Browsing for News

In August, CNN, CNN International and CNN Headline News were preparing to roll out the low-resolution browsing system that has been in use at CNNSI and CNN en Espanol for several months.

This project involves Silicon Graphics (SGI) and Virage, according to Ivey. Using an SGI Origin 2000 server, the new system will have the ability to "listen" through a serial port to all the VTRs in the feed area in an active transport mode. This system mimics the activity of a VTR, matching the timecode and the asset in question to a high-resolution tape version via a proxy server. CNNSI uses a Compaq PC with Windows NT to tap into one port on the main air ClipBox server. Among other things, it identifies and retrieves new clips including last-minute comments added by on-air.

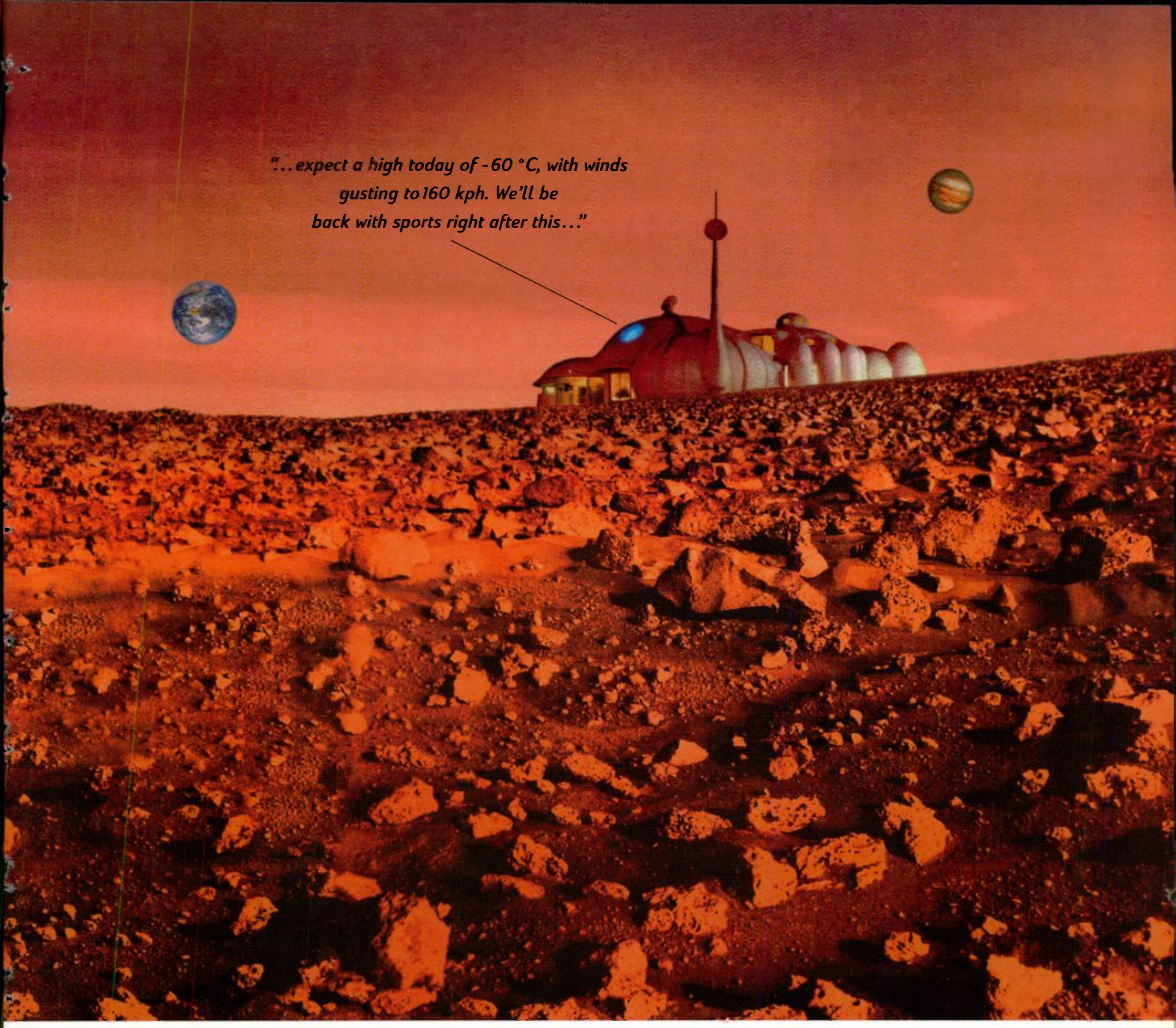
Bringing additional automation to the rundown control process is something that Ivey identifies as a separate area of concern, although it plays indirectly into the low-resolution solution. He has developed a time-centered hypothetical matrix involving a horizontal axis with individual story-building elements along that axis. In addition, all media of the same type that might be used to construct a playlist are on the vertical axis.

"The way the system works now, when a big chunk of the parent media exists in one file and the children [cut versions of the parent raw material] have been isolated onto the playlist, any deleting that might occur as a part of the routine file management process leaves you with a lot of orphan children," Ivey says.

At the National Association of Broadcasters annual convention, the entire CNN News Group announced that it is in the midst of a three-year deployment of Sony Betacam SX hardware, first used by CNNSI and CNN en Espanol. When it is completed, it will propel CNNSI and the rest of CNN's far-flung newsgathering operation into the digital realm of 480p.

"CNN's investment in Sony represents our joint effort to deliver an MPEG2 format, and our deployment of Betacam SX represents an interim step in this joint undertaking," Ivey says.

The first Sony SX cameras will arrive this fall, according to Ivey, who indicates that interchangeability was a key determining factor. CNN Sports already had a full complement of Sony Betacam SP decks at the time CNNSI launched. New Sony SX VTRs operate in tandem with SP playback units, serving as backups for loading onto the servers.—*Peter J. Brown*



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SPECIAL REPORT • DTV IN THE NEWSROOM

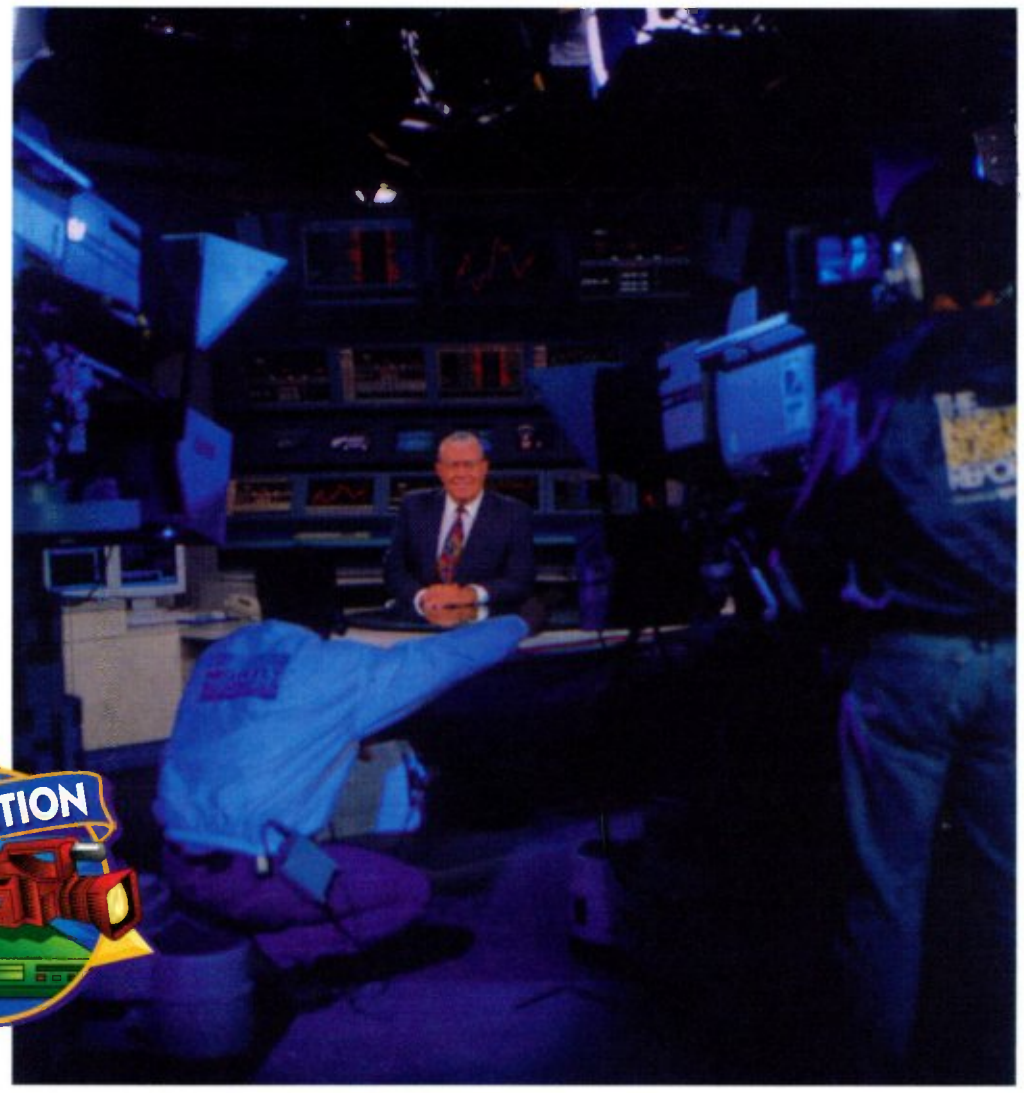
Nightly Business Report Taps into Nonlinear Advantage

By Peter Brown

When it comes to national news broadcasts, CNN and the major networks offer the most. But night in and night out, WPBT2 Miami, home of South Florida Public Television, is also the home of the *Nightly Business Report* (*NBR*).

NBR is a national leader in daily business news programming, and it's jointly produced by NBR Enterprises, a division of WPBT, in association with the global information and data company BRIDGE.

NBR is beamed to 277 PBS TV stations nationwide as well as a global audience via the Armed Forces Television Service (AFTS) and USIA Worldnet Satellite Network. *NBR News Brief* and *NBR Morning Report* are also produced here. In addition, WPBT owns a commercial TV production unit known as Comtel.



Paul Kangas, Miami-based co-anchor of the Nightly Business Report on the set of the program with a camera operator and floor manager. A Scitex Digital Video StrataSphere nonlinear editing system was just added to the facility.

According to Larry Krupa, WPBT's director of engineering, it's ready to make the switch to a digital transmission format. PBS is pursuing a 1080i solution, but such a transition is not likely to occur soon at WPBT, primarily for budgetary reasons. Evidence of intensive remodeling is everywhere in the building.

"How much will HDTV transmission cost? Probably around $1.5 million just to put it on the air and pass the signal straight through. That covers the transmitter, antenna, studio-to-transmitter links (STLs) and monitors," Krupa says.

WPBT is also awash in digital hardware. A WavePhore Systems "Wavetop" PC interconnection was installed last year, offering viewers WPBT programming via VBI for PC. Two years ago, WPBT began providing its visually impaired viewers with descriptive video services (DVS) using secondary audio programming (SAP). This amounts to a continuous play-by-play description of on-screen actions.

In the master control room, a Tektronix Profile video server was installed in early 1998. It is married to an Odetics Systems 2000 cart system.

"We're wired for the future," Krupa says. "We don't set the technical requirements. Whatever the producers want, that's what we produce. We just make it work correctly."

For example, the RGB cables in the brand-new component graphics room—finished last November—are cut to equal lengths using Belden's 1505A Precision Digital coax. This will ensure a quick conversion to serial 601. Faroudja Labs encoders and decoders are in place. And the audio mixing room sports a Wheatstone 600 analog console along with a Korg digital audio mixer and a SoundLink SL100C. The audio mixers tap into 360 Systems DigiCart IIs.

"We won't have to replace the analog machine. We can continue to mix in analog, convert it and embed it," Krupa says.

NBR's editing and graphics facilities are great examples of putting digital technologies to use, and their ownership of Scitex Digital Video ImMix Cube editing system shows that they are a believer in nonlinear technology.

NBR's three edit suites include a Scitex ImMix Cube, Betacam SX and SP units, BVE 800s and an Avid Newscutter disk-based news editor. NBR's staff has produced its own virtual sets. Otherwise, the NBR set in WPBT's Studio B is equipped with Ikegami 357A cameras that will have to be replaced whenever the switch to 1080i occurs.

Graphics hardware includes Macintosh work stations, Quantel Paintbox units, Abekas still store, Chyron character generators and an SGI Indigo2 in the separate NBR graphics production room.

One new tool in the facility is a new Scitex StrataSphere nonlinear editing unit. It's currently set up on the facility's second floor, where all NBR production takes place. Manny Lopez, a member of the production staff, indicates that, with its ability to handle up to 51 layers of video, the StrataSphere is a welcome addition.

"PBS is looking to us for content as we enter the multichannel era. This is a competitive environment, and we want to be in the foreground of digital TV," says Jim Fasilis, director of marketing for NBR.

"Acquisition is the big question, with our field acquisition eventually migrating from Beta SP to Beta SX. It comes down to money. We also have a multiyear migration plan with Avid. We are an existing Basys customer, and we see no reason to move off Newscutter," says Joseph Sherrill, NBR's supervisor of news operations. "NBR is put together in one hour. NBR revolves around its editorial content. The Avid system works well—it ties the production and editorial together."

WPBT and NBR use Williams Vyvx Services fiber to link its studio facilities in Miami to its studios in New York City, Chicago and Washington, D.C. Outbound fiber links are in place to serve local cable headends. Fiber-based hardware includes Grass Valley Wavelink, Alcatel 1718 VC decoders, ALS transmitter/receivers and AT&T Lightwand.

"We have gone from all satellite to virtually none on the incoming side—unless it is out of an SNG truck somewhere—whereas we once used an hour of inbound satellite time per day," Sherrill says.

WPBT uses two Ma/Com 7GHz STLs to beam out to an RCA transmitter, supported by Comark. Additional tower space for a new UHF antenna is available on the existing tower, which is five miles from the studio due to the departure of a former UHF tenant. And despite the large facility already in use, additional space for any studio expansion or replacement is also available on WPBT's property. The on-site Ku-Band satellite uplink for PBS uses an MCL transmitter with GI DigiCipher II encryption and Tektronix GVG SMS 8000 audio/video encoder, which is used to convert the analog feed to digital, according to Krupa.

This facility includes a Blonder-Tongue Labs 12-channel internal CATV system that is fed by a large dish farm on the roof. ■

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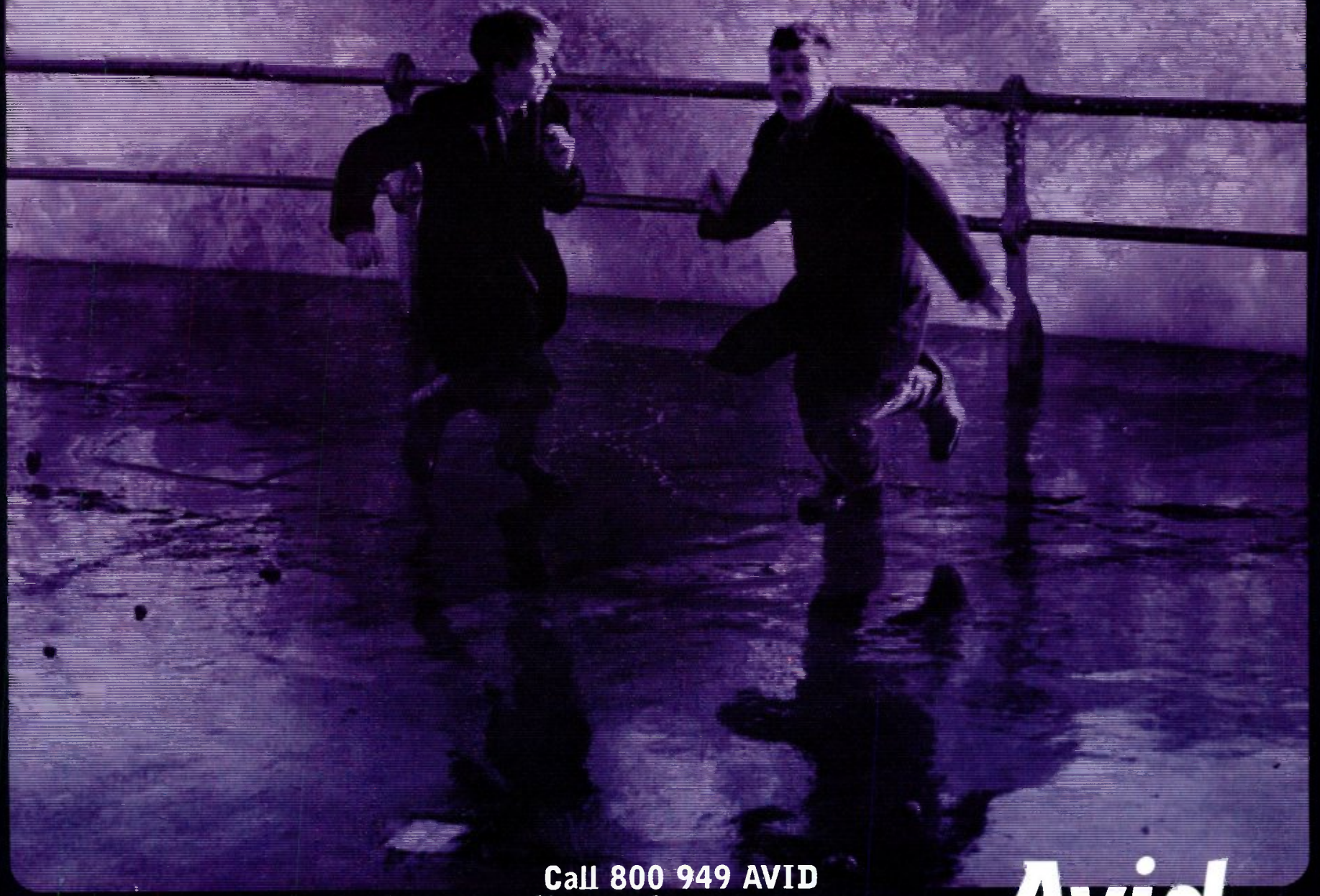

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Taking DTV Audio to the Air

Analog still reigns with on-air consoles for television stations and networks

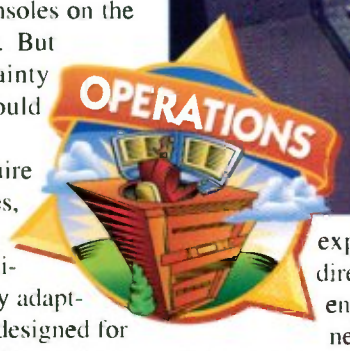
By Dan Daley

The Euphonix CS3100B console.

