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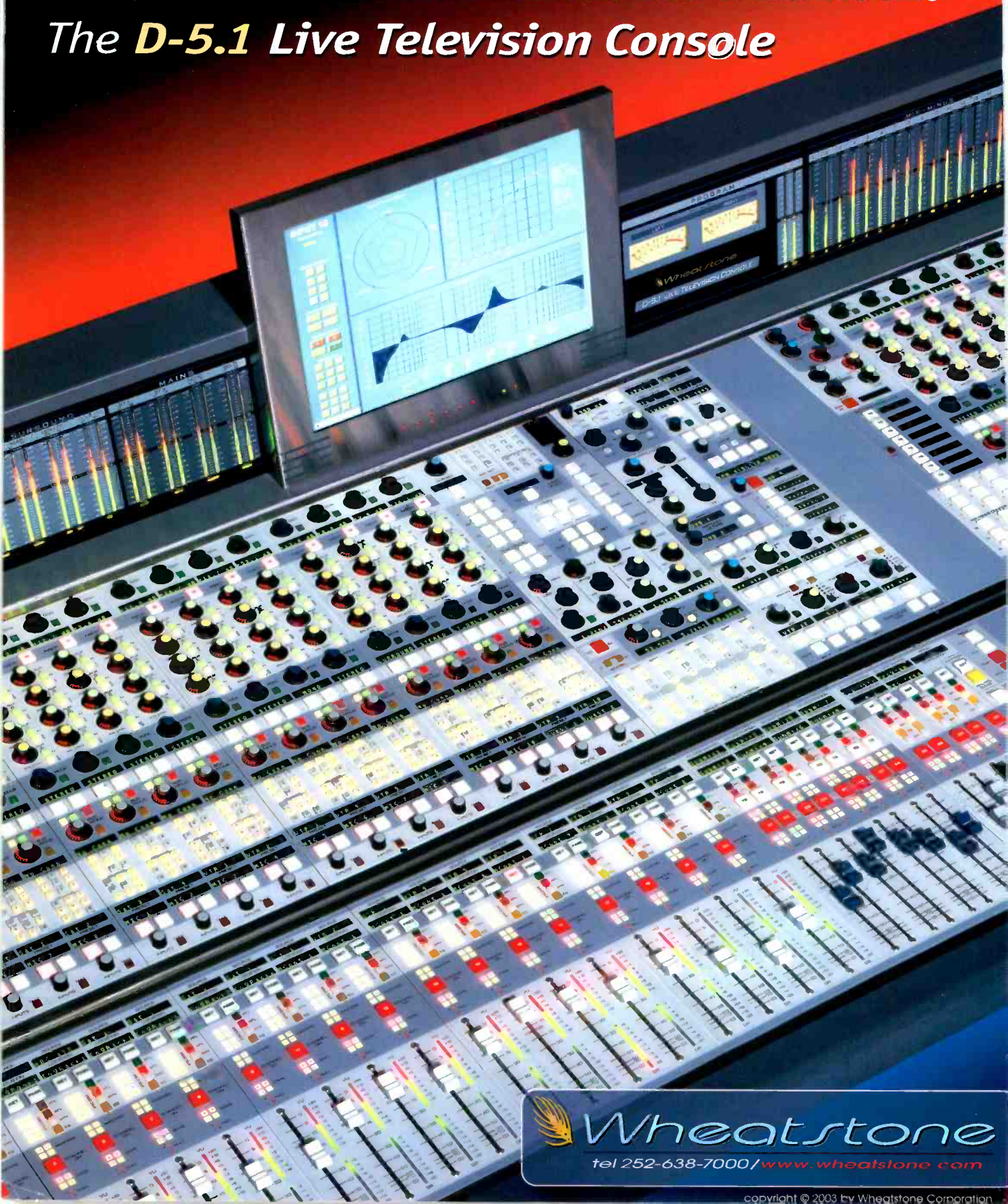
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- 2003 Excellence Awards
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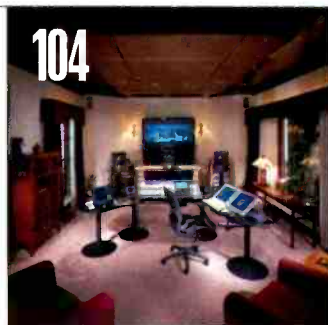
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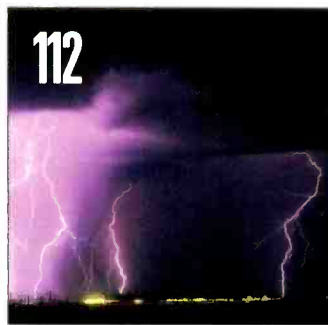
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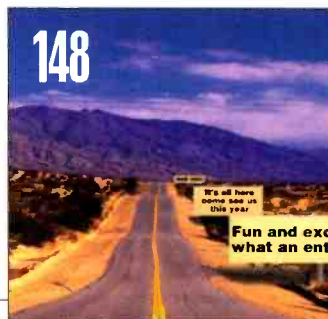
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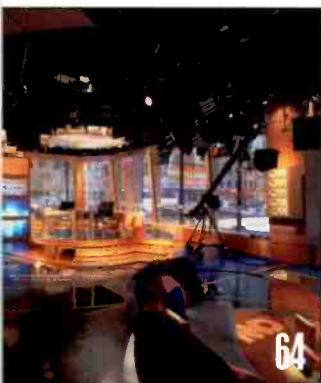
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## Still a player



Name this camera's manufacturer and model number. Hint: While the manufacturer no longer makes cameras, it is still a large player in the broadcast industry. Correct entries will be eligible for a drawing of the new *Broadcast Engineering* T-shirts. Enter by e-mail. Title your entry "FreezeFrame-March" in the subject field and send it to: [bdick@primediabusiness.com](mailto:bdick@primediabusiness.com). Correct answers received by May 17, 2003, are eligible to win.



▶ What company gives studio pros the most technologically advanced media possible?



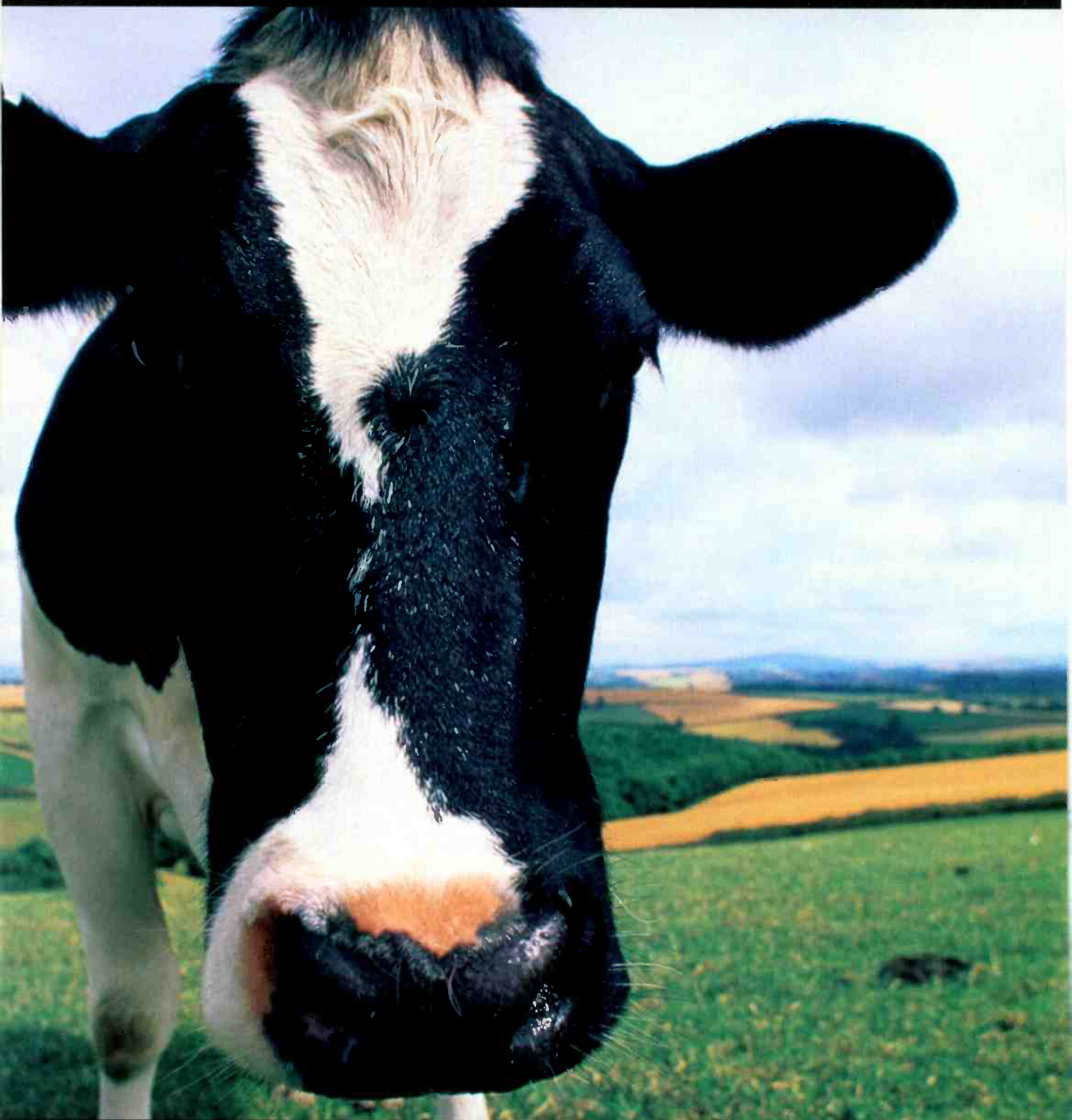
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## Losing the race

**H**ey, I don't mind a race, but I want a fair race. And, I'm not against competition, in fact, I believe in competition. What's not good for anyone is when one industry is given unfair access to the customer through government mandate. That's called preferential treatment, not competition.

TV broadcasters continue to be, dare I use the word, *discriminated* against by the FCC. Broadcasters carry an unfair burden of antiquated, obsolete and burdensome legislation created by years of congressional, presidential and FCC mismanage-



ment. Whether it's the costs of DTV implementation that no other industry has incurred, ownership caps that artificially affect market conditions, diversity/EEO/special treatments that restrict sales or the \$500 million/year tax on analog broadcasters, TV broadcasters are increasingly being burdened by unreasonable regulations.

*Broadcast Engineering* recently hosted a DTV seminar where attendees examined the causes and effects of legislation, technology and market conditions on stations. What we learned is that stations are finding it increasingly difficult to remain profitable or even stay on the air with the new onerous conditions placed on them by Congress and the

FCC. Let's take a closer look at a couple of the reasons broadcasters are struggling.

First, DTV is expensive. Every broadcaster I talk with mentions the money they've had to spend in converting to DTV. Many have invested huge sums, even millions of dollars, just to meet the FCC's arbitrary requirements to begin broadcasting DTV signals.

Second, while the FCC just loves regulating broadcasters, it avoids regulating cable. Just three years ago this month I blasted the ever-political suck-up FCC chairman William Kennard. I said then, "When it comes to protection from regulation, Kennard sucks up to cable like a newborn calf to a wet teat." Three years later, even without that worthless chairman, the FCC is still doing the same thing. In fact, it's now added the consumer electronic manufacturers to that same suck-up list. "Let's not regulate DTV receiver performance. That's not within the FCC's prerogative," says the Commission.

Third, market conditions are vastly different now than they were 10 years ago. Broadcasters need the freedom to build, buy, sell and group stations according to what the market needs, and not what some politician decides.

And please don't give me the crap about "It's the public's spectrum." If you want to go down that path, I'll bury you in valid comparisons to other so-called public resources (like water, air, forests, land) and the industries that use them – all absolutely free. Broadcasters give back to their communities far more than what they are given credit for.

Broadcasters just want the chance to compete on a level playing field. Loosen the restrictions on doing simple business. Require others to operate under the same rules and guidelines as we must, and there will be no complaints. Failure by the Commission to allow broadcasters to compete equally will have catastrophic consequences.

*Brod Dick*

editorial director

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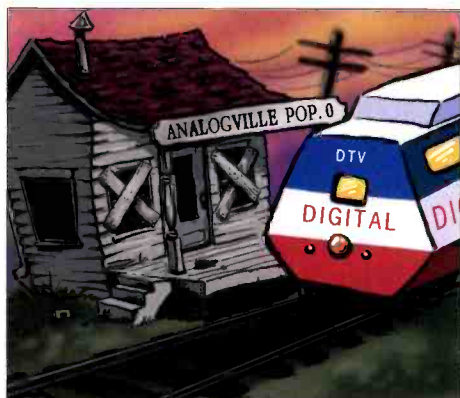
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## DTV problems

To the editor:

I take exception with your comment that there is no demand for LPs, likewise analog TV. Just a reminder, analog TV sets and VCRs outsell digital TV sets and digital VCRs by a ratio of about two million to one. There is no visible diminishing of demand for analog TV sets. And comparisons to audio devices or DVD/CD vs. VHS or LPs may illustrate your point, but are poor comparisons in actual sales or demand. DTV may be here but the consumer is not buying it. The consumer is buying DVDs and big-screen TVs, but not many ATSC-compliant receivers. It is still hard to find any store showing or selling more than one or two ATSC receivers, and many have none on display. There are lots of HD monitors, or big-screen sets with analog tuners. I expect to be long retired 25 years from now and still watching analog TV on eight of the nine TV sets in my house. Only one is ATSC-HDTV. And local broadcast signals are usually worse in HD than NTSC because of artifacts, source media noise and the ability to see even more grunge through a wider pipeline. The grass still looks like a sheet of plastic – not blades of grass – and fast action and pans still dumb down to smears or jerks or blocks. All much less watchable than the analog companion signal. “The Simpsons” still has frozen film dirt and gate hairs, the multiplex channel still looks like VHS copies of VHS copies, and the power reductions mean I can only get some

DTV stations part of the day and CBS usually not at all. I watch a distant market UHF station because local channels 2 and 3 (DTV) are unwatchable 90 percent of the time. A grade 3 picture from 80 miles away in NTSC is still better than blue screen, broken audio, fractured pictures or grade 1 analog from a crap antenna on the Hancock 30 miles away. Long live analog TV. It works.

HENRY RUHWIEDEL  
CROWN POINT, IN

To the editor:

The only reason that stations in this country are on the air with a digital signal is that someone decided to get rid of all the analog stations, auction all the frequencies and make a bundle. That’s not going to happen soon. I bet there will be analog stations still on the air 15 years from now. A good friend who’s a chief engineer told me that his station is on the air, but only one person associated with the station even has a digital set. In most cases, no one knows how good or bad the digital signal is, or how far it goes. Why would I buy a digital set with no tuner, so I can spend another \$200 or more for a box on top of my television, and then find out that the signal off the air stinks? I will close by asking one question: How many digital antennas have you seen on homes where you live?

GEORGE G. SPELLMAN

## Choosing a name

To Paul McGoldrick:

Just finished reading your enjoyable article regarding company names. I’ve had this theory for quite some time that for the most part, successful companies (last name, acronym or invented name), or at least well-positioned companies, consist of a name with three syllables or fewer, or three words or fewer. Hence, the 17,576 three-letter combinations available

work because that’s what we’re used to remembering.

Pop music execs have utilized this theory in promoting groups – Stone Temple Pilots (now referred to as STP), Three Doors Down, or Third Eye Blind come to mind.

However, in order for a company named for the owner to be well-positioned, the owner must have a short, common, highly recognizable and memorable name. Orban, Leitch, Gates and Moseley fit the bill, but some of the names of folks I know (Bobrzynski, Mruk, and even mine, Ziemiński) would never be remembered by the public at large, even though they passed the three-syllable test. Looking around the studio today, I see Sony, Panasonic (okay, there’s a successful polysyllabic one), TASCAM and Mackie. The name is important, but quality, reputation and service (hey, “QRS” — don’t bother...they’ve been in business since 1988), as well as a product’s timeliness, usefulness and value, also play important roles in determining a company’s success.

MIKE ZIEMSKI  
PRODUCER, “ACCENT ON THE AIR”

## Recent Freezeframe winners

The October 2002 Freezeframe question, “Who was the famous broadcaster who promoted Chyron products, and where did he work when he wasn’t promoting products?” resulted in a large number of correct answers. The late Julius Barnathan, president of Broadcast Operations and Engineering for ABC, was well-known in the industry. Shown below is an abbreviated list, displaying the names of winners chosen at random:

David Horowitz  
Cindy Hutter  
Harvey Caplan  
Tom Weems  
Mike Snyder

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# Evolution?

BY CRAIG BIRKMAIER

In a rare break with tradition, this month's episode of "Download" continues down the path we began exploring in the February column, "DeVolution." When we conceived the editorial calendar for this year, we anticipated the need to talk about enhancements to the ATSC modulation standard. At that time, the ATSC expected a decision by the end of 2002.

But, as is often the case, things did not work out as expected. After the T3/S9 ATSC Specialist Group on RF Transmission makes its recommendations to the parent committee, the committee could make its final decisions about which, if any, enhancements it will standardize in time for NAB in April, or in May.

Fortunately, there is plenty to write about regarding potential enhancements to the ATSC standard. Some of the proposed changes dovetail nicely with the subject of February's column, which examined the prospects for replacing the aging MPEG-2

video-compression standard.

In December, the ATSC issued a request for information on advanced video and audio coding systems for use in a robust ATSC DTV channel. Also in December, the ATSC published a candidate standard: Synchronization Standard for Distributed Transmission. The standard paves the way for single-frequency networks (SFNs) that are largely compatible

MPEG-2, and the prospects for these new compression techniques to displace MPEG-2 in other digital-distribution infrastructures, including cable and DBS.

### Give and take

The ATSC Specialist Group on RF Transmission has been evaluating three techniques to improve reception through backward-compatible

**Changing both the modulation and compression standards would disenfranchise the approximately 500,000 ATSC receivers already deployed.**

with existing receiver designs, but optimized for next-generation receivers with improved adaptive equalizers.

With this in mind, let's examine three issues: the potential for changes to the ATSC standard, the enhanced video-compression technologies that are vying to co-exist with or to replace

modifications to the 8-VSB modulation standard. Each of these proposals reduces the 19.3Mb/s payload of the current 8-VSB standard. Two of the proposals involve significant reductions in the payload to support a smaller robust channel that legacy receivers would ignore. Let's look briefly at what each proposal involves.

Broadcom has proposed adding an extended training signal. This would make it easier for new receivers to lock onto the 8-VSB signal, improving reception under most circumstances. The training signal would have minimal impact on the 19.39Mb/s payload – only a fraction of a percent.

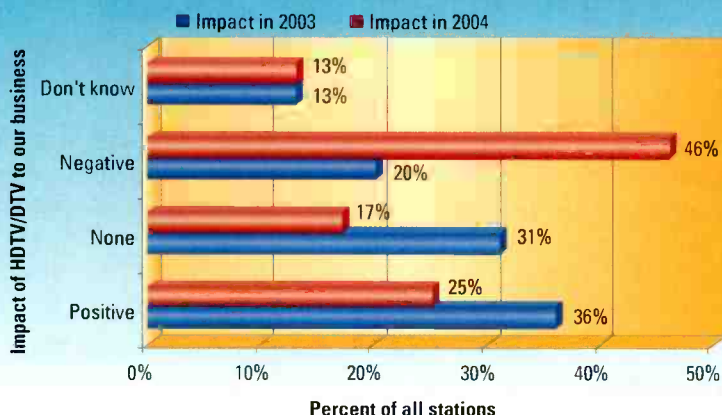
Zenith and ATI Technologies have proposed a robust channel that would reduce the 8-VSB payload by 3Mb/s to provide a robust channel with 1.5Mb/s throughput. ATI acquired receiver-chip manufacturer NxtWave Communications in June of 2002; NxtWave developed this proposal jointly with Zenith.

Philips has proposed a robust channel that would reduce the 8-VSB payload by 9Mb/s to provide a robust channel with 4.5Mb/s throughput.

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

### The impact of HD

A higher percentage expect a negative impact in 2004



SOURCE: Trendwatch

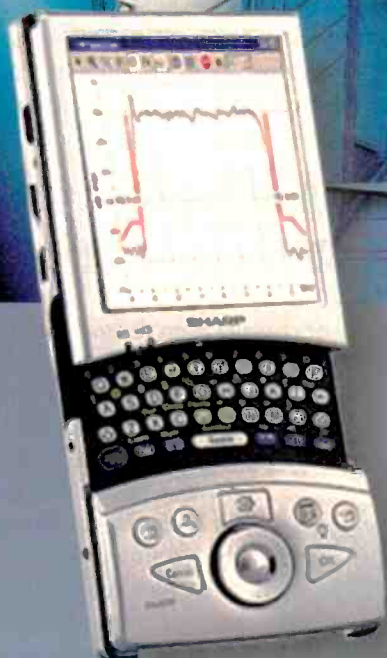
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The Specialist Group has not released the results of testing these enhanced-modulation proposals to the public. Members of the group are bound by a non-disclosure agreement regarding committee work and these tests. In anticipation of the final decision, however, a public debate has already begun.

On one side of the debate are broadcasters who believe that adding a robust transmission mode will provide new video and data broadcast services for portable and mobile receivers. The testing process for the enhancement proposals has included a test of "walkabout portability." In essence, this would allow the use of handheld receivers comparable to NTSC WatchMan receivers, and the delivery of data to digital media devices such as PDAs.

On the other side of the debate are broadcasters who believe that it is unnecessary to make any changes to the ATSC modulation standard. This camp believes that improved adaptive equalizers and active-antenna designs are addressing reception problems adequately.

A December demonstration of improved adaptive-equalizer technology developed by Linx Electronics showed significant reception improvements in the demanding multipath environment of downtown Chicago. The complexity of the implementation, however, raises questions about the costs for the chip(s) being developed by Linx.

On Jan. 1, NewsCorp's Fox Unit and Philips Research announced a new technology they say will deliver perfect digital TV signals to more homes through indoor antennas. The technology, developed through laboratory simulations using RF signals recorded in major cities, is based on the use of multiple antennas, multiple equalizers and a summing decision network

to derive a reliable signal. No one has announced plans to commercialize this technology.

The proposed enhancements being developed by the ATSC Specialist Group on RF Transmission may encounter resistance as they work their way through the ATSC standardization process. Further indications that the ATSC will choose not to change the modulation standard have emerged from off-the-record discussions about the testing of the three proposals. According to these reports,

## The question of whether the ATSC standard will be enhanced may soon become irrelevant.

there is no way to show from the test results that any of these enhancements will improve reception in a quantifiable way, and none of these proposals will support mobile reception.



**Evaluation of proposed ATSC enhancements to the 8-VSB modulation system have included testing of "walkabout portability" using the test configuration pictured in the images above; the separate receiver is not shown. Note the wireless phone and headset used for communications between test personnel.**

While U.S. broadcasters would have much to gain from a "hard reset" (changing both the modulation and compression standards), most currently view this as being highly unlikely because it would disenfranchise the approximately 500,000 ATSC receivers

already deployed. Meanwhile, broadcast competitors (including cable and DBS, which operate in less hostile channel environments) are evaluating more efficient modulation and video-compression techniques – despite the fact that they have deployed tens of millions of set-top boxes that they would have to replace.

The DBS operators have already begun to migrate to 8PSK modulation on new transponders. To facilitate a phased-migration strategy, they are using these transponders to deliver services

to next-generation set-top boxes that support 8PSK. When EchoStar proposed a merger with DirecTV, the company stated that it was allocating a sizable amount of money to replace all of

the existing set-top boxes for both systems. Now that the proposed merger has been blocked, improved modulation and improved compression may be even more important. To serve more local-into-local broadcast markets, throughput will have to increase significantly.

The cable industry is less affected by the need for more bandwidth because each cable system need only provide non-duplicated broadcast signals from surrounding markets. And recent digital upgrades to 750- to 900MHz systems provide cable with sufficient bandwidth to meet current needs. But future

needs may dictate radical changes for cable as well.

Cable uses a hybrid fiber/coax network infrastructure. Fiber runs to neighborhood nodes where it terminates at the traditional coax cable plant. These nodes typically serve between

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250 and 600 homes. A significant portion of the forward bandwidth serves legacy analog cable service. The remaining bandwidth is segmented between forward channels and a return channel. The forward channels serve digital cable and cable modems; the

existing plant more efficiently; more efficient modulation, more efficient video compression, and more efficient use of the available bandwidth by eliminating service segmentation.

The cable industry is currently evaluating a shift to 1024 QAM, and to an

The consumer-electronics industry has challenged the ATSC-receiver mandate in court. There are strong indications, however, that they would drop this challenge if the FCC adopts the recent agreement with the cable industry and codifies it into rules that would require digital television products to include both ATSC and cable tuners.

Meanwhile, the Sinclair Broadcast Group has asked the FCC to impose minimum-performance specifications for the mandated ATSC receivers, a requirement that the consumer-electronics industry strongly opposes because it would increase the cost of the front-end and adaptive equalizers in ATSC receivers.

Since most consumers will never use the ATSC receiver in new digital televisions, it is likely that there will be little incentive for the consumer-electronics industry to adopt evolutionary designs that will improve performance. This may, however, create a niche market for higher-performance receivers that can be added to TVs with integrated receivers when the internal ATSC receiver does not work reliably – that is, if over-the-air broadcasting survives the DTV transition. **BE**

## It is unlikely that the FCC will impose performance specifications on receivers.

return channel is for signaling and for the cable-modem upstream path.

Currently, digital cable systems are using many of the digital channels for near video on demand (NVOD). But cable is now beginning to migrate to true video on demand (VOD), which allows the user to pause, rewind and fast-forward through the content.

Each home using a cable modem or watching a VOD event is receiving private, rather than broadcast, bits. And, as more homes take advantage of these services, the demand can exceed the capacity of the neighborhood loop.

The traditional solution is to reduce the number of subscribers on a neighborhood loop. This requires lighting up another fiber to the neighborhood and adding additional switching gear at the headend(s). The alternative is to use the

all-IP-based digital infrastructure to eliminate the segmentation of cable modem and digital TV services. The analog tier is likely to endure because it is a major competitive advantage over DBS.

### Let's make a deal

The question of whether the ATSC standard will be enhanced may soon become irrelevant. On Dec. 19, the consumer-electronics and cable industries announced an agreement that sets the stage for a national "plug-and-play" standard for digital television products and digital cable systems. The FCC, which issued a mandate last fall to include ATSC receivers in virtually all digital television products by 2007, is reviewing the agreement, and has opened a proceeding to gather industry comments.



Send questions and comments to:  
cbirkmaier@primediabusiness.com

## Extensibility

In February, we asked the question: "Given the historic longevity of broadcast standards, why are some people, including this author, suggesting that MPEG-2 is growing old?" We pointed out that there are more than 200 million MPEG-2 decoders deployed worldwide. This would seem to create an insurmountable barrier to "DeVolution," the term created to describe the evolution of digital video-compression technology.

We also pointed out that the MPEG-2 standard was constrained by the processing power available in 1995. In seven years, the capabilities

of MPEG-2 have been fully exploited, thanks in part to a 400 to 500 percent increase in processing power.

SMPTE fully anticipated and understood this evolution in capabilities as early as 1992, when it published its Task Force Report on Digital Image Architecture. The report was an input document to the Working Party 4 (WP4) interoperability review of the systems proposed for the U.S. Advanced Television standard. The Advisory Committee on Advanced Television Services (ACATS) commissioned the WP4 review at the behest of FCC Chairman Al Sikes, after the committee pointed out that the shift to

digital HDTV would facilitate convergence with technologies being developed by the rapidly growing U.S. computer industry.

The Task Force Report identified critical issues for an interoperable, scalable and extensible digital-imaging architecture. According to the report, extensibility "implies designing evolution into the system." A hierarchical, modular architecture is used to allow higher levels of performance as technology advances but, at the same time, provides backward compatibility to existing products.

The rapid evolution of video

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codecs used for streaming video over the Internet is a classic example of extensibility. The downside is that, periodically, it is desirable to replace the underlying hardware to take advantage of the improved technology.

In this light, it is desirable to separate the components of a digital television system. For example, expensive components that do not evolve rapidly, like displays, can be used with several generations of receivers that evolve rapidly with new capabilities. It is worth noting that the consumer-electronics industry apparently got the message. Only a small percentage of the more than five million HDTV-capable displays shipped to date have integrated digital receivers.

The DBS industry has been built almost entirely on the large installed base of NTSC receivers. Now it is driving the development of premium HDTV services for the growing base of HDTV monitors. In turn, this is causing the cable industry to roll out premium HDTV services. Both of these industries are driving DeVolution through modular set-top receivers. Both are now looking to next-generation digital-video-compression technologies to make room for HDTV.

A variety of next-generation video-compression algorithms are vying for the opportunity to replace MPEG-2.

Microsoft and Real Video have been pushing the envelope in the PC-based streaming-video markets. Microsoft recently announced a licensing program for its Windows Media 9 technology, for use in applications other than Windows

PCs.

Work began on MPEG-4 as soon as the MPEG-2 standard was finished. The improvements in video-compression efficiency offered by the current MPEG-4 standard were incremental – about 10 percent at most. Noting the rapid advance in video-compression technology, MPEG evaluated next-generation compression algorithms two years ago. As a result, they formed the Joint Video Team with the video-compression experts from the International Telecommunications Union (ITU), which has traditionally worked on video-compression technology for videoconferencing

and video telephony. The result is a new video-compression standard that will be known as MPEG-4 Part 10 as an ISO standard, and H.264 as an ITU standard. The informal name for the new codec is Advanced Video Coding (AVC). (See Figure 1.)

Each of the would-be contenders vying to dethrone MPEG-2 offers at least a 200 percent improvement in compression efficiency. These new codecs also include image-reconstruction

filters that minimize the perception of compression artifacts. Thus, for highly compressed applications, they may offer as much as a 300 percent improvement in bandwidth efficiency relative to MPEG-2.

Obviously, there is a cost. The complexity of these algorithms is about four times that of MPEG-2. As noted earlier, however, the 400 percent improvement in processing power is already here.

The new compression algorithms do a much better job of adapting to changing image information, especially to critical edge details for which the MPEG-2 motion-compensated prediction and quantization tools are relatively crude. MPEG-2 tends to distort edge detail, replacing it with quantization errors that look like noise.

Major improvements in the way that differences from predictions are quantized contribute to improved picture quality, and reconstruction filtering largely eliminates the blocking artifacts MPEG-2 reveals when it is severely stressed.

#### Related Web sites:

- ATSC RFI on Coding for Robust Transport  
[www.atsc.org/T3S5\\_202r5.pdf](http://www.atsc.org/T3S5_202r5.pdf)
- ATSC Candidate Standard CS/110: Synchronization Standard for Distributed Transmission  
[www.atsc.org/standards/cs\\_documents/cs\\_110.pdf](http://www.atsc.org/standards/cs_documents/cs_110.pdf)
- Linx Electronics Chicago Field Test Results  
[www.linxelectronics.com/pdf/12-20\\_LINX\\_Tribune\\_Field\\_Test\\_Release\\_-\\_Final.pdf](http://www.linxelectronics.com/pdf/12-20_LINX_Tribune_Field_Test_Release_-_Final.pdf)
- Report of the Task Force on Digital Image Architecture  
[www.pcube.com/pdf/Report%20of%20the%20SMPTE%20TFDIA.html](http://www.pcube.com/pdf/Report%20of%20the%20SMPTE%20TFDIA.html) **BE**

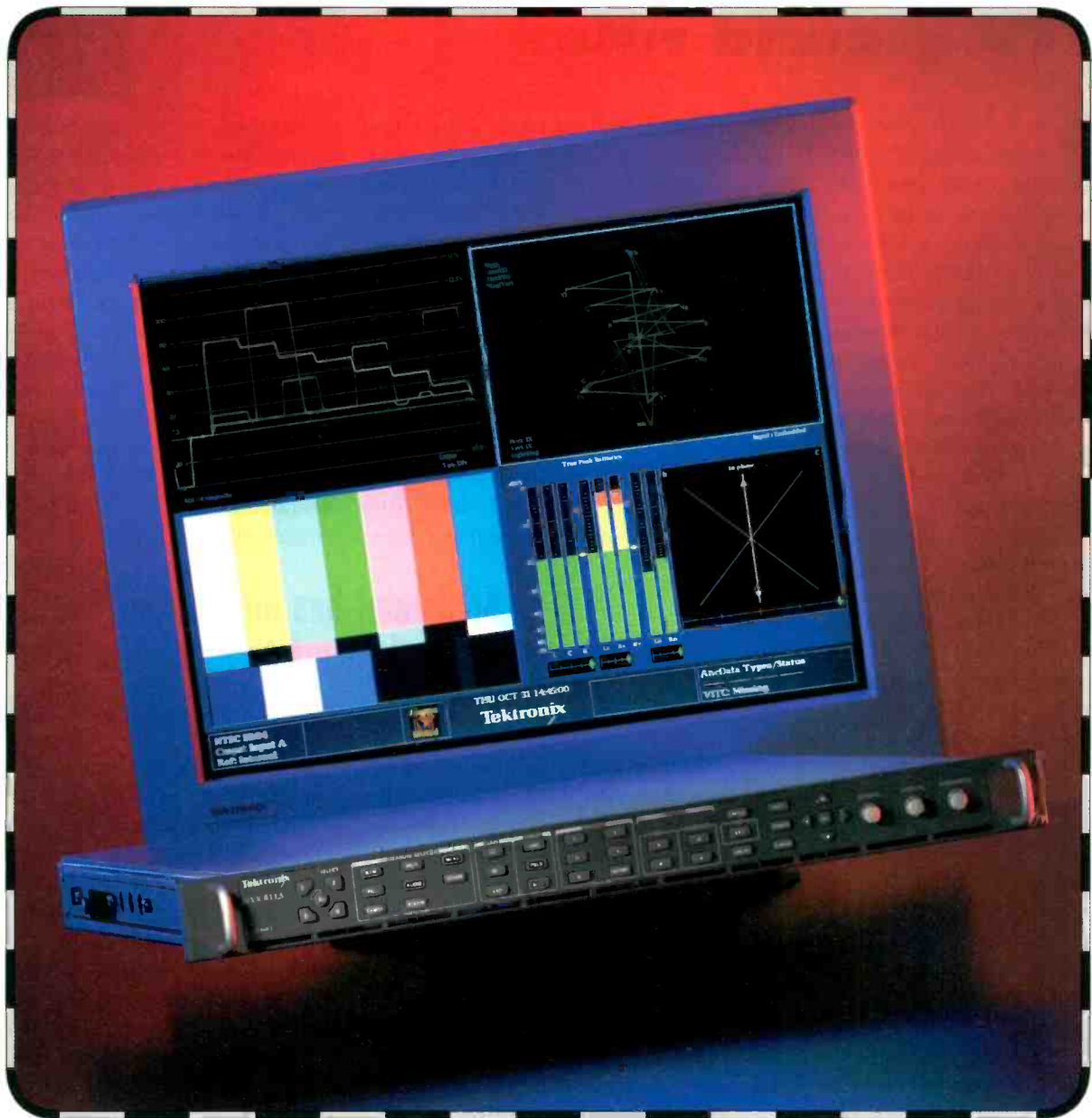
*Craig Birkmaier is a technology consultant at Pcube Labs, and hosts and moderates the OpenDTV Forum.*



**Figure 1. MPEG-4 part 10, or Advanced Video Coding, uses reconstruction filtering to minimize the perception of the blocking artifacts common with earlier MPEG standards. The image sequence above includes the original, the result after AVC encoding/decoding, and the final result after reconstruction filtering. Images courtesy of Iain Richardson.**

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# FCC changing DTV ground rules

BY HARRY C. MARTIN

In a Notice of Proposed Rulemaking ("NPRM") released in January, the FCC proposed adjustments to its rules and policies governing the DTV transition.

