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JUNE 2003

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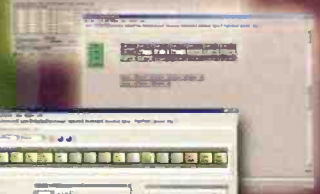
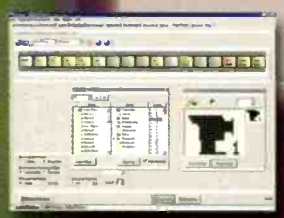


Geneostat Virtual Control Panel



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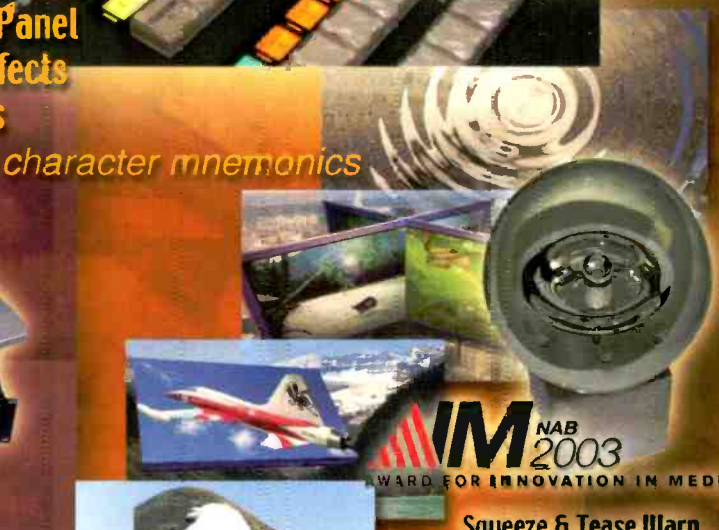

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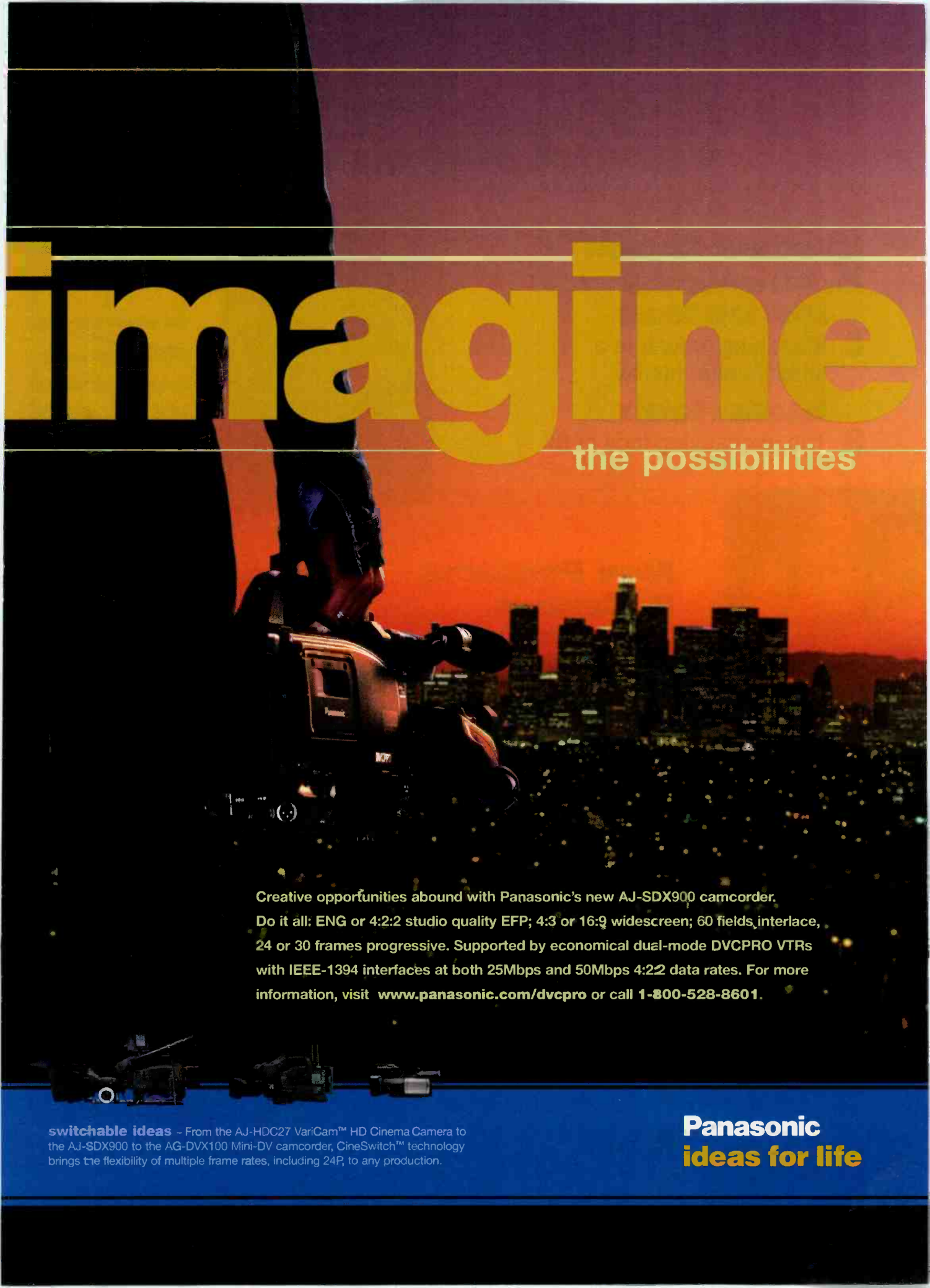
FEATURES

BEYOND THE HEADLINES

DIGITAL HANDBOOK

ON THE COVER: The network operations center for Scripps Networks is located in Knoxville, TN. The NOC supports the playback origination of Home and Garden Television (HGTV), Food network, Do-It-Yourself network (DIY) and the Fine Living network. Equipment used to support the NOC includes Thomson Grass Valley Media Pool video servers and automation systems, and a StorageTek Powderhorn near-line archive system. Photo by Robert Wolsch Designs.

(continued on page 8)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SYSTEMS DESIGN & INTEGRATION

NEW PRODUCTS & REVIEWS

DEPARTMENTS

Pick Hit redux

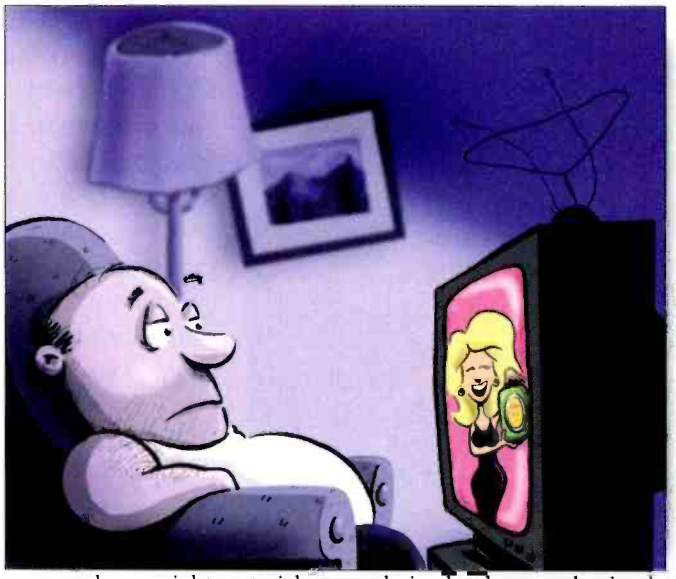
One of this year's Pick Hit recipients is a second-time winner. Their 1990 Pick Hit award was given in recognition for innovation in audio storage. This year, the same company won a Pick Hit for their video storage product. Name the company and the technology used as the storage medium in that 1990 Pick Hit-winning product. Correct entries will be eligible for a drawing of *Broadcast Engineering* T-shirts. Enter by e-mail. Title your entry "Freezeframe-June" in the subject field and send it to: bdick@primediabusiness.com. Correct answers received by Aug. 17, 2003, are eligible to win.

Watch TV
and become good-looking and rich

It's late, or early, depending on your viewpoint. I feel lousy. I'm coughing like crazy and can't sleep. But why would I want to sleep? It's only 3 a.m.

Hence, I found myself channel-surfing at this ungodly hour of the morning. As I clicked through the channels, I discovered there are only three kinds of programming at this hour.

First, there's the news and weather. Second, there are reruns of 20 year-old sitcoms or 40 year-old movies. In the third category are programs that show you how to



lose weight, get rich, grow hair, develop an absolutely fabulous body in only 15 minutes a day, have the sex drive (and equipment) of a 25-year-old, and live forever! Wow, what have I been missing?

Man, I need a new plan. First, I'd have to improve my body. We have the Ab Swing, the flexible bow, the Thighmaster, "Buns and Thighs of Steel" and body sculpting. Look out, Arnold, I'm going to pump it up!

Need to lose weight? May I recommend any of these fine solutions? There's the all-herbal diet, the fiber-thin diet, the liquid diet, the patch and the eat-anything-you-want diet. One of these plans showed the person drinking something resembling molten plastic. The actor claimed the stuff expanded in your stomach so you'd feel full. Yeah, but what happens when this ball of goop needs to leave the stomach?

Need a bit more hair on top? No problem! There are two different solutions and both rely on pills. One plan blames your follicle-challenged head on excessive testosterone, and the other on your grandmother. Pop a pill, grow hair. What could be easier?

Some male readers may be interested in, shall we say, a little male enhancement. Don't worry, the show "Sex-Talk" claims that two pills a day will result in a 25-percent increase in... well, you get the idea.

For the females in the audience, a similar solution for the upper body comes in the form of a cream. Apply twice daily and you too can enjoy a larger presence.

Then I discovered I can live almost forever. First, a few pills for the prostate, improve the liver function with a once-per-day drink, then add some herb-based vitamins, an anti-gravity bed and finally, the live-forever HGH pills. By then I'll be taking 100 pills a day, but what the heck, I'll soon be able to afford it.

Now I want to become rich. There are two basic get-rich schemes (I mean, legitimate ways) to make money: real estate and direct marketing.

The no-money-down, get-money-at-closing, seller-financed real estate thing looked good and it must work. After all, all the pitchmen either live in Hawaii or have huge homes complete with Olympic-size pools.

The second way to become a millionaire is through direct marketing. I kind of liked the one called "Stuff Your Mailbox with Cash." The guy said their plan simply required me to place a few newspaper ads around the county. Soon, my mailbox would be filled with checks and cash. Whoa baby, this is for me.

I can hardly wait until broadcasters get multichannel going. With all those channels to fill, maybe these informative, factual and trustworthy programs will be on in prime time. Then I won't have to stay up late to learn how to live longer and become rich.

Brad Dick
editorial director

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Evolution?

Mr. Birkmaier,

In your March column, entitled "Evolution?", you begin a statement on tuner performance with the premise, "Since most consumers will never use the ATSC receiver in new digital televisions, ..." If that premise is true, then why (beyond Federal mandate) should broadcasters sink millions of dollars into ATSC broadcasting? Would it not be prudent financially, as well as ecologically, to simply phase out all terrestrial broadcasting in favor of expanding the reach of cable? A basic local service tier could be fully subsidized by the former broadcasters in the market — now strictly content providers — in lieu of capital, maintenance and utility expenditures. Cable would benefit by increasing their penetration to 100 percent, and could then attempt to capitalize on the "foot-in-the-door" to sell non-subsidized tiers and services.

DBS, or IP video via telco-delivered broadband service, could serve the rural areas beyond the reach of cable.

Isn't this the time to gracefully end free, over-the-air video broadcasting? Blame progress. Blame the economy. Blame the government, the regulators, even the consumer.

Why beat a dead horse? If nobody watches, who'll notice? Shut them down like 405 B/W in the UK — if no one complains, then you were right.

RICHARD A. PITCHFORD, CSTE, CSRE
CLEVELAND STATE UNIVERSITY

Craig Birkmaier responds:

Richard,

Clearly, many broadcasters are questioning why they are being forced to invest (potentially) millions of dollars in a digital terrestrial broadcast system (DTTB), for which only a handful of viewers have shown any interest.

The premise upon which I based the statement that most people will never use the soon-to-be-required ATSC tuners in new digital television receivers is quite simple. Like the NTSC service it seeks to replace, the new DTTB service is incapable of delivering a competitive television service reliably to the masses.

You raise the interesting alternative of ending all terrestrial broadcasting services, allowing broadcasters to become "strictly content providers." I would suggest that this has been mostly true for more than a decade; however, I would rephrase your wording to "content gatekeepers." The sad truth is that, with the exception of local news and the occasional public service program, broadcasters produce very little content. The economic engine of local broadcasting is the government-supported franchise to act as gatekeepers, providing access to local advertising markets. The economic engine of public broadcasting is our tax dollars and contributions to subsidize the service.

Cable and DBS serve fixed receivers. If this is all that we want in the future then I strongly support your plan. So a more relevant question is, why should local broadcasters exist at all?

The answer is also simple. The broadcast spectrum is fully capable of supporting a competitive and reliable multichannel service; one that can deliver not just television entertainment, but a tidal wave of bits that carry relevant services to local communities. We are an increasingly mobile society, and we expect to be able to access information and entertainment anywhere, anytime. This is an important competitive advantage for DTTB that will become increasingly important in the future and, in my opinion, sufficient justification to allocate spectrum to digital broadcasting.

Cable and DBS ascended to their current dominant position as distributors of television content because the analog broadcast system was incapable of delivering expanded program choice, AND because the broadcast business model remained focused on serving the masses, rather than the market niches. For the most part, the philosophy behind the DTV transition has been to preserve the existing broadcast business model. I will leave it to our readers to decide whether this means preserving NTSC and its attendant regulatory benefits, or migration to a digitized version of the old business model.

The technology exists for broadcasters to re-invent the way in which all forms of digital media content are delivered to the masses, and the niches. Why cede the business to cable and DBS and the "broadcast" networks who care only about controlling local advertising revenues?

January Freezeframe:

Q. A product was introduced in a private suite at the 1994 NAB covention. It may never have been fully successful, but it could be called the first of today's large-scale storage systems. Name the product and the company that introduced it.

A. BTS introduced the Media Pool in a private suite. No one correctly guessed the company and product. BE

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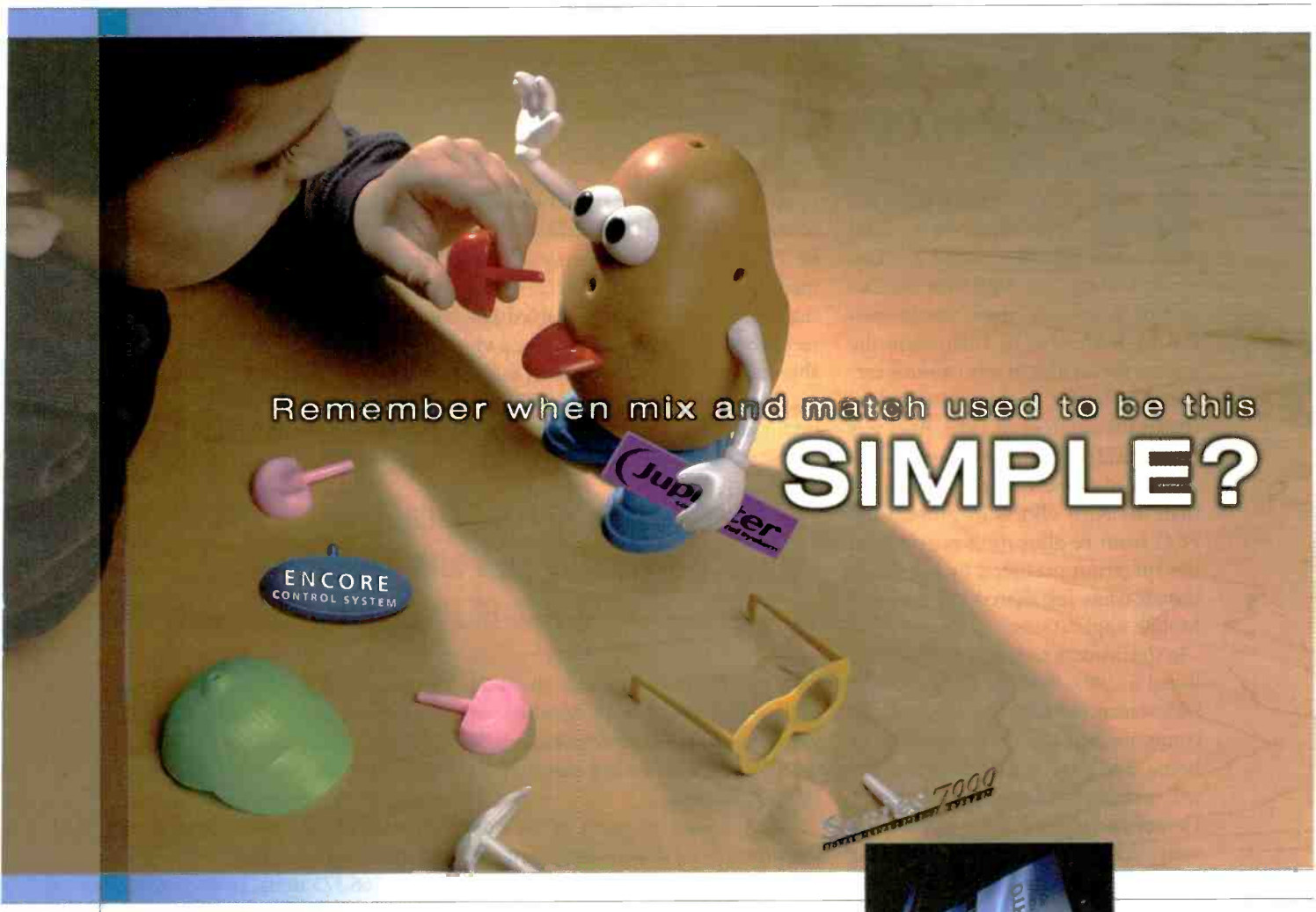

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(H)DTV competitors

BY CRAIG BIRKMAIER

HDTV... Maybe that's it!" According to Joel Brinkley, author of "Defining Vision: The Battle for the Future of Television," these words, spoken by John Abel in 1986, were the genesis for an idea to avert almost certain disaster for the broadcast industry. In the summer of 1986, Abel was vice president of the National Association of Broadcasters – the point man for NAB efforts to prevent the FCC from re-allocating portions of the spectrum occupied by television broadcasters for shared use by Land Mobile applications.

In the introduction to his book, published in 1997, Brinkley writes: "Soon, widescreen digital televisions will be commonplace features in almost every home, and today's square-screen sets will seem as archaic as a record player." He went on to predict the end of conventional broadcasting in the next decade, saying that "The entire nation will have switched to digital TV."

Six years later, nearly 40 million homes are enjoying the benefits of digital TV. The digital compression that made it possible to deliver HDTV in a single 6MHz TV channel enabled Direct Broadcast Satellite to become a viable competitor to multichannel cable, even before Congress and the FCC officially launched the broadcaster's DTV transition in 1997. The DBS services grew quickly and now serve about 20 million U.S. homes with hundreds of channels of standard-definition digital TV and a growing number of HDTV channels.

Six years into the so-called DTV transition for broadcasters, less than one percent of U.S. homes are capable of receiving DTV broadcasts.

DBS siphoned off many of the best customers from cable systems – those who subscribe to premium service tiers with the best profit margins. This, in turn, accelerated the deployment of a new digital infrastructure for cable television, as the cable monopolies scrambled to hold onto their customers. Cable now delivers digital television – including HDTV – to about 20 million U.S. homes.

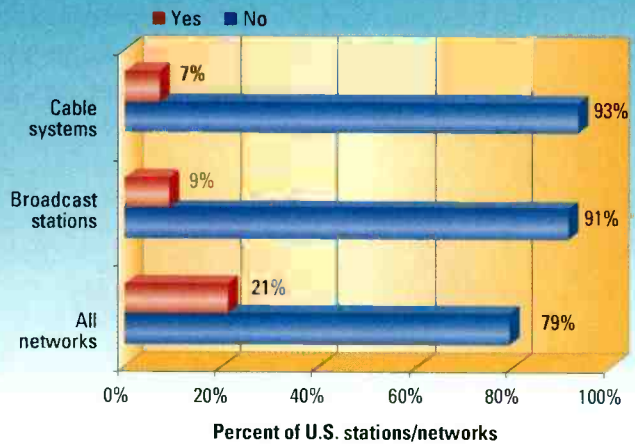
Meanwhile, sales of HDTV-capable displays are beginning to take off. At NAB, the Consumer Electronics Association announced that the CE industry has shipped more than five million DTV products, which include displays with 480p or better resolution, integrated DTV receivers and digital set-top boxes. Several weeks later, the CEA announced first-quarter 2003 sales totaling 766,373 units, an 86 percent increase in units over the first quarter of 2002. Cumulative sales figure for DTV set-top boxes – sales from 1999 through March 2003 – have now reached 348,019 units. This brings ATSC-receiving products, including both integrated sets and stand-alone set-top boxes, to 633,897. The CEA release did not mention that the vast majority of these set-top boxes and many integrated receivers are HD-capable DBS receivers with ATSC tuners.

Six years into the so-called DTV transition for broadcasters, less than one percent of U.S. homes are capable of receiving DTV broadcasts. And with the May deadline passed for non-broadcast stations to begin DTV broadcasts, only about half of the nation's broadcasters are delivering DTV signals, many at reduced power levels. The notion advanced by

FRAME GRAB A look at the issues driving today's technology

HD not in broadcasters' plans

Vast majority of networks not planning HD programming



SOURCE: TrendWatch www.trendwatch.com

Brinkley and the FCC that analog TV broadcasting would end this decade is now viewed as a joke.

Almost everyone agrees that John Able's "idea" turned out to be a stroke of genius. Broadcasters have not given up a single hertz of spectrum to alternate uses, despite the fact that Congress and the FCC expected to recover most of the 700MHz bands by this point in the transition. The consumer electronics industry has a new cash cow. While HDTV displays account for a relatively small percentage of unit sales for TVs, they represent the lion's share of profits. And now, there is a new battle cry in the world of multichannel television distribution: "HDTV... Maybe that's it!"

The opportunity to serve a rapidly growing niche audience, willing to pay a premium for HDTV programming, is irresistible.

The new DTV food chain

Given the reality that the average price of a new TV is still hovering below $300, it would be easy to question the notion that HDTV would be the salvation of digital terrestrial television broadcasting (DTTB).

But HDTV is now a quantifiable success, and the quantity of HD programming is growing. There are several reasons for this "unexpected" turn of events. Perhaps most important, big-screen home theater systems are a good match for the larger homes and larger incomes of the world's largest economy. This was true even before the introduction of HDTV. Rear-screen projection TVs are a uniquely U.S. phenomenon, accounting for the majority of worldwide sales.

HDTV-ready displays – with their integrated de-interlacing circuits – do a good job of making NTSC acceptable on a big screen. Better yet, when you hook up the analog component output of a DVD player to one of these sets and a surround sound system, the home theater experience comes alive. Even without access to HDTV programming, as is the case in our home, the investment in an HD-capable display is well worth the price.

The ability to watch real HDTV programming is the icing on the cake; something that many purchasers of HD-capable displays are willing to pay a premium for, along with premium movie channels and premium sports packages.

You might say that HDTV and premium program tiers are a marriage made in the heavens, and now the earthbound competitors to DBS are jumping on the HDTV bandwagon.

This Week in Consumer Electronics recently predicted that the outcome of the ongoing battle between the digital satellite and cable multichannel TV industries could affect sales of billions of dollars' worth of products, including higher-end set-top boxes, integrated HDTV sets, HDTV monitors and other related products.

These broadcast and cable networks are offering HDTV programming.

The report notes that many new HDTV set owners have come to satellite from cable, and that cable has to respond by aggressively deploying its HDTV solutions.

Multichannel TV programmers can smell the money, too. The opportunity to serve a rapidly growing niche audience, willing to pay a premium for HDTV programming, is irresistible. Hardly a week goes by without the announcement of a new HD service that will be delivered via cable and DBS. ESPN recently launched its HD sports channel, and HDNet is expanding to three channels that will be offered by both cable and DBS services.

The new DTV food chain described in the April "Download" is beginning to materialize. The major questions yet to be resolved involve how it will be packaged, what it will cost and what the broadcast networks will do to capitalize on this opportunity.

Sleight of hand?

At the moment, all eyes are focused on Washington, where the FCC was expected to complete its biennial review of ownership rules on June 2. Concerns about media consolidation are uppermost in the minds of everyone involved with mass media.

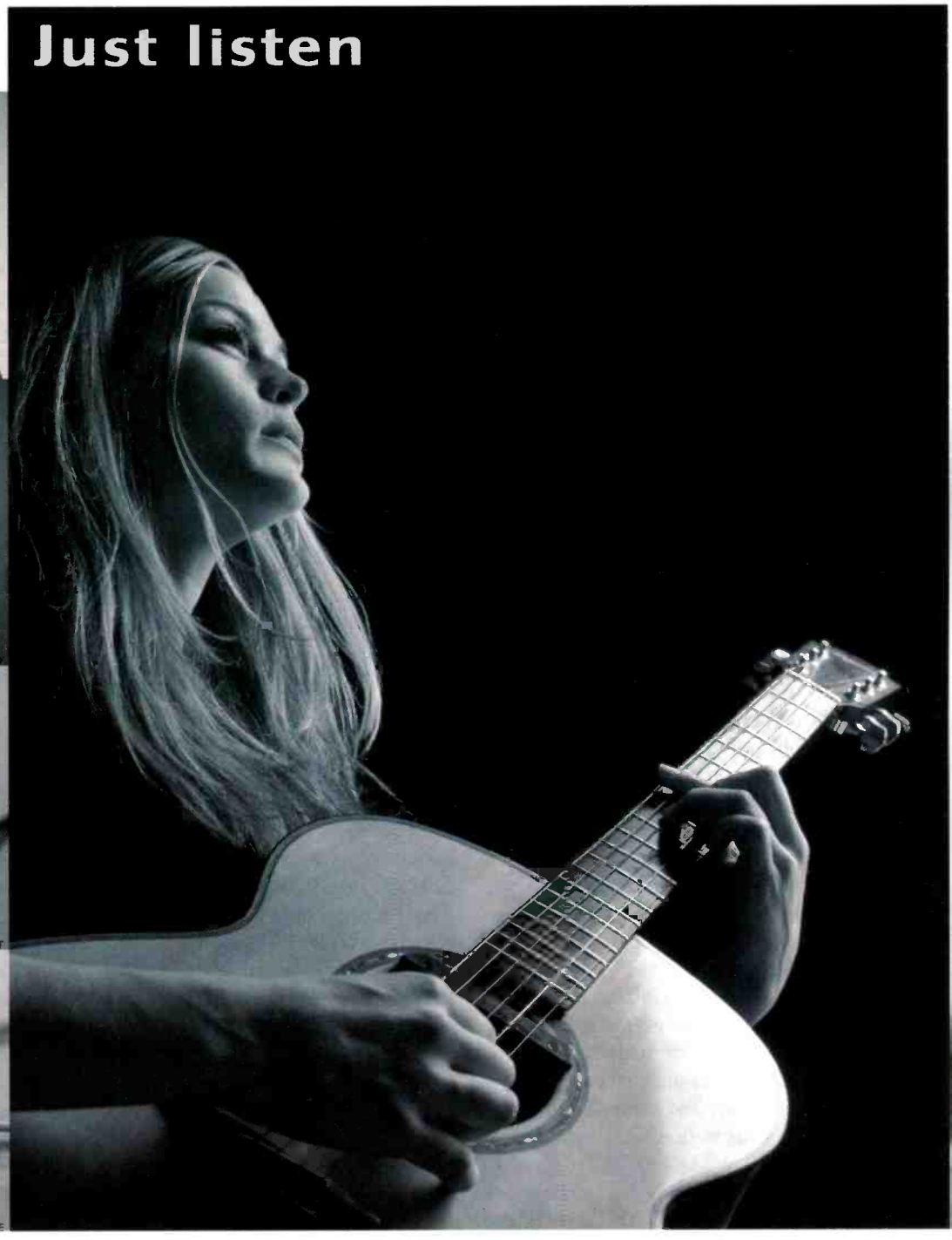
In a classic sleight of hand, while broadcasters have focused attention on the pending media consolidation rules, they are gobbling up cable networks to recapture the audience lost to program diversity. At NAB, NewsCorp announced its deal to acquire DirecTV – the most important missing piece to their global DBS ambitions.

Leading up to the FCC decision, Congressional leaders held a series of hearings on media consolidation. At one hearing, Viacom's President Mel Karmazin issued dire warnings about the future of broadcasting if the big media conglomerates are not allowed to grow. Karmazin noted that the rising cost of programming, especially rights fees that networks pay sports leagues, causes networks to lose money by putting their shows on broadcast stations instead of cable. "Sports content will be the first to go to cable," Karmazin warned. "Then other [programming] will follow." BE

Craig Birkmaier is a technology consultant at Pcube Labs, and hosts and moderates the OpenDTV Forum.

Send questions and comments to:
cbirkmaier@primediabusiness.com

Trust your ears



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DTV build-out
sanctions approved

BY HARRY C. MARTIN

The Commission has adopted a series of new sanctions to be applied to DTV permittees who fail to complete construction within their required time and fail to receive an extension from the Media Bureau.

The great majority of DTV stations currently on the air are operating under Special Temporary Authority (STA), which allows them to operate at a lower power and with less-than-full facilities. The DTV construction deadline is tolled upon grant of an STA, although the FCC may later decide to start the clock running again. The only group of DTV permittees who were not given such an opportunity are network affiliates in the top 30 markets. They are required, absent extraordinary compelling circumstances, to build out a full facility. This policy was reaffirmed in the FCC's latest action. The only top-30 stations that have met the "compelling circumstances" waiver criteria are those who were previously located on the World Trade Center.

Under the new sanction procedures, if a request for an extension of time to complete DTV construction is denied because the Commission has not found extraordinary and compelling circumstances, the station will receive an admonition and be required to file a series of reports with the Commission. These reports, which will begin with a report due within 30 days after extension denial, must outline the steps that the permittee intends to take to complete construction and provide specific dates by which it expects construction to be completed. Again, absent extraordinary and compelling conditions, the Commission expects the build-out to be done within six months of the initial denial and admonition.

If at the end of the first six months the DTV build-out is still not completed, absent extraordinary and compelling circumstances, the Commission will issue a Notice of Apparent Liability. The forfeiture amounts could be in the $20,000 range. In addition to the NAL, the station also will be required to submit a report every 30 days as to proposed construction goals and its efforts to meet those goals. If construction is not completed within the second six-month period, then, absent extraordinary and compelling circumstances, the Commission will determine that the DTV permit has expired and the broadcaster will be left with no DTV channel.

Perhaps the most important effect of the loss of the DTV authorization is that the licensee will be subject to cross-filings even if its channel is in the core.

Perhaps the most important effect of the loss of the DTV authorization is that while the licensee may at the end of transition seek to convert to DTV on its analog channel, it will be subject to cross-filings even if its channel is in the core (i.e., Channels 2 – 51).

In the event that a DTV authorization is rescinded, the channel will be deleted from the DTV allotment table. In the future, if other parties are interested in having that allocation revived, they will have to file a petition for rule making. In the meantime, the allocation will not be an impediment to modifications or maximizations of current DTV authorizations and allotments.

FCC regulatory fees up 23 percent

The Commission has issued a Notice of Proposed Rule Making to solicit comments on the reg fees due in September.

The total amount of money that must be collected for each fee category will go up by 23% this year. Because that 23% increase is measured by category, if the number of stations in a category has declined, fee increases in that category may be higher. On the other hand, if the number of stations in a category has increased, the fee increase may not be a full 23%.

The Commission plans to discontinue the routine mailing of regulatory fee public notices to all affected parties.

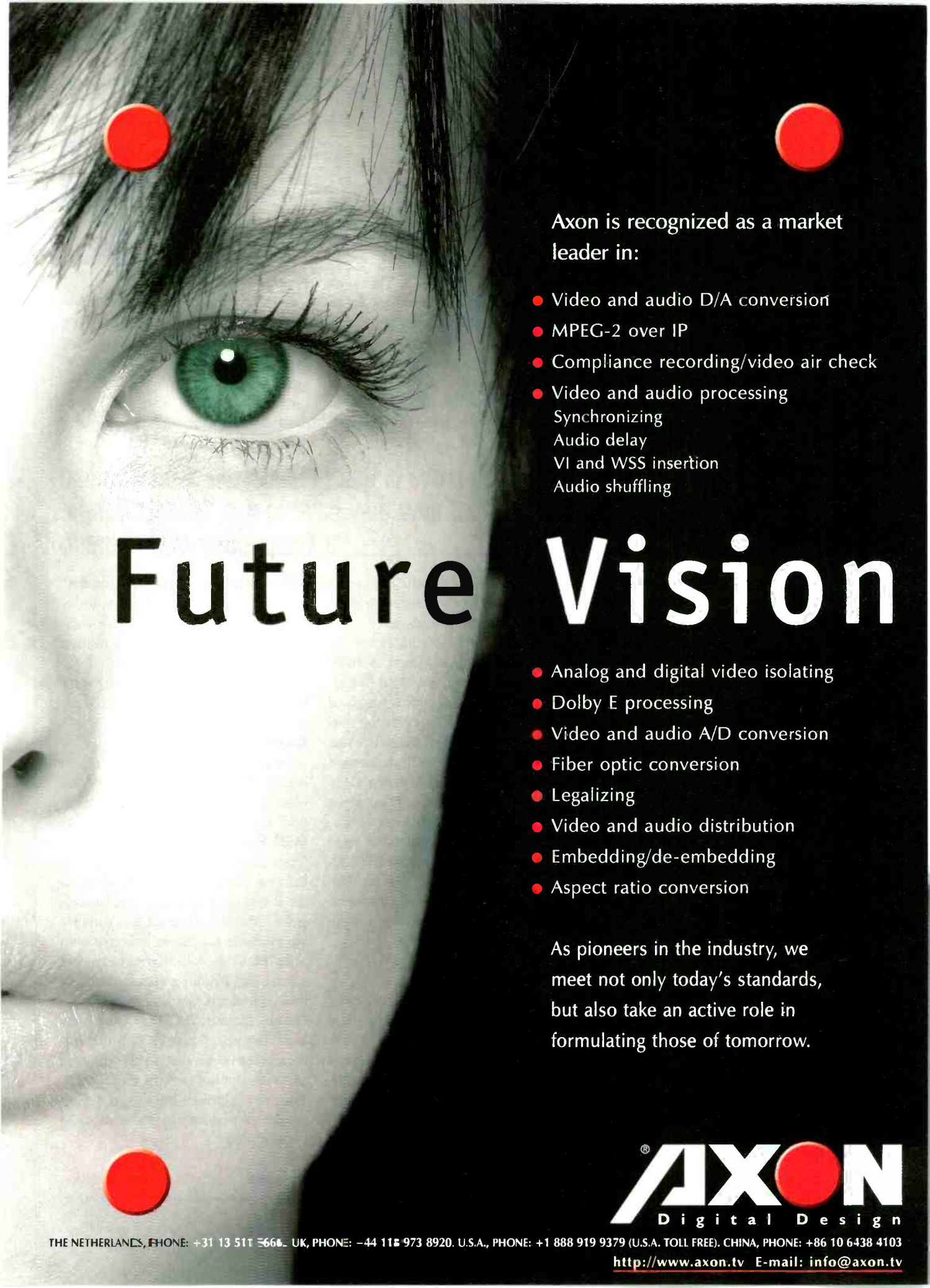
The Commission is planning a pilot program to mail postcards specifically stating the amount owed. The postcard will identify the station call sign, address, facility identification number and amount owed. The station will then have the opportunity to correct any mistakes before paying. BE

Dateline

Stations in North Carolina, South Carolina, California, Illinois and Wisconsin must file their biennial ownership reports with the FCC and place their annual EEO reports in their public files by Aug. 1.

Harry C. Martin is an attorney with Fletcher, Heald & Hildreth PLC, Arlington, VA.

SEND Send questions and comments to: harry_martin@primediabusiness.com



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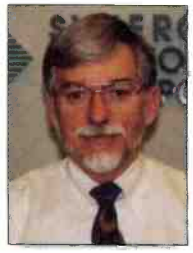
BEYOND THE HEADLINES

The cost of HD

BY JOHN LUFF



The first impetus behind broadcast HDTV, emerging around 1986, was an attempt by broadcasters to keep all of the broadcast spectrum for themselves. In "Defining Vision: The Battle for the Future of Television," author Joel Brinkley relates a story about NAB staffers John Abel and Tom Keller visiting Dr. William Glenn, a college professor and former director of CBS Labs. Their purpose was to discuss HDTV technology and how it might be used to justify their argument that the FCC reserve the contended spectrum for broadcasters. The thoughtful minds of Dr. Abel and company found HDTV to be a reasonable purpose for the contended spectrum. Broadcasters used HDTV to lever the Commission into protecting the spectrum while they, the broadcasters, worked out the details. They correctly knew that much was yet to be done –in fact, digital HDTV was yet to be invented.

CrossCreek Productions mobile truck company uses Thomson Grass Valley's Kalypso switcher. Thomson introduced an HDTV and switchable HD/SD variant of the popular switcher at NAB this year.

You've come a long way, baby

From that early HDTV system, we have come a long way indeed. Broadcasters retained the spectrum but they didn't have a clear business model to make it profitable. Now, almost two decades later, broadcasters are faced with deadlines that require them to deliver advanced services they once claimed they needed FCC protection to foster. But though the Commission granted their fondest wish, they are no closer, in the opinion of some, to making HDTV a financial success.

The good news is that broadcasters won. The bad news is that now they have to use the spectrum in a competitive environment.