Digital consoles are *au courant* in most market segments. But on-air television broadcast applications still find the analog domain both familiar and comfortable, and it looks as though it will remain that way for some time to come.

Make no mistake—as the broadcast industry hurtles toward a decidedly digital future, consoles, like all other audio components except speakers and microphones, will follow. At some point it will simply become unreasonable—economically and technically—not to be digital. But just as analog technology has managed to outlive predictions of its demise for the last 15 years in music recording, so it seems to maintain a hold in on-air applications.

It has nothing to do with lack of choices. There are many digital consoles on the market and more every year. But there is also great uncertainty about what platforms should replace existing ones.



On-air audio boards require very specific sets of features, such as separate power supplies and status lock capabilities, that make them less easily adaptable from consoles originally designed for other markets. And as opposed to post, on-air applications will continue to favor those audio elements that are most related to analog. Even as six-channel discrete broadcasting becomes a reality, the audio will still hang primarily around dialogue and music.

Musing on that contrast, John Sanborn, product manager for the Euphonix CS3100B hybrid digitally controlled analog signal-path console, notes that Bob Whyley, director of audio for *The Tonight Show with Jay Leno*, has chosen to keep his show's audio in the analog domain despite NBC's decision to make it one of the first late-night shows to go high definition next spring.

"He told me that it doesn't make sense to go digital—it's all dialogue and music," says Sanborn. "He believes that analog EQ is better for music and smoother for the dialogue. To make it digital, he'll simply run it through six [A-D] converters."

Sanborn has reason to feel as he does. He's selling what is at heart an analog console, although he'll also point out that digital signal paths in general have the potential for latency delays, causing asynchronous artifacts between audio and video signals. But those selling digital signal paths will tell you that they're far more survivable in a digital broadcasting environment, particularly one that will find itself dealing with a range of data compression algorithms and schemes in coming years.

As a result, converting audio to digital prior to the final broadcast output stage is not high on everyone's lists at the moment. "It's not at the top of our list at all," explains Alex Likowski, director of operations and engineering for NewsChannel 8 in Washington, D.C. While digital six-channel sound is growing in consumer awareness, it's going to be at least several years before he expects his and other midsized (in this case a 1.1-million household market) independent operations to spend time and money on significant digital audio conversions.

"Not everyone's future is being fueled by the same things that are propelling large network decisions," he adds.

Digital Links

But digital's proponents are equally vociferous. Thanks to the economics of the computer industry, with which the entire pro-audio industry is increasingly aligned, costs of digital technology are dropping. As Studer's vice president of Sales, Joe Bean, explains succinctly, "It's simply less expensive these days to build a digital console than it is to build an analog one—a digital console that gives you all the functionality of analog and more."

Bean adds, "DTV has had little or no effect on our thinking. The film and post industries are the ones that use the most resources on a console, and we've found that whatever they require eventually trickles back to broadcast. And there's very little demand for surround in broadcast now, relative to how much programming is out there. Film uses it, and DVD and home theater will continue to drive it. But it's not yet a big issue with many broadcasters."

That sentiment is backed up by Glenn Saunders, president of Zaxcom. "Post drives the evolution of broadcast to a large degree," he says. That's different than the FCC-mandated transition to digital television, which Saunders says creates a sort of faux demand for new audio features, one driven by legislation rather than reality.

"That's why you're not really seeing a lot of HDTV still in one box," he adds. "[HDTV] doesn't produce as natural a technological evolution as does post production."

If there is a trend in on-air consoles, it is perhaps that digital audio consoles have a while to go before broadcasters feel compelled to embrace them, and before they do, manufacturers will have a lot of educating to do as the market becomes even more crowded.

"Digital television was supposed to produce a revolution in broadcasting, but so far all it's produced is a lot of confusion," says Harrison Marketing manager Steve Turley, half in jest, half in frustration. "One of our biggest customers, WFAA, an ABC affiliate in Dallas, a top-10 market, is raring to go digital, but it's being held up by its own network. ABC, like other networks, has not specified what digital format it will use or when it will use it. What you have are affiliates around the country who want to move on digital and other new audio things, but they're dependent upon what programming they're getting. It's hard to convince someone to make the surround investment when most of the broadcast day is still in mono. Some broadcasters want to press the edge of technology, others want to hold back. All we can do as manufacturers is offer as much capability as we can to accommodate as many people as we can."

Other Trends

Both for analog and digital on-air consoles, other trends are afoot. Price ranges have become wider, but not because users are necessarily paying more for enhanced functionality. Rather, the consoles themselves are becoming larger as broadcast audio's requirements for channels and source elements increase.

Part of that is also a desire on the part of broadcast audio engineers not to have to rely on sidecar mixers for additional channels, mainly since those sidecars can't always be interfaced with the automation systems upon which they have increasingly come to rely, particularly as broadcast management wants cost efficiencies in their boards in the form of dual on-air and post-production capabilities. The ability to flip a console between those functions, and to be able to recall status setups in each mode, has moved from luxury to necessity.

"It's all part of the trend towards larger, more sophisticated on-air consoles that offer high levels of automation and high levels of integration with the rest of the digital broadcast environment," observes Bean. ■

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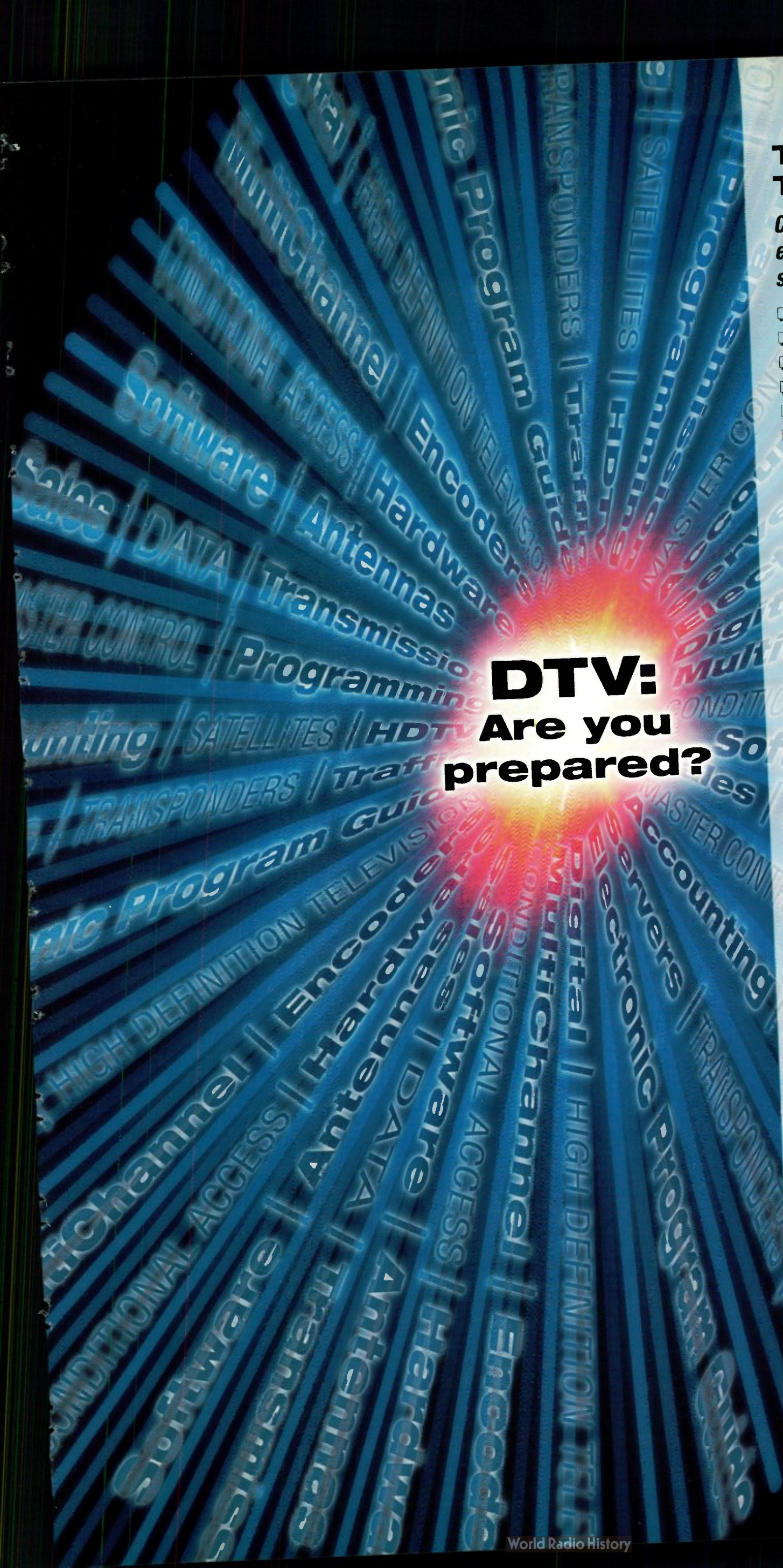

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Hybrid Fiber-Coax Plants Help Cable Go Digital

By Peter Brown

When it comes to cable systems being able to offer such future digital products as DTV and interactive TV, there's no doubt that hybrid fiber-coax (HFC) plants will be an important part of the puzzle.

Their *raison d'etre*: the necessary bandwidth for a variety of existing and emerging services for both residential and commercial customers. There are already a number of HFC users that are growing their networks well beyond 750 MHz to the next frontier of 862 MHz.

This article examines three different style and size MSOs, offering three different perspectives on the integration of fiber into an existing cable plant. One conclusion is clear after talking with all of them—a hybrid fiber-coax plant is a robust and cutting-edge concept that is hard to beat. Dismantling headends while plugging in new services appears to be the way to go, and from IP telephony to VOD to DTV, it's all beginning to happen on the HFC highway.

Scientific-Atlanta's Explorer 2000 digital set-top box system is currently being used in Austin, TX, for Time Warner's testing of its 750 MHz Pegasus platform.

Time Warner

At Time Warner Cable in Stamford, CT, the standard 750 MHz configuration is broken out into a 550 MHz analog component with a ceiling of roughly 80 channels and 200 MHz digital component. That 200 MHz includes a so-called "dark alley" or "digital bank" of more than 100 MHz of instantly available and currently unassigned bandwidth. That same unassigned digital bank expands to more than 200 MHz in an 862 MHz configuration.

With cable MSOs, as fiber goes in, headends come out, and this trend shows no sign of slowing down. And it's not just the Time Warner's of the world who are taking on HFC. There are also a number of small and mid-sized MSO's joining the fray.

In Austin, TX, Time Warner is testing the 750 MHz Pegasus platform, and a close-up look at how the 750 MHz is divided shows that just 2 MHz, far less than 0.5 % of the available bandwidth, is devoted to network control functions. It's this sort of bandwidth conservation that makes it easy to understand why some of the most aggressive telco overbuilders in North America, such as Ameritech and New Brunswick Telephone (NBTel) in Canada, are embracing HFC.

Bill Wall, Scientific-Atlanta chief scientist and technical director, says, "Our [Explorer 2000 digital set-top-box system] and Pegasus use one MHz each in both the forward and reverse direction, for a total of two MHz for control and signaling. This bandwidth may be shared with other applications that require out-of-band and upstream data transmission and it's both bandwidth conserving and cost-effective in providing continuous Internet Protocol (IP) connectivity to the STB."

For James A. Chiddix, chief technology officer at Time Warner Cable, the light at the end of Time Warner's HFC upgrade tunnel is finally in sight. He anticipates that by the end of this year, the process will be 70% complete with the whole project wrapping up by the end of the year 2000 across all 40 large operating divisions. At that time, while some smaller 550 MHz systems will remain in the mix, the standard will be 750 MHz, two-way interactive with a 1 GHz rating on all passives and taps with 500 households per node—and potentially half that total where nodes are split in two.

"As far as what we're doing with digital, it's an evolutionary, low-risk strategy. All the pieces are there, not that it can't get better. Today 750 can carry 80 analog channels and 1.3 Gbps of digital content or services," Chiddix says. "It represents a logical path from analog to hybrid analog/digital. Eventually we may get to an all-digital environment, but not in my lifetime."

Chiddix sees no quantum leaps forward on the horizon with respect to interconnections. Running 1550 and 1310 nanometer windows on the same fiber is one possibility on which Chiddix is keeping his eye. However, while he has watched WDM technology-related developments ever since WDM was deployed in Hawaii in 1985, he is not sure how dense WDM will play out.

"With respect to dense WDM, the question is obvious. What do we gain? We just don't know at this point," Chiddix says. "It is something we will use in the coming years as the tradeoff between fiber costs and WDM equipment for short runs becomes more favorable, but the model is not clear yet."

"[Building this type of plant] helps ward off the overbuilders who see the cost of entry as too high once the fiber is in place."

—David M. Heyrend, FrontierVision VP of Engineering

Pushing Fiber Deeper

As Time Warner's cutting-edge, fourth-generation interactivity platform has shifted from Orlando—home to Time Warner's Full Service Network—to Austin, integration has become as big a focus as interactivity. This integration begins at the headend.

"In order to support two-way interactivity, there are two-way modems at each hub to talk to the set-tops connected to that hub. These, in turn, are connected via an IP-based wide area network (WAN) to the master headend. This WAN may incorporate standard IP routers at both the hubs as well as at the master headend," Wall says.

A small ATM switch may also be used as a concentrator from the hubs to the headend, as well as for routing high-speed data like Time Warner's Broadcast File Server (BFS) to QAM modulators. Digital QAM modulators are required for both video and data applications. And to tailor the content on a given cable system, MPEG add-drop multiplexers and signal conditioners such as Broadband Integrated Gateway (BIG) may be used.

"The integrated two-way network has to provide a number of services, and in the process you encounter software-related challenges in all parts of the network," Wall says.

In terms of where things stand today, Wall credits both the influence and the credibility of the Society of Cable Television Engineers (SCTE) and the OpenCable initiative for reinforcing and propelling further developments in such important areas as the defining of protocols.

Wall sees the presence of the Federal Communications Commission in this unfolding story with its pronounced advocacy of a retail model for the set-top box market linked to a set timetable for implementation in 2000 as another catalyst for the move to a broader, standardized approach.

"Look at how far we have come from the Full Service Network. The cost for the video-on-demand (VOD) hardware alone on that 4,000-home network was in excess of $10,000 per stream. The goal all along has been to drive that cost down to under $1,000 per stream. We're there now," Wall says. "The cost models necessary to make the promise of interactivity economically viable simply were not there in the early 1990s."

Wall adds that the big lesson from all previous VOD trials was that standards are necessary. "Achieving interoperability and the portability of applications is essential if this new marketplace is going to grow in a meaningful way," Wall adds.

VOD-based solutions from SeaChange International and Concurrent Computer Corp. are part of the Pegasus trial. At the same time, Concurrent is in a joint development effort with S-A to push the VOD envelope by joining Concurrent's MediaHawk server with the Explorer 2000. Wall indicates that a beta system deployment will occur by the end of the year.

Does this adoption by S-A of an OpenCable-friendly, 256 quadrature amplitude modulation (QAM)-based approach signal a further abandonment of any ATM-based systems in the future?

"ATM may be used in the backbone, but it will not be a factor for video carriage within the HFC part of the plant, where everything is MPEG transport. Incidentally, the control channels use IP over ATM as part of the DAVIC standard," Wall says.

Wall sees 256 QAM as the cable industry's magic bullet, but he adds that there is still a need for additional research proceedings on other modulation techniques.

"A key consideration in developing 256 QAM was the ability to pass two full HD channels," he explains. "It is also a significant factor in making VOD economical since it can handle 40% more capacity than 64 QAM. We are always looking at new technologies, but I believe 256 QAM will be here for a while. Higher levels of modulation are possible, but the gain in bandwidth is incrementally smaller with each step, and the cable plant constraints become more difficult to address as well."

According to Wall, most MSO's who are using 750 MHz systems today are far under utilizing that capacity today and will do so far into the future. "It's the matter of pushing fiber deeper and deeper into the network and determining with how many homes do you share that bandwidth. It's the network that connects up to the HFC--that's where the bottlenecks are in terms of bandwidth constraints, not in the HFC network itself."

A Ring Within A Ring

According to Ken Wright, executive director for engineering at Nashville-based Intermedia Partners, its most-aggressive digital fiber interconnection to date has been playing out in Nashville, where 400,000 customers—are now served off a single headend which feeds four digital hubs. In other words, approximately 20% of the two million households passed by this nation's 10th-largest MSO are accessed off one network.

Intermedia is a big user of Headend-In-The-Sky (HITS), tapping every pod or transponder that HITS lights up on Galaxy 7 as part of Intermedia's strong emphasis on digital services that are grouped together under the "I-dig" banner.