In November 2001 the FCC permitted DTV stations to go on the air with lower-power, and therefore less expensive, facilities and suspended its requirements that stations replicate or maximize their service areas and select their post-transition channels. In connection with its periodic review of these measures, the FCC is proposing the following changes in these policies:

**Channel election.** The FCC proposes May 1, 2005, as the channel election deadline for commercial and noncommercial broadcast licensees with two in-core assigned channels, and seeks comment on alternative deadlines.

**Replication and maximization for DTV channels within the core spectrum.** The FCC proposes to end replication and maximization interference protection for the top four network affiliates (i.e., ABC, CBS, FOX and NBC) in markets 1-100 as of July 1, 2005; and for all other commercial DTV licensees, as well as noncommercial DTV licensees, as of July 1, 2006.

**Intermediate coverage requirement.** The NPRM asks whether the FCC should adopt an intermediate signal coverage requirement beyond a broadcaster's current obligation to cover its community of license, expanding into nearby areas of the market.

**Channels 52-69.** The NPRM also seeks comment on replication and

maximization interference protection deadlines for stations operating on TV channels 52-69 in order to speed the clearing of the 700MHz band for use by new services, and to ensure continued progress in the digital transition.

**Audience penetration.** The Communications Act states that licenses for analog television service expire on Dec. 31, 2006, except where DTV is not available to 85 percent or more of viewers in the "television market." The NPRM seeks comment on when stations should file an extension request with the FCC on this basis, how the FCC should define a

Abernathy, Kevin Martin and Chairman Michael Powell, and Democrat Michael Copps on the FCC. Although the White House nominated Adelstein for the position in November 2001, he sat in the wings for a year waiting for Congress to confirm his nomination, which occurred in November 2002. The 40-year-old former senior legislative aide and history professor was sworn in on Dec. 3, 2002. He will complete the term of departed Commissioner Gloria Tristani, which expires June 30 of this year. It is assumed that he will then be reappointed for a full term.

**[Adelstein] has emphasized the need for broadcasters to take advantage of technological advances.**

"television market" for purposes of this provision, how it should interpret the requirement that digital-to-analog converter technology be "generally available" in a television market, and how it should interpret the test to determine if at least 85 percent of viewers have access to digital broadcast signals.

The NPRM raises a number of other issues, including whether the FCC should retain, revise or remove the requirement that licensees simulcast a certain percentage of their analog channel on their DTV channel; whether and how the FCC should license multiple lower-power transmitters, similar to cellular telephone systems; whether the FCC should adopt digital V-chip requirements; and what station identification requirements should apply to digital stations.

Adelstein made his debut speech as a commissioner at the Future of Music Coalition Policy Summit 2003 in Washington, DC, on Jan. 6. It was there that he accompanied R&B legend Lester Chambers on the harmonica and, as both a musician and a commissioner, spoke of his soft spot for community-oriented broadcasters, his cautious approach toward media ownership and his fear of the impact overconsolidation could have on diversity and localism. Additionally, he has emphasized the need for broadcasters to take advantage of technological advances such as broadband, Wi-Fi, satellite radio and digital cable to take their programming to more people and allow the marketplace of ideas to flourish.

BE

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

## Commissioner sworn in

Jonathan Adelstein (pronounced "ADD-dull-steen"), a Democrat, joins Republican Commissioners Kathleen



Send questions and comments to: [harry\\_martin@primediabusiness.com](mailto:harry_martin@primediabusiness.com)

## Dateline

April 1 is the deadline for biennial ownership reports for stations in Delaware, Indiana, Kentucky, Pennsylvania, Tennessee and Texas.





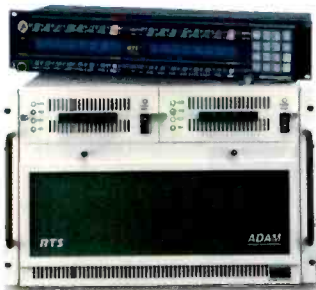
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## Making money with news

BY JOHN LUFF

**B**usiness is all about developing a product, marketing it, selling it and delivering it. Broadcast news is not much different, except it is all about being different – that is, differentiating yourself while delivering the same “product.” The news that happens in any market – indeed, in the world – is of course the same, regardless of who delivers it to the consumer. But choices about content and how to deliver it can move a newscast in a different direction, effectively delivering a differentiated (different) product.

These days, the driving force in all aspects of broadcasting is bottom-line performance. Managing any business is about making hard decisions. In the news business, it is about hard choices on issues like staff size, operating and capital budgets, content-provider affiliations and operations models. These decisions determine whether the busi-

ness is a profitable one, a marginal one that contributes by delivering an audience for other programming, or a failing one that may no longer be a rational use of resources.

### New and improved

Some of these decisions involve technological advances. The broadcaster must base his decision to use any particular technological advance on whether it promotes the long-term health and profitability of a news op-

eration. Otherwise, it's as ineffective as rearranging deck chairs on the Titanic. Manufacturers tout marvelous workflow tools, like newsroom automation and nonlinear news editing on high-speed networks, as saviors of the business. But do they fulfill the promise? Such advances as the ability to push and pull content from the broadcast networks and other news content providers, other advances made possible by computer networks, and ubiquitously available bandwidth at affordable prices can indeed create huge operational changes in the newsroom. Newsroom automation can even extend to “script automation” of the entire production process, complete with robotic cameras, automated switching and computer-assisted audio post-production. Do these and other advances actually contribute to the station's success and generate profits for it and its shareholders? Has the promise of savings and consistency proved itself in stations that have chosen this route? These questions and many others beg review and analysis, because solutions do not necessarily provide the same benefits at the same costs in all situations.

**The driving force in all aspects of broadcasting is bottom-line performance.**

### NewsCentral

In researching this article, we spoke with Sinclair Broadcasting, which has news outlets in many markets. Sinclair has often innovated in the past, and currently is implementing NewsCentral, a concept that integrates a newscast produced in Sinclair corporate news facilities outside Baltimore with locally produced segments. The company has centralized weather origination to reduce the duplication of effort at every station. (Sinclair owns 62 stations in 39 markets, 29 of which aired local news before NewsCentral began operations.) In some markets, the economics of broadcast news had deteriorated to the point that Sinclair had to cease news operations. NewsCentral appears to be an effort to reverse the trend and rejoin news production in markets where it may not have been profitable in the past.

Saving money is not only about cutting out capital expense. In this case, it appears likely that Sinclair will also trim staff and reduce long-term investment in news at the local level. While one might think it is regrettable that the state of broadcast news has reached this point,



Tools like newsroom automation and nonlinear news editing on high-speed networks, as well as other advances in newsroom technology, are creating huge operational changes. WJTV-TV newsroom, Miami, FL. Photo by Carmen Schettino Photography, Sarasota, FL.

ness is a profitable one, a marginal one

cameras, automated switching and



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the half-full/half-empty glass analogy is particularly apropos here. By reducing cost, Sinclair has facilitated resurgence in local news, a trend that other group owners having sufficient mass to take the same tack will likely study carefully. If the concept is successful, not only will it have saved some jobs in many markets, it might create jobs in markets where news was just too marginal to succeed.

Flint, MI, was the first NewsCentral site. It went on air Oct. 28, with new crews and experienced news staff. The relatively low cost of producing the newscast makes it likely to produce a return in short order. It leverages the strength of a central operation whose cost will be spread across many markets in the future. Michael Eichhorn, general manager of WSMH, said that FOX66 News at Ten will provide mid-Michigan viewers with a new and unique choice for quality news coverage. He described the program as fast-paced news in a 60-minute format, covering local, regional and national news stories, and said it will be aired at a more convenient time for viewers. Perhaps more important, by enfranchising the market with a new product, Sinclair hopes to achieve the goal of all corporations: increasing shareholder return while providing a valuable product.

### Production automation

Much is made of newsroom automation in the form of newsroom computer systems. But there is another automation advance that has emerged in the last couple of years. Most broadcasters have experience with master control automation, which runs from a script generated by the traffic department. Now there are

newscasts free from operator error. But in this case, the entire production control room is squeezed into a single box, combining the functions of video mixer (production switcher), audio mixer, character generator, remote camera control and DVE – essentially all the systems in-



**Production-control-room automation systems like ParkerVision's can replace a room full of hardware and reduce staff.**

stalled in the control room. In a highly structured environment, the system allows for the script and metadata to be ordered on a timeline, which then operates automatically. There are differences between production automation and master control automation, the most obvious being the strict control of master control by a master clock most of the time. Production automation orders the elements, but the transitions must be timed to the actual length of the script as read in the show. Also, the news business, while highly scripted, must routinely accommodate unplanned events, especially in the instance of breaking news. Reordering an entire block of the automation schedule in master control would be nearly impossible, and likely lead to the departure of the unwitting staff. Not so with production automation, where it is

operation in many stations. One group that implemented it in three major markets was able to eliminate 34 staff positions, and dropped literally millions of dollars to the bottom line in doing so. ParkerVision provides the cameras, robotic camera controls – basically, everything but the microphone, lights and set. One trade-off is the lack of choice of cameras – the ones in the package are not high end. The latest lowdown on their offerings should be available on the floor of NAB 2003.

Sundance Digital's NewsLink system takes the newsroom automation script and metadata and extracts the data necessary to control all of the VTRs, server ports and other controllable devices. While in some ways similar to Parker's systemVision, it is not a full automation system with its own mixers, etc., but rather a control system for existing assets. But it does allow a station to leverage the power of some existing assets while reducing control room stress somewhat.

In a logical progression, one might ask for a full script-automation system without encapsulated electronics. This hybrid, which may someday exist, would take the best of both approaches, and provide the Full Monty solution and all of the labor savings. It is an intriguing concept, and a possibility that is appealing to many stations that are not quite ready for wholesale change but still need the savings automation could provide.

### Newsroom automation

Over the last two decades, newsroom computer systems have improved workflow and freed personnel from clerical tasks. At the same time, they have allowed major changes in the speed with which broadcasts can be produced, and the consistency and accuracy of both the content and the production decisions. Who would argue against the use of what amounts to word processing over typewriters in the newsroom? The charm of the "rip and read" newsroom era has given way to the quiet click of keyboards and the simplicity with which copy is passed to producers for review

## Over the last two decades, newsroom computer systems have improved workflow and freed personnel from clerical tasks.

production-control room automation systems that take the script and metadata from the newsroom computer system in much the same way master control takes data from traffic. The goal is much the same: to reduce labor cost and make

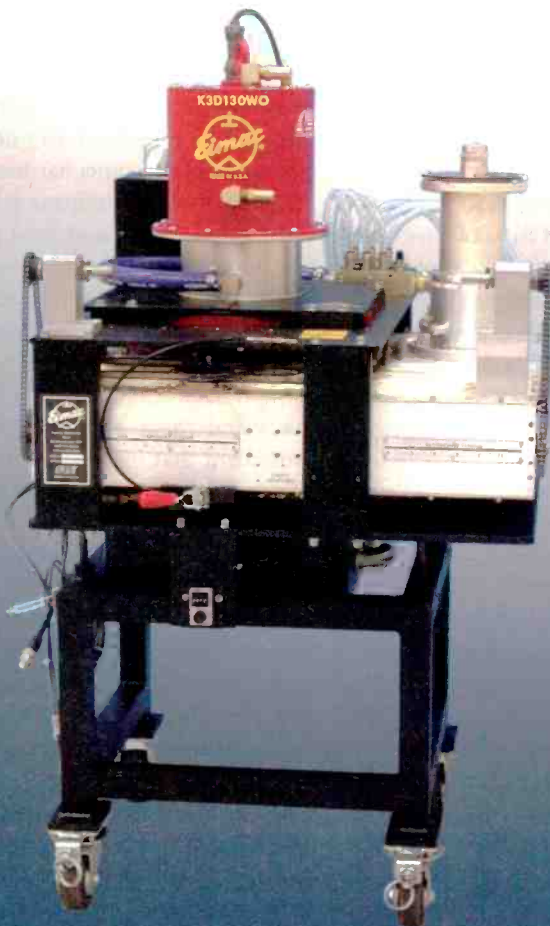
expected that when the script is reordered, cut, rewritten, or even tossed out, the system must accommodate the change gracefully.

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and incorporation into a completed newscast rundown. The ability to load supers and run the script straight to the teleprompter without typing it on yellow fan-fold clearly has improved the economics of news. It is reasonable, however, to ask if it has allowed stations to grab new viewers, raise ratings, and improve cash flow and profit consistently. According to Joe Defeo, corporate news director at Sinclair NewsCentral, it has. He says that technology allows him to distribute the load around the newsroom, and to bring new people into the operation faster. He still can't hire people without skills, but he has found that people with less experience are productive faster in the new automated environment. Less experience leads to lower staffing costs, and the environment could provide a training ground for staff to gain experience and move on quickly. In many industries, that has been the case. Today's college graduate is almost certainly computer-literate and thinks more visually than graduates of a decade ago, and thus fits well into a computerized newsroom with nonlinear editing. Journalism schools, however, need to keep up.

With no full-time newscast to pro-



**Gordon Swenson of ABC's "Nightline" in an Avid suite. Avid introduced and popularized nonlinear editing systems. Photo by Andy Washnik, copyright 2002.**

duce, and thus no pressure to perform, it is difficult for a school of journalism to teach the trade. There are a few notable exceptions, but the high cost of acquiring content and the capital hardware needed to sustain the intensity and relevancy of the hands-on experi-

ence is a significant barrier. There are not many PBS affiliates at universities broadcasting regular newscasts, and even fewer that have the latest newsroom automation and editing tools.

### News editing

Editing news linearly began with news film, which lasted through the '60s and into the '70s. We sometimes forget that the Vietnam War was shot on film and ferried back to the United States by plane. Soon after, film gave way to Umatic ¾-inch videotape, which radi-

cally altered the landscape and permanently changed the immediacy of news production. In the '90s Avid and Ikegami conceived of and designed a hard-disk recorder built onto a news camera. The theory was that one could go directly to nonlinear editing without transferring the media to the NewsCutter for editing. It was a great idea but, at the time, the cost of hard disks was so high that a news photographer may have had \$10,000 worth of disks in his kit. Also, disks could be a high-risk recording medium (if the disk crashed, the content was forever lost). Videotape, by comparison, was considered a much safer and cheaper medium.

But, since then, newer technology has eroded the hard disk's advantage of immediate editing. Years ago, a news editing station required a relatively serious computer (clunky by today's standards), a VTR for ingest, mixers and the usual linear editing tools. With the advent of DV recording, all that can be done in a garden-variety laptop computer. In the last year, LACIE and others have built inexpensive hard-disk recorders that are shock-mounted and have USB and IEEE 1394 FireWire connections. Now, the producer and/or photographer can edit in the car on the way to the station and deliver the finished story to the station with no transfer time. At the very least,

a station can effectively build its own disk-based camera by dropping the FireWire disk drive in the photographer's vest pocket so he can deliver it to the station ready for immediate access.

Nonlinear news editing grew from the general computer editing industry. It was commercially introduced and popularized by Avid. Avid saw a ripe market for hundreds of thousands of dollars in new hardware in each station and the promise of radically changed workflows. Time has a way of chang-

## Seamless integration of newsroom automation and editing systems into a holistic approach is the true editing solution.

ing plans. Today, DV cameras are inexpensive, costing less than 20 percent of the cost of an ENG camera only a decade ago. And DV editing is delivered on millions of home PCs each year. It didn't take long for the computer geek in the maintenance shop to say to the news director, "Give me a few thousand dollars, and I'll deliver you nonlinear editing using consumer hardware." The problem is that nonlinear editing is usually networked, and total production workflow is the ultimate goal. Seamless integration of newsroom automation and editing systems into a holistic approach is the true editing solution. What's missing from the fast, quick and cheap solution is the improvement that integration provides.

But, make no mistake about it, this dynamic has not finished playing out. One manufacturer of news editing products recently admitted that it is hard to refute the perception that such products are simply computers with "a little specialized software." Cisco, SeaChange and other companies are building general-purpose media repositories that allow network-attached storage to mimic the specialized media networks that editing manufacturers sell today, while potentially providing storage for all of a station's media assets, including graphics, stills and moving images.



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The day may come when the hardware is unbundled from the software, freeing the boy genius to save truly large dollars while achieving the same desired goal of full integration of all systems. The savings could make a network of non-linear editing hardware extremely affordable indeed, with a five-station node perhaps under \$50,000. It is hard to say

what the software might cost, but the future holds truly affordable solutions.

Nonlinear editing does not, in and of itself, save labor cost. It is in the implementation that labor can be saved. One important extension of the news-editing cubicle is the ability to give producers low-resolution browse and editing on their desktops. This combines

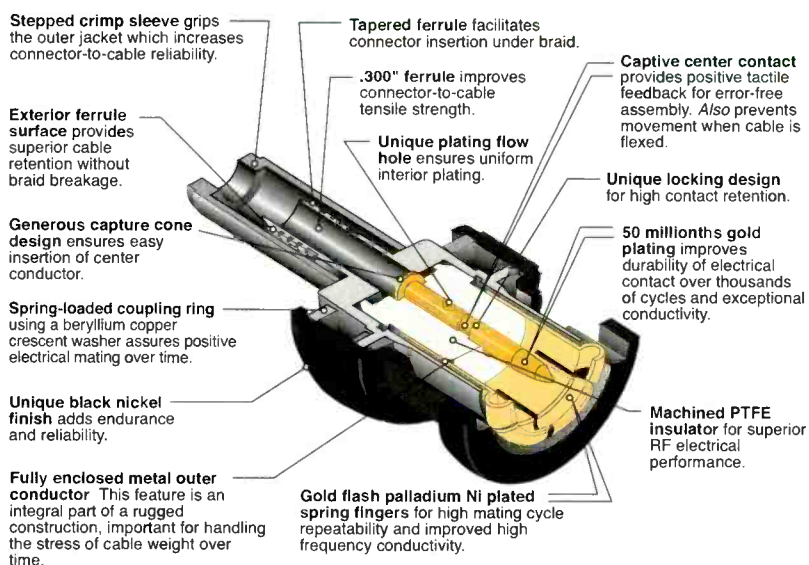
workflow improvements with the ability to more fully use editors, or perhaps work with fewer editors if the producer completes the rough story line without having to have the pictorial and technical skills of an experienced editor. The ability to browse for important content on the network is an important enhancement brought by server-based editing solutions. The central server's content is usually mirrored by a low-resolution copy of the same content, which is used for the browse library. Managing both is usually a mostly automated function, though it is quite possible that stories might be pushed by a media asset management system to an archive, while the proxy remains online for viewing and searching purposes. If the searching system is well designed, it can reduce the search for the needle-in-a-haystack shot to a few keystrokes. Integrating search tools like Virage, Sonic Foundry and others could lead to powerful script, audio and visual searching capabilities within a newsroom system at relatively low cost.

Another money-saving, workflow-improving advantage that newsroom editing systems offer is centralized record and server ployout. Centralized recording can make the media immediately available to all connected workstations and edit systems. It gives multiple users simultaneous access, and gives producers immediate access to begin cutting stories about live breaking news. This alone is worth considerable investment because the resulting improvement in workflow can free staff time for other functions. In addition, scheduled recordings can be executed without intervention, as with regular news or sports feeds, which operate on a scheduled basis. Once ingested, the media is quickly accessible to all. If the ingest operation includes metadata, the database is immediately searchable as well.

### News cameras

Part, in fact the first part, of a news broadcast is the acquisition of pictures and sound. Sony, Panasonic, Ikegami, Thomson Grass Valley, Hitachi, JVC and others have continuously lowered the

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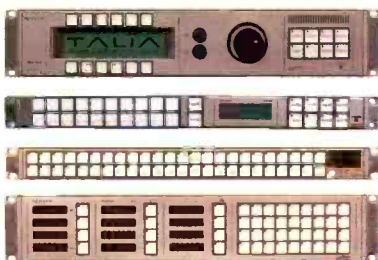
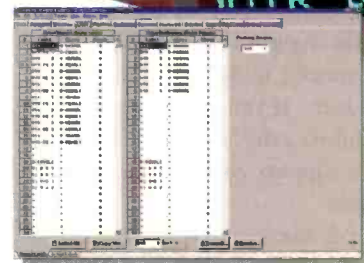
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price of their news cameras while steadily improving the features. Replacing the ubiquitous Betacam are a crop of digital camera formats, including DVCPRO from Panasonic; DVCAM and Betacam SX, the digital cousin of Betacam from Sony; and Digital S from JVC. These cameras provide high-quality pictures, robust digital recording in component form, and features news cameramen need. The same manufacturers also make crossover consumer cameras (so-called "prosumer" cameras) that, like their professional cousins, offer three-chip sensor arrays and DV recording, but are lightweight and low cost. Cameras costing under \$3000 list price have become the mainstay in many stations. Indeed, one national producer gave prosumer cameras and laptops to all producers with the admonition that the producer who could shoot and edit would be more valuable, and thus the inference that they would be more likely to survive budget cuts. This kit can be put in every news car for under \$10,000 – barely more than the cost of a good lens a few years ago.



Many of today's cameras offer improved features to help broadcasters streamline the acquisition of pictures and sound. Photo courtesy Panasonic Broadcast.

### Handling content

Once stories are cut, the results are published to the editorial process, perhaps filling slugs left in the run-down when the newscast was planned. At airtime, no one needs to find the right tapes, load and cue them – now they play from the server directly and are automatically cued to the correct point. At the con-

clusion of the newscast, some stories might be purged, while others are retained for future use, or archived on tape or to a library-management system to become part of the stock-footage library. Some might also be retained for future reference in legal issues, or for other uses. In theory, nothing is ever lost, but the reality is that a system created by man fails at man's hand. Care and maintenance of the library is the final step in the production process, one that cannot be ignored.

Until recently, stations bought national news footage from their network, or another service provider like CNN NewsSource, as a live-from-tape feed that had to be locally recorded. Run-downs were sent as far in advance as possible, allowing the production staff to choose which stories might fit well in the planned newscast. This could generate literally thousands of recordings each year. The RAI Corp. (the Italian network) stores literally tens of thousands of tapes in every nook and cranny in its New York facility. Most television stations do not hold so much material. But, with up to six feeds a day and perhaps two copies of each recorded, the amount of material processed per year can be enormous. In the last four years, the services have struggled to find ways to free the real-time, wide-bandwidth, satellite-based circuits used for news exchanges. The answer again permits major improvements in workflow. Content can be pushed by the provider, or pulled by the station to a server at the station. Stories can be viewed in proxy form on the Web, or even from a proxy server at the station, refilled each day in a trickle of continuous media. Now, the producer can view the material when he wants, tag stories to be kept or request stories be delivered to his server without scheduling operators and worrying about operations errors. The content needed is held locally and purged as needed to keep space available. PathFire has been an innovator in this effort and has gained significant clients at several broadcast news providers.

### The next step

The real goal is to make the next step possible. SMPTE has worked through a technology called material-exchange format (MXF), currently in the standardization process within SMPTE, which will permit the exchange of files between servers and other devices, along with the metadata required to populate searchable databases or automation systems. When manufacturers begin to adopt the standard, it will make it possible to pull stories from the network into a local news editing network seamlessly, along with the metadata, perhaps including transcripts, scripts, timing, descriptive information about the story and other valuable information. Doing that without needing retyping of the data or operator intervention will make a smooth and seamless process that saves time. That's money in the news business.

One person the technology cannot now do without, though, is the computer-network specialist – the network administrator. Complex networks with complicated technology cannot be treated lightly. It would be dangerous for a station to assume that the technology is just desktop computers and therefore manageable by existing IT staff in the station without additional training specific to the new technology and products. If you are going to rely on it 24 hours a day, you would be wise to keep a support person on a beeper at all times.

In the end, it is clear that modern technology allows significant improvements in workflow, speeds operations, and allows a small staff to accomplish a lot. The news business is not automatic; people will always be an important part of the cost of a news operation. But, increasingly, the hardware costs less and the level of equipment sophistication will require training and careful evaluation of staff experience. **BE**

*John Luff is vice president of business development at AZCAR. To reach him, visit [www.azcar.com](http://www.azcar.com).*



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System 5-B



Max Air





## Max Air for San Francisco's KRON Local News Studio

Today's news shows have become more sophisticated, from the graphics and sets to the technology behind the scenes and like all other areas of broadcasting is moving to an all-digital world. San Francisco based, KRON TV, has upgraded their news studio and recently installed a Max Air digital broadcast audio console for their live Channel 4 news. KRON's Max Air console is a 48 fader, 96-channel model with a combination of analog and digital I/O.

Craig Porter, Chief Engineer at KRON said, "The Max Air represents the last piece in our station's transition to digital. The new board gives us much more flexibility in providing mix-minus feeds to the field. It also allows us to interface directly to our already existing digital audio sources for cleaner audio."

Max Air was designed specifically to work in regional stations such as KRON and offers a feature set tailored to live news broadcasts. Channel 4 is an independent television station producing over eight and half hours of local news daily. KRON is owned by Young Broadcasting Inc.

## TVM Ireland Chooses Max Air for OB Truck

The digital transition in broadcast is also in full swing in Europe. Ireland's Television Mobiles Ltd. (TVM) has purchased a 48 fader, 96-channel Max Air digital broadcast console to be installed in their newest 24-camera OB unit. TVM is known as Ireland's premier outside broadcast company. Their current five OB units cover a range of applications including news, entertainment, music and sports.



Bart Arnold, TVM CEO and founder said, "After extensive evaluation by our audio department it was decided that the Max Air desk was an excellently thought-out console. The audio quality is superb and it gives us surround capability up to 7.1. It is the ideal choice for TVM's OB 6, complementing the High Definition vision capabilities of this new unit."

## KVUE, Austin Texas Goes Digital

KVUE in Austin Texas has purchased a Max Air digital broadcast console for their live KVUE News broadcasts. KVUE is owned by Belo, one of the nation's largest media companies with 16 network-affiliated television stations, including six CBS affiliates, four NBC affiliates, four ABC affiliates, one independent station and one FOX affiliate.



Mike Wenglar, Director of Engineering for KVUE said, "KVUE auditioned a lot of consoles before choosing Max Air. The console has a depth of operational features that the competition just doesn't offer. That, along with Max Air's modularity, remote microphone pre-amps, and a fresh approach to how a system should be built helped make us select Euphonix."

## New Broadcast Options for System 5-B and Max Air

### FiberLink for Remote Digital Audio Connection

The new FiberLink connection works up to 1,000m and includes digital bi-directional MADI for up to 56 channels of audio together with the remote mic preamp control link.

### 75ohm AES/EBU MADI Converters

Two new multi-channel converter rack mount units for MADI to AES/EBU 75ohm coax, and AES/EBU 75ohm coax to MADI. Each converter includes 26 digital inputs or outputs (13 AES pairs).

## Digital Audio Mixing Products for Broadcast



**New System 5-B Broadcast Package** — System 5-B, Euphonix's flagship broadcast digital mixing system has just become more affordable with a new mixer software package. The new model allows for up to 96 channels using a single DSP mixer core — this is up from 72 channels.

The new System 5-B includes a dedicated mix minus bus with single button press mix minus outputs and talkback from each channel. The base System 5-B model now also includes the same redundancy and dual mains input capabilities as Max Air and has been priced to fit the demanding budgets of network production.



**Max Air is Now On-Air** — With the first Max Air systems already installed and running, and the Max Air Broadcast Tour having completed 6 months of station demos, Max Air is creating a buzz in the industry. First users are reporting favorably on the operational simplicity and the impressive feature set that Max Air provides.

Max Air is powerful and flexible — with 96 channels, 32 mix buses, 24 clean feeds, 12 aux sends, a built-in router and modular I/O. And, it has been priced to fit the demanding budgets of local and international broadcast stations to ease the transition to digital.

## Game, Set and Match to Seven Network and Euphonix

While Andre Agassi and Serena Williams triumphed on court at the 2003 Australian Tennis Open (January 13 - 26), behind the scenes host broadcaster Seven Network put together a championship-winning performance of their own. With the help of three Euphonix audio consoles, including two of the new all-digital Max Air systems, Seven Network not only provided exclusive Australian coverage for their own broadcasts but also delivered feeds to 25 international broadcasters.



With over 300 Seven Network staff involved in technical installation and operation 'The Open' is the largest annual OB in Australia. Network Seven's host broadcasting commitment necessitated that all matches, on any of the five major courts were

constantly available to international broadcasters as separate mono, stereo and multi-format live feeds.

"The system complexity made the analog or digital decision for us," commented John Hancock, Head of Technical Production, Seven Network, Melbourne. "After seeing Max Air in October last year we were confident that it had all the facilities and operational flexibility that we needed — and we were right!"

Those at the wheel found Max Air to be a very pleasant drive. George Hennessy, Audio Supervisor Seven Network Melbourne said "For me 'Max Air' was power and control with heaps of both, it's a wonderfully flexible, sonically accurate, intuitive broadcast mixer." He added, "The Max Air was operated by people with limited knowledge of the unit. However, with a couple of days of 'hands-on' instruction everyone was fully confident. Throughout the whole tournament, 14 days of competition plus 7 days of setup, we found the consoles to be easy to operate, easy to setup and completely stable."

## Two Max Air Consoles for Television New Zealand

### Max Air Swings into Action at the New Zealand Golf Open

The new Max Air console installed in Moving Pictures' latest OB truck got its first on-air run-through for the 'New Zealand Golf Open' in January 2003. This is the first OB truck completed with a Max Air console.



The 96-channel, 32-fader Max Air was specifically designed to work well in OB trucks and this first live broadcast proved the fact. As the outside broadcast division of Television New Zealand (TVNZ), Moving Pictures operate nine outside broadcast units

in New Zealand, ranging from 16 camera-capable semi-trailers to three camera capable OB facilities. They also offer 'Fly Away' capability allowing service to clients throughout the Pacific Rim.



### Avalon Production Studios Upgrade to Digital Audio

TV production facility Avalon Studios, also a subsidiary of TVNZ, has installed a Max Air for program creation. The 32-fader, 96-channel Max Air system went on-air in February 2003. Avalon Studios is one of the major film and television production facilities in the southern hemisphere, consisting of television studios, post-production facilities and sound mixing suites. TVNZ operates two national networks attracting 70% of New Zealand's total market share.

Learn More At: [www.euphonix.com](http://www.euphonix.com)

#### Phillips Jupiter Router Connectivity

Two-way high speed control connectivity between the Euphonix Studio Hub digital audio router and third party routing environments such as the Phillips Jupiter router control system.

#### Max Air Offline Session Setup

Max Air's touch screen application and file system can now be run on a PC laptop running Windows XP. Max Air Titles can be created from scratch or edited offline.

## System 5-B or Max Air?

System 5-B and Max Air use the same DSP core, I/O and have the same EQ, dynamics, surround panning software, and multiple surround format mix busses, together with many similarities in operation and routing. They differ in two respects; the control surface, and the number of inputs and outputs.

System 5-B has 8 knobs per channel (as opposed to Max Air's 4), hi-res stereo meters next to each fader and a color screen at the top of the channel strips showing routing, metering and panning graphs. Both base systems have 96-channel capability but System 5-B can be expanded with additional DSP and routers and includes dynamic automation. As a result Max Air is a more cost effective solution for the majority of broadcast applications.



In larger facilities, combinations of Max Air and System 5-B allow project planners to install operationally compatible systems to meet exact production needs in each studio.

## Redundancy & Reliability

Both Max Air and System 5-B share the same rugged DSP and I/O hardware. Both systems are designed for the rigors of on-air broadcasting with comprehensive redundancy packages including redundant power and AC mains for the surface, DSP core, system computer and converters. They also include RAID array redundancy of the system hard drives and optional redundant DSP card. Both systems have built-in software diagnostic routines.

# Max Air Broadcast Tour Continues!



The custom built Max Air Broadcast Tour vehicle hit the road in Sept 2002 with an ambitious route taking it to over 77 cities in the US and Canada and visiting over 35 SBE local chapter meetings. The truck features the new Euphonix Max Air console, and is set up to simulate a local TV news digital audio control room. In each city the vehicle will be visiting up to 5 stations to allow operators, management and technicians to see the possibilities and powerful features that digital audio and video can bring to local TV operations. Check the tour schedule opposite and call or email Jonathan McDonell (650) 846-1114 (email: [jmcdonell@euphonix.com](mailto:jmcdonell@euphonix.com)) to request the truck to visit your station.

## 15 Years of Innovation from Euphonix

Euphonix this year celebrates 15 years of innovation in professional audio. Based in Silicon Valley, California, Euphonix was founded in 1988 and introduced the first commercially and operationally viable digital control analog large-format console. With up to 96 audio channels, SnapShot: Recall of all console parameters and a digital console surface with remote analog audio racks, the CS Series of consoles found instant favor in all markets. Seven Network in Australia was the first broadcaster to purchase the console in 1991 followed by many top broadcast organizations including NBC, CBS and Fox in the US and international broadcast organizations including RAI Italy, ABC Australia, NHK Japan, and CCTV in China.

Over 100 broadcast facilities have chosen Euphonix for their on-air, outside broadcast and production audio mixing requirements. Euphonix's latest product offerings are the all-digital System 5-B mixing console, which has been shipping for over three years, and the powerful new Max Air mixing system designed to make the transition to digital affordable for all stations.