Initially, the NAB and others warned that the transition could cost as much as $30 million per station. And though the equipment's visual performance was stunning, its ability to provide the production values to which the public was accustomed was lacking. How expensive is it today to build HDTV systems that offer production capabilities that viewers will accept? Will pricing trends continue to make HDTV capabilities more accessible, or have we reached diminishing returns? The "cost" has two elements: economic cost, and adjustment in the expected performance of initially immature HDTV hardware.

The bad old days

When the DTV transition officially began on Nov. 1, 1998, very little HDTV hardware existed. In 1999, HDTV waveform monitors were just coming on the market, and 720p scopes were nonexistent. The first master-control switcher offered cuts, wipes and dissolves, limited keying and no push back. The limitations they placed on on-air continuity would have been hard to accept.

Equipment evolution

In 1998, the only large production switcher and DVE was the HDVS-7000 from Sony which, with two channels of effects, cost nearly one million dollars. Cameras were still nearly 50 percent more costly than high-end, standard-definition cameras. Lenses were scarce and similarly expensive. Handheld cameras were heavy, bulky and offered no new features. An encoder was half a rack, half a million dollars. The brightest spot was the audio system: Dolby AC3 hardware worked and was not overpriced.

Cameras

Today, HDTV cameras cost about what EFP or studio cameras cost five years ago. They offer at least equivalent performance as well. The LDK-6000 MKII from Thomson Grass Valley offers multi-standard image capture. Panasonic's AJ-HDC27 VariCam offers the ability to "over-crank" and "under-crank" like film cameras. Box cameras are available for use in sports venues or as "POV" shots in studios or control rooms, just like their standard-definition equivalents. Studio cameras from Hitachi, Ikegami, JVC, Panasonic, Sony and Thomson Grass Valley offer features at least equivalent to SD offerings, and with superior performance to boot. The price premium has dropped from nearly 300 percent in 1998 to about 25 percent today.

Lenses

Lenses have evolved to the point that,

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while there is a premium cost, virtually all SDTV models have HDTV variants. Lenses for handheld cameras offer the same range of focal length and zoom ratio, and Canon and Fujinon have developed prime lenses intended for film-style shooting. The improvements required by HDTV imaging have also helped make today's standard-definition lenses outstanding in quality. Chromatic aberration (variation in the focal length as wavelength changes) has been greatly reduced in all lenses, and especially in HDTV models. Focus breathing (zoom changes as focus is adjusted) has also been substantially improved.

Today, HDTV cameras cost about what EFP or studio cameras cost five years ago.

Switchers

HDTV production switchers have improved in just a few years. Sony has added the MVS-8000 to the product line which offers both 1080i/1080p and 720p capability. Thomson Grass Valley introduced the popular Kalypso series in an HDTV and switchable HDTV/SDTV variant this year at NAB. Neither suffers any compromises for HDTV production over SDTV production, a major improvement in a few short years. Compared to SD equivalents, the price premium in this equipment category has dropped from almost 300 percent a few years ago to about 30 percent today.

Terminal equipment

HDTV terminal equipment in 1998, could have best been described as a bit thin, and much more expensive than standard-definition options. Distribution amplifiers had only a few outputs, cost a bundle, were often large and in short supply. A couple of manufacturers offered frame synchronizers. Terminal equipment today is smaller, uses less power and is available in a much broader range. Stand-alone keyers are available from several manufacturers, and distribution amplifiers with monitoring downconversion outputs are readily available from several companies. This year, the availability of new chip sets for image scaling has allowed manufacturers to offer downconversion and upconversion at prices (under $10,000) not possible until now.

Routers

The first 32x32 router cost almost a quarter of a million dollars. Now, a 128x128 HDTV router costs about $50,000 less, though that is still a premium of about $80,000. Wideband routing capable of seamlessly handling data rates from 19.39Mb/s (SMPTE 308) to more than 1.485Gb/s (SMPTE 292) are readily available with features and performance much like that of standard-definition products a couple of years ago.

The price gap

Often, people assume that HDTV is so expensive that it is impractical. Some of the items mentioned in this article show little effective difference in cost between SD and HDTV variants, while others show a considerable gap in price. Some HD items, like monitors, will always cost considerably more. Some technologies for display hold the promise of achieving near parity. Those technologies that scale with size will fit this model – plasma displays, for instance. Large plasma screens that maintain the same pitch between pixels as smaller screens are inherently higher in total resolution and are a natural fit to HDTV applications. And some of the newer display technologies, including plasma, have yet to achieve the uniformity and accuracy of modern CRT displays, which is required for critical viewing applications such as telecine transfer and camera shading.

Panasonic's AJ-HDC27 VariCam, shown here being used by TOMBO FILM (Hollywood, CA), offers the ability to "over-crank" and "under-crank" like film cameras.

The performance gap

Potentially, there is a second cost to HDTV technology. If the range of production capabilities of HDTV equipment was not equivalent to SD equipment, HDTV's price/performance ratio would show a disadvantage. As recently as three years ago, this certainly was the case. Early production switchers, for instance, offered fewer features, more limited DVE capabilities, fewer inputs and, in general, fewer options the industry has come to take for granted. HDTV copper camera cable lengths were (and still are) shorter, and operational complexity is generally higher.

Trends

Today, a high-end, standard-definition mobile unit costs in excess of five million dollars. A similar HDTV unit might cost as much as two to three million more. The cost differential is shrinking, but is still considerable. At the end of the day, content will be the deciding factor in the maturing of the HDTV production industry. HDTV is clearly the future of television, as the pioneers told the FCC in 1986. It is finally coming true. BE

John Luff is senior vice president of business development at AZCAR. To reach him, visit www.azcar.com.

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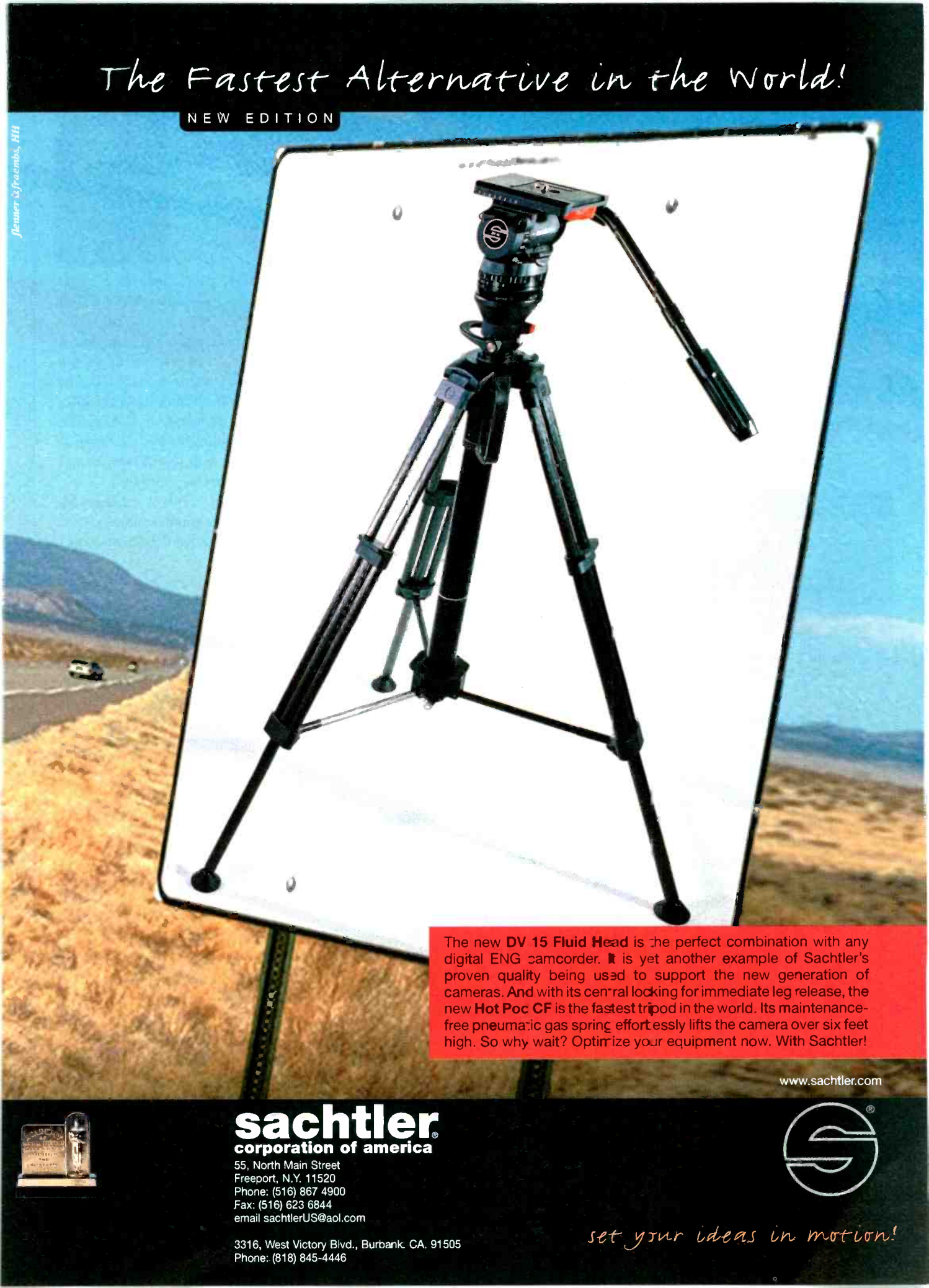

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The 1280x720/60 HDTV format

BY MICHAEL ROBIN

The latest (January 4, 2001) revision of SMPTE Standard 296M, 1280x720 Progressive Image Sample Structure - Analog and Digital Representation and Analog Interface, defines a family of eight progressive image sampling systems. The standard covers both GBR and YC_BC_R formats. There is no ITU counterpart of this standard because at present, ITU does not consider it as an HDTV format.

	Formats	Y Samples per line			Lines per frame		Frame rate
		Total	Active	Ancillary	Total	Active	(Hz)
1	1280x720/60	1650	1280	362	750	720	60
2	1280x720/59.94	1650	1280	362	750	720	60/1.001
3	1280x720/50	1980	1280	692	750	720	50
4	1280x720/30	3300	1280	2012	750	720	30
5	1280x720/29.97	3300	1280	2012	750	720	30/1.001
6	1280x720/25	3960	1280	2672	750	720	25
7	1280x720/24	4125	1280	2837	750	720	24
8	1280x720/23.98	4125	1280	2837	750	720	24/1.001

Table 1. The 1280x720 image sampling formats and some basic characteristics are listed above.

Table 1 lists the members of the family and some basic characteristics. All YC_BC_R formats have a common image format (CIF). CIF means that all formats have a 16:9 aspect ratio, 1280 active Y horizontal pixels and 720 active scanning lines, irrespective of the frame rate. There is no corresponding ITU standard, but certain signal characteristics, such as the colorimetry and coded signal's matrix coefficients, conform to the ITU 709.

This article will focus on some aspects of the more commonly used 1280x720/60 and 1280x720/59.94 formats. Table 2 shows the picture scanning characteristics of the formats.

The digital representation

Table 3 on page 26 details the digital representation of the format. The digital coding is based on one luminance, E'_Y, and two color-difference, E'_{CB} and E'_{CR}, analog signals. The coded signals matrix coefficients are defined in ITU-R BT.709 and are significantly different from those specified by ITU-R BT.601. The implication here is that format conversion applications require matrixing recalculation.

The luminance sampling frequency of 74.25MHz is obtained from the analog input video sync signal using a phase-locked-loop-controlled oscillator operating at 1650 x f_H, resulting in a Nyquist frequency of 37.125MHz. The specified anti-aliasing low-pass filter has a cutoff frequency of 30MHz. The color-difference signals' sampling frequency is 37.25MHz or 825 x f_H, resulting in a Nyquist frequency of 18.5625MHz. The specified anti-aliasing low-pass filter has a cutoff frequency of 15MHz. The selected sampling frequencies result in an active line with 1280 Y samples and 640 each C_B and C_R samples.

As shown in Figure 1 on page 26, the digital representation assumes two separate bit-parallel datastreams consisting of:

- A digital datastream conveying a digitized luminance bit-parallel signal Y with a data rate of 74.25Mwords/s.
- A digital datastream conveying digitized time-division-multiplexed bit-parallel signals C_B and C_R with a data rate of 74.25Mwords/s.

Item	Parameter	Value
1	Frame rate (Hz)	60 Hz (60/1.001)*
2	Interlace ratio	1:1
3	Number of total lines	750
4	Number of active lines	720 (26-745)
5	Blanked lines	30 (1-25, 746-750)
6	Line frequency (f_H)(Hz)	45,000 (45,000/1.001)*

** NTSC friendly in paranthesis*

Table 2. The picture scanning characteristics of the 1280x720/60 format are provided.

Each datastream carries the active video information as well as its own TRS information, end of active video (EAV) and start of active video (SAV), and the ancillary data if present. As shown in Table 1, due to the wide variation of frame rates of the formats, keeping CIF of 1280x720 results in widely differing horizontal blanking intervals and ancillary data spaces.

In a 10-bit system, the digital information occupies a range extending from 000_h to $3FF_h$ (0 to 1023 decimal). Table 2 shows that the luminance (Y)

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(Numbers in 000s)	2001	2002	2003	2004	2005	2006	2007
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signal normally extends from black, 040_h (64), to white, $3AC_h$ (940). The C_B and C_R signals normally extend from 040_h (64) to $3C0_h$ (960). In order to cater to overshoot and undershoot, the allowed range is extended to 004_h to $3FB_h$ (4 to 1019). Values from 000_h to 003_h (0 to 3) and $3FC_h$ to $3FF_h$ (1020 to 1023) are reserved for TRS signals (EAV and SAV).

The EAV and SAV signals each consist of a 4-word sequence:

- The three synchronizing words with hexadecimal values of, respectively, 3FF, 000 and 000.

Item	Parameter	Value
1	Coded signals	$E'_Y = 0.7152\,E'_G + 0.0722\,E'_B + 0.2126\,E'_R$ $E'_{CB} = 0.5389\,(E_B - E'_Y)$ $E'_{CR} = 0.635\,(E'_R - E_Y)$
2	Sampling frequency (MHz)	Y: $1650 \times f_H = 74.25$* C_B: $825 \times f_H = 37.125$* C_R: $825 \times f_H = 37.125$*
3	Sampling structure	-Orthogonal -Line, field and frame repetitive -C_B,C_R samples cosited with odd Y samples in each line
4	Samples per total line	Y: 1650 C_B: 825 C_R: 825
5	Samples per active line	Y: 1280 C_B: 640 C_R: 640
6	Coding	Uniformly quantized PCM
7	Black level Y	040_h (64)
8	White level Y	$3AC_h$ (940)
9	Lower peak C_B,C_R	040_h (64)
10	Upper peak C_B,C_R	$3C0_h$ (960)
11	Video data range	004_h to 3FBh (4 to 1019)
12	Lower prohibited codes	000_h to 003h (0 to 3)
13	Upper prohibited codes	$3FC_h$ to $3FF_h$ (1020 to 1023)

* Divide by 1.001 for NTSC friendly signals

Table 3. The digital representation of the 1280x720/60 format is illustrated in this figure.

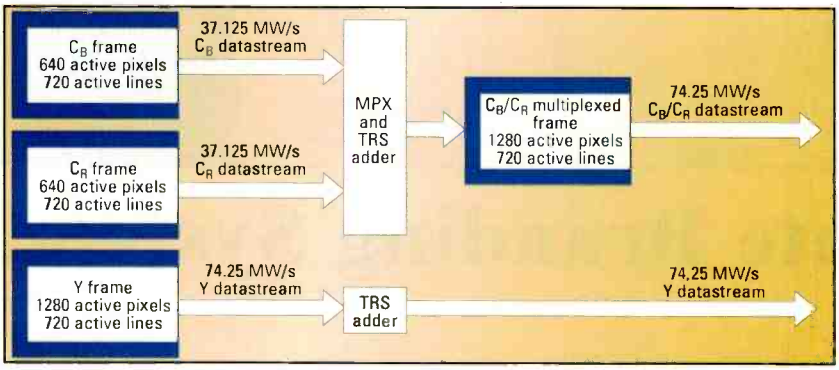

Figure 1. The formation of Y and C_B/C_R bit-parallel datastreams is shown here.

- The XYZ word, which carries the V bit, the F bit and the H bit. These bits define the vertical and horizontal blanking. Note that the F bit is always zero, as there are no fields requiring identification. In addition, bits P0, P1, P2 and P3, which assume values depending on the status of the V, F and H bits, provide a limited error correction (single errors) and detection (2 errors) of these bits.

Resolution considerations

The static vertical resolution, expressed in "lines per picture height" (LPH), uses concepts dating back to the 1930s. It is equal to the number of active lines (720) multiplied by the controversial Kell factor, taken as 0.7. So the 1280x720 format has a vertical resolution of 720 x 0.7 = 504. This holds true for video camera source signals. Digitally generated signals can individually activate each scanning line, so here the Kell factor is meaningless.

Computers use progressive scanning and have a vertical resolution equal to the number of active lines. Some people assume that all progres-

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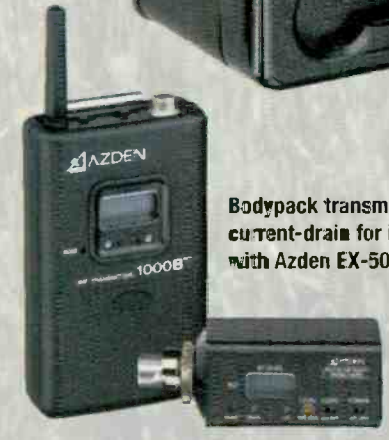

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sively scanned video displays have a vertical resolution equal to the number of active lines. However, when the video signal comes from a camera, this is not true, and the Kell factor applies.

Given the active line duration of this format, the horizontal resolution factor is 19.4 lines/MHz. With the specified anti-alias filter with a cutoff frequency of 30MHz, as per Figure 2, the horizontal resolution is equal to 30MHz x 19.4 Line/MHz = 582 LPH. Thus, the horizontal resolution exceeds the vertical resolution. For equal horizontal and vertical resolution, the bandwidth can be reduced to 26MHz. With the specified anti-alias filter with a cutoff frequency of 15MHz, as per Figure 2, the chrominance resolution is equal to 15MHz x 19.4 lines/MHz = 291 LPH.

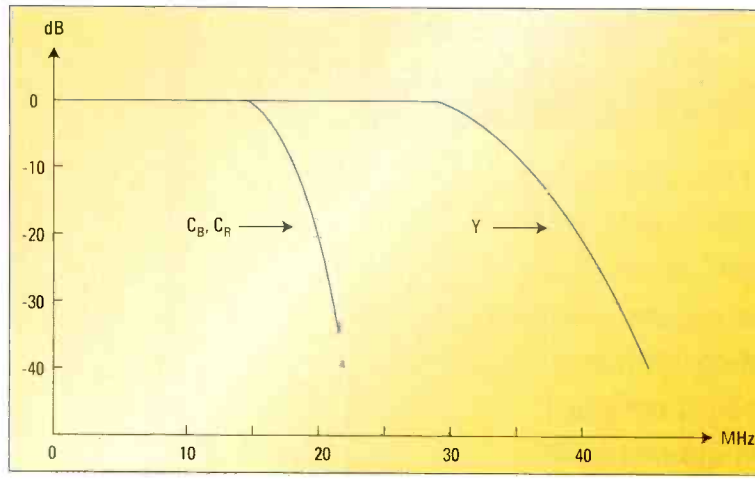
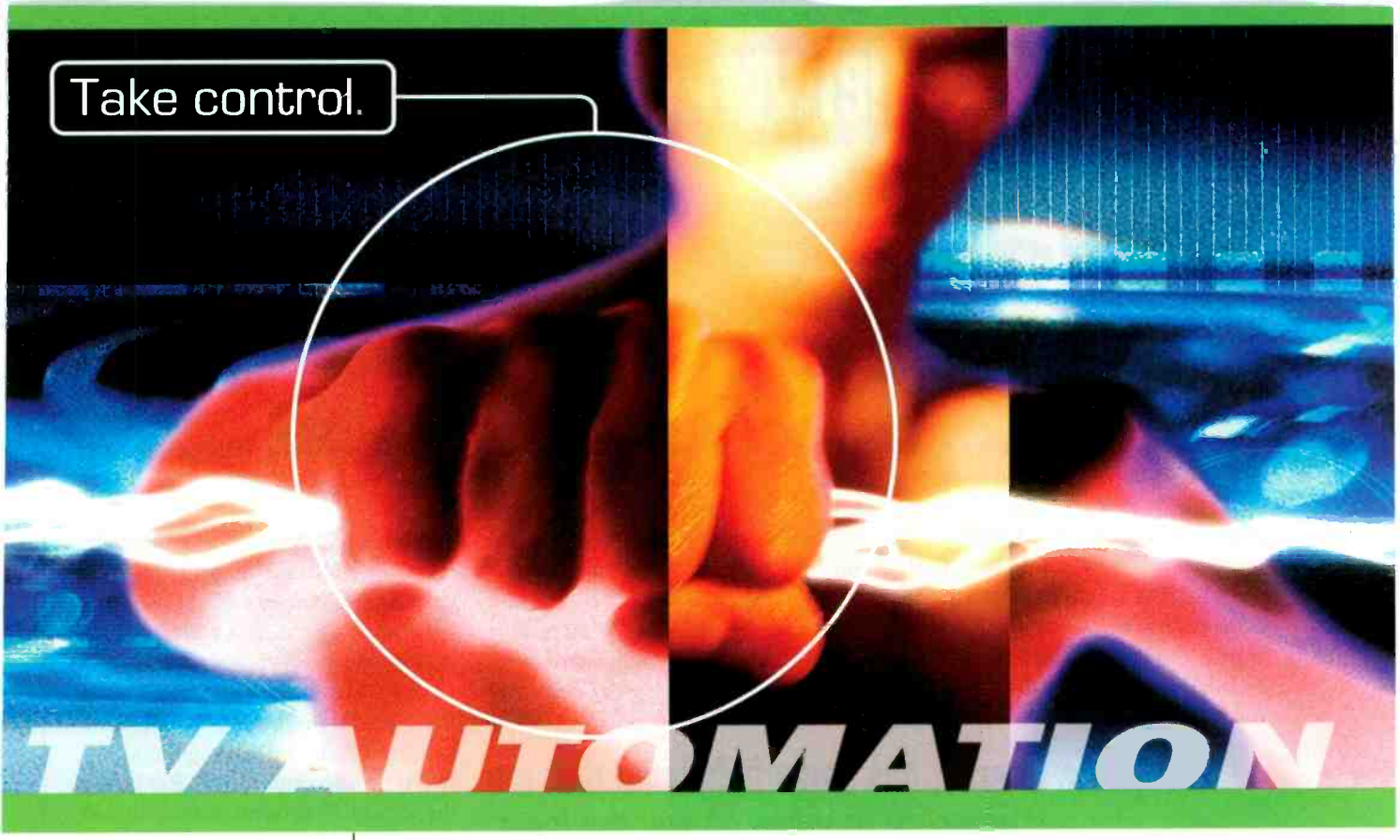


Figure 2. The typical frequency response of the C_B, C_R and Y channels is illustrated.

Being a progressively scanned format, the reproduced pictures do not suffer from interlace artifacts such as sporadic inter-line flicker and movement judder. Consequently, the displayed picture is "quieter," giving the impression that it has a higher static resolution, comparable to that of the 1920x1080/60i format, which it does not. BE

Michael Robin, a fellow of the SMPTE and former engineer with the Canadian Broadcasting Corp.'s engineering headquarters, is an independent broadcast consultant located in Montreal, Canada. He is co-author of Digital Television Fundamentals, *published by McGraw-Hill, and recently translated into Chinese and Japanese.*

Send questions and comments to: michael_robin@primediabusiness.com



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Video over IP

BY BRAD GILMER

Some broadcasters dream about being able to pull up to a remote venue, plug a camera into the Internet, and send live video and audio back to the station. This scenario is not too far from reality, but there are still some hurdles to overcome. Several large broadcasters have conducted streaming tests over the public Internet. The results of these tests have been mixed. The good news is that it does seem to be possible to stream broadcast-quality video over the Internet. The bad news is that the public Internet has some behaviors that are impolite to video, to say the least.

The public Internet has some behaviors that are impolite to video, to say the least.

Nevertheless, real progress has been made in this area. Generalized multiprotocol switching (GMPLS) provides traffic-engineering (TE) capabilities for Internet-protocol (IP) networks. TE has been a critical component of ATM networks from the beginning, and is the basis for quality-of-service (QoS) delivery. Simply put, QoS parameters allow equipment manufacturers and users to make basic assumptions about "how bad (or how good) the connection can be" between two nodes. The parameters they might specify include those with which video engineers are familiar, such as delay, jitter and wander. In the past, it was difficult to obtain any specific QoS out of an IP network. But IP equipment manufacturers have been working hard to address this issue, and GMPLS is one technology that allows the engineers to nail down the parameters of the network.

What's the problem?

But before we go into possible solutions, let's look into the problem. What is wrong with using a traditional IP network as it stands? For one thing, when you make a connection with a server providing IP streaming video over the Internet, there is no guarantee of how long the delay will be from the point of origin across the network. Furthermore, that delay may change during the time that the feed is taking place. You have probably seen the effects of this as an Internet video feed halts while the buffer reloads. In practice, it is almost impossible to design a streaming asynchronous video decoder when you do not know how bad this delay could get. Another issue is that packets may take different paths over the Internet. In fact, there is no guarantee that the destination will receive packets in the same order the originator sent them. Additionally, the best path available may become unavailable without warning. One of the strengths of the Internet is that, if this path goes down, traffic will be dynamically rerouted around the outage. This strength means that there is no critical path between any two nodes on the network. However, this flexibility plays havoc with any sort of synchronous transmission where timing across the network is an important component in delivering the quality of service required.

An example may help to highlight these issues. Let's look at a hypothetical Internet network connecting the cities of San Francisco, Chicago, Dallas and Boston, shown in Figure 1. Let's assume for the moment that there are high-speed links between San Francisco and Chicago, and between Chicago and Dallas. You have a theoretical IP-capable camera in San Francisco and a system capable of receiving video over IP and displaying it in Dallas. Let's also assume that you are using the generic Internet with no special protocols – just TCP/IP.

Direction and delay

First of all, even thought it might seem logical, there is no guarantee that the packets will be sent directly from San Francisco to Dallas, even though there is a direct path between two cities. And even though a high-speed path exists from San Francisco via Chicago to Dallas, there is no guarantee that even one packet would take

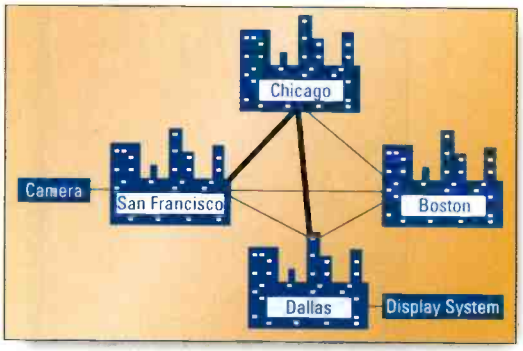

Figure 1. In this hypothetical Internet network, the dark lines represent high-speed links. When streaming over IP, there's no guarantee that any packet will take the same path between points.

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this route. This is because the Internet is a fully meshed network. It is dynamic, and the exact routing between any two points on the Internet may change packet by packet as loading, circuit outages and other factors come into play. When our hypothetical feed starts, the "best" path may be from San Francisco via Boston to Dallas. Just because there are high-speed paths between other cities does not mean that there will be available bandwidth when a given packet needs to be sent.

Now let's consider delay. Even if we have a constant path from San Francisco to Dallas, the timing on a packet-by-packet basis will be constantly changing depending upon queuing, switching and other delays across the network. This is because constant timing across the network was not a critical design criterion for the Internet. Obviously, if the packet never makes it to its destination, this is a problem. But, for most data traffic, it does not matter whether the packet makes it there in 5ms or 500ms.

Outage and rerouting

As you may know, the Internet started out as a project to link government facilities together. Messages had to get across the network, even in the event of an attack. The network was designed so that a failure of one link would not take down the whole network. This rerouting capability is still a core characteristic of the Internet. And while this self-healing capability is a desirable trait, it can play havoc with network timing. Let's refer back to our example. If we are in the middle of a feed, and the path is from San Francisco via Chicago to Dallas and the Chicago-to-Dallas leg has a momentary outage, the traffic might be dynamically rerouted to Boston and then to Dallas. This new path might stay active for a second or two and then, when the Chicago-to-Dallas leg comes back up, packets would again be received from Chicago.

Gaps and rearranged packets

Figure 2 illustrates some possible effects from this momentary outage and reroute. We start with packets coming in from Chicago. When the link from Chicago to Dallas goes down, a gap forms – caused by the time it takes the network to reroute the packets to Boston, plus the additional transit delay across the longer network path. In a matter of moments, the traffic is rerouted and packets begin arriving again, but now they are coming from Boston. As soon as the link comes back up, a packet is received from Chicago. Unfortunately, this is packet #6, but the receiver was expecting packet #5. Shortly thereafter, packet #5 arrives from Boston. The packets were reordered because of switching and transit times across the network. As you can imagine, the impact of reordering on receiver output timing might be extreme. These sorts of delays and reordering happen every day over the Internet and things work just fine. This is because TCP is responsible for reordering packets and requesting that packets that got lost along the way be resent. For most data applications, this system works, and it has served us well for many years.

The single biggest hurdle to be overcome is the issue of dynamic rerouting.

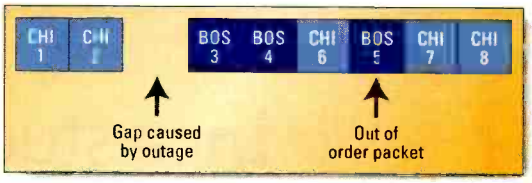

Figure 2. In the event of a temporary network outage, packets may be delayed and reach the receiver out of order.

You might be able to fix the problems pointed out thus far with a huge buffer. If you have a 10-second buffer in your receiver, then you can deal with all sorts of problems across the network. But there are two issues with this approach for broadcast. First, a 10-second delay in network transmission makes the circuit unusable for any two-way live interview purposes, a common electronic-news-gathering (ENG) application. Second, since there are no service-level guarantees across the Internet using most technologies, there is no guarantee that a 10-second buffer, or even a 100-second buffer, would provide the sort of reliability broadcasters need.

Possible solutions

The issues presented so far are well known in the Internet community, and various groups have been working on a number of solutions. To make a long story short, a lot of progress has been made in providing traffic-engineering capabilities over the public Internet. Traffic engineering allows the network operators to control the behavior of the network, and the flow of packets over the network, so that delays become consistent and so that the consequences of a failure in the network are predictable. The single biggest hurdle to be overcome (and perhaps this problem has already been solved in a laboratory somewhere) is the issue of dynamic rerouting. Until someone invents a technology that can predict the future – predict when and where a network component will fail – there will be some impact on the receiver as the network heals itself. But it seems that the network's self-healing capability is well worth the occasional hits caused as traffic is routed around the failed component. BE

Brad Gilmer is president of Gilmer & Associates, a technology consulting firm. He is also executive director of the Video Services Forum and executive director of the AAF Association.

SEND Send questions and comments to: brad_gilmer@primediabusiness.com

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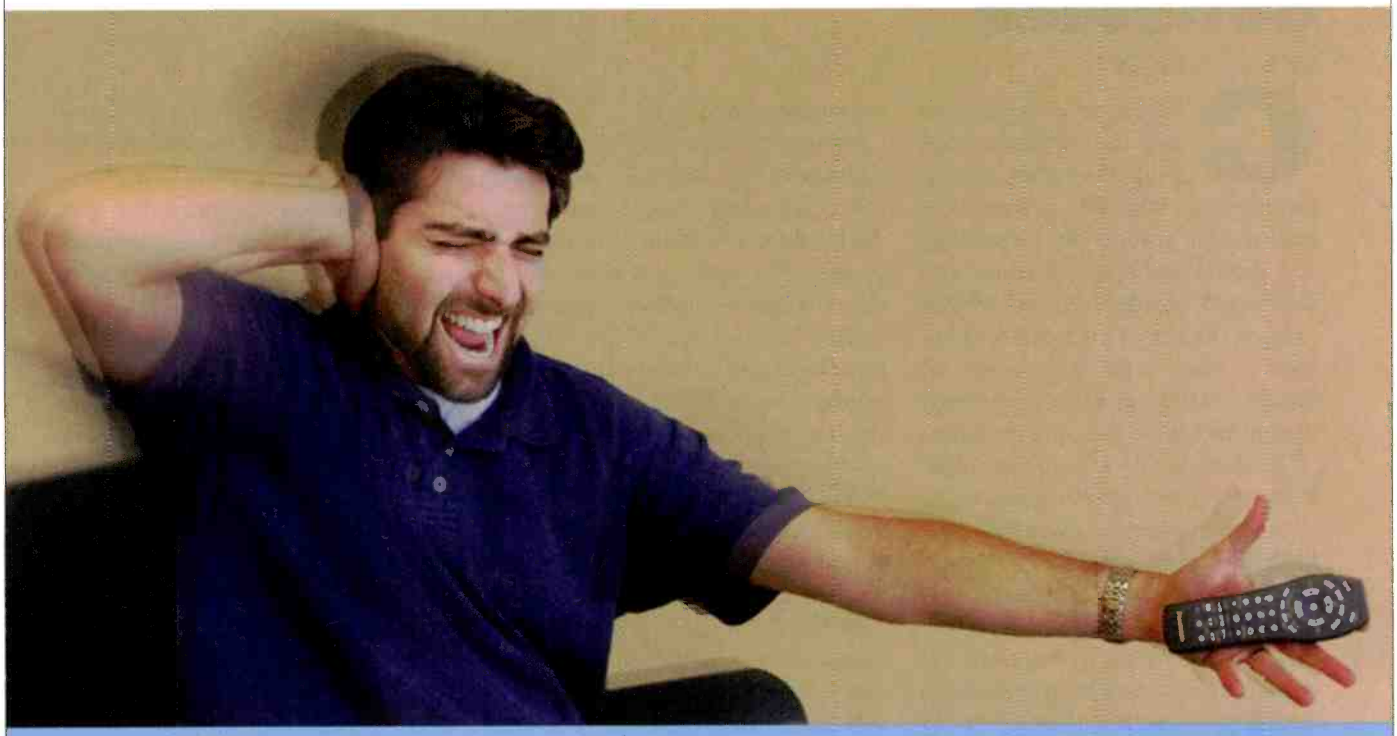

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Audio consoles

BY GARY ESKOW

Computer development over the last 50 years supports the notion that an inverse proportionality between size and strength governs our technology. The digital audio workstations and chip-based consoles that have radically reduced the size of the work environment in many areas of the audio industry, including music recording/mixing and audio post, are examples.

The third major area of the audio industry — live, on-air broadcasting — presents challenges that are distinct from the others, primarily in the need for redundancy of features and ease of access to them. A firm understanding of where we are in the evolution of music, post and on-air audio is critical to the success of any company that serves these markets.

One of the most fundamental concepts of music recording has been that tracking and mixing are discrete stages. These days, musicians and producers often record parts, clean them up, comp from various takes and normalize the gain on the completed track as one continuous procedure, obliterating the line between editing and mixing.

Applying reverb to localize multiple tracks can be done at any time. Why leave it to the "mix" stage? If the effect isn't right in the end, an engineer can always retrieve the unprocessed tracks and take a second crack at things.

As a result of the dissolving need to work on many tracks simultaneously, a trend has emerged that favors less physical strips and high-quality components, packaged in consoles that offer an attractive combination of performance and price.

An emphatic ditto may be applied to audio post. One major distinction between the music and post markets is the need for a well-documented, easily accessible database of sound effects that is required in post. Networked servers that can shuttle data to multiple workstations have become essential. The ability to deliver discrete strips of music, dialog and effects on a variety of media, including (amazingly) tape, is still essential. Routing needs make a console more of a required piece of gear in an audio post room than in a music studio.

The specific requirements of on-air broadcasting — which include redundancy, flexible routing and metering — will always distinguish the consoles used in this area of the audio industry from those housed in facilities that specialize in music and audio post work. However, the move toward smaller mixing boards that intelligently spread out at least some of their functionality across multiple layers has clearly reached the on-air market as well.

The move toward smaller mixing boards has clearly reached the on-air market.

Solid State Logic, long associated with large format boards, recenty released the C100 console. It is constructed around a control surface and a DSP rack that can be configured in a variety of ways. Metering is one of the console's assignable features. Using a touchscreen, the operator can assign the meters to reflect the state of any of the console's buses at any time. Although the company continues to place large format consoles in major music rooms and sound stages, it is augmenting its traditional fleet with smaller boards that can serve multiple constituencies, including the on-air market.

Euphonix also recognizes the need for assignability and a smaller work surface. It uses Layouts, templates that let the engineer reconfigure the console at a push a button, bringing critical channels within easy reach. Operation of a large board can be trimmed down so that only the center section is used at certain points.

Sony Electronics addresses both the high- and mid-range console markets with its Oxford and DMX-R100 digital boards. It recently released three products designed to expand the functionality of the DMX-R100. These units — the SIU-100 system expansion interface unit, SIU-RM101 remote control and the DMBK-S101 8-channel mic pre amp board — allow for audio networking of both analog and digital audio signals with multiple consoles, thereby expanding the digital board's I/O capabilities.

The SIU-100 was designed with the broadcast industry in mind. A typical usage would involve a broadcast production facility that has placed the system expansion interface unit on the production stage linked to a pair of DMX-R100 consoles located in two separate audio control rooms. In this scenario, mic-pres could easily be networked between the two consoles.