"It's one of the largest clusters of subscribers/homes passed off a single headend. The primary and secondary (backup) headends were already in place. We used ADC Telecommunications equipment for the digital interconnect, and we used Scientific-Atlanta in the digital hubs for the upconverters," Wright says. The four digital hubs are interconnected via a fiber ring and Intermedia has a second set of digital encoders at the backup headend so that it can switch in and be the signal source feeding the ring, giving the system full redundancy.

Growth and new housing construction are important considerations for Intermedia,

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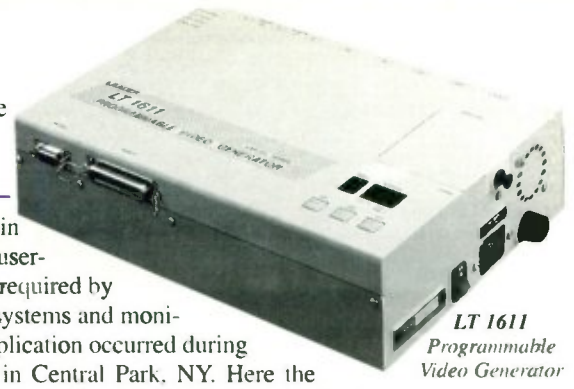

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which will have somewhere between 75 and 80% of its systems rebuilt by the end of this year with two-way, interactive plants.

"Our OTN's (Optical Transition Nodes) are placed strategically in a manner that allows us to react more efficiently and effectively to new housing construction. Our decision to deploy OTN's is still driven by the size of the system," Wright says. "We are scaling our fiber network, and we have left ourselves ample flexibility in the process."

Intermedia's blueprint calls for four fibers per node with forward and reverse-path fibers backed up by two spares. OTN size varies from 7,000 to 30,000 homes per OTN, according to Wright. "With fiber feeding a few hundred nodes management could be a nightmare without OTN's," Wright adds.

Aggregate return traffic with approximately 700 homes per node is a key concern.

"Within the Nashville metro system itself—the plant fed directly from the primary headend—the OTNs within that plant feed approximately 20,000-30,000 homes passed each. And so each OTN is as big as many cable systems,"

Because of that large size, redundancy of the physical plant was important. The OTNs are interconnected by a secondary fiber ring that has a feed from both the primary and the backup headends. This ring within a ring carries a signal from both headends.

"In all four of these DMAs, we are the operator. This industry is consolidating and moving toward the kind of clustering that allows an operator to be the service provider for an entire DMA," Wright says. "In these four markets, we're there, although I should probably qualify that and say that in both Greenville/Spartanburg and Lexington, there are operators who have a fair number of subscribers in some of the suburbs."

On The Frontier

From its start three years ago, Denver-based FrontierVision Partners has been focusing on extremely rapid growth and enhancing the density of its clusters. With more than 600,000 customers in four major multi-state clusters in the Northeast and Midwest, FrontierVision has been able to leap into the ranks of the top 20 MSO's, and now is fine-tuning its base of operations.

FrontierVision's HFC strategy mirrors Time Warner's and Intermedia's. The big difference between FrontierVision and Time Warner and Intermedia is a lower average households per mile density (although its household penetration rate at 69% is slightly higher than the two other MSOs). This low HH density greatly impacts on how FrontierVision intends to upgrade its HFC networks.

"Like everyone else, we want to drive fiber as far into the plant as possible, but we have to look at the economic feasibility and the demographics," says David M. Heyrend, FrontierVision's vice president of engineering.

Achieving 750 MHz two-way interactive capacity on a system-wide basis is out of the question, at least for now, according to Heyrend, who estimates that the FrontierVision pie chart can be broken down into almost equal thirds in terms of households hooked up to plants that are at least 550 MHz, 450 MHz or below 450 MHz.

"We are establishing anchor systems with adjacent fill-in properties. The make-up of our clusters is constantly changing. We are operating with a backbone or FTF (fiber-to-feeder) fiber distribution model in mind. Whereas we can work with a star, we cannot pursue a ring-based solution," says Heyrend.

Redundancy is also an issue. "When you go 15 miles down a rural highway, it is tough to make a redundant ring," explains Heyrend. "I can see pieces of a ring coming together in some of our properties, but for now our areas tend to be widely separated and that makes it tough to get rings together."

Heyrend estimates that as a general rule FrontierVision runs six fibers to a node and serves 500 homes off each node. Eliminating headends that can cost $500,000 to $750,000 and adding passive coupler-OTN hubs at $5,000 each is another objective. Consolidating return path fiber in particular is one of Heyrend's top priorities.

"WDM means a lot to us, but we have not deployed it at this time. However, our architecture is counting on it," Heyrend says. "What do you do with the smaller systems? That's a question that lots of people are asking these days. There are lots of overbuilders out there. We have deployed fiber, because fiber counts. Among other things, building this type of plant represents an effective defensive strategy. It helps to ward off the overbuilders who see the cost of entry as too high once the fiber is in place."

Large or small, the potential business opportunities provided by new digital services mean it's time for cable systems to look at ways to make sure they can offer customers every available product. And an HCF plant just might be the first step. ■

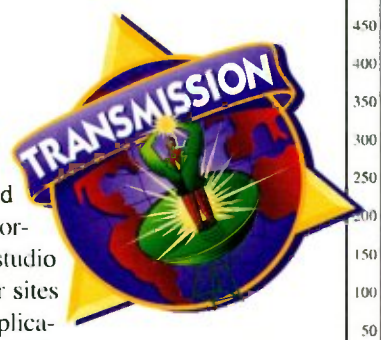
Thorough Digital Path Profiling Important For HDTV STL

Part Two

In the first part of this article, we presented an overview of a recent demonstration project involving California Microwave's Microwave Radio Communications (MRC) business area, the Model HDTV Station, WHD-TV, Washington, DC and Public Broadcasting Service (PBS), Alexandria, Virginia. These groups worked together to integrate, install and operate the first two-channel NTSC/ATSC microwave link between the Model Station and PBS. The first part presented the system engineering, integration and fade margin considerations. The second part of the article starts with issues of digital path profiling.

Thorough digital path profiling is the key to successfully overbuilding legacy analog links for digital and allowing for later upgrades in system capacity.

To provide an accurate profile, television engineers need to pin-point coordinates of the studio and transmitter sites and, when applicable, the backhaul from the satellite downlinks.



The verification of line of sight transmission is accomplished by plotting these coordinates on the latest topography software and analysis programs. The coordinates can then be superimposed on a terrain database that reflects whether or not obstructions are identified.

In planning an HDTV STL it's important to use the latest computer modeling technology to provide for effective digital path profiling. Figure 1 shows the basic path characteristics of the link between the Model HDTV Station and PBS Braddock Place.

Figure 2 shows the multipath propagation modeling that the MRC path profile system provides. In this example, there is a clear indication of no multipath reflection problems on the path. If reflections were observed to be hitting the receive antenna, this would be an indication that a higher receive antenna height would be required, or possibly two spaced antennas for a diversity receive installation.

A complete digital path profile shows the system and link characteristics, including the calculated fade margins. Figure 3 contains the calculated system availability for the Model Station, 99.9996% system availability. One thing to watch out for when working with highly compressed digital signals, such as the 19.39 Mbps ATSC transport stream signal, is that the loss of an "I" frame during a fade can potentially result in a loss of programming. For this reason, digital links need to be designed to a higher standard of availability as well as a higher standard of reliability—at least 10-9 bit error rate (BER) performance.

Figure 4 illustrates the differences in typical system availability and transmission distance for a 2-watt 7 GHz microwave system. The charts compare the analog link operating at 2 watts (+33 dBm), the comparable DS3 digital system using 16QAM modulation and operating at 0.5 watt (+27 dBm), and the improved availability and path distance that can be achieved by using a space diversity receive system with the digital link.

Overbuilding Analog Links

Summing up these considerations, it becomes critical to look at each digital upgrade link as a new link, not just as a swap out of the analog radio for the new digital video microwave system. For short STL links with high fade margins, the existing antennas and waveguide or transmission line may be fine. For paths longer than 10 miles, it may be necessary to add adaptive equalization to the digital microwave system. Depending upon the radio demodulator design, adaptive equalization may provide from 7 to 12 dB of additional system gain.

If additional system gain is still needed or if adaptive equalization is not the right solution, then it may be necessary to improve the link by replacing the antennas and transmission line with low VSWR, high-performance models.

The purpose of the Model Station is to provide the platform to work out integration and interface issues facing broadcasters' transition to digital. Once again, the Model Station met this goal with its first successful STL. ■

Figure 1

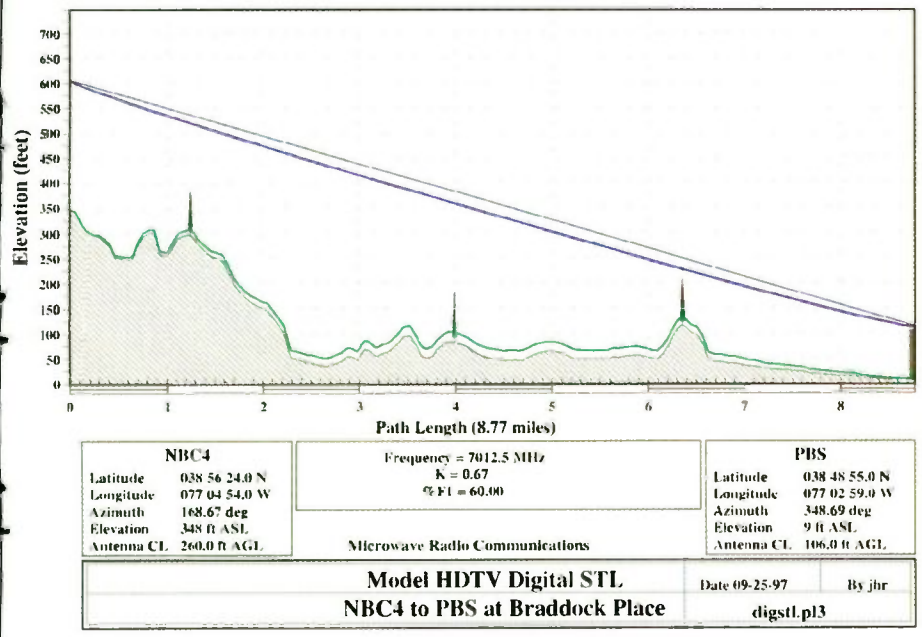


Figure 2

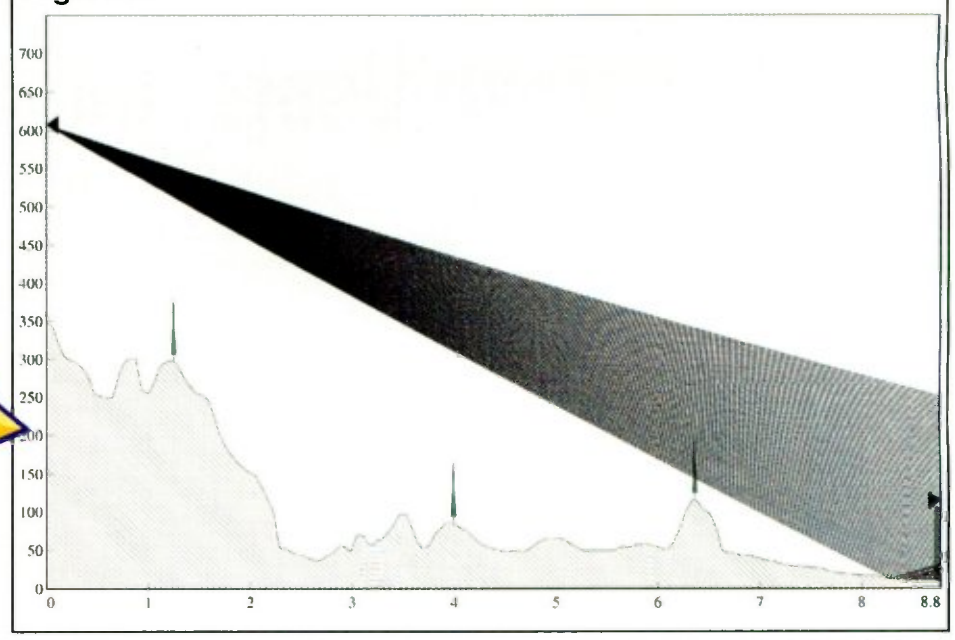


Figure 3

	NBC4	PBS
Terrain Roughness (ft)	97.23	
C Factor	1.00	
Average Annual Temperature (deg F)	55.00	
Diversity Type	Non Diversity	
Worst Month Multipath 1 way (sec)		11.43
Worst Month Multipath 1 way (%)		99.999565
Annual Multipath 1 way (sec)		37.72
Annual Multipath 1 way (%)		99.999880

Figure 4

Digital vs Analog System Availability

	Analog NTSC	DS3 16QAM	DS3/16QAM Space Diversity
Power Output	+33 dBm	+27 dBm	+27 dBm
Receive Threshold	-85 dB	-80dB	-80dB
Frequency	6.8 GHz	6.8 GHz	6.8 GHz
Antennas	8-ft	8-ft	8-ft
Distance @99.999%	40 miles	23 miles	>50 miles
Distance @99.9999%	25 miles	12.5 miles	35 miles

DTVPOST for Mac

For Macintosh Users, the Sky Is (Not) Falling (Again)

Every year it's the same old song and dance, but the Mac keeps on sticking around

By Ed Eberle

Macs rule!

That's according to industry experts who pilot professional edit suites and count on Apple's Macintosh-based editing interfaces and software applications to see them through their most complex, artistic and even most mundane editing chores.

While they readily agree that the Mac still does the job better than anything else, the grumbling within the post-production community about Apple's commitment to video is almost loud enough to be heard as far away as Apple headquarters in Cupertino, CA.

Like most technology-driven businesses, the future of modern post production is being forged in the crucible of the 18-month technology development cycle.

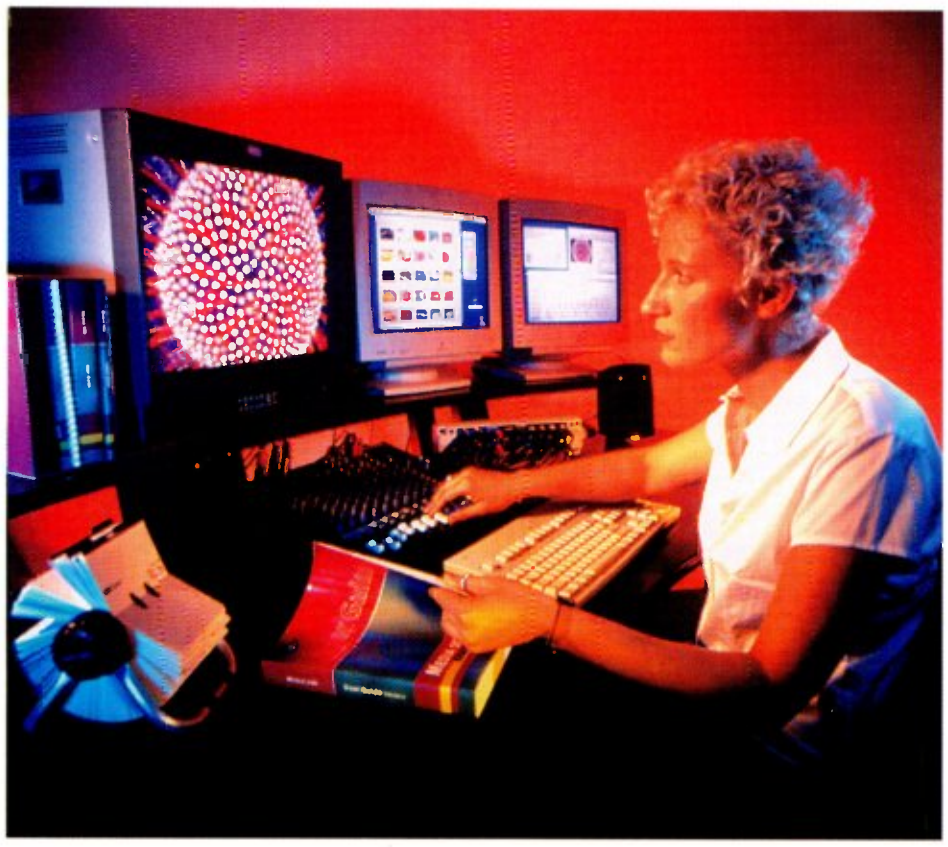
Moore's Law not only defines the technological curve but also shapes strategic planning and impacts the bottom line with a resounding thud. As overpriced single-purpose boxes are tossed overboard in favor of sharp-finned, multifunction and lower-priced desktop editing solutions, the desktop is not only shaping up as a battleground for supremacy between Mac and NT-based editing systems, but it's also becoming ground zero for an explosive redefinition of the concept of modern post production.

Has Apple, the company that invented the idea of desktop creativity and brought affordable computational power to the fingertips of America, abandoned the television industry?

Keith Hatounian, manager of solutions marketing worldwide design and publication markets for Apple, says, "Apple has always and continues to see video post production as a strategic market. And while some developers have offered NT-based products, none have abandoned their Mac products and in fact have continued to enhance them." He adds, "Apple Macintosh-based systems continue to dominate professional video. We are still seen as the most robust, easy to configure and easiest to use system. And in the deadline-driven environment of post production, that advantage can be the difference between making or losing money."

Ron Honsa, president of New York's pioneering all-Avid facility Moving Pictures, says, "Let's remember that the creative community doesn't buy platform, it buys what it takes to get the job done. When it all evens out, I'm not sure there will not be an essential difference between platforms. Mac is supreme at the moment, but both platforms will eventually be capable of doing the job. It's more a question of which standard remains attractive to software and plug-in developers.