### Extended US Tour Dates

Arrival Date	Last Day	Location	SBE Local Chapter Meeting Dates
<b>2003</b>			
Mon Mar 03	Thu Mar 06	Vancouver	
Fri Mar 07	Tue Mar 11	Portland	Tue Mar 11
Wed Mar 12	Tue Mar 18	Seattle	Thu Mar 13
Thu Mar 20	Fri Mar 21	Salt Lake City	Fri Mar 21
Wed Mar 26	Fri Apr 04	Las Vegas	Thu Mar 27
Fri Apr 04	Sat Apr 05	Las Vegas PBS Conference	
Mon Apr 07	Fri Apr 11	NAB Las Vegas	

See us at NAB: Euphonix booth N3014, Broadcast Tour Truck booth MM203

Mon Apr 07	Fri Apr 11	NAB Las Vegas	
Mon Apr 21	Fri Apr 25	Denver	Wed Apr 23
Mon Apr 28	Wed Apr 30	Wichita & Hutchinson	
Thu May 1	Fri May 2	Kansas City	Thu May 1
Mon May 5	Fri May 9	St. Louis & Springfield	Thu May 8
Mon May 12	Wed May 14	Chicago	
Thu May 15	Fri May 16	Milwaukee	
Mon May 19	Fri May 23	Cincinnati & Columbus	Thu May 22
Mon May 26	Mon May 26	Holiday (Memorial Day)	
Tue May 27	Fri May 30	Toronto	
Mon Jun 2	Fri Jun 6	Buffalo & Rochester	Mon Jun 2
Mon Jun 9	Fri Jun 13	Syracuse & Albany	Wed Jun 11
Mon Jun 16	Fri Jun 20	Montreal	
Mon Jun 23	Fri Jun 27	Hartford & New Haven	Tue Jun 24
Mon Jun 30	Fri Jul 4	New York City	
Mon Jul 7	Fri Jul 11	Wilkes Barre & Scranton	Mon Jul 7
Mon Jul 14	Fri Jul 18	Harrisburg & Johnstown	
Mon Jul 21	Wed Jul 23	Wash D.C.	
Thu Jul 24	Fri Jul 25	Arlington	
Mon Jul 28	Fri Aug 1	Richmond, Norfolk & Newport News	
Mon Aug 4	Mon Aug 11	off	
Mon Aug 18	Fri Aug 22	Raleigh, Durham	
Mon Aug 25	Fri Sep 5	Charlotte	Mon Aug 25
Mon Sep 1	Mon Sep 1	Labor Day	
Tue Sep 2	Fri Sep 5	Ashville, Greenville	
Mon Sep 8	Fri Sep 12	Charleston, Savannah & Columbia	Tue Sept 9
Mon Sep 15	Fri Sep 19	Jacksonville, Orlando	Wed Sept 17
Mon Sep 22	Wed Sep 24	Tallahassee	
Thu Sep 25	Fri Sep 26	Mobile	

### US Tour Sponsors

The companies listed below have provided audio and video equipment that interfaces with Max Air to help create a realistic state-of-the-art digital broadcast environment.

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## Revisiting Kell

BY MICHAEL ROBIN

The 1930s witnessed an unprecedented technical development frenzy in television. In the United States, in 1933, RCA had developed a 180-line, progressive scan, 24Fps all-electronic system. In a paper published in 1934 by Proceedings of

by an all-electronic camera using an iconoscope and 180 progressively scanned lines. While experimenting with different types of static pictures containing horizontal and vertical wedges of increasing detail it was realized that the vertical spatial resolution rarely equalled the number of

Eventually it came to be called the Kell factor. It could have just as well been called the Bedford or the Trainer factor.

The IRE paper further details the synchronizing pulses, the electrical signal, the video amplifiers and the transmitter. This early scanning standard was unsatisfactory because of excessive flicker due to the low number of 24 progressive frames per second.

The 1930s witnessed an unprecedented technical development frenzy in television.

the Institute of Radio Engineers, RCA Engineers R.D. Kell, A.V. Bedford and M. A. Trainer described an experimental television installation located in the Empire State building.

Initially, the camera used a Nipkow rotating disc with 120 scanning lines. This camera was later replaced

active lines. It was determined that, statistically, the vertical resolution equalled 64 percent of the number of active lines. To achieve the desired vertical resolution the number of scanning lines was increased to 240, resulting in a bandwidth of 600 kHz. The 0.64 figure was called the k factor and was later rounded up to 0.7.

Source	Kell factor
Kell, Bedford and Trainer (1934) <sup>1</sup>	0.64
Mertz and Gray (1934) <sup>2</sup>	0.53
Wheeler and Loughren (1938) <sup>3</sup>	0.71
Wilson (1938) <sup>4</sup>	0.82
Kell, Bedford and Fredendall (1940) <sup>5</sup>	0.85
Baldwin (1940) <sup>6</sup>	0.70

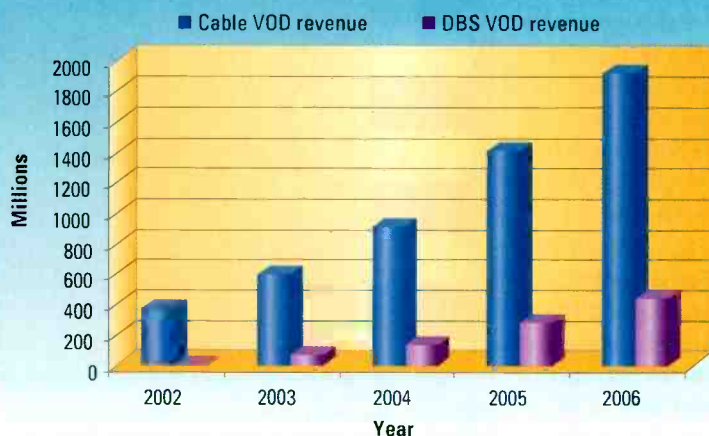
Table 1. Several different numerical values have been reported for the Kell factor — variations probably caused by differences in picture display systems, and subjective picture quality appreciation.

### FRAME GRAB

A look at tomorrow's technology

#### VOD dollars

#### Cable outweighs DBS in revenue from VOD



SOURCE: Kagan World Media

www.kagan.com

Various writers have reported different numerical values for the Kell factor (see Table 1). The variations from one source to another are probably attributable to differences in the picture display systems used by different observers, as well as subjective picture quality appreciation.

It is interesting to note that, contrary to what some people think, the Kell factor concept was initially related to progressive scanning simply because interlaced scanning had not been invented yet! So the Kell factor simply reflects the combined camera/CRT capture/display ambiguities, which affect equally the progressive and interlaced scan formats!

Figure 1 illustrates the effect of the combined effects of the camera and CRT scanning spot shape and size

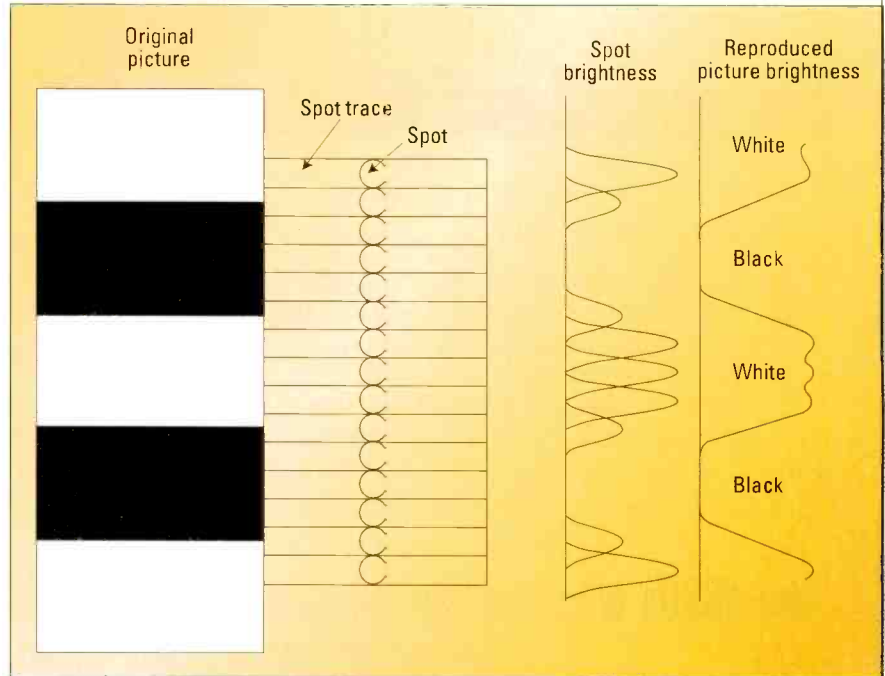
on the vertical resolution of the television picture. It is evident that the larger the number of scanning lines, the better the quality of the reproduced picture. The vertical resolution can evidently not exceed the number of active lines. But can it equal it? Figure 2 shows an ideal case when the number of active lines equals the number of vertical details in the picture. With camera-generated signals this is practically impossible to achieve because there is no way to ensure the details will constantly line up with the spot scanning structure. Most of the time, as shown in Figure 3, the spot will straddle the picture details, resulting in a loss of vertical resolution. The Kell factor merely expresses this vertical resolution uncertainty. Remember that we have been dealing with progressive scanning until now.

### Towards high-definition television

By 1934 RCA had introduced a new, higher-definition scanning format. The number of scanning lines was now increased to 343 and the scanning was interlaced, and the pic-

**The Kell factor concept was initially related to progressive scanning simply because interlaced scanning had not been invented yet!**

ture repetition frequency was raised to 60 fields/s (30Fps). The interlace was rather poor because there were no equalizing pulses. By 1938, the number of scanning lines was increased to 441, interlaced, with pre- and post-equalizing pulses and ex-

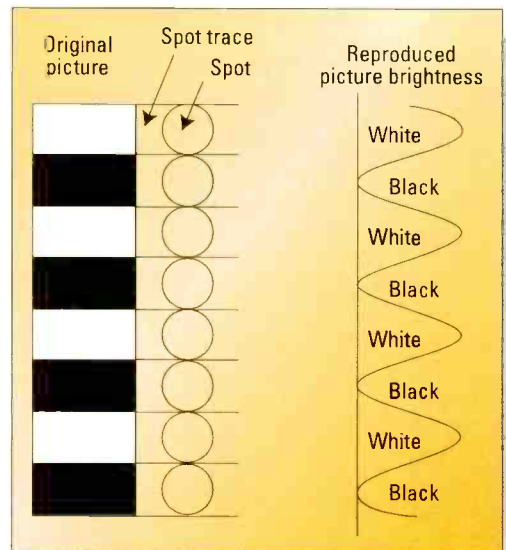


**Figure 1. The camera and CRT scanning spot shape and size affect the vertical resolution of the television picture. As the number of scanning lines goes up, so does the quality of the reproduced picture. Vertical resolution cannot exceed the number of active lines.**

cellent interlace. The transmission channel was now standardized to 6MHz with a full video upper sideband and a vestigial lower sideband, the video modulation was negative, and the audio modulation was FM. By 1941 the number of lines was increased to 525 and the FCC approved the system, which was called NTSC. Very few things have changed since then. It is to be noted that this system, a precursor to the post-war European 625-line system, was now based on the Kell factor in an effort to achieve equal horizontal and vertical spatial resolution.

In the UK, the 1920s legacy, the Baird electromechanical capture and display system, reached a picture format of 240 lines progressively scanned with a huge Nipkow wheel. For a while, in 1936, this system was alternated on a daily basis with an all-electronic system

developed by Marconi-EMI. The Marconi-EMI system had a scanning format of 405 lines interlace scanned, 50 fields/s (25Fps). The interlace was rather poor because there were no equalizing pulses. The



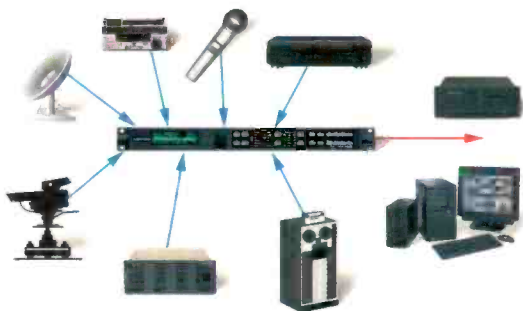
**Figure 2. Vertical resolution equals the number of active lines when the raster lines are centered on the picture details. It is nearly impossible to achieve a vertical resolution equal to the number of active lines when using camera-generated images.**



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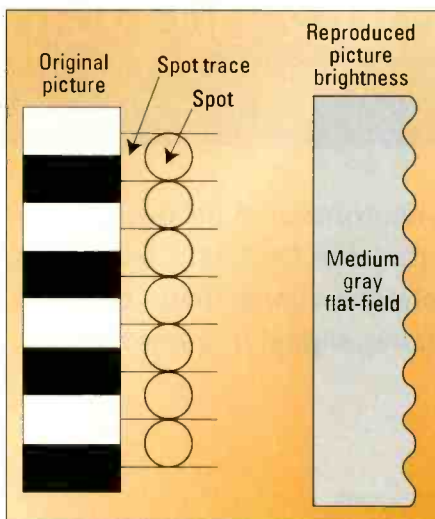
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transmission was double sideband, positive modulation and the audio modulation was AM. By 1937 the BAIRD system lost to Marconi-EMI. By 1939 there were some 20,000 home receivers in use in the London area. The transmission ceased in 1939 at the beginning of the war and restarted in 1946. The same standard was kept except that the VHF spectrum was organized into 5MHz channels featuring a full lower sideband and a vestigial upper sideband. Transmissions in this standard ceased in the 1980s.

### Progressive vs. interlaced scanning

In addition to the spatial vertical resolution limitations, which it



**Figure 3. A loss of vertical resolution results from scanning spots straddling picture details.**

shares with progressive scanning (equal Kell factor), the interlaced scanning introduces its own peculiar artifacts. Movement-related artifacts result in "judder." This effect is added to other related effects such as film-related stroboscopic effects, popularly known as "the wagon wheel effect," and the 3/2 process of film-to-video transfer. Progressive scanning is unaffected by judder but keeps the other two effects.

A special interlaced scan spatial

resolution problem, called interline flicker, occurs when sequential lines, in alternate interlaced fields, contain a great deal of vertical detail, as shown in Figure 2. This is unlikely to occur with camera-captured pictures, except sporadically. Interline

flicker is 30Hz (25Hz in Europe) and, when present, is visible when the viewing distance is less than six times the SDTV picture height (three times for HDTV). In the 1930's this was considered a small price to pay for the reduced transmission bandwidth. The only signal source that will consistently generate interline flicker is the character generator. Progressive scanning displays are unaffected by interline flicker, but require twice the video signal bandwidth. The large area flicker frequency for both progressive and interlaced television is 60Hz (50Hz in Europe).

Computers use progressive scanning and high picture repetition rates to avoid interline flicker and large area flicker. Their vertical resolution is equal to the number of active lines. This is due to the fact that the computers, unlike cameras, can assign individual brightness values to each individual scanning line.

Interlaced scanning is just about 70 years old and used by all SDTV 4:3 aspect ratio formats. Is it a compromise? Definitely, but a very popular one if we consider the huge number of television receivers used throughout the world. In conclusion, is progressive scanning superior to interlaced scanning? The answer is definitely yes! Is there a definite trend towards progressive scanning in broadcasting equipment? Here there are many things to consider including the fact that the ATSC has left the choice to the broadcaster. It is the

marketplace that will decide how things will develop, and at what pace and price.

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# Computer backup systems



BY BRAD GILMER

**B**acking up data has always been a concern of anyone who uses a computer. It can be of special concern to broadcasters for obvious reasons; the needs of the broadcaster are unique. Broadcasters may need to back up critical software programs on the order of several megabytes, or they may need to back up video files larger than several gigabytes. In this month's article, we will focus on backup of conventional computer files. You probably will choose to back up massive video files using some other approach, such as mirrored servers or tape backup.

I can remember a few years ago using a backup program called Fasttrack, backing my data up to a 1.2MB floppy disk. As with many things about computers at the time, it was cumbersome to use and you always said a little prayer when you had to restore a file. Some things with computers have gotten easier with time and improved technology. The process of backing up data is much easier now, but I still say that little prayer when I need to restore a file or drive.

## What to back up

It may seem an obvious question, but what exactly should you back up? Your first response may be, "Well, everything on the disk, of course." This certainly is one approach, and it can

be effective. But consider this – the critical programs you run on your computers are usually stored on CDs, hopefully locked in a file cabinet somewhere in Engineering. This software is readily available on short

reasons. First, if you start with a blank disk and reload the operating system, you start with a fresh registry and system file directory. All vestiges of programs you may have loaded but later uninstalled are removed. If

**It may seem an obvious question, but what exactly should you back up?**

notice. Unless the software requires complex configuration after it is loaded, you might consider reloading

you reload from a disk image backup, your disk will be just as cluttered as it was before the installation.

Second, corrupt system or application files may have caused the failure in the first place (assuming you are restoring after some sort of problem). Reloading from your backup may reintroduce those corrupt files back into the system. I partition my storage into two logical drives. I use the C: drive for operating system and application software. I use the drive D: for data created by these applications. When I do a backup, I do one backup of drive C: and put it away "just in case." I then put my drive D: on a regular backup rotation (one complete backup per week, and then one incremental backup every night). If I have a failure, I reinstall the operating system and applications from the

original disks onto the C: drive and then reload the data from the most recent backup set onto the D: drive.



**The iomega USB Mini drive holds up to 128MB of data in a device about the size of a pack of matches and is a great way to back up presentations and other data that need to be kept portable.**

it from the original distribution CDs rather than loading from backup. This may be a good idea for several



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With this system, my backups take less time and perhaps result in a cleaner restore than if I simply back up both drives and then restore both of them at a later time.

No one backup solution is going to work for everyone. Backup devices range in size starting at 64MB and go up from there, although you can still use 1.2MB floppies if you like. We will divide the devices up into two categories, personal and corporate. Some could easily fit in both categories. I will focus on the hardware devices in this article. There are a number of software programs, such as Symantec's Ghost, that create a mirror image of the contents of your hard drive. These are often the fastest way to recover a failed computer, but you will still need a storage device upon which to place the disk image.

Personal devices vary widely and can be used as mobile devices to move data, not just for backup. (See Table 1.) The Iomega devices have long been a favorite for personal data. They are simple to use and come in a wide variety of

choices for backup. Where CD-R/CD-RW shines is in the archive arena. There is no better way to

choices for backup. Where CD-R/CD-RW shines is in the archive arena. There is no better way to



**The Seagate Viper tape drive using Ultrium tapes can store up to 200GB per cartridge at 2:1 compression, with a throughput of up to 1.92GB per minute.**

Personal backup devices	Drive cost	Media cost
Mini USB Drives (64MB, 128MB or 256MB)	\$59.95 - \$159.95	N/A
ZIP drive (100MB, 250MB or 750MB)	\$69.95 - \$199.95	\$11.99 - \$14.99
CDR/CDRW drive (640MB)	\$85.99 - \$224.99	\$0.69 - \$1.29
External removable hard drive (40GB-120GB)	\$129.99 - \$499.99	\$69.99 - \$279.99
Seagate Travan 40GB tape backup	\$369.99	\$49.99

**Table 1. Personal backup devices range in capacity and price, and can often be used to transfer data as well as serve as backup. New Mini USB drives may be useful for storing small amounts of data in a portable manner.**

sizes. A relative newcomer is the Mini USB drive. These drives plug into the USB port and can be used to back up or transfer personal data up to 256MB. These devices are more targeted at transferring data than for backup; however, this can be a useful backup device for someone who is on the go and doesn't have a great deal of data. Most of you are familiar with ZIP drives, which now come in sizes ranging from 100MB to 750MB.

CD-R/CD-RW drives have increased

times (in other words, once they are burned, you cannot erase them). CD-RW drives are write-many, read-many devices. There is a limit to the

number of times you can erase and rewrite a CD-RW disk (somewhere around 1000 times). CD-R/CD-RW drives are popular due to their capacity and availability, but backing up data to a CD-R/CD-RW drive is time-consuming compared to other backup devices. If you regularly make changes to your data, there are far better

archive data that you don't need to change than CD-R. DVD-R drives are also available; they too can be good for backup. However, the added expense of the DVD-R still leaves it on the emerging technology list. There are still some issues with interoperability of DVD drives. Just as there are CD-R and CD-RW, DVD technology includes erasable and non-erasable media.

External hard drives are becoming ever more popular as a backup device. They can even be bootable in event of a failure. There are several manufacturers that make bundled external hard drives ready to use. However, one problem with these systems is that if you want a larger drive, you may be limited to drives from the manufacturer of your current drive. It is also

possible to find manufacturers that use standard 3.5-inch EIDE or SCSI drives. These are preferred due to the interchangeability of the drives when you outgrow a specific capacity.

Corporate backup devices	Drive cost	Media cost
Seagate Travan 40GB tape backup	\$369.99	\$49.99
Seagate DDS/DAT drive (40GB-240GB)	\$825.00 - \$2489.00	\$19.99 - \$89.00
Seagate Ultrium drive (200GB-2200GB)	\$4995.00 - \$9315.00	\$89.00
Iomega NAS (network area storage) (160Gb-720GB)	\$2199.00 - \$5999.00	N/A

**Table 2. Companies may pay a high price for corporate backup devices, but with higher price comes improvement in performance measures such as I/O speed, seek times and mean time to retrieve (MTTR).**

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One thing to be cautious of when selecting an external hard drive is how it interfaces with the computer. Most common today is the USB connection;

corporate devices can get expensive rather quickly. But as costs go up, so does performance. Performance measures such as I/O speed, seek

of these devices comes when you put multiple units into tape libraries. At the moment, they are almost the only solutions for backing up large amounts of data (short of the very large MAM systems offered by a number of manufacturers for video). While these systems can store a lot of data (up to 2200GB), they can be quite expensive, and may have recurring maintenance expenses as well.

## No one backup solution is going to work for everyone.

however, you can also get parallel and SCSI interfaces. Make sure that your computer has the correct interface.

times and mean time to retrieve (MTTR) all improve. The DDS/DAT drives replaced the Travan drives as

The Iomega NAS (Network Area Storage) device is listed here just as

another option. It isn't really a backup device, but more of a storage device for networks, such as a hard drive for a computer. However, it can be used as a backup device if so desired. The NAS devices can be configured with various levels of RAID to make them redundant. In fact, you might think about taking an old computer, putting a 100Base-T card and a large disk drive in it and using it as an online storage system. Falling disk prices have made this a viable and economical solution. Once the system is on the network, map a network drive on the local computer and then backup the local computer to the network drive.

BE



**External hard drives up to 120GB capacity are available from Iomega. The software that ships with the drives can either back up data as it is changed, or it can back up on command. The unit uses off-the-shelf drives.**

The Travan tape drive at one time was the premium tape backup unit for personal use and most small businesses. With new technologies and larger capacities it has all but fallen from use. Seagate is the only manufacturer that still produces the drives. The media is readily available through a number of manufacturers. It is still a good option for capacities up to 40G, but in recent months I have found that some stores have stopped carrying these products.

As you can see from Table 2, the

new technology. Unfortunately, these new drives cost more than twice as much as the Travan. The upside to the DDS/DAT drives is that the media is a fraction of the cost of the older Travan tapes, and they can break the 40GB barrier. DDS/DAT drives normally have a SCSI interface, so be sure that your PC will support SCSI before purchasing one of these drives.

The Ultrium drives are enterprise backup solutions. You can purchase single drives; however, the real benefit

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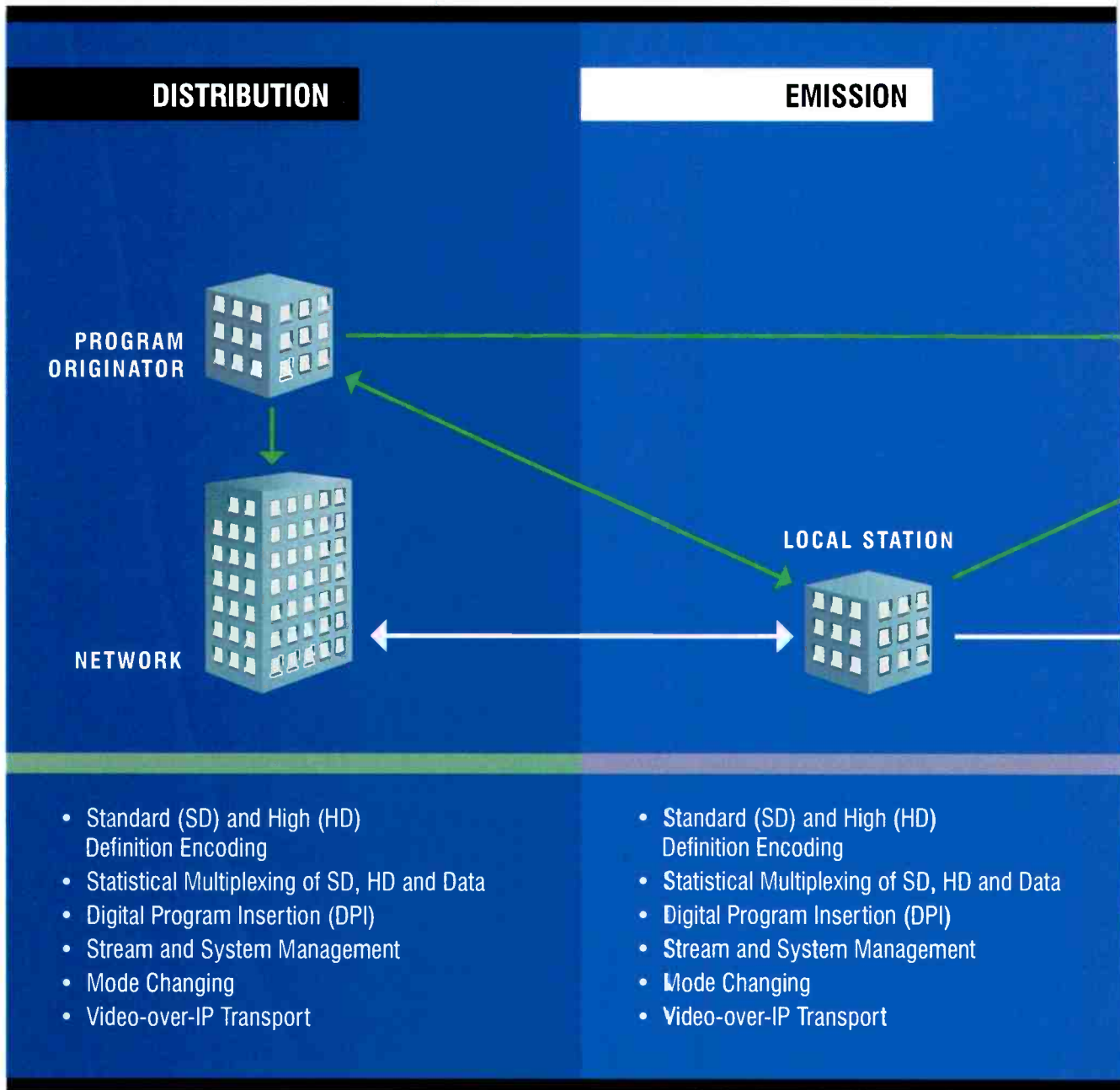




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## New scalable multichannel audio solutions

BY TED LAVERTY

The numbers are explosive: DVD player sales are up 39 percent this year and expected to reach 90 percent U.S. household penetration by 2010. Accordingly, consumers' tastes and expectations are becoming more sophisticated when it comes to both sound and picture quality. In order to compete with high-resolution formats, such as DVD and the emerging D-VHS, broadcasters are increasingly pressured to deliver an experience not currently available through standard broadcast systems. One of the ways that broadcasters can do this is by offering scalable surround sound options with their programming.

One multichannel technology available for home theater installations is from Digital Theater Systems (DTS). In conjunction with the DVB Forum, it is introducing an DVB-compliant encoding system for surround sound that is compatible with terrestrial broadcast,

### The audio chain

A typical broadcast installation would use a DTS encoder to develop a datastream from up to six channels of pre-processed audio. The encoder pro-

The system does more than just multiplex audio channels. During the audio encoding process, the encoder also loads the audio stream with the Packetized Elemental Streams needed for proper de-

**Broadcasters are increasingly pressured to deliver an experience not currently available through standard broadcast systems.**

vides the processing to sample and scale the audio based on the desired number of inputs and desired quality output.

This data rate can be scaled from 64kb/s up to 1.5Mbps for 5.1- or 6.1-channel. The audio sampling frequency includes 44.1, 48, 88.2 and 96kHz. The system can accommodate multiple configurations including mono, stereo, 5.1- and 6.1-channels. One advantage of these high sampling rates is that they result in a higher-quality decoded signal.

coding. This provides the program supplier with the same control over program audio dynamics as with other systems.

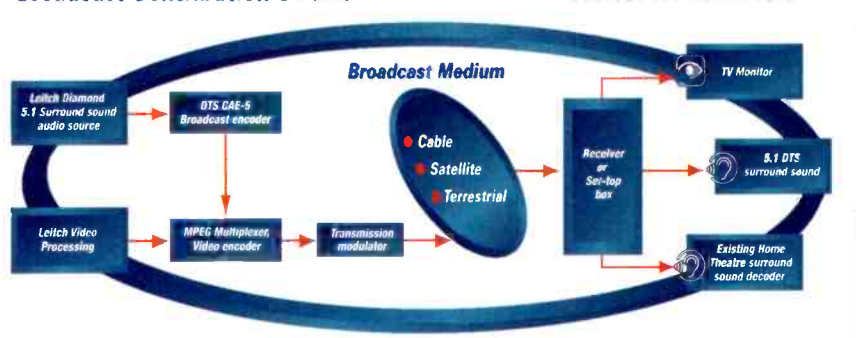
### Compatibility

A key broadcast concern with any audio surround system is the need to remain compatible with all consumer receivers and decoders. With the DTS system, viewers need only an STB or receiver with a standard SPDIF output to receive full surround sound audio. (See Figure 1.)

DTS is licensed for most companies' home theater equipment, so it's common to see the digital output jacks on the back of these units. Some manufacturers are even adding multiple SPDIF outputs so users can switch between a variety of digital audio sources, not just broadcast. For those of us who grew up listening in monaural, getting six channels of audio from our television stations seems like a dream. Fortunately, it has come true. **BE**

### Broadcast Contribution Circuit

### Receiver Home Circuit



**Figure 1.** This typical audio system supported by Leitch and DTS equipment would give a station a simple and compatible transmission audio chain from source to receiver.

as successfully proven by a test conducted this year by Swedish Radio. In conjunction with Leitch, it has developed an audio system capable of encoding six channels of digital audio into a standard MPEG-2 video stream.

While the current AC3 system transmits at 384kb/s, this encoder will allow the broadcaster to choose whatever audio bandwidth is desired. For typical discrete 5.1 transmissions this can range from 384kb/s up to 1.5Mb/s.

*Ted Laverty is director of business development for DTS Europe.*

*Editor's Note: Background information for this article was supplied by DTS. For additional technical information go to their Web site at [www.dtsonline.com](http://www.dtsonline.com) and click on the "Tech Info" section.*

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MON 3-6 WTTB OTV



MON 9-4 TCM America  
Edge of the City (TV-PG)

MON 9-5 TCM America  
Edge of the City (TV-PG)



# Turner Entertainment's Network Operations Center



The transmissions operation center is divided into two portions: incoming and outgoing, the latter of which is pictured here. This area serves as a final QC point as signals from all 19 networks are sent out of the building to the satellite.

**H**ow do you design and construct a major broadcast television facility when you have the unique opportunity of starting from scratch? Turner Entertainment Group, a division of Turner Broadcasting System, built a 193,000-square-foot broadcast facility at its Atlanta headquarters. The original facility had been filled to capacity with 19 television networks distributed to cable television operators throughout North and South America.

Just over two years ago, Turner Studios moved out of the old building and into a new structure on the 33-acre campus. It was during this period that plans developed to move Network Operations, the broadcast division, into an advanced facility of its own.

Ground broke on the project on March 13, 2000, clearing several parking areas to make way for Network Operations' facility and an office building. Turner Construction and KPS Architects provided the bulk of the building work as plans were being drawn for the massive layout of the new facility. Perkins & Will interior designers and systems integrator AZCAR assisted in the preliminary design. MCSi, a systems integrator out of Atlanta that also worked on the new Turner Studios facility, was brought on later to help develop the

HD equipment as it is added. Furthermore, the building is designed to employ file distribution as opposed to strictly audio/video distribution. This allows air material (programs, commercials, promos) to be delivered as files via fiber or satellite and enter the building as data instead of the traditional audio and video. Error-checking takes care of automatic resends should part of a file be corrupt, and programs are subsequently stored on a central server for easy access by network-distributed servers when needed.

As of September 2003, this facility will be home to the 19 Turner television network feeds. The first networks to move were TNT East and TNT West in December 2002, followed in March by TBS Superstation, local channels WTBS-17 analog, WTBS-20 digital and regional network Turner South. Of the 13 remaining networks, Cartoon Network East and West, Boomerang and Turner Classic Movies will move this May. The final nine networks, all Latin American, launch in September. With their associated equipment, the current 19 feeds will occupy 10 active control rooms. There is space in the new building to eventually accommodate up to 30 control rooms and 87 feeds.

The current 19 feeds originating

## How do you design and construct a major broadcast television facility when you have the unique opportunity of starting from scratch?

final design, produce the drawing package, and assist with the wiring and installation. MCSi is still on-site, handling all equipment logistics for the final stages of construction.

The new, all-digital network operations center offers room for network expansion and connectivity with its high-definition infrastructure. All facility wiring and routing is HD-capable and can easily accommodate

from the network operations center are conveniently centralized on the first floor of the six-story building. The lower three, with computer flooring, were designed for technical equipment to support the broadcast operations.

The 10 active control rooms, or broadcast operations centers (BOCs), are comfortably isolated from one another and are divided

BY RON TARASOFF

MARCH 2003

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among four separate "pods" with four control rooms each. In the event of a major equipment or software problem in one of the pods, the others will remain unaffected due to this isolation. Each pod features a spacious, glass-walled, central supervisor's area for overseeing operations. Supervisors can also make changes to the individual automated playlists. The pods contain mostly computer-based equipment associated with Chyron Pro-Bel automation and its MAPP playout systems for machine control.

Though each pod features four control rooms, the number of active control rooms and quantity of feeds from each control room varies. For example, the international BOC will initially handle nine feeds between three operational control rooms, while an additional control room remains available for future channels. Meanwhile, the TBS BOC has three active control rooms, and a fourth is already earmarked for use later this year. Of these three active control rooms, TBS Superstation and Turner South each have their own control room with

share the third control room.