And at this year's AES and NAB conventions, Calrec launched the Zeta 100 digital console. More compact than the earlier Sigma 100 console, the unit's surface can be configured to hold 24, 32 or 48 faders. BE

Gary Eskow is a composer and journalist who lives in New Jersey. He's held a number of editorial positions in the field of audio journalism and is currently a contributing editor at Mix *magazine.*

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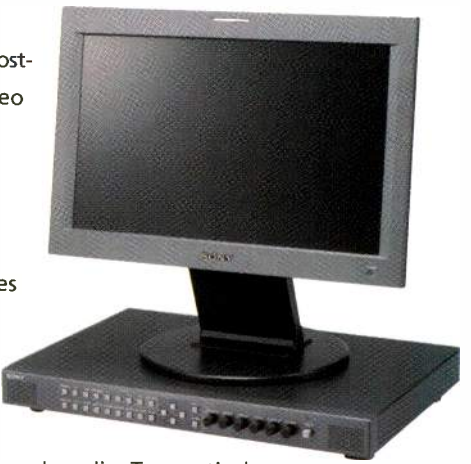
SONY UNVEILS NEW WORKFLOW INNOVATIONS INCLUDING PROFESSIONAL OPTICAL DISC VIDEO SYSTEM, MXF FILE TRANSFER, METADATA SOLUTIONS, REMOTE MANAGEMENT AND DIAGNOSTICS, AND STORAGE SOLUTIONS



At NAB 2003, Sony Electronics is unveiling new technologies that enable broadcasters and video professionals to work smarter, faster and more cost-effectively, with improved access to recorded material and enhanced video system management.

Sony's workflow innovations will leverage industry-standard data networking for greater efficiency throughout the video production process. With these innovations, video professionals will be able to move assets over IT networks without having to hand-carry videotapes from one process to the next, track the contents of videotapes through metadata, and monitor the health of their systems through remote maintenance and administration.

The workflow benefits will feature prominently in new Sony products, including a professional optical disc video system and newly developed media. Two optical disc camcorders, along with associated studio, compact and mobile decks, will offer remote management via Simple Network Management Protocol (SNMP), as well as metadata networking of low resolution proxy audio/video, which can be transferred up to 50 times faster than real-time. The three optical decks also will support Material Exchange Format (MXF) file transfers over IT networks.

"Our new workflow innovations are designed to help our customers streamline their acquisition and production without the need for radical changes in infrastructure," says Pat Whittingham, president of Sony Electronics' Business Solutions and Systems Company. "Many of these workflow enhancements will feature prominently in our products and are compatible with existing Sony equipment that many industry professionals already own."

MEDIA EXCHANGE FORMAT (MXF) FILE TRANSFER

The new professional optical disc decks will join other Sony products that support MXF. The company will also introduce new technologies that link MXF and non-MXF products.

(W/S)²

WORK SONY.

MXF-enabled IT-file transfers represent a practical alternative to shipping videotapes or scheduling satellite feeds. MXF enables producers to transfer audio/video assets as conventional data files on IT networks around the office or around the world.

"The MXF technology enables a producer sitting at a PC in New York to send a video clip from a VTR in Moscow to a server in Los Angeles," Whittingham says. "At NAB 2003, the world of devices compatible with MXF file transfer will expand dramatically."

METADATA SOLUTIONS

Sony is also pursuing a complete metadata network, from acquisition and production, to emission and archiving, with many of the key components to be made available to the industry at NAB 2003.

The Sony approach leverages meta-data in the form of Unique Material Identifiers (UMIDs), good shot markers and low-resolution proxy audio/video, which users can browse remotely from any PC on the network. This will enable robust identification of recorded assets—for convenient access at every stage of production, post-production and archiving.

REMOTE MANAGEMENT AND DIAGNOSTICS

In the IT world, the Simple Network Management Protocol (SNMP) enables an administrator anywhere on the network to track the status and health of networked hardware. At NAB, Sony will showcase how current professional and broadcast video products will incorporate the SNMP standard. Users will be able to monitor and administer the equipment any time, anywhere, via standard data networks.

STORAGE SOLUTIONS

To store and archive the growing volumes of digital files in content storage, production and post-production environments, Sony will demonstrate a next-generation PetaSite® storage system powered by SAIT technology and PetaServe™ hierarchical storage management software (HSM) to provide seamless operation with online disc storage.

SEEING IS BELIEVING

SONY'S PROFESSIONAL **OPTICAL DISC SYSTEM** FOR STREAMLINING WORKFLOW FEATURES CAMCORDERS, MOBILE, COMPACT AND STUDIO DECKS, AND MEDIA

Sony Electronics' new professional optical disc system, which includes two camcorders and three decks, will be available in the fall. The system is expected to bring a revolutionary change to the world of broadcast news (ENG) and electronic field production (EFP).

"Our professional optical disc system will offer an entirely new paradigm in field acquisition and editing, in moving material at high-speed from the field to the television station to facilitate editing, and by introducing significant new efficiencies to a station's overall workflow," says Steve Jacobs, senior vice president of the broadcast and professional systems division.

The professional optical disc system will offer the choice of recording video with the DVCAM® codec at 25 megabits per second or the MPEG IMX™ codec at 30, 40 or 50 megabits per second. Optical decks will accept both formats and offer the full range of analog A/V, digital A/V and

Professional Optical Disc System

information technology (IT) standards, including metadata storage, proxy A/V and compatibility with i.LINK® (based on the IEEE 1394 interface standard) and Ethernet interfaces.

PROFESSIONAL OPTICAL DISC PRODUCTS LAUNCH

Sony's two professional optical disc camcorders and three decks support both the i.LINK® and Ethernet interfaces for transferring assets as Material Exchange Format (MXF) files.

The two camcorders are able to capture high-quality pictures with 2/3-inch EX HAD image sensors and 12-bit analog-to-digital converters. Features include loop/interval recording on a built-in cache memory, Ethernet or wireless LAN interfaces through optional PC-CARD adaptors, and a 2.5-inch (viewable area, measured diagonally) LCD monitor.

The battery-powered mobile deck plays back DVCAM and MPEG IMX recordings and displays them on the built-in LCD monitor. The deck supports up to 30 times faster-than-real-time transfer of low-resolution proxy video over i.LINK and Ethernet interfaces, in addition to MXF file transfers over a 100-BaseT network connection.

The compact, NLE companion deck, a half-rack feeding/recording machine for non-linear editing, supports up to five times faster-than-real-time transfer of full-resolution DVCAM audio and video and up to 50 times real-time transfer of low-resolution proxy audio and video. Transfer speeds for MPEG 4:2:2 video range from four times real-time for MPEG 30Mbps to two-and-a-half-times real-time for MPEG 50Mbps.

The studio deck, which is a standard editing deck that offers both DVCAM and MPEG IMX recording and playback, provides a full complement of analog A/V, digital A/V and IT interfaces, including the i.LINK interface and Gigabit Ethernet port. The studio deck supports up to five times faster-than-real-time transfer of full-resolution DVCAM audio and video.

WELCOME TO THE WORKFLOW REVOLUTION

THE PROFESSIONAL OPTICAL DISC SYSTEM WILL ENHANCE EVERY STEP OF VIDEO WORKFLOW, FROM ACQUISITION TO POST-PRODUCTION

With Sony's professional optical disc system, every step of a customer's video workflow, from acquisition, field editing through studio post-production, will be greatly improved, says Theresa Alesso, director of marketing for the optical and network products group.

"Our professional optical disc system will offer dramatically faster editing, faster transfer from field to studio, far easier identification of recorded assets, and lower operating costs," says Alesso.

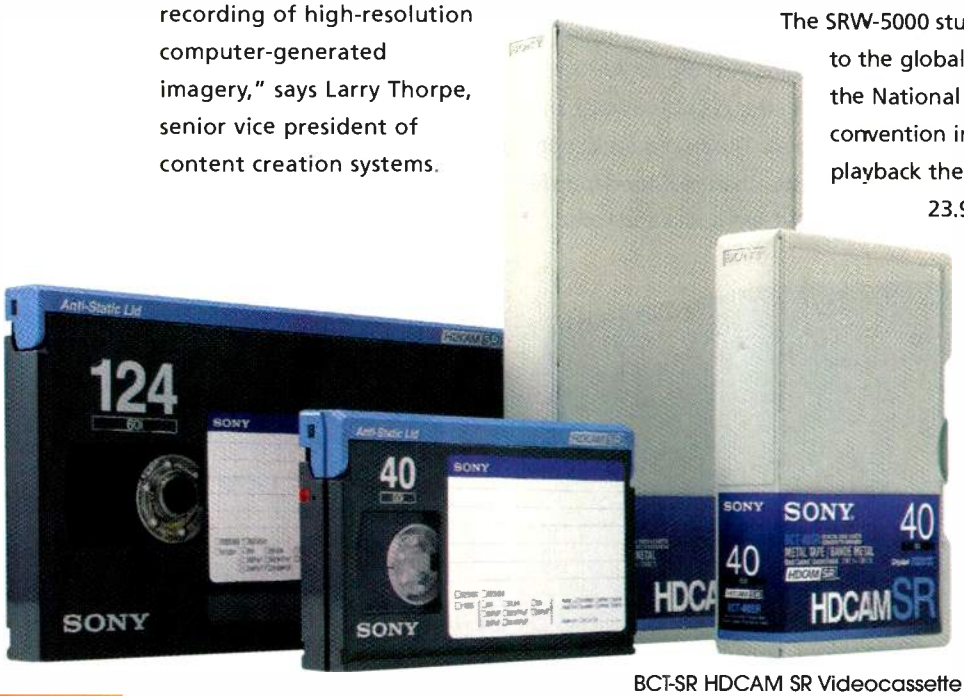
Sony's two professional optical disc camcorders will enable users to mark their good shots, identify them from a picture-stamp storyboard on the camcorder's LCD monitor, and seamlessly play them back, says Alesso.

The professional optical system records both the high-resolution original and a low-resolution, frame-accurate version called proxy video and audio. From the camcorder, or a battery-operated mobile deck, ENG and EFP teams will be able to transfer the proxy information to laptop editors or back to the studio at up to 30 times faster-than-real-time, so producers can immediately start writing scripts. Based on those scripts, field crew will be able to transfer the high-resolution footage either as video or as a data file over IT networks, saving precious minutes over the current "bulk feed" approach, says Alesso. In the case of compact decks or studio decks, this proxy material will transfer at up to 50 times faster-than-real-time.

GREAT EXPECTA

In a significant expansion to its CineAlta family of digital motion picture capture and production equipment, Sony has introduced a new high-definition (HD) camera with uncompressed digital 4:4:4 RGB outputs. The company has also announced 4:4:4 HDCAM SR™ portable and studio recorders and specially formulated BCT-SR series videocassettes capable of recording full-resolution RGB digital HD component video.

"For HD imaging this will provide the highest level of digital motion picture production, including shooting miniatures in moviemaking, HD blue/green-screen compositing, motion picture film digital intermediate work, film restoration and recording of high-resolution computer-generated imagery," says Larry Thorpe, senior vice president of content creation systems.



BCT-SR HDCAM SR Videocassette

HDC-F950 PORTABLE CAMERA

In accordance with the international high-resolution Common Image Format standard, the new HDC-F950 camera captures a full 1920 (H) x 1080 (V) digitally sampled image. This image is output as uncompressed 4:4:4 digital RGB high-definition video for direct connection via dual HD-SDI to Sony's new family of HDCAM SR recorders or third-party hard disk recorders.

A significant system innovation is facilitated by a 3Gbps fiber optic link to the new HDCU-F950 camera control unit using the SMPTE standardized composite fiber/copper cable system.

SRW-5000 STUDIO EDITING VTR

The SRW-5000 studio VTR extends Sony's commitment to the global multi-format strategy introduced at the National Association of Broadcasters convention in 1999. The VTR can record and playback the 1920 (H) x 1080 (V) HD format at 23.98P, 24P, 25P, 30P or 50i and 59.94i. It can also record and playback the 1280 (H) x 720 (V) @ 59.94P HD format. In addition, it can play back all existing HDCAM tapes, providing compatibility with the broadest range of HD assets.

SRW-1 PORTABLE VTR

The SRW-1 portable VTR facilitates battery-powered remote acquisition of full-bandwidth 4:4:4 or

NEW 4:4:4 CAMERA AND HDCAM SR RECORDERS JOIN THE **CINEALTA™ FAMILY** AND DELIVER FULL RESOLUTION HD RGB

TIONS

SRW-5000 Studio Editing VTR

4:2:2 digital HD at the same progressive and interlaced picture capture rates as the SRW-5000. The SRW-1 exclusively utilizes the standard small half-inch cassette, providing 50 minutes of 4:2:2 recording at 1080/24P. The SRW-1 incorporates the powerful new capability to record two full bandwidth 4:2:2 HD signals simultaneously onto a single half-inch tape, allowing for 3D stereo applications and for two-camera productions.

HDC-F950 Portable Camera

ALL IN THE FAMILY

THE NEW HDCAM SR™ RECORDERS AND MEDIA EXPAND THE CAPABILITIES OF THE CINEALTA™ FAMILY AND EXISTING HD FORMATS.

While Sony's new SRW-5000 studio VTR, compact SRW-1 portable VTR and specially formulated BCT-SR series videocassettes significantly expand the cinematic potential of the CineAlta family, they also expand capabilities of the 1080i (lines) and 720i (lines) HD formats and are compatible with all previous HDCAM 1080i recordings.

"This new recording format is a strategic extension of the HDCAM® format, which Sony continues to nurture and develop. The combination of the HDCAM SR and HDCAM format offers an important hierarchy of performance, creative features and pricing," says Larry Thorpe, senior vice president of content creation systems. "With more than 9,000 VTR units in operation, the present HDCAM format is by far the world's most popular HD production system, and the extension offered by HDCAM SR fulfills the full potential of the two primary 1080-line and 720-line HD formats, while also carefully maintaining compatibility with all prior HDCAM 1080-line recordings."

A crucial component of the new format is Sony's new HDCAM SR videotape, the BCT-SR series. These cassettes provide about +6dB output specially designed to maximize HDCAM SR recordings. As a result, the HDCAM SR system achieves a new benchmark in performance without sacrificing the size, operating convenience, practical media costs, and the reasonable recording time that today's productions require.

EASY OPERATORS

THE DSR-390L CAMCORDER AND THE DSR-DR1000 STUDIO VIDEO DISK RECORDER ARE THE NEWEST ADDITIONS TO SONY'S EVER-GROWING **DVCAM® FAMILY**

Heralded as innovative production tools, the DSR-390L camcorder and DSR-DR1000 studio video disk recorder deliver new opportunities to the DVCAM family.

DSR-390L CAMCORDER

The DSR-390L is a high-performance full size DVCAM camcorder designed specifically for news acquisition and independent production. With its new design half-inch type Power HAD™ CCDs, it boasts an amazing sensitivity of F13 with 65 dB signal to noise ratio.

As well as combining the excellent performance of the DVCAM format with a variety of advanced camera features, the DSR-390L allows full studio operation. The camcorder comes equipped with a 26-pin connector, which enables connection to either a Sony CCU-D50 camera control unit for studio use, or to a portable component video recorder. It also interfaces with the DSR-DU1 for HDD DV storage via the provided i.LINK® (based on the IEEE 1394 interface standard) port.

Special attention to the DSR-390L's ergonomic design has resulted in an extremely lightweight and compact unit, providing maximum operational comfort when used on the shoulder or mounted on a tripod. The DSR-390L heralds a new level of performance, versatility, and convenience for virtually any application, ranging from ENG to EFP and to multi-camera studio operation.

DSR-DR1000 HARD-DISK RECORDER

The DSR-DR1000 is a DVCAM stream-based, hard-disk recorder. This half-rack unit uses a large capacity hard-disk drive to provide up to six hours of DVCAM stream recording.

Primarily designed for recording and edit feeding applications, the DSR-DR1000 takes full advantage of the benefits of disk-based recording while maintaining the same operational feel as a VTR. The DSR-DR1000 can simultaneously record and playback, allowing a recording to be available immediately for play out and other feeding purposes without interruption.

An i.LINK connector supports both the SBP2 protocol for DV file transfer and the conventional AV/C DV protocol. The SBP2 protocol allows DV files on a DSR-DR1000 to be transferred to other compatible

DSR-DR1000 Hard-Disk Recorder

equipment at high speed. In addition, the DSR-DR1000 offers a full complement of digital and analog interfaces, such as SDI, Ethernet, AES/EBU audio, composite and component analog video, and analog balanced audio XLR connectors.

CALLING ALL BROADCASTERS

A HIGH-DEFINITION STUDIO CAMERA, THE HDC-910 COMPETES HEAD-TO-HEAD WITH SD CAMERAS

Upgrading your studio to high definition? Sony Electronics is introducing an affordable high-definition (HD) studio camera that makes it more attractive for program producers to migrate from standard definition to HD.

"With our new HDC-910 studio camera, high definition has become a feasible alternative for any television production that's currently using high-end, standard-definition cameras," says Larry Thorpe, senior vice president of content creation systems. "There is no significant cost premium in moving to HD origination."

According to Thorpe, three elements combined to realize this cost-effective HD camera system: the ubiquitous deployment of the 1920 x 1080 HDTV format within 60Hz-based North America and 50Hz-based regions of the world; a breakthrough, lower-cost HD CCD imager; and the utilization of powerful Digital Signal Processing microcircuit technology.

The HDC-910 studio camera joins Sony's cost-effective family of DTV-oriented products, which includes the HDC-930 portable camera, the HDC-730 camcorder and the HDW-M series of HDCAM® VTRs.

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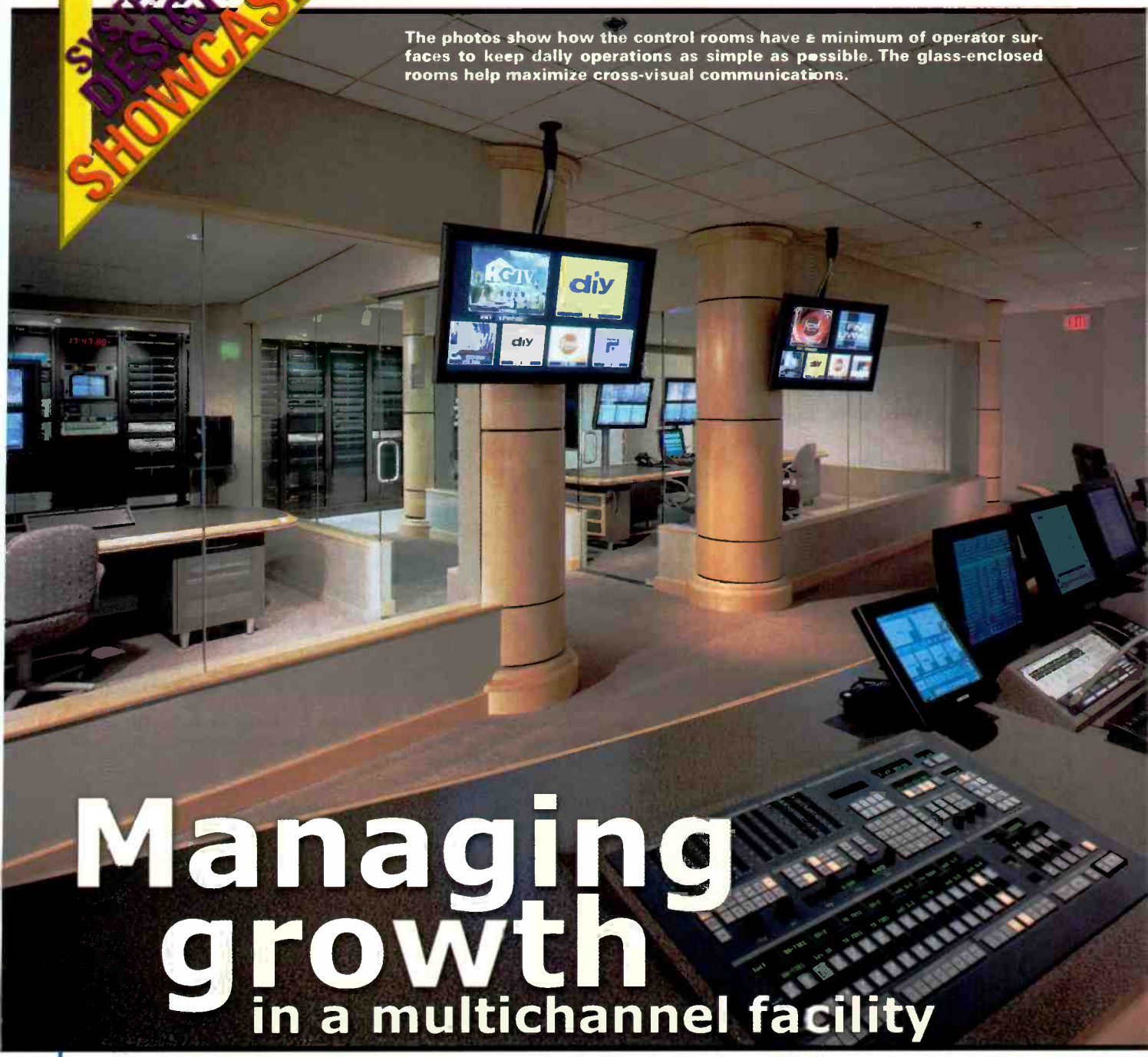
SYSTEMS DESIGN SHOWCASE



The photos show how the control rooms have a minimum of operator surfaces to keep daily operations as simple as possible. The glass-enclosed rooms help maximize cross-visual communications.

Managing growth in a multichannel facility

BY MIKE DONOVAN AND TOM MICHALES

Since 1994, Scripps Networks has grown from the successful launch of Home & Garden Television (HGTV) to a multichannel network that includes Food Network, Do It Yourself network (DIY) and the most recent addition, Fine Living. Recently, Scripps and A.F. Associates completed phase three of the additions to the network facility in Knoxville, TN, to support the network launch of Fine Living.

With the expanding number of networks, and the need to size for the future, Scripps and A.F. Associates re-examined the entire playout process. The goal was to simplify the on-air playout system while ensuring absolute quality control of the final programs.

Scripps Networks was an early adopter of server-based playout systems, basing its first system on the BTS/Philips MediaPool. It was also one of the first facilities to incorporate mass data storage of its air library, all under automation control. With multiple networks involved, uptime is critical, so the network carefully examined its use of these systems.

After this careful re-examination, the network decided that a bit of

technology retrenchment would actually improve operations. Ultimately, it decided to move from server-based on-air playout to creating compilation reels and using VTRs in library cart machines to deliver programs over dual signal paths. This design greatly simplifies master control's operational requirement, providing the highest on-air reliability, and a seamless transition strategy for the deployment of the next-generation server system.

The first step was to construct a new broadcast operations center (BOC) that contains the following functional areas:

- compile preparation
- data archive
- duplication
- quality control
- compile processing
- program playout/master control
- automation
- media library
- closed-captioning services

The compile preparation and dubbing area initially handle the media (assets) and their eventual ingest into the video server system. The traffic system and playlist drive the instructions to the automation system. The staff ensures that all content scheduled on the playlist is in the main data archive or video server. A playlist for each of the four networks is set up on automation, which then compiles it to Digital Betacam and DVCAM tapes.

Multi-network, full transmission signal monitoring is facilitated in the transmission control room using an Avitech video command center and three Christie Digital 50-inch DLP projectors.

Scripps' traffic system outputs an electronic log to the BOC staff. The staff uses this log to create the playlist they need to create the compilation reels. If content is not already on the server, the staff must dub it into the server. Traffic generates this list about 48 hours prior to air.

Assets arrive primarily in Digital Betacam format, but the dubbing department often encounters other formats. When this occurs, the department staff dubs that asset onto the house standard Digital Betacam format. Once the staff identifies the needed assets, they retrieve the tapes (from the library, for example) and dub them (if necessary) onto a Digital Betacam compilation tape. They check the quality and then move the tape into the digital archive.

After careful re-examination, the network decided that a bit of technology retrenchment would actually improve operations.

Data archive

The video file server system then batch ingests this compiled tape of commercials and programs. The staff archives the assets to the data archive, which consists of a StorageTek Powderhorn with 9940B data drives for near-line storage. Interstitial content remains solely on the video file server. The data archive system currently has five 9940B drives and 6000 data cassettes, each with a storage capacity of 200GB. This yields a total storage capacity of nearly 1 petabyte. The current video file server is a Thomson Grass Valley MediaPool using MJPEG compression. The network uses a 45Mb/s encoding rate which, when multiplied by the storage capacity of the data archive, yields a total storage capacity of 59,000 hours.

Based on current per-network storage requirements of approximately 14,000

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Meet Jack - one of ADC's engineering extraordinaires. Brilliant, brainy and innovative, Jack and our engineers are the reason why ADC's audio, video, and data products are technology leaders. With unique features like our high-definition Midsized (MVJ) Video Jack's patented tuning fins, environmentally-sealed casing, and 15-year warranty, you don't have to sacrifice electrical performance for mechanical reliability. Though competitors may pursue our lead, the fact is they can't beat our ingenuity. And when it comes to jacks, they don't know Jack Schmidt. Invest in the best for your network, and find out why more engineers choose ADC. Call us at 1.800.366.3891, ext. 73784 or visit www.adc.com/jack today.

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hours, the four existing networks require 18,000 hours of archive storage. Eventually, Scripps plans to originate up to eight networks from this facility, so its total archive needs could grow to approximately 112,000. However, some of the new channels could repurpose existing assets and rely on some repeat programming schedules. This could cut total storage requirements for each channel by two-thirds.

The actual ingest requirements vary from day to day, depending on the availability of content. At a typical data transfer rate of 8MB/s, it can take five drives 4.25 hours per day to move the data from server to archive, not including the time required for tape mount and dismount, robot retrievals and other mechanical overhead.

Compile processing

Once the server has ingested the assets and archived the program segments, the BOC staff plays out the assets in proper sequence and records them in two-hour packages, complete with interstitials and graphics.

The compile signal-processing chain consists of a Pinnacle DekoCast CG processor, a Norpak TES-5 VI data inserter for closed-caption data, V-chip, and other ancillary data inputs, and an Evertz GPI data inserter for DTMF/GPI insertion. The system uses the Thomson Grass Valley Saturn master-control switchers as an alternate air path feeding Evertz 12x1 switchers, but the staff may use them in the compile processing chain if the playlist calls for additional processing. A Pinnacle DekoCast with DVE option provides squeezeback functions. Because this entire process is accomplished offline, a failure of any one element in the chain will not affect on-air signals. Once the BOC staff records the compiled reels, a QC station screens the tape and the tape is ready for air.

Program playout and master control

The program playout system consists of two Sony Flexicart systems, each with four Digital Betacam DVW-510 VTRs and 12 L-format Betacam cassette bins controlled by Flexicart automation software.

A failure of any one element in the compile chain will not affect on-air signals.

HGTV and DIY use one Flexicart, Food Network and Fine Living use the other. Scripps uses separate DVCAM tape machines for mirrored playback and can switch to them if it encounters a problem on one of the Flexicart VTRs (see Figure 1).

The Flexicarts feed DAs for monitoring and then feed a pair of Evertz 12x2 clean switch routers (one primary, one secondary). Their outputs pass through DAs for monitoring and then on to the coax tie lines to the transmission-control room. This signal chain is replicated for each of the network streams.

The master-control switchers are connected in parallel to the Flexicarts so that production can send a live event to air. These outputs connect to routers that feed the transmission-control room. There, the signals are processed and uplinked to the satellites for national distribution.

Network operations

To keep things simple, A.F.A. designed virtual monitor walls for easy viewing and control. Avitech Video multi-window display processor systems, each of which can support up to four audio 42" Sony PFM-42B1 plasma display panels, create a virtual monitor wall. Each processor group has eight SDI inputs, each with AES digital audio (four channels per video input). The Avitech processors can overlay audio metering as part of the virtual monitor wall. Signals monitored include program video and audio, and satellite return video and audio.

Transmission-control center

There are three primary subsystems in the transmission area: signal processing, signal monitoring and uplink control. The transmission-control and monitoring systems receive broadcast-to-air signals from the BOC and pass them on to the satellite uplink system.

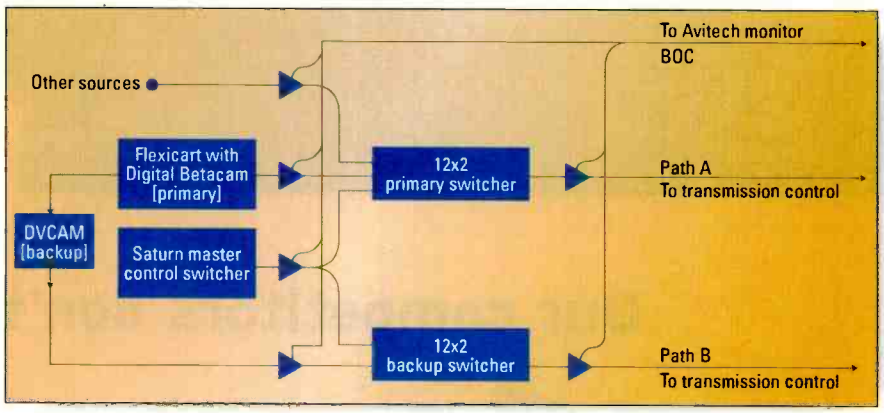
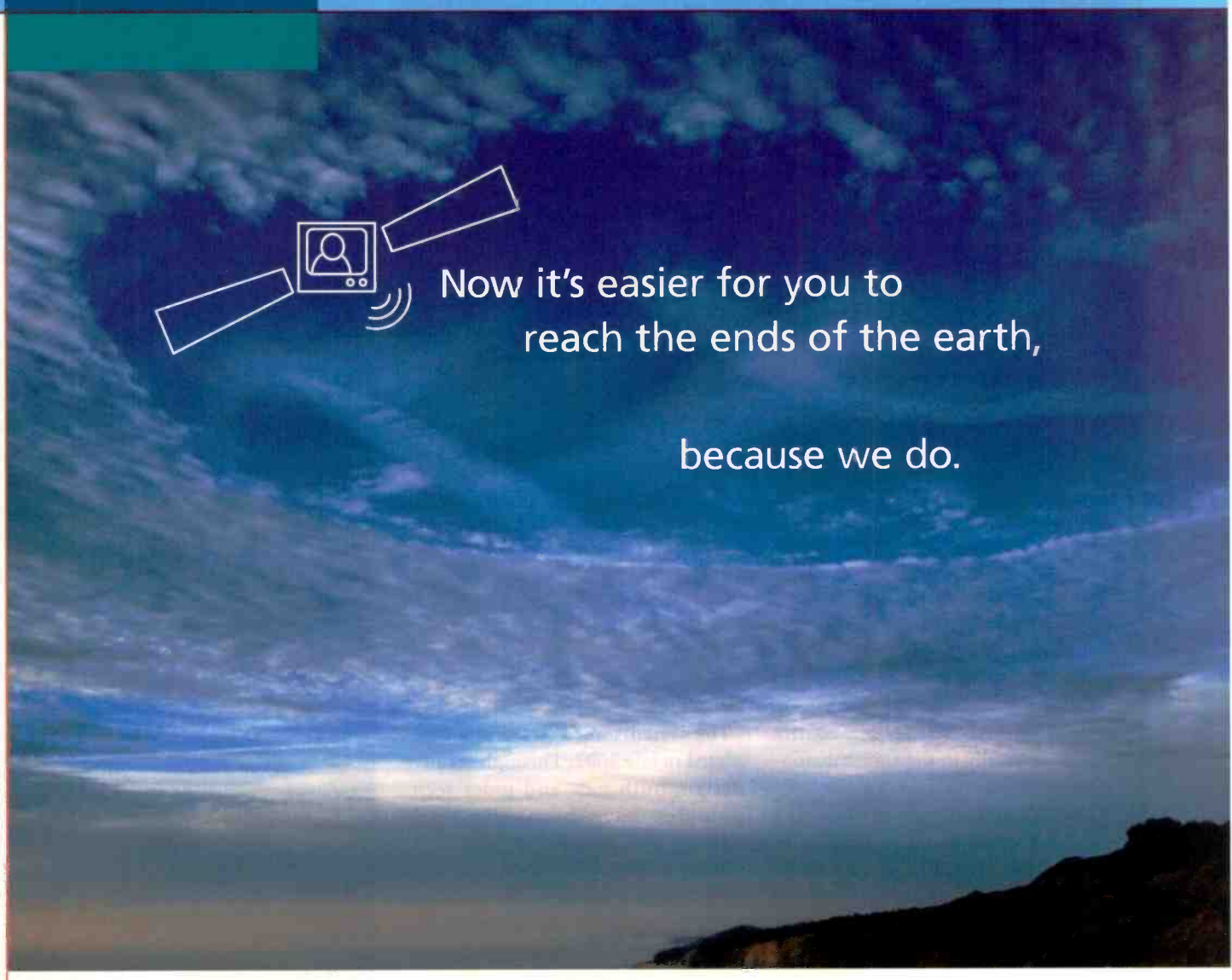


Figure 1. This block diagram shows the signal flow for program playout and master control.

Additional processing is required for audio compression, live ancillary data insertion and video processing (such as color legalization).

The center receives dual-path signals from the BOC through tie lines and uses reclocking digital DAs on each path. The "A" and "B" paths for each network feed an Evertz 4x1

Occasional Video Solutions



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Thirty-six inch racks help support deep profile equipment. All digital audio and video signals enter the transmission area from broadcast operations through independent path routing.

switcher whose output is processed prior to uplinking. The 4x1 switcher is actually configured for 2x1 operation and can be controlled from two locations: a hardware-control button located in the BOC network-control room, or locally in the transmission-equipment center.

The "A" air path passes through a series of signal processors prior to the 2x1 switcher. A Videotek DPA-100 performs color legalization. An Orban Optimod compresses the AES audio.

After this processing, a General Instruments VideoCipher encoder scrambles the Home & Garden signals for conditional access. A Motorola DigiCipher II encoder scrambles the Food Network, DIY and Fine Living feeds. Commercial-break cue tones (either through sub-audible DTMF tones or GPI contact closures) are input to the encoders. The DTMF tones go through a Wegener system to the VideoCipher, while cue tones flow to the DigiCipher Event Trigger System (ETS).

The encryption system's output connects to a Miteq modulator, whose output connects to the uplink shelter through a fiber-optic connection. This L-band signal also goes to an IRD for confidence monitoring of the DigiCipher encoded signal.

Success

The systems wer successfully completed in late 2002. Through creative design, both new and older technologies have been effectively melded into an efficient and high-quality play-to-air system. The new system lets machines do the mundane tasks and allows operators to concentrate on duties that require human intervention.

This new system allows Scripps to plan for future networks, knowing that the facility is already in place to support them. While the success of such a project can be measured in many ways, the first must be how it met the initial operational goals. Scripps has found that, even with an increase in the number of on-air channels, the staff is fully able to maintain the fast-paced schedule and high-quality programming for which the network is well known. BE

Mike Donovan is vice president of engineering at Scripps Network. Tom Michales is senior project manager at A.F. Associates.

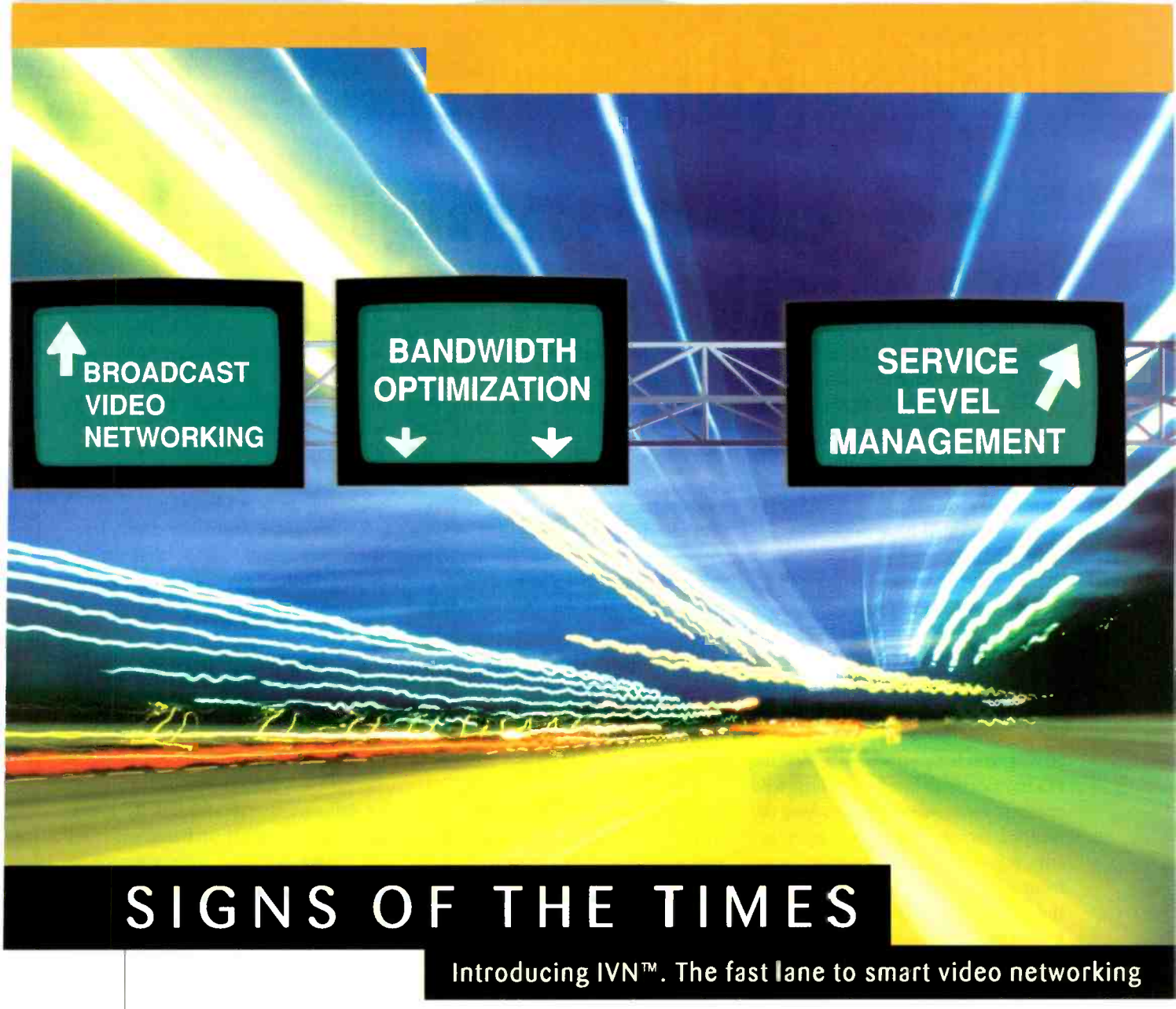
Project team

Scripps Networks
- Mark Hale, executive VP, production and operations
- Mike Donovan, VP, engineering
- John Ajamie, VP, operations
- Jerry Nantz, chief engineer
- Tim Harty, director of network engineering

AF Associates
- Tom Michales, senior project manager
- Mark Bressack, VP, sales
- Scott Buchholz and Brian Luscombe, senior project engineers – BOC
- Harry Thompson, senior project engineer - transmission
- Tony Kilkenny, project leader and site supervisor

Equipment list

Odetics TCS-90 cart system
StorageTek Powderhorn data archive with 9940B data drives
Thomson Grass Valley MediaPool video file server
Pinnacle DekoCast CE processor
Norpak TES-5 VI inserter
Evertz GPI data inserter
Sony Flexicarts
Digital Betacam DVW-510 VTRs
Evertz 12x2 clean switch routers
Thomson Grass Valley Saturn master-control switchers
Avitech Video multi-window display processors
Sony 42-inch PFM-42B1 plasma display panels
Videotek DPA-100 color processor
Orban Optimod audio compressor
General Instruments VideoCipher
Motorola DigiCipher I encoder
DigiCipher Event Trigger System



SIGNS OF THE TIMES

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MIMSAR & SHIFRIN

The unchanging face of RF

BY DON MARKLEY

This year at NAB was somewhat unique in what wasn't there. In addition to 30,000 or so less people, there really weren't any huge, earthshakingly new items in the RF area. What was there was a continuing steady improvement in the technologies that have been emerging over the last several years.