"To many Mac loyalists, Apple seems to have severed its connection to the video business by not paying much attention to the market, and not, for instance, offering a six-slot machine when we really needed it. None of the systems have been able to get up onto the G3 platform because of that lack of slots. And that's become a major issue to Mac-based editing facilities."



Media 100 is one of a handful of companies offering a complete line of Macintosh-based nonlinear editing systems. The others include Avid and Scitex Digital Video.

Mac evangelist Jeff Cahn of New York-based Earth to Mars, which houses eight Avids in its Park Avenue facility, believes that Apple and others are taking strides to fill any product gaps.

"Apple and companies like Avid are in complete sync about the kinds of products they develop. Higher-resolution 3D graphics programs are being developed for SGI and Windows, and that may give the impression that Mac has been overlooked because of the speed issues. But Macintosh's latest, the G3, is outperforming the Pentium at all benchmarks," according to Cahn.

"I believe Apple will develop a Mac server solution to compete head-to-head with NT to take care of the server situation," he says. "Actually, OS10 is what we've been waiting for. And now that Apple is building a six-slot machine along with an expansion chassis that will work with current G3s, that solves a lot of our problems. If it's all true and they are doing that, and with the G4 machine coming up right around the corner, that means we will have a full 400 MHz six-slot machine that Avid users will go crazy for."

Apple's Chris Gulker, director of strategic relations, design and publishing markets, says, "We're quite aware of our position in the video industry. And we believe that the competition between Mac and Windows machines will benefit the entire industry. While prices are falling and speed and all other performance measurements are going up, We'll will continue to target and serve the broadcast and video post-production industry."

While not intending to upset the apple cart completely, Honsa says that there is a very real irritation among some users and adds, "While there is more video work than ever before, more video-related applications and more opportunities for Apple Computers in post production than ever before, Apple has not been shy about relegating video post to the position of a niche market. I think that could be a serious miscalculation on its part."

Moving Pictures is a full-service visual media company, posting commercials and producing long-form broadcast television and music video and has been an Avid beta site for more than 10 years. Partner Alan Miller, vice president of post production, believes, "Both Macintosh and NT-based systems could very easily coexist. One might handle one post application better than another, but there is no reason why both couldn't handle cross-platform applications and share the work," he says. "Right now, the strength of the NT system lies in its power, multiprocessing support and networking capabilities, while Mac has to go quite a distance to measure up in networking. And Macintosh's support for multiprocessing pales in comparison to NT.

But," he adds, "keep in mind that when Mac's next-generation operating system, OS10, comes out early next year, some of these differences disappear. The key, he says, "is, was and always will be, the OMF (Open Media Framework) concept. Open architectures can eliminate all of the transfer barriers and generally make life easier for everyone while expanding opportunities at every level of the business."

While Macs might have a long way to go achieve power parity with NT, they are, as they have always been, a more user-friendly platform, according to their users. Apple brought home computing into American households, single-handedly kick-started the desktop publishing revolution, has an installed base of fanatical devotees and, except for 3D, handles graphics better than any system available, so it would seem unlikely that Apple is ready to forgo its leadership in desktop-based edit systems.

Producer/Director Brendan Meyer of Endless Pictures, an L.A.-based full-service video production and post boutique running both Mac-based Avid and Media 100 systems, says, "[It's] hard to believe that Apple would walk away from the video market. There are Macs in every post facility in the country, and even now, when you speak to the guys in the driver's seat, working editors, they prefer to keep on running with Macs."

Meyer, whose company specializes in sports and music video, says, "The great majority of our stuff is more picture than graphic intensive, so we tend to stick with picture quality, high cut volume and editorial options rather than graphics and effects. We send anything more sophisticated in terms of graphics outside and then bring it back in-house for finishing."

As for the viability of Apple and its relationship with the post-production industry, he says he is "not at all worried about Apple falling behind. This is a changeable business, and technology grows with the creative demands of the market. People are always questioning what's next and are concerned about playing catch-up with technology and software, but," he adds, "aside from its inroads in 3D graphics, I don't believe that we will see a sudden shift to PC editing platforms anytime soon."

Is Apple abandoning the video market? David Goddess of Spark Productions says emphatically: "No. The interface is still very strong, and we're confident they'll continue to be supported. Most people started out with Apple products. But from an editing point of view, you do what you have to do to get the work out."

Feeling that the industry has little control over Apple's picture of the post world, Goddess says, "Working on Scitex Stratasphere for picture editing and graphics, Spark Video and Spark Design live exclusively in a Mac-based world. If developers begin creating more innovative products for NT, and the economics of post continue to be changed, then of course we would switch."

Spark Video produces, posts and creates

DTVPOST for Mac

graphics for corporate as well as commercial productions, and Goddess explains that the combination of Stratasphere, the Mac interface and available software combine to make an ideal finishing tool for the sort of short-form, graphics-intensive production Spark Video does.

Soft for Mac

Software availability is another factor influencing Mac users. The truth is that there will always be more software development activity for PC-based product than for Apple, thanks to Apple's reluctance to open its box and expand its industry user base.

"Being secretive with your approach to hardware or applications is not the way this particular world is working," says Cahn. "And of all people, Apple should have realized that at the outset. They were in the pool long before anyone else, and now they've left it to Microsoft, Intel and IBM to call the shots. I think they have suffered for that."

He says, " I want to be able to cut and work in Mac and then let my client, or his client, take a look at that finished workproduct on the PC at his office. I want them to see it on their Windows machine without glitches, add-ons or excuses about why that isn't possible. And opening that box is the only way to do it. The OMF concept is the solution to doing business in the digital age, whether you run a supermarket or cut commercials."

In addition to commercial and music video work, Earth to Mars is designing websites, and it's there that Cahn says he sees the role of the editor and the post-production facility undergoing a radical change.

"With the advent of things like WebTV, you have the television format becoming integrated into an HTML browser where on one hand you are showing programming while at the same time you have clickable areas where you can get additional information about the program or products you are seeing. Post and graphics houses that can develop for the new combinations of technologies like WebTV are jumping one step ahead of the game," he says.

"The future of television is about interactivity, and all of our ideas about how we work with video and what exactly television is are going to have to change."

While NT systems have great potential and already are demonstrating tremendous strengths in 3D graphics and some levels of video editing, at the same time they've had a hard time shaking their reputation for being difficult to operate, maintain and troubleshoot. NT systems are successful in corporations and institutional environments because of their networking abilities. And in situations where problems can be handed off to a computer specialist or network administrator, they tend to work out just fine. For some boutique or one-man-band operations, NT video editing solutions are working out well for an amazing variety of work on both the video editing and graphics ends of post, and there are people doing some amazing work on NT systems.

"At the moment, except in the area of 3D graphics, no one is clamoring for the latest NT editing system," says Honsa. "And there is certainly no groundswell of expectation that NT will rise up and overcome Mac as the interface of choice."

Partner Miller agrees. "The Mac user base is deep, and its comfortable familiarity will continue to keep it alive." But, he cautions, "People in our industry are very pragmatic. They're willing to fall in love with innovative products from a reliable source, but if it's not supported, if the software starts lacking flexibility, or if we find that the skills and tool sets of a new generation of creative editors become less tuned to that particular product line, then sooner or later we'll have to move on."

"People have been saying that the Apple sky is falling for years. I sure don't see that happening anytime soon," says Director/Editor Ben Stokes of H-Gun Productions. "With five Media 100s and one SGI workstation, we are primarily a Mac-based facility. Apple's viability in post production is something we talk about quite a bit, and although we are perfectly happy with our Mac running Media 100s, we've already decided to invest in some NT-based machines to round out our capabilities."

H-Gun is a full-service production and post-production company with offices in Chicago and San Francisco. It specializes in commercials, music video and broadcast graphic design. Stokes says he finds Apple's flexibility and user-friendliness an attractive advantage over other systems.

"There are complex Mac-based machines like the Avid and there are less complex solutions like the Media 100. Both systems have their strengths and weaknesses. But having that choice is one major advantage of the Mac interface. More simplicity means less editing features, and more complexity means both a steeper price and a higher learning curve. But still you have to fall back on Apple reliability, support and software applications that you can count on."

Strata's product lineup can be used to create stunning visual images like the one above. Below is a graphic from Fox Sports NHL coverage created using Electric Image. Copyright Fox Sports, modeling and animation by Reality Check.

Keep the Faith

The availability of standardized high-powered software, ease of use and elegant solutions like QuickTime are just a few of the compelling reasons that Mac users continue to put their faith in the Apple product. Whether the software is used to post music video, commercials, feature films or corporate promotions, both system bundled and third-party software like Strata AfterEffects, Electric Image, Adobe Photoshop and 3D Illustrator are driving the creative machine at most professional facilities.

"There are a world of post programs that now exist on NT, and that's something to keep an eye on," says Stokes. "But as far as our software use is concerned, we tend to go with the usual suspects. We make extensive use of AfterEffects, Photoshop and 3D Illustrator, but we also use Illuminaire, which works almost as a 3D extension of AfterEffects."

Citing another product developed for Mac, Stokes adds, "A really unique Mac product is MovieFlow by Valis, which I think is the best free-form elasticity and warping software that I've ever seen.

"For my money," says Stokes, "AfterEffects is still the best application for Mac that we have, and certainly developers have concentrated on creating a large number of AfterEffects/Mac plug-ins."

Missing the Boat

Some industry insiders point the finger directly at Apple President Steve Jobs and say that, for reasons unknown, he has apparently decided to ignore the desktop wave that has broken across the bow of the post-production industry. They add that, by not acknowledging the desktop video revolution, Apple could lose the race for desktop supremacy and slowly but surely sink beneath the surge of NT power and its installed user base.

With PC giants like Intel and Microsoft making investments in Avid and Discreet Logic, and with Avid's recent acquisition of SoftImage making headlines, the handwriting on the wall describing the future of these platforms is not too difficult to read. When totaled, the investments that Intel and Microsoft will have made in these post-production products within the next few years will be significant. Microsoft's present investment in Avid is near 9% and with Intel having just bought 8-10% of Discreet Logic, there would seem to be a corporate agenda that seems to be skewing toward NT. And while Avid President Bill Miller says that Avid has no intention of ever abandoning its installed base of Avid/Mac users, at the same time, by attrition alone, Mac-based products may never catch up to the full capabilities of future NT products.

With both Avid and Media 100 releasing new NT-based products and Targa, Matrox and a host of other manufacturers making NT post production an affordable option, it will be left in the end to the facility owners and editors who drive the machines to make the final decisions. And if it's true, as so many believe, that the traditional session rate and box-per-hour post-production business model, with its high-end and low-end facility designations, is quickly becoming a thing of the past. If creative flexibility is fast becoming the coin of the realm, then it won't be long before the voice of the marketplace will be heard loud and clear. And Macintosh users will once again have to try to prove the worth of their currency. ■

DTVPOST for Mac

MACINTOSH GRAPHICS: They Keep Going and Going

Despite inroads by the PC platform, tools are still being developed for the artists who love their Macs

By Adam Matthews

The Macintosh platform no longer dominates the computer graphics scene. Virtually everywhere you look, programs that started out as exclusively for the Macintosh are being ported to the Windows platform.

Mac versions of software continue to be available, but there are very few differences between these products and their siblings that run under Windows. The biggest differences, of course, are based on the platform themselves.

A few years ago, there was a plethora of products that ran only on the Mac. It was easy to justify this less-popular platform when you needed to run one or more of these tools. For example, nonlinear editing almost single-handedly kept the Macintosh alive in many production and post-production facilities. Whether you were using a system from Avid, Media 100 or Scitex Digital Video, you needed to have a Macintosh.

As these companies push into the Windows environment, Apple has actually made it easier for the migration to occur. Earlier this year, Apple released QuickTime 3.0, the first version of QuickTime that is truly a cross-platform product. QuickTime 3.0 offers all the benefits of QuickTime under the Windows 95/98/NT Operating environment. With this barrier removed, some companies may shift to the Microsoft side of the fence faster.

Strata

One example of a company that started out as a strong Macintosh player and is now shifting to Windows is Strata. All of Strata's products originally ran only on the Mac. A few years ago, the company released Windows versions of its popular MediaPaint and StudioPro products, although new versions of the products were always available for the Mac platform first.

Earlier this year, Strata announced the first simultaneous release of a new version for both Windows and the MacOS. This new product, StudioPro version 2.5, is Strata's flagship product for 3D modeling, animation and rendering. The press release accompanying the release quotes the company as saying it is not "abandoning the Mac platform," but is "very serious about entering the Windows market in force."

Strata's MediaPaint product, which combines painting with special effects capabilities, is also now available in a Windows version. VideoShop, Strata's low-cost video editing software (SRP $89), is still available only on the Mac. The latest version of MediaPaint, version 2.0, includes links to VideoShop to make it easier for users to integrate the two products together.

High-end 3D animation is available from auto des sys Inc. through its form Z product, which has been available for the Macintosh since 1991. Auto des sys claims that "If you can imagine the shape, you can build it with form Z." This package is now available for the Windows platform, but continues to be a strong player in the Macintosh arena.

ElectricImage

Another animation company that has traditionally supplied high-end products for the Mac is ElectricImage, recently purchased by Play, makers of the Trinity system. The ElectricImage Animation System has held its own against SGI and PC-based competitors in spite of lacking an integrated Modeler.

It was widely speculated that the Play purchase would lead to support for the Windows platform from this powerful product.

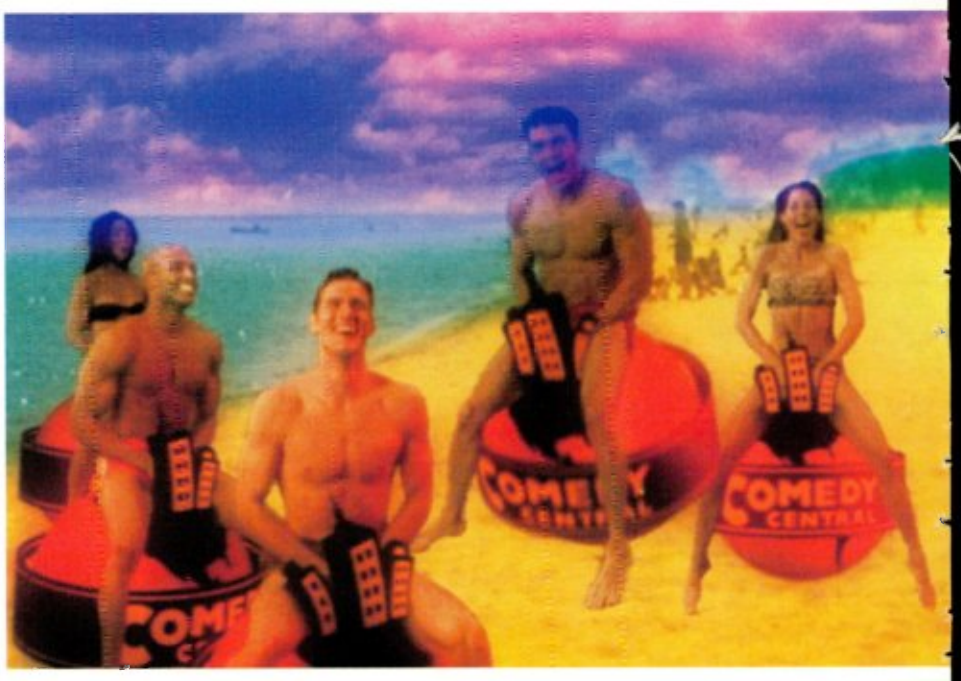
At July's Siggraph Conference in Orlando Play did not have a booth, but Jay Roth, the founder of ElectricImage, hinted that a Windows version of the product was "close." On a more formal note, there was a new version of the ElectricImage system, including a Modeler, running in the Sun Microsystems booth.

DTVQUICKINFO

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

800-837-8072

Adobe Systems ■ RS#287
Auto des sys Inc. ■ RS#288
Deneba Software ■ RS#289
ElectricImage ■ RS#290
Fractal Design ■ RS#291
Linker Systems ■ RS#292
Puffin Designs ■ RS#293
Strata ■ RS#294



H-Gun Labs of Chicago recently used Commotion from Puffin Design to create the Comedy Central logos used in the above pictured network ID.

Other than rendering software for SGI, this was the first time ElectricImage showed software running on a platform other than the Mac. Clearly, the company is spreading its wings under the Play banner.

Linker Systems

If your projects are more oriented to 2D animation and cartoons, Linker Systems offers Animation Stand, a powerful animation system that has always been released first on the Mac. The company has been supplying animation systems since 1989 and started to offer SGI and Windows versions of its products a few years ago. The Mac remains its first love, however, and all new releases are introduced on that platform first.

Illustration software has always been a powerful Macintosh application and a wide variety of products are still available in that arena.

Deneba Software

Deneba Software, in spite of releasing Windows versions of its high-end graphics product, Canvas, is usually thought of as a Macintosh graphics company. Canvas 5.0 runs on Mac, PowerMac, Windows 95 and Windows NT, but lower-end Deneba products are only available for the MacOS. These include Deneba artWORKS, a 24-bit paint program priced under $50 and UltraPaint, a painting and vector illustration package available for under $20 at select national resellers.

Adobe Systems

No mention of graphics software for the Mac would be complete without including the many products offered by Adobe Systems. When the Macintosh was first trying to get a foothold in the marketplace, Adobe PhotoShop on the Mac was the package used by virtually every graphic artist around the world. PhotoShop is still the standard by which every other graphics program is measured, and it is still going strong on the Macintosh. Over the years, it has been joined by other Adobe products including Premiere, After Effects, Illustrator and PageMaker, all of which are available today as both Mac and Windows products.