Each BOC has full redundancy in case of failure, with an A chain and a B chain of equipment for every feed. In the event the A chain fails, a push of a button switches to the B chain and its duplicate complement of equipment. Likewise, if maintenance is needed on a piece of equipment within the A chain, the B chain is switched on without being noticed by viewers. A switching system was de-

Two 50-inch Barco projection displays round out each control room to monitor the various inputs and what is happening on air. These are rear-projection monitors that use the Barco Hydra for displaying multiple pictures on each screen. The redundancy factor figures into this setup as well: If the left display burns out, one button shifts all monitoring capabilities to the right display, and vice versa. Flexibility to alter the

## Turner Entertainment broadcasts numerous live events, especially sports, from its transmissions operation center.

signed in-house by Turner engineers to accomplish these tasks.

Each network chain (A or B) contains a separate automation system synchronized with the other chain (38 systems in all, with a total of 168 associated computers for playout to server, ingestion and other purposes). Both systems independently run a playlist and are separately connected to their own Pinnacle MediaStream 900 server on separate SANs and Thomson Grass Valley

size of separate video windows serves as one advantage, while the ability to view a feed in HD means simply changing a card within the system. Information from the automation system (with A chain information coded red and B chain information coded blue) is also readable on the screens.

Some equipment is shared between the A and B chains. A 360 Systems DigiCart serves both chains for voiceovers and other audio work, and a Fibre Channel managing server is shared to move material between the redundant Pinnacle servers, if necessary. There is more sharing in the international BOC. Here, the Chyron Aprisas are shared and the B chain uses a simple 10x1 switcher. International live programming, while rare, is assigned to the A chain.

To perform voiceovers, or otherwise manipulate and mix audio in the control room, Snell & Wilcox IQ Modular equipment for audio de-embedding is installed. Throughout the facility, wherever possible, sound is embedded with the picture to avoid "lip-flap" that comes from processing signals. This is particularly useful during live events where satellite transmission, video effects, encoding, decoding and synchronizing all play a role in delaying video.



**The supervisor's area of the TBS pod offers a view of the TBS Superstation and WTBS local analog/digital broadcast operations control rooms.**

small producer stations for live programming, while feeds for the local WTBS analog and digital channels

work control rooms, but single systems are shared between chains in the international rooms.



A dedicated test control room that features all the equipment and redundancy of an operational control room, was built to evaluate and test equipment before it is put online. Most often this involves software updates. With a fully operational test room, the staff avoids the risk of using new versions of software on the air and having them fail. They can also test equipment from other manufacturers to make certain it is compatible with the gear that is on-air.

A separate training control facility features fully operational domestic and international control rooms. Here, system faults can be simulated to train the staff on how to react to problems or troubles that they may encounter in the on-air control rooms. This is much like a flight simulator in the airline industry. Sessions can also be videotaped for future training. With the test and training rooms separated, conflicts between the two situations are avoided. Both can serve as emergency backup control rooms in a disaster.

The BOC pods take up a large portion of the first floor, but another area vital to the operation is also located here, notably the transmissions operation center (TOC). Viewable from the lobby of the Network Operations building, a massive area of curved glass surrounds the TOC, which is divided into two sections: incoming and outgoing.

The incoming section is generally dedicated to the reception of live feeds. As Turner Entertainment broadcasts numerous live events, especially sports, this area features three quality control stations for live incoming signals. Operators will then coordinate the satellite uplink feeds originating at the venue sites, control the downlinks at the Turner Teleport dish farm, and feed the incoming signals to the correct control room with a Thomson Grass Valley Trinitex routing system.

Incoming TOC embeds the audio using Snell & Wilcox audio embedding modules into the live video as it



**The test control room replicates the layout and design of a functioning BOC. This room provides a designated area to test and evaluate hardware and software in a simulated broadcast and media operations environment.**

is sent to its control room destination. There, it is de-embedded and mixed with additional audio before being re-embedded and sent on to the teleport.

The outgoing side features large Barco screens along the entire front wall with numerous windows assigned different feeds. This area provides operators with a final look at a signal before it is sent out of the building. A signal is sent to the satellite 23,000 miles up, and a return signal comes back to outgoing TOC. Scientific-Atlanta IRDs and Leitch frame synchronizers are used to receive and condition the satellite feeds.

A Snell & Wilcox RollCall network monitoring and control system is instrumental to this room, with the main terminal yet to be installed. This will allow virtually every piece of equipment throughout the facility to be monitored. Using this system, a signal loss due to a problem in any connected piece of gear can be easily pinpointed. In addition to the network monitoring system, this is also the location of the central alarm system that monitors the health (fire, power, HVAC, water) of the entire facility. The room is protected by an FM200 gaseous fire suppression system.

The remaining technical areas of the first floor include a BOC maintenance shop and two squeeze credit rooms. While most of the production and editing work is done at the adjacent Turner Studios facility, the addition of the squeeze credit rooms, supported by two Pinnacle Liquid blue systems, is vital for altering credits close to airtime. Promos often change prior to air, so this flexibility to make immediate revisions is needed in the network operations center.

More space is available for additional control rooms on the first floor (as well as the third floor), and audio delay suites may be added as well in the future, depending upon programming. Computer flooring throughout the first three floors allows for easy expansion. Additional feeds can be added to all existing control rooms when needed.

The second floor features a variety of rooms vital to 24-hour operation. A high-density storage library close to the size of a football field holds 20,000 commercials, a large number of promos and seven days worth of programming. The floor in this section was reinforced to carry the weight of

the shelving.

Near the library is the short-form ingest area, comprised of 10 small rooms featuring Pro-Bel workstations, Sony videotape machines and Ikegami monitors. This area is part of the media operations center (MOC). Operators in these rooms type program information into a database and then ingest commercials and promos into the servers. These servers are controllable from the ingest stations to allow the operator to run a complete quality control check of ingested materials.

A central tape area is available for dubbing from one format to another and serves as "guard source VTRs," providing a third level of redundancy for the BOCs. These machines are used to back up high-profile programs and are automation-controlled. As the A and B chain roll a program, the automation simultaneously rolls the VTR. While unlikely that both control room chains will fail simultaneously, a guard source VTR brings extra peace of mind for heavily



**Maintenance engineer Chuck Armitage adds a module to one of the numerous Snell & Wilcox IQ Modular systems throughout the facility.**

promoted programs.

Syndicated programs that come into the facility via satellite are also videotaped in this area of MOC. Snell &



**The media operations control center is the broadcast equivalent of an air traffic control center for the coordination of playlist changes and ingest operations.**

Wilcox IQ Modular equipment conditions and decodes the signals in this area as they come into the building. Soon, these programs will all come in as files using the newly installed Pathfire system.

This section also features Snell & Wilcox audio shuffling modules. This is a unique product developed in partnership with the Network Operations' engineering team to reconfigure various audio tracks associated with a program, depending on how it will be used. The majority of their programming reaches them in stereo English, yet they feed Latin America. This means they have to feed in Spanish, Portuguese and French.

Their Venus routers handle six channels of audio, and Pinnacle servers are programmed to store these six channels in their house standard configuration: Channel 1 is stereo English left; Channel 2 is stereo English right; Channel 3 is Spanish; Channel 4, Portuguese; Channel 5 is DVS to accommodate DVS-enhanced programming; and Channel 6 is French. When a program is ingested, audio de-embedders separate the audio and video, and audio shufflers rearrange the audio tracks as they are ingested

into the server. They are then stored in memory as six designated audio paths. When needed for air, a network recalls the file and shuffles the audio back into a new configuration according to where it will be sent. For example, with the Brazilian feed, Portuguese language is the main audio associated with the video, possibly backed up by English.

Another portion of MOC handles automated long-form ingestion. This area features 18 Sony Flexicarts controlled by automation cache engines. Programming is loaded on an automated basis via a robotic arm that pulls two tapes from the bins and loads them into the VTRs. The programs are then ingested into server memory according to the cache engine schedule.

The MOC also holds the long-form ingest area for the quality control check and ingestion of high profile programs, such as premiere movies or special made-for-television programs. These rooms operate much like the short-form rooms and feature similar equipment, but are used for programs that an operator wants to review closely.

A prominent feature of the MOC is the media operations control center (MOCC). This unique glassed-in

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room is the broadcast equivalent of an air traffic control center, from which changes and ingest operations are coordinated.

A large number of computers reside in the MOCC and are part of the same automation systems in the BOC control rooms. Operators there are able to monitor everything and connect to sources in every control room. If certain commercials need to be eliminated immediately (like after a plane crash), an MOCC operator can alter the playlists from there. This room, along with the BOC supervisor areas, allows control room operators to concentrate on what is going out to air instead of making changes to the playlist. As the MOCC operators make changes to the individual network playlists, they can direct new commercials to be ingested in the short-form rooms. These changes show up on the supervisor's automation as well as in the control room.

With 18 Flexicarts, up to 36 programs can be simultaneously streamed into server memory. Teranex digital processors, using one microprocessor per pixel of picture, clean up the material in real-time, reducing noise, fixing impairments, and making the video easier to be compressed for storage in the server. A confidence feed is automatically played back out of the server and onto monitor screens less than a second after being recorded. Automated alarms appear on the screens if anything fails, and operators can print out a report documenting the final results.

The MOC and library occupy just one-half of the second floor. The other half is the central equipment room

(CER). Kept at a cool 65 degrees, the CER houses 400 APW racks (with room for 100 more) and spans the length of a football field.

To address HVAC issues, an air conditioning slot was added to the ceiling along the front of each rack. This helps to bathe the front of the equipment

for file distribution. These routers are redundant as well; if one goes down, the other instantly takes over. Seven Venus routers and nine Trinitix routers handle audio and video distribution. Tektronix test equipment is also located throughout CER.

The majority of noisy or high

## Operators in the media operations control center (MOCC) are able to monitor everything and connect to sources in every control room.

with a curtain of cold air that falls from the ceiling. The equipment naturally sucks the cool air in from the front and the hot air is exhausted out the back or side to the interior of the rack and then up into a plenum in the ceiling, avoiding the addition of plenum cabling underneath the flooring. All racks feature rear access for maintenance through doors in the back.

power consumption equipment is housed in CER. Two separate 1500 KVA electrical generators back up power for the entire building. There are associated separate UPS systems for power redundancy. In addition, every rack contains two electrical strips. Each piece of equipment, where possible, is plugged into two separate power panels supplied by two different UPS systems. If one system were to be lost, the other will keep the equipment in operation.

Snell & Wilcox IQ Modular equipment occupies a large amount of rack space in CER. This gear ties everything in the facility together and distributes, conditions, manipulates and processes the signals at all stages. A massive facilitywide installation of more than 5000 modules in 3RU enclosures, these modules handle an enormous

variety of applications. Included in these applications are analog and digital audio and video distribution, analog-to-digital and digital-to-analog conversion, video decoding and encoding, frame syn-



**The central tape area of the media operations center features a variety of tape machines, including the "guard source VTRs," which provide a third level of on-air redundancy for high-profile programs.**

The CER is laid out in network groups (TNT, TBS, etc.) to help maintenance quickly pinpoint and correct a problem. This room features two massive Cisco IP data routers connected to every source in the building

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chronization, audio conversion, subframe remapping, digital "proc amp" control, gamut legalization, and standards conversion for international program exchange. Each enclosure features variable fan speed and input and output temperature monitoring while also allowing additional slots for expansion. The majority currently feature 10 or fewer populated slots, while up to 16 slots are available in each 3RU enclosure. This provides Network Operations with the means for extremely simple expansion of these functions in the future.

The network management system offers additional benefits. When a RollCall-enabled piece of equipment fails, the loss of signal will be noted by that piece of equipment on the management software. While most of the system's electronics live in the CER, stations are set up at several locations

needed to pinpoint a problem is crucial in a facility of this size. The system enables the 500 racks in the facility to react in a timely manner so the effects of a failure are minimal.

The CER also holds the central cache area, which is dedicated to storage. Two redundant EMC data storage systems feature 11TB of live server memory each. All 20,000 commercials and promos spend their lives in EMC, along with three days worth of programming. Avalon Management software controls the movement of spots onto and off of the memory and Pro-Bel automation manages ingestion. One might think this degree of redundancy



**The TNT portion of the central equipment room is a designated area that allows for immediate action to any equipment problems.**

ing the same 11TB of material as EMC, are available.

By June 2003, the network operations center will have Broadcast Inventory Management (BIM) online. BIM is the central cache holding everything featured in EMC and DVD jukebox memory. It delivers air material to a network playout server as a file when called upon by an automation system. BIM will allow the staff to truly ingest once and play out as often as necessary, across all networks. Once BIM is operational, a commercial can be ingested into the system from any short-form ingest station in MOC. Any network that then calls for that commercial will have it delivered to its network server at four times real time. In the event that a piece of equipment in the inventory management system fails, they can cache directly into the playout servers as they currently do.

The new network operations center is running efficiently with all of its advanced automation and redundancy systems. The equipment choices throughout the facility complement each other. With the new facility, Turner's Network Operations is ready for just about anything that comes its way.

**BE**

*Ron Tarasoff is vice president of broadcast technology and engineering for Turner Entertainment Group.*



**The incoming TOC is generally dedicated to the reception of live feeds. Operators here coordinate satellite uplinks and feed signals to the appropriate BOC with a Thomson Grass Valley Trinx router.**

within the facility. The main terminal is installed in outgoing TOC. This system is critical to keeping the networks on-air. Reducing the time

backing up the main system is enough. However, in the event of a catastrophic failure, two redundant ASACA DVD jukeboxes, each hold-

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# New CNN

## street-level studios

BY ANTONIO ARGIBAY AIA

In the summer of 2000, CNN initiated a search for street-level studios in New York with high visibility to show that the network was broadcasting from the world's media capital. The network selected Meridian Design Associates Architects for the project. This article describes the process and the technical and design issues faced in the course of the project.

The most obvious feature of a street-front studio is that it allows production that has been enclosed and "placeless" to be associated with a specific location. At the same time, it brings the production process closer to potential viewers by removing walls and opening the studio visually to the public. The effective interaction of a street audience and production is crucial to many of the shows' formats; however, the use of the space as a TV studio is really part-time.

one side was right on the Avenue of the Americas, where the hustle and bustle of a busy midtown sidewalk was visible from the studio.

Having found the location, the next challenge was to turn a commercial space that had previously housed a bank branch into a multi-studio television facility, a use inherently more demanding of the building's infrastructure. Existing ceiling height, column spacing, available floor structural loads and available square footage posed difficulties. Creating a major stand-alone HVAC plant and managing available electrical power were also major concerns. Another issue was security – providing safety for prominent guests while on air, as well as while entering and leaving the facility. The design team also considered lighting temperature issues to determine whether the studio should be lit with HMI luminaries

**The most obvious feature of the street-front studio is that it allows production . . . to be associated with a very specific location.**

The majority of the time, the space serves as marketing for the network and its products. The selected site at the Time Life Building's plaza had features that gave it an architectural advantage. The most prominent was that the space chosen for the street studio had glass on three sides. Additionally,

to compensate for the daylight, or whether the lights should be typical tungsten fixtures, thus requiring the daylight to be filtered.

### Design criteria

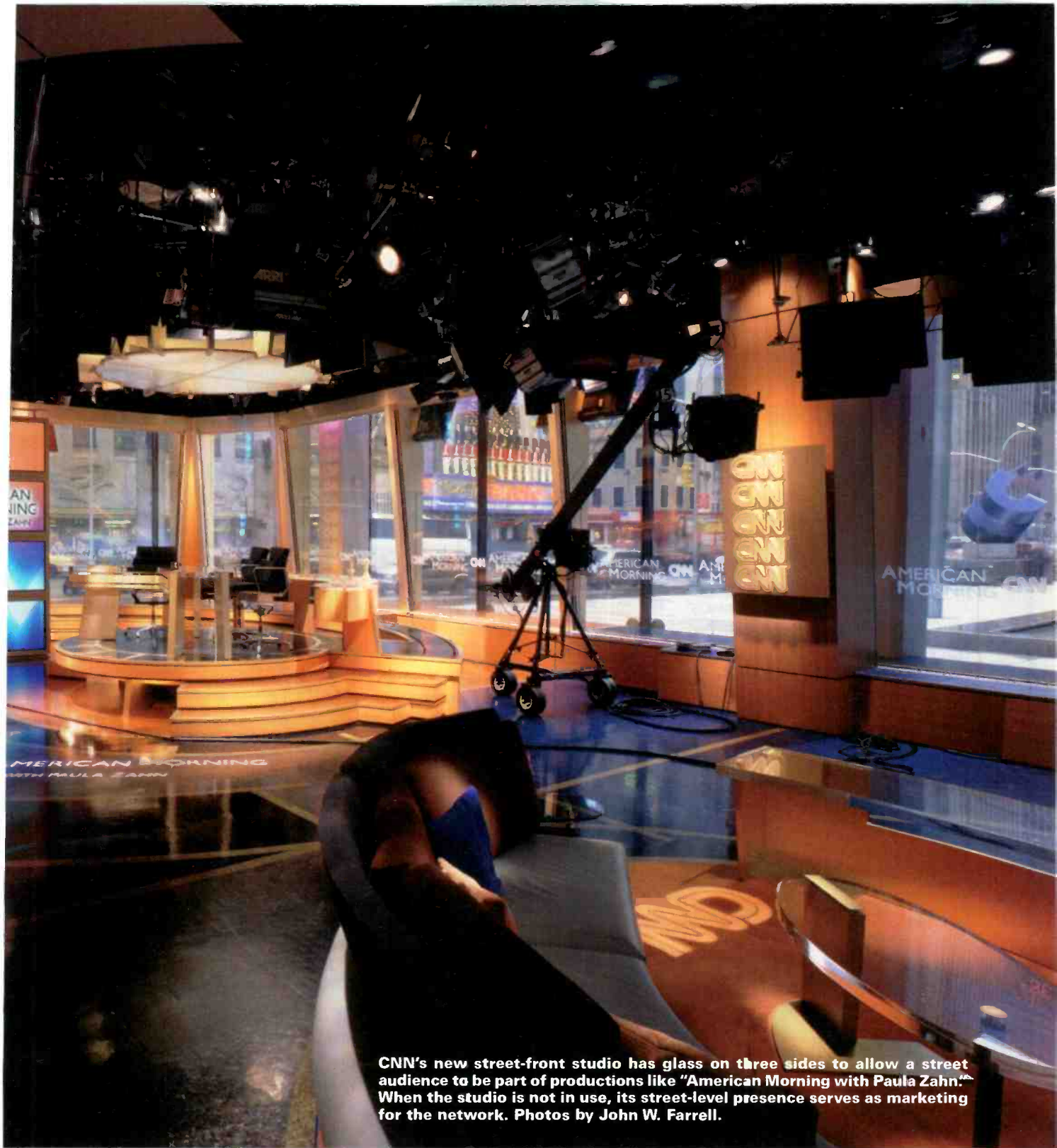
The space available for the project was approximately 5000 square feet

at street level and 10,000 square feet one level down, in the Rockefeller Center Concourse.

The street studio for "American Morning with Paula Zahn" was the driving force for the project – thus, meeting its criteria was paramount. Not surprisingly, the mandate was given to make it as big and as high as possible, and also to make it column-free. It







CNN's new street-front studio has glass on three sides to allow a street audience to be part of productions like "American Morning with Paula Zahn." When the studio is not in use, its street-level presence serves as marketing for the network. Photos by John W. Farrell.

would have glass on three sides, but also needed to include a bullet-resistant enclosure to protect talent and guests. The second studio, a conventional "black box" studio, was to be 1000 square feet.

The new studios have a completely digital technology backbone for the broadcast operation. The studio cameras presently operating in NTSC stan-

dard are fully capable of providing HD.

The minimum height of the lighting grid above the studio floor in both spaces was to be 14 feet. The acoustical performance was to meet a minimum of NC25, and cooling capacity was to be 45W per square foot. Additionally, backup power was required to stay on the air for at least 15 minutes in case of a power outage.

### Facility tour

It takes more than a studio space to house the physical requirements for a production. These additional spaces – usually referred to as "production support" – generally break down into four categories: technical, office/support, storage/maintenance and mechanical/electrical.

The technical spaces include a control

room with its usual component of audio control, graphics, producer's area, TD and equipment room; a lighting area; a video shading area; an audio mix room (mixing for musical guests); a central equipment room for transmission gear and servers; and an appropriate technical maintenance shop. In the final

The office/support spaces needed to include talent offices, workstations for approximately 20 people, two greenrooms, and two security screening areas (one for each level). The storage/maintenance component required an entrance for scenery deliveries with large (eight-foot-wide by 12-foot-high) acoustical doors, and a separate area to stage

## It takes more than a studio space to house the physical requirements for a production.

design, however, the requirement of a control room on site was reduced to an on-site producers' viewing area that would mirror the functions associated with a normal producers' station in a control room. All control room functions are handled remotely from the existing CNN facility in New York. Eight DS3 digital

and store the necessary materials for production in the plaza.

The electrical, mechanical and plumbing components were among the most critical. Mechanical load requirements in the studios added up to 70 tons of cooling without redundancy, another 20 tons of cooling for the space between the



**Production at CNN's new facility takes place not only in the studios, but also in technical spaces like the lighting and video shading room shown above.**

lines provide for up to eight camera feeds from the studios, and an additional six TV1 analog lines provide return program and plasma display feeds to the studios.

building's exterior glass and the studio's interior glass, and a balance of approximately 50 tons for the office functions and the technical spaces, for a total of 140 tons.

## Design team

Meridian Design Associates,  
Architects:

Antonio Argibay, AIA, principal in charge

Sumita Arora, project manager

The Systems Group:

Paul Rogalinski, project manager

Production Design Group

Eric Ulfers, principle in charge

## Equipment list

Sony HDC-950 digital cameras

Vinten Quattro studio pedestals

and Vector 70 pan-and-tilt heads

Vinten Vision 100 tripod and head systems (VB 100LT)

NEC NP2 plasma displays

McCann Systems plasma wall

multi-image processing system

Sennheiser wireless microphones

Benchmark MDA-102 microphone pre-amplifiers

Electrosonic wireless IFB

Telex wireless PL

Systems Wireless antenna distribution system

Telex Adam CS intercom system

Thomson Grass Valley 7000 routing switcher

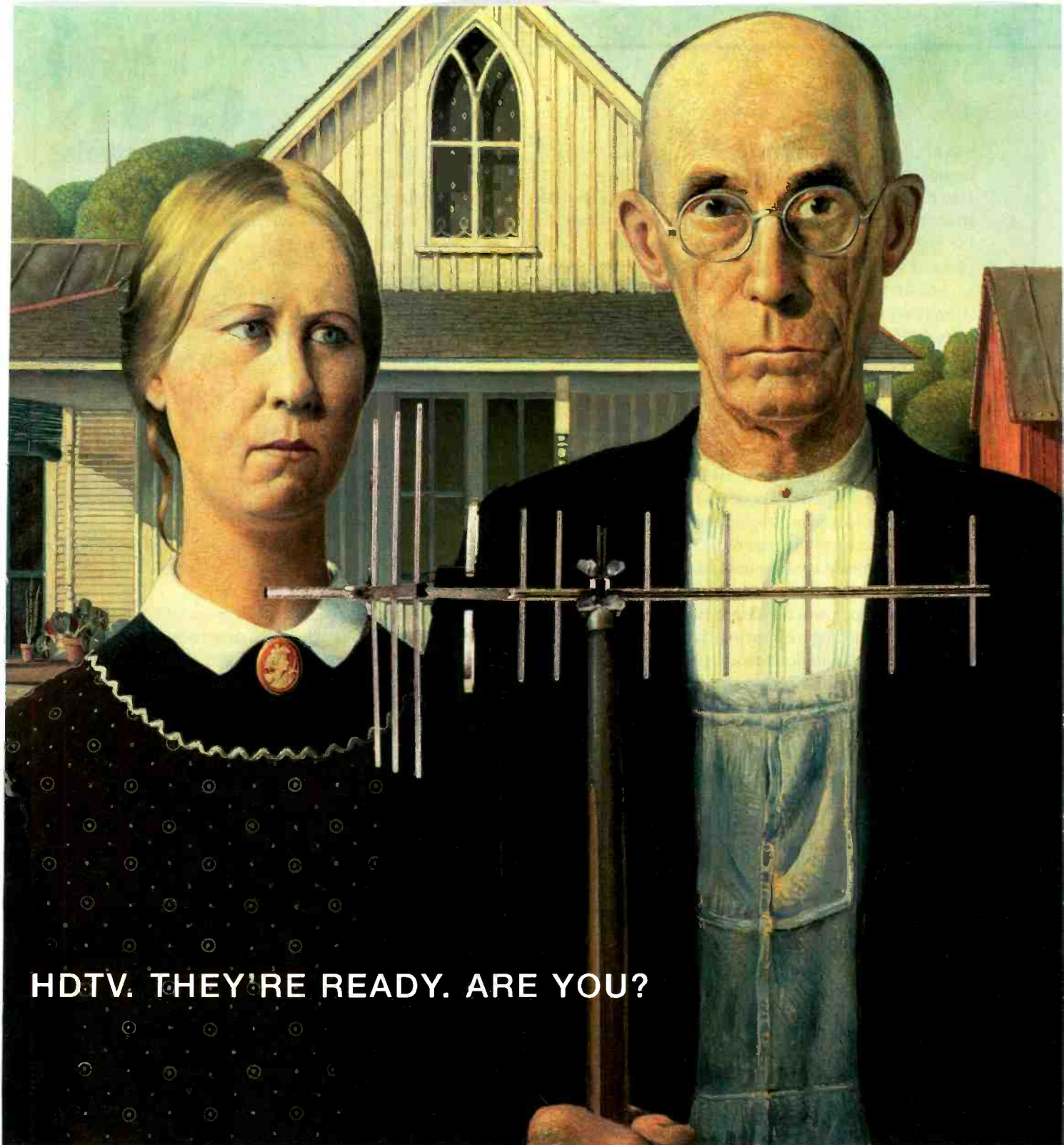
Yamaha OCR digital audio consoles

Sony PVM and BVM video monitors

A key aspect of the design requirements was the "branding in place" — the primary reason for creating a street-front studio in the first place. The space between the glass walls of the studio and the building glass wall was designed by PDG to provide passersby with a news ticker/zipper sign and plasma screens with network feeds. This cavity space acts as a show window of the product and is an extension of the studio within.

## Implementing the design

Due to the relatively small spaces available, especially at street level, the design team's first order of business



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was to triage the uses and needs to be housed on the first floor. In the Time Life Building there are two distinct structures: the skyscraper tower and the eight-story “pavilion” where the planned studios were to be. A 1000-square-foot breezeway between the structures provided an opportunity to increase the facility’s first floor space by 20 percent. Capturing the space required extensive negotiations with building owners, CNN, the NYC Department of Buildings and the Landmarks Commission. The additional space made all the difference in creating a functional space to house a security lobby and a plaza staging area in close proximity to the studios.

In order to provide a column-free area for the money shot in the “American Morning” studio, it was decided to remove a major building column from the first floor. This is a difficult procedure in any location. In this project, it was further complicated by issues arising from the exterior detailing of the building and the impossibility of access to existing column footings – they were

of the Landmarks Commission.

Ironically, the solution *added* two columns on the first floor in the plane of the studio’s sloping glass wall. Transfer girders spanned between the two new columns, a shorter distance than between the existing columns. The shorter span made it possible to keep the girders to 36 inches in depth and allowed the cavity space to be free

low-iron laminated glass performing to a certain Underwriter’s Laboratory (UL) security standard. The criteria for this selection were clarity and color rendition. To comply with the UL standard, the framing system also had to be part of the protective assembly. With the given

## Elimination of structure-borne sound and vibration from the subway train station located below the facility was the biggest acoustical challenge.

of conspicuous structural members. On the concourse level, the structural loads were brought back to the column below the one removed via a pair of 52-inch-deep girders, thus transferring the load to its original footing (see Figure 1).

### Studio glass wall

To create a wall that satisfied the above design parameters, i.e., visually

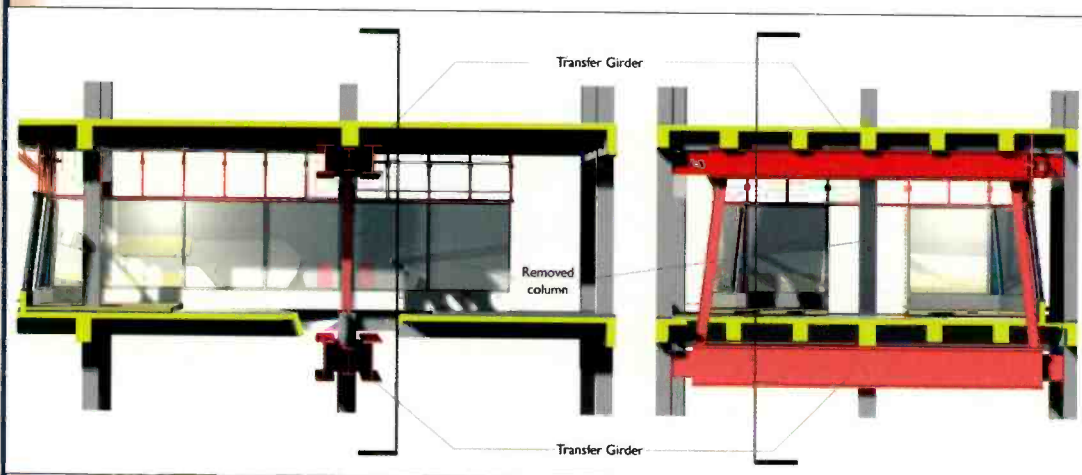
conditions at the site, they were able to utilize a UL security-rated pre-fab framing system.

Glass of this type can only be manufactured in a few locations worldwide, through a lengthy and arduous process that could potentially add five months to a project schedule. So the standard avenue of first installing the support mullions and then creating templates from the installed supports

was not feasible for this fast-track project. Working with a glazing consultant, their firm developed detailed computer modeling, essentially building the wall in the computer. These models were developed into shop-drawing-quality construction documents from which all elements of the wall were ordered and fabricated.

### Acoustical considerations

Elimination of structure-borne sound and vibration from the subway train station located below the area of the project was the biggest acoustical challenge. Horizontal airborne noise transmission was effectively kept within design parameters



**Figure 1.** To remove a conspicuous column from the studio area, the design team added two columns in the plane of the studio’s sloping glass wall, connected by 36-inch transfer girders to keep the cavity space free of structural members. Two 52-inch girders brought the structural loads back to their original footing on the concourse level.

two cellars down among the subway tracks. The team needed to insert a structural element more than four feet deep and seven feet wide in the middle of a studio requiring critical ceiling heights, without affecting the exterior appearance of a building under the protection

open, bullet-resistant and acoustically adequate, was one of the most difficult tasks to realize in the project, especially since time was of the essence.

After camera-testing several options, it was decided that the most acceptable solution was a multilayer



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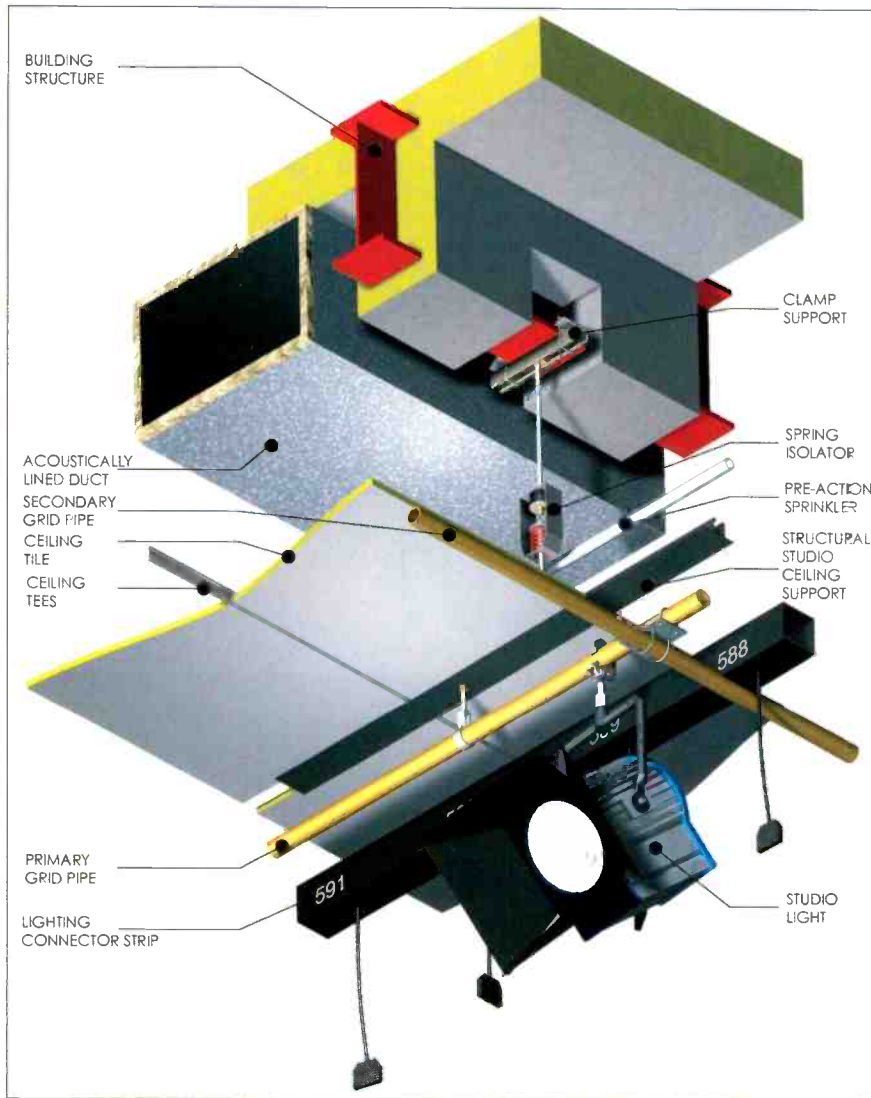
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**Figure 2.** The ceiling system in the new studio incorporates a series of Unistrut supports anchored to building steel with spring isolators. The design provides some acoustic separation to the floor above and a place to attach the lighting grid.

by the thick glass required for security reasons. Vertically, the airborne separation in the existing building was quite good – so good, in fact, that had structure-borne noise not been such a big issue, an isolated ceiling probably would not have been required.