One item that, while seemingly small, was good to see, was the elimination of "crowbar" circuits in some of the UHF transmitters. As a refresher, the "crowbar" circuits were designed to dump all the existing energy in the power supply system when an arc was sensed in an IOT. This has always been something of a frantic circuit involving hugely wild currents. Now, manufacturers have developed switching power supply circuits that will remove the power source from an IOT quickly enough to save the device in a more calm and controlled manner.

This will be helpful with UPS systems. While these systems have worked capably with crowbar circuits, it has often been necessary to get the UPS manufacturer to adjust the equipment to a non-normal mode of operation. This was necessary in order to dump the UPS load back to the power line when the huge current demand hit during the crowbar activation. The new circuits will eliminate that sudden demand on the UPS.

Almost everyone now has controllers in their transmitters that permit access and adjustment in varying degrees from either a modem or via the Internet. Some have gone even further. As an example, Ai offers a service they call Remote Parameter Monitoring (RPM). In this system, the factory monitors a station's transmitter performance with trend-spotting software and notifies the station when conditions appear to indicate the development of a problem. This type of service has been offered by independent groups in the past. However, this differs from a "broad brush" approach in that it is offered by manufacturers only for the equipment that they have produced.

Liquid-cooled solid-state transmitters seem to be developing nicely. At least one brand of such transmitters allows the amplifier modules to be hot-swapped without dumping coolant all over the place. This makes the liquid-cooled systems as user-friendly as air-cooled units, while still gaining efficiency.

Speaking of efficient, some manufacturers now offer exciters that can be changed from analog to digital by simply changing a single circuit board or by software control. Essentially, a new transmitter can be purchased and used for analog until that great conversion in the sky takes place. At that time, the changeover can be done at the keyboard. Neat, huh?

Who would have anticipated that the granddaddy of them all in rigid coaxial lines would introduce a line of semi-flexible cable?

Some exciting things have also occurred in the antenna and transmission line arena. First, who would have anticipated that the granddaddy of them all in rigid coaxial lines would introduce a line of semi-flexible cable? Dielectric, previously of rigid coaxial cable, truncated elliptical waveguide and rectangular waveguide fame, introducing a full range of semi-flexible cables. Dielectric has also improved the outer conductor attachment to the cable. One of the favorite games being played on the show floor was guessing at just who is making that line for Dielectric. As of this date, no one is talking.

As most readers are aware, semi-flexible waveguide became the transmission line du jour for most microwave systems many years ago. Those waveguides essentially eliminated large runs of rectangular microwave, as they were less expensive, easier to

FRAME GRAB

A look at the consumer side of DTV

Newspaper, TV news or the Internet?

Different age groups often find different news sources

Patterns of news use by age*	Total	<30	30-49	50+
Goes online	54%	74%	62%	33%
Online at least once a week for news	33%	46%	37%	20%
Online daily for news	15%	17%	18%	10%
Watched TV news yesterday	55%	44%	51%	67%
Read newspaper yesterday	46%	29%	43%	58%

**Based on total sample.*

SOURCE: The Pew Research Center www.people-press.org

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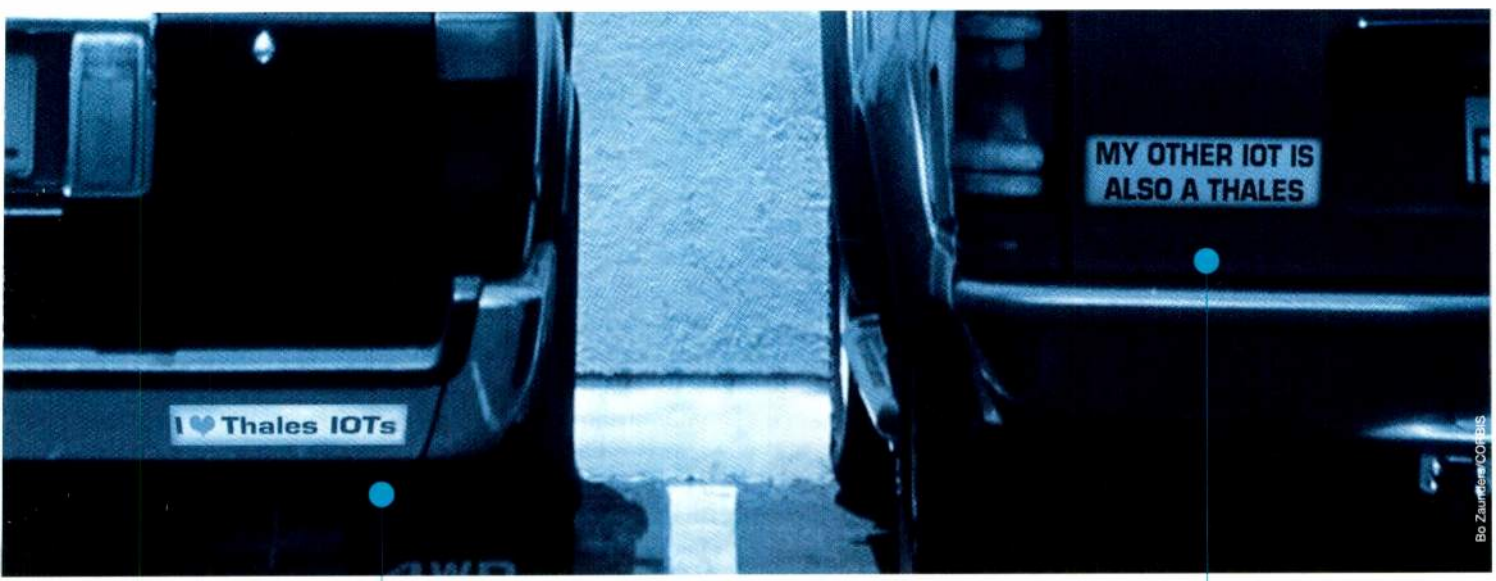
THALES



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Thales gives you greater cost-efficiency for your IOT investment. Focusing on more than just energy savings, we've engineered our solutions to take into account the bigger picture—and the overall structure of your business. That's why our IOTs are simpler, more reliable and easily upgradeable, which also means a smoother transition to digital compliance! What will you do with the money you save?

Ready for performance? Make the switch!

Thales offers the most powerful range of IOTs on the market. For high-power operators, that means significant cost-savings potential by reducing the number of transmitter cabinets. At lower power, it means longer tube life and more available headroom. No matter what you need, a brand new transmitter or an upgrade to the latest technology, Thales IOTs are ready when you are. Contact us at information@thalescomponents-us.com

www.thales-electrondevices.com

install and performed essentially as well. Their problem in the larger sizes has been the difficulty of consistent fabrication. They cannot be flexible, as that type of construction would not provide enough stability in the big sizes. Therefore, they must be rigid, making them somewhat more difficult to construct. In any case, Myat seems to have come up with just that, in their UHF rigid elliptical waveguide, subject to seeing the final tuning results. A brave soul was found and a full system was under construction at a station at the time of NAB. More complete information on the performance of a real-world version of the new waveguide should be available soon.

Dielectric offers the FLEXLine coaxial cable, which is available in 7/8" through 6-1/8" line sizes and features patented precision-fitted connectors.

There were also some new items in the antennas area. Antennas are now available that work equally well on two channels – in the same or different bands – while avoiding the huge tower burden of either a major panel array or separate radiators in two different apertures.

The other area of new designs is what will be called inexpensive antennas. Not "cheap," that would tend to indicate poor quality, which isn't the case. The quality of these antennas is fine, but they aren't capable of handling a lot of power and are usually rather limited regarding some of the niceties concerning beam tilt, null fill and widely varying patterns.

The less expensive antennas have always been popular in the translator or LPTV areas. The large demand from broadcasters seeking STA operations for DTV covering only the community of license requirement has motivated manufacturers to develop these inexpensive antennas. In many cases, they will find long-term use as auxiliary systems in case of failure in the main system.

In any case, the antennas will perform well. Their VSWR performance is at least very close to their more expensive relatives. As a rule, several standard patterns are available for directional operation. Most also have beam tilt available, although this sometimes has to be selected from "standard" values. The only big negative here is power handling capability and being able to tailor the pattern freely. It takes just as much engineering time to work out specialized patterns on the small antennas as for a larger, standard unit. Therefore, going after such modifications makes the price change rapidly. The place to use these antennas is where a fairly standard configuration will do the job and low power is acceptable. BE

Don Markley is president of D.L. Markley and Associates, Peoria, IL.

SEND Send questions and comments to: don_markley@primediabusiness.com

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NAB RE

56 Pick Hits

The top 40 new products from this year's show. The only NAB convention technology awards selected by readers like you.

58 Product jackpot

Information on some of the hottest products from this year's show.

58 New tools

Broadcast Engineering's writers and consultants detail what they found on the show floor.

PLAY

Continuing coverage of today's technology

Pick

Reflecting the increased number of NAB exhibitors and new technology, we've expanded the *Broadcast Engineering* Pick Hits to 40 winners. For complete information on each Pick Hit, see the noted page numbers. Now for this year's winners.

360 Systems Image Server 2000
This recorder/server can play three independent video programs at once, each with four digital audio channels. Alternatively, it can record a video program while playing two others (see page 58).

Apple Final Cut Pro 4
Apple's major upgrade of its Emmy-award-winning editing software is packed with more than 300 new features, including RT Extreme for real-time compositing and effects, and powerful new interface-customization tools (see page 58).

Avid DNA Family
This trio of hardware accelerators, dubbed Nitris, Adrenaline and Mojo, pumps up the power of nonlinear-editing and media-processing systems (see page 114).

Axcera DXA2B
The system allows broadcasters to use distributed multiple on-channel transmitters to cover population centers and improve coverage in weak-signal or shadowed areas without additional channels (see page 66).

Bella Professional Series
These custom-designed keyboards can change the editing process from a chore to a breeze. Each of the five professional keyboards is custom designed for use with a specific NLE platform (see page 68).

Calrec Zeta 100
The Zeta 100 is Calrec's third digital audio console, emerging from the Alpha and Sigma platforms. It is targeted at local TV and network stations and broadcast vehicles (see page 68).

Chyron SOLO
The portable editing system consists of a Chyron-specified laptop PC, a PCMCIA PCI CG/squeezeback card contained in a separate three-pound box, and a complete CG/squeeze & tease software package (see page 72).

CineBags Production Bag
Sometimes it's the simple things that matter the most – like a bag in which to organize and carry your myriad production tools and accessories (see page 74).

Clear-Com CellCom
This intercom system is an unusual blend of cellular technology and digital-matrix functionality. It comprises a base station and transceiver antennas that create coverage zones, supporting full-duplex beltpacks (see page 74).

Computer Modules DVB-ASI TimeShifter
The delay system allows broadcasters using the DVB-ASI format to multiplex several MPEG channels into a single serial bitstream to delay one or more of the feeds to those channels (see page 74).

Digital Voodoo HD/Vengeance
The device is the first uncompressed 10-bit HD/SDI dual-link QuickTime video card with SD/SDI downconversion for the Macintosh (see page 76).

DNF Controls DC-30
This tally interface box allows mobile production trucks, production facilities and broadcasters to share tallies with other types of control/status lines (see page 78).

Dolby LM-100
This meter provides a simple method for determining program audio levels using "Dialogue Intelligence" technology to measure subjective loudness of dialogue (see page 78).

Drake FreeSpeak
FreeSpeak is a license-free, full-duplex, digital wireless intercom, part of a larger matrix consisting of a cell controller card, antenna splitter and active antennas (see page 82).

Evertz HD9625LG
This logo inserter will key one or several "bugs" over a full-bandwidth HD video signal from logos created in BMP, TIFF or TGA file formats (see page 83).

Global Translation TranslateTV
Hablas Español? TranlsateTV is the first device capable of instantly translating live closed captions (see page 83).

Grande Vitesse Systems GVS9000-Series
This series of graphic workstations offers the oomph of dual Apple PowerPC G4 processors and the versatility of single or dual IBM PowerPC processors (see page 84).

Hamlet Adept
A compact, transportable, versatile replacement for CRT generator/scopes in production environments. It generates several test signals and offers on-screen waveform and vector display of multiple video formats (see page 80).

Harris ReCon
A suite of remote-control and facilities-monitoring software products is ideal for multi-site and multi-user operation (see page 88).

Hits NAB2003

For more on the Pick Hits judges and rules for the contest, visit pickhits.broadcastengineering.com/pickhits2003/index.htm.

Horita Script Kit
The Script Kit combines Horita's PTR portable LCD time-code reader with its WTS100M wireless time-code system for field logging (see page 84).

JVC JY-HD10U
This compact, handheld ENG HD camcorder uses a single 1.18 million-pixel CCD chip to capture true 16:9 aspect-ratio images (see page 86).

Leader FS3018
This portable, PDA-like monitor displays the camera's image and technical information about the picture (see page 90).

Leitch NEO VR
This hard-drive-based video recorder on a card plugs into the company's NEO modular platform to perform the functions of a traditional SD VTR (see page 92).

Logic Innovations TSM-2800
This eight-input re-multiplexer combines HDTV, SDTV, PSIP, data and multi-program transport streams into a single multiplex and provides a universal post-insertion capability to insert PSIP tables (see page 114).

Miranda Densité SCP-1121
These SDI control-probe circuit boards provide confidence monitoring of SDI signals with embedded audio (see page 98).

Nvision NV5128-MC
This switcher combines the functions of master control and routing in the same frame. The consolidation results in less hardware and lower cost without sacrificing functionality (see page 92).

Panasonic Solid-State Newsgathering System
The system records broadcast-quality video directly onto solid-state memory chips (see page 98).

Pioneer PRV-LX1
This modular DVD video recorder is specifically designed to transfer video and audio content to DVD easily while maintaining the flexibility to customize DVD menus (see page 102).

Quantel QEdit Pro
A multiformat editing and effects system, comprising three Quantel PCI cards and a dual Xeon PC, delivers 10-bit uncompressed quality and a high-end creative toolset for finishing (see page 86).

RTW Surround Monitor
This multichannel analyzer and display monitors multiple audio parameters, including peak levels, loudness, channel balance and dialnorm, for 5.1 surround-sound projects (see page 100).

Sachtler Artemis EFP and EFP Pro
These camera stabilization systems are designed to stabilize professional video camcorders for electronic field production (see page 100).

SeaChange Media Publisher
This software plug-in is designed to speed file transfer between Adobe Premiere and SeaChange's Broadcast MediaCluster (BMC) on-air server system (see page 102).

Snell & Wilcox Ukon
This Swiss Army Knife of converters is designed for situations where different frame rates, image sizes and aspect ratios present additional image-quality challenges (see page 104).

Sony Professional Optical Disc Camera/Recorder
The system records DVCAM signals at 25Mb/s or MPEG IMX video signals at 30-, 40- or 50Mb/s directly onto optical discs (see page 104).

Sony Cine Alta Family Expansion
The new additions to the Cine Alta product family include a new camera, portable and studio versions of 4:4:4 SR recorders, and specially formulated BCT-SR series videocassettes (see page 109).

Tektronix WFM700
Tektronix has added advanced video-measurement features and an optional audio-monitoring module to the popular WFM700 multiformat waveform monitor (see page 110).

Thales Amber
Amber is a broadcast-DTV-to-cable-network translator system that allows broadcasters to translate off-air digital TV broadcast signals into cable networks. This re-multiplexer combines ATSC/PSIP processing with a wide range of functions and flexible configuration (see page 109).

Thomson Grass Valley M-Series iVDR
This revolutionary series of digital video recorders can replace the VTRs found in broadcast and video production facilities worldwide. It has a touch-screen interface and traditional VTR controls (see page 110).

Wohler MONFlex
This family of LCD video monitors can mount in places where rack space is at a premium. The NTSC/PAL monitors are mounted on adjustable goosenecks, giving users complete control of their viewing angle (see page 112).

Zenith P50W28A
Perfect for the professional environment, this huge plasma display has a high drool factor. It boasts a resolution of 1366x768 pixels for outstanding clarity (see page 112).

Product jackpot

COMPOSITE CABLE

Belden 7804R
800-235-3361; www.Belden.com

Cable designed specifically for HD camera control; mates with SMPTE 304M connectors; can multiplex audio and video signals and power; offers longer transmission distances and improved noise immunity. ▲

NLE SOFTWARE

Apple Final Cut Pro 4
408-996-1010; www.apple.com

The software supports high-quality eight- and 10-bit uncompressed formats, and full 32-bit floating-point-per-channel video processing. It includes three new integrated applications: LiveType for advanced titling, Soundtrack for music creation and Compressor for batch transcoding. ▲

DIGITAL TV CONSOLE

Wheatstone D-9TV
252-638-7000; www.wheatstone.com

Modular series available with four to 52 input faders with sample rate converters on each digital input; route any source to any fader; integral dynamics/EQ functions and snapshot recall. ▲

MPEG-2 VIDEO SERVER

360 Systems Image Server 2000
818-991-0360; www.360systems.com

The server's internal drives provide up to a terabyte of program storage. It uses a RAID disk array to protect program material from disk-drive failure. Each channel has both composite and SDI video ports, as well as analog and digital audio. ▲

DIGITAL MATRIX INTERCOM SYSTEM

Systems Wireless Drake Series 4000 II
800-542-3332; www.swl.com

Allows users to interface up to 48 telco lines without using a single port in the frame; supports up to 256 ports in a single frame. ▲

New tools

Audio

BY TOM PATRICK MCAULIFFE

Now that the new digital television standards are finalized (sort of) and the conversion to the digital TV environment is well under way, one area that's enjoying increased emphasis and at least a little growth is audio, for both broadcasting and video post production.

A cast of companies

Over 750 audio equipment manufacturers showed their wares at NAB 2003. While space does not allow us to mention all of them, here are a representative few.

Sony, though known for its video products, also had plenty of audio solutions to show. The new DMX-P01 digital portable mixer offers full 24-bit processing and a sampling rate of either 48kHz or 96kHz. At a lower price point, the new SRP-X700P digital mixer is designed to process material from a wide range of sources including microphones, video, audio, DVD players, audio tape recorders and computers. Sony also had new wireless microphone systems including the UWP series UHF synthesized system.

Dolby had one of the most interesting booths, featuring several education seminars, including four separate kiosks highlighting the Dolby products required by network affiliates to receive and distribute surround audio and to transmit Dolby Digital 5.1 audio to viewers. Broadcasters could learn how to upgrade an existing two-channel facility to include Dolby Digital 5.1-channel capability. Dolby was also showing its Pick Hit-award-winning LM-100 loudness meter.

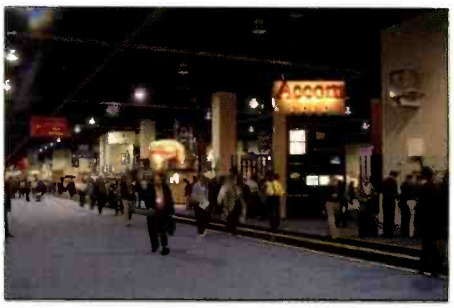
SRS Labs showed off its new Circle Surround (CS) technology, a multichannel audio encode and decode system capable of supporting a wide range of surround sound creation and playback applications.

Yamaha's commercial audio division featured new production products including the PM5000 analog mixing console and the DM1000 digital production console, which delivers 48 channels of transparent 24-bit/96kHz audio.

Also debuting at NAB was the D-9TV digital television console from Wheatstone. Targeted at mid-market facilities, the modular series offers four to 52 input faders with sample rate converters on each digital input. The D-9TV directs any source to any fader and features integral dynamics/EQ functions and snapshot recall. Multiple control surfaces can share common resources, which continues the trend of feature flexibility seen over the past few years.

Calrec introduced its Zeta 100 digital mixing console, which received a Pick Hit.

DVD recorders from Sony, Panasonic and Pioneer drew crowds, and Fostex showed an HD-compatible post-production DVD unit with Ethernet connections. It's easy to see that the DVD audio and surround sound formats will be here for the foreseeable future. BE



Consumer demand for better audio may have led to increased traffic by audio booths at the show. Convention photos by Doug Schwartz.

Tom Patrick McAuliffe is a journalist and consultant living in San Francisco.

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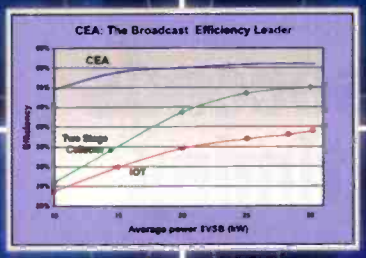

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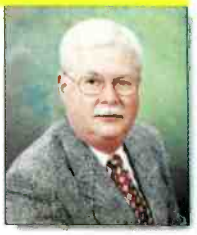
Performs real-time and historical graphical/analytical reporting of transmitters and transmission systems; provides remote access via private LAN/WAN or by Internet. ▲

New tools
Automation systems

BY PAUL BLACK



The definition of "automation" is currently in transition. Once only applied to on-air operations, the term is now being used to describe systems that can control every aspect of a station's operations, including commercial acquisition and newsgathering (as "ingest" functions), segmenting, scheduling and billing of spots, and even general accounting functions.

The master control operator still handles switching of on-air programs, but that is changing fast. Today, broadcasters can purchase a system that does everything from swinging the satellite dish around to record the event to printing and mailing the invoice to the ad buyer.

Starting out with one of the larger vendors, Harris, will give an idea of just how much some systems can do. Harris calls their overall system the Resource Suite, which contains subsystems that perform different functions. They all tie together, talk to each other and even talk to other vendors' products. This is common, because no one wants to dump a multi-thousand dollar nonlinear news editing system because it won't work with the automation. Harris promotes their products as "end-to-end" solutions. As soon as the raw tape is edited into a package, or the spot enters the house, the system takes over, and via its "Workflow Management" section, takes care of everything needed to get the event on the air. It will even update the news rundown if a package runs over scheduled length.

Encoda introduced a new idea to TV automation: a dealer-only system. The company's product lines fit the needs of facilities ranging from a small-market UHF facility to a large multi-distribution cable network plant. The company decided that its Series A5000 system

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MediaStream™ 900si

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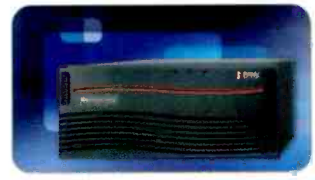

Pinnacle's new MediaStream 900si delivers all the functionality MediaStream is known for—Standard and High Definition in the same server, automatic up and down conversion between SD and HD formats, mission-critical reliability and thousands of channels on-air daily worldwide. HD functionality is included as a standard feature on every playout channel—at no additional cost. Based on Pinnacle's new Palladium™ Store 1000 storage subsystem the MediaStream 900si sets a new price standard for mission-critical servers needed in on-air operations.

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PINNACLE SYSTEMS

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New tools

could be sold, installed and supported by dealers. The A5000 is based on the larger A7000, and uses many of its modules, so users of the smaller system can take advantage of system improvements offered to larger customers.

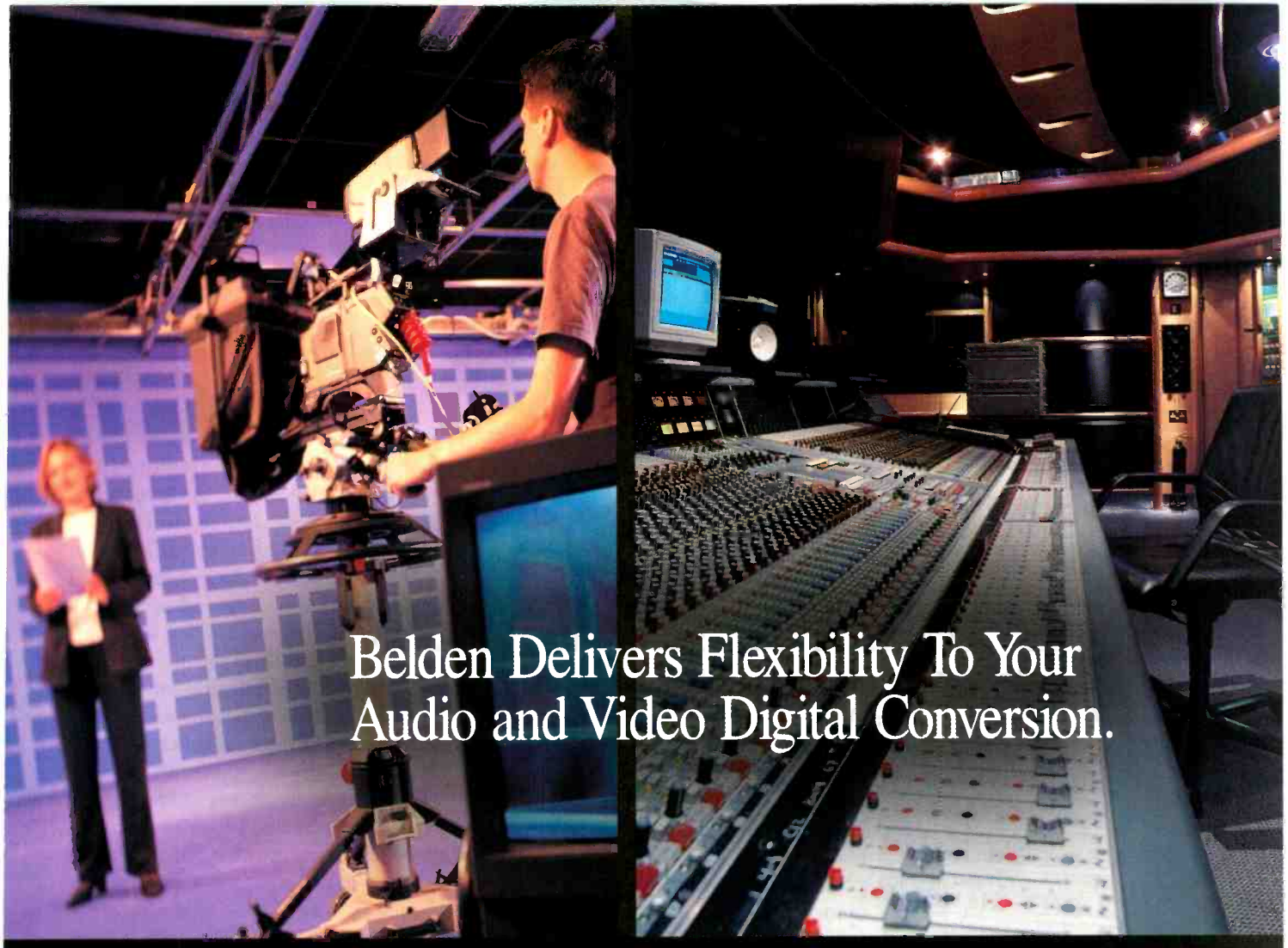
Florical, another provider of automation systems, offers products running the gamut from the LT series, designed to be affordable for the smaller user, up to ShareCasting products, which address centralcasting needs. The company believes that the future of viewer-delivery systems is the multi-stream, single-facility model, and is working hard to ensure it becomes a major player in that arena.

Crispin also has full automation capability and provides "sizing" for different users. Their modules are designed so that they will add onto existing systems as seamlessly as possible. They also provide news automation with their NewsPlayX products.

Titan is the newest top-of-the-line system from Sundance Digital. Originally a vendor of MAC-based editors, Sundance's products evolved into the FastBreak system, which was introduced in the early 1990s as a server-based commercial inserter. The company also has a new product called SegmentShare, which allows users to segment an event at one location and transmit that data to other locations. This means one central place, such as a station owned by one company, can take care of all the details needed to segment a program and then send this data to other company-owned stations. It's designed to eliminate unnecessary duplication within an organization.

Artesia, which is now up to their fifth generation of asset management products, released a new version of their software designed to provide a rapid learning curve. PCs are used as controller stations with access to the necessary servers via the Web or by means of other connectivity. Artesia uses their extensive background in industrial software to create their broadcast software. BE

Paul Black is owner of Media Technical Consulting.



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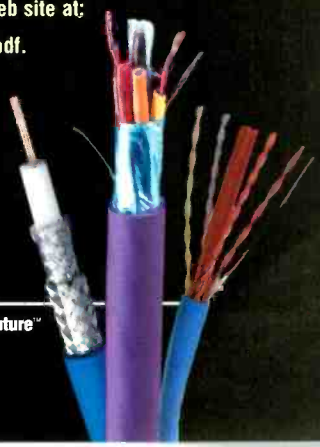

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MPEG-2 TRANSMISSION PRODUCT FAMILY

Axon Digital Design MStream
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Designed for carrying high-quality live video and audio as video-over-IP or T1/E1 links over a network; options include analog and digital ports, and 4:2:0 and 4:2:2 MPEG coding formats up to 50Mb/s. ▲

New tools

Cameras

BY DAN STARK

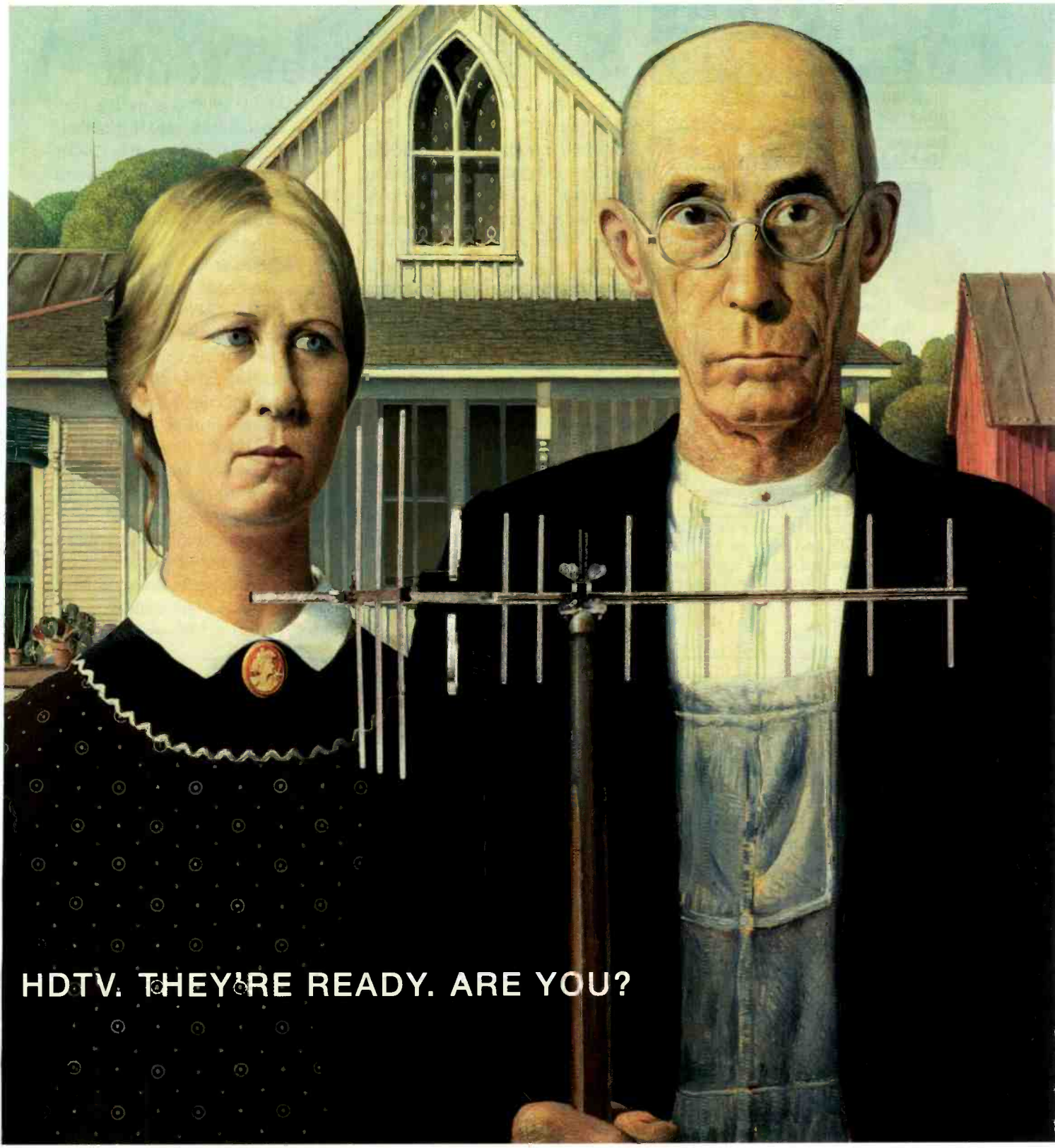
This year's 2003 NAB provided some interesting camera offerings. The products that brought the most attendee interest belonged to the low-end (DV) and the high-end (high-definition) portions of the market.

Sony's biggest news was its new Professional Optical Disc system. This Pick Hit-award-winning product line includes a camcorder as well as three decks, featuring a full complement of analog and digital I/O, and IEEE 1394. The optical disks have a capacity of 23GB and can withstand up to 1000 write/rewrite passes. Sony also joins the 4:4:4 dual-link technology wave with its Pick Hit-award-winning expansion of the Cine Alta family. The additions to the family include a new camera, portable and studio versions of 4:4:4 SR recorders, and specially formulated BCT-SR series videocassettes. The new HDC-F950 camera offers HD outputs at 4:4:4 or 4:2:2. The new SRW-5000 studio recorder and the SRW-1 field recorder feature MPEG-4 compression to capture the full common-image format resolution of 1920x1080 pixels.

A new lower-cost studio camera, the HDC-910, uses a lower-cost HD CCD image sensor. This camera offers a producer the ability to capture high-definition images at costs similar to current high-quality, standard-definition products.

The HDVF-C30W 2.7-inch high-resolution color viewfinder offers mounting options at the traditional viewfinder location or at the rear of the camera. It is available with or without an eyepiece, and can be used on all Sony HD cameras.

Sony upgraded the popular DSR-370 camera to the DSR-380 camera, with PowerHAD CCDs, offering 800 lines of resolution, 65dB signal-to-noise ratio, 0.4 lux minimum illumination and -115dB smear. The new DXC-D50 camera offers PowerHAD EX CCDs with 12-bit A/D, 30-bit DSP technology and -140dB smear. The CCU-D50



As demand for HD output gathers pace, UpCaster, the broadcast upconverter, is the simple and affordable way to give your viewers the full HD experience, without expensive re-equipping. This compact, plug-and-work™ unit uses Emmy award winning technology to convert your SD signal into high quality digital HD for transmission in whatever standard you want.
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Distributed transmission can minimize power consumption and improve signal quality. The adaptor inserts the necessary timing signals into the SMPTE 310M bitstream to synchronize all transmitters in the network. ▲

ROUTING SWITCHER

PESA Switching Systems Cheetah 448X Flexi-Frame
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Incorporates a 27RU frame designed to support SD and HD, as well as other non-standard digital signals simultaneously; internal backplanes are programmable for input or output connection. ▲

New tools

also was shown with two new RCP remote panels.

Panasonic introduced evolving RAM-recording technology with a camera demonstration using PCMCIA RAM cards instead of tape or disk to record images. The solid-state memory DVCPRO camcorder won a Pick Hit award and promises to be an exciting technology that will demand the industry's attention as it matures.

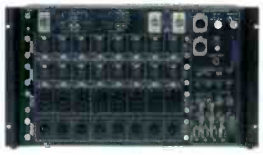
Panasonic's introduction of 24p recording to the miniDV world made quite a splash, as evidenced by the crowds of NAB attendees hovering around these exhibits. The AG-DVX100 supports 480i/60, 480p/24 and 480p/30 images and offers two XLR audio inputs with auto or manual audio levels. The AG-DVC80 offers features similar to the DVX1000 without 24p images. The company also introduced the AG-DVC7 camera in a larger DV camera package.