MetaCreations

MetaCreations Painter is another groundbreaking Macintosh graphics product. Originally introduced by Fractal Design, which is now a part of MetaCreations, Painter was the first program to offer "artist's brushes" for use in the image creation process. This capability is now available in a number of other products, but Painter was first and was only available on the Macintosh at the time. Through a series of mergers and acquisitions, MetaCreations today includes a number of 2D and 3D graphics products for the Macintosh including Infini-D, Ray Dream 3D and Studio, plus the full line of "Kai" products for image manipulation. As the company has grown, it has "folded in" both Macintosh and Windows-oriented products, allowing it to offer a very diverse range of products for both platforms. Based on recent announcements from the company, it may have folded in a little bit more than it can handle. The company recently announced some layoffs that will lower overhead and help it compete more effectively.

Puffin Designs

Puffin is shipping version 1.5 of Commotion. Commotion 1.5 integrates new motion tracking capabilities with its existing tools for realtime playback, paint and rotosplining. Additional new features include Auto Paint for recordable painting and write-on effects, enhanced rotosplines and wire removal, as well as Cineon import/export and support for QuickTime 3.

The companies mentioned above are just a few examples of how development of graphics products for the Mac has continued and changed over the past few years. The future of Apple and the Macintosh platform is always a subject for heated discussion, but companies still develop for the MacOS, even while they seek a larger market with Windows versions of the same products.

DTVPOST for Mac

The Mac Feels Like Home For NLE Systems

Onslaught of Windows-based systems pose little threat to Macintosh users for now

By Adam Matthews

Although the Macintosh market continues to struggle in general, the platform still shines in a few applications. One of those is nonlinear editing. There are literally hundreds of choices for nonlinear editing today and the list of options keep growing. Most, but not all, of the new choices are developed around the Windows platform. Still, the "big three" of nonlinear, Avid Technology, Media 100 and Scitex Digital Video, continue to develop new systems for the Mac and sell the majority of systems for the platform.

Since all of these companies are actively developing (or already selling) Windows products, it isn't clear how long this trend will continue. Avid's recent purchase of SoftImage from Microsoft and the equity stakes of Intel and Microsoft in the company are strong indications that the Windows platform will become even more important to the company that helped create the nonlinear editing market. But for now Avid remains committed to the Mac market.

Given the number of nonlinear editing choices that exist, it isn't possible to cover them all in a single piece. Rather, this article will look at products from Avid, Media100 and Scitex Digital Video along with a couple of smaller players that have taken interesting approaches to this market—Radius and CFE.

Avid Technology

Few people would argue that Avid and nonlinear editing were synonymous as the company grew during the early part of the '90s. Although there were a few rough patches in the middle, Avid continues to be a major player in the nonlinear editing market and has developed a presence in a number of other areas through mergers and acquisitions.

Today, Avid offers a full range of nonlinear editing solutions at many price points and quality levels. One thing that all of these systems have in common is that they use compressed video for capture, editing and playback. That will change early next year, when the company will enter the uncompressed video market with the introduction of Avid Media Composer Version 8.0 and Avid Symphony, a high-end finishing system for long-form television projects. With Symphony, Avid will be competing directly with high-end finishing systems from companies like Quantel and Discreet Logic.

Media Composer 8.0 was announced a few months ago at MacWorld in New York City. Scheduled to ship in Q1, 1999, version 8.0 will introduce a new model into the Media Composer family, Media Composer Online. Featuring Avid's next-generation Meridien video subsystem, this new product will bring uncompressed images to Media Composer for the first time.

The Meridien video board, developed by Avid, provides a single, uncompressed realtime video stream and a downstream keyer. In addition to handling uncompressed video, the product is compatible with a wide range of compressed video formats. It also includes a separate breakout box supporting serial digital, Betacam, S-Video and composite video formats, plus analog and digital audio formats.

Media 100

Media 100 has recently started shipping its first Windows products, Media 100 qx for Windows NT and Media 100 qxc for Windows NT. However, the company also offers a Macintosh version of these products and at least five other product families that are exclusive to the Mac platform.

The Scitex Digital Video Sphere line of nonlinear editing systems offer compression as low as 3:1 and support for 16:9 images and QuickTime 3.0.

Media 100 qx and qxc are the first products from Media 100 to support Apple's QuickTime 3 and Adobe Premiere 5.0. This allows programs to be shared across platforms without requiring the use of separate translation software. The product also offers a software-only upgrade path to other Media 100 systems.

Media 100 le is an entry-level system supporting S-Video and composite video input and output using off-the-shelf, high-performance Macintosh SCSI drives. One step up is Media 100 lx, which adds component video input and output.

Moving up to the "x" family of Media 100 products brings editors into the realtime environment. Media 100 xe has realtime static titling and keying of graphics with alpha channel. These features allow the system to be used for online finishing. Moving up to the Media 100 xs systems increases throughput by 50%, allowing higher-quality images to be captured, edited and recorded.

The most powerful product offered by Media 100 is the Media 100 xr system, which uses Media 100's HDRfx technology to provide two streams of video and 21 different realtime effects. The system also supports 24 accelerated transition effects and is completely compatible with QuickTime.

The ability to upgrade from one Media 100 system to another makes it extremely attractive to editors that need to start out on a limited budget but expect to grow over time.

Scitex Digital Video

Through the beauty of mergers and acquisitions, Scitex Digital Video is strong in a number of areas beyond nonlinear editing. As a result, the company offers product combinations that marry nonlinear editing products with special effects and titling systems, for example.

All of the Sphere products share a basic set of features, including compression rates as low as 3:1 for high-quality images. Version 2 software, introduced at this year's NAB show, adds support for 16:9 aspect ratio and QuickTime 3.0 across the product line. Like Media 100, this enables cross-platform capability for SDV users.

Scitex Digital Video's entry-level system is the MicroSphere, which uses the TrueVision TARGA2000 RTX for video input and output. All other Sphere products use the company's VideoSphere Media Processor to provide single or dual-stream video capability. In the VideoSphere system, realtime 3D DVE is added and even more capability is available through the optional DveousFX module. At the highest end is SDV's StrataSphere, which includes the ability to composite up to 50 layers of video in a single generation.

Radius

The introduction of FireWire (IEEE 1394) video has started a revolution in the industry. The DV video format used across this interface features a constant data rate compression technique. In all but the most extreme environments, this compression technique yields video that appears to have a high quality with very few artifacts. Since DV cameras can be purchased starting at around $3,000, DV-compatible editing products have been introduced by a number of companies to capture a piece of this fast-growing market.

Radius has focused completely on this market with EditDV, available today for the Macintosh platform. EditDV includes a FireWire card for the Mac as well as editing software for both still images and video streams, all for less than $1,000.

With EditDV, as with many other DV-oriented products, video comes in digital, stays digital and goes out digital. The only potential drawback to this product is that even the editing software comes from Radius. It would be nice to see the product bundled with a popular software package like Adobe Premiere. However, that's a small issue compared to the overall functionality and affordability provided by the package.

CFE

Listening to the statements being made by other companies, it would be easy to assume that there are no solutions available today that support uncompressed video on the Macintosh. At this year's NAB, however, an uncompressed solution was demonstrated by CFE, based in France.

Previously available for Windows only, CFE's Gallea videographics engine is a single slot PCI bus card that supports uncompressed digital video in composite, component and serial digital formats. At NAB, the company announced new software from Mipsys, another French company, that integrates the Gallea with Apple's Power Macintosh platform.

There are three versions of software available for the Gallea, but the most appropriate one for nonlinear editors is called the Previewer Post package and is priced at $2,950 (not including the Gallea). This package includes an uncompressed QuickTime codec developed by Mipsys. Using this codec, the Gallea can be used to create and play uncompressed QuickTime movies using any QuickTime-compatible software package (like Adobe Premiere).

Creating an uncompressed video system on the Mac requires more than just the Gallea and Mipsys software, however. Since standard disk drives don't support the high data rate required by uncompressed video streams, a disk array must be used with a high speed interface. Digital Marketing International, CFE's U.S. distributor, has tested a number of these arrays and offers solutions that bundle the card, software and disk subsystem for easy configuration. ■

NONLINEAR ROUNDUP

The Latest In Nonlinear Editing For The Macintosh

Avid

The Media Composer 1000 system is Avid's most popular digital nonlinear online editing system for television. It features two-field images, including broadcast-quality AVR 77; integrated compositing with 24 video tracks; realtime titling; transitions, keying and 2D effects; optional real-time 3D effects; optional Intraframe editing; extensive audio features for online editing projects and optional offline and film capabilities. Avid Visual eXtensions opens the system's core to third-party plug-ins.

The Media Composer 1000 includes a hardware-independent QuickTime codec that can be used to create QuickTime effects on Media Composer or on a separate Macintosh. In addition, Media Composer 1000 supports a wide range of realtime 2D effects including picture-in-picture. Avid's 3D Effects Module can be added, giving extensive realtime, customizable 3D effects capabilities seamlessly integrated into the editing environment.

Standard audio features in the 1000 (and 9000) include eight channels of 44.1 kHz and 48 kHz audio I/O with eight-track monitoring and 24 audio track editing.

The Media Composer 9000 system features Avid's seventh-generation editing model and allows the user to customize the editing interface. Users can display clips in frame, text or script views and locate material using multi-level sift and sort criteria. Avid's script-based editing interface allows for instant access and editing of shots based on lined scripts located on your system.

Realtime Multicamera Play allows for the playing back of four images simultaneously and "cut on the fly" by switching between the images on a per-cut basis. Other editing features include interactive timeline editing, customizable timeline views and frame-accurate trimming with slip and slide. Version 7.0, which shipped in February, includes advanced effects and audio.

The Media Composer Offline system is Avid's flexible, cost-effective turnkey editing system for offlining commercials, documentaries, corporate videos, TV shows and other projects. With the Media Composer Offline system you can bring bins and project information to an online Media Composer system for batch digitizing and project finishing, or generate an EDL for use in a tape-based online environment.

For more information contact Avid at (800) 949-2843 or visit www.avid.com.

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Media 100

Media 100 qx and qxc for Macintosh are the first products to support QuickTime 3 and Adobe Premiere 5.0 enabling anyone, anywhere, to create broadcast-quality programming from their desktop. The Media 100 qx products feature QuickTime integration and cross-platform support, 23 accelerated effects, 300 KB/frame picture quality, and realtime playback of eight audio tracks.

Media 100 xr has simultaneous processing of eight realtime effects and uses HDRfx technology to provide two streams of video, each running at 300 KB/frame (360 KB PAL). The dual-stream technology yields 21 realtime transition effects. Driven by the Vincent digital video engine and the HDRfx card, the Media 100 xr digital video system also includes professional audio tools and a realtime feature set.

Media 100 xs allows the user to record, edit, create effects, do compositing and master-to-tape from a single system. Driven by the Vincent digital video engine, Media 100 xs enables broadcast television stations, high-end independent producers, and post-production houses to finish programs online at 2:1 compression, without spending time in offline edit suites.

Media 100 xe delivers realtime audio processing and graphics performance. Features like realtime audio EQ, ColorFX, six tracks of audio and preview MotionFX enhance productivity and drive on-the-fly creativity. And with realtime static titling and keying of graphics with alpha channel, producers and program authors in independent post-production, cable television and high-end corporate video can finish programs online, from a single system.

Media 100 lx provides a complete digital video system for creating broadcast-quality programs. Realtime ColorFX, preview MotionFX, EDL import/export and a realtime waveform monitor/vectorscope enable corporate video authors, multimedia producers and others to finish programs quickly and easily. The system also provides a variety of draft-mode compression selections to help saves disk space.

Media 100 le includes realtime editing and playback, realtime ColorFX, realtime preview MotionFX, four tracks of realtime audio and realtime preview dissolve. Media 100 le also includes 24 accelerated effects, genlock support and an integrated character generator. A built-in QuickTime codec provides transparent interoperability with any QuickTime application.

Contact Media 100 at (508) 460-1600 or visit www.media.com.

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Radius

Radius EditDV is a nonlinear post production solution for DV camera owners producing video content. It provides an intuitive user interface for editors and computer users alike so that anyone new to the nonlinear editing space will quickly be producing quality results. Radius EditDV provides a QuickTime compatible integrated environment capable of delivering both professional quality and ease of use.

Radius EditDV includes DraftDV, a specialized rendering mode unique to EditDV, providing a three-to-five times improvement in rendering time. And digital in/digital out provides full screen interactive preview of all DV footage, allowing the user to easily set marks on the fly. Radius EditDV is also a professional style three-point editor providing for L-cuts, J-cuts, back-timing and fit-to-fill. All editing can be handled via keyboard control for efficiency, or easily handled with the mouse for convenience.

Contact Radius at (800) 5-RADIUS or visit www.radius.com.

■ For more information circle Reader Service #297

Scitex Digital Video

MicroSphere is the only desktop production station to offer the Sphereous professional user interface. MicroSphere works in conjunction with other Sphere products, sharing the same file structure, user interface and ability to operate standalone or be integrated through common network connection into a Sphere collaborative workgroup.

VideoSphere features broadcast-quality, dual-stream video, four internal stereo pair audio, realtime program finishing with effects, wipes and transitions. A realtime 3D DVE is standard with VideoSphere providing capabilities including realtime 3D x, y and z rotations with page turn, warps, lighting effects, planar 3D with perspective, scaling, z-axis positioning pageturns, rolls and warps. The DveousFX option adds Abekas-caliber effects capabilities including SurfaceFX 3D light sourcing and texturing that fully interact with the UltraWarp palette. VideoSphere also features sophisticated picture correction controls originally developed for the Abekas 8150. Files are stored in native QuickTime format for up and downstream compatibility throughout the Sphere line, and for compatibility with all QuickTime capable graphics applications. VideoSphere may be used as a standalone platform, or may be integrated into a Sphere collaborative workgroup.

StrataSphere is designed for broadcast-quality, dual-stream video with full-motion alpha channel, DveousFX 3D effects option, four internal stereo pair audio, realtime program finishing with maximum effects, wipes, and transitions. It is the only video finishing platform today with full motion alpha key capability, according to Scitex. Having full motion alpha keys on both Program and Background video tracks delivers unprecedented realtime keying power. StrataSphere provides a combination of nondestructive compositing power and image quality superior to any competing systems. StrataSphere allows the user to composite up to 50 layers of video, each with full key signal integrity, in a single generation. It combines Abekas 8150 production switcher keying power and the 3D effects of the Abekas Dveous DVE with the realtime video horse-power of Sphere media processing. StrataSphere's movable, direct and secondary intensity light source effects are interactive with StrataSphere 3D effects to provide an unmatched level of sparkling clarity and distinctive realism.

DigiSphere consists of a single video stream DigiSphere Media Processor, ergonomically designed control panel, interconnecting cables and SphereOUS user interface software. The Media Processor and control panel are intended to be set up and used on a typical desktop or on a specialized video production desktop. The customer may supply their own Power Macintosh, PCI-bus, 7200/7300 or better computer and hard drive storage, or may purchase a Power Macintosh and a Sphere StorageDock from Scitex Digital Video. DigiSphere is designed for media acquisition and digitization and graphics, animation and audio artists to produce and digitize their work.

Contact Scitex Digital Video at (888) 846-7017 or visit www.scitexdv.com.

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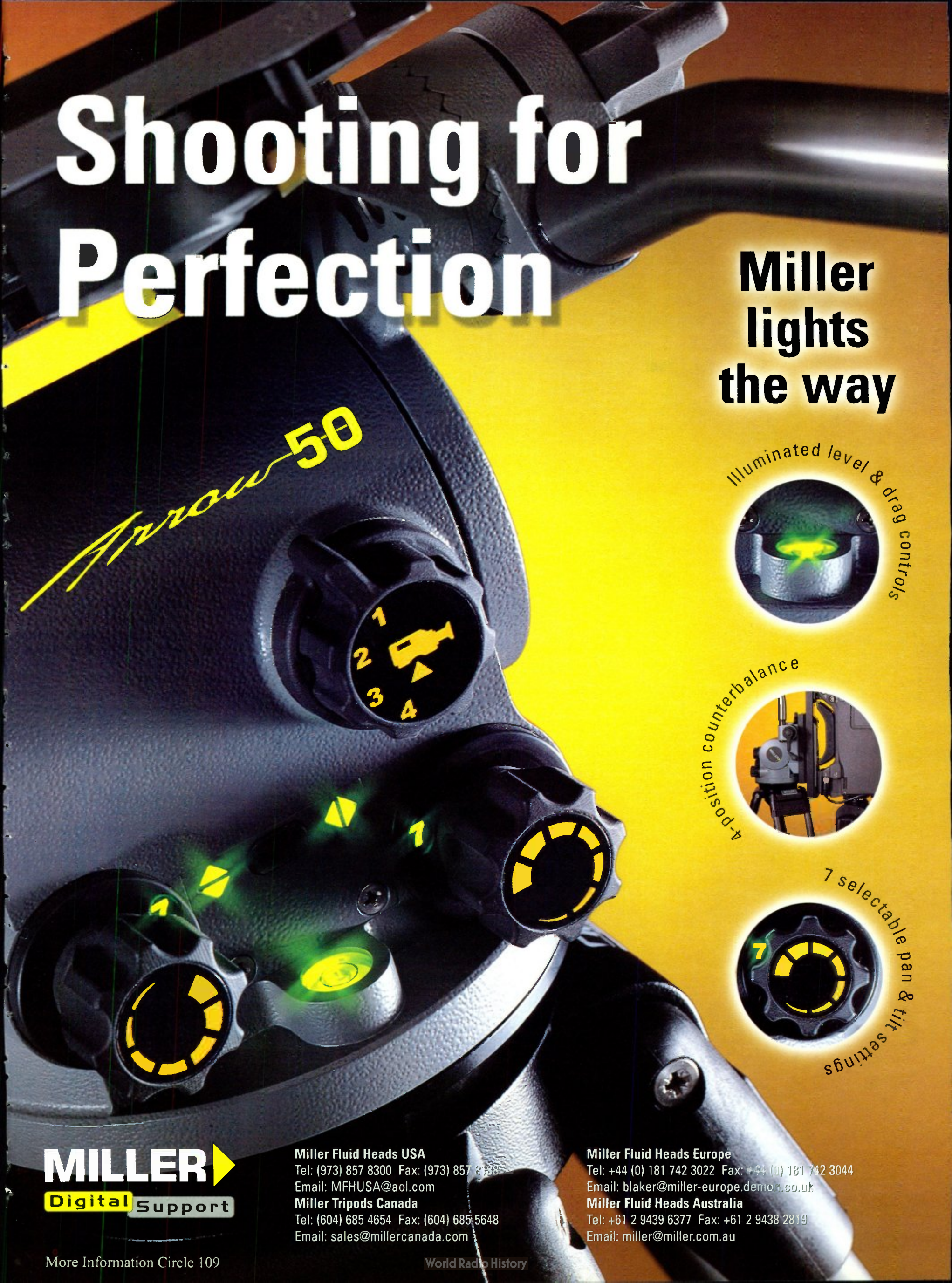
Shooting for Perfection

Miller lights the way

Arrow 50



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Continued from page 8

wide screen and in Europe broadcasters are introducing digital with the view of going to widescreen.