To abate the vibration in the structure, the team designed a four-inch reinforced concrete floor on top of a Kinetics RIM isolated floor system. The design criteria of the floor included structural design to allow for rolling loads for the security glass installation and rigging (each pane at over 3000 pounds, plus the weight of a forklift).

The need for an acoustical barrier

ceiling was marginal considering that the existing structure provided an acceptable level of separation. However, to eliminate the possibility of audible rattling, precautions had to be taken to ensure that no vibration would be transferred to the lighting grid and its instruments.

### Maximizing studio height

In any TV studio design project, the height of the lighting grid is critical to assure adequate light distribution. At the CNN project, this challenge was exacerbated by the column removal, which for practical purposes divided the ceiling cavity in two, and by unusually large supply ductwork to satisfy cooling demands for the studio

lighting and a large solar load.

The first task was to minimize the size and distribution of ductwork without creating acoustical noise issues. To this end, we split the supply and return ductwork into two zones, one for each side of the studio ceiling cavity separated by the transfer girders, eliminating ducts crossing under the transfer girders. Additionally, we eliminated the use of direct return ductwork by designing transfer ducts from the studio ceiling to the ceiling plenum, allowing the air to free flow to an opening for return at the studio wall.

The second effort was concentrated in the design of a ceiling system that would function as a plenum, provide a modest amount of acoustical separation to the floor above and provide a method to attach the lighting grid. The solution incorporated Unistrut members anchored directly to building steel by appropriately sized spring isolators and installed in a north-south direction at approximately four feet on centers. From these supports, we anchored the main members of the lighting grid pipe with the cross piping, also at four-foot centers.

This system is an adaptation of the subframe support system typically seen in much larger studio spaces, where a structural grid is provided below the finished ceiling construction to facilitate rigging and installation of lighting support systems. Installation of such subframes adds flexibility to studio spaces and also eliminates coordinating penetrations of the ceiling cavity for the lighting grid supports (see Figure 2).

The CNN project is now on the air, on time and on budget, with a street-front studio that brings the flavor of New York to viewers, and provides visibility for CNN and its products to the people of New York.

BE

*Antonio Argibay, AIA, is principal-in-charge for Meridian Design Associates.*

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The PVS 3000 is available as a standalone system or as an upgrade package for existing Profile XP Media Platform users.

With recent advances in the delivery of HD signals, broadcasters must increasingly contend with the complexities of handling multi-format programming. Consider a television station that has an SD and an HD programming schedule. Some programming and commercial playout overlaps and some do not. Some material arrives in SD only, others in HD only. Traditionally, coping with this complexity has required additional server channels, management software, and switching infrastructure—which drive up the cost and complexity of implementation.

In addition to supporting SD and HD materials in the same server and in the same timeline, the PVS 3000 offers HD vertical ancillary data support for captioning and interactive TV (iTV) data, as well as support for SMPTE 334M, 291M, and EIA-708A standards. And it's designed to fit into any topology—supporting standalone, distributed, and SAN configurations. The PVS 3000 also supports data bridging to seamlessly convert between SD VBI data and HD ancillary data.

The PVS 3000 also offers a Profile Asynchronous Serial Interface (ASI) option for MPEG transport stream ingest, playout, and time delay. The Profile ASI technology supports frame-accurate base-band editing while eliminating



the need for broadcasters to go through multiple distribution, encoding, recording, and storage steps to ingest program and commercial spot material. It also maintains the highest-quality image by reducing the number of times that incoming material must be handled.

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  - Automatic up/down conversion of SD and HD materials to independent timeline
- SD format support:
  - MPEG 4:2:0, 4–50 Mb/s, long GOP
- HD format support:
  - MPEG-2 @ HL, 20-80 Mb/s, long GOP, 4:2:0
  - 1080i @ 50, 59.94
  - 720p @ 59.94
- Built-in decoders, encoders ensure seamless operation in less rack space at lower cost
- Supports SMPTE 334M, 291M, and EIA-708A standards
- Supports closed captioning and iTV data
- Available as an upgrade for existing Profile XP Media Platform users

### Grass Valley Servers & Shared-Storage Systems

- Profile XP Media Platform
  - PVS 1000 SD Platform for On-Air Applications
  - PVS 1100 SD Platform for Production Applications
  - PVS 2000 HD Platform for On-Air and Production Applications
  - PVS 3000 SD/HD Platform for On-Air Applications
- Grass Valley Open SAN SD/HD Shared-Storage System

servers

[www.thomsongrassvalley.com/products/servers](http://www.thomsongrassvalley.com/products/servers)

## LDK 5000

### HD Upgradeable SD Camera

For broadcasters and video professionals who need superb standard-definition (SD) performance today and unmatched high-definition (HD) support in the future, the Grass Valley™ LDK 5000 is a perfect fit. Created by one of the best known imaging design teams in the world—one with five technical Emmy® awards to its credit—the LDK 5000 offers pristine SD acquisition and output as well as an easy migration path to HD acquisition.

Supporting everything from robotics to studio and fixed camera installations—as well as portable hand-held and EFP uses—the LDK 5000 features a video processing architecture that includes three 9.2-million pixel CCDs, 12-bit analog-to-digital conversion, and 22-bit digital signal processing. Because this architecture is designed for HD acquisition and output, it's easy to upgrade the LDK 5000 for true high definition.

With a lightweight, ergonomic design, the LDK 5000 speeds production workflows with focus-assist tools as well as smart cards that store visual and operational settings. And its TriaxHD system interfaces with standard triax-based transmission infrastructures, eliminating the need for expensive, fiber-based retrofitting.

The LDK 5000 features a small, robust, and lightweight base station that provides SD video output, audio output, intercom, external video, genlocking, teleprompting, and control facilities. The smallest and lightest base station of its type, it also supports a variety of optional modules for re-configuration and customization.

The LDK 5000 supports two migration options to HD acquisition: one that results in the LDK 6000 mk II Standard camera, which supports 1080i/720p HD formats in 50- and 59.94 Hz, and simultaneously provides high-quality SD output in either 50- or 59.94 Hz; and one that results in the LDK 6000 mk II Worldcam system, which provides all the functionality of the Standard version as well as support for digital cinematography formats 1080p and 720p at 24p.



### KEY FEATURES

- Superb SD acquisition and output
- Built on unmatched HD video processing architecture that features:
  - Three 9.2-million pixel CCDs
  - 12-bit A-to-D conversion
  - 22-bit digital signal processing
- Unique focus-assist tools:
  - Crawler, for creating motion on the edges of an object in focus
  - Instant push button electronic zoom for focusing on small details
- Small, robust base station with superior SD output
- SuperXPander support enables configuration with studio lenses, accessories
- No compromise, easy upgrade to HD

### Grass Valley Cameras

#### Standard-Definition Cameras

- LDK 100 High-Performance Camera
- LDK 100 IT (W) Cost-Effective Widescreen Camera
- LDK 200 High Resolution Digital Portable Camera
- LDK 20S Large-Lens Camera System
- LDK 23HS mk II Slow-Motion Replay Camera
- LDK 5000 HD Upgradeable High-Resolution Camera
- LDK 1707 Cost-Effective Portable Digital Camera
- TTV 1657D SD Camera
- Microcam™ Compact Camera Head System

## LDK 6000 mk II

### Native Multi-Format, Multi-Rate HD Camera

With three 9.2-million pixel HD-DPM+™ CCDs, the Grass Valley™ LDK 6000 mk II is the only camera available that can capture true progressive HD images, natively, in multiple formats and frame rates. Coupled with an extensive feature set, format flexibility, and excellent performance, it's a perfect match for the intense demands of today's production requirements.

The LDK 6000 mk II enables easy HD format switching via a simple menu on the camera or the camera control system. Because the camera's CCDs group the pixels on the sensors themselves to create the correct number of video lines necessary for a chosen format, electronic format processing is eliminated.

The result? There's no quality degradation when you switch formats.

The LDK 6000 mk II camera head is available in two versions: Standard and Worldcam.

The Standard version supports 1080i/720p HD formats in 50- and 59.94 Hz, and simultaneously provides high-quality SDTV output in either 50- or 59.94 Hz. The Worldcam version provides all the functionality of the Standard version as well as support for digital cinematography formats in 1080p and 720p. These formats provide an impression of motion (motion portrayal) comparable to that of film cameras running at the same speeds.

The WorldCam version of the LDK 6000 mk II, running at 24p, also provides convenient built-in 3:2 pulldown conversion for easy connection to existing HD peripherals. As a result, you get cost-effective monitoring and recording combined with the motion portrayal of film cameras.

With a lightweight, ergonomic design, the LDK 6000 mk II speeds production workflows with focus-assist tools and smart cards that store visual and operational settings. And its TriaxHD system interfaces with standard triax-based transmission infrastructures, eliminating the need for expensive, fiber-based retrofitting.

For digital transition management, the LDK 6000 mk II features a small, robust, and lightweight base station that can output SD and HD signals simultaneously. You can also outfit it with a large lens adapter and an optional HD high-resolution viewfinder and turn it into a fully featured studio head.



### KEY FEATURES

- Captures true progressive HD images natively, in multiple formats and frame rates
- Supports 1080i and 720p formats at 50- and 59.94 Hz
- Supports instant switching between 720p and 1080i for studio applications
- Unrivaled video processing architecture:
  - Three 9.2-million pixel HD-DPM+ CCDs
  - 12-bit A-to-D conversion
  - 22-bit digital signal processing
- Emmy® award-winning dual skin contour circuits makes talent look its best
- Unique focus-assist tools:
  - Crawler, for creating motion on the edges of an object in focus
  - Instant push button electronic zoom for focusing on small details
- Flexible TriaxHD transmission system
  - Rated up to 3,300 feet/1,000 meters
  - Supports standard triax cabling
- SuperXPander support enables configuration with studio lenses and accessories
- Lightest weight camera body in its class

### Grass Valley Cameras

#### High-Definition Cameras

- LDK 6000 mk II Standard - Native, multi-format, multi-rate HD support
- LDK 6000 mk II Worldcam - Native multi-format, multi-rate HD and digital cinematography support

cameras

[www.thomsongrassvalley.com/products/cameras](http://www.thomsongrassvalley.com/products/cameras)

## Kalypso HD

### High Performance HD Switching

Installed in more than 300 broadcast and production facilities worldwide and with more than 50 shipped in 2002, the Grass Valley™ Kalypso™ Video Production Center is ideal for broadcast and live, multi-camera events.

Providing native support for 1080i and 720p high definition (HD) formats, the 15 RU Kalypso HD switcher is less than half the rack size of its nearest fully optioned competitor and supports up to six internal transform engines (digital video effects), serial machine control, tally/GPI interfaces, and a redundant power supply system.

Extremely compact to support both studio and mobile applications, the Kalypso HD system contains the broadest set of HD production features available, including up to 90 inputs (video or key) and optional RGB color correction for every keyer and background to complement the switcher's built-in YUV video-processing capability.

The Kalypso HD switcher also uses the same user interface, feature set, and effects-generation capability as its SD counterparts. These capabilities eliminate the need for operator retraining and enable broadcasters and production companies to leverage the significant base of freelance operators already proficient with the Kalypso system.

The Kalypso HD system is available in two or four mix/effects (M/E) versions and supports one-, two-, and four-M/E control panels. Additionally, operators can use the switcher's resource-sharing technology to share M/E capabilities between one frame and multiple control panels.

The Kalypso HD system is also designed to seamlessly select between SD or HD formats in the same frame.

For proactive system health and status monitoring, the Kalypso HD switcher supports the Grass Valley NetCentral™ software for remote monitoring using the Simple Network Management Protocol (SNMP).



### KEY FEATURES

- 1080i/29.97 and 720p/59.94 support (other formats in future releases)
- 2- and 4-M/E configurations with up to 90 inputs, 48 outputs
- 4 keyers per M/E each with linear, luminance and optional Chromatte™ chroma key capability
- 2 utility buses per M/E for a secondary program mix in each M/E, video in borders, or masking with external sources
- Built-in digital effects with 6 channels of effects (video and key) plus external effects support
- Built-in 8-output, 100-frame still store (expandable to approximately 800 frames)
- FlexiKey™ programmable clean-feed system
- DoubleTake™ split M/E technology for creating two separate M/E outputs from a single M/E bank
- Built-in device control for Profile® storage devices, routing systems, DVEs, VTRs, and more
- 15 RU frame, including power supplies

### Grass Valley Switchers

- Kalypso Video Production Center
- Kalypso HD Video Production Center
- XtenDD™ SD Digital Video Switcher
- XtenDD HD Digital Video Switcher
- Zodiac™ Digital Video Switcher
- Kayak 1 M/E Digital Video Switcher



## Kayak

### Sophisticated Switching in an Affordable, 1 M/E System

The Grass Valley™ Kayak™ digital production switcher is an affordable, compact, and flexible system that offers an array of high-end features for everything from live studio and mobile production to small corporate studios and editing applications.

The Kayak switcher leverages many of the features found in the Grass Valley Zodiac™ and XtenDD™ switchers. The result is a compact system with superior image quality and features not found in any other product.

Switchable between 525-line and 625-line formats, the Kayak system includes four high-quality keyers and complete machine control functionality. It features 16 inputs, five fixed outputs, and 10 timed auxiliary buses. And it accommodates such options as Chromatte™ chroma keying, RGB color correction, and up to four transform engines for sophisticated digital video effects.

For ease of operation, the Kayak system features an intuitive menu using an integrated touch-screen color display. It also offers a networking capability that enables different frames to be delegated to a single panel as well as multiple panels to share a single frame.

Only 2 RU high, the lightweight Kayak switcher is designed to be highly portable, enabling it to be transported easily. Its control panel is 19 inches wide, but has the largest number of direct crosspoints of any 1 M/E switcher available.



#### KEY FEATURES

- Switchable between 525-line and 625-line formats
- Fully digital 10-bit, 4:2:2 inputs, outputs, and video processing
- Compact, lightweight 2 RU frame
- Low power consumption
- Intuitive menu with touch screen
- 16 inputs
- 5 fixed outputs
- 10 timed auxiliary buses
- Internal frame store holds shot clips and stills and works as frame synchronizer
- Supports extensive list of control protocols, including those for:
  - VTRs (BVW-75)
  - Servers (Louth VDCP, Odetics BVS)
  - Routers/ Routing Control Systems -Trinix™, Venus™, Triton™, and other third-party routers and routing control systems including Jupiter™ and Encore™ (future)
  - Tally control systems (Grass Valley Andromeda™ and third party systems)
  - Grass Valley under monitor displays
  - Grass Valley external auxiliary panels
  - ESAM II for Audio-follow-video applications
  - Edit controllers (native and Grass Valley Model 200 protocols)
- Remote monitoring support via NetCentral software
- Four keys, each with linear, luminance and optional Chromatte Chroma key functionality
- Optional RGB color correction
- Four channels of high-end digital effects

switchers

[www.thomsongrassvalley.com/products/switchers](http://www.thomsongrassvalley.com/products/switchers)

## Apex

### Highest-Density, Large-Scale Audio Routing Switcher

With a dozen design-related patents pending, the Grass Valley™ Apex™ digital audio routing switcher is the highest density system available for large-scale audio distribution. The 11 RU chassis offers the smallest footprint of any system in its class while providing breakthrough linear expansion capabilities, as well as high reliability and serviceability features. It is also the perfect complement to the Grass Valley Trinitix™ digital video routing switcher.

Users can leverage the system's unique, high availability, Time Division Multiplexing (TDM) architecture to interconnect multiple chassis with minimal wiring—and without distribution amplifiers. Linearly expandable to 1280x1280, the Apex router requires only a handful of wire interconnections between each chassis.

The multi-format capabilities of the Apex router include support for AES digital audio (75 Ω unbalanced and 110 Ω balanced), Multiple Audio Distribution Interface (MADI) and Dolby E formats.

Unlike other routing systems that force users to purchase separate board sets and sample rate converters to handle multiple signal types, the Apex system can automatically detect a signal's type (synchronous or asynchronous), its rate (from 30 kHz to 100 kHz) and switch and route it properly without any additional modifications or user intervention.

Among the significant features of the Apex system is a silent-switching design that eliminates unwanted clicks and pops due to signal switching within the router. It also supports a variety of control systems, including the Grass Valley Encore™, Jupiter™ and SMS-7000 routing control systems.

Offering easy serviceability and remote monitoring, the Apex router features a passive rear panel that allows all modules to be hot swapped from the front of the chassis—allowing users to keep the router on-line during upgrades.

With its network-based status and control via Simple Network Management Protocol (SNMP) and the Web-based Hypertext Transfer Protocol (HTTP), the Apex router eliminates the need for a technician to go to an equipment room and physically check its status.

Using Grass Valley Broadlinx status and monitoring tool, users can configure, monitor, interrogate, and upgrade the Apex router from any networked PC running a browser. The router also supports the Grass Valley NetCentral software for SNMP-based remote monitoring.



#### KEY FEATURES

- 256 inputs x 256 outputs in a compact 11 RU frame
- TDM switching architecture for cost-effective linear expandability to 1280x1280 in five frames
- Redundant matrix cards, expansion links, power suppliers and cooling fans to maximize availability
- Broad format support:
  - AES digital audio, 75 Ω unbalanced, 110 Ω balanced, MADI, Dolby E
- Simultaneous synchronous/asynchronous support for 30-100 kHz signals, and AES-11 timing
- Silent switching minimizes unwanted clicks and pops due to signal switching
- Audio modes: swap, mix, mono, AES Pair Breakaway
- Multiple audio and video reference inputs
- Full compatibility with Grass Valley NetCentral™ and Broadlinx™ status and monitoring applications

#### Grass Valley Routers, Control Systems, & Master Control Systems

- Trinitix™ SD/HD Digital Video Routers
- Apex High-Density, Large-Scale Digital Audio Router
- Venus™ Multi-Format Routers (to 256x256)
- Concerto™ Series Multi-Format Router (to 128x128)
- Triton™ Single-Format Utility Routers (to 64x64)
- Encore™ Facility Control System
- Jupiter™ Control System
- Series 7000 Control System
- M-2100 SD, HD Digital Master Control Systems
- Saturn™ SD, HD Master Control Systems
- NetCentral Software for SNMP Monitoring

# routers

[www.thomsongrassvalley.com/products/routers](http://www.thomsongrassvalley.com/products/routers)



## Kameleon Media Processing System

The Grass Valley™ Kameleon™ Media Processing System offers a revolutionary approach to signal conversion and processing, one that is ideal for the complex processing of multiple program streams such as those found in broadcast centers, video production facilities, satellite uplink operations, OB vans, and production trucks.

The advanced design of the Kameleon system gives you flexible modular functionality in a high-performance wideband frame.

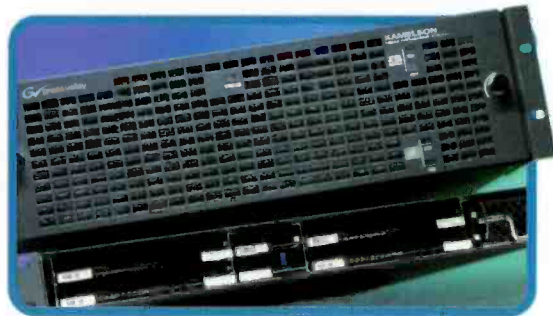
The Kameleon multifunction module is the heart of the Kameleon system. This complete processing module has both analog and digital inputs and outputs for video and both balanced and unbalanced audio.

The Kameleon multifunction module incorporates multiple discrete modular functions into a single processing unit—functions you can combine in more than a dozen different ways. This field-configurable approach offers tremendous audio and video processing flexibility with an assortment of I/O connector sets.

Using the Kameleon system, you can array up to four different modules in a single 1 RU frame for a flexible signal processing solution that offers more functionality per rack unit of space than any other modular solution. And this powerful software-based processing module provides for future processing enhancements.

The Kameleon multifunction module provides A-to-D and D-to-A conversion for audio and video, audio embedding and de-embedding, signal timing, digital audio input sample rate conversion, and level adjustment. A sub-module can be attached to the Kameleon multifunction module for eight-channel multi-channel audio A-to-D and D-to-A conversion and processing. You can also adjust delay and tracking on each channel and easily sum, swap, or invert the phase of audio channels through a control interface.

The Kameleon frame allows you to add single-function modules for a variety of applications for HDTV, SDTV, analog audio and video, and AES signals. The single-function modules include HD distribution amplifiers and a new collection of Kameleon fiber-optic modules for distribution and processing. And the Kameleon frame accepts many Gecko™ 8900 modules using an adapter module.



### KEY FEATURES

- Processes up to 4 program streams in a single 1 RU frame—up to 12 in a 3 RU frame
- Integrated audio and video processing in a single module set, featuring:
  - Integrated audio and video multiplexer and demultiplexer
  - Audio and video A-to-D, D-to-A conversion
  - Audio and video delay, synchronization, and processing amplifiers
  - Audio and video test signal generators
- Powerful eight-channel audio processing, including A-to-D or D-to-A conversion, embedding/de-embedding
  - AES input sample rate conversion
  - Built-in 8x8 audio router for re-mapping to specific I/O
  - Powerful VBI processing
- Intuitive Web browser-based configuration and SNMP monitoring
- Full line of fiber-optic processing modules and wideband DAs

### Grass Valley Modular Products

- Gecko™ 8900 Signal Processing System
- Kameleon Media Processing System
  - Kameleon Multi-Function Modules
  - Kameleon Optics Modules
  - Kameleon HD Modules
- Newton™ Modular Control System

modular

[www.thomsongrassvalley.com/products/modular](http://www.thomsongrassvalley.com/products/modular)

## NewsEdit SC

### Cost-Effective, Nonlinear Editing for News

The Grass Valley™ Digital News Production Solution touches the entire news-production process, from ingest to edit to playout. With the addition of the NewsEdit™ SC system, this solution now includes a software-based nonlinear editor that offers a new level of affordability to broadcast news organizations of all sizes.

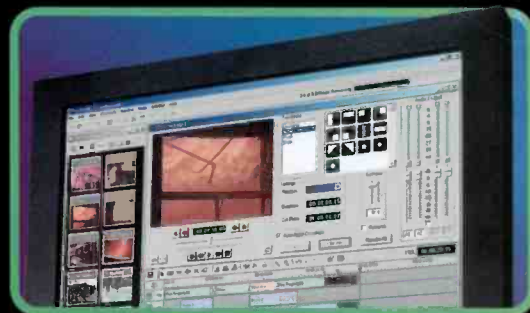
Based on the NewsEdit nonlinear editor, the fastest hard-news editing system available for news, the NewsEdit SC combines cuts-only edit bay capabilities, traditional A/B Roll Suite transition functions, and storage and network connectivity options to create a highly cost-effective editing toolset for news.

Available in tower or rack configurations, the NewsEdit SC system offers broad storage options, support for the Grass Valley Open storage area network (SAN) and network attached storage (NAS) systems.

By combining the feel of a tape-to-tape environment with the speed of nonlinear functionality—as well as the performance and cost effectiveness of Grass Valley storage systems—the NewsEdit SC system makes triage, editing, and story-creation workflows familiar, fast, and efficient. News organizations can create finished stories with less staff and equipment, maximizing the returns on their investments.

The NewsEdit SC system supports DV media, offers tight DV camcorder integration, and features up to four channels of audio, internal storage, and a variety of networking options. Using it, editors can trim clips with frame accuracy, add transitions, create edit decision lists, and add audio tracks.

Like the full-featured Grass Valley NewsEdit nonlinear editor, the NewsEdit SC system lets you see an edit while it's being made—there's no need to go back and review. This capability makes the NewsEdit SC system twice as fast as other nonlinear editors.



### KEY FEATURES

- Combines cuts-only edit-bay capabilities and A/B Roll Suite functions in a software based nonlinear editor
- Enables recording directly from tape to timeline without pre-digitizing—just like tape-to-tape environments
- View edits in progress
- Trim in/out points with frame accuracy with audio and video punch ins
- Supports cuts and transitions (cuts, dissolves, pushes, slides, SMPTE wipes) with optional titling
- Operates as a standalone system or as part of a networked news environment
- Includes RS-422 ports for direct machine control
- Supports script AP ENPS, iNews NRCS interfaces
- Optional MUI jog/shuttle/edit controller and 4 flying fader mix controller

### Digital News Production Solution

- FeedClip Interactive Feed Capture System
- NewsBrowse Web-Based Browser/Editor
- NewsEdit Nonlinear Editors
  - NewsEdit High-Resolution Editor
  - NewsEdit LT Laptop-Based Editor
  - NewsEdit SC Software-Based Editor
- NewsQ™ Manual Playback System
- NewsQ Pro Automated News Playback System
- Grass Valley Network Attached Storage System (NAS)
- Grass Valley Open SAN SD/HD Shared-Storage System
- Profile XP Media Platform
  - PVS 1000 SD Platform for On-Air Applications
  - PVS 1100 SD Platform for Production Applications





## Network Attached Storage (NAS) System

**Cost-Effective, Shared Storage  
Using Ethernet Connectivity**

As part of a comprehensive line of media storage offerings, the Grass Valley™ Network Attached Storage (NAS) system is designed to help broadcasters accelerate their digital production transition with the highest levels of production quality and greatest capital efficiencies possible.

The NAS system leverages the same high availability and proven workflow-improving capabilities of Grass Valley storage area network (SAN) technology and makes them available in an Ethernet architecture at an extremely attractive entry point. It uses the same Fibre Channel array as the Grass Valley SAN system and provides Ethernet connectivity to enable customers to afford shared storage without the cost of a fully networked SAN system.

The Grass Valley NAS system provides fast, centralized access to multiple video files in multiple video formats, including DV50. The system scales to 14.6 terabytes.

And debunking the myth that NAS-based storage approaches offer an unreliable quality of service, the Grass Valley NAS system uses NewsShare™ QOS technology to provide deterministic server and client channel bandwidth, which is key to ensuring smooth workflows in demanding news production environments.

Both the Grass Valley NAS system and the popular Grass Valley Open SAN system—on which multiple broadcast operations worldwide have standardized—are enabled by the new Grass Valley Cohera™ common storage architecture. Cohera storage-based solutions ultimately lower the cost of ownership of server-based facilities by leveraging the advanced NewsShare QOS technology to manage bandwidth so that more channels can be squeezed into a given storage configuration.

The Grass Valley Cohera storage architecture further drives down the total cost of server-based facilities by using a common set of building blocks (such as RAID storage devices, PC servers, and Fibre Channel and Ethernet connectivity technologies) and enabling broadcasters to move easily from NAS to SAN topologies as facilities and applications requirements expand. The Cohera architecture offers open systems capability for easy third-party integration, a common security model for secured engineering log-in access, and broadcast-ready availability and redundancy.



The Grass Valley NAS system directly supports the Grass Valley FeedClip™ interactive feed capture system; the NewsEdit™, NewsEdit LT, and NewsEdit SC nonlinear editors; the NewsQ™ manual playback system, and the NewsQ Pro automated news playback system, extending the reach of shared-asset production all the way to the desktop.

### KEY FEATURES

- Up to 14.6 terabytes of RAID-3 protected storage
- Media data rates: up to 50 Mb/s for DV, MPEG
- NewsShare QOS technology provides deterministic client/server bandwidth
- QOS tools for maximizing bandwidth efficiency and flexibility
- Supports gigabit Ethernet or 10/100/1000 Base-T networking
- High Availability features including dual RAID controllers, dual power supplies and dual gigabit Ethernet connections

news production

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SYSTEMS  
DESIGN  
SHOWCASE



# Centralcasting at WALA-TV

By Dwight Crumb

**W**ALA-TV, an Emmis Broadcasting television station located in Mobile, AL, recently opened its new facility following a move from its long-time location in downtown Mobile. The move into the new facility marked the station's transition to digital.

A FOX affiliate serving the Mobile and Pensacola markets, WALA also serves as a spoke station to the Emmis centralcasting hub at WKCF-TV in Orlando. Along with WFTX-TV in Ft. Myers, FL, and WVUE-TV in New Orleans, the station now receives all programming with the exception of local news directly from WKCF.

Digital System Technology (DST) was selected as systems integrator for the new facility, in part because of its successful systems integration work at sister station KHON-TV in Honolulu. It, along with the station engineering

staff, began work on conceptual drawings in spring 2000. Following construction, on-site integration began in fall 2001, culminating with the launch of the facility in spring 2002.

The move was necessary for many reasons. Most notably, the previous

centralcasting spoke station.

As a spoke station, WALA does not have a master control center. Since all programming besides local news originates from Orlando, there is no need for one. However, the new site featured enough physical space to allow for a

**The previous facility had been expanded three times and the station had run out of physical space.**

facility had been expanded three times and the station had run out of physical space. The new site would allow for a full analog-to-digital video upgrade (it remains an analog audio plant) and be ideal for a

master control center in the "hub room" should the situation change.

The hub room currently houses 73 racks for equipment, with space for 100 racks to accommodate a master control center. This space was created

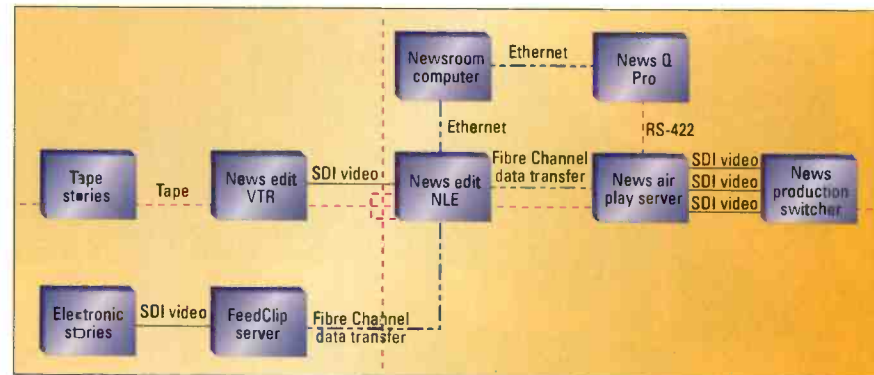
**Above photo: WALA is a spoke station in a centralcasting system; thus, local news is basically the only programming produced live at the station.**

**SYSTEMS  
DESIGN  
SHOWCASE**

in the center of the core. This way, the facility does not require centralcasting. If Emmis Broadcasting ever decides to sell the property, the resale value would not be hampered due to space limitations.

The equipment racks were built for easy maintenance. For the main set of 60 racks, there are four back-to-back, face-to-face rows of 15 racks. A three-foot-wide corridor between the two sets of racks allows for easy access to the back of the units, as the racks were constructed without back doors. The space allows station engineers to handle maintenance with plenty of breathing room.

The absence of a master control center is not the only attribute that sets the facility apart from most other television stations. The elimination of traditional station programming creates a local news bureau type of environment.



**Figure 1. This diagram of WALA's tapeless news environment shows how the server, editing system and AP news system communicate via the Thomson Grass Valley Multimedia NewsQ Pro interface.**

While the facility is more complex than a simple news bureau, the absence of regular programming allowed more focus on simplifying local news production. To this end, DST implemented two special systems.

The first is a tapeless news environment created using a Thomson Grass Valley Multimedia NewsQ Pro news playback interface. The install allows news reporters to transfer stories

directly onto a Profile server. This system, installed in the main production room along with a Vibrant editing system, uses the news playback system to interface with an AP news system (see Figure 1). As the interface between the server, editing system and AP news system, NewsQ Pro tracks the stories and keeps the playlist current with the newscast rundown. Then, when a producer

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## SYSTEMS DESIGN SHOWCASE

floats a story in the newscast, the playlist is automatically updated.

This eliminates the possibility of airing the wrong footage, and the need for tapes to be loaded manually. Instead, the operator can take the story directly from the server. Once in the server, the operator can review a story

seconds after it comes in electronically from a network, satellite or microwave feed. The user can then play back and begin editing the story instead of waiting for a feed to be completed, as is necessary in a news environment reliant on tapes. The story is also available to multiple users once it's within the server.

Story editing is also finished faster. Once the story is on the editing system, the user can transfer a story to the server as a fiber-optic file for play-to-air, making the transfer faster than real time. This provides both the advantages of nonlinear editing and the speed of linear editing. Six identical news edit bays are located directly off

for communication and one Wheatstone TV-80 console. A Mackie eight-bus 24-8 mixer serves as a floating console and is integrated with the TV-80 for IFB communication.

The second groundbreaking solution is a unique interface designed to automatically segment certain news

## Design team

### DST:

Janet Crumb, project manager  
Dwight Crumb, lead design engineer  
Mike Quinn, sales  
Donna Gramlich, purchasing  
Bill Hodson and Simon Shepherd, installation leads

### WALA:

Johnny Reece, complete design review  
Marty Draper, corporate design review  
Mike McKinnon, Emmis vice president of engineering  
Engineering staff

## Equipment list

Thomson Grass Valley:  
Multimedia NewsQ Pro  
Profile server  
Vibrant editing system  
Venus router  
Zodiac production switcher  
CompuSat satellite systems  
Discreet NLEs  
Wheatstone TV-80 audio console  
Mackie mixer  
Evertz Quattro quad-split monitors  
Ross DSS-8024 switchers  
TANDBERG Television:  
TT6010 MediaLink interface systems  
TT4030 transport stream processors  
Leitch terminal gear  
Tektronix T&M equipment  
Sony BVP-950 studio cameras  
Vinten camera robotics  
Ikegami monitors  
Telex/RTS IFB systems  
Elco audio bulkheads



**WALA's production control room features an Ikegami monitor wall with Evertz quad-splits. On the "Front Bench," from left to right, are the Vinten remote control for the Sony BVP-950 studio cameras, a Thomson Grass Valley Zodiac switcher and a Chyron Duet graphics station.**

## Cabling from one device into another instead of using patchbays requires significant rewiring for system reconfiguration.

the newsroom, along with three Discreet nonlinear editing rooms: one main room and two smaller rooms designed for production of promos and commercial spots. The audio control room features common audio control

feeds. Network news feeds come into a station via satellite, and a gap of several minutes will appear between each story. When recorded to a server, the entire feed is saved as one large file. An automated CompuSat system takes

care of recording the network feed, but human intervention is required to break the news feed into separate files for each story. With the system already online, the question was how to address this issue.

For a fully automated process, DST developed an interface using an Evertz Quattro quad-split display to sense freeze frames between stories from network news feeds. The display speaks to CompuSat, reads



**WALA's audio control room features a Wheatstone TV-80 console.**



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the frozen video as one story ends, stops recording and starts again at the beginning of the next segment. As a result, each story is saved as a separate file with a different name onto the server. The quad monitor provides an SDI output on the station's 96x96 Venus router. (In the event that a master control center is ever built, the router has the potential to grow to 160x128.) As a fringe benefit, operators can view up to four channels being recorded onto four different server feeds. Also, because there was an Evertz card tray available on the router, it was a relatively inexpensive solution to a complex problem.