The AJ-SDX900 is a native 16:9 camera providing 24p/30p/60i recording at 480 lines with 25- or 50Mb/s recording with the onboard DVCPRO recorder. It offers GPS metadata capabilities, an SD memory card for storing settings and a 15-second cache recorder.

Thomson Grass Valley introduced the LDK 200 ITW camera, a standard-definition camera based on a new IT sensor that features a low smear rating of -140dB. It is a dockable camera based on the familiar LDK 200 footprint.

Thomson Grass Valley also displayed the Viper Filmstream camera with a variety of third-party integrations, including solid-state dual-link recording, fiber-optic cable interfaces and an Angenieux optical viewfinder.

Hitachi introduced its new Z4000W camera with 16:9/4:3 standard definition, featuring 530k sensors, 12-bit



ADDER 162 and 882i

The heart and soul of any live set, the Adder 162 carries 32 mic/line audio, 6 intercom/IFB, and 4 duplex data and closures, all on one fiber conductor. Supports data for stats and scoring, courtesy audio feeds to the booth and commentator feeds to the truck. Further expand your capacity with the Adder 882i, which carries 10 intercom/IFB, 8 data and 4 closure signals in both directions.

SHED and HDX

Run your HD cameras on ordinary single-mode fiber, without the need for heavy, bulky hybrid cables. The SMPTE Hybrid Elimination Device (SHED) simplifies your infrastructure, while the HDX also supplies power to your HD field cameras.

VIPER II

Small throw-down modules are ideal to augment your production. POV links for NTSC and HD point-of-view cameras provide full duplex data for camera and PTZ control, plus genlock/tri-level sync return and power to the camera. Other links support NTSC/audio, SDI and HD distribution to all locations in the venue.

COBRA

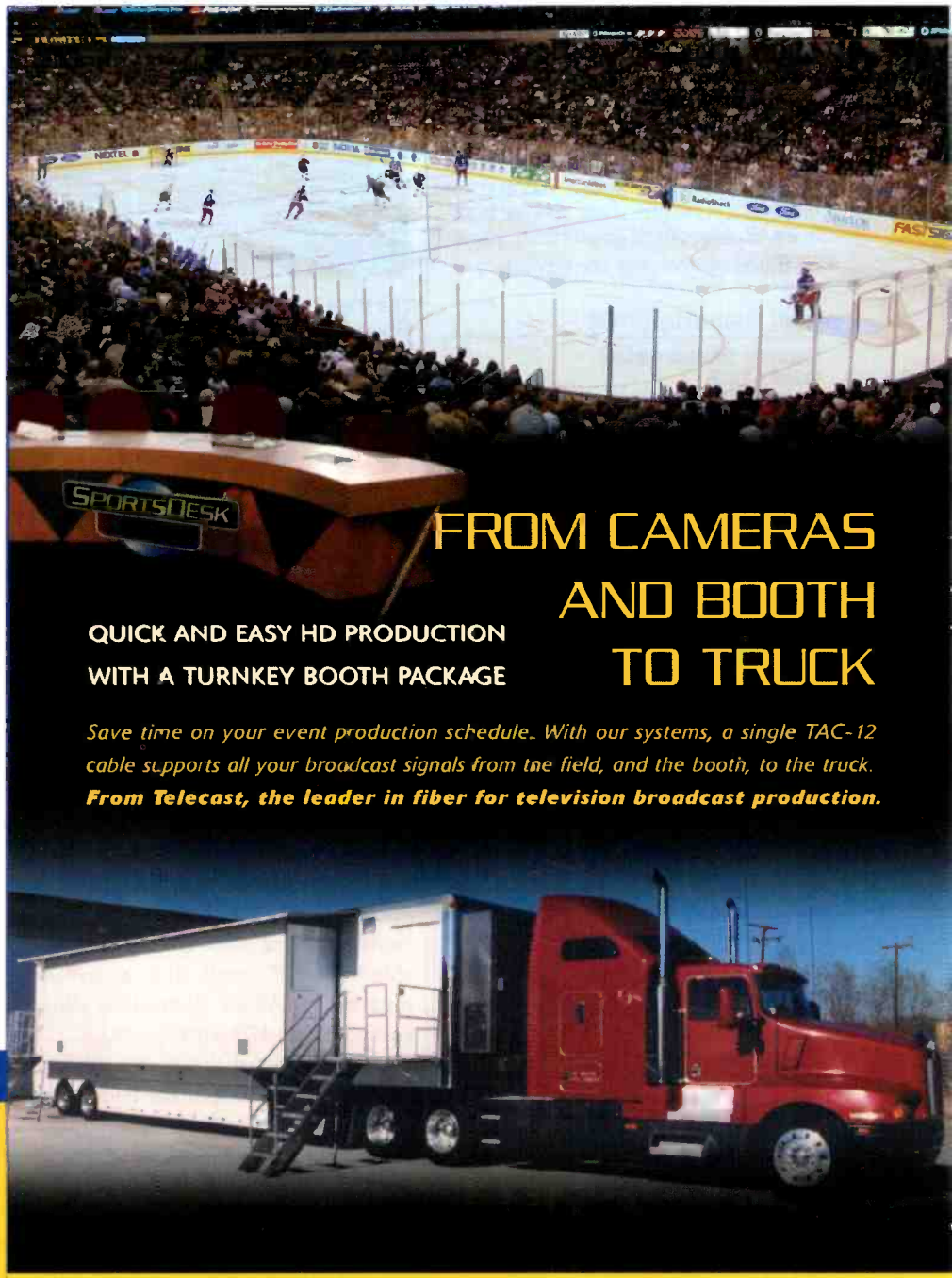
Send your triax camera signals with this patented, field-proven converter. All bidirectional video, audio, intercom and control signals on a single fiber with ten times the distance, one-tenth the weight. Designed for most popular camera families, including slow motion and HD triax.

COPPERHEAD HD/SDI

Replace your triax backs and cumbersome base stations with this camera-mounted fiber transceiver, and turn your ENG camera into a remote production camera. Provides all your bidirectional signals, including HD/SDI/analog video, audio, genlock/tri-level sync, intercom, data control, return video, IFB, tally and PTZ over any distance.

DIAMONDBACK

This video mux is ideal for distributing monitor feeds to a booth, set, monitor wall or to other trucks. Uses only one fiber to transport 8 NTSC signals, with expansion to 64 videos per strand using CWDM. Or swap out any video channel for 16 audio circuits, using an Adder serial coax output.



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NLE KEYBOARDS

Bella Professional Series NLE Keyboards
818-563-9500; www.bella-usa.com

Color-coded and icon-coded keys on these custom-designed keyboards speed navigation through editing functions, and the built-in jog/shuttle control gives precise, frame-by-frame control over the timeline. ▲

TWIN CHANNEL SYSTEM

Quartz Electronics QMC-TCS
888-638-8745; www.quartzus.com

Doubles the number of independent channels possible in the same space for automated applications; each channel has a dedicated linear keyer and its own voice-over capability. ▲

DIGITAL AUDIO MIXING CONSOLE

Calrec Zeta 100
+44 1422 842159; www.calrec.com

The console is available in three frame sizes: 24, 32 and 48 faders, and has DSP allocation for up to 56 channels. Standard features include dynamics on every channel, eight auxes, 16 multitrack/IFB sends, 99 flash ROM setup memories, internal routing and 5.1 surround mixing and monitoring. ▲

ENCODER

Doremi Labs ORCA
818-562-1101; www.doremilabs.com

Real-time MPEG-2 encoder for HD and SD video; offers encoding parameters such as GOP structure, 4:2:0 and 4:2:2 encoding profiles and compression bit rate. ▲

New tools

The Viper Filmstream camera was among the products shown at the Thomson Grass Valley booth.

A/D, 38-bit digital signal processing and 360-degree skin-tone-detail circuitry. The SK888 upgrades to 1050k-pixel IT CCDs offering 800 lines of resolution and a sensitivity of 2000 lux at f11.

A new box camera, the HVD30P, is one of the smallest box cameras available. It uses 1/3-inch CCDs with a minimum sensitivity of 0.9 lux and 12-bit A/D.

Offering HD recording on a miniDV tape, JVC's new JY-HD10U camcorder can record 720/30p, 16:9 images and 480/60p, 4:3 images in MPEG-2. Based on a single 1/3-inch, 1.18-megapixel progressive CCD, this Pick Hit-award-winning camcorder also features XLR microphone inputs, audio levels in the viewfinder and color bars. It is available with a PC application as well as plug-ins for Adobe Premier to allow editing of the HD MPEG images.

Ikegami offered the HDK-79EX, a new compact HD camera boasting a 30 percent smaller footprint than the HDK-79E. It uses 2.2-million-pixel, 2/3-inch FIT CCDs with 12-bit A/D conversion and 38-bit digital processing. It provides 1080i or 480i as standard outputs and optional 720p/480p outputs. It has 1000 lines of horizontal resolution with a S/N of 56dB.

The standard-definition HL-60W is a three-chip, AIT CCD-based camera with 520k-pixel sensors. It has a sensitivity of f11 at 2000 lux, 67dB signal-to-noise ratio and a modulation depth of 75 percent.

New box cameras include the HDL-20 HDTV designed for POV applications such as helicopter gyroscopes, industrial and other applications that require a compact camera. It uses three 2/3-inch, 2.2-million-pixel CCDs with 1080i output of 1000 TV lines of resolution.

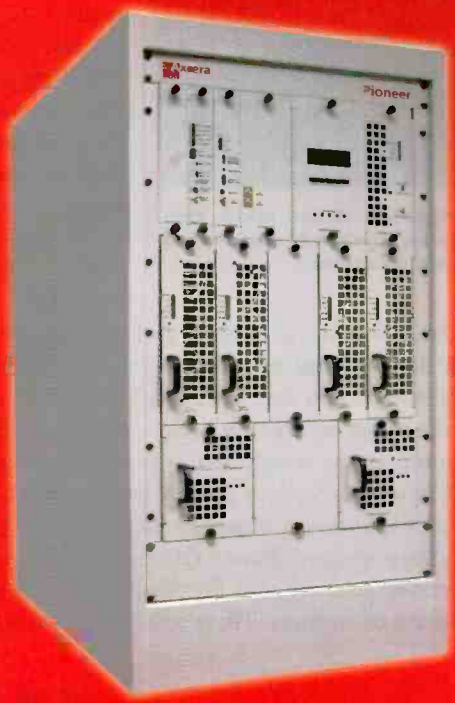
Camera stabilization

Sachtler's Artemis EFP and EFP Pro camera-stabilization systems won a Pick Hit. The new Artemis Cine/HD utilizes a modular construction that allows it to be used with different cameras. Its design features a 180° pivoting battery backpack, allowing different battery positions for different operation modes.

Image-sensor technology

Rockwell Scientific showed its new CMOS imaging device, which consumes only about 20 percent as much power as its CCD counterpart, while offering similar or improved picture quality at a reduced sensitivity of one f stop.

Eliminating obstacles for today's broadcaster



Introducing the Pioneer

When we asked broadcasters what they want in a transmitter, one theme continually resurfaced - broadband. A broadband transmitter allows group owners to minimize spare parts stock and adds simplicity for stations planning to move DTV channels to current analog frequencies, or community broadcasters relocating to core channels. Introducing the **Pioneer** and **Pioneer DT**, meeting the needs of today's broadcaster like no other solution on the market. The modular LDMOS amplifiers cover the entire UHF band with no retuning, allowing simple channel changes and minimizing spare parts stock. And all Pioneer and Pioneer DT transmitters can be upgraded to high power with nearly 100% reuse. For over 20 years, the best-engineered transmitters have come from Axcera - *The RF Experts.*

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New tools

CMOS technology will allow manufacturers to produce imaging chips on standard chip production lines rather than by the specialized manufacturing processes currently required by traditional CCD technology.

JVC and Ikegami previewed HD box cameras that employed CMOS sensors, and Dalsa had its first public showing of its prototype HD camera designed for high-end film replacement. The Dalsa Origin camera features a new CMOS 4k x 2k image sensor the size of current 35mm film frames, offering four times the resolution of current 2/3-inch sensors. It also has an optical viewfinder, and a form factor more like a traditional film camera than a television camera. BE

Dan Stark is president of Stark Raving Solutions.

Compression

BY STEVEN M. BLUMENFELD

Compression – the time allotted for me to see all the new technologies at this year's NAB. Decompression – Thursday afternoon when the next show is a mere 364 days away.

NAB 2003 saw the expansion of a trend that began a few years ago. The large investment in compression technologies is finally beginning to bear fruit. This year, traditional broadcast, IP broadcast, streaming and compression were tightly integrated.

Probably one of the most impressive technologies this year was Sony's Professional Optical Disc system, a Pick Hit recipient. The full system includes camcorders, mobile and studio recorders and, of course, the disc media. The optical disc media is based on a professional version of the Blue Ray format used in consumer optical HD recorders. The system records using both the DVCAM codec at 25Mb/s and the IMX codec at 30-, 40- or 50Mb/s, and has Gigabit Ethernet ports and i.Link. That is covered in Tom McAuliffe's article on streaming, so let me get to the topic at hand – compression.

Many companies at the show this year offered innovative, end-to-end compression solutions.

From a compression standpoint, it is no longer acceptable to just have great codecs. Simply being a codec company does not lead to a profitable business model in this post-technology-frenzied climate. Offering a solution, preferably an end-to-end solution for the broadcaster, is still high on the list of winners. There were a few well-placed

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516 Pro Video Fluid Head

The 516, designed as the upgrade of the 3066 (which sold over 100,000 units) is sure to be a favorite of Professional DV Cam operators. Incorporating new technology and design features, the 516 gives you the smoothest view with great control - guaranteed to meet all budgets.

- 360° Pan / +90° -60° Tilt
- Separate Pan and Tilt Locks
- Loads up to 22 lbs
- Advanced Fluid Cartridge Drag System
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Available in kit form with tripod, fluid head and carry bag.

The 516 Professional Video Head - New advanced features for an undisputed favorite.

The Complete 500 Series meets every DV support need

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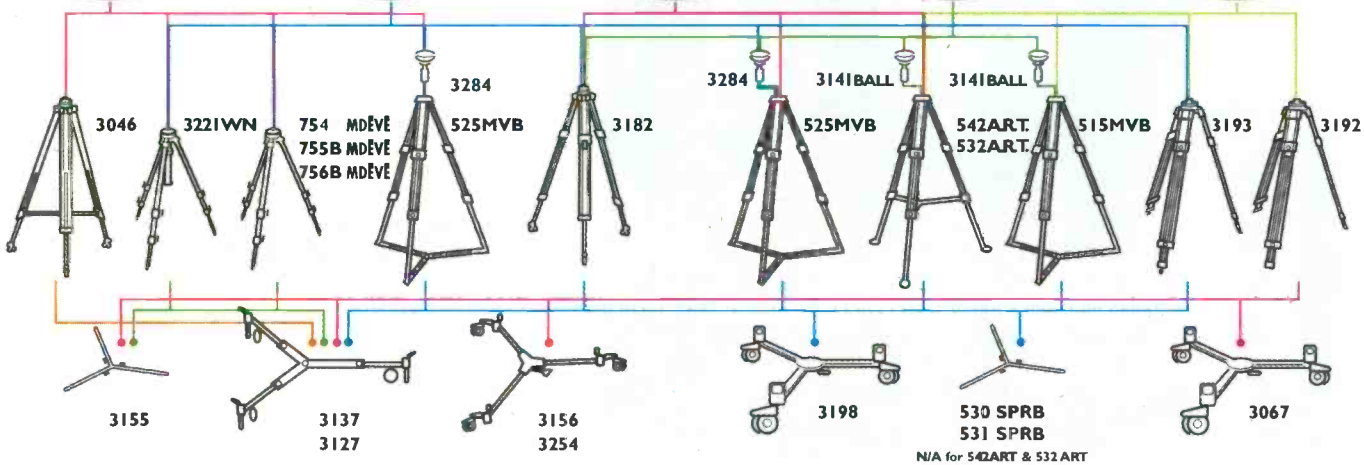
503
- Return to center counter balance spring
- Fluid cartridge drag system
- Loads up to 13.2 lbs

505
- Interchangeable counter balance springs
- Adjustable fluid drag
- Loads up to 22 lbs

516
- Return to center counter balance spring
- Fluid cartridge drag system
- Loads up to 22 lbs

510
- Adjustable counter balance spring
- 4 position fluid drag settings
- Loads up to 23 lbs



Bogen Photo Corp., 565 East Crescent Ave, Ramsey, NJ 07446 Tel: (201)818-9500 Fax: (201)818-9177 www.bogenphoto.com

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Product jackpot

LAPTOP-BASED CG

Chyron SOLO
631-845-2000; www.chyron.com

This system allows its operator to create CG messages and real-time or flip-book animations. The squeezeback function includes two video inputs plus a background, allowing squeeze & tease promos, bumpers, opens and closes. ▲

PROFESSIONAL HDTV DECODER

Digital Vision BitLink
818-769-8111; www.digitalvision.se

Modular MPEG-2 HD/SD decoder with an extensive choice of I/O modules including ASI input, satellite demodulator, VGA HD monitoring and video reference; up- and downconversion; support for advanced Closed Caption; controlled via front panel or Web interface. ▲

New tools

companies showing new and innovative products. Envivio is the first one that comes to mind.

Envivio showed off its H.264 solution to deliver live broadcast-quality video over satellite, cable and telecommunications networks. H.264 Advanced Video Coding (AVC) is the new codec developed by the MPEG ISO and ITU-T groups. H.264 has shown a 50 to 60 percent improvement in bit-rate reduction with a significant improvement in coding efficiency. Compared to other compression standards such as MPEG-2, H.264 delivers live broadcast quality much more efficiently. Envivio has been instrumental in developing the H.264 standard and will deliver H.264 throughout its product line.

iVast offers a number of products as part of their MPEG-4 platform. The platform consists of a suite of standards-based encoding, authoring, distribution, media management and playback products. Studio Author is an object-oriented MPEG-4 solution that allows users to easily create MPEG-4 digital audio and video, as well as 2-D and 3-D graphics content.

Compared to other compression standards such as MPEG-2, H.264 delivers live broadcast quality much more efficiently.

Ligos seems to be bucking the trend of moving from pure technology to a hardware solutions supplier. The MediaRig Core is a set of scaleable

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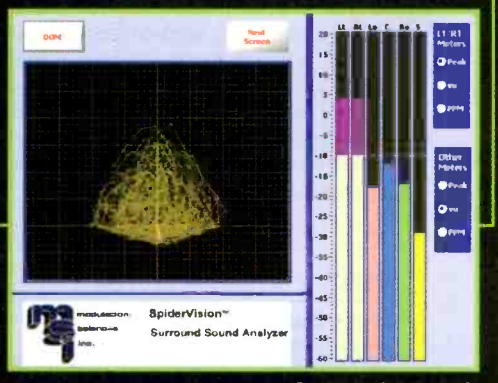
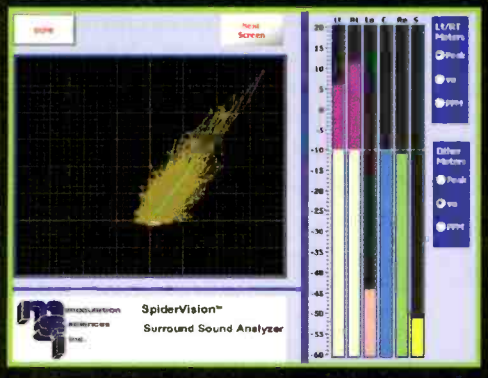


Center and Surround

Introducing a revolutionary **NEW** product and **WINNER** of the prestigious, 2003 Mario Award . . .the ***SpiderVision™***



Left Heavy

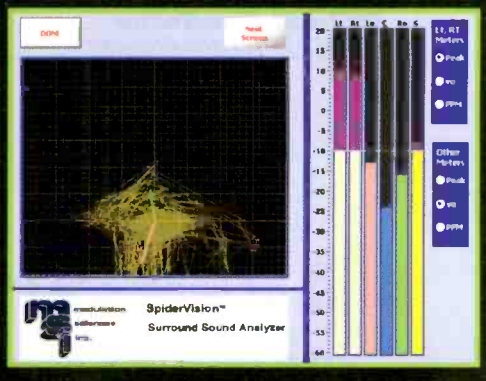
SpiderVision provides a complete visual analysis of your Pro Logic® surround sound field. It is the only tool you need to ensure your sound is compatible, regardless of the way your viewers are listening. Perfect for use in a variety of environments including Master Control, Remotes, Production, Live Sports Events and Centralcasting.

PERFORMANCE.

SpiderVision takes Left and Right audio in, analog or digital, and separates the left, right, center and surround channels. It then displays the sound field as the SpiderVectors®, which provide quick, accurate, at-a-glance monitoring of the average sound field. The SpiderMesh® provides a more detailed real-time view. The bar graphs deliver level information such as Left and Right, Center and Surround audio in absolute, PPM or VU modes.

FEATURES.

The built-in, full color display is bright and easy to see. In a half-rack wide case, ***SpiderVision*** has the same form factor as a standard waveform monitor for easy mounting. With a simple push-button or remote screen selector, ***SpiderVision*** is a true "plug and play" instrument. Some important user selectable features include operating level adjustment, vu, peak or ppm metering standards and ***SpiderVision*** or standard XY display modes.



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Product jackpot

EQUIPMENT BAG

CineBags Production Bag
323-660-6642; www.cinebags.com

Four detachable Velcro pouches allow users to custom design this production bag's interior. The bag also has two large zippered side pockets, one large detachable pen pocket, five see-through mesh pockets and a business-card-size label holder. ▲

WIRELESS INTERCOM SYSTEM

Clear-Com CellCom
510-496-6666; www.clearcom.com

The base station on this wireless intercom marries wired communications such as party-line and digital-matrix systems with wireless transceivers and beltpacks. Each transceiver creates a coverage zone of up to five beltpacks. The system operates above the UHF TV bands and is license-free in over 100 countries. ▲

MPEG STREAM DELAY SYSTEM

Computer Modules DVB-ASI TimeShifter
858-613-1818; www.dveo.com

The TimeShifter can delay multiple channels by a set amount of time. Features include programmable time delay and 60Mb/s playback rate with standard HD, 100MB HD and 10/100 BaseT. ▲

New tools

software modules that provide reliability and performance equivalent to hardware encoders, while surpassing the picture quality of those encoders. Its flexible encoding features allow live real-time encoding, file transcode, stream transrating and dual-stream processing.

Pixeltools... I love these guys! This little software company seems to turn out some of the most innovative and powerful tools for MPEG experts. While everyone is working on making standard-definition content encoding faster and better, Pixeltools has been working on HD. Expert-HD is a high-performance, high-quality software MPEG encoder that produces MPEG transport streams that are compliant with HD video specifications and compatible with HD video decoders.

Expert-HD can encode one hour of source video in 26 minutes for 720x480 24fps source, 40 minutes for 1280x720 24fps source or 90 minutes for 1920x1280 24fps source.

As important as compression is, delivery of media content has become a hot issue. Network costs and bandwidth continue to rise, and truly efficient delivery is the Holy Grail of compression.

Xiran is a new division of SimpleTech – the large memory chip supplier. They have developed an innovative IP delivery mechanism: the STM-1000. It uses what Xiran calls the DirectPath architecture to assure wire speed delivery of streaming media.

Truly efficient delivery is the Holy Grail of compression.

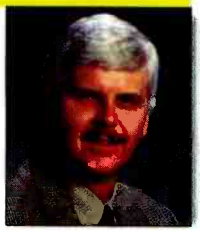
With its direct path between storage and the network, optimized streaming software and high-capacity storage, the STM-1000 delivers multiple formats and bit rates up to 1 Gb/s. Because the DirectPath hardware removes the overhead usually done by the CPU, a single-port STM-1000 can serve over 3000 simultaneous 300kb/s users without sacrificing quality.

Three companies received 2003 Pick Hit awards for compression products. Computer Modules won for their DVB-ASI Time Shifter, Logic Innovations for their TSM-2800 multiplexer, and Thales for their Amber cable translator. **BE**

Steven M. Blumenfeld is president of StudioBroadcast.com.

Digital acquisition

BY CRAIG BIRKMAIER



There is a digital revolution taking place in the world of television broadcasting. At NAB 2003 there was a buzz in the air, created by the realization that the relentless growth in digital processing and data storage capabilities has now turned the video industry on its head.

Digitized video

While the rest of the world is going digital and nonlinear, the video workflow for many stations remains analog and linear. For those who have moved on to linear tape-based formats such as DVCPRO, DVCam, Digital BetaCam, Betacam SX and IMX, the workflow is little more than the digitized version of

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Product jackpot

VIDEO CARD

Digital Voodoo HD/Vengeance
+61 3 9682 9477;
www.digitalvoodoo.net

This video card allows broadcast professionals and artists to work with programs like Adobe Photoshop, Adobe After Effects or Discreet combustion in the desktop-extension mode by simply dragging the composition window over to the broadcast monitor and painting in real time. ▲

FLUORESCENT LIGHTING FIXTURE

ARRI Studio Cool
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Offers choice of reflectors, three control options, and traditional cast and extruded aluminum housing; slide-in lamp support and locking lamp holders allow for six 4-tube units on one circuit.▲

New tools

the legacy analog workflow.

Meanwhile, the revolution in computer-based tools for image synthesis, composition and video editing launched a new paradigm in which audio and video streams are treated as data. These tools deal with video and audio as files that can be accessed randomly, shared across digital networks, and manipulated to create traditional linear audio and video programs. These tools are also being used to create new forms of digital media content that give the viewer more control and the programmer the ability to localize, even personalize, the presentation.

For more than a decade we have been told that a tapeless digital workflow was right around the corner. Yet the death of videotape has appeared to be just as remote a possibility as the end of analog television broadcasting scheduled for Dec. 31, 2006. However, at NAB 2003, it became a distinct possibility that broadcasters may be acquiring images without tape by 2006.

For more than a decade we have been told that a tapeless digital workflow was right around the corner.

Leapfrog

In February, Sony pre-announced a major shift in its strategy for video acquisition and production to be introduced at NAB. This strategy is

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www.360systems.com

Product jackpot

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DNF Controls DC-30
818-898-3380; www.dnfcontrols.com

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Florical Systems L100
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L100 provides a cost-effective entry into automation with a commercial insertion solution that includes on-air presentation, spot ingest and traffic schedule import and reconciliation. ▲

DIGITAL PLATFORM

Inscriber Inca Studio
800-363-3400; www.inscriber.com

Integrates functions of multiple CGs, DDRs, logo generators and other equipment, all on a single channel; features independent clock and logo channels, real-time clip-to-clip dissolves, and multi-layer 3D effects. ▲

BROADCAST LOUDNESS METER

Dolby LM-100
415-558-0200; www.dolby.com

This meter presents subject loudness measurements in an easy-to-understand numerical format. A set of user-definable alarms and monitoring functions can indicate input loss, signal clipping, overmodulation, high or low signal levels, silence, and incorrectly set dialogue level (dialnorm) values. ▲

HIGH-DENSITY BANTAM AUDIO PATCHING SYSTEM

ADC ProPatch
952-938-8080; www.adc.com

Provides a compact normal-adjustable 2X48 Bantam patch panel in a 1RU space system; can convert to a 1.5RU panel with larger designation strips with the installation of a conversion kit. ▲

New tools

optimized for the new digital workflow, treating video, audio and related metatdata as digital media files. The product family is based on optical disc recording using the new Blue Laser technology being developed by Sony and other consumer electronics companies. The 12-centimeter optical discs can store 23.3GB of data and offer random access to the recorded files.

At NAB, Panasonic unveiled its plans to move directly to a solid-state camera design for video acquisition, based on the recording of data to Panasonic's SD memory cards.

Meanwhile, products that enable acquisition and archiving directly to magnetic hard disks proliferated at NAB.

With the introduction of its optical disc-based product family, Sony has embraced the new digital workflow and a variety of existing and emerging standards for connectivity, video compression and metadata. Two camcorder models offer a choice of compression codecs for recording. The PDW-510 DVCAM camcorder supports 4:1:1 DVCam at 25Mb/s; the PDW-530 MPEG IMX/DVCAM supports both DVCam and IMX (MPEG-2 4:2:2) at 30-, 40- or 50Mb/s. Both cameras can support 50i/25p (625 line) and 59.94i/29.97p (525 line) formats. An optional card will allow the camcorders to capture images at 23.97p/25p for digital cinematography applications.

In addition, both camcorders allow a low-resolution MPEG-4 proxy stream to be recorded simultaneously; this stream can be used both in the production and archival aspects of the digital workflow. The camera also records separate head frame images and a variety of metadata about the captured images; it is capable of searching imagery already captured to disc and recording metadata produced by field editing systems onto the disk with the essence media.

The system components support both the IEEE-1394 and Ethernet interfaces for transferring assets as Material eXchange Format (MXF) files and are also capable of remote management via Simple Network Management Protocol (SNMP) over IP networks.

Panasonic's decision to move directly to a solid-state memory design for image acquisition may indicate what it perceives as significant limitations of optical recording technology. These concerns are centered on operational limitations related to environmental issues and the data transfer rates for files recorded on the optical discs.

Blue Laser discs will be housed in a shuttered carrier, similar to removable floppy and hard disks. The reduced track size makes the discs more vulnerable to environmental contamination,

The prototype camcorder shown by Panasonic at NAB will allow the use of up to four PCMCIA modules. These modules can be plugged into the PCMCIA slot of notebook computers where the files can be transferred or edited directly.

especially dust particles. And like magnetic hard disks, optical drives are sensitive to shock and gyroscopic errors. In the new Sony camcorders the optical drive assembly is isolated on foam shock mounts. The optical recording process requires that the media be heated in order to effect a phase change to record the data. Sony specifies the operating range for the new camcorders at 32 degrees Fahrenheit to 104 degrees Fahrenheit. But there are concerns that power consumption may increase significantly below 40 degrees Fahrenheit, affecting the duration of recording on a battery charge. These issues do not affect workflow; however, they may influence applications for optical recording, especially in demanding ENG environments.

The data transfer rates that can be achieved with optical media, however, have a significant impact on workflow

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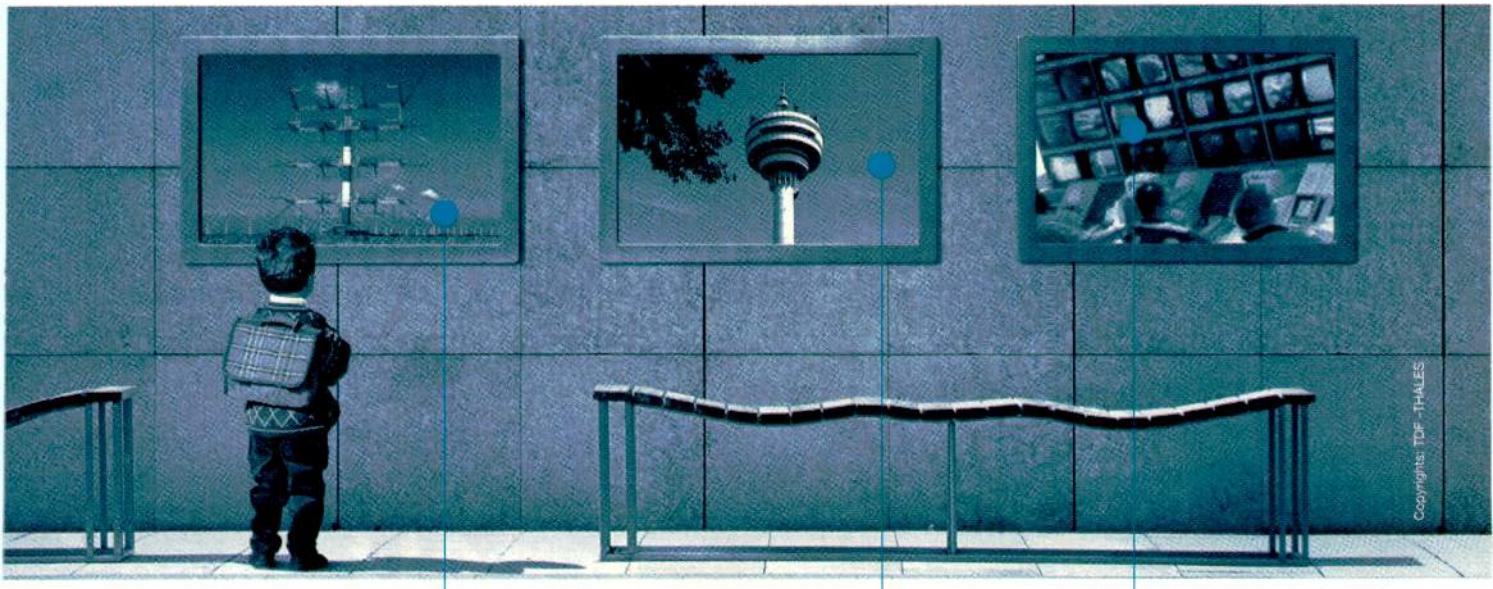

Radio

A key pioneer in the creation and evolution of Digital AM, Thales leads the way in advanced radio innovation, offering today's broadcasters scaleable, dependable high-performance solutions. It's no wonder half the world's high power transmitters today carry the Thales name.

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Product jackpot

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This vectorscope displays signals on a video monitor through composite video or S-video connections. Features include full field line select, bow-tie and parade displays, quad split-screen display, and trace store and freeze functions. ▲

UPLINK ENCODER

Scopus Codico E-1510
609-987-8092; www.scopus.net

Professional MPEG-2 DSNG exciter integrates encoding and modulating capabilities with an upconverter in a 2RU chassis; encoder features full SNMP remote management and control.▲

New tools

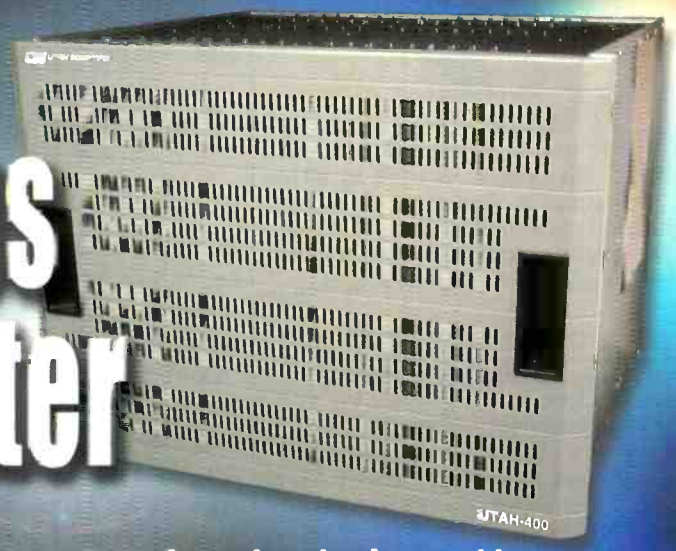
and may limit the use of optical recording for high-definition image acquisition. The write speed for the consumer version of Blue Laser recorders will be 36Mb/s; this is inadequate to support the higher data rates needed for the higher quality IMX formats. To address this limitation the optical drives that Sony developed for this product family support a write speed of 72Mb/s; this is adequate to support all of the available formats, but insufficient to support the write speeds needed for a future HD version without heavy compression. The studio decks use two optical head assemblies to support transfer rates of 144Mb/s.

The camcorders and battery-powered mobile player can transfer DV25 files at 2.25x realtime and IMX files at 1.25x for 50Mb/s files to 2x for 30Mb/s files. Proxy files can be transferred at 30x real time. The studio decks can transfer DV25 files at 5x real time and IMX files at speeds between 2.5x and 4x; proxy files can be transferred at 50x real time.

Panasonic espouses the advantages of solid-state camcorders in dealing with both the environmental and transfer speed issues. A solid-state design will allow the development of camcorders that operate over a much wider range of temperatures and environmental conditions. They also noted that the elimination of the bulky drive mechanism has the potential to enable radical changes in the physical packaging of camcorders, significantly reducing their weight, size and power consumption.

Like other memory devices, SD memory cards support high read/write speeds. Panasonic has developed PCMCIA card modules with four embedded SD memory cards. These modules will support a data transfer speed of 640Mb/s; 20x real time for 4:1:1

UTAH-400



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Product jackpot

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The matrix of this wireless intercom connects directly with the cellular network of active antennas located around the production environment. Each of the active antennas provides a radio cell that supports up to five beltpack users. ▲

SIGNAL MONITORING SYSTEM

Videoframe PROXY VNODES
530-477-2000;
www.videoframesystems.com

Control audio/video interface equipment from multiple vendors from a single control panel; has equipment-specific interfaces. ▲

New tools

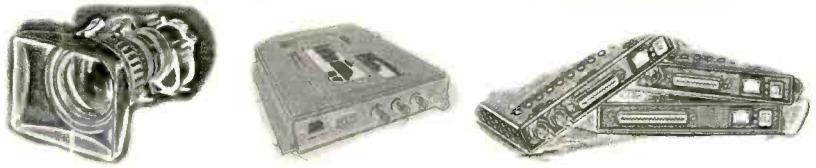
DVCPRO25 and 10x for 4:2:2 DVCPRO50. This transfer speed will also support future HD camcorder products. First-generation PCMCIA modules will use four 1GB SD memory cards, supporting a record time of 18 minutes for DVCPRO25. The prototype camcorder shown by Panasonic at NAB will allow the use of up to four PCMCIA modules. These modules can be plugged into the PCMCIA slot of notebook computers where the files can be transferred or edited directly.

One limitation of solid-state memory is that it is too expensive for archival purposes.

One limitation of solid-state memory is that it is too expensive for archival purposes. For first-generation products, the media cost per minute will be relatively high compared to other acquisition media. But the SD memory cards are riding the Moore's Law curve; over the next five years storage densities will increase to 4GB per card, then 16GB. And all of the products that use SD memory storage will be able to take advantage of the higher density cards as they become available.