Widescreen sets are now beginning to sell quite widely across Europe and when broadcasters in France and Germany show movies they show them in widescreen. People in the UK don't like letterbox; it's a cultural divide. So broadcasters are looking at using both 16:9 and 14:9 which is a thin letterbox to get over this dislike. As a viewer you will be given the choice along with 4:3.

The jury is out and we look with great interest over the next five years at the consumer acceptance of HD in North America. We could be wrong in Europe, only time will tell. An American colleague said to me recently, "Phil, we expect it to be a long slow race, a marathon for the take-up of HD sets." American broadcasters see HD as the future of television and quite rightly they want to stake their place in it.

DTV ■ **So how do you think things will go in the U.S. with regards to HDTV?**

The European broadcasters are against HDTV in the short term, but we're going to be looking across North America and Japan to see what's happening there and what will develop.

Surely, if HDTV is a staggering success in North America then Europeans would follow. But most people are much more cynical and they say it's not going to be a rip-roaring success but rather a long, slow haul. And what I think people in Europe will be looking at with great interest is how the sale of HD receivers go in the first two or three years. And how long will it be before 10 percent of households have HDTV sets?

DTV ■ **Do you think the U.S. consumer may be confused by the different resolutions and standards?**

Confusion in the marketplace is never going to help growth. The battles about video recorder formats in the early '80s didn't help their penetration. A clear proposition about what you're offering, like the audio CD where people said "Great, this is staggeringly hi-fi quality," is important, and the CD was originally marketed on the basis of high quality. But what really sold it was that it didn't have the clicks, pops and bangs, and that it was resilient to rather rough handling. That was something that became a success, but it became a success because of convenience, not intrinsic quality.

So what are you selling when it's HDTV? I think it's essentially better picture quality. Now, you'll get a better picture quality anyway because of digital. But the next thing is improved resolution. A lot will depend on the quality of the television sets that people buy. It's very easy to demonstrate how brilliant the quality of HDTV is on a professional monitor, but if it's a consumer electronic product it probably won't yield the huge benefit that engineers would hope.

We all know that the quality of standard definition televisions has improved significantly in the past few years and HDTV displays will get better with time also. And if you have a simple comparison that shows this is 1080i and this is 480i the viewer will see the difference. But if you have halfway houses and other intermediate resolutions you might diminish the perceived added value of HDTV. And I'd like to feel that we were able to offer the consumer a large jump in quality so they would feel they were getting a value. But if you buy something which is capable of doing the highest quality and stations are broadcasting at a lesser quality they may feel slightly short-changed.

DTV ■ **What about a global standard in terms of delivery to the consumer?**

I think we've gone too far in terms of entrenched camps. You have ATSC in North America and DVB in Europe. It's too late to force those two groups to bash their heads together to come up with something uniform. What I do hope is that we can get a commonality of standards of production equipment.

Clearly there are some differences that will remain across the world. For example the 50, 60 Hz difference will not disappear. But we did it with production equipment in making 601 handle both 525- and 625-line standards. What we are hoping in the HD world is that cameras, tape machines and editing equipment will all capture images to the same format and the logical system to look for there is the 1080x1920 format. It's been agreed within the ITU, acknowledging there will need to be 50, 60 Hz variations. But it is quite likely that equipment will be devised to switch automatically between 50 and 60 Hz and that will be significant for broadcasters across the world and it will replicate the success of 601.

DTV ■ **Once digital TV is rolled out do you think that will be the end of technical innovation in broadcasting?**

People have always asked me this. There is always something around the corner and so you say "hang on." What about the delivery of high-quality services through the internet, what about on demand, fully interactive services and so forth delivered by telephone? I'm sure the web and its successors will bring new infrastructure challenges and will turn out to be a very important delivery mechanism for broadcasters. They will consider themselves as content providers and they will be agnostic about the delivery system. If people want to receive their programs or multimedia over the web, then broadcasters will do that. And I just look across Europe at the moment at individual countries and ask which are the most popular web sites? Most of the time it's the ones run by the national broadcasters because they have the resources and the material. I just think it's a natural progression if you like to say, "We will offer new services through new delivery systems."

There's an ancient Chinese curse: "May you live in exciting times." Well, we do, and one of the great problems facing broadcasters and production people is they are faced with a bewildering number of technologies.

The digital TV genie has been let out of the bottle in Europe and there will be a multiplicity of new services, most of which we haven't yet thought of.

DTV ■ **When it comes to European and North American broadcasters and engineers working together there's probably nothing stronger than the EBU/SMPTE joint task force. Can you tell me about that relationship?**

There are differences between Europe and the U.S. in delivery to the consumer, like high definition or different modulation schemes. But when it comes to the production end of television there are many similarities. We're still going to have differences between the 50 Hz and the 60 Hz parts of the world, but clearly there is a great benefit in the EBU working closely with SMPTE on production technologies, as we did with 601 equipment which is multi-standard capable with no problem, and we would very much like that to happen when we're taking about interconnection of bitrate-reduced television or of HDTV.

DTV ■ **Can you tell me a little about what is in the final report which was just released by the EBU/SMPTE task force?**

The first EBU/SMPTE task force in 1981 led to the definition of the 601 system for interconnection of digital devices in component form and we now realize there's a significant emerging market for interconnection of digital television equipment using compressed bitstreams. And rather than having everyone using different compression systems and file formats and pin connectors we would like to make sure that, in essence, a group of people making a television program are able to buy equipment from a variety of manufacturers in the knowledge that all of the machines will work together.

There will be legacy systems around, but we hope that we would limit the number of permutations needed to transcode between formats. For example, a few years ago if you bought a nonlinear editor from one company you were lucky if you were able to find an electrical way to transport that material onto equipment made by the same manufacturer, never mind different manufacturers. We really can't have that anymore—we have to have the same basic level of compatibility that we've taken for granted in the analog composite and digital uncompressed worlds. So that's the task that we've been dealing with.

The other thing about the work of the task force is that it is looking at much more than just the physical interconnection of the equipment. It's looking at things like file formats and metadata like program descriptors, and things that will become very important to us. I think it's just begun to scratch the surface and there's a lot more to be done in this area. It's absolutely important that you have a coherent way of labeling things when they're recorded by an automatic system because producers and others will want to access material immediately.

DTV ■ **The U.S. is just beginning its move to digital, but there are a number of European broadcasters that have had digital facilities. What lessons do you think Europeans have learned that U.S. broadcasters can apply?**

My personal view is that some of the people who changed very early and jumped into bed with proprietary manufacturers may well regret that decision in the longer term. For instance, if you're buying equipment one studio at a time you'll have to return to the same manufacturer because you'll want to be able to run the facility as an integrated operation. And I just have an in-built hatred towards monopolies and I just love the idea of manufacturers winning their fair share of the market because their product is better.

DTV ■ **So what are your thoughts on the challenge facing Europe? It seems like every country is doing their own thing in one way or another.**

There's an ancient Chinese curse: "May you live in exciting times." Well, we do, and one of the great problems facing broadcasters and production people is they are faced with a bewildering number of technologies. If you look back over the past 50-odd years and see the rate at which new technologies come out it has accelerated dramatically the last few years. The problem is that there are probably far too many technologies for people to choose from, and professionals are perplexed as far as what to do, and that problem will get worse before it gets better.

Now, hopefully the work done by the EBU and SMPTE will help clear the water slightly. It doesn't give all the answers but it gives a lot of the answers and points in the direction of the answers.

Broadcasters are facing choices, should we go digital or hang back and do it later? It's all very easy to hang back and wait for the technology to develop, but the trouble is that you may find that the competitor has taken the lead and others will then set the agenda for you. ■

ON-AIR CONSOLE ROUNDUP

AMS Neve

Hardware and software enhancements to AMS Neve's Libra Live digital broadcast production console further improves performance levels and on-air dependability, according to the company. New software features include enhanced IFB matrix, new split console mode, snapshot 'scope,' improved 'on-air' logic, user-definable channel control and stand-alone I/O units.

New hardware allows the console's remote I/O systems to be used as stand-alone units. This enables industry-standard MADI routers to be inserted between Libra Live and its inputs and outputs. Any I/O rack may then be routed to any console.

Fast reboot from Flash RAM is an advanced-design Logic Control Board that accelerates the console boot-up time by storing control code in Flash RAM instead of on the system's hard disk.

Also from AMS Neve is the 55 Series analog broadcast console. It now has new fader and upstand options, including VCA faders and mix minus matrix faders that, when combined with the master controller, provide a complete IFB solution. Other features include new input pre-selector system and new bargraph meters.

Contact AMS Neve at 212-965-1400 for East Coast and 818-753-8789 for West Coast or visit www.ams-neve.com.

■ For more information circle Reader Service #299

Euphonix

The CS3100B is Euphonix' latest digital control audio broadcast mixing system. It's shipping with the backstop PFL-equipped motorized or non-motorized faders and version 3.1.1 Mixview software.

Available in configurations from 16 to 104 inputs, the CS3100B also has a wide variety of signal processing and bussing options. Other features include improved redundant power supplies, the AudioCube routing matrix and the TrackPanner controller, providing dedicated 5.1 surround panning from every console fader.

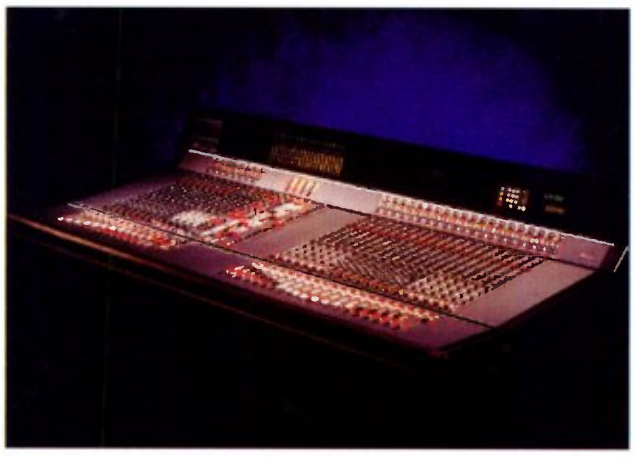
Also made recently available was Mixview Software Version 3.2, the latest software upgrade for the CS series of mixing consoles. The new software includes a comprehensive automation editing suite of tools specifically designed for the Euphonix Hyper-Surround panning system. The software makes it possible to edit an entire scene or slip an individual panning move. Fader "Glide," an industry standard, has also been added on both fader systems.

Contact Euphonix at 818-766-1666 or visit www.euphonix.com.

■ For more information circle Reader Service #300

Harrison

The TV950 console is designed for the television broadcast market. The console is available in frame sizes from 24 to 64 positions, and its compact footprint makes the console ideal for truck-mounted installations.



The console has 100 percent steel frame construction and componentry that includes gold-plated connectors, 104mm Penny+Giles faders and PC motherboards. The mono mic/line input modules each have A and B inputs for both the Mic and the Line input side.Up to 70dB of clean gain is available, as well as on-board compression, phase reverse and phantom power. Four auxiliary and two stereo cue sends handle signal routing. Panning is instantly switchable between mono, stereo, LCRS and 5.1 surround sound.

Contact Harrison at 615-370-9001 or visit www.glw.com.

■ For more information circle Reader Service #301

Panasonic

The Panasonic DA7 is a 32 input, eight bus and six aux digital mixer that includes 24-bit I/O capability. It features surround sound mixing capabilities,

dynamic and snapshot automation and one function/one step screen layer operation. It has an "LED Farm" display, a series of LED's enabling a quick reference at the console's current routing status, automation modes, channel on/off status, EQ on/off, dynamics on/off, panning in/out and aux send on/off. Back-panel expansion slots allow for increased console functionality and four plug-in modules are available.

Contact Ramsa/Panasonic at 714-373-7277.

■ For more information circle Reader Service #302

Solid State Logic

The Aysis Air is a 48-channel digital console designed for live broadcasters. It has its own router for standalone operations, yet can be extended to use SSL's Hub Router. The system offers the advantage or reduced wiring complexity with 95 channels of digital audio on a single coaxial cable.

The console also has four stereo subgroups, each with inserts and master dynamics, multi-channel Surround capability, 20 mix minus sends for clean feeds to remote studios and phone-ins, and eight aux sends per channel, switchable to stereo or mono. It also has a dedicated control surface that is optimized for realtime mixing operations. All console controls are fully automated via snapshots, and all settings, including routing assignments and settings for faders, EQ, dynamics and effects can be stored and instantly recalled, selectively or globally.

Contact Solid State Logic at +44 (1) 865-842300.

■ For more information circle Reader Service #303

Sony

The MXP-700 audio console is designed for live TV operations, and is available in 16, 28 and 44-channel input frames. Features include talkback functions, multiple mix-minus functions for monitoring the mix signal minus selected sources, and auxiliary send outputs (four monaural and two stereo). The console also has up to eight group modules, all with full send capabilities, along with dedicated returns, each containing a three-band equalizer. Five different types of meter housings, electronically balanced differential outputs, two stereo master outputs, and four monaural clean feed outputs are also standard.

Contact Sony at 800-686-SONY.

■ For more information circle Reader Service #304

Wheatstone

Wheatstone's TV-1000 audio console is designed for live local and network television broadcasts. All switching is electronic and the console is available in frame increments of as little as one module width. Features include computer recall of all switching, built-in alphanumeric source displays, house router interface, two independent mix-minus systems and a master confidence IFB panel. Standard configurations have eight stereo submaster and four stereo master outputs, eight user-configurable auxiliary sends, four mute groups and direct outputs for every input.

The TV-80 offers a smaller footprint than the TV-1000 while retaining the same essential features. Standard configurations include eight module submaster and two stereo master outputs (each with metered mono sum outputs), eight user-configurable auxiliary sends, four mute groups and direct outputs from every input. Features include computer recall of pre-selected audio sources, alphanumeric source displays, house router interface, an operator-intuitive eight mix-minus system and a master confidence IFB panel.

Contact Wheatstone at 252-638-7000 or sales@wheatstone.com.

■ For more information circle Reader Service #305

Yamaha

The PM4000-48 is a professional audio mixing console That has eight primary mix buses, eight VCA groups, eight mono auxiliary mixing buses and an 11x8 mix matrix. The groups have mute capability and full-length group faders and the console also has extensive input priority, featuring an "in-place" Cue system. Large, dedicated stereo VU meters are included in the redesigned, lighter-weight chassis.