At this time, this interface is operable for approximately 50 percent of the news feeds. Many of the feeds are sent in open timecode, which requires human operation to break stories into separate files. The station expects the interface to be used more often in the future as more feeds come into the station as MPEG streams.

Johnny Reece, the station's director of engineering, had some difficulty with patchbays at the previous facility. With Mobile's shoreline location, corrosion of the patchbays due to the salty ocean air became a problem over



**At WALA, Elco audio bulkheads were used in place of a normal patching system to facilitate system reconfiguration while avoiding the problems associated with patchbay corrosion.**

the years. Because of the corrosion, the patchbays became more of a reliability problem than the hardware. To address the growing number of failures due to patchbay corrosion, the integration team systematically removed the patchbays from the broadcast system and implemented point-to-point cabling. However, cabling from one device into another instead of using patchbays requires significant rewiring for system reconfiguration.

## Because of the corrosion, the patchbays became more of a reliability problem than the hardware.

To provide the station with the flexibility to alter its system as required by station growth, a unique patchbay-like

system was created without using actual patchbays. Instead, three-pin Elco audio bulkheads were used to connect the audio portion of the broadcast system. The audio bulkheads are designed to connect to a device where the cable terminates. A jumper cable connects one bulkhead with another, which is the input that receives the signal. If an input needs to be changed, the cable is removed and plugged into

a different input for simple system reconfiguration. These were created strictly for audio – serial digital video connections often conflict with these bulkheads. Some patchbays are used for video, while the majority of these connections are sent directly into the router.

Centralcasting often results in cost savings and operational efficiency. To increase the new facility's efficiency, Vinten camera robotics were employed to reduce the need for human camera operators. The robotics were designed so human operation is possible when

needed, such as during morning newscasts when there is a tendency to go for a more free-form approach. News department employees are called upon when free-form camera work is required. As a result, the facility has the flexibility of traditional camera operation when required, in addition to the cost savings realized by not employing three people to run the cameras at all times.

DST also developed a special switching system to enable operators to bypass the program output and go directly to the M/E preview. This allowed operators to easily switch to a backup path if the regular program output was interrupted.

The new facility features a solid digital broadcast system that meets all of WALA's current requirements as a spoke station, with the flexibility to grow and change as all successful television stations do. In the event that the facility's broadcasting needs branch away from centralcasting, the station is well prepared to bring in a master control for traditional broadcast station programming as required. It's a fail-safe approach for any obstacle the facility may face in the future.

**BE**

*Dwight Crumb is vice president of engineering for Digital System Technology.*





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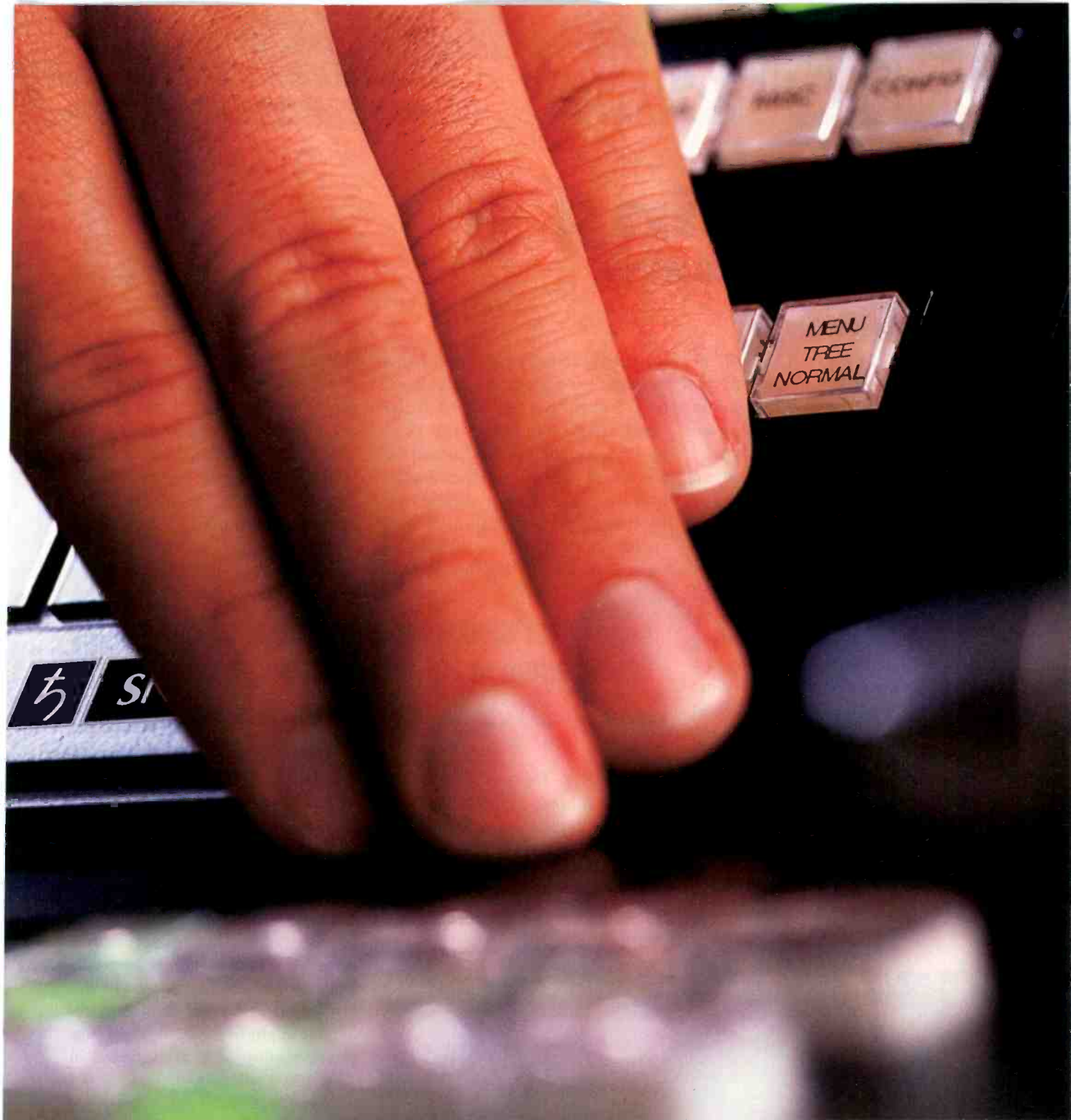
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## Avoiding the RF hazard

BY DON MARKLEY

In days of yore, prior to 1982, the amount of non-ionizing RF radiation that was acceptable in the workplace was largely based on educated guesses. If the nails in your shoes didn't get hot or the metal frames on your glasses didn't become uncomfortable, you could assume that you weren't working in a dangerous place. Tower workers routinely climbed through the aperture of FM broadcast antennas while the antennas were radiating. When working near a transmitting TV antenna, a tower worker determined how close he could approach it by the point where he started to sense something strange. We now know that such actions weren't too smart.

After a lot of hand waving and supposition, and after commercial, educational and governmental institutions performed a great deal of good research, the first standards were published. For broadcasters,

the thesis hit the fan when the Office of Science and Technology published OST Bulletin No. 65 in 1985. Titled "Evaluating Compliance With FCC-Specified Guidelines For Human Exposure To Radiofrequency Radiation," it explained the theory concerning the effects of non-ionizing radiation on people, established a method for calculating the extent of

and TV antennas radiate equally in all directions with the peak value of power. It also assumed that all towers in an AM array operated with the total value of licensed power. It attempted to be overly conservative or, in other words, to err only in the direction of maximum protection.

Then, the American National Standards Institute (ANSI) published a



**Tower workers routinely climbed through the aperture of FM broadcast antennas while the antennas were radiating.**

such exposure from RF sources and established limits for such exposure. The bulletin established limits based on an average exposure over a six-minute period. Further, it based all calculations on a truly worst-case situation. That is, it assumed that FM

standard identified as C-95.1-1982. The FCC adopted that standard as a requirement for the operation of broadcast stations. Subsequently, the standard was modified and published as ANSI/IEEE C95.1-1992. The modification contained a two-tier approach regarding exposure limits both for workers who supposedly knew how to work around an RF environment, and members of the public that might be exposed. The Commission adopted that standard in 1996 and it still is in effect.

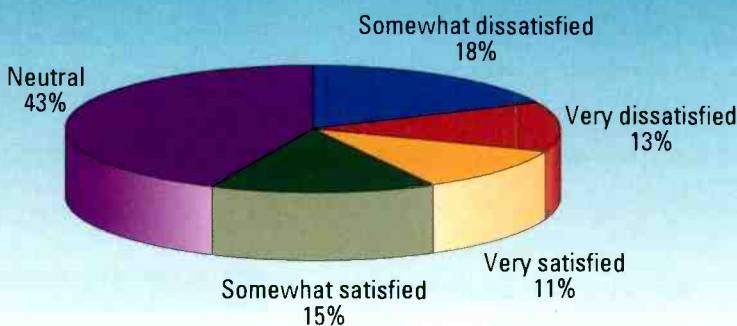
Now, what does all that mean to the broadcaster? First, virtually any application for a change in facilities requires that the broadcaster assess the non-ionizing levels involved. Applicants should be advised that simply stating that everything is fine on the applications won't necessarily get the job done. The Commission will check to be sure that something isn't totally out of place. The result can be a construction permit that requires the broadcaster to make measurements to show compliance with the standard.

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That is particularly likely for multiple-station sites.

There are several systems available for such measurements, most of which are offered by two manufacturers - Holaday Industries and Narda - a division of L3 Communications.

One system that is particularly useful has a probe with a shaped frequency

response. The overall system response is essentially the same as the exposure-limit curve contained in C-95.1-1992. This means that no extensive calculations are involved because the instrument indicates the measured levels as a percentage of the allowable limit. The measurement procedure is very simple. The tip of the handheld probe contains



Stations are responsible for the safety of personnel working in high-RF environments, as well as for the safety of members of the general public. Photo courtesy Wisconsin Educational Communications Board.

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the measurement point. The user takes the measurement by holding the probe well clear of himself and moving it through the area of concern. The probe must remain clear of the body or any object that could reradiate signals and cause error in the measurement. The measurement and calculation processes are simple and plainly described in the instrument instruction books.

Personal monitors are available with varying features. These small monitors alert the wearer when entering an area with high field levels. They

**For work on the tower,  
the simplest thing for  
AM stations is simply  
turn the station off.**

also alert the user if some idiot turns a transmitter back on when it should stay off. This does happen, despite lockout procedures. When using these personal devices, take care. They don't provide an accurate measurement of the non-ionizing radiation levels like the big meter and probe configurations. Instead, they really are intended as alarms.

The question then becomes one of just how often and in what manner should broadcasters take measurements. First, OSHA requires that the normal safety

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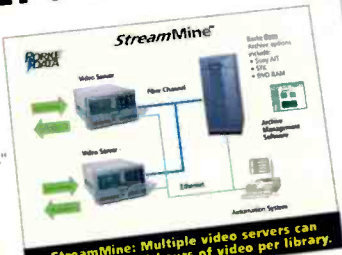
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# Transmission & Distribution

meetings cover exposure to non-ionizing RF. The station should post a hazard assessment that identifies any area where the non-ionizing radiation levels would be in excess of the standard. To confirm the location and/or the existence of those locations, the station should take measurements and record the results. Unfortunately, a meter that will do that job accurately is expensive and is needed rarely, but the station's consulting engineer should own



The FCC adopted ANSI/IEEE C95.1-1992 in 1996 to protect tower workers (like this one installing a transmission line system for four digital television stations in Louisville, KY) by limiting their exposure to dangerous non-ionizing radiation. Photo courtesy Andrew.

one. The simplest solution is to have your consulting engineer come in and determine the non-ionizing levels for all parts of the site.

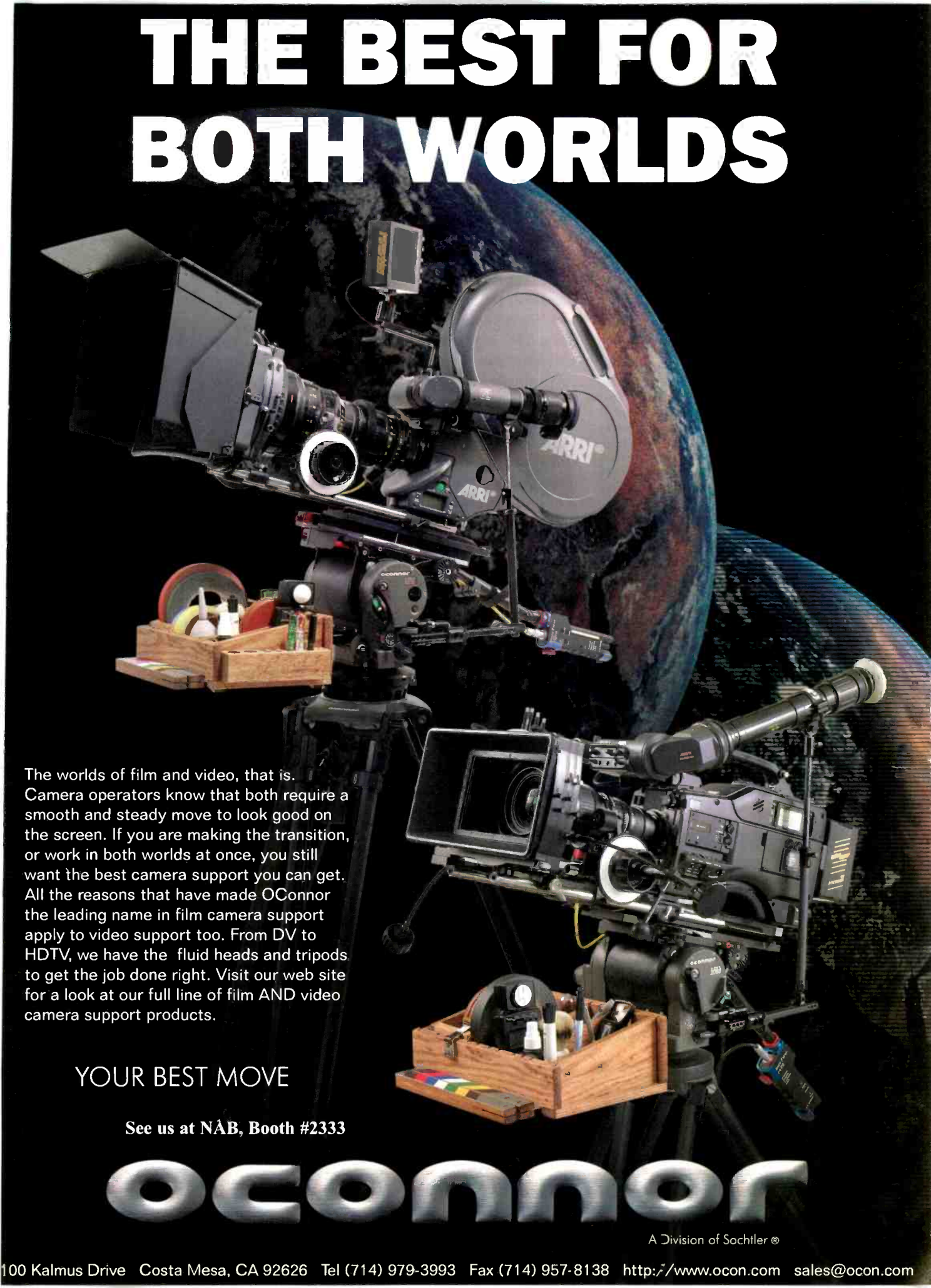
For work on the tower, the simplest thing for AM stations is simply turn the station off. There are other ways of handling the problem, but they require more measurements and they leave the station open to possible problems if a governing agency determines that the workers

**In today's litigious society, the tendency is to look for someone to sue if anything, however petty, goes wrong.**

were exposed to levels in excess of the standard. True, it is averaged over six minutes. But the only sure way of avoiding problems is to turn it off. If necessary, for work such as tower painting, get an STA to operate with an alternate antenna. String a wire or two and get off the tower altogether until the work is done.



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Broadcasters building multiple-station sites like this six-station tower in Wausau are more likely to find it necessary to provide measurements to the Commission showing compliance with the standard for non-ionizing radiation levels. Photo courtesy Wisconsin Educational Communications Board. Photo by Rick Bowe.

For FM and TV operations, a qualified technician who climbs can go up the tower with the meter and record

levels all the way up until the RF values reach the maximum level the standard permits. This is the way many of the large multiple-station sites do it. For example, technicians measure the non-ionizing radiation levels on the Sears Building at all rooftop locations regularly. In addition, when they encounter excessive levels, they also make measurements on the towers at all levels with the necessary transmitters shut down. That information makes it possible to predetermine just which stations must shut down or switch to other antennas when work is being done at any particular location.

Stations should record all this data and maintain it in their files. In addition, whenever work is done on the tower or antenna systems, keep a full record of who did the work, what work was performed, where the work was done on the tower and what steps were taken to avoid hazardous

exposures. In today's litigious society, the tendency is to look for someone to sue if anything, however petty, goes wrong — from athlete's foot to dandruff. It is quite possible that a station may someday face a lawsuit claiming that someone's illness was caused by that old devil RF, and that the station didn't provide a suitable level of protection. In such a situation, the station's complete and well-maintained records could save it a lot of money. Not that any of that money will ever get to the engineering department, but the engineering staff will look like properly clever fellows when they produce the necessary records.

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



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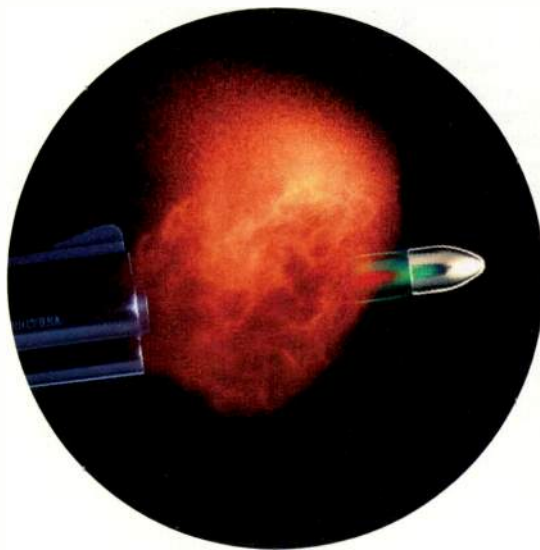
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Room design for audio facilities can be divided into four general categories, which vary slightly to meet the specific requirements of individual facilities. One possible configuration is a symmetrical arrangement of the cockpit style, as illustrated by Mi Casa Multimedia's Studio A. Photos courtesy Robert Wolsch.



# Studio design

By John Storyk



internal room acoustics) in creative ways. It is the job of the room designer to accommodate user ergonomics and room layout requirements, while maintaining these standards. We now discuss these tasks in more detail.

### Ergonomics

Ergonomics is the room's architectural program — how we arrange equipment, furniture and other elements in our rooms, and how these elements affect the usefulness and comfort level of the environment. It is also important in audio production suites to consider how these arrangements affect and are affected by acoustics. Remember, our goal is to have the most accurate acoustic response possible in the critical listening position. Acoustic design is then applied to accommodate these requirements. The old architectural anthem "Form follows function" is especially true for audio production environments.

### Control room layouts

Audio control rooms can be categorized into four room layout configurations: cockpit style (symmetrical arrangement), cockpit style (asymmetrical arrangement), railroad layout (symmetrical) and railroad layout (asymmetrical).

In each of these configurations, there will be variations resulting from changes in speaker size and mounting, glass (viewing to studios and/or outdoors), egress in and out of the room, 5.1 surround requirements, etc.

*Cockpit style (symmetrical arrangement).* The room's acoustic centerline (the axis between the primary stereo mixing speakers) will be centered on



**In WNET's New York audio production suite, columns and a need for corner seating required the creation of an asymmetrical version of a railroad room layout.**

a mixing/production console or workstation. This axis is aligned with the room's architectural (physical)

centerline. There is really no reason for this not to happen. All other equipment — processing devices, composing gear (ie. keyboard), etc. — will be arranged on either side of this position, as symmetrically as possible. In this configuration, there is no equipment or furniture directly behind the listening position. The acoustic advantage of this layout is that the equipment and furniture are

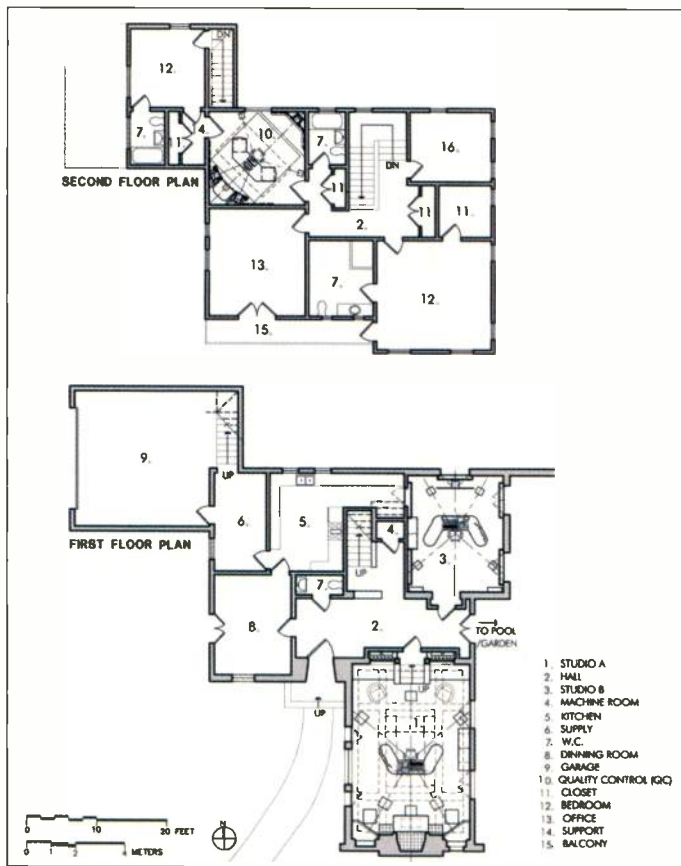


**Carter Burwell's private production studio is a symmetrical arrangement of the cockpit style. In a cockpit-style room, the console or workstation is located on the room's physical centerline, with all other equipment arranged as symmetrically as possible around it.**

not in conflict with speaker reflection patterns. On more than one occasion, we have seen a perfectly well-designed room be acoustically compromised by one large piece of equipment (ie. tall equipment rack) that created a comb

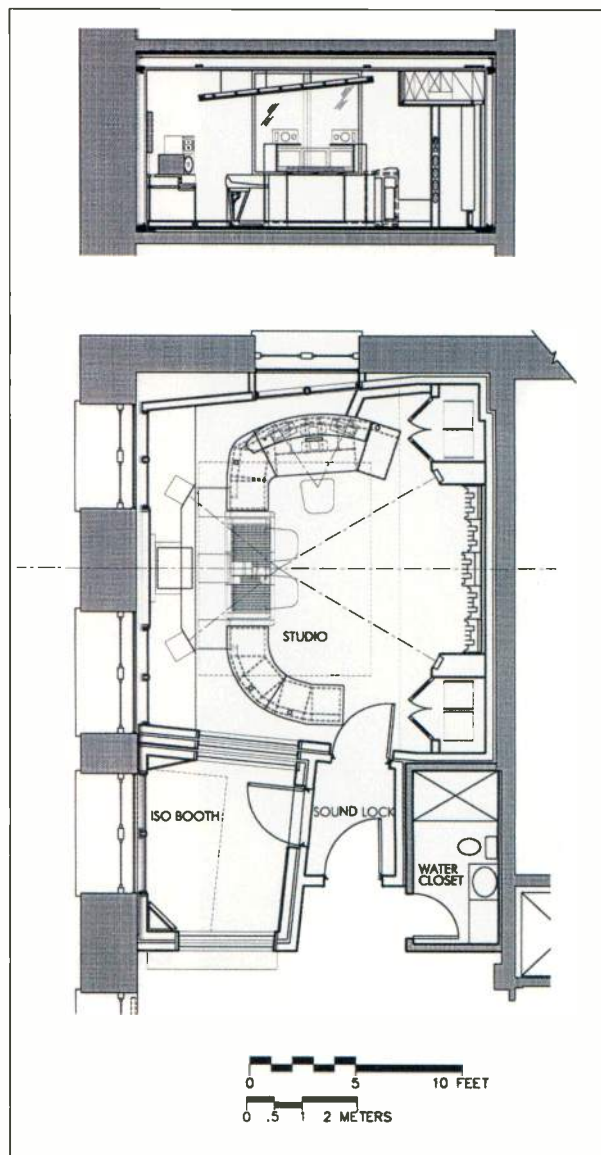
**L**ast month we briefly summarized some of the issues concerning acoustic criteria and acoustic design as they relate to audio production suites for the broadcasting industry.

In that discussion, we determined that finished design solutions integrate two fundamental acoustic categories (sound transfer acoustics and



Above: Figure 1a. Equipment in Studio A of Mi Casa Multimedia, a cockpit arrangement, is almost perfectly symmetrical, and no reflective furniture is placed in the rear of the room.

Right: Figure 1b. In Carter Burwell's film mixing and composing facility, rear corner cabinets house equipment, keeping the space directly behind the listening position clear.



filter or harsh reflection for one speaker that was quite different than the other.

Both Mi Casa Multimedia in Hollywood and film composer Carter Burwell's private production studio (see figures 1a and 1b) exhibit this type of layout. In Carter Burwell's production studio, extensive equipment is housed in rear corner cabinets, but no equipment is directly behind the listening position. Mi Casa's Studio A exhibits a near perfect symmetrical arrangement of equipment with no rear reflective furniture.

around a room acoustic centerline – but has the characteristic of one side of the room creating a non-symmetrical equipment configuration. This is often due to a door location or window placement, or the need for a large rack or piece of furniture. In general, I would try to avoid this configuration, but it frequently represents an architectural/layout requirement that must be accommodated. In this case, try to minimize the physical difference between the two halves of the room. At the very least, keep a symmetrical configuration in the front portion of the stereo sound field. Ultimately a simple ray trace pattern will reveal whether there will be an acoustic conflict in the primary listening position. Occasionally a slight repositioning of a rack will



Cockpit-style rooms like the one at WETA in Washington, DC, sometimes have to be arranged asymmetrically because of architectural requirements. When this is necessary, the difference between the two sides of the room should be minimized as much as possible.

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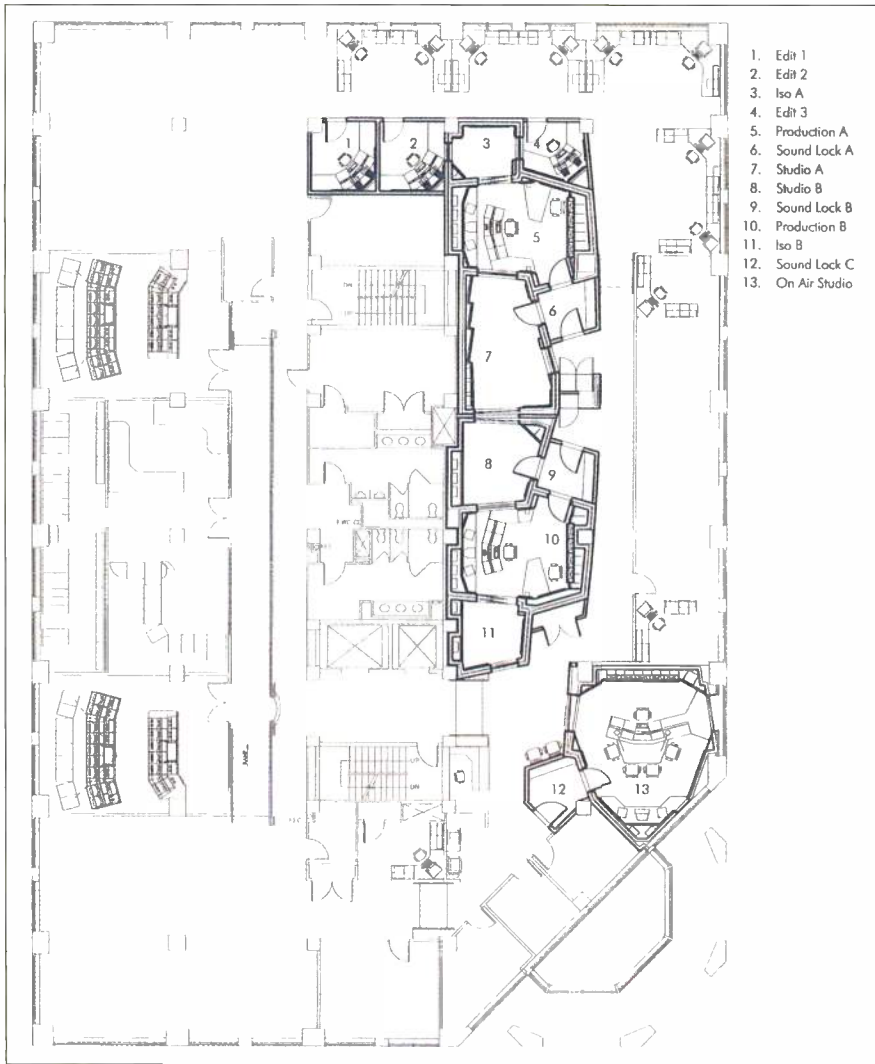
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**Figure 2. Control rooms five and 10 at WETA had to be arranged asymmetrically due to the rear entry door configuration. Equipment in the front of the rooms is still arranged symmetrically, and the side glass configurations are identical.**

solve what could be a serious reflection control problem. In the case of the radio production control rooms (rooms five and 10, see Figure 2) for

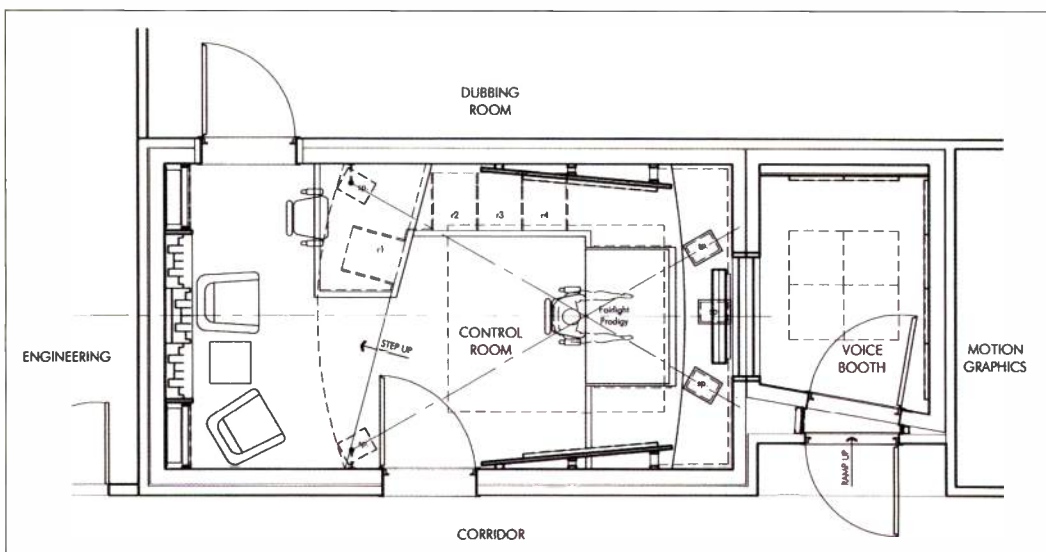


**New York audio post house Superdupe features a railroad-layout room design, with partially asymmetrical furniture arrangement, but symmetrical room boundaries and acoustic surfaces.**

WETA in Washington, DC, asymmetry was required in the rear of the room in order for the entry door configuration to work. Notice that the fronts of the rooms are totally symmetrical around the acoustic centerline and that the side glass configurations are also identical.

*Railroad layout (symmetrical).* This is probably the most common room layout for the broadcast and audio production industry. A producer's desk is typically located in the rear of the control room on top of a rear equipment rack housing with close proximity to the primary mixing position. We can also configure rooms in this fashion with equipment being partially asymmetrical, while the room boundaries and acoustic surfaces are perfectly symmetrical. Again, where

possible I would recommend these types of layouts. New York audio post houses Berwyn Editorial (see Figure 3) and Superdupe both illustrate room symmetry, despite furniture layouts that are partially asymmetrical. Critical acoustic treatments (such as side wall absorption and rear room diffusion), as well as room boundary geometries, are symmetrical for the entire length of the room's acoustic centerline.



**Figure 3. The floor plan for Berwyn Editorial reflects symmetry of room boundaries, even though its furniture layout is partially asymmetrical.**



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**Berwyn Editorial in New York features a symmetrical railroad layout, probably the most common room layout for audio production rooms. This layout features a producer's desk at the rear of the room, on top of a rear equipment rack near the primary mixing position.**

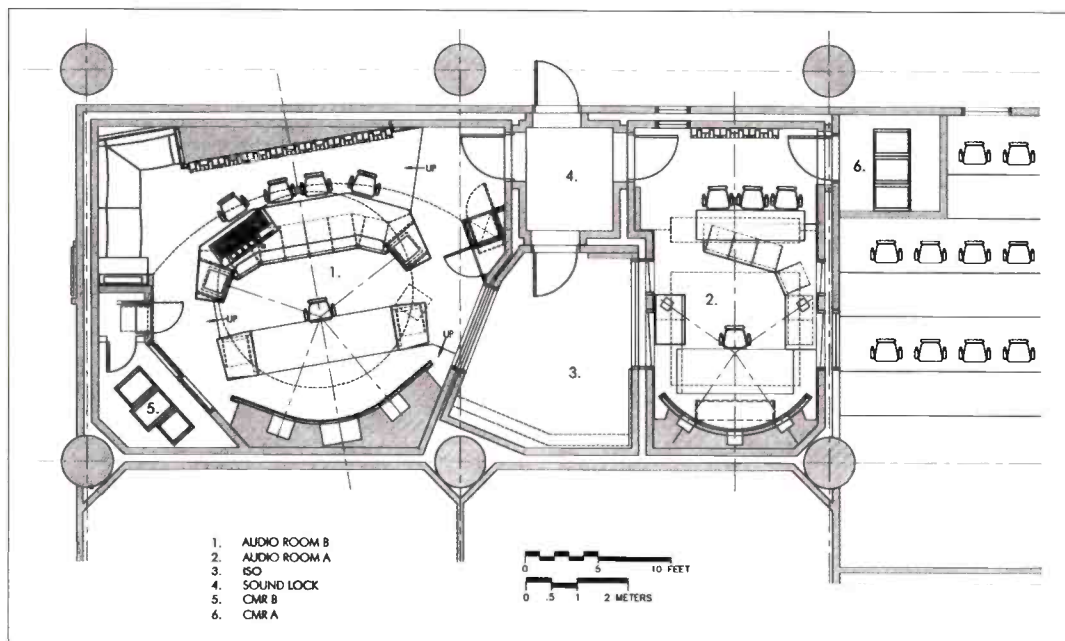
*Railroad layout (asymmetrical).* Architectural circumstances (doors, columns, glass, client seating, etc.) often demand that we create an

asymmetrical version of type C. In the case of New York station WNET's 5.1 audio production suite, columns as well as a need for a corner seating

environment. As we have discussed, room layouts depend on the room's exact use, size, budget, equipment requirements and existing site circum-

stances. When ergonomic and function uses have been solved (this always has to happen first!), use the basic acoustic principals of comb filter prevention, reflection control and low frequency analysis (room ratio organization and well-placed low-frequency absorption) to assist in creating an acoustically accurate room. Enjoy working in these rooms!