Sony has indicated that they will migrate to solid-state memory for acquisition products as the cost of the media becomes practical. This raises the issue of whether optical storage for acquisition will have a relatively short window of opportunity. And it raises the specter of another competitive threat to the companies that now dominate sales of acquisition gear to broadcasters.

Memory cards are one of the core



technologies enabling the revolution in digital photography. Most of the new digital cameras from the traditional photographic vendors like Canon, Fuji, Olympus and Nikon already offer still image resolutions that are higher than HDTV acquisition year. And most of these cameras support the capture of short clips of low-resolution video as well. It is just a matter of time until digital photography and HDTV acquisition collide. By the end of this decade, the chips needed to build a high-resolution still/video acquisition system will become commodities; at that point the core competencies for these products will be the lens and the packaging.

Hard (disk) realities

Over the past few years there has been another quiet revolution in digital workflow. That revolution has been driven by the incredible increases in storage capacity and transfer speeds for hard disk drives.

A year ago, Thomson introduced the Viper FilmStream digital cinematography camera. This flexible camera system has the ability to output uncompressed RGB data via two 1.5Gb/s SMPTE 292M connections. Director's Friend stepped up to the opportunity to capture this avalanche of bits directly to their HDreel hard disk arrays, now available only through rental arrangements. Many companies took notice.

This year, new hard disk-based digital cinema and HD recording systems proliferated like MP3 files. The new product introductions include: Accom's WSD/HDi, BayTech Cinema's CineRAM, BOXX Technology's CineBOXX, DVS's CineControl/CineReel, Kei Soku's UDR-2E (seen with the Thomson Grass Valley Viper camera) and S.two's D.Mag (found in the back of an SUV).

Focus Enhancements and JVC teamed up to integrate disk-recording performance with the camcorder. The FireStore DR-DV5000 can be mounted directly to JVC full-size DV camcorders for simultaneous recording to tape and disk. The FireStore FS-1 allows recording direct to disk via a Firewire interconnect; Sony offers a similar product, the DSRDU1 DVCAM video disk unit. The FireStore FS-2 is a studio VCR replacement with Firewire I/O as well as analog composite, S-video and analog component I/O, which is converted to DV 25 for recording. BE

Craig Birkmaier is a technology consultant at Pcube Labs, and hosts and moderates the OpenDTV Forum.

Graphics and effects systems

BY C. JASON MANCEBO

This year's convention brought back the single-venue concept of yesteryear. Unfortunately, there was still just too much great technology to see such a short period of time. That said, I did make an effort to spend time with the leading graphics-and-effects systems and software vendors, with the goal of understanding the latest information on their products and the state of the industry.

Chyron, the longtime big kid on the graphics block, has a newfound vision that was received well by attendees. Chyron showed SOLO, its new laptop-based portable graphics system with full ITU-R 601/SDI input and output. The system works well in fast-paced sports and entertainment environments where flexibility is key. Alone or working with other Chyron applications, SOLO offers functionality and

Product jackpot

RF AMPLIFIER TUBE

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Three-stage, MSDC IOT; delivers 130kW peak power output and 30kW average power for DTV service; when combined with the HA3000 hardware, it provides a high efficiency amplifier for UHF digital TV. ▲

LOGO INSERTER

Evertz HD9625LG
905-335-3573; www.evertz.com

This inserter stores logos in flash memory so the user can quickly access them through the device's front-panel quick-select keys or through GPI inputs. Logos can be static or moving, and can be as small as one percent of the display area. Their position and fade rate are user controllable. ▲

CLOSED-CAPTIONING TRANSLATOR

Global Translation TranslateTV
614-855-9980; www.translatetv.com

This device instantly decodes closed captions, translates the text stream and then re-encodes the results in unused caption fields such as CC2, CC3 and CC4. The company installs and maintains the translation server, and continually upgrades and customizes the translation software. ▲

MICROWAVE POWER MODULE

L-3 Communications Microwave Power Module (MPM)
570-326-3561; www.L-3com.com

Includes a helix TWT, a solid-state driver amplifier and a high-density electronic power conditional; all three components are housed in a compact and lightweight package. ▲

Product jackpot

TRANSMITTER

Thales DCX Paragon
413-998-1100; www.thales-bm.com

Uses MSDC IOT technology for better transmission efficiency; offers up to two times conventional IOT and four times that of a solid state transmitter. ▲

GRAPHIC WORKSTATIONS

Grande Vitesse Systems GVS9000-Series
415-777-0320; www.gvs9000.com

These workstations are available with 867MHz, 1GHz, 1.25GHz or 1.42GHz G4 processors. The series offers 2MB of dedicated L3 cache memory per processor, with up to 4GB/s throughput, one full-length 64-bit slot, one AGP 4X slot, four or 10 66MHz PCI expansion slots for up to 533MB/s throughput, up to 2GB of DDR SDRAM and up to 4.5TB of disk space. ▲

AUDIO ANALYZER

Modulation Sciences SpiderVision
732-302-3090; www.modsci.com

Delivers a picture of the direction and amplitude (vector) of the dominant sound sources; real-time digital analyses alarm a host of conditions that might otherwise corrupt sound quality; visualizes the sound field of stereo and surround signals. ▲

PA LOGGING CLIPBOARD AND SOFTWARE

Horita Script Kit
949-489-0240; www.horita.com

A production assistant uses the hardware portion of the logging kit to capture and store up to 50 time-code values, and uses the PTR-LOG software portion of the kit to download the time code into a PC. ▲

New tools

ease of operation in a laptop portable graphics system. SOLO won a Pick Hit award, and is also my pick of the show for graphics systems.

Also introduced was Chyron Asset Management and InterOperability (CAMIO), a graphics content-management and distribution system. It's a "hub-and-spoke" software system that is Web-enabled, MOS-compliant and open standards-based. CAMIO allows graphics operators at a "hub" location to create and manage graphic elements for local and remote "spoke" stations. It provides local station operators full access to the hub-created graphics templates, with the ability to either simply schedule graphics as is, or to easily modify them according to local needs. This allows stations to maintain corporate branding while assuring that the local graphics look and feel is not compromised.

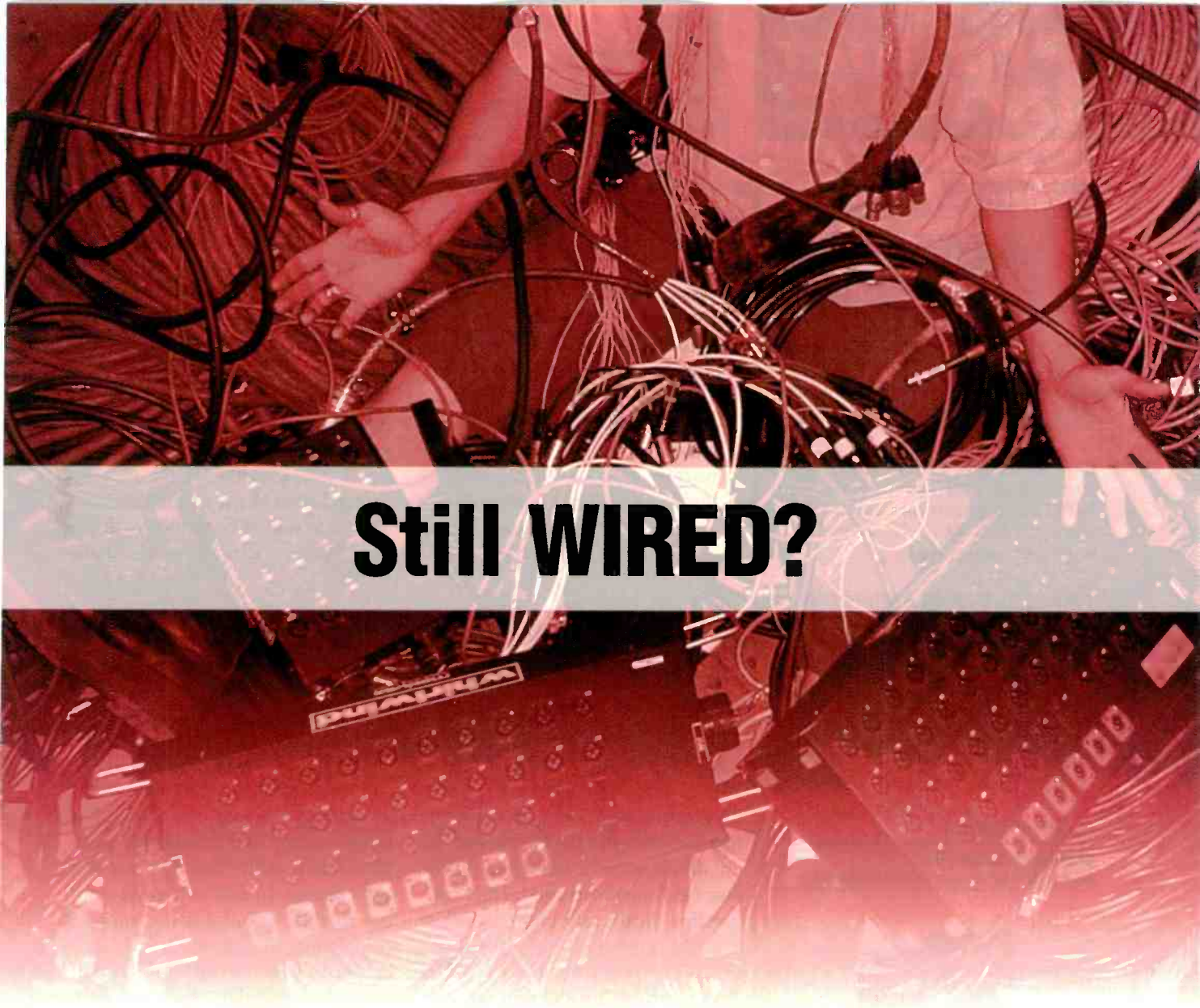
SGI debuted its next-generation Onyx 350 computer system with InfiniteReality 4 graphics. Designed with a PCI-X architecture, it is the follow-up to the class of system used for real-time virtual set and graphics generation at facilities around the world. Also seen on SGI's Fuel desktop graphics system was WSI's Weather Central Super Genesis live system, a full-featured weather graphics system.

VizRT demonstrated its latest Content Pilot solution interoperating with and controlling broadcast servers and an included template-graphics system. The Content Pilot is the heart of the graphics-insertion automation as well as distribution- and playback-automation system. Although it is a complex system, it is simple to use. Expect more focused and complete systems from this Norwegian-based developer in the automation and management of live and real-time graphics.

The team at Pinnacle Systems released several updates to existing packages. These updates are focused on expanding upon their comprehensive solutions for the broadcast market with a specific focus on complete workflows. The company announced additions to all of its Deko platform systems and introduced Deko 1000, a low-cost, on-air graphics system built on the same technologies as their FX Deko II. Deko 1000 has all of the key features of the Deko line, whose members are now available at lower price points and targeted at entry-level customers. Deko 1000 offers users with smaller remote operations the opportunity to unify their graphics platform. The company also introduced DekoObjex, which is an option for FX Deko II, Deko 2200 and Deko 1000 that enables DVE-style object control. It enables users to define and play back independent DVE actions for individual elements or groups of elements on the screen. It can display complex compositions of up to two external video sources, two internal clips with key (alpha), text with effects, a lower-fifth crawl, and show elements such as a bug or clock – all from a single system.

NAB attendees seeking the latest in graphics and effects got an eyeful of new hardware and software solutions.

Inscriber unveiled its new Inca line of products. The Inca Studio CG is designed with flexibility in mind. Instead of tying up several switcher rails with multiple CGs, DDRs, logo generators and other equipment, Inca Studio lets users perform many operations, such as create and display clocks and bugs, without using a



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Product jackpot

HD CAMCORDER

JVC JY-HD10U
973-317-5000; www.jvc.com/pro

The camcorder can record one HD format (720/30p) or one of two SD formats (480/60p and 480/60i) onto a MiniDV tape. It records the two progressive formats in 16:9 aspect ratio with MPEG-2 compression, and the interlaced SD format in 4:3 aspect ratio with DV compression. ▲

TWO-STAGE CARBON FIBER TRIPOD

Bogen Manfrotto MDeVe 754
201-934-8500; www.bogenphoto.com

Allows the video camera to be positioned at a height just under five feet; can support up to 13 pounds; features center column construction and a built-in 50mm leveling ball system. ▲

PC-BASED EDITOR

Quantel QEdit Pro
+44 1635 48222; www.quantel.com

The editor includes an improved pen-and-tablet interface, keyboard shortcuts and a jog/shuttle control. Each superlayer of the toolset offers 3-D DVE with independent shadow control, fettle-based color correction, chroma and luma keying with spline-based garbage mattes, motion tracking with fast directional blur, and Quantel's Paintbox for graphic creation and retouching. ▲

DIGITAL ROUTING SWITCHER

Utah Scientific 400/64
801-575-8801; www.utahscientific.com

Three-board architecture consists of an input board, a crosspoint board and an output board; contains 36 I/O slots; features signal presence detection and an internal monitor matrix. ▲

New tools

separate box or channel. It can also dissolve between clips that can reside on any surface of composited graphics. Its ability to input both key and fill for capture, as well as for video pass-through, enables users to utilize it to be used as part of their compositing stream. The system also provides real-time transitions using images as mattes.

While it is typically not thought of as a player in the production-graphics market, Apple's recent acquisitions of high-caliber effects technologies are starting to pay dividends. Apple showed Shake 3, a compositing and effects solution for film and HD that supports Apple's OS X operating system. New features for this version are unlimited network rendering on the Mac OS X platform and further support for third-party plug-ins. While it might be overkill for many facilities, it's a system for many facilities doing creative production work to consider seriously.

While not a pure graphics or effects package, Apple's Final Cut Express has limited graphics functionality and supports DV and DVCPRO out of the box. It would be ideal for news operations.

Both Evertz and GVS won Pick Hit awards for products in the graphics and effects realm – Evertz for its HD9625LG logo inserter, and GVS for its GVS9000 Power Mac G4/Power PC graphics platform.

The single standout feature of the show was a trend toward integration and interoperability. While this is something that most vendors have worked for recently, it was not at the top of their priority list. But that has changed, as evidenced by the product releases as well as booth demos at the show. Rather than the latest whiz-bang feature that someone thought was a great idea, customers are demanding (and vendors are delivering) complete functionality that interoperates and coexists. In addition to smoothing workflow and cutting time to completion, this approach is extending Facilities' return on capitol investment. As a popular television celebrity once uttered, "I heartily endorse this game." BE

Customers are demanding (and vendors are delivering) complete functionality that interoperates and coexists.

C. Jason Mancebo is president and chief technologist at Korsade Technologies, a broadcast and digital media consulting firm.

Production systems

BY SCOTT G. GRIFFIN

NAB 2003 presented a new crop of production system technology choices that met a wide array of needs in the broadcast production environment. From affordable playback sources to automated closed captioning, a variety of niche products caught the attention of our team's research group.

Of particular interest were the latest product line offerings from Junger Audio. A line of discrete AES and even embedded SDI

small wonder

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Product jackpot

REMOTE-CONTROL AND FACILITY-MANAGEMENT SYSTEM

Harris ReCon
513-459-3400;
www.broadcast.harris.com

These Windows-based programs allow broadcasters to monitor and control transmitters from a PC. The operator can use the software's root-cause-analysis function to diagnose any alarm activity and take action from any location. The suite can handle an unlimited number of status, analysis and control channels. ▲

New tools

audio processors including channel shuffling, limiting, compression, equalization, mic mixing and surround processing are now available in modular and 1RU form factors. Junger's new B44 audio converter/router provides channel shuffling, summing and audio insertion access for SAP and DVS audio services into an embedded SDI stream from either discrete analog or AES sources. All settings are remotely accessible via serial or GPIO control, making this a great tool for the ingest, production or release path areas of a facility.

A second product of interest is the Evertz MVP. This multiviewer platform supports as many as 64 inputs; a variety of input formats (discrete SDI/AES, embedded SDI and multiple-VGA to start); as many as two simultaneous, but independently configurable, UXGA outputs; SNMP signal monitoring (audio, video, VBI, Web streams); and a movable/scalable display image. The MVP is competitively priced to Miranda's KaleidoK2 and Barco's Hydra processors, and it affords comparable features with multiple outputs available to support multiple displays or rooms.

This year's crop of production solutions included products for playback, closed captioning, audio processing and switching.

In the control area we found DNF Controls' FlexControl networked control system. This modular platform includes control panel, serial

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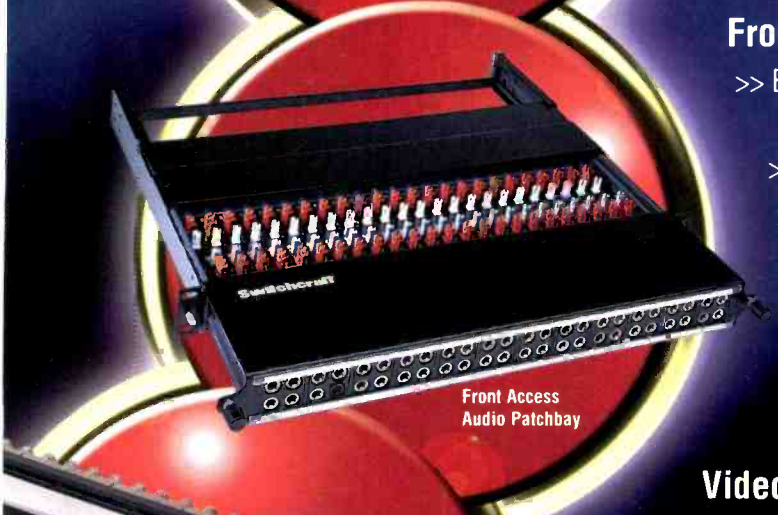

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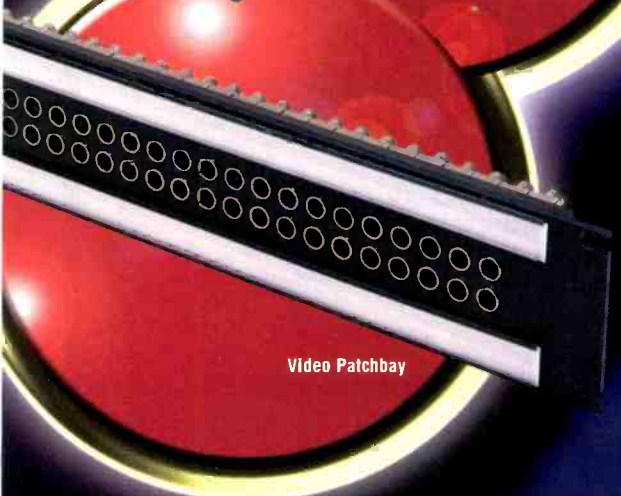
>> Available in both long-frame or bantam configurations

>> All jacks are nickel-plated, steel frame, with gold-plated crossbar contacts

>> Part of a complete line of audio patchbays, call for details



Video Patchbays:

>> MVP midsize High Definition version rated at 3.0Ghz

>> VPP standard High Definition version rated at 2.4Ghz

>> VPP standard Serial Digital version rated at 1.5Ghz

>> Available in 1RU, 2RU's, 24, 26 or 32 jacks, terminated, non-terminated, or non-normalled

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Product jackpot

NETWORKED NEWS SYSTEM

Pinnacle Vortex
650-526-1600; www.pinnaclesys.com

Provides drag-and-drop storyboard editing and timeline-based editing for video, audio and titles; real-time transitions allow dissolves and wipes without rendering. ▲

LIGHTING MONITOR

Leader Instruments FS3018
800-645-5104; www.leaderusa.com

This monitor allows the lighting director and other key people on the set to see the picture from the camera's viewpoint. The system links wirelessly to the company's LV 5700 multi-SDI monitor, allowing it to display waveform/vector monitoring and peak measurements. ▲

New tools

control I/O and GPIO building blocks that utilize TCP/IP as their interconnect. Multiple control positions can access the same control hub, and each control panel can access multiple control I/Os. Distributed systems can utilize Web links to access remotely linked control bridges, and a wide array of device protocol drivers are currently available. TD control of a complement of IP-connected source devices is now possible in a streamlined package.

Another control product of interest is Television Systems' UMD-SC-21 tally interface. This interface device is a key data bridge between router control systems, multiviewer display processors and production switcher tally sources in the modern control room monitor wall. Dynamic source identification display in a multiviewer monitor wall requires that not only switcher tally status, but also destination assignment mnemonic information, be assignable to movable image boxes in the multiviewer system. The TSL device creates the translation tables that match this data up and enable the true power of under-monitor display in the virtual environment. On a recent job site, we found the graphical user interface (GUI) to be intuitive and the support sufficient to glue two systems together rather quickly.

In the studio and remote production environments, another new product of interest, and a Pick Hit winner, is the Clear-Com CellCom wireless beltpack. The base station can support up to 10 beltpacks and it provides selective combination of as many as four matrix crosspoints with as many as 10 total beltpacks, all controlled from the beltpack GUI. The ability to group Party Line (PL) participants from the beltpack, and the extended range (~1,000m) that is offered, makes this

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Product jackpot

DIGITAL VIDEO RECORDER

Leitch NEO VR
800-231-9673; www.leitch.com/neo

This modular recorder can record play-by-play or ISO cameras for instant replays in mobile sports production or news footage for newsroom edit suites. It also handles playout of frequently used material, emergency playout for master control, and continuous playback for on-air displays. ▲

FIBER OPTIC SYSTEM

Telecast Fiber Systems Viper II HD/POV module
508-754-4858; www.telecast-fiber.com

Supports bi-directional transmission of HD/SDI video and data signals from remote POV cameras; sends return video/genlock/tri-level sync back to the camera and handles tally/closure sign. ▲

MC/ROUTING SWITCHER

Nvision NV5128-MC
800-719-1900; www.nvision1.com

The switcher's standard MC features include A/B mixing with auto transition control, multi-level video keying, logo store, squeezeback effects generator and audio over mixer. The platform has eight pre-wired input slots and eight configurable output slots. ▲

SATELLITE

Intelsat IS-907
202-944-6800; www.intelsat.com

Provides enhanced C-band coverage for the Americas, Africa and Europe, as well as high-power Ku-band spot beam coverage for Europe and Africa.▲

New tools

a versatile platform. And because it operates above the UHF band, it requires no discrete licensing. PL groupings can be selectively addressed from a matrix-connected keypanel via one to four crosspoints, providing on-the-fly PL groups.

The manufacturers have returned to their core businesses – making interesting broadcast equipment that meets the industry's needs.

On the captioning front, automated captioning via voice recognition software was introduced by International Computers in their enhanced ccE Voice product. As cable channel providers and other niche programmers are required to increase their percentage of captioned programming with expanded viewership, ccE Voice offers complete compliance to ADA/FCC captioning regulations, addresses the Telecommunications Act and supports the latest SAPI/EIA608 standards. The voice recognition capabilities are notable, and the subsystem hookup is simple (audio in, caption data out). Global Translation introduced a Pick Hit-award-winning captioning product, the Translate TV translator, which decodes closed captions to translate the text stream. The system then re-encodes the translation in unused caption fields such as CC2, CC3 and CC4.

Another new product that caught our eye was the Pioneer PRV-LX1 DVD video recorder, which was awarded a Pick Hit. This unit features an onboard hard drive, one or two CDR/W-DVD drives, an Ethernet NIC and a Firewire port that supports file transfers. The key feature is a baseband analog or SDI I/O that allows direct recording of audio/video programs through an "auto-authoring" feature. This feature allows stream record without manual authoring, but allows some flexibility for later menu import and DVD chapter specification. Adding one of these units to an interformat dub area may prove to be a valuable decision.

On the camera front, the new JVC JY-HD10U HD handi-cam was awarded a Pick Hit. The unit supports 720p/480p record capability and 1080i/720p/480i playback, all on standard miniDV tape. The handi-cam sports a typical prosumer feature set including Firewire interface for data transfer, balanced audio connections and a built-in image stabilizer, but the proprietary HD codec allows MPEG-compressed HD video to be stored and edited onboard. The model will be available next month from JVC, and it may prove to be a videographer's dream or even an interesting possibility for news and entertainment organizations looking to expand their HD production.

Eight additional companies received Pick Hit awards in this area: Cine Bags for its production equipment bag; Digital Voodoo for its HD/Vengeance video cards; DNF Controls for its DC-30 tally interface box; Drake for the FreeSpeak wireless intercom; Horita for the Script Kit logging clipboard; Snell & Wilcox for the Ukon conversion platform; Wohler for the MONFlex LCD video monitor; and Zenith for its P50W28A HDTV monitor/display.

This year's show was more visitor-friendly than in previous years, and the more compact exhibit layout allowed our group a wider exposure in a more time-efficient itinerary. Fallout from the many "mega-mergers" of last year are finally settling down, and the manufacturers have returned to their core businesses – making interesting broadcast equipment that meets the industry's needs. BE

Scott G. Griffin is a principal and vice president of engineering at the Systems Group, a broadcast systems integration firm.

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ARRI

www.arri.com

New tools

RF products

BY VICTORIA WAY KIPP, CSTE, CBNT

While the physics of RF transmission don't change, the products do. NAB 2003 revealed new products and services that improve an already mature television RF industry. The event showcased improvements to transmitters, transmission lines, antennas, tower lighting, and transmitter/site monitoring products.

Conversations with vendors revealed several DTV-related RF trends. Stations that purchased low-power DTV transmitters plan to purchase separate high-power transmitters instead of upgrading the low-power units, keeping the latter as backup transmitters. Many broadcasters who decided not to replace aging analog RF gear after 1996 are considering replacing analog transmitters and antennas now that NTSC may continue past 2006. Transmitter energy efficiency is a concern, since many broadcasters are now supplying power to both an analog and a DTV transmitter.

Active RF

Harris unveiled the Atlas analog series of UHF transmitters, with the company's new common platform for UHF transmitters. The Atlas contains the DTV-660 analog/digital exciter. It allows on-air servicing of the PA modules and power supplies. Users can upgrade this analog transmitter to digital simply by replacing one transmitter module with an ATSC module.

Thales Broadcast & Multimedia showcased the DCX Paragon MSDC-IOT digital transmitter for high-power UHF stations. This transmitter affords improved energy savings thanks to its multi-staged, depressed-collector (MSDC) IOT. The Paragon can be twice as efficient as a conventional IOT and four times as efficient as a solid-state transmitter. It has increased reliability since it uses "Soft Arc Technology" instead of a crow bar. Users can integrate the device's internal oil-cooling loop with an existing site cooling system.

Thales introduced the Adapt III next-generation 8-VSB digital exciter. The Adapt III includes the features of earlier Adapt exciters (digital adaptive precorrection, straight baseband-to-RF conversion and frequency-agile output), plus it has a transmitter Web interface for local or remote monitoring and control of transmitter equipment.

Axcera won a Pick Hit award for its DXA2B distributed-transmission adaptor.

New tools

Feedline

Dielectric introduced FLEXLine, an alternative to rigid transmission line for installation on congested towers. Available in diameters between 7/8" and 6 1/8", FLEXLine features precision-fitted connectors for excellent VSWR performance.

Since lamp use is divided between two red LED obstruction lamps, lamps last twice as long as they would if used continuously.

Designed to overcome the problem of difficult and time-consuming disengagement after several years in the field, Dielectric's Lite-Fit coaxial patch panel uses a stainless-steel, quick-release locking mechanism and low-insertion-force contact fingers to allow immediate patch-link release after the handle is rotated.

Lighting

Unimar showed an alternating light control with transfer relay (ALTR) obstruction lamp. The ALTR alternates between the lamps of a double obstruction lamp each time the lighting fixture is energized, such that the fixture usage is split evenly between the two sockets. If one of the lamps fails, the remaining operational lamp is automatically energized. Since lamp use is divided between two red LED obstruction lamps, lamps last twice as long as they would if used continuously.

Remote site control and monitoring

Burk Technology released Lynx 4 with Custom Views to enhance the GSC3000 and VRC2500 transmitter remote-control systems. Lynx 4 does simultaneous multi-site control. Available as a free upgrade for existing GSC3000 and VRC2500 users and included with new remote-control purchases, Lynx 4 supports TCP/IP connections. Its Custom View allows users to create a transmitter-site map, on which users can click on an alarming site and drill down to the alarm-conditions display. The system offers three tiers of user access.

Dielectric's Symphony monitor-and-control system has a touch-screen interface at the transmitter site and allows remote Web-based access to real-time RF monitoring and control. The Symphony indicates the complete RF path, monitoring from the transmitter to the antenna. Designed to control a multiple-transmitter plant, it can calculate VSWR and reduce or shut down transmitter power.

Harris's new eCDi enhanced transmitter-network

It's not the first time we changed the way you look at pro-video test equipment. And some people noticed...

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The newsgathering system records video onto four PCMCIA-size cards attached to the camcorder. The four 1GB memory cards in a parallel data array provide a maximum data rate of 640Mb/s, recording 18 minutes of DVCPRO-quality video. ▲

FILM RESTORATION TOOL

Teranex ScratchOut
407-858-6000; www.teranex.com

Adds real-time scratch detection and removal to StarFilm restoration application; designed for use with film-originated SD and HD material; automatically detects, classifies and replaces over 80 percent of scratches. ▲

SDI CONTROL PROBE

Miranda Densité SCP-1121
514-333-1772; www.miranda.com

Typically, several of these circuit boards are placed at key monitoring points within a broadcast facility and controlled by Miranda's iControl Web monitoring system. The boards allow users to measure and analyze relevant signal parameters in real time. ▲

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New tools

Dielectric's FLEXLine is an alternative to rigid transmission line for installation on congested towers.

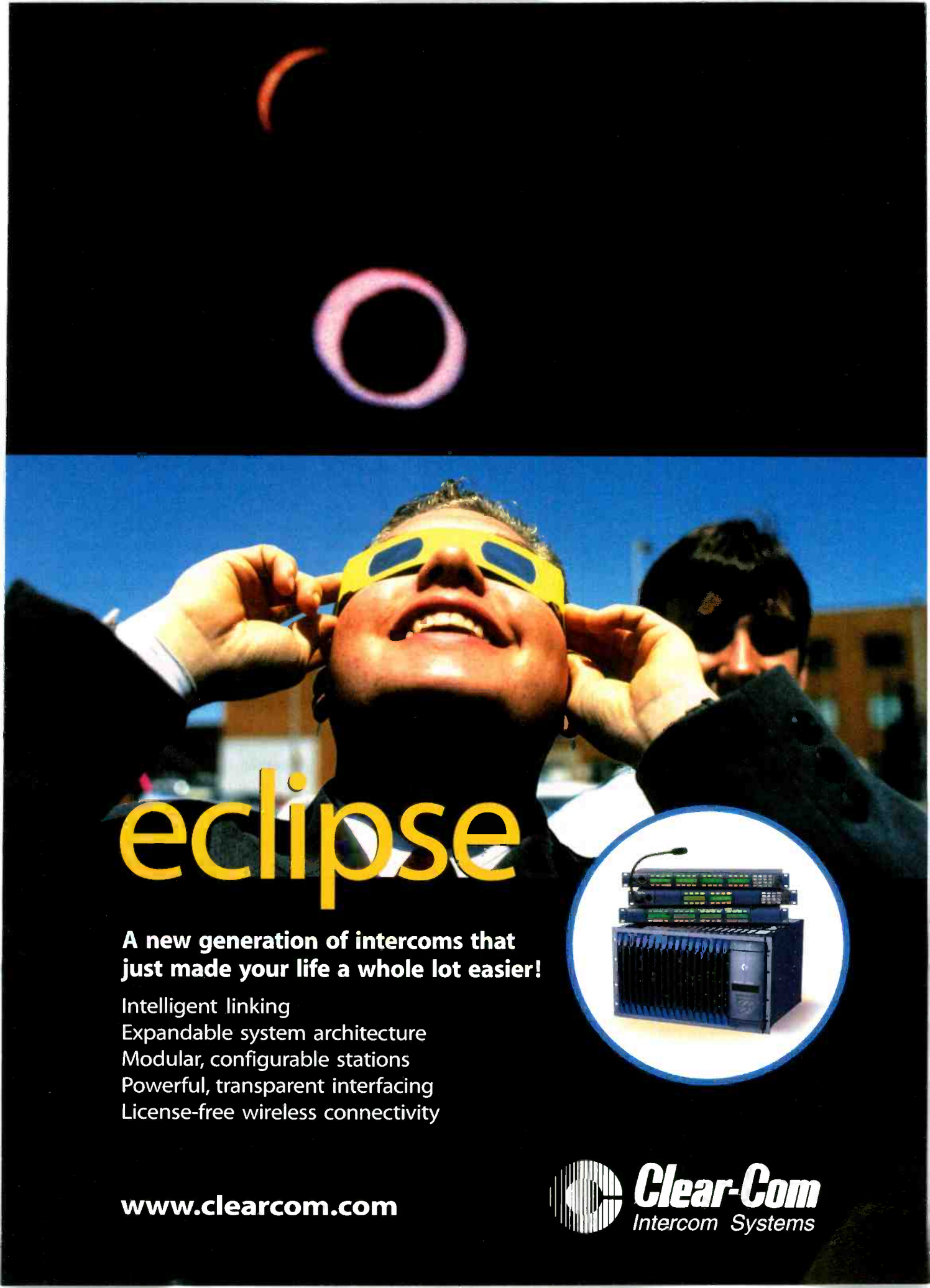
monitoring-and-control system gives broadcasters remote access to in-depth transmitter analysis and management for Harris television and FM transmitters. Using a Web-enabled computer, wireless PDA or cellular phone, broadcasters can monitor and control most transmitter functions. For DTV transmitters, eCDi also monitors SNR and Error Vector Magnitude (EVM), FCC mask compliance, and real-time adaptive control (RTAC).

Harris's ReCon remote-control and facilities-management system provides IP-based computer remote control of transmitters with a serial interface. This flexible, Pick Hit award-winning product can work with almost any brand of transmitter. With SNMP monitoring and EAS logging among its abilities, ReCon facilitates an unlimited number of status, analysis and control channels, and can monitor site conditions.

Andrew's new Broadcast Systems Site Services provides users with site survey and inspection services, transmission-line system design and layout, field technical-advisory service, system-optimization testing service, and system-optimization tuner service.

Dielectric introduced its Single Source Solution, a comprehensive site-monitoring-and-maintenance package. Dielectric does 24-hour remote monitoring from its Alarm Response Center in Franklin, TN. Through the combined abilities of its Brookstone Telecom, Central Tower, Flash Technology and TCI brands, Dielectric can test, inspect, preventatively and predictively maintain, and remotely monitor and diagnose, issues of the site plant, tower, transmission line, antenna, and aviation obstruction lighting through its Web-enabled portal. BE

Vicki Kipp is a media technician at the Wisconsin Educational Communications Board (ECB).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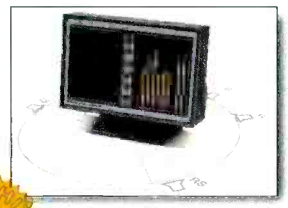


The monitor's 31-band, real-time spectrum analyzer shows the spectral distribution of single or multiple channels. A multi-correlator display shows the relationship among all channel pairs. The vectorscope helps identify hidden distortion and the directions of impulse signal components. ▲

CAMERA STABILIZING SYSTEMS

Sachtler Artemis EFP and EFP Pro
516-867-4900; www.artemis-hd.com

The EFP model of the Artemis family (shown above) offers a Touch & Go system that helps the operator switch between the stabilizer and a tripod. It also has a 6.5" color flat-panel monitor. The EFP Pro model has an internal 1.5GHz video line for work with SDI/HD cameras. ▲

LENSES

Thales Angenieux studio and remote/sports lenses
973-812-4326; www.angenieux.com

Series includes a new 70x HD lens with a focal range of 9.5mm to 665mm (22mm to 1330mm with a 2x extender); Advanced Display System (ADS) allows users to adjust digital functions including anti-breathing. ▲

COMB FILTER

Fortel DTV QuadraComb
800-530-5542; www.forteldtv.com

4-D digital comb filter adds spatial and temporal error detectors to traditional 3-D comb filters; intelligently separates luma and chroma on a pixel-by-pixel basis. ▲

New tools

Routing switchers

BY MIKE BETTS

Digital switching of video and audio signals is now standard in many broadcast facilities, with many products providing multi-rate SD/HD capability. Hybrid systems capable of routing combinations of analog and digital signals within the same matrix are still the solution for integrated applications. AES and embedded audio solutions are now becoming more accepted, especially with the advent of quiet AES routers. Routers range from 4x1 to 1024x1024 or larger, but it is often the control capability that is the deciding factor when choosing a new routing system.

Typically an increase in the physical size of the router produces an increase in the complexity of control. This complexity is based on the need to control a wide variety of features including the control of multiple matrix frames, multiple signal levels, virtual matrices as subsets of a physical matrix, and internal features such as swapping the left and right audio channels. A graphical user interface can provide Ethernet control with remote configuration, status monitoring and control capability.

Leitch offers a control system that combines control of large routing systems, such as their Integrator series, with many of their smaller legacy frames. The new Panacea small routing solution can also be incorporated into an existing control system to allow expansion without the need to replace an entire control system.

Miranda was awarded a Pick Hit for its Densité SCP-1121 SDI control probe.

Programmable panels are also becoming more economical to produce, allowing a 16x1 panel to be programmed for use as two 8x1s, four 4x1s or even eight 2x1s. The same panel could also operate as an X-Y panel for 8x8 control, 10x6 control, 12x4 control or some other combination. Quartz offers a variety of programmable panels, including the CP-1000A, with display buttons that change their label and color depending on the current function. Sources can be assembled for fast selection groups of sources and destinations.

PESA offers a selection of control panels that work with matrices from 8x8 on up. Thomson Grass Valley, Leitch, Ross and NVision are among others that offer a variety of different control panels to suit single destination, multibus control as well as full or restricted X-Y control.