■ For more information circle Reader Service #306

Product Review

Videotek Frame Capture Device

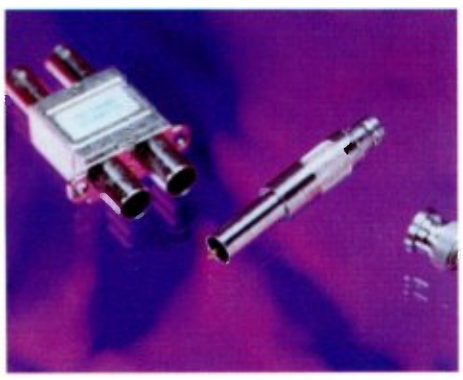
Videotek's new frame capture unit allows users to capture and print the output image of any VTM-200 family member. The 1/2-rack-wide unit is installed between the VTM-200 family member

and the corresponding monitor. Users can then capture the VGA output from any VTM-200 family product and convert it to a standard data file. The software also allows automatic printing and storage in the host PC. Capture can be initiated from a front-panel pushbutton, GPI contact closure, or PC command. *Contact Videotek at (800) 800-5719 or visit www.videotek.com.*

For more information circle Reader Service #203

Trompeter Monitor Plug

Trompeter has introduced the MP20W monitor, a companion product to the Trompeter J1214W serial digital video jack. The MP20W plugs into the jack to



sample the signal without degrading or interrupting the normal-through signal path. This is done by placing a 20dB isolation network within the unit. The MP20W can be used with most other WECo standard normal through jacks. Pricing is $105.74 each in the 10-piece quantity. *Contact Trompeter at (818) 707-2020 or visit www.trompeter.com.*

For more information circle Reader Service #204

Scitex Sphere Version 2 Software Shipping

Sphere Version 2 software is now shipping from Scitex Digital Video. Version 2 features widescreen aspect ratio support and a QuickTime 3.0 native file format, delivering cross-platform compatibility through the Sphere Windows NT codec. There are also specific features tailored to each member of the family. MicroSphere has support for the new TextFX realtime title animation board. DigitSphere, VideoSphere and StrataSphere all offer support for Apple's new G3 computers. And StrataSphere has substantially increased compositing speed, enhanced title capabilities and a graphics package that incorporates Commotion Version 1.5 from Puffin Designs. *Visit Scitex at www.scitexdv.com.*

For more information circle Reader Service #205

Dynamic Realities Offers NatureTools 1.0

Arete Image Software has partnered with Dynamic Realities to create Digital NatureTools version 1.0 featuring RenderWorld and NatureFX for NewTek's LightWave 3D. The plug-in is currently only available for SoftImage and PowerAnimator, but users of LightWave will now be able to create the same water and atmospheric effects. Vast ocean scenes to pool effects, as well as clouds and atmospheres can all be created with the plug-in. *Contact Dynamic Realities at (414) 549-2200 or visit www.dynamic-realities.com.*

For more information circle Reader Service #206

DPS LockStep Plug-In

LockStep is a plug-in available from Digital Processing Systems that allows users of the Kinetix 3D Studio Max to control the DPS Perception RT dual-stream, real-time DDR system. Features include frame buffer device rendering mode enabling unlimited test renders without having to delete files; easy control of PVR-RT parameters; support for rotoscoping and video clips in the viewport; and direct support for selecting, playing, deleting and managing the PVR-RT disk and files. Current owners of the DPS Perception RT system can download the plug-in at no charge at www.dps.com. *Contact DPS at (606) 371-5533.*

For more information circle Reader Service #207

Tiffen Crystal Image Color Software

Tiffen has released Crystal Image software as the newest plug-in application for Discreet Logic's Inferno, Flame, Flint, Fire and Smoke visual effects and editing systems. Discreet Logic users will now be able to precisely emulate 92 of Tiffen's award-winning optical effects filters. It replicates the standard saturation grades of the optical filters, but can also be used to create intermediate grades, or any custom combination of colors desired. The creative potential of the filmmaker is extended, and the software is also a powerful tool for pre-visualization of effects on location footage, makeup, wardrobe and screen tests of actors. *Contact Tiffen at (800) 645-2522.*

For more information circle Reader Service #208

Communications Specialties Offers Fibervision

The Fibervision serial digital video transmission system from Communications Specialties equalized the 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 more than 360 Mb/s. Designed for use with multimode optical fiber, the system supports distances up to 2 km with no degradation of signal. It is adjustment free and built-in regulators allow both the transmitter and receiver to operate from low voltage, unregulated DC power sources, providing versatility. *Contact Communications Specialties at (516) 273-1638 or visit www.commspecial.com.*

For more information circle Reader Service #209

VAS Group Improves Downconverter

The VAS Group has introduced new HD digital video inputs for the RTC HD3:2 format converter and HDTV downconverter. The new HD digital video input board accepts high definition SMPTE 292m digital video (HD-SDI). The HD

signal remains in digital form from input to the standard definition serial digital outputs, offering improved video clarity and lower noise. In addition to HD downconversion the unit can also convert between 525 and 625-line signals. Features such as off-speed PAL input and output, 3:2 pulldown and aspect ratio control make the RTC HD3:2 a solution for tape-to-tape mastering. *Contact VAS Group at (818) 843-4831 or visit www.vasgroup.com.*

For more information circle Reader Service #210

Artel Boris AE 3D DVE

Boris AE is a comprehensive set of filters for Adobe After Effects that enables users to create 3D special effects. Advanced 3D filters have controls for positioning, full XYZ rotation, pivot, camera and light, soft borders and shadows. Unique Pixel Chooser technology for partial filtering of images based on individual pixel value or location is available, along with true 3D shapes that rotate, wrap, unwrap and displace, and the ability to map different video on all sides of 3D objects. A high-quality chroma key filter is offered for complex and intricate keying, and photographic color correction and effects are also available. Boris AE hosts Adobe After Effects, ICE Blue ICE, Discreet Logic Illuminaire and MetaCreations Infini-D. *Contact Artel Software at (617) 451-9900 or visit www.borisfx.com.*

For more information circle Reader Service #211

Telemetrics Digital-S, DVCPRO Docking Adaptors

Telemetrics has introduced a new VTR adapter to dock JVC's Digital-S dockable VTRs directly to a Ikegami HL57 or HL59 digital broadcast camera without any modifications. The adapter provides transparent operation of all VTR and camera functions, including: Y video; R-Y; B-Y; Video GND; MIC (hot); MIC (cold); MIC shielded; REC Tally Warning OUT; VTR Start; Return Video SW IN; +12V; Return Video OUT; Save CTL IN; VTR Warning IN (low battery); VF Tally; Return Video In; and Standby. *Contact Telemetrics at (201) 848-9818 or visit www.telemetrics.com.*

For more information circle Reader Service #212

Panasonic Delivers AJ-D90

Panasonic is delivering the AJ-D90 DVCPRO50 dockable VTR. It features 4:2:2 signal processing and switchability between a DVCPRO 4:1:1 signal and the

DVCPRO50 signal. The digital video data rate is 50 Mbps, and 16-bit 48kHz sampled channels (four channels in DVCPRO50, two in DVCPRO) of uncompressed digital audio is offered. Maximum record time on

Product Review

e cassettes is 30 minutes in DVCPRO50 ode. *Contact Panasonic at (800) 528-01.*

For more information circle Reader Service #213

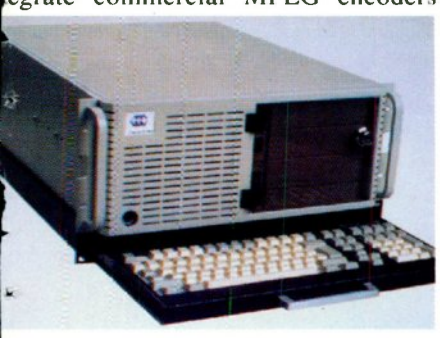
ool-Lux Battery Belt

he L-10 Smart Power Battery Belt fea-res a 1.2 amp charger with a 3.5-foot iled, heavy duty powercord with a bat-y assembly made of durable materials. e battery belt has power fill for medium-zed events with 117WH professional per-rmance and other features and benefits cluding lightweight and a cigarette or ur-pin XLR plug. The belt has the Cool-ux method of volt-balanced cells, no emory, and spacing to allow for record-g from a seated position. Pricing is $100. *ntact Pana-Tek at (805) 482-4820 or ail coollux@cool-lux.com.*

For more information circle Reader Service #214

omputer Modules PEG Shuttle

mputer Modules has introduced its PEG Shuttle Series, offering turnkey PEG1 and MPEG2 transmission systems r those looking to transmit over multiple lines rather than ATM. The systems egrate commercial MPEG encoders



th Computer Modules' high-speed com-nication cards with TCP/IP, T1/T3, /E3 or RS422 interfaces for a lower-cost lution. Based on open Wintel technolo-the system is also a unique blend of rdware and software, providing the abil-to continuously monitor operations h a custom GUI front end that displays kinds of error conditions and statistics realtime. *Contact Computer Modules at 8) 496-1881 or visit www.compumod-s.com.*

For more information circle Reader Service #215

RF Connectors Universal Adapter Kit

The PT-4000-150 unidapt female-to-female barrel adapter has joined the RF Industries Universal Adapter series. The connector can be used to couple Universal male terminations on RFA-4070 series

cable assemblies as well as the RFA-4059-A1 RF sampler and injector, or the right-angle and tee Unidapt adapter. The kit comes complete with two male and two female each of BNC, Mini-UHF, N, TNC, SMA and UHF coaxial adapters. Each, when joined using the universal center adapter, create many adapter combinations of coaxial interfaces. The connectors are made of silver-plated, machined brass with gold-plated contacts. Teflon dielectrics are standard on all connectors in the RFI Unidapt line, and the kit features a convenient and easy-to-use paddled, zippered leatherette carrying case. The kit answers the needs of technicians and engineers and provides the right adapter, available when needed. *Contact RF Connectors at (800) 233-1728 or email rfi@rfindustries.com.*

For more information circle Reader Service #216

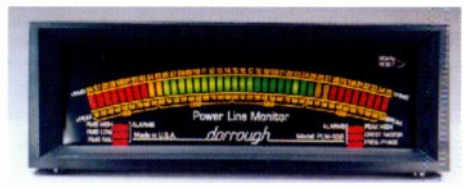
C-Band TVRO Blockband Bandpass Filter

Microwave Filter Company's Model 11870DC C-band TVRO blockband bandpass filter is installed between the down-converter and receiver in C-band TVRO systems to remove mild to moderate out-of-band interference. The filter passes 950 to 1450 MHz with a loss of 3 dB maximum. Rejection is 20 dB at 850 MHz and 30 dB at 1550 MHz. The unit has a DC passing spec of 500mA, impedance is 75 ohms and connectors are type F female. *Contact Microwave Filter Company at (800) 448-1666 or visit www.microwave-filter.com.*

For more information circle Reader Service #217

Dorrough Power Line Monitor

Dorrough's PLM-120 power line monitor combines A.C. line monitoring functions, data logging features and flexible reporting



capabilities in a single device. It provides everything needed to resolve daily engineering issues ranging from proper conditioning operation to proper UPS changeover functioning, to fault and improper load mix identification in building and facility power feeds. Following the CBEMA Curve for proper AC line operation, the PLM-120 captures, logs and alarms all power quality violations up to and even after a complete power outage. The information-at-a-glance front panel displays current values and alarm status, while the additional RS-232C remote access pathway to non-volatile event history logs, assessable via WIN95 or dumb terminal, provides extended data display and analysis capabilities. *Contact Dorrough at (818) 998-2824.*

For more information circle Reader Service #218

BAL Broadcast Serial Solution

BAL Broadcast offers a choice of five standalone serial-to-analog units allowing users a wide range of combinations of output configurations, including component, composite, Y/C, sync and re-clocked SDI

outputs in a range of packages, as well as different methods of power supply. Flexibility in output modes is provided by an easily accessible switch and enables NTSC set-up and Beta level selection. 625/525-line operation is automatic and other features include switch controlled analog/digital blanking and color kill facility. *Contact BAL Broadcast at +44 (0) 1203-375827.*

For more information circle Reader Service #219

Orad PostSet

PostSet is a revolutionary, easy and cost-effective solution based on CyberSet's unique tracking and preview capabilities for the post-production industry. It enables the loading of camera parameters into Soft Image and Alias off-line rendering engines for virtual environment creation. The feature enables the efficient creation of special effects shots or sequences suitable for commercials, music videos and film productions. It can be purchased as an optional feature for any of Orad's CyberSets or as a standalone product. *Contact Orad at (212) 554-4225 or visit www.orad.co.il.*

For more information circle Reader Service #220

Radamec EPO Track Cam

Radamec Broadcast Systems has introduced the Track Cam. It's designed to support both the Radamec 421 and 435s pan/tilt heads and is capable of carrying a large range of cameras, lenses and lightweight prompters. The system can be configured with any of Radamec's control panels, such as the ARC 2000 Touch Control Panel, and can be easily integrated with existing Radamec systems enabling broadcasters to enhance their current productions with additional movement. *Contact Radamec EPO at (908) 518-0685 or email at radamecinc@delphi.com.*

For more information circle Reader Service #221

DNF Industries Two Machine Editor

DNF Industries' two machine, cuts-only editor is designed specifically for fast news-style editing. A backlit four line display quickly shows in, out and duration. Commands for in, out and duration are easily entered using a numeric keypad also used to simplify Trim+ and Trim functions. The cuts-only editor features off-speed capabilities easily implemented even during edits. Editors select a playback speed for the source machine, set the source in point, the recorder in (and out) point and go ahead with the edit. Decisions can be evaluated during editing using the Hot Punch features. The two machine editor is priced at $2,800. *Contact DNF Industries at (818) 252-0198 or visit http://dnfindustries.com.*

For more information circle Reader Service #222

Pro-Bel Digital Master Control Switcher

The TX 320 is a digital master control switcher available from Pro-Bel. It's targeted at a wide spectrum of applications, from complex manual presentation to multi-channel automated transmission. The standard TX 320 package including routing switcher, control system, video and audio mixer, occupies no more than 6RU, and options for DVE and the standard downstream keyers enable complex junctions to be set up and executed. The control surface is assignable to many mixer channels, enabling one position to handle a number of outputs, or for a supervisor's position to take control in an emergency. Configuration and setup is performed from

COMING ATTRACTIONS

OCTOBER

Special Report
DTV SPORTS PRODUCTION

Special Supplement
DTV POST: POST FOR SGI

Production
PRODUCTION SWITCHERS, CHARACTER GENERATORS

Station Operations
HDTV ENCODERS

Transmission
SATELLITE

BONUS DISTRIBUTION
SMPTE Pasadena,Oct 28 - 31

SPACE CLOSING 9/25
MATERIAL CLOSING 9/28

NOVEMBER

SPECIAL ISSUE
THE DAWN OF DIGITAL: THE STATE OF THE INDUSTRY

Production
STILL STORES/DVEs

SPACE CLOSING 10/21
MATERIAL CLOSING 10/23

DECEMBER

Special Report
TECHNOLOGY FOCUS: DTV POST PRODUCTION

Special Report
MANUAFACTURER'S SOLUTION

Production
CAMERAS
CAMERA SUPPORT GEAR

Post Production
COMPOSITING SYSTEMS

Station Operations
INTERCOMS

Transmission
MICROWAVE

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Anaheim, December 2 - 4

DTV3 Forum
Los Angeles, December 1 - 3

SPACE CLOSING 11/11
MATERIAL CLOSING 11/13

Product Review

the panel's integral display. It also offers support for up to eight levels of digital, analog or embedded audio. An upgrade path for HDTV is available by replacement of the modular vision mixing element with an HDTV version shipping later in the year. *Contact Pro-Bel at (314) 980-1917 or visit www.pro-bel.com.*

For more information circle Reader Service #223

Broadcom Cable Modem Reference Design

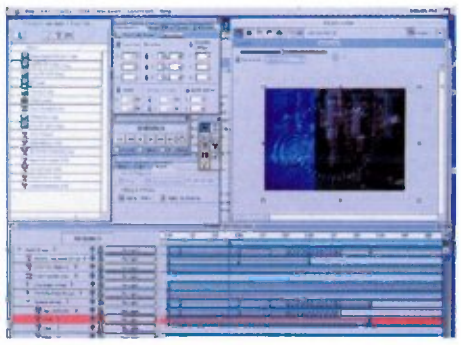
The BCM9322OB is a complete, MCNS/DOCSIS-compliant, cable modem solution using highest integration hardware and software based on the industry-leading pSOS operating system and application software provided by Broadcom. Integrated

SLIC/SLAC design supports IP voice functionality and the modem is suitable for two-way RF or Telco return. It provides the flexibility to build designs for either Ethernet or USB interfaces, including necessary driver support. It also accelerates software development by providing source code for core software functionality and low-level diagnostics. *Contact Broadcom at (949) 450-8700 or email info@broadcom.com.*

For more information circle Reader Service #224

Videonics Effetto Pronto

The Effetto Pronto digital video effects and compositing system for the Macintosh has been added to the Media 100 Compatible Peripherals Guide. The software



seamlessly recognizes the Media 100 codec through QuickTime, allowing users to take their Media 100 footage files into the Effetto Pronto application to add multiple layers, titles and 3D effects. *Contact Videonics at (408) 866-8300 or visit www.videonics.com.*

For more information circle Reader Service #225

Vecta DTV Still Store

The Vecta DTV still store from Avica Technology is for use in post production or telecine applications. Based on the Windows NT platform, the Vecta takes advantage of distributed and central storage, third party software and inter-connectivity to other networked components. It has record and retrieve access times of less than 0.25 seconds, and has a dedicated control panel and/or keyboard/mouse/GUI control. Uncompressed 8 or 10-bit images are available in the following formats: 4:2:2:4 plus key (two, four or six channels), 4:4:4 (two to four channels), 8:4:4 (two to four channels), 8:8:8 (two channels) 480p (two or four channels) and, in the fourth quarter, 720p (two channels) or 1080i (two channels). Other features include SMPTE standard DPX file format for stills, multiple thumbnail picture SVGA/picture monitor browse screen and built-in horizontal and vertical wipe patterns with trackball control, between stored and live images. *Contact Avica Technology at (818) 716-0958 or visit www.avitech.com.*

For more information circle Reader Service #226

Nothing Real Shake 2.0

Shake 2.0 is the graphical user interface for the compositing toolkit from Nothing Real. Shake includes tools for compositing, color correction, format translation and image viewing/analysis. Other features include support for time-manipulation tools (including 3:2 pulldowns), anti-aliased text rendering, global aspect-ratio

control, simulated film grain and interlacing/deinterlacing. Shake 2.0 has an intuitive interface that recognizes the needs of feature film visual effects. It's aimed at users who need to quickly process high volumes of large-format imagery without any loss of image quality. The package is also completely resolution independent and scalable to work with extremely high resolution imagery. It's set for fall release and will be available on Unix and NT platforms. *Contact Nothing Real at (310) 664-6152 or visit www.nothingreal.com*

For more information circle Reader Service #227

Gitzo Mountaineer Tripod Line

Bogen Photo Corp. has three new tripods from Gitzo, all with strength and rigidity thanks to lightweight carbon fiber. The G1227 Mountaineer tripod is similar to the G1228 Mountaineer and features a three-section leg design for quick setup. Each leg can be adjusted to either 24 or 60 degrees for low angle shooting or for uneven terrain. Legs extend to 64 inches and the tripod supports up to 13.25 pounds, while weighing only three pounds itself. The G1325/1329 Mountaineer tripods can be adjusted to 24, 55 or 80 degrees for low angle shooting or uneven terrain. The 1325 extends to 59 inches and can support up to 26.5 pounds, while the G1329 can extend to 72 3/8-inches. *Contact Bogen Photo Corp. at (201) 818-9500 or visit www.bogenphoto.com.*

For more information circle Reader Service #228

Cinema Products ProVid 2 Steadicam

The ProVid 2 is a streamlined version of the ProVid, lightweight yet strong due to its carbon fiber construction. The unit has an enhanced monitor, a one-piece sled and the convenience of no-tools adjustments. It is totally modular to permit additional and upgraded components, and it can be upgraded all the way to the ProVid level. Upgrade options include a dual-action Iso-Elastic arm, a high-performance four-inch green screen monitor offering a 4:3 aspect ratio and a telescoping post. The upgraded vest includes a reversible bridge for operating on the left or right side, and a unique adjustable angle of lift that allows the operator to change the position of the arm. *Contact Cinema Products at (310) 836-7991 or visit www.steadicam.com.*

For more information circle Reader Service #229

Broadcast Electronics TalkPort

The TalkPort from Broadcast Electronics is the industry's only micro-cellular remote with three-channel mixer. The portable unit allows for remote interviews to be

conducted with two mics instead of one and dual mics enable the interviewer to set separate levels and avoid mic sharing for a more natural interview. Also available is the RPS-402, a compact four-channel telephone remote mixer. It has dual phone lines and four-channel versatility. *Contact Broadcast Electronics at (217) 224-9600 or visit www.bdcast.com.*

For more information circle Reader Service #230

Letter to the Editor

Sinclair vs. Shapiro: The Second Installment

On behalf of Sinclair Broadcast Group I would like to address a number of statements made by Gary Shapiro, president of Consumer Electronics Manufacturing Association (CEMA) in the June/July ition of Digital Television.