**BE**



**Figure 4. Despite a partially asymmetrical arrangement of WNET's 5.1 audio production suite, critical acoustic treatments remain symmetrical, and rear furniture is low to prevent harsh comb filter reflections.**

*John Storyk is a principal owner of the Walters-Storyk Design Group.*

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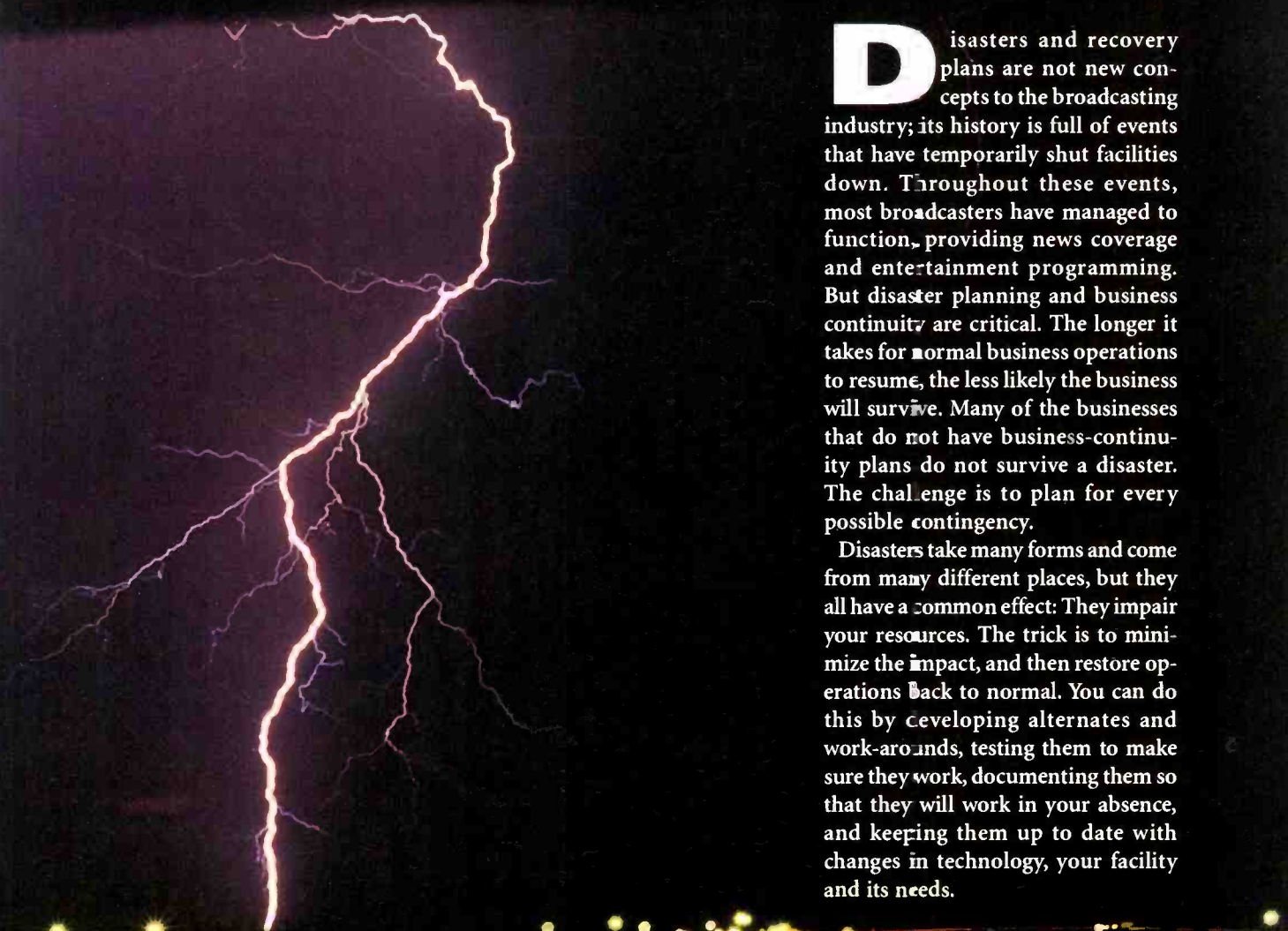
Lightning from a powerful thunderstorm strikes part of an electrical power grid. Such strikes release billions of watts of electricity, which can easily overload portions of the grid and cause widespread power outages.



# The calm before the STORM

## Preparing for disaster

BY WILLIAM KIRKPATRICK



**D**isasters and recovery plans are not new concepts to the broadcasting industry; its history is full of events that have temporarily shut facilities down. Throughout these events, most broadcasters have managed to function, providing news coverage and entertainment programming. But disaster planning and business continuity are critical. The longer it takes for normal business operations to resume, the less likely the business will survive. Many of the businesses that do not have business-continuity plans do not survive a disaster. The challenge is to plan for every possible contingency.

Disasters take many forms and come from many different places, but they all have a common effect: They impair your resources. The trick is to minimize the impact, and then restore operations back to normal. You can do this by developing alternates and work-arounds, testing them to make sure they work, documenting them so that they will work in your absence, and keeping them up to date with changes in technology, your facility and its needs.

# The calm before the STORM

Preparing for disaster

## Starting to plan

To initiate a disaster and business-recovery plan, start off with an honest risk assessment. To what risks are you exposed, and how likely are they to happen? Many stations have experienced disasters and have plans and equipment in place to deal with them. (See the sidebar for some examples of the types of risks you might encounter.) Many stations have some backup equipment such as second transmitters and antennas, but have not reviewed the need for further backup equipment. There is a school of thought in some broadcast business offices that it is cheaper to insure against a loss than to try to prevent it, so some broadcasters purchase insurance rather than extra equipment to get back in business. This increases profits temporarily, and makes owners happy. But insurance costs are rising, and some coverage is unobtainable at any cost.

Some departments, such as engineering, might have a false sense of security, and see themselves as immune to some risks. For example, let's assume that everyone at a station agrees that the responsibility of the traffic system belongs to the sales department. But, if the traffic system goes down, master control will soon run out of programming, which will affect engineering. And any department can experience the untimely departure of a key person, which means that others in the department will have to carry extra responsibilities until that key person is replaced.

Another issue that crops up in times of crisis is that a clear delineation of responsibilities is sometimes lacking, which can separate resources from people who need them. Some resources, such as office supplies, can be handled by one person, with someone

else acting as a backup. But trying to locate a suitable studio may require a team approach, with each member bringing in an area of expertise. For example, engineering can be responsible for focusing on issues such as access to satellite receiving while the



**A tornado rips through a community like a chainsaw through a miniature village. A tornado's formation and path, unlike that of a thunderstorm, is very difficult to predict.**

business office focuses on the legal issues. The important point here is that you must decide these issues before you need the resources.

Your viable disaster-recovery plan must include a list of the resources – utilities, equipment and supplies – your facility uses, along with documentation

on how you normally obtain them, how else you can obtain them and, when they are temporarily unavailable, how you can make do until you can get them again. Start with the obvious

things, like electricity, skilled labor, and technical and office equipment, and then consider more unusual items, like the building itself. As you make a list of each item, document how often it breaks or depletes, how you could replace it, how long it would

take to replace it, where to get the replacement and how you would transport it, what else is affected by its loss, and what might place an unusual demand on this resource. Most disasters don't create a total loss, so having alternate resources can help you make a substantial recovery.

Some items will stand out as being important to your operation – perhaps because they take a long time to replace, or because their absence makes processes more difficult. The question for those items then becomes: How can you reduce the chance of losing that resource, or reduce your dependency on it? If your phone service fails often and you lose the transmitter link, can you get the programming to the transmitter some other way? Perhaps documenting losses caused by old equipment will help get replacements.

## Backup

The amount and kind of backup a facility should have varies from one facility to the next, and seems to contradict the current wave of consolidation.

**Disasters take many forms and come from many different places, but they all have a common effect: They impair your resources.**

The real question is: How long can your station afford to be out of business, and how likely is it to happen? You need to weigh this against the cost of maintaining a second facility, and

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# The calm before the **STORM**

Preparing for disaster

the possibility that it will suffer problems at the same time. From that, you can subtract the amount of daily work you can accomplish there. For example,



**Uninterruptible power supplies are a station's first line of defense against disasters, both natural and man-made, that cause power outages.**

if you put your small studio to productive use by producing a show that is more convenient for the people involved, then you can have one fewer studio in your main location and have a backup facility for your radio station at a minimal cost. It will need to have some extra equipment, but a lot of the major costs are being used for an ongoing part of your station's daily operation. Maybe keeping one of the old station's facilities around makes sense in today's world.

Much of the technical equipment used in broadcasting, such as RF components and production equipment, is unique to the industry. This equipment tends to be expensive, and generally there are no spares standing by. While you probably will have an auxiliary transmitter, perhaps even at a different location, the same cannot be said for a production switcher. If you have a second switcher, it is probably located in the same facility and is used at the same time as the main one. Is there a way that corporate can have some of this equipment available for all the stations?

In times of disaster, some people adopt an attitude that was prevalent in the wild, wild west: every man for himself. Suppliers that you had

counted on to have things you consume may not have them. Repair people that previously would have come over on short notice may not be available for days. On top of that, your equipment may break more than usual due to the heavy workload on it. If you are in a disaster situation, your suppliers (and the suppliers' suppliers) may in a similar situation. They would have a higher than usual demand for their goods and services, while deal-

ing with the same problems you are. They also supply places like hospitals, local government and relief agencies and would give priority to

## Most disasters don't create a total loss, so having alternate resources can help you make a substantial recovery.

those customers, leaving you in third place. While you can try to get promises of priority service, the reality is that suppliers will want to make sure that the emergency services taking care of the disaster have the materials they need, even if it means you don't get the supplies you need. This means that, in your recovery plan, you need an alternate supply source. A good place to start might be a co-owned facility in a nearby city. It may take longer than usual to have the supplies delivered from 100 miles away, but you might get the supplies sooner than waiting for your usual supplier. Then, if they are ever in a similar situation, they might be able to use your suppliers.

### Availability

There are several things that can help you speed the recovery process. First,

make the recovery plan and the tools to implement it readily available. In the heat of the moment, will you be comfortable scanning through your address book on your laptop or PDA, or flipping through pages in a notebook? Since part of the recovery plan is accounting for your own lack of availability, will all the other possible users of the plan be able to implement it? How will it be kept current, and where will it be kept? Some of the information, such as employees' home addresses and telephone numbers, may be sensitive. Yet this information will be invaluable in times of crisis. Some departments may need to have their business continuity separated from the main station's plans and staging, yet will need guidance on the complete plan. The legal department may not want it widely known exactly where the backup copies are kept, but it will need to know where to send them in a crisis.

### Test and update

Once you have looked at all your

options, the next thing to do is to test them. For example, find out if the rental house really has the two cameras right now. Make sure the backup microwave really works. You need to



**A snapped utility pole dangles helplessly after a storm. Don't let your station suffer the same fate.**



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# The calm before the STORM

Preparing for disaster

test everything. And you need to familiarize the people who would be

Make sure that the new maintenance engineer can start the generator manu-

tape operator can move and tune the satellite dish by hand. While you are testing your plan and training new personnel, ask yourself what else could go wrong. The exact training schedule will vary by station. The recovery plan and the people involved with it change, and operators forget. The plan is a living thing that needs to change as circumstances change. Having old information may slow recovery and increase the cost of returning to normal.

We hope this review has given you an idea of the size and scope of disaster recovery. The most important things to remember are that making information available and rehearsing the basics can keep your station in business. More than 50 percent of the businesses that shut down for 30 days never reopen. Don't let yours be one of them. **BE**



After a hurricane, a transmitting tower lies in ruins. You can't prevent such an event, but you can and should plan to recover from one.

implementing the changes with the proper implementation procedures.

ally, that the master control operator can change transmitters, and that the

*William Kirkpatrick is engineering manager at WABC-TV in New York. Views expressed in this article are not necessarily those of ABC.*

## Disaster characteristics

**D**isasters come in many forms and have many characteristics. It would be wise to take these characteristics into account in your plan so you can prepare for them and recover from them.

*Local impact vs. regional impact.* How large an area does the disaster affect? A fire next door to the station is a local event, while a blizzard is more regional. This will influence issues such as the availability of local resources.

*Newsworthy vs. not newsworthy.* An event such as a water-main break in front of the station may not be newsworthy, while a neighbor's evacuation may be. This will influence the news department's expectations and use of the available resources.

*Predictable vs. unpredictable.* How much warning, if any, will you have prior to an event occurring? Some natural phenomena, like tornados and hurricanes, are seasonal and,

therefore, predictable to a certain extent. In North America, the summer months inevitably bring tornados to the midwest, and late summer and early autumn bring hurricanes to the Gulf, southeast and mid-Atlantic states.

Specific hurricane events can be predicted days in advance. But other specific natural events like tornados and earthquakes are much harder to predict. Man-made events like accidents, crime and terrorism are largely unpredictable. The bottom line is that, the more predictable an event, the more time you have to prepare for it. If an event is unpredictable, you will have to be prepared for it at all times.

*Preventable vs. unpreventable.* What steps can you take to prevent an event? And what steps can you take to minimize the effects of

inevitable ones? Man-made events like accidents, crime and terrorism are preventable to a certain extent. Natural disasters are not preventable.

*Minimal impact vs. severe*

*impact.* How severely might a disaster impact your operations? Having limited resources will increase the severity of an

event's impact on your operations.

Each of the above sets of characteristics has two conditions: one is bad; the other is worse. The key to returning business to normal is to minimize the duration of the occurrence and the severity of the worse conditions, speed your way through the bad portion and return to normal. **BE**



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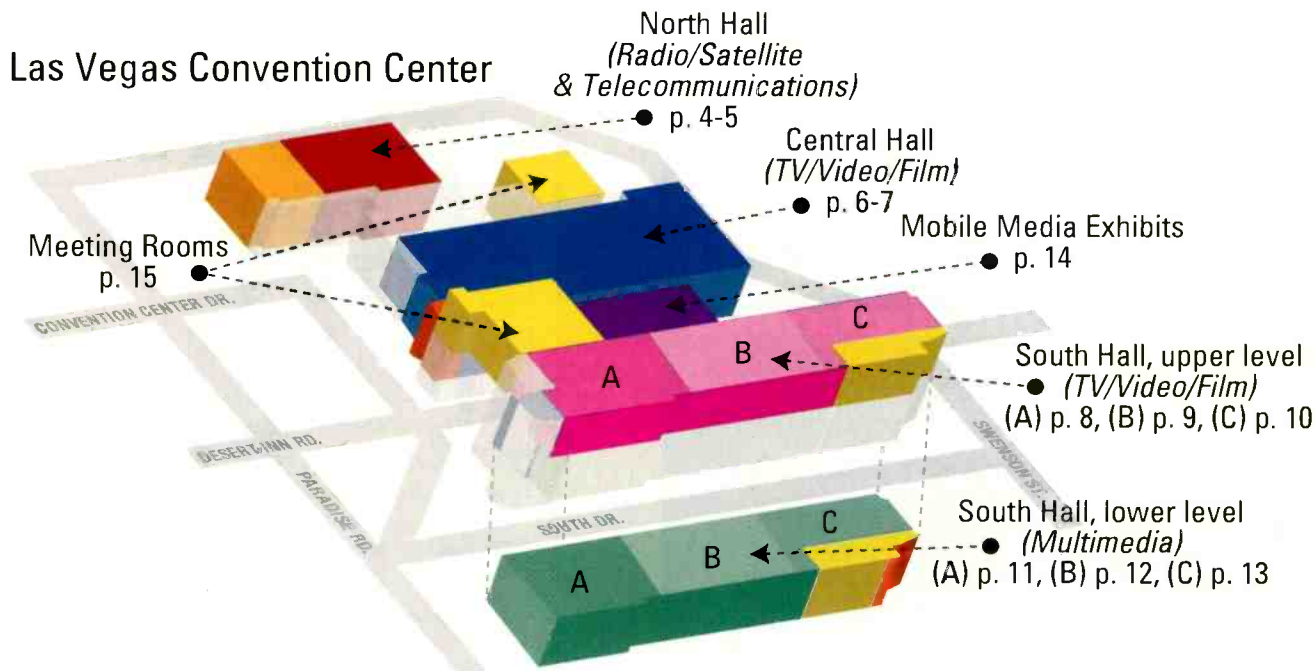
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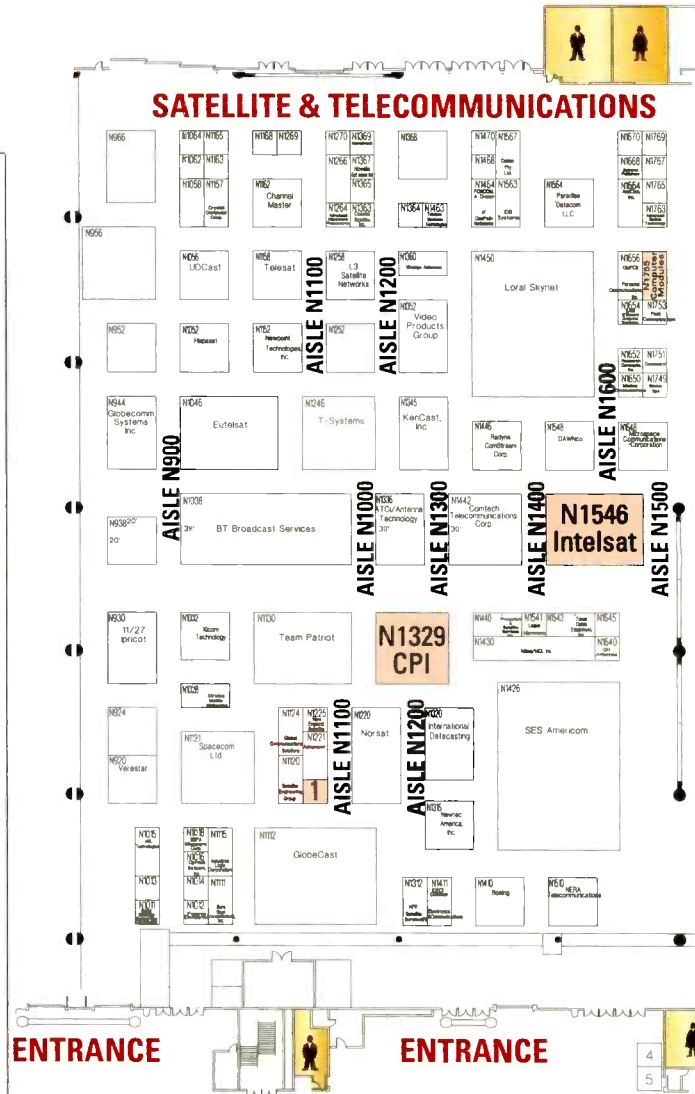
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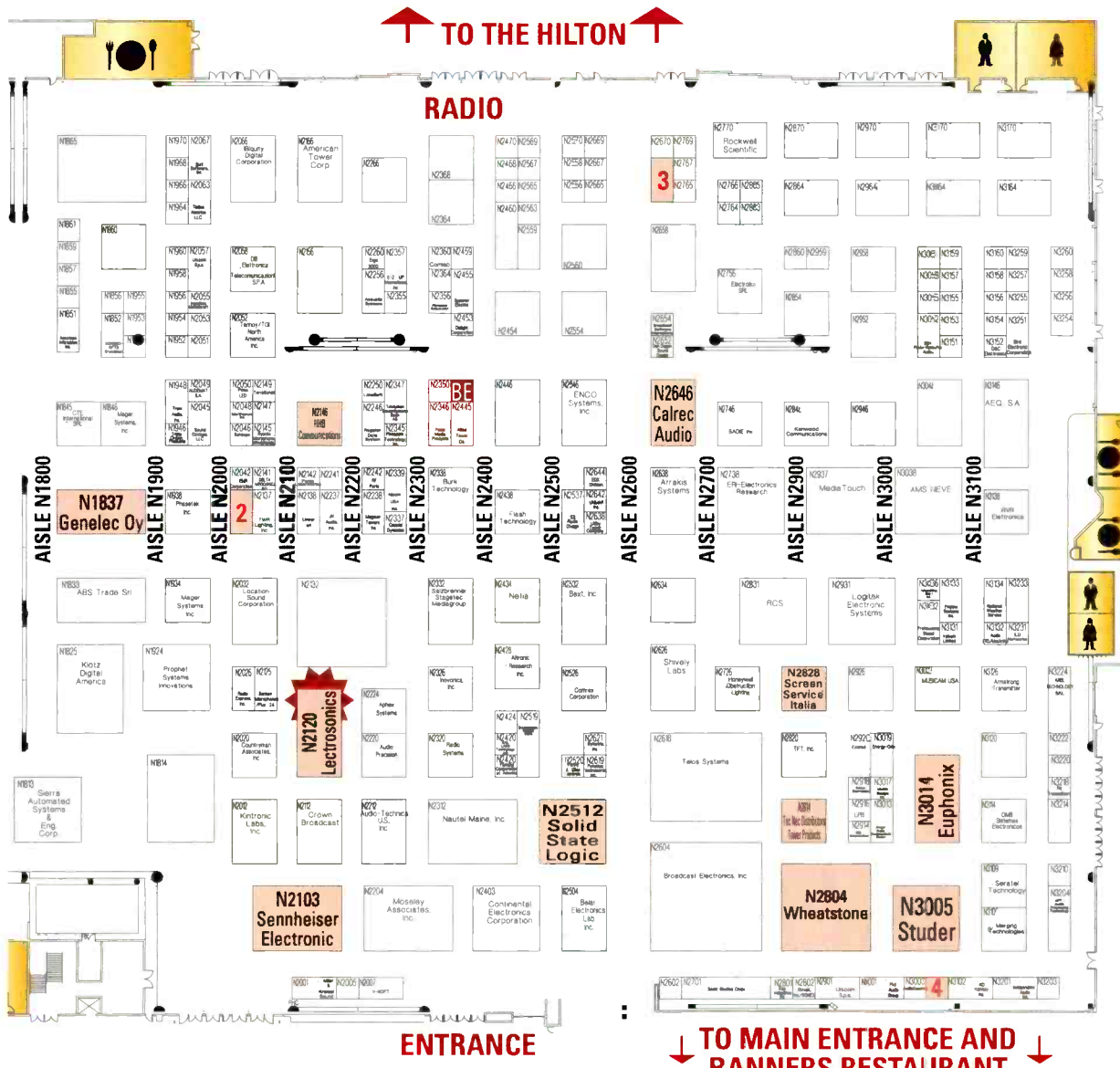
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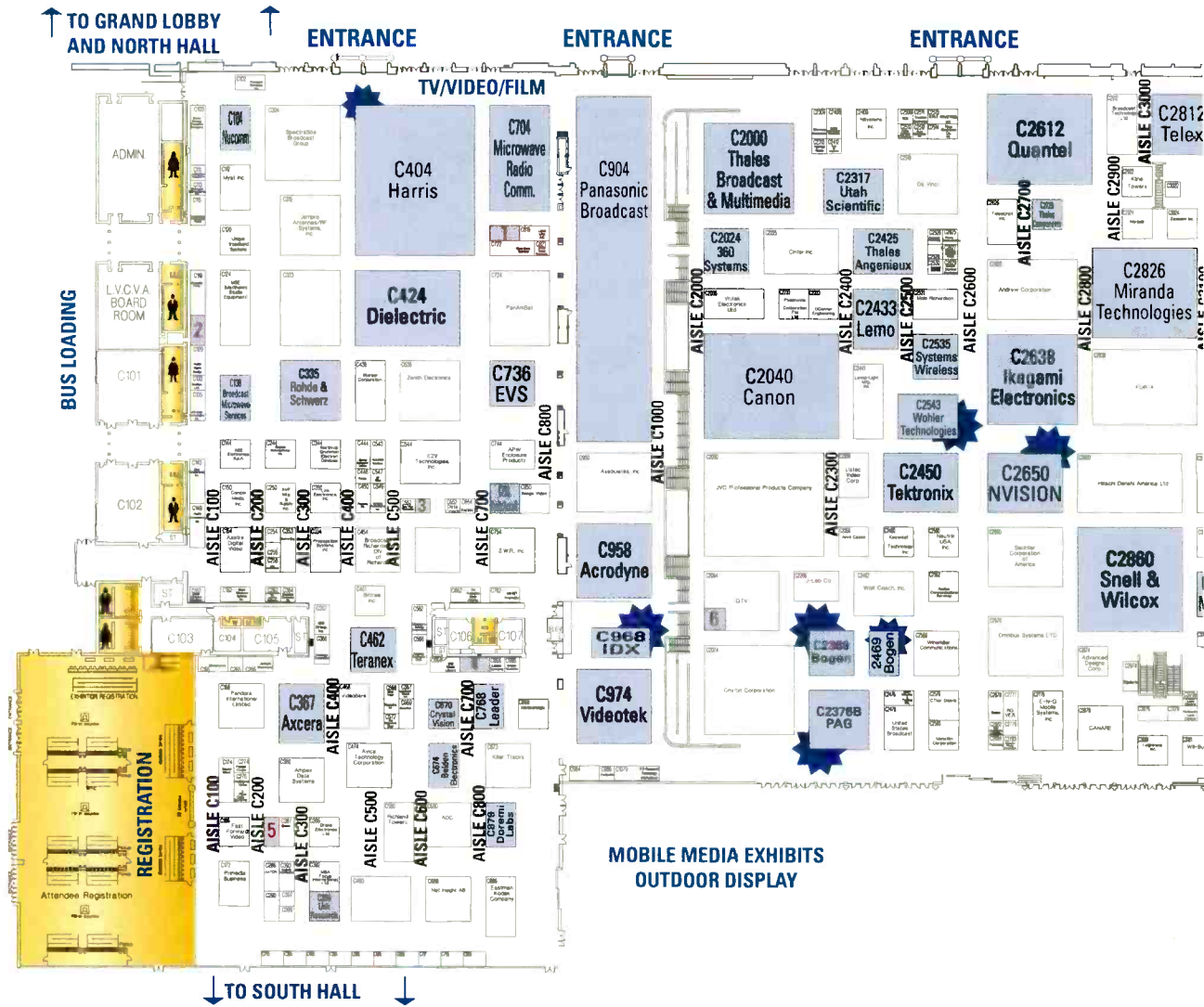
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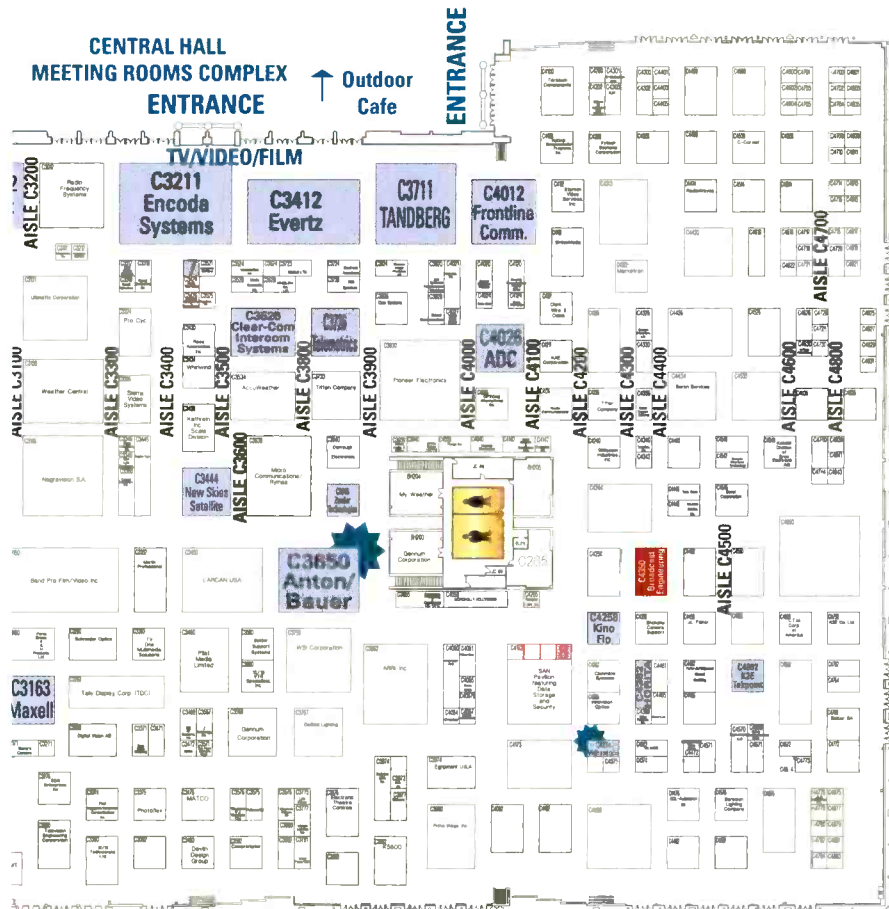
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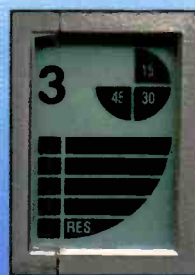
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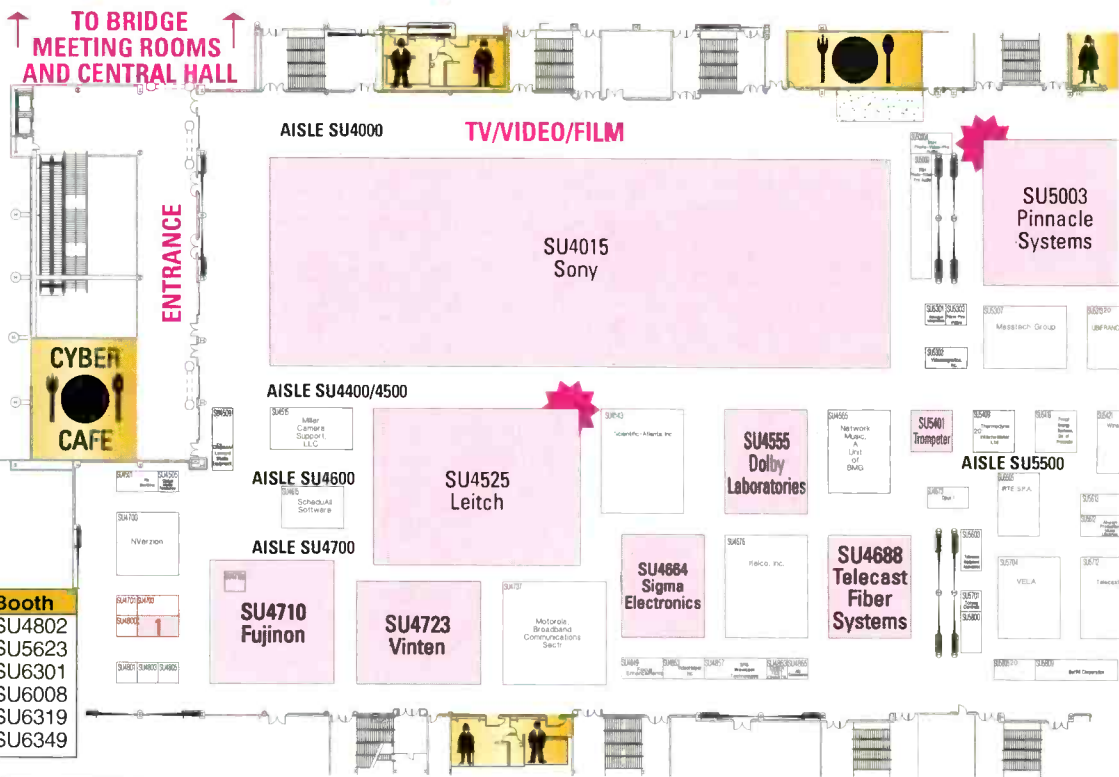

  
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★ See Videssence at Booth C4274, page 7

## My, what bright lights you have!

*All the better to see you with, my dear.*



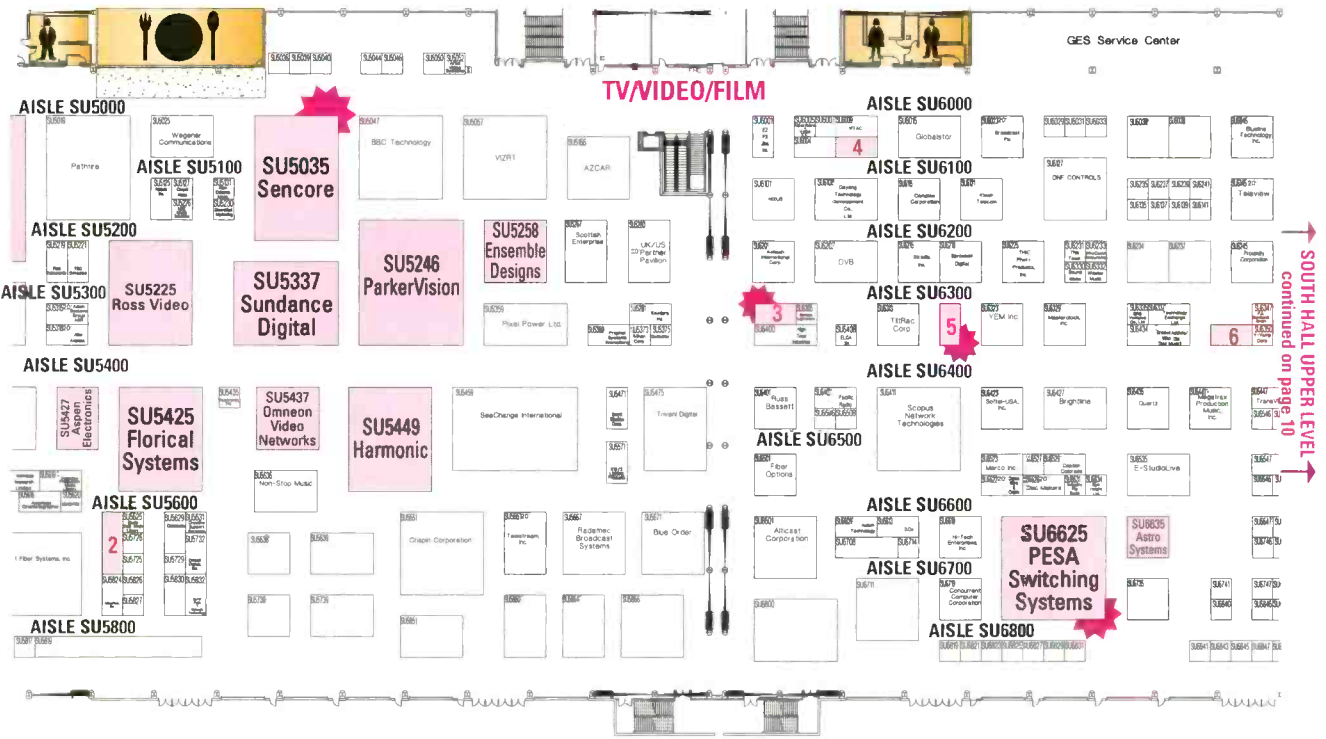
Come see our versatile, cool Studio/Location Lighting Fixtures.