The CP-1000A is one of the programmable panels offered by Quartz.

NVision offers a unique approach with their NV900 control system. It resides in a control panel, thus removing the need for a separate control computer. Other systems use an online PC or internal or external server to provide the brains to control the router.

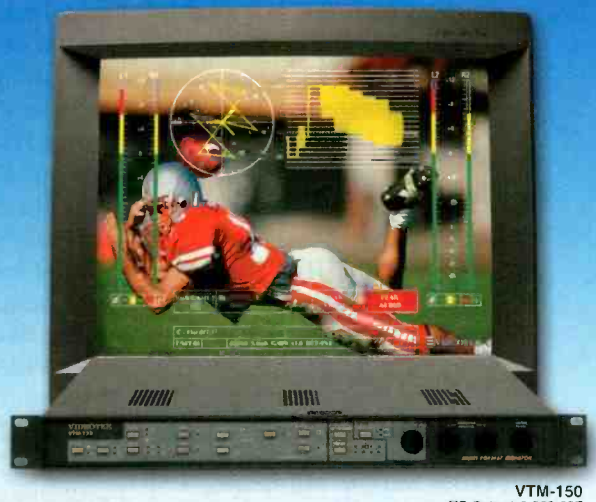
Digital audio (AES) routing systems are available from many manufacturers such as Thomson Grass Valley, PESA, Utah Scientific and NVision. Matrices may also offer control of signal parameters such as left only, right only or the ability to swap channels. Control of these parameters may involve a simple "swap channels: button, although selecting "VTR-X" to choose a swapped path is also an option.

Large AES audio routers such as the Thomson Grass Valley Apex and the NVision NV7256 router use TDM to make interconnection of individual

Continuing to Lead the Way Through Innovation...

VTM-450E HD/SD
US Patent 6,069,607
Patent Pending

Emmy Winning Technology



VTM-150
US Patent 6,069,607
Patent Pending

Videotek introduces two new precision VTM on-screen test instruments to provide the exact measurement device for your specific application. With more than ten models to select from, backed by our exclusive five year warranty and FREE future VTM enhancements, Videotek instruments are the most flexible and cost-effective choice!

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- Eye Pattern, Gamut Display, Jitter Measurements
- Pixel Locator/ Data Word Analyzer
- Ethernet connection with SNMP agent
- Closed Captioning detection and display
- Unique Analog/ Digital relative timing display
- Two RS-12 Series router control ports for input expansion
- XGA output, high resolution, for 16:9 or 4:3 displays
- Single user SpyderWeb™ IP software included
- Two composite analog inputs optional
- Audio optional

VTM-150

Digital and Analog Multi-Format On Screen Monitor

- Waveform/ Vector/ Analog Audio level and phase meters over Picture
- Video and Audio Alarms on screen
- NTSC/ PAL, 525/625 and CAV with four analog audio channels
- SVGA output, 800 x 600 resolution, for display on any standard computer monitor

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Direct: 610-327-2292

SpyderWeb™ is a trademark of Videotek Inc.

Product jackpot

DVD VIDEO RECORDER

Pioneer PRV-LX1
800-527-3766;
www.pioneerelectronics.com

The base model of this recorder has a 120GB hard drive and single high-speed DVD-R/RW drive and provides real-time recording from external sources to both drives or from the hard drive to the DVD drive. An optional second DVD-R/RW is available. ▲

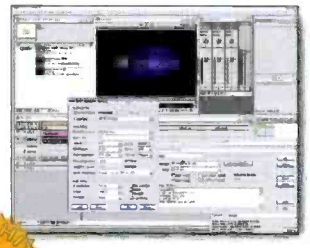
MSDC IOT TRANSMITTER
AUDIO MIXING CONSOLE

Solid State Logic C200
212-315-1111;
www.solid-state-logic.com

Compact in-line digital mixing console designed for multi-bus production for surround-sound TV; operates at 48kHz or 96kHz; features self-healing DSP and integrated DAW control. ▲

MPEG-2 PLUG-IN NLE FOR
ADOBE PREMIERE

SeaChange Media Publisher
800-661-7274;
www.seachangeinternational.com



This plug-in allows users to select MPEG-2 files residing on the Broadcast MediaCluster and import them into Adobe Premiere for editing. It also allows the user to import Long GOP and I Frame-only MPEG-2 files directly into the Premiere timeline. ▲

FIELD MIXER

Azden FMX-2
516-328-7500; www.azden.com

Portable, two-channel field mixer can be attached directly to a camera; features XLR inputs and outputs for larger cameras, and a mini-plug output for miniDV cameras. ▲

New tools

matrix frames simple and efficient. The ability to switch AES signals without audio disruptions is often important. AES signals need to be processed and synchronized before the switch is made to make quiet switching possible. Chyron (Pro-Bel) offers hybrid solutions with the Halo and Procion series, which offer both analog and digital I/O, enabling mixed input formats to be routed to digital or analog outputs simultaneously. The PESA Cheetah series includes the 448X Flexi-frame providing HD to SDI output conversion cards and 10-bit D/A output options to feed existing analog systems. Utah Scientific's Utah-400 offers eight port groups for analog I/O into a digital environment.

One flexible option is the NVision NV5128, the MC upgrade to which was awarded a 2003 Pick Hit. This 8RU frame can accommodate combinations of analog and digital, and video and audio up to 128x128 in increments of 16. Signals are converted to digital for internal routing. The matrix frame also accommodates routing and SD master control modules.

Tie lines can allow sources to be routed automatically between matrices through external conversion products. This offers the ability to combine analog and digital hardware while integrating the old with the new. Tie lines also allow smaller distributed matrices to be utilized while keeping a single control system.

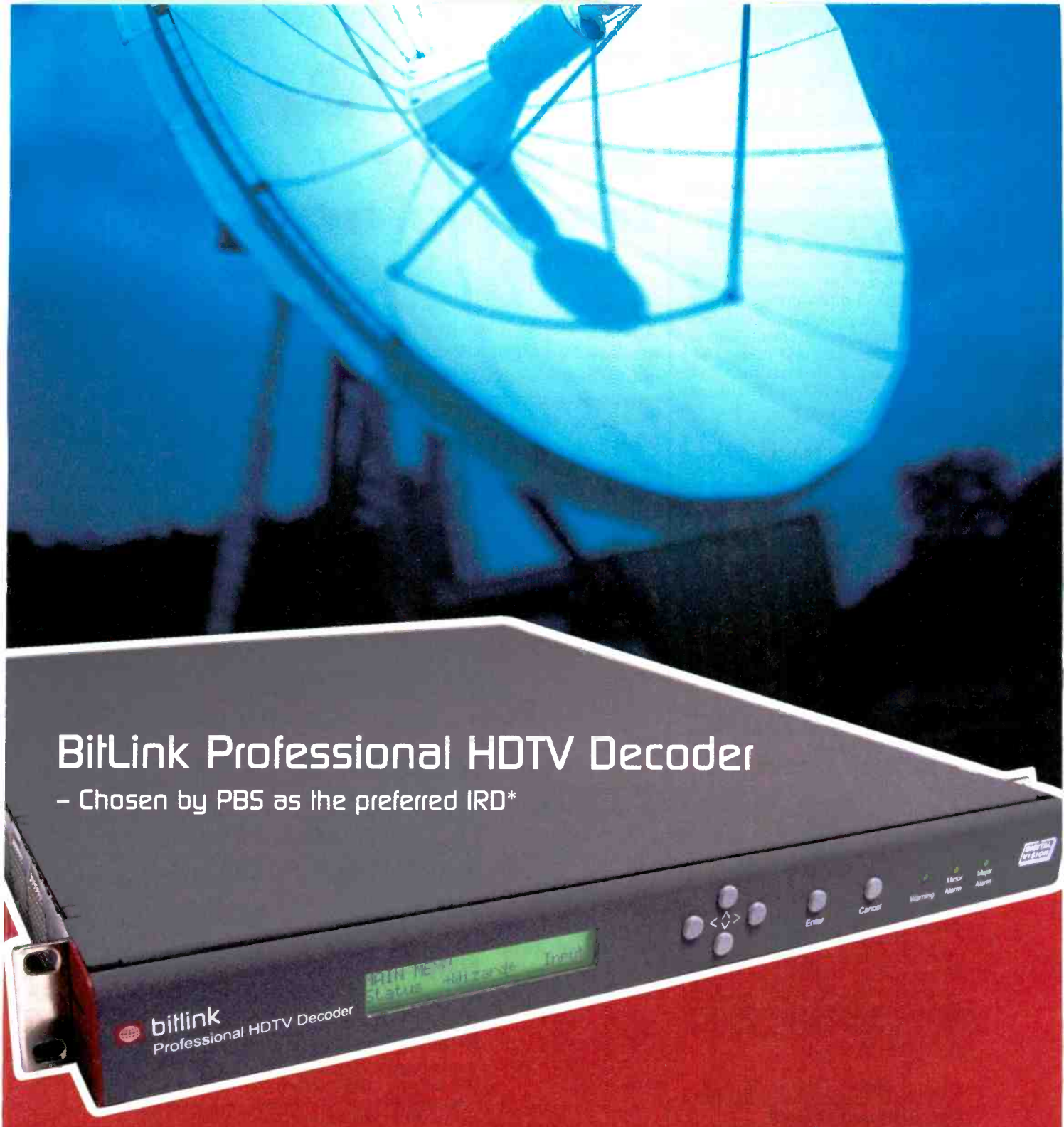
Systems like the PESA Cheetah series of digital video routing switchers are able to route signals from 3Mb/s to 1.5Gb/s. The Thomson Grass Valley Trinix and 7500 WB routers and NVision routers also offer routing solutions that cover the full spectrum of signals. A universal digital matrix offers the ability to incorporate HD signals in the future. The Leitch Integrator Gold also provides switching of any signal between 30Mb/s to 1.5Gb/s in matrices anywhere from 8x8 to 128x128.

An abundance of small routing switchers are available from manufacturers like Network Electronics, Ross Video, Sigma, Ensemble Designs, Quartz, Knox, Sierra Video Systems and Miranda. These companies offer solutions that cater to the low-cost, small- to mid-range video and audio routing needs. Sierra Video Systems offers its Sequoia range of small routers while Network Electronics' VikinX range of small routers provides both Ethernet control and SNMP reporting, often only found in large systems. Sigma Electronics offers small analog or digital, V and A from 16x1 to 32x2 and 4x4 to 16x16. Ensemble Designs also offers an 8x1 and 8x8 range of video utility switches in their Avenue range of products.

Nvision's NV5128 master control routing switcher can accommodate combinations of analog and digital in an 8RU frame.

Thus, there is an abundance of routing choices available today to suit a variety of needs, signals and control options. BE

Mike Betts is the senior partner of Broadcast Training Partners.



BitLink Professional HDTV Decoder

– Chosen by PBS as the preferred IRD*

"During evaluation of all available IRDs*, we found the Digital Vision unit to be the best value for the stations, offering outstanding picture quality, high modularity, genlock functionality and web based remote control at reasonable yet competitive price."

Edward P. Caleca, Senior Vice President
PBS Technology, Operations and Distribution Services

* Integrated Receiver Decoder

DIGITAL VISION

Phone: 818-769-8111
E-mail: sales@digitalvisionusa.com
www.digitalvision.se

Product jackpot

UNIVERSAL CONVERSION PLATFORM

Snell & Wilcox Ukon
+44 20 8917 4330; www.snellwilcox.com

This device converts to and from any format – HD or SD. It offers precise lip-sync and time-code integrity, and addresses audio requirements including embedded, AES and compressed audio formats. It converts time code to and from any SD or HD format with exact frame mapping. ▲

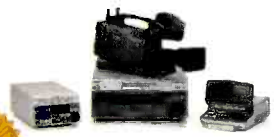
AES DIGITAL AUDIO SIGNAL MANAGEMENT SYSTEM

Sigma Electronics OctaStream family
801-575-8801; www.sigmaelectronics.com

Series is designed for the S5000 signal management frame which allows unrestricted access to all modules and is capable of hot-swapping all modules and power supplies. ▲

OPTICAL DISK CAMERA/RECORDER SYSTEM

Sony Professional Optical Disc Camera/Recorder
800-686-7669; www.sony.com



This system's random-access media will accelerate field editing, and its IT standards will speed the transfer of video from the field to editing workstations. The two camcorders and three decks support iLink and Ethernet interfaces for transferring assets as Material Exchange Format (MXF) files. ▲

SERVO-CONTROLLED PAN/TILT HEADS

Telemetrics PT-CP-S2
201-848-9818; www.telemetricsinc.com

Compact pan/tilt head available with either top- or side-mounting platforms. ▲

REMOTE MONITORING SYSTEM

PatchAmp PA-RMS
201-457-1504; www.patchamp.com

Can monitor frozen video, loss of video, black, snow, max and minimum video levels, frame fan speeds, and power supply voltage; can alarm and notify a technician via on-screen pop-up display, e-mail or WAV file playback via phone. ▲

New tools

Storage technology

BY DON MORGAN

Remember the good old days when media storage decisions at NAB were based on which videotape format to choose? When introduction of cassette-based formats were considered major disruptive technology? When facility workflows were driven by linear tape?

During the late 1990s, a major market opportunity emerged for both traditional broadcast and IT storage vendors. This technology transition was anything but smooth, as broadcast and IT vendors entered the media storage marketplace.

This year, several viable storage hardware and software products could be found that address today's workflow requirements and frugal budgets. Diverse storage platforms and system architectures were demonstrated at the show.

First, the original disk storage technology, direct attached storage (DAS), is far from obsolete. Along with several video servers, some innovative, network-friendly disk recorder products were introduced.

Leitch introduced the NEO VR DVR-3901 module, which was a 2003 Pick Hit winner. This disk recorder module contains two 40GB IDE drives that plug into the NEO tray system. A Motion JPEG device, each module either records or plays back (non-simultaneously) one channel of video and stereo audio with a nominal two- to four-hour storage capability, depending on compression setting.

Thomson Grass Valley introduced the M-Series iVDR, a Pick Hit recipient targeted as a VTR replacement tool. Featuring a VTR-like interface, the M-Series is a dual-channel and simultaneous record/playback device that supports DV and MPEG-2 materials. It can store up to 64 hours of DV material online and supports low-cost removable storage via its 5 1/4-inch drive bay.

Optimized for file sharing, network-attached storage (NAS) consists of a server that can support several clients from its attached storage array. Benefits of NAS systems include the lower costs associated with Ethernet networking (compared to Fibre Channel fabrics) and easier operation in heterogeneous OS environments.

In their Hilton suite, Ciprico demonstrated a solution to a problem that can exist in NAS media network applications: guaranteed quality of service (QoS). Typical NAS systems can have problems with network crashes caused by overloading from an offline client, resulting in online client failure. Ciprico's DiMeda appliance allows users to guarantee QoS for critical online clients and, in the case of network overload, will only freeze the lower-priority clients.

SeaChange's Broadcast Media Library (BML) offers a unique node storage system using their RAID squared architecture.

Most NAS systems utilize some form of mirrored or non-mirrored RAID in their drive arrays. SeaChange's Broadcast Media Library (BML) offers a unique node storage system using their RAID squared architecture. This eliminates the need for mirrored

Continued on page 109

More than
20 MILLION
U.S. households
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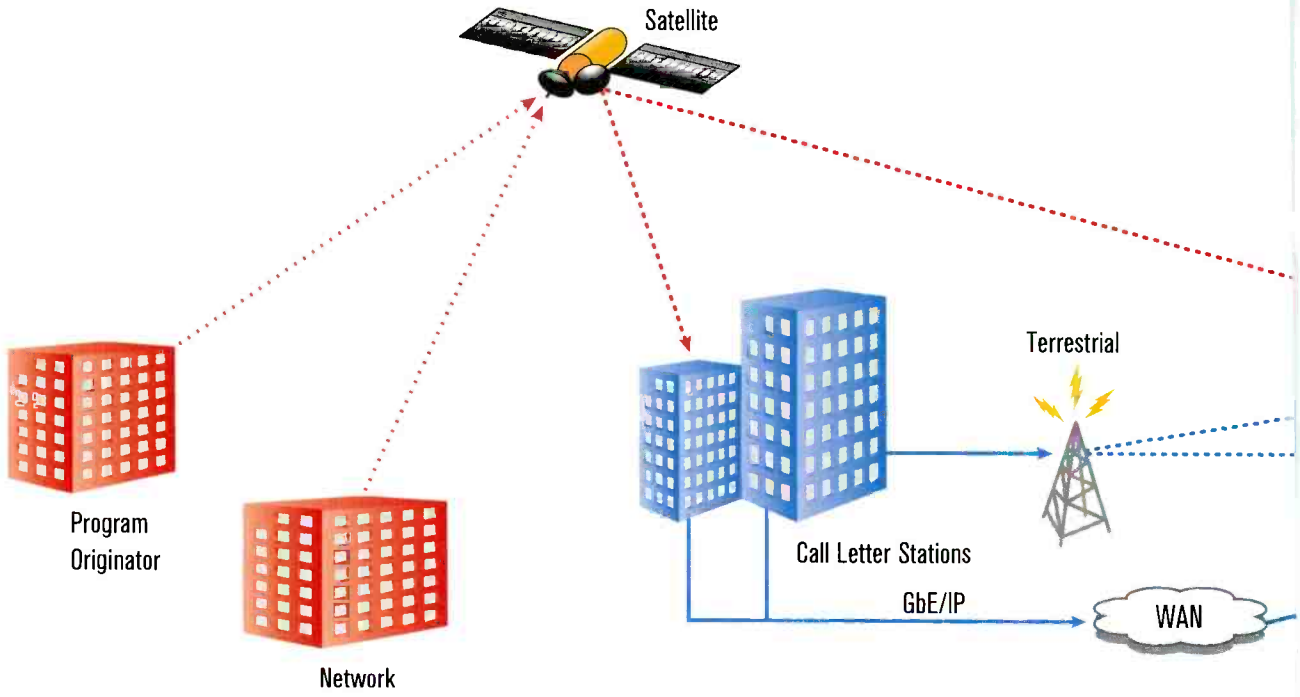

DISTRIBUTION

- Industry Leading High (HD) and Standard (SD) Definition Encoding
- Closed-loop Statistical Multiplexing of VBR HD, SD and Data in a Single Pool
- Digital Program Insertion (DPI)
- Multiple Video Transport Options
- Digital Service Management

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- Closed-loop Statistical Multiplexing of VBR HD, SD and Data in a Single Pool
- Digital Program Insertion (DPI)
- System Mode Changing
- Multiple Video Transport Options
- Digital Service Management

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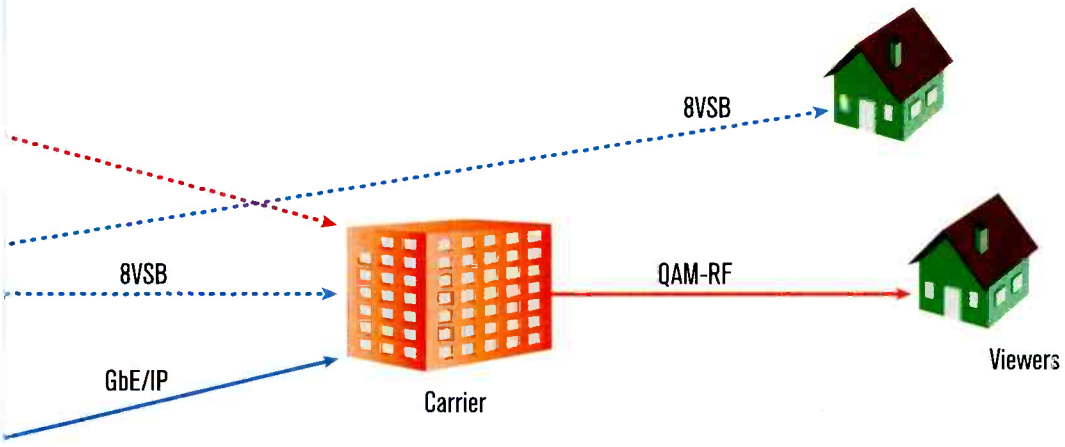

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- Smart Edge Devices
- Multiple Video Transport Options
- Network Management

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Continued from page 104

storage and provides a much higher level of useable storage, which results in lower cost per GB. The system's benefits are inverse compared to typical systems because by adding more nodes you increase both your storage bandwidth and useable storage ratio.

Storage area network (SAN) technology performs best when data must be shared at the block level. SANs are typically Fibre Channel-based and have a current bandwidth benchmark of 2Gb/s per FC port. The SAN systems at NAB represented some of the best examples of combined broadcast and IT solutions.

Avid, Thompson Grass Valley, Quantel, Pinnacle and Leitch all have SAN-based post-production and news edit solutions. Typically, these systems are integrated with high- and low-resolution browse capabilities that can be linked to asset management systems. Omneon Networks and Rorke Data support Final Cut Pro, offering some of the first high-performance SAN solutions for Apple users.

DataDirect Networks has partnered with several companies to produce several high-end products, including the Pinnacle Palladium system. They have also developed a high-speed GSN interface that can support 2K datacine transfers in real time. SGI and Storage Tek both use LSI Logic Storage SAN to support their media server and cache applications.

Besides traditional disk storage companies, vendors such as ASACA, Promise Technology and Nexsan Technologies are all offering ATA RAID solutions. These systems can support most post-production and intermediate cache requirements today. SCSI reliability and performance will probably be needed for a while, particularly in heavy use online applications requiring high-bandwidth access.

Sony has introduced the SAIT tape format featuring a 500GB cartridge that is shipping to OEMs this year. Another improvement is the SAIT cartridge, which has taken on the more rugged features of the LTO-2 cartridge which, at 200GB, is the next largest capacity available.

Sony also introduced a new professional optical disc system that received a Pick Hit award. DVCAM @25Mb/s, or MPEG IMX @30-, 40- or 50Mb/s can be selected and stored on a Blue Laser-based 5-inch disc medium. The system replaces the tape-based workflow with several camcorder and deck options.

The DVD RAM debate continues (i.e. shelf life vs. tape, capacity, access, etc.). Blue Laser technology is emerging and will represent up to five times capacity and throughput compared to today's DVD technology.

There were two additional Pick Hit winners in this category. 360 Systems won for their Image Server 2000 video server and Pioneer won for their PRV-LX1 dual-deck DVD video recorder. BE

Don Morgan is director of project development for Doyle Technology Consultants.

Streaming media

BY TOM PATRICK MCAULIFFE

In many ways the saga of harnessing the power of the Internet for today's broadcasters could aptly be described as, "The continuing search for a business model that works." What was hoped to be a river of rapid adoption has currently become only a trickle. Both radio and television broadcasters are trying to utilize the Web to increase revenues and audience share. Due to advances in streaming video and high-fidelity audio, and

Product jackpot

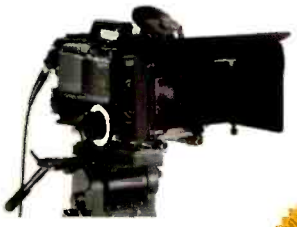
DEMODULATORS/DECODERS

Videotek
DDM-520 and DDM-540
800-800-5719; www.videotek.com

Have a variety of I/O capabilities; can display signals at 1080i, 720p, 480p and 480i; decode and display EIA 608 and 708 closed captions on-screen; support three MPEG-2 streamed formats. ▲

ACQUISITION EQUIPMENT

Sony Cine Alta Family Expansion
800-686-7669; www.sony.com



The new HDC-F950 camera captures the full 1920 x 1080 pixels and outputs an uncompressed digital 4:4:4 RGB signal. The new SRW-1 field recorder and SRW-5000 studio recorder can record either 4:4:4 or 4:2:2 video at approximately 440Mb/s. The smaller of the two new HDCAM SR videotapes holds 50 minutes of 24p video, while its big brother holds 155 minutes. ▲

CABLE TRANSLATOR SYSTEM

Thales Amber
413-998-1100; www.thales-bm.com

Features of the cable translator include Web-based configuration and supervision, multiplex bandwidth management, PSIP rebranding and protection, PSI reconciliation, dynamic configuration changes, and opportunistic data insertion. ▲

SERVICE MANAGEMENT SYSTEM

Harmonic NMX Digital Service Manager
408-542-2500; www.harmonicinc.com

Allows operators to assemble video and audio services into efficient digital transports; system reconfigures the underlying encoding, multiplexing, digital turnaround and delivery equipment. ▲

Product jackpot

VIDEO RECORDERS

Thomson Grass Valley M-Series iVDR
415-558-0200;
www.thomsongrassvalley.com

This VTR replacement offers removable media, and the ability to ingest directly from a camera. It provides support for multiple channels, simultaneous record and playout, networking, clip editing, and playlist creation. It can exchange materials with a variety of applications using industry-standard protocols. ▲

WAVEFORM MONITOR

Tektronix WFM700
800-835-9433; www.tektronix.com

A firmware upgrade adds new status-reporting and error-detection features to this waveform monitor, and a new video-session screen that summarizes a variety of statistics. The upgrade adds a two-pane, user-definable, multimode display and new event logging with time-of-day and VITC time stamping. ▲

TECHNICAL FURNITURE

Forecast Consoles MASTERail
631-253-9000;
www.forecast-consoles.com

Universal mounting system allows for random placement of all monitors, EIA rack boxes, speakers, script stands and special-purpose devices anywhere along the length of the console. ▲

LI-ION BATTERY SYSTEM

IDX ENDURA E-80
310-891-2800; www.idx.com

Two battery packs can be linked together to provide 164Wh of power at only 3.3 pounds; joining the line is the ET-8 tower charger for charging eight channels simultaneously.▲

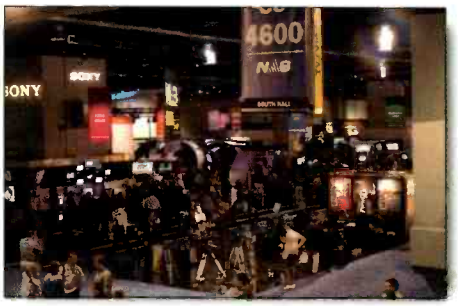
New tools

the increasing broadband infrastructure and its lowering costs, content is not only looking and sounding better, but also becoming a lot more interactive. NAB 2003 saw over 500 streaming or Internet-related companies hoping to help broadcasters with the challenges of working with the Web. A recent Arbitron Audience Survey study indicated approximately 12 million Americans would be willing to pay a small fee to listen to specialized content. Research shows rich interactive media is a key area of future growth. Come what may, the battle cry seems to be, "Diversify or Die!"

Bringing broadcasters to the Internet was an important thrust for this year's show. Multimedia World is held in conjunction with NAB and covers everything from broadband digital content delivery and wireless media to DVD post production and encoding. Although the newer section of the show dedicated to Internet broadcasting and multimedia was brimming with brand-new companies, there's still a lot of aftermath from the implosion of the heavily funded dotcoms. It was clear that the recent tough times are making every broadcaster count their dollars and justify new purchases, including those dealing with the Internet. But today's consumer is much more educated, and there were lots of learning opportunities at NAB 2003.

RealNetworks CEO Rob Glaser gave an interesting keynote address during the Webcasting Super Session. It examined how some broadcasters are using subscription fees and sponsorships or corporate underwriting for new revenue opportunities on the Internet. Additionally RealNetworks hosted free seminars exploring a unique new, low-risk program designed to allow broadcasters to deploy an Internet subscription strategy with little or no start-up cost and effort. The seminar discussed how broadcasters can participate and benefit from online subscription models today.

On the technology side, MPEG-4 is still growing in adoption. Many new solutions – both hardware and software – are utilizing this new worldwide standard, which delivers many features important for streaming, including dramatically higher audio quality coupled with better video and significantly faster compression speeds. Backbone Networks of Worcester, MA, is one example. It announced a new centralcasting Internet streaming application at NAB 2003. The new software application utilizes the digital media standard and the Internet to deliver high quality audio directly to affiliate stations, resulting in higher quality transmission at lower operating costs. The application also enables stations to link studios with their transmitter sites via the Internet. Broadcasters stream their standard and



The success or failure of streaming technologies may not be revealed until next year's NAB.

specialty programming to select affiliates, distribution points and transmitter sites. Before long a station may not need cable, microwave or RF transmission technology.

A gamble?

With television looking for new multimedia markets, more Web sites embedding audio ear candy, and the growth of high-speed streaming in the American home, the future indeed looks bright for online media, despite current challenges. Broadcasters are looking to the Web to diversify their businesses, increase profit to pay for the digital transition and to reach a larger audience. Industry watcher Forrester Research estimates that by 2005 about 40 percent of U.S. consumers (more than 118 million people), will listen to online audio content at least once or twice a week, and video

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Product jackpot

VIDEO MONNITORING AMPLIFIER

Ross Video QMA-8044
613-652-4886; www.rossvideo.com

Card provides high density methods for monitoring conversion of multiple feeds; RossGear card frame holds up to 10 cards; provides up to 40 monitoring converters in a 2RU space. ▲

LCD VIDEO MONITORS

Wohler MONFlex
888-596-4537; www.wohler.com

Several monitors up to 7" diagonal can mount in just 1RU of rack space. The monitors are available in diagonal sizes of 3.5", 4", 5.6", 6.8" and 7" (the 7" is a 16:9 aspect-ratio screen). All models have composite video inputs with loop-through, and optional SDI input. ▲

STORAGE SOLUTION

Ciprico DiMeda 3600
763-551-4000; www.ciprico.com

Features a fibre channel back end, Gigabit Ethernet transport and an embedded software layer on top of the filer head; enables heterogeneous file sharing, as well as real-time ingest and playback of captured and stored content. ▲

50" PLASMA HDTV MONITOR DISPLAY

Zenith P50W28A
877-993-6484; www.zenith.com

Features of the display include 600:1 contrast ratio, a peak brightness of 620cd/square meter, Faroudja DCDi de-interlacer, intelligent image scaling, and built-in aspect-ratio correction. A range of inputs provides compatibility with DVDs, computers, digital broadcasting and multimedia as well as traditional video sources. ▲

New tools

shows even higher numbers. This does not include the vast markets overseas, nor the coming wireless/cell phone revolution for both audio and video. When one looks at the numbers, it's hard to see that streaming media is any real gamble at all.

Satellite and online content delivery mediums have most traditional over-the-air broadcasters panicking. This is especially true for those broadcasters in smaller markets, who are having a hard enough time switching over to digital television, let alone retooling for an entirely new medium.

One thing appears certain for today's broadcaster – simulcasting an over-the-air signal online via audio and video streaming will still offer the biggest ROI for the foreseeable future.

Webcasting, narrowcasting and secondary data services are receiving increased emphasis both from exhibitors and attendees. New solutions offering higher quality at more effective price points were in abundance at NAB 2003, but sales remain to be seen as broadcasters strive to squeeze every bit of profit out of whatever they can. Will Bluetooth wireless technology, WANs, Internet Webcasting and other audio delivery technologies continue to attract a torrent of new adopters, or will online media delivery believers continue to just swim upstream? We'll need to tune into NAB 2004 next April to find out! BE

Tom Patrick McAuliffe is a journalist and consultant living in San Francisco.

Test equipment

BY PAUL BLACK

For the last few years, and this year as well, test-equipment manufacturers concentrated on introducing products that analyze digital TV streams. But one outstanding difference between 2003 and past shows is the much larger number of new products introduced this year.

One of the most exciting products in test gear comes from Leader Instruments. This Pick Hit award winner, the FS3018, is a portable monitor that works in conjunction with the company's lab-benchtop model LV5700 multi-SDI monitor. A display small enough to carry in one's hand shows what the benchtop monitor is measuring. Users can read the FS3018 lightning monitor on a PDA while walking around a set, changing lights or shading cameras. (Prediction: this is the start of a trend to send all kinds of displays via a wireless link to PDAs for remote analysis.) In addition to this introduction, Leader has upgraded many of its existing products with new features, software or both.

Videotek also has a long list of new product entries, including an HD/SD on-screen monitor, plus several others that display on-screen data. The company also has a logging and alarm-reporting system upgrade for the SQM-LT in the form of new software that provides increased signal monitoring. Videotek's product-development people have put a lot of work into the

Tektronix's WVR600 rasterizer monitors digital and analog video and audio and shows as many as four waveforms simultaneously.

SQM-series, and have greatly increased the flexibility of this line.

Tektronix introduced a host of new products and substantial improvements to some of its existing ones. The long-time favorite WFM700 has undergone several changes this year. The addition of audio measurement capability makes the unit more flexible and useful, and has earned it a Pick Hit award. In the confidence-monitoring area, the model WVR600 rasterizer is a 1RU unit that allows an output to an external display and shows as many as four waveforms simultaneously.

Triveni Digital also has jumped into the multiformat monitoring arena with the introduction of its StreamScope products. These products allow users to monitor the condition of high-level DTV streams on an SVGA-compliant monitor, and their analysis capabilities are considerable. If there's a DTV-related parameter users need information about, the StreamScope will likely provide a way to monitor it. Triveni Digital has cut deals with Harris and Rhode & Schwarz to market its products.

And, speaking of Rohde and Schwarz, its MPEG-2 DVM 100 base unit allows simultaneous control of two, three or four transport streams. By adding the DVM 120, it is possible to set up a scaleable monitoring system with a maximum of 20 transport-stream inputs.

Hamlet has a reputation for its unique on-screen monitoring products. In addition to having added DTV test capability to some products, it has something that no one else seems to have: a combined signal generator/signal analyzer. This Pick Hit award winner, dubbed the Adept, can feed a signal through a system and analyze the result. With it, users can generate and analyze composite, component, Y/C and even SDI video, along with digital and analog audio. This company specializes in unusual products not available from other manufacturers.

As always, Sencore's offering of test items run the gamut from just simple NTSC test boxes to 8-VSB demodulators and testers, and SDI/DTV/MPEG testers and generators. Sencore was one of the early players in DTV analysis and, a few years ago, it had one of the earliest digital-television test units on the market. The company's products are mature and proven, and it is proud of its technical-support people. This bodes well

Product jackpot

MINIATURE D/A CONVERTER

AJA HD10C2

530-274-2048; www.aja.com

Dual-rate HD/SD converter; DA/Downconverter card can directly drive analog high-resolution monitors or projectors; the SVGA mode allows HD monitoring on many SVGA multisync monitors. ▲

Product jackpot

NLE ACCELERATORS

Avid DNA Family
978-640-6789; www.avid.com

Nitris boasts processing power equivalent to 30 Pentium-4 processors and supports uncompressed HD formats. Adrenaline promises to transform PC and Mac desktops into high-powered editing workstations. Mojo targets notebook-computer users and offers real-time effects. ▲

PATCHBAY

Switchcraft Video Patchbay
773-792-2700; www.switchcraft.com

Available with either HD or SD series video jacks; HD series meets SMPTE 292M specifications, features rugged, diecast housing, reduces RFI emissions, and is available in 75V terminated or non-terminated. ▲

COLOR LCD VIDEO MONITORS

Boland Viewport
800-918-9090; www.bolandcom.com

Four- to 30-inch color LCD video monitors offer options including metal cabinets and protected screens, remote controls, scans, PiP, high brights and transflectives. ▲

REMULTIPLEXER

Logic Innovations TSM-2800
845-455-7200; www.logici.com

ATSC broadcasts, the remultiplexer provides the interfaces required to combine multiple encoder, PSIP, video server and data sources into a single transport stream. It allows DVB broadcast, CATV and satellite operations to combine up to eight program/transport streams into a single transport stream/carrier. ▲

MICROPHONES

DPA microphones
866-dpa-mics; www.dpamicrophones.com

Available in four styles: large diaphragm, standard, compact and miniature; provide professional options for live and broadcast use. ▲

New tools

for the field engineer who may need a little hand holding when testing the HDTV side of the house.

Modulation Sciences, being devoted to audio, introduced a new monitor to help the broadcaster deal with multichannel sound. Dubbed SpiderVision, it uses a display that has a roughly triangular shape, and is of very high resolution. The name comes from the fact that the display lines are very fine, like a spider's web. Even a quick glance at this display will tell an operator if everything in the audio is in place and working correctly.

RTW won a Pick Hit award for its multichannel/surround-sound audio monitor.

Finally, here's a quick nod of the head to two companies that are not normally considered TM vendors, but that have unique items.

PatchAmp, a manufacturer of patching systems and distribution amplifiers, now has monitoring capability built into their DAs. If someone pulls the wrong patch and causes signal loss somewhere, an alarm rings. The operator can customize the GUI on the monitoring computer to meet the needs of a particular control room's display requirement.

Ward-Beck Systems introduced a little box called a Video Buddy. Housed in a can about the size of two Tektronix Pathfinders sitting back to back, the unit has an LCD color display and a headphone output for audio. The unit will accept NTSC or SDI video, and AES/EBU or analog audio. Since it's battery-powered, users can carry it around and use it to confirm the presence of audio and video.

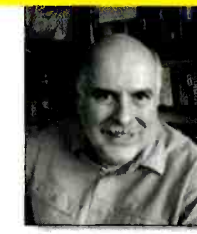
If you've had trouble in the past finding a TM product to test or measure a particular parameter or signal, this could be the year that someone introduced what you need.

If you've had trouble in the past finding a TM product to test or measure a particular parameter or signal, this could be the year that someone introduced what you need. Take a good look at the offerings; there are many new items available. **BE**

Paul Black is owner of Media Technical Consulting.

Video editing

BY BOB TURNER



By now you have probably heard all the excitement generated by Avid's new Xpress Pro, Media Composer Adrenaline, and DS Nitris products (and the DNA family, which was awarded a Pick Hit) – and the ooohs and ahhhs of Apple's Final Cut Pro 4 (which was awarded a Pick Hit)– especially when combined with one of the several new third-party-compatible hardware products like AJA's Io and Blackmagic Design's DeckLink. Both Apple and Avid products were highlights of this year's NAB, but there also were many other exciting video editing and compositing products. Here are a few in alphabetical order.