In his profile, Mr. Shapiro makes several unjustified statements and insinuations. First, he implies that Sinclair's concern with the development of DTV has focused exclusively the performance of indoor antennas. He also claims that y problems associated with DTV reception over indoor tennas are rendered moot by the development of outdoor tenna technology. He finally states that Sinclair's analyses garding the performance of indoor antennas on DTV ceivers were already common knowledge in the broadcast dustry, and that SInclair has not played an important role the recent development of the DTV framework.

Simply put, Mr. Shapiro is wrong on all these points. As the largest operator of commercial TV stations in e nation, Sinclair has a huge stake in the development DTV. Sinclair believes the U.S. public deserves the st DTV service possible, and is committed to provid- viewers with a quality of service that exceeds that fered in today's analog TV world. Sinclair has exam- ed and continues to review all issues related to the velopment of digital service, and it remains Sinclair's al to direct the industry's attention to any potential oblem in the development of this new medium.

Late in 1996, Sinclair and other UHF broadcasters recnized that DTV reception by sets with indoor antennas uld likely be problematic, and Sinclair continues to ieve that this issue is one of the greatest threats to successful DTV transition. Millions of Americans currently rely on indoor antennas to receive broadcast service, and, even for the moment assuming the technical capability of outdoor antennas, it is unrealistic to expect that a significant percentage of these viewers will desire the large outdoor antennas that Mr. Shapiro extols. Sinclair is concerned that, in the absence of appropriate changes in the design of DTV receivers, it will be poor and minority viewers in urban environments that get left behind in the digital revolution. The results from the Washington, DC tests presented at NAB '98 certainly confirm there is reason for concern on this point.

Sinclair is concerned that these large outdoor antennas are not the proper solution to the DTV reception problem. Certainly, the Washington, DC test results suggest that reception through outdoor antennas may not live up to the expectations of American consumers. In addition, Sinclair has learned that outdoor DTV antennas will likely require narrower beamwidths than antennas currently utilized. While such antennas might receive all local channels in a given market when all stations are collocated, viewers will be required to manipulate antenna direction when stations are scattered across that market. Viewers located between markets will be required to make similar directional adjustments. Clearly, "channel surfing" will be problematic in the 1950's-like DTV world that Mr. Shapiro envisions.

In addition, Mr. Shapiro appears overly optimistic about the desire of consumers to use a cumbersome systems of in-store, color-coded maps and diagrams to determine what kind of outdoor antenna to purchase and where to mount this equipment (assuming local ordinances permit rooftop antennas). Millions of television viewers admit that they cannot program their VCRs or stop the persistent flashing of their VCR clocks, and Sinclair believes it unlikely that such consumers will want to confront this kind of complexity in their DTV purchasing decisions.

To the extent that over-the-air reception of DTV programming is not available, either through indoor or outdoor antennas, cable system distribution of DTV broadcasters programming becomes critical. Otherwise, disinclined viewers might be forced to subscribe to cable in order to access local DTV broadcast programming (assuming for the moment that must-carry applies in the digital environment). Sinclair is concerned that, in response to such concerns, CEMA might be hedging its bets and is moving towards development of a class of "cable only" DTV receivers. In fact, in response to a May inquiry from Sinclair CEMA's George Hanover indicated that CEMA had not yet made a decision on this issue. Sinclair believes strongly that the mass production of "cable-only" DTV sets is counter to the interest of the American consumer and urges CEMA to work against this result.

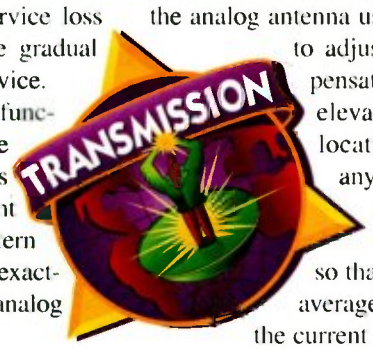
Finally, Sinclair is proud of its efforts in the FCC's ongoing DTV proceeding. At the very least, Sinclair is always willing to initiate a dialogue on the important issues confronting the broadcast industry. Thank you for the opportunity to address the issues raised by your interview with Mr. Shapiro.

Sincerely,
Mark E. Hyman,
Sinclair director, government relations

Transmission

Continued from page 4

Advisory Committee to insure satisfactory reception of DTV. The propagation curves used are the FCC F50/90 as opposed to the F50/50 curves used for NTSC predictions. These curves are intended to predict signal levels on a statistical basis at 50% of the locations for either 90% or 50% of the time. The 90% time statistic for DTV is intended to compensate for the DTV service loss "cliff effect" as opposed to the gradual signal degradation of analog service.



Because the difference as a function of distance between the F50/50 and the F50/90 curves is not linear, each DTV assignment requires a different antenna pattern so that the service contour will exactly duplicate the shape of the analog contour.

The two exceptions were designed to address concerns about power disparity between stations in the same market. Because most of the DTV channel assignments are in the UHF band, in some instances the literal application of the above described process causes considerable differences in DTV powers. Why? Because analog stations operating on VHF channels tend to have much larger Grade B service contours than UHF stations. Therefore, if the same antenna height is used, the DTV power required to replicate VHF analog grade B contours will be much greater than that required to duplicate the UHF grade B contours.

To address this concern, the FCC set a minimum and, for the initial implementation, a maximum power for DTV facilities of 50 and 1000 kW. Furthermore, the FCC decided that the protection from future interference for these facilities will be the area that is now within the paired analog station's grade B contour.

This means that the additional service gains for the stations receiving the minimum power could be wiped out by interference because the FCC only intended to address the power disparity issue within the current grade B service. On the other hand, stations that were capped at 1000 kW still receive protection to the area encompassed by their NTSC grade B contour.

Implementation Flexibility

Recognizing that it may not be possible or desirable to construct the exact facility that was assigned, the FCC has provided for some flexibility that does not require any extensive engineering analysis to support the changes. The antenna may be placed 10 meters above or 25 meters below the analog antenna using a simple formula to adjust the power to compensate for the difference in elevation. Likewise, the location may be moved anywhere within a 5 km radius if the antenna elevation is adjusted so that the height above the average terrain is the same as the current location.

One final item of flexibility that the FCC has given is the option to select either the analog channel or the DTV channel for digital use at the end of the transition.

In order to not unduly restrict changes in existing analog facilities, DTV assignments and for additional new DTV stations, the FCC will permit some additional interference. The criteria, referred to as the de minimis interference standard, states that the amount of new interference any single station may cause is 2% population loss and the aggregate from all new interference cannot exceed 10%.

The baseline from which these percentages are to be determined is the transition service population as given in the FCC DTV plan. However, if this number is less than the population currently served by the paired analog station then the analog service population becomes the basis for determining the limit on any new interference.

The FCC Computer Model

Before discussing what must be satisfied to meet the FCC requirements when proposing the type of modifications mentioned above, a brief explanation of the FCC's computer model is in order.

The service area and population data provided along with the FCC's DTV channel plan were determined in the following manner. Using the parameters in the FCC's engineering database, the F50/50 propagation curves and the heights above average terrain along a set of evenly spaced radials, the distance to the grade B contour for each NTSC station was determined.

This contour was then overlaid on a grid of 4 square km cells (2 km on a side) centered on the station location. For each cell the location of the population centroid was determined.

These points within each cell were then examined using the terrain-based Longley-Rice propagation model to first determine if the signal level was equal to or greater than the minimum acceptable for service (grade B) and if so, whether the point was subject to any interference that would negate service. Cells that had acceptable signal and no objectionable interference were then counted to provide the totals contained in the plan.

A similar procedure was followed for each DTV assignment using a power that would produce an acceptable DTV signal at the same location as the NTSC grade B contour. The only exception to this procedure is that minimum and maximum powers were applied to some DTV assignments. Stations that would need more than 1000 kW to replicate their NTSC grade B contour were capped at 1000 kW and stations that required less than the minimum 50 kW were increased to that level. However, the service evaluation area remained that defined by the NTSC grade B contour.

Although the FCC has stated that it will accept analysis to support applications that were made using different methods the results must still agree with those provided by the Commission model. Given the complexity of the analysis and that small differences can cause major shifts in population counts it is almost impossible to produce the same results using other approaches. However, the FCC will permit the use of smaller grid cells since that will increase the accuracy of the predictions. In cases where a proposal may not be acceptable using the larger cells the use of smaller cells may produce a better result.

Power Limits and the de minimis Interference Standard

Although the FCC will permit stations to apply for power increases to maximize service, increases for stations operating on UHF channels are currently limited to 200 kW. The exception is for applications where beam tilt is proposed and in those cases where the power can be increased to the maximum of 1000 kW provided that there is no increase in the signal level at the previously defined DTV noise limited contour.

Also, in cases where beam tilting is proposed, the FCC requires that computations of field strength at the edge of the service area include an additional 1 dB of antenna gain above that specified by the antenna manufacturer.

Improving Your Facility

When attempting to maximize DTV service the main concern will be meeting the FCC's de minimis interference standard. As noted above, this requirement states that increased interference to another station will not be permitted if it would cause an additional population loss of more 2% of the stations service population or if the additional loss would raise the total population lost to interference to more than 10%. Although mentioned above in relation to DTV stations, the same standard also applies to interference to analog stations where the baseline is the population inside the grade B contour without considering any loss due to terrain or interference from other stations.

Because the protection requirements are more stringent toward analog stations and because protection is required not only to co-channel and adjacent channels but also to the UHF "Taboo" channels, most of the maximization difficulty will likely be the protection of analog stations. The Taboo protections will be of considerable concern to stations that may wish to use beam tilting to improve service since stations on Taboo channels may be inside the DTV noise limited contour.

Because of the complexity of the *de minimis* interference analysis and the sometimes-unexpected interference problems that arise, it is recommended that a complete analysis be made before placing any binding orders for specific equipment or facilities.

To do this you should retain a competent consultant who is familiar with the intricacies of the FCC's regulations, policies and computer model as they relate to DTV maximization. You should then work with the consultant to explore your options and determine the best course of action based on your service goals and available resources.

Once a plan has been finalized you will then file the necessary application and supporting documentation with the FCC and upon approval begin equipment purchases and construction.

Finally, it is important to note that those wishing to improve their DTV facility should file early, because as other stations file applications to enhance their facilities your opportunities may be diminished.

Sparling, Inc., an electrical engineering firm, recently completed construction of a 72,000 sq. ft. digital-ready floor for KCPQ-TV Seattle, local Fox affiliate. Playing a major part in making the floor possible was **Gepco's VPM 2000 and VSD 2001** digital coaxial cable. Larry Brant, KCPQ-TV chief engineer, says Gepco provided between 80,000 and 100,000 feet of cable on only four days notice. "Our marching orders were to build a facility that was entirely automated, digital, heavy on robotics and could accommodate high-definition and interactive television."

Autodesk Looks To Acquire Discreet Logic

Merger of Kinetix and Discreet Logic would result in new Discreet division; awaiting regulatory approval

By Ken Kerschbaumer

Autodesk, parent company to leading 3D software developer Kinetix, has entered into an agreement to acquire Discreet Logic by the end of the year. If approved, the acquisition will result in a new Autodesk division called Discreet, made up of a New Media Group based in San Francisco and an Advanced Systems Group based in Montreal.

According to a press release, "The combination is intended to create the premier total solutions provider of digital content design, creation, and manipulation tools for the creation of moving images."

Under the terms of the agreement, Autodesk will issue 0.525 shares of common stock for each outstanding share of Discreet Logic stock and is intended to be accounted for as a pooling of interests.

Both companies are considered among the leaders in their given fields, with Discreet Logics's strengths found in turnkey systems and software used for visual effects and compositing, editing and broadcast production in films, video, broadcast, HDTV, new media and the web.

Kinetix is considered by many to be the leading PC-based 3D graphics and animation software developer, with Kinetix' 3D Studio MAX and Character Studio used for a variety of projects.

Based on the August 19 closing price of Autodesk's stock, the aggregate value of the transaction to Discreet Logic's shareholders is approximately $520 million. Subject to several conditions, including regulatory approvals and approval of the shareholders of both companies, the transaction is expected to close by the end of the year. Until this transaction is finalized, both companies shall operate as separate entities.

At a press conference discussing the merger Christine Singles, Autodesk vice president and treasurer, said, "The net result is a company that will allow customers to realize significant productivity gains by having access to a single integrated and interoperable production pipeline."

The Discreet Advanced Systems Group will be based in Montreal and managed by Richard Szalwinski, Discreet Logic President and CEO. In San Francisco Kinetix's Jim Guerard, vice president and general manager, will head up the New Media Group which will be comprised of PC products from both Kinetix and Discreet.

Carol Bartz, Autodesk chairman and CEO, explained that the acquisition is part of a larger Autodesk strategy. "For the past three years we've been executing a strategy to broaden our business and expand beyond the traditional design software market. With the acquisition of Discreet we can add software for the creation of digital images to our portfolio of leading-edge design technology."

Bartz added that the move to PC/NT-based creative solutions is set to accelerate, playing into Autodesk and Kinetix' strengths. "The market is beginning to demand product suites that include total solutions for the production pipeline," she explained. "Together, Discreet and Kinetix can meet this demand and accelerate growth."

The acquisition of Discreet actually builds on a relationship between Kinetix and Discreet that began at last NAB. Discreet Logic and Kinetix made a joint announcement concerning a collaboration aimed at delivering two-way integration between Discreet's New Media product line and 3D Studio MAX 2.5 from Kinetix.

"The customer response [to our working together] has been fabulous," she explained. "Taking this partnership to the next level is a natural step. Our businesses are very complimentary, and together we can realize incremental opportunities by leveraging each others brand, customer channels and, of course, technology."

Richard Szalwinski, Discreet Logic president and CEO, said, "The more we meshed the more we knew we could do great things together." ■

Zeros and Ones

Commentary from the Editors of Digital Television

The Magnificent Seven Proposals...Or Are They?

The must carry fight from a few years back is something the industry doesn't need to relive, but with new digital services being offered by broadcasters it's come to the forefront once again.

The FCC recently reopened the discussions on must carry by laying out seven proposals ranging from the good to the bad and to the downright ugly. In particular order:

Immediate carriage: Require all cable systems to carry all commercial digital and analog stations up to the one-third capacity limit.

System upgrade: Require cable operators upgrading their systems to add digital channels as they come on air.

Phase-in: Require immediate carriage of digital broadcast signals, but limit digital channel additions to three to five channels each year.

Either/Or: Require broadcasters to choose mandatory carriage for either the analog or the digital channel, but not both, during the early transition years.

Equipment penetration: Begin digital carriage obligation when a set percentage of viewers have bought digital reception equipment.

Deferral: Defer implementation of digital must-carry rules until a certain date, such as May 1, 2002.

No must carry: Enforce no must-carry obligation for the digital channels until stations cease analog broadcasting.

It seems to us that our nation's cable and broadcasting infrastructure is not yet in good enough shape that a "One-size-fits all" approach will work. In certain areas of the country some of the above are possible today, some will be possible tomorrow and some may never be possible.

While the above proposals may be a good starting point, it may be in the best interest of all involved that local broadcasters and cable operators be left to figure out their own solutions.

Can Carry

Frankly, we're more concerned at the moment with the question of can carry—whether cable can pass high definition signals at all. This is the piece of the puzzle that was left out by digital's designers, and the piece without which DTV may not fly at all. Talk about the public's interest.

We're Not Alone

If there's one thing shown by our interview with Phillip Laven, director of the European Broadcast Union's technical department, it's that the U.S. broadcast industry isn't the only one that is unclear as to what the clear pictures of DTV will mean to the viewer. The Europeans don't have the added burden of HDTV pictures and widescreen, but we think Laven's answers allow the real question concerning DTV to come to the forefront: When is the right time to turn off the analog service? More importantly, when will that be?

One thing seems pretty sure: broadcasters will not be giving back the analog spectrum in 2006. As Laven says, "To put it crudely, there are no votes in telling people that they have lost their television services."

2050, anyone?

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