In addition to their new Encore DVD creation application, Adobe Systems demonstrated Adobe 6.5 and After Effects 5.5 and plans for updates later in the year. It was also interesting to observe that all demo stations were Windows-based – there were no Apple platforms. In the AAF press conference, Dave Trescott, senior director of



Adobe's Digital Video Group, demonstrated AAF media and metadata interchange between Media Composer and After Effects using a prototype of the AAF XML schema. Trescott gave credit to Metaglue and others for assistance in this development effort.

Bella was awarded a Pick Hit for its Professional Series keyboard for nonlinear editing.

Canopus offered its new Edius editing software for its post-production products (DVRex RT and DV Storm) and Rextor software for its broadcast NLEs. The latter was found on the CWS-100 broadcast workstation and the new CWS-30 laptop edit product. The CWS-30 offers three render-free streams with 2-D and 3-D real-time transitions, animated titling, video filters (including color correction with a WFM/VS display) and motion effects.

Edirol was showing version 1.628 of its DV-7 VideoCanvas nonlinear editing turnkey. The product now offers a new M-100FX 10-channel audio mixer with effects hardware option in addition to the DV-7C proprietary controller. They will offer a DV-7 Pro version in June. This pro-expansion kit offers a deluxe upgrade including a USB external multimedia memory card reader and a new titling interface with 3-D roll and crawl effects and new audio effects. The kit also offers new video effects, transitions and filters – including more real-time capabilities.

Global Streams demonstrated version 2.9 of its GlobalCaster Studio family, which features its real-time hybrid editing system, animation and paint compositing tools, and a real-time 3-D Video Warp Effects Creation tool.

IMC Incite did not have a booth of its own, but was demonstrating version 3.0 of the Incite Editor in the Matrox, Snell & Wilcox, Sony and Thomson Grass Valley booths. New features in version 3.0 include an improved GUI and improved operations workflow. The product offers hybrid tape-to-tape editing capabilities, a new Sound Surround tool, improved VO recording tools and major improvements in media asset management.

In-sync also was without a booth of its own, but was on the show floor in several booths. The company was in the BOXX Technologies booth showing Speed Razor HD version 2.0 (only available as part of the HDBOXX), in the Panasonic booth with Blade 2.1 on a Panasonic ToughBook laptop editing from an AG-DVX 100 camcorder, and in the Utah Scientific booth showing Speed Razor/Shear MPEG editing with automated playlist video servers. The company just announced Blade version 2.2, a service update that also includes (for a limited time) Boris FX LTD and Boris Graffiti LTD plug-ins. Speed Razor version 5.5 offers Audio True Scrub, precise VU Meters, a rewritten EDL import and export module, a faster "save projects" feature and an updated Druid system diagnostic utility.

Leitch unveiled its new version 8.2 software for the dpsVelocityQ multi-stream nonlinear editing system and dpsVelocity dual-stream NLE. They were promoting the new and customizable GUI, EyeCon View (a feature displaying the picons and clip time code of all visible layers based on the current playhead position), multi-cam editing, and the AAF and OMF import and export interoperability option.

The flagship dpsVelocityQ features real-time, full-quality playback of four streams of video, up to six graphics streams and four channels of 3-D DVE. It can also stream to the Web live from the timeline. The product comes bundled with eyeon Software's DFX+, Inscriber TitleMotion, Sound Forge XP STUDIO, Ligos GoMotion and Sonic ReelDVD LE.

Lightworks TOUCH is one of those surprising offline systems. It is simple and easy to use, so users can focus on what they are editing and not on the technology. It can play back four locked real-time picture viewers at top picture quality for multi-cam editing.

Linux Media Arts was demonstrating a resolution-independent (10-bit video) real-time

Product jackpot

ASP APPLICATION

Encoda MART
303-237-4000;
www.encodasystems.com

Provides reporting and business intelligence using data from Encoda Deluxe, turnkey and traditional products; Web-based ASP application consolidates data across departments and stations. ▲

VICES

Professional Communications Systems
800-447-4714; www.pcomsys.com

Provides consulting, design and integration services; provides all system integration services and do much of the system pre-assembly and staging at its integration facilities in Tampa, FL. ▲

VIDEO TIME/DATE INSERTER

ESE ES-206U
310-322-2136; www.ese-web.com

Inserts time and date into video (NTSC/PAL or S-video); features include switchable background mask, and keyed or transparent display as well as variable character size and position. ▲

Product jackpot

CD IOT

Thales Electron Devices
TH 790 CD
+33 1 30 70 35 00;
www.thales-electrondevices.com

Features a 55 percent efficiency at 30kW average 8-VSB power, an increase in efficiency of 12 percent over standard IOTs; high gain is constant over the entire UHF band. ▲

SYSTEM INTEGRATION SER ROUTING APPLICATION

Chyron Pro-Bel Procion 2
631-845-2000; www.chyron.com

Through a single configuration database, integrates with the COSMOS system configuration and monitoring solution to enable router control and monitoring mimic soft panels to be built. ▲

DIGITAL ASSET MANAGEMENT SYSTEM

Sundance Digital Seeker
972-444-8442;
www.SundanceDigital.com

Management system comprised of a wide-ranging set of database tools that enable facility users to classify, disseminate, organize and manage media asset information throughout a TV station. ▲

LCD MONITOR

Marshall Electronics
V-R71PA-SDI
800-800-6608; www.lcdracks.com

Accepts SDI, S-video and composite video sources with active loop-through capability and has 16:9/4:3 ratio switch; offers high-resolution 10-bit D/A video converter with composite video output. ▲

More new products

Don't miss the NAB Special Report packaged along with this magazine. The Special Report contains more than 200 additional new products and technology from the 2003 NAB convention. This article and the NAB Special Report are posted on the *Broadcast Engineering* Web site, complete with hot links for all the new products. Go to *www.broadcastengineering.com* for complete access.

New tools

HD/SD nonlinear editing solution, CINELERRA. The system includes dual processors, 1TB of storage and 2GB of RAM.

Matrox was offering its RT.X100 Xtreme professional real-time video editing and DVD authoring platform with full versions of Adobe Premiere 6.5 and both Sonic Solutions ReelDVD Studio and DVDit! SE applications.

Newtek debuted its VideoToaster [3] software. The new software offered hundreds of new features and workflow improvements, ranging from radical new concepts like Zebra stripes for hot video and illegal colors with auto calibration for 75IRE bars and 100IRE bars, to the more traditional media asset management, text generation, real-time multiformat editing and DV support enhancements.

Pinnacle Systems' Liquid products may be the second most popular Windows NLE software package after Avid's products. NAB saw the debut of Liquid chrome. This product combines three of Pinnacle's hot components: the Liquid version 5 editing application, the TARGA 3000 compositing engine and the K2 single-chip 3-D DVE. Liquid is a powerful software package, but until now, layers compositing and effects utilized background rendering with InTime processors rather than the real-time effects or real-time previews that many editors prefer. The TARGA 3000 compositing engine provides four real-time edit streams of 50Mb/s I-frame MPEG-2 4:2:2, and uncompressed or DV25 codec editing/compositing. Chrome offers a multipass process that automatically renders composites with more than four layers without taking foreground control from the user so workflow is not interrupted. It should be pointed out that for the first version of the product, the InTime processors will not work with chrome, but this should change in the next software version. The product will still do background rendering with the host platform's processor – called "IdleTime" rendering. The system is designed for networking with built-in support for Pinnacle's Palladium network storage, but does not yet offer AAF-compatibility.

The Liquid blue, Liquid silver, and Liquid purple solutions were also displayed at Pinnacle's booth, as were the Vortex news editing products, Edition NLE and CineWave hardware. Version 4 of Cinewave was introduced, featuring FCP 4 compatibility and many new real-time effects for a variety of formats. The system also supports eight audio tracks output and enhanced HD and film, and allows offline resolution, as well as providing TARGA Ciné Codec workgroup support for PC platforms.

Quantel demonstrated AAF metadata and media exchange between Apple's Final Cut Pro system and a Quantel eQ, thanks to the Automatic Duck AAF Interchange plug-in. This new capability will allow filmmakers to bring their FCP projects to a Quantel finishing suite to "up-rezz" polish, add hi-resolution titles, color grade for the appropriate output and either print to film using a digital film recorder or output to a Digital Cinema format.

Avid and Apple got ooohs and aahhs for their NAB announcements, but many other companies offered exciting video editing and compositing tools as well.

Quantel also introduced the new QEdit Pro Windows-based turnkey nonlinear editing system, with three hours of uncompressed video storage. This product, featuring resolution co-existence (up to standard-definition uncompressed video – and multi-resolution compositing at up to 2K resolutions), was awarded a Pick Hit. The product's version 1.5 software includes real-time aspect ratio conversions, and features major



improvements in editing, audio and compositing tools. The product now offers selective color correction of every layer, multiple keys on every layer and improved archiving, as well as an exchangeable storage option called HotSwap.

Seachange's Media Publisher, an MPEG-2 plug-in for Adobe's Premiere NLE, was also a Pick Hit recipient.

Sonic Foundry was winning over skeptics at NAB with its Vegas NLE software – another one of the more powerful yet underrated products with excellent audio tools. The product offers what naysayers call a "non-standard graphic user interface" and what advocates call easy-to-learn-and-use editing methodology with many real-time features.

The Vegas' HD editing and 5.1 Sound Surround mixing capabilities were demonstrated in the Microsoft booth

Sonic Foundry was winning over skeptics at NAB with its Vegas NLE software.

using Microsoft's WM9 series format. In its own booth they were promoting their new color grading capabilities (with built-in waveform/vectorscope/parade/histogram monitor window and secondary color corrector control), 24fps editing featuring native support for the Panasonic AG-DVX100 24p DV camera, the much-improved MPEG-2 (and AC3) encoding and new advanced video effects capabilities (with split-screen preview) – especially the Motion Blur. There were major improvements in performance and media asset management. The company was also promoting its Vegas+DVD product, which is a complete suite of integrated tools that not only includes Vegas, but its AC3 encoder and DVD Architect as well.

Ulead introduced StudioQuartet, a suite of applications for video production including the MediaStudio Pro 7 video editor (with software-only, real-time, full-resolution preview and output), the PhotoImpact 8 image editor for enhancing digital images or creating graphics, the COOL 3D Studio 3-D text and object animation for video production, and DVD Workshop AC3 advanced DVD authoring software with support for Dolby AC3 audio files.

Version 7 of MediaStudio Pro ingests and edits DV and MPEG video, and composites PhotoImpact stills or graphics along with COOL 3D animated titles or lower thirds. It then applies a wide range of effects and filters, with the result immediately available in full-resolution either in the preview screen or on a second display device (using a dual display graphics card). It also features paint, rotoscoping, 2-D vector motion graphics, audio editing and DVD authoring tools. BE

Bob Turner is a contributing editor for Video Systems *magazine and operates Bob Turner Post Production Services.*

Thomson Grass Valley M-Series iVDR

PICK HIT BroadcastEngineering 2003

BY MICHAEL CRONK

Broadcasters are making the move in ever-increasing numbers to shared-storage, networked infrastructures to streamline production workflows and thereby reduce operational costs and improve productivity. This often means reducing redundant staff and eliminating counterproductive processes and technologies that cannot deliver the efficiencies necessary in today's fast-paced, competitive environment.

One such technology is the VTR. For video professionals, this device is immediately identifiable and easy to use. But its inherent limitations, such as linear-only access and the cost of equipment maintenance and tape stock, have prompted professionals to seek a better way to store and access content.

One solution would be a recording device that supports a variety of removable media-storage devices and provides instantaneous, random access to all material as it is downloaded. It should be fully networkable into any production environment – be it a single workstation or multiple machines on a storage-area network (SAN). An even better solution would also include a highly intuitive user interface that is familiar to everyone involved with the program-production process.

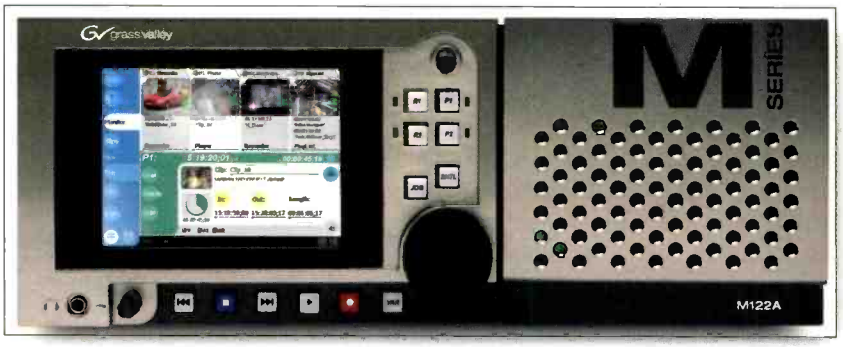
Incorporating all of these design ideals was foremost on the minds of Thomson Grass Valley engineers when they developed the M-Series intelligent video digital recorder (iVDR). It replicates traditional VTR capabilities, including playback, record, removable media and the ability to ingest directly from a camera. But it eclipses traditional VTR capabilities by supporting multiple channels, simultaneous playout and recording, robust network support, clip editing and trimming, playlist creation, and the ability to exchange materials with a variety of applications digitally using industry-standard protocols.

The iVDR replicates traditional VTR capabilities, including playback, record, removable media and the ability to ingest directly from a camera.

The iVDR is available in two configurations: one that handles DV 25 files and another that supports both DV and MPEG files. Both configurations have two record channels and two playback channels that share a common disk array. All these channels operate simultaneously. This multichannel capability provides the flexibility to address a wide variety of uses in the marketplace. For instance, it streamlines the handling and repurposing of digital commercials, satellite feeds, graphics and promotional material. Once this material is stored on the device's hard drive, the files are available to both playback channels as well as to anyone on the network – even as the system is ingesting the files.

Among the device's chief features is a touch-screen user interface that mimics a VTR's front panel. This interface connects directly to the device for operation in an equipment rack. Users can operate the touch-screen interface directly, or remotely using an RS-422 or Ethernet connection. The interface includes advanced clip-management functions that allows users to create similar but separate programs from the same material. In addition to creating and trimming clips and subclips, users can build clip playlists. By contrast, a standard VTR requires additional hardware and software systems to make these capabilities possible.

The device can locate time code quickly. Users can call up a scene as it is being ingested – or retrieve it in a fraction of a second from the system's internal hard drive. The system also takes advantage of scalable media networking, such as 10/100 BaseT Ethernet, Gigabit Ethernet



The M-series iVDR features a touch-screen user interface that mimics a VTRs front panel.

and Fibre Channel architectures, and SMPTE 360M, as well as AVI, and will support QuickTime file import/export capabilities, to rapidly transfer files anywhere on a secure network.

The basic configuration uses three 36GB drives (eight hours of DV 25 storage) but can be expanded up to six 146GB drives (for 64 hours of storage). The company is also offering a disk-expansion chamber that will hold 12 drives, providing 130 hours of video and audio storage capacity.

A camera with a Firewire interface can transfer video and audio materials to the iVDR without any compression degradation.

The product's architecture can take advantage of most digital-media drive technologies. It uses a 5.25-inch computer bay with industry-standard I/O, so you can plug any media drive into it, be it a DVD drive or a future optical-disk Blu-Ray device. It supports an option for the ubiquitous DVD-R format optical drive, making it compatible with any nonlinear editor on the market. It also supports the IEEE 1394 standard. A camera with a Firewire interface can transfer video and audio materials to the iVDR without any compression degradation. For non-Firewire VTR-based camcorders, the M-Series will, in a future release, be able to support VTR-control software so that operators can bring material in just as they do in a two-machine edit.

The device supports common compression formats, including MPEG-2 4:2:2, I-Frame Long GOP, and DVCPRO25. It will also support the MXF protocols for network transfers of material between devices. It is also compatible with the entire Thomson Grass Valley Digital News Production Solution. For remote system monitoring, it supports the NetCentral Simple Network Management Protocol (SNMP)-based software application.

VTRs have been around for over 25 years. Certainly, broadcasters will continue to use them, but they now have a new device that will enable them to replace many VTRs with something that is more flexible and efficient, but that retains the familiar operational characteristics of a VTR and, importantly, fits within a typical VTR replacement budget. As broadcasters rethink their system designs and strive to achieve workflow efficiencies, making a decided move away from videotape processes, the M-Series iVDR may be the right tool at the right time in the transition to all-digital operation. **BE**

Michael Cronk is general manager of Digital News Production and director of Server Product Management at Thomson Broadcast and Media Solutions.

NEW PRODUCTS & REVIEWS

WISDOM selects Wheatstone

BY CRAIG MOORE AND JEFF HORNE

WISDOM Media Group, a global media resource located in Bluefield, WV, recently made the decision to consolidate all its offices, including administrative, programming, marketing, IT/Internet and production, into one location. The new facility was designed to follow the principle of *feng shui* in order to provide the optimum working conditions for employees, who would be moved into the building from five local office buildings. Construction on the seven-million-dollar, state-of-the-art facility began in May 2001. On-air operations began Nov. 25, 2002.

Making the transition

During construction, all West Virginia operations were housed in temporary facilities. The greatest challenge was to allow for working studio/production facilities within the existing architectural design. Office space had to be re-allocated to accommodate two studios and a four-person interview booth. Installing suites in the existing architectural design tested the team's resourcefulness.

WISDOM chose two Wheatstone D-4000 digital audio consoles as the centerpieces of their new on-air studios.

To begin, the suites had glass windows on three sides that required soundproofing foam and seals to be added to all walls and doors in the suites. Next, custom cooling and fire suppression systems were installed in the existing rooms and raised flooring was added to the two radio suites. Microphone stands and a console had to be designed and built to accommodate having one host and three guests, two video camera operators, and equipment within the existing space in the interview suite.

WISDOM served as its own systems integrator, designing the technical facilities of the streamlined workspace.

A new design

WISDOM served as its own systems integrator, designing the technical facilities of the new facility to provide for a streamlined workspace. New digital equipment figured prominently into the plans for the new facility; however, the network wanted to keep its options open should a need for analog arise. A digital router was installed to eliminate the need for D/A converters. TV and radio production capabilities were combined to achieve the best use of space.

They also wanted to ensure that the new customized, state-of-the-art equipment would work seamlessly with the pieces being brought from its previous studios. Some of their core legacy equipment from the former WISDOM Radio studios was ailing and unable to meet WISDOM standards. That which did pass muster was integrated into the new studios and became an essential part of the studio design. A small complement of legacy equipment – ENCO DADpro32 digital file playback – was integrated with the equipment purchased for the new router logic circuits to attain a new level of complexity, and a backup studio to ensure continuity in the event of a transmission failure. Some of the legacy equipment included: four Panasonic SV3800 DAT recorder/players, one Tascam DA-30MkII DAT machines, one Yamaha SPX 990 voice processor, Orban DSE7000FX, and the Telos 2x12 phone hybrid

Handling audio

The unique nature of the multimedia facility operating under one roof required a powerful and flexible audio system. Two Wheatstone D-4000 digital audio consoles were chosen as the centerpieces of the new on-air studios. The D-4000's compact footprint provided a practical solution to their small space allotment. The console, new to Wheatstone's product lineup, offers totally modular construction, flexible configuration options and powerful mix-minus features in multiple frame sizes. WISDOM's team also

WISDOM operator Jason Frasher performs mixing for Carolyn Craft's radio program, "Inner Wisdom," using the facility's new Wheatstone D-4000.

preferred the console's analog meters over digital meters.

With all the glass in the studios (for talent convenience and public viewing of the activities) WISDOM took measures to attenuate external sound from hallway traffic and removing unwanted sound reflections inside the studios. Some unseen considerations built in were three different levels of sound absorption materials in and on the walls. Special STC rated doors; glass and ceiling tiles were installed, along with baffled ventilation and carpeted raised flooring.

A Wheatstone Bridge router comprises the central router system. The Bridge was brought in to achieve a better interface and offer the upgradeability that the facility needed. The Bridge is capable of increasing routing functionality and can be configured in multiples of eight instead of 16, making the system extremely flexible. The drop-in console and rack-mount router X/Y control panels make "salvo" reconfiguration of WISDOM's shared studio microphones, automatic tracking of on-air tallies, and microphone talent controls between the control rooms easy. The router can also accept multiple network interface modules – each one transmitting 64 channels of simultaneous bi-directional digital audio (plus intercage communication, logic signals, X-Y controller commands and auxiliary RS-232 datastreams) across one duplex fiber optic link or a single CAT-5 wire. Production capabilities include being on-air with a remote host, being on-air live, editing and the capability to broadcast five shows at once.

Wheatstone's Wiremax wiring interface modules provided another solution for finishing the studio environment. With Wiremax, standard cables interface from the Wheatstone products to below-counter panels with XLR, removable screw terminal blocks and other common connector types, making installation fast and easy. Wiremax provided the interface needed to meet WISDOM's specifications with an off-the-shelf solution. **BE**

Craig Moore is an operations manager for the WISDOM Radio, and Jeff Horne is chief engineer for WISDOM TV and Radio.

DTV peripheral equipment

BY JOHN LUFF

Dictionary.com defines peripheral as:

1. Related to, located in or constituting an outer boundary or periphery.
2. Perceived or perceiving near the outer edges of the retina: *peripheral vision.*
3. Anatomy.
   a. Of the surface or outer part of a body or organ; external.
   b. Of, relating to or being part of the peripheral nervous system.
4. Of minor relevance or importance.
5. Auxiliary.

Of these, the fourth seems to apply most closely to DTV peripheral. However, only two items for DTV origination would be outside this scope —the transmitter and the encoder. Nothing else major is specified by the FCC as required, except for closed captions. That leaves fertile ground for exploring what might be useful in a DTV installation.

Highest among these items is anything HDTV. HDTV, while a major focus of many statements by the FCC and the subject of much public nudging, is just not part of any standard. So, HDTV encoders vary quite widely in capabilities and cost. Currently, the least expensive option I know of costs well under $50,000.

Add to the list an encoder for 5.1 channel sound. The FCC is mute on whether surround sound is required, leaving broadcasters with all the options in the Dolby AC-3 Standard, codified as ATSC A-52 in December of 1995, and revised in 2001. Stereo is fine (2/0), as is mono (center channel only defined as 1/0) and, of course, 3/2 for 5-channel surround. So our next peripheral might be a Dolby AC3 encoder to permit 5.1-channel surround. Because this is available from only Dolby, as no one else has it licensed so far, you should not bother looking for other suppliers. However, several encoders are available with 2/0 stereo coding of AC3 internally without calling Dolby.

Add ATSC stream monitoring to the list. Analyzing MPEG requires a device to parse out the fragments, keep track of what is in the stream and determine if it is compliant. You might like to know when your PSIP or audio goes away after all. Many manufacturers have devices in this category, including Pixelmetrix, Rohde & Schwarz, Sencore, TANDBERG TV, Tektronix and Triveni.

The sound quality of DTV begs that you should be able to hear what your listeners have at home.

Transmission monitoring equipment would also be high on many lists. You might use an RF test set in the exciter, or choose an external system from Agilent, Rohde & Schwartz, Sencore, Tektronix and others.

Though likely to be required by the FCC in the future, the PSIP portion of the ATSC standards "suite" – A-65 – is not yet required in full. So-called static PSIP, literally just channel numbers, must be broadcast, but the static information that requires can be generated internally in most encoders. Full PSIP requires an external box to use data from traffic, listing services and even automation to generate the tables required in A-65. Look to Harris, Leitch AgileVision, Triveni and others for full systems for PSIP.

Loads of other options might be considered. For instance, you might want to translate captions from your NTSC channel to DTV, and hardware is available from several manufacturers, including Evertz. Or, you might want to do HDTV pass-through, and a switcher for HD signals might be the order of the day. Evertz, Leitch, Miranda, Sony, Thomson Grass Valley and others make switchers and logo inserters that would be key to making that happen. You could probably use a set-top box or two and some monitors as well. Barco, Ikegami, JVC, Panasonic, Sony and others make HDTV monitors, but don't forget virtual monitor walls from companies such as Barco, Evertz, Leitch and Miranda that can permit both 16:9 and 4:3 images to be combined on a VGA projector, display cube, DLP imager, plasma display or LCD monitor.

It might be wise to have a consumer setup somewhere in the station for seeing the actual program guide as displayed by your viewers, as well as gauging the delivered quality of the picture and sound coding.

Lastly, there is audio monitoring. The sound quality of DTV begs that you should be able to hear what your listeners have at home. That means a decoder or set-top with 5.1 channel outputs, some good speakers and acoustics that are not too far gone. Wohler makes useful surround sound decoder/speaker combinations with metering in a 2RU chassis. Dolby makes the reference decoder, as well as numerous gadgets for setting and monitoring the metadata that is part of the AC3 audio stream. BE

John Luff is senior vice president of business development at AZCAR. To reach him, visit www.azcar.com.

SEND Send questions and comments to: john_luff@primediabusiness.com

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MAINTENANCE ENGINEER. KTNV Las Vegas, Nevada is searching for an energetic person with a strong background in engineering. This successful applicant must have a thorough knowledge in the repair of broadcast equipment and a general understanding of all aspects in the operations of a television station. Experience with DVC-Pro, Beta SP., digital switchers, and video servers desired. This person must have excellent verbal and written communication skills. He or she must have an associate's degree or a minimum of two years experience as a maintenance engineer in a broadcast or production facility. Applicants should e-mail resumes with salary history to Adair@ktnv.com or mail resume to Director of Engineering 3355 S. Valley View Blvd. Las Vegas, NV 89102. KTNV is an Equal Opportunity Employer.

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ASSISTANT DIRECTOR OF ENGINEERING: ABC7, the number one station in Los Angeles, is seeking an experienced, hands-on technical manager who will assist the Director of Engineering by overseeing the day-to-day technical operations of this fast-paced, news-oriented station. Qualified candidates should have significant experience in modern television engineering including broadcast and news automation systems, network/IP-based television systems, studio and remote operations, and project design/management. A strong working knowledge of RF transmission systems, ENG/SNG vehicles and systems, and physical plant systems will also be necessary as well as a strong familiarity with applicable laws, regulations, and standards. Candidates must evidence exceptional interpersonal skills and be proficient verbal and written communicators. Prior experience working with collective bargaining units is desirable. A minimum 5 years of major market television experience in engineering management or supervision is required and a college degree is preferred. Please send resume to: ABC7 Los Angeles, Attn: HR, Dept. ADE/BE, 500 Circle Seven Drive, Glendale, CA 91201. Equal Opportunity Employer.

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ENGINEERING MANAGER: Supervise technical operators and maintenance staff. Act as liaison with all departments to ensure quality of station operations. Research vendors for goods and services, and manage inventory of consumable engineering supplies. Coordinate staff training and development, and assist in the hiring of technical personnel. Coordinate other departmental activities as assigned. Minimum of four year's technical experience in a television environment with a minimum of two years in a supervisory capacity required. Undergraduate Degree in Electrical Engineering or Computer Sciences strongly preferred. Strong background in the maintenance and repair of television broadcasting equipment, including large-scale news operations required. Solid engineering skills with the ability to troubleshoot and repair technical equipment and excellent communication, interpersonal, and leadership skills essential. **Maintenance Engineer**: Responsible for the repair and maintenance of broadcast television equipment, including cameras, switchers, videotape machines, audio and graphics equipment. Perform routine and restorative maintenance on electronics and electrical systems, and maintain microwave systems and ENG and SNG equipment. Minimum three years experience maintaining and repairing broadcast television equipment. Must possess solid working knowledge of electronics and electrical systems. Knowledge of FCC rules and ability to work flexible hours and shifts essential. Must have the ability to work with minimal supervision. Technical training in electronics strongly preferred. Qualified candidates only, send résumé and cover letter to: Human Resources–BE, WFXT Fox 25, 25 Fox Drive, P.O. Box 9125, Dedham, MA 02027. For immediate consideration, fax your resume to 781-467-7212, or e-mail in MS-Word format only to: fox25hr@hotmail.com No Phone Calls Please. EOE/M/F/D/V

ENGINEERING MAINTENANCE TECHNICIAN for WPVI-TV6 Philadelphia. Position requires a minimum of 5 years experience in broadcast television with extensive knowledge of and experience maintaining analog and digital video/audio systems, switchers, cameras and VTRs. Candidate will have demonstrated a knowledge of computer systems, networks, video servers, and station automation, and have a balance of experience between broadcast TV maintenance and computer (IT) maintenance. Must be willing to work a varied schedule. Send cover letter **(no calls)** to James D. Gilbert, Director of Engineering, WPVI-TV, 4100 City Ave., Suite 800, Philadelphia, PA 19131 FAX 215-581-4515; Email: james.d.gilbert@abc.com EOE

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Passing the kudos

BY PAUL MCGOLDRICK

There is an organization in our industry that has continually been at the cutting edge of technology and has pushed for improvements in engineering. It is not NAB, not the Consumer Electronic Manufacturers Association (CEMA, which was re-incorporated as the Consumer Electronics Association [CEA] in November 1999), and certainly not the FCC – but those are the names that seem to get all the headlines for what they have done or, more commonly, for what they have not done. I'm talking about Maximum Service Television (MSTV). I would actually expect a good proportion of readers to ask, "Who is that?"

MSTV was launched in the early years of NTSC and has been the unparalleled leader for improvement in technical quality of television in the United States, and in that much-needed virtue: logic. It was responsible for the early propagation studies that were eventually adopted by the FCC; it pushed the industry to accept UHF transmission by getting the All-Channel Receiver Act passed in 1962; and it harangued everybody to keep UHF channels protected in 1987. It was also responsible for creating the Advanced Television Test Center in 1987.

MSTV also took the ideas of the advisory committee and co-sponsored the field-testing and analyses of the results. And then, to cap it all, the organization drafted all 12 of the joint industry pleadings for the FCC's ATV hearings and went on to develop the computer program that allows DTV/NTSC channels to be coordinated for coverage and protection against interference.

So, over a span of almost 50 years of service to the industry, MSTV has been the inventor and subsequent guardian of the FCC's Table of Assignments; has ensured that UHF broadcasters received a fair shake at audience building; kept other, greedy services off most of the UHF band; pushed the industry away from a Japanese analog HDTV system; and basically developed the model that the FCC has used for DTV channel allocations. It has done extremely well for the broadcast industry – and it deserves our recognition.

What MSTV has not been really good at is putting a spin on its own work. It just stays in the technical background, although the very public flagship demonstration station, WHD-TV in Washington, was a joint project by it and CEMA.

What MSTV has not been really good at is putting a spin on its own work. It just stays in the technical background.

NAB has used MSTV's technical expertise in a number of ways over the years, sometimes lending technical credence to its own bizarre positioning. MSTV truly does represent the interests of about 400 local TV stations on technical issues. So it was not surprising that the recent reply comments to the FCC under CS Docket No. 97-80 were jointly from NAB and MSTV. Don't remember that docket? It's the ongoing battle on getting a DTV receiver a real front-end, one that can look at any RF source, whatever the medium used for delivery (that's NAB's and MSTV's point of view, and that of any sensible human looking in on the ridiculous proceedings). Even Chairman Powell, in whose agenda many of us have seen little logic, was quoted when the DTV Tuner Order was adopted as saying, "Consumers will expect their television sets to go on working in the digital world just as they do today. This includes the ability to receive broadcast signals."

So why is this still an issue at all?

The cable-ready rules floated by the CEA and the National Cable Television Association (NCTA) ignore any kind of x-VSB modulation. Why on earth the cable industry wants to limit any cable system to not using 8-VSB or 16-VSB is beyond me. Some of us certainly expect that some systems will want to "rebroadcast" 8-VSB signals in order to save expensive remultiplexing. The CEA has openly admitted in FCC filings that adding x-VSB demodulation to a receiver is a "relatively trivial" cost.

We don't know whether the receiver manufacturers intend to include x-VSB reception or not, but clearly the cable-ready rules should spell it out. There's always the possibility, of course, that it was an intentional omission... but one would like to think that the cable industry was thinking only of its own situation and not the industry as a whole.

As has often been the case, I am in agreement with MSTV in yet another of its technical pitches. We should applaud its previous work and hope that it can find ways to succeed in its next task of mitigating the costs of converting smaller-market stations into DTV facilities. BE

Paul McGoldrick is an industry consultant based on the West Coast.

SEND Send questions and comments to: paul_mcgoldrick@primediabusiness.com

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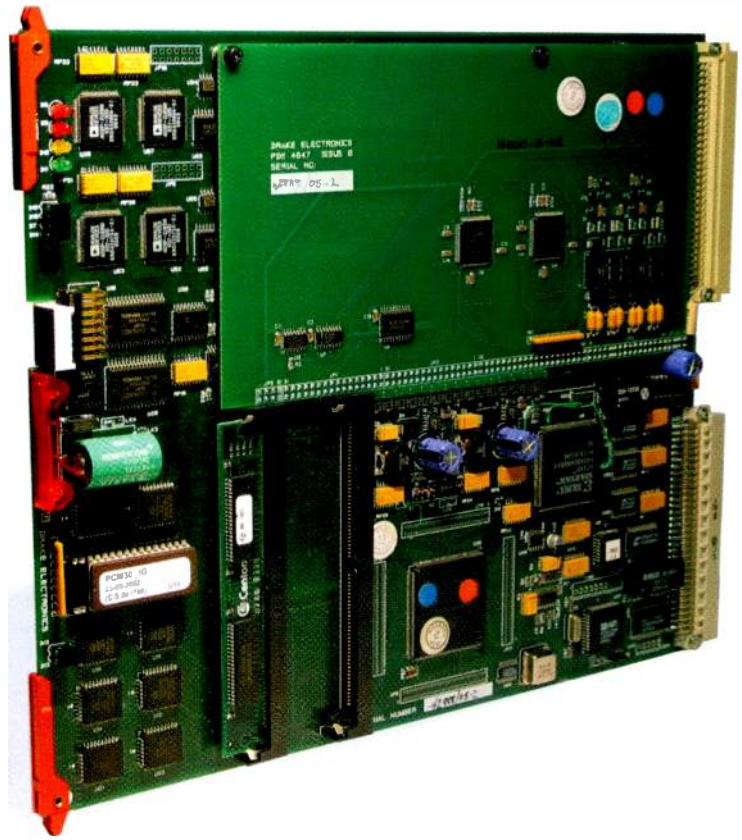

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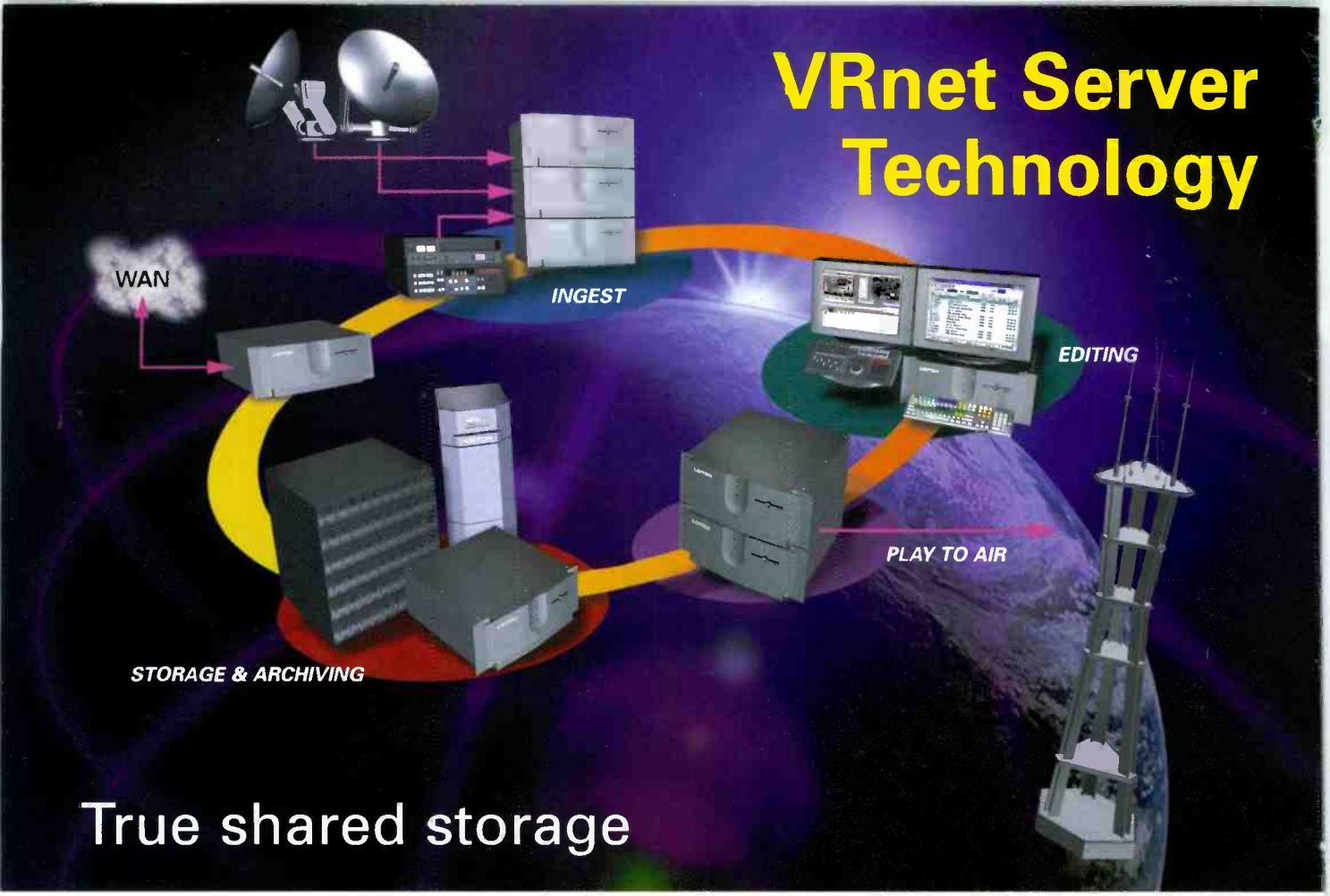

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