**Booth C4274**



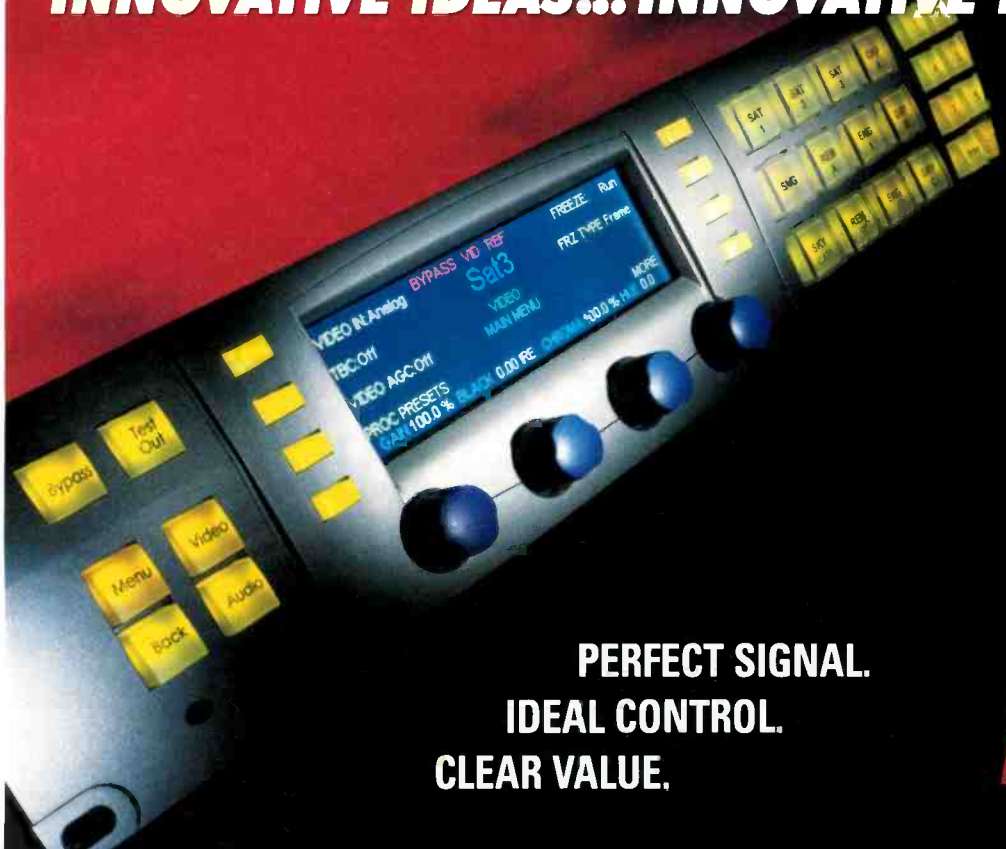
10768 Lower Azusa Road • El Monte, CA 91731 USA • 626-579-0943 • [www.videssence.tv](http://www.videssence.tv) • [www.videssence.com](http://www.videssence.com)

# South Hall, upper level (B)



★ See Fortel at Booth SU6319 (#5), page 9

## INNOVATIVE IDEAS... INNOVATIVE PRODUCTS.



Come see our new products at **Booth #SU6319**:

**DEC-410:** NTSC decoder for cleanest, clearest conversions to SDI.

**RCP-303 Express Remote** (pictured left): the fastest way to manage multiple feeds.

**FS-415:** Integrated SDI digital video synchronizer and Perfect-Palette™ Legalizer.

**RCI-300:** Quickly access and control Fortel DTV products from your PC.

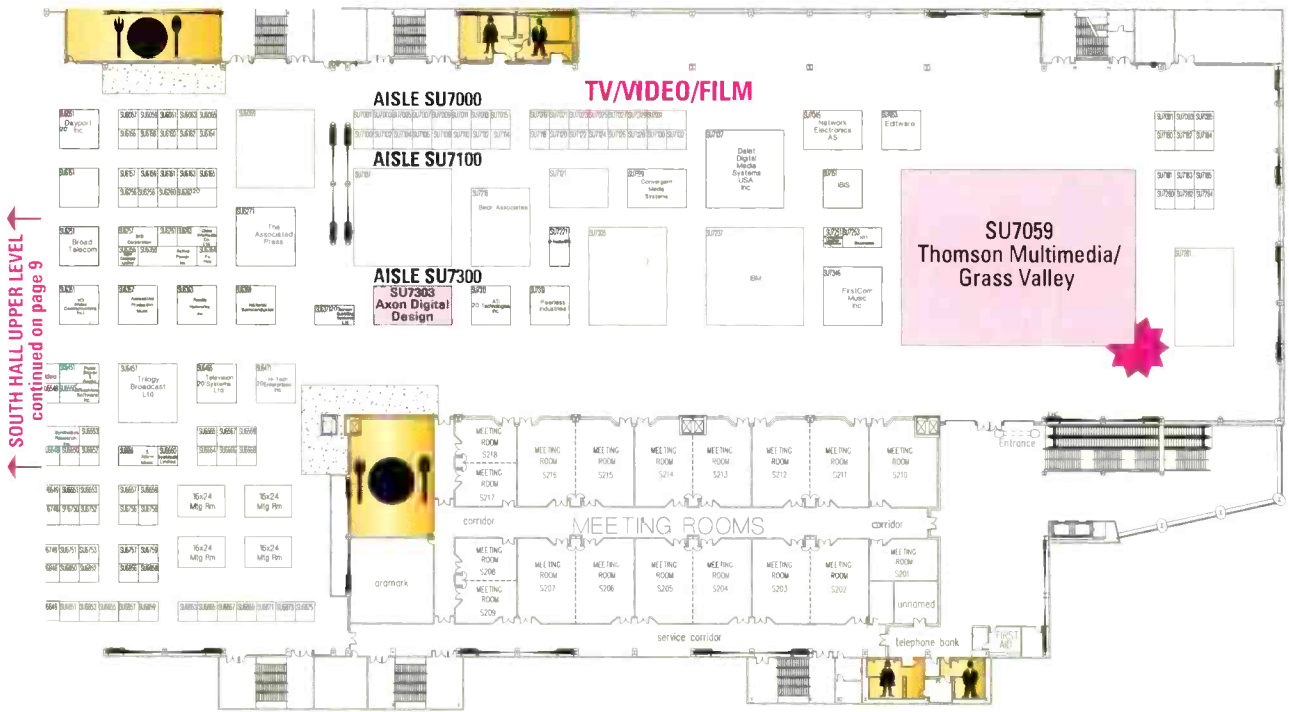
**PERFECT SIGNAL.  
IDEAL CONTROL.  
CLEAR VALUE.**



# South Hall, upper level (C)

**NAB Convention, April 5-10**  
**Exhibit Hours**  
 Mon. - Wed. .... 9 a.m. - 6 p.m.  
 Thurs. .... 9 a.m. - 4 p.m.

○ Advertisers      ● Points of Convenience      ★ Map Advertisers

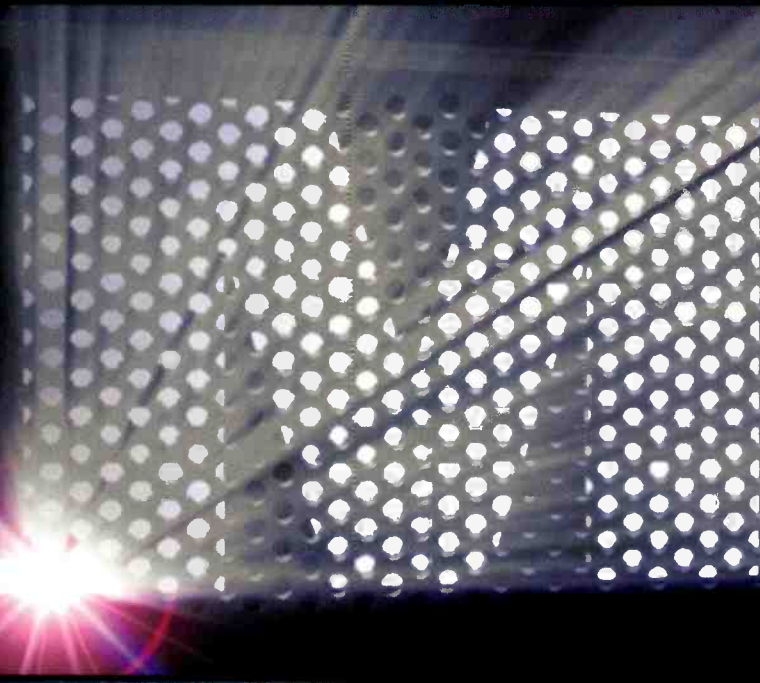


← SOUTH HALL UPPER LEVEL continued on page 9

★ See Grass Valley at Booth SU7059, page 10

## AFFORDABILITY THROUGH INNOVATION

The digital breakthrough you've been waiting for.

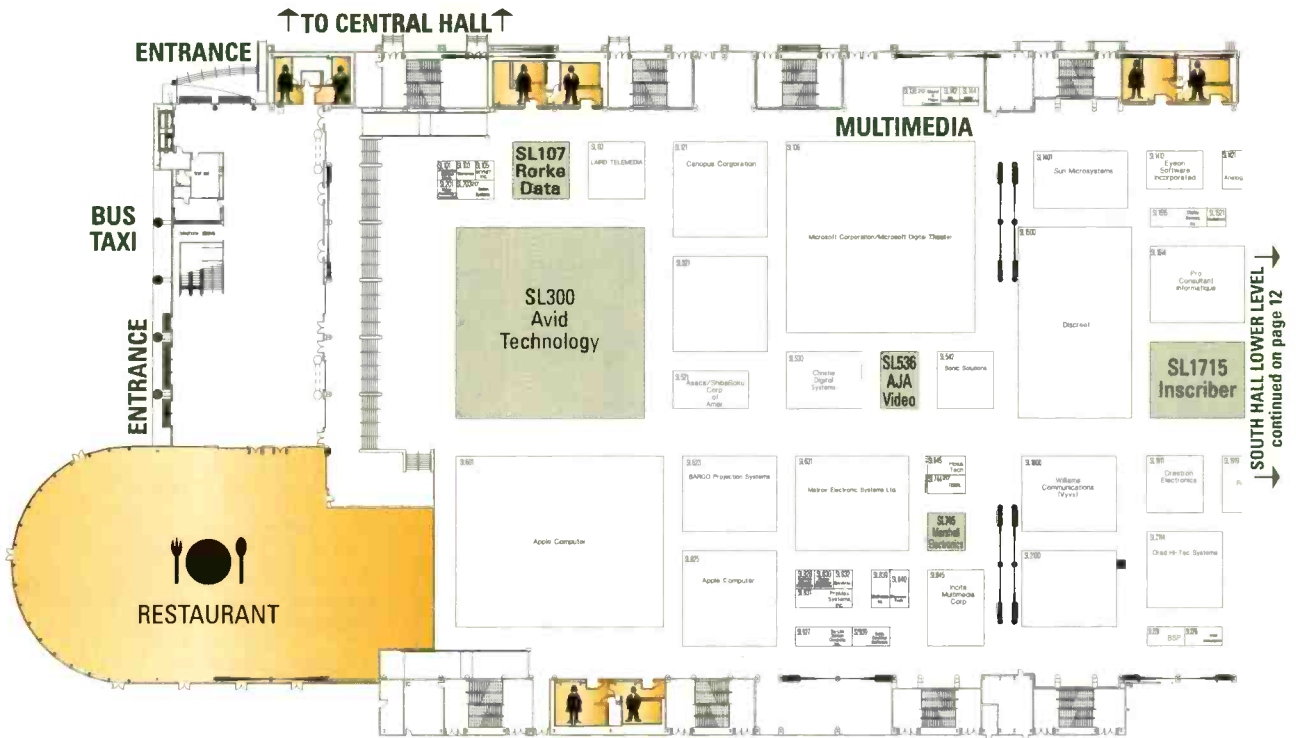


Coming to NAB 2003, booth SU7059. For a sneak preview go to [www.thomsongrassvalley.com/M](http://www.thomsongrassvalley.com/M)

**grass valley**  
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# South Hall, lower level (A)

● Advertisers ● Points of Convenience



\* See Pinnacle at Booth SU5003, page 8

## IT-Based Workflow

Solutions for Post & Broadcast



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- Networked Editing
- Automated Graphics
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connecting  
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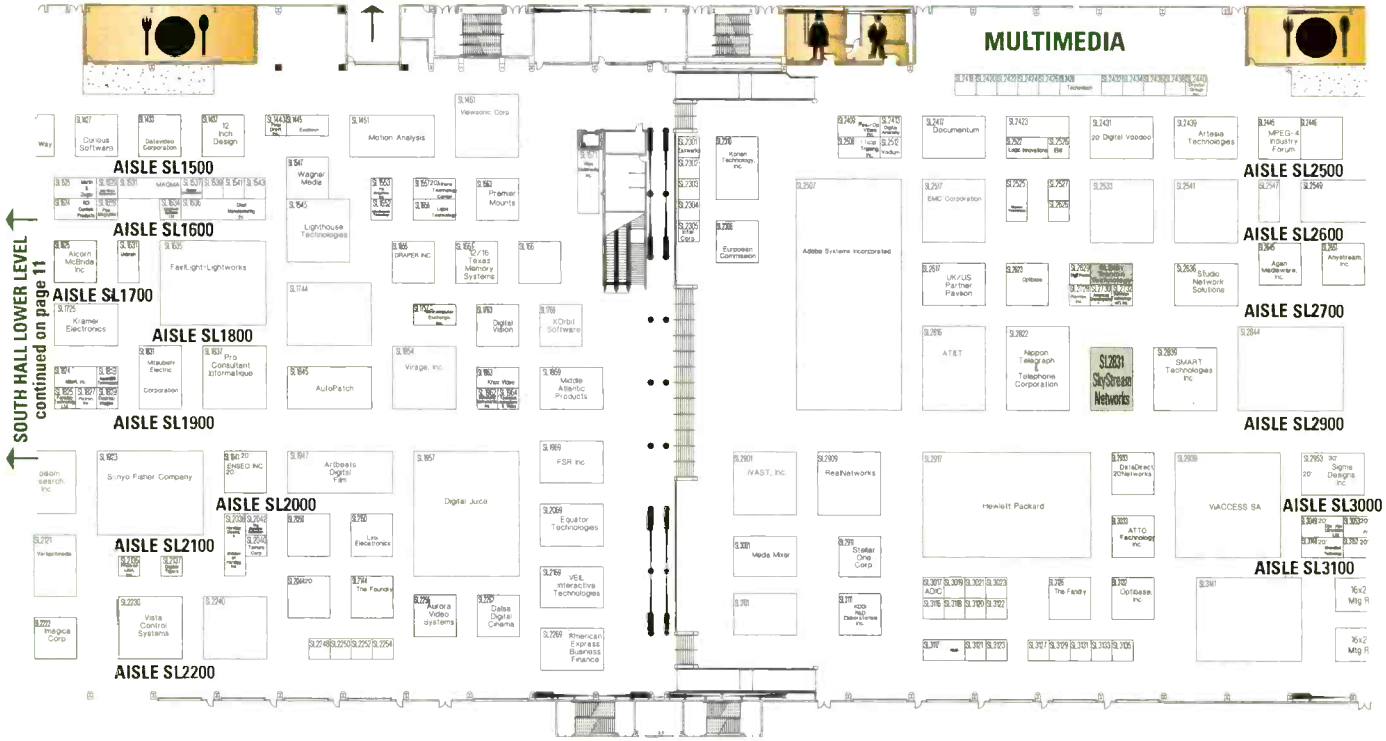
**PINNACLE**  
SYSTEMS  
www.pinnaclesys.com

# South Hall, lower level (B)

**NAB Convention, April 5-10**  
**Exhibit Hours**  
**Mon. - Wed. .... 9 a.m. - 6 p.m.**  
**Thurs. .... 9 a.m. - 4 p.m.**

● Advertisers    ● Points of Convenience

## WALKWAY TO NORTH HALL AND MOBILE MEDIA EXHIBITS



\* See *BUF Technology* at Booth *SU6301* (#3), page 9

## Sometimes The Smallest Components Make The Biggest Impact



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Video Server Controller



www.buftek.com  
 email: info@buftek.com  
 or call 858-451-1350

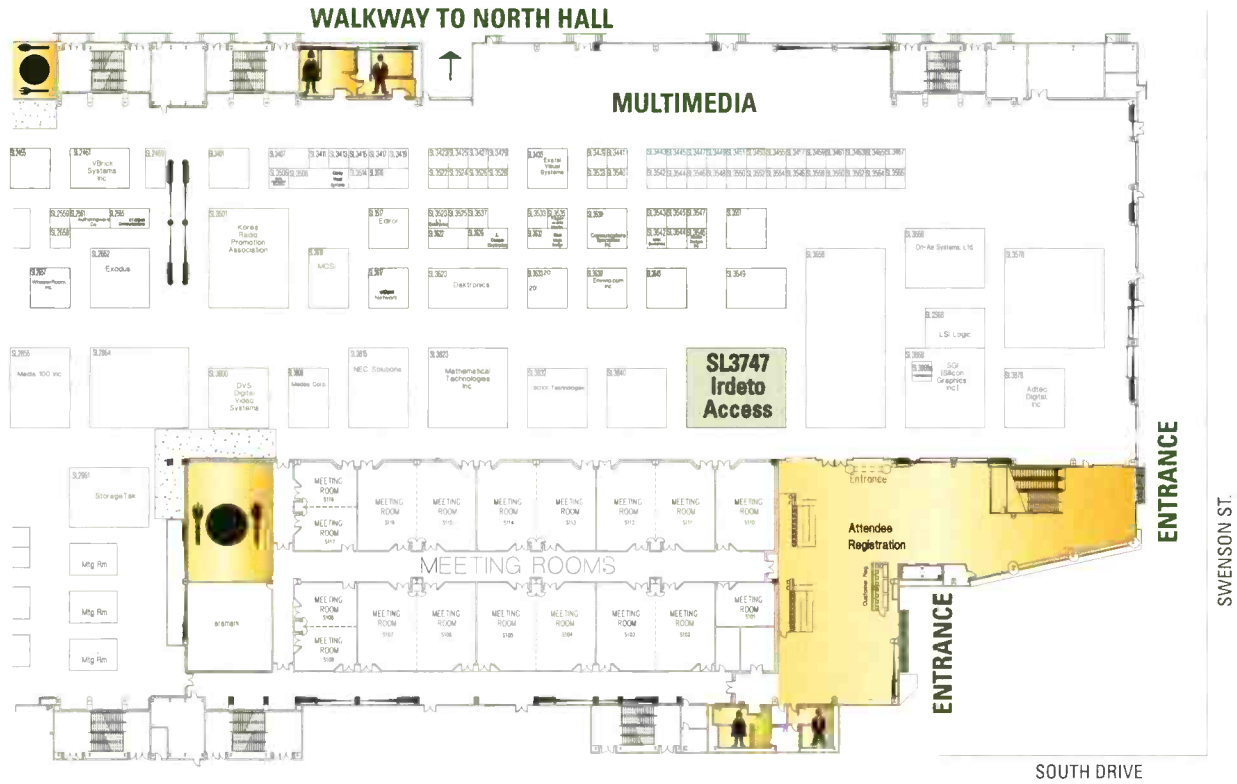


Kevin Washburn  
 Director of Production Operations, C-SPAN

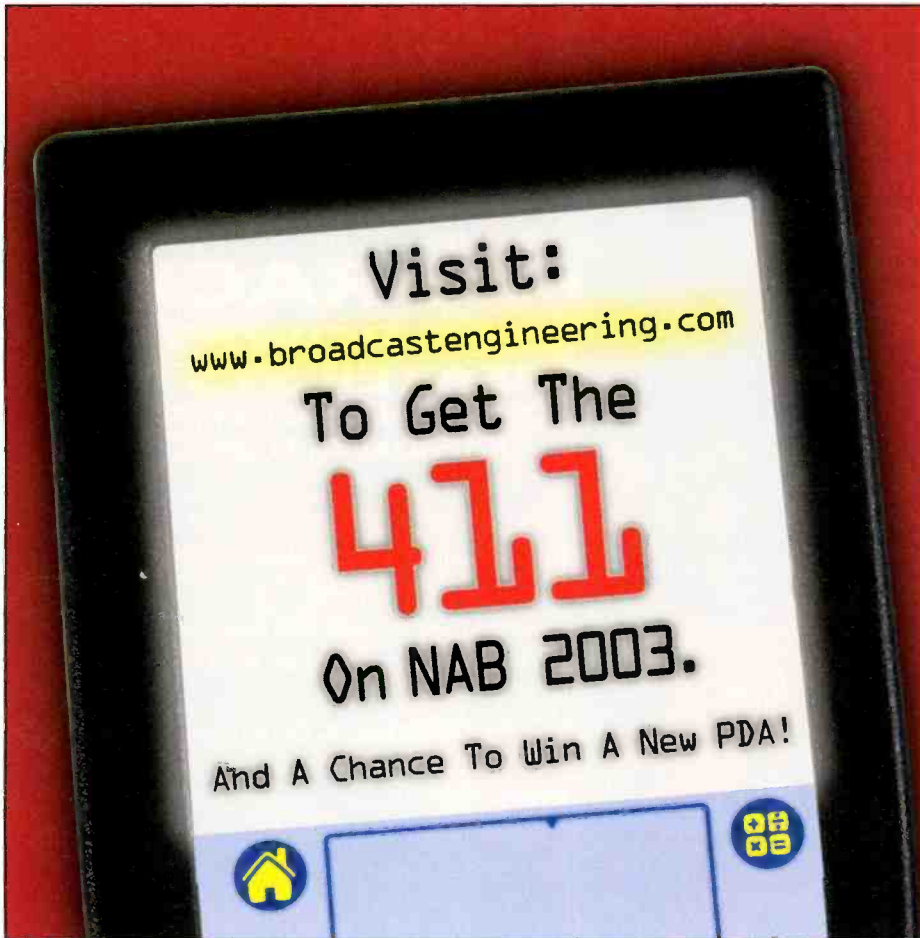
"We needed a lot of video server control power in a small amount of counter space and chose Spot for its features, small size, and ruggedness. The operators love the system and BUF Technology's customer support has been great. It is very easy to use and its quickness of operation is unbelievable. Spot works really well for planned programs, and is great for unplanned events like comments called-in by C-SPAN viewers. We were on the air for the State of the Union Address quickly grabbing shots during recording. Then afterwards we were able to air segments instantly that related to comments from callers. One person can record, pick points, and play back. This used to take four people! Our staff can do more now using Spot than we ever could before."



# South Hall, lower level (C)



★ See Harris at C404, page 6



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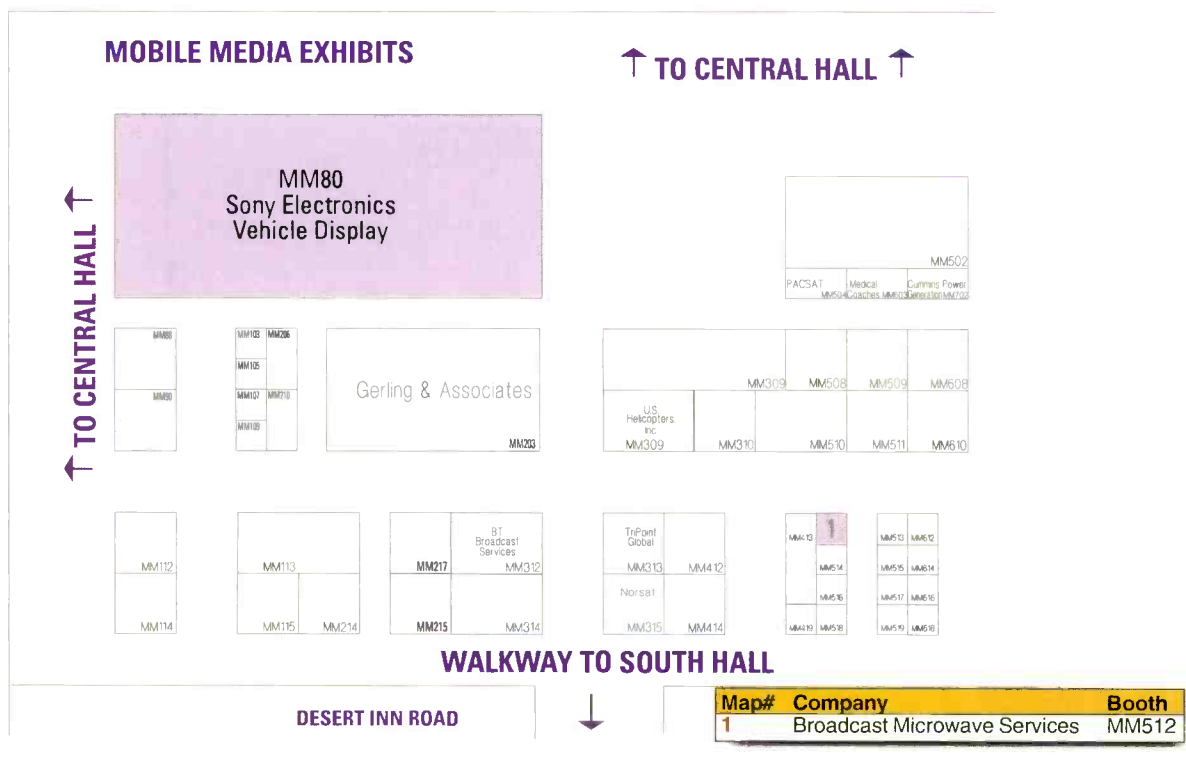
**HARRIS**

[www.broadcast.harris.com](http://www.broadcast.harris.com)

# Outside display

NAB Convention, April 5-10  
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 Mon. - Wed. .... 9 a.m. - 6 p.m.  
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● Advertisers      ● Points of Convenience



★ See Wohler at Booth C2543, page 6

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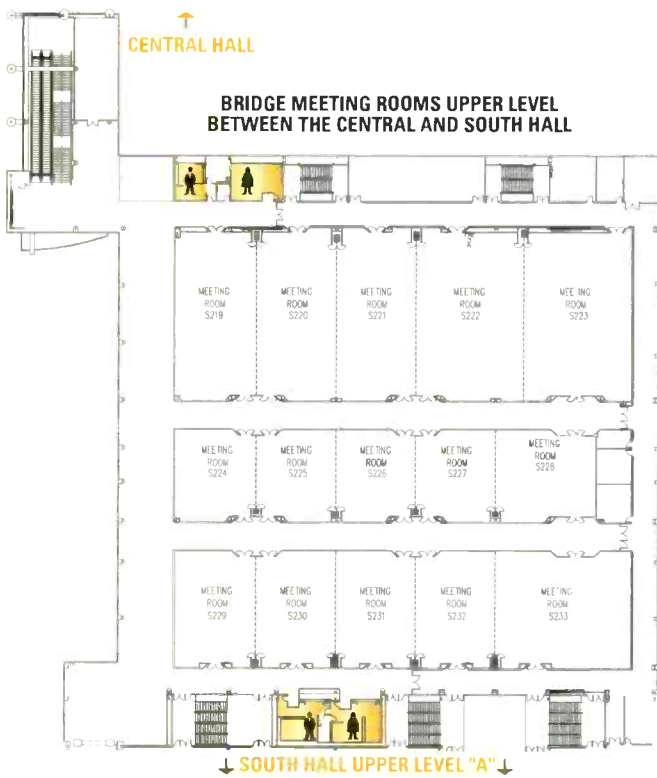
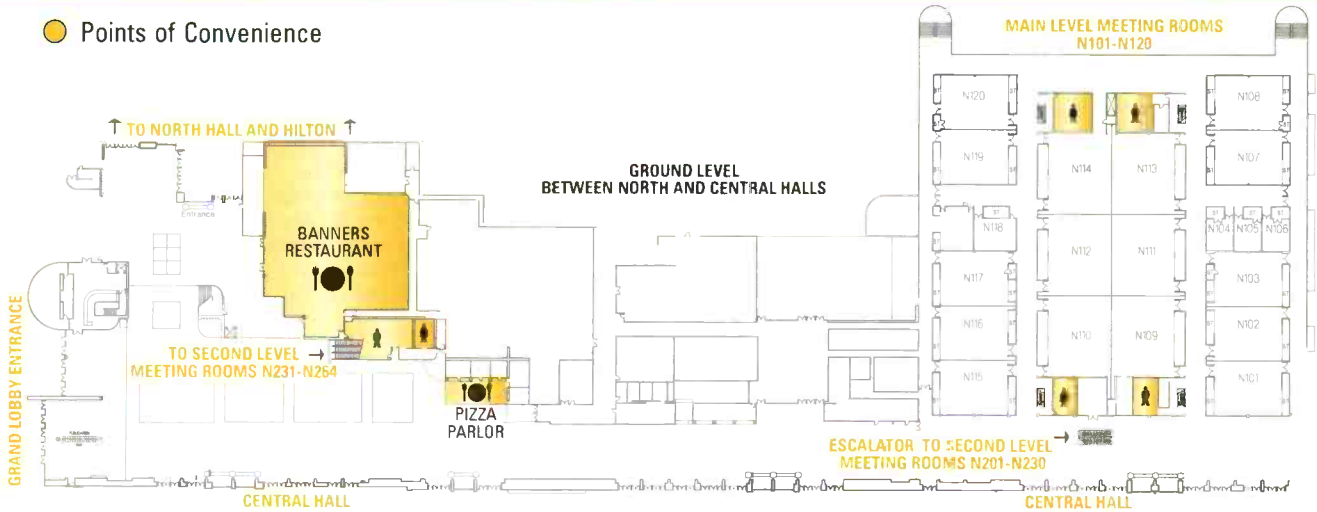
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# Meeting rooms

● Points of Convenience



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★ See Sencore at Booth SU5035, page 9

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★ See PRIMEDIA Business Magazines and Media at Booths N2449 and C4350, pages 5 and 7

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Visit Booth C4350, Central Hall page 7 and Booth N2449, North Hall page 5

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# Radamec's Scenario-XR

## next-generation virtual studio

BY JAMES OLIVER

The broadcast industry has endured 3-D polygon virtual-set systems since they emerged in 1995. The first systems required high-end computers to render even the most basic of sets. While computers have become faster and costs have fallen slightly over the years, a trade-off still exists between the number of polygons/textures and

feeds inserted upstream. Such reflecting was heretofore impossible. But, because the Scenario-XR accepts any SDI video source or graphic to be inserted in the virtual set, it treats such images as dynamic textures and reflects them in real time in any reflective surface of the set. By the same process, the system can refract inserts dynamically through glass objects in the set. Similarly, it can fade

### Nuts and bolts

Each camera in the studio requires a dedicated hardware/software system, called a Scenario-XR unit (XRU), that creates a view, and offers a preview, for every camera. This hardware/software system includes a Radamec-commissioned Windows 2000 workstation that can operate either as a stand-alone or in conjunction with the XR control unit (XRCU). Each individual XRU communicates with the XRCU through standard COM1 RS-232 data channels. The company recommends the XRCU option for multiple-camera studios.

The XRU system consists of a broadcast-optimized, high-end video graphics accelerator, an industry-compliant video/key I/O module, and the dongle-protected licensed XR core software. Also included is a high-end graphics accelerator with 416MB of



Users interact with the virtual set through an intuitive touch-screen interface that shows the entire set from the director's chosen viewpoint.

total onboard memory, as well as the following features:

- Up to 32 lights accelerated in hardware
- Dual DVI support
- Genlock input

**Much of the power of the system is provided by Cross Reality, a robust software kernel that allows real-time rendering.**

smooth on-air quality rendering.

Radamec's Scenario-XR requires no such trade-off because it is not a polygon-based virtual set system; it is ray-traced-based, running on a Windows 2000 platform. Ray tracing is a method by which software models light rays as they reflect and refract in a rendered world. This process can involve billions of floating-point calculations per second and requires considerable processing power. Much of the power of the system is provided by Cross Reality, a robust software kernel supplied by XR Technologies that allows real-time rendering.

### The power of ray tracing

Using ray tracing in a virtual set environment yields a high-quality, 360-degree background image. Ray tracing also affords new functions and facilities for the virtual set environment. For example, with polygon-based systems, using features such as Perspex flooring or special paint could reflect the image of the human presenter in the floor, but could not do the same for graphics and live video

panels to become transparent windows, revealing objects in the set that were not previously visible.

The system imports set designs from the 3D Studio Max package. Future plug-ins will add other popular applications such as Maya, SoftImage and others. The system then produces a rendered set that allows inclusion of live elements from internal or external sources while providing a fully ray-traced, live output.

Another advantage of the system is that it allows sets and shows to be stored on and recalled from internal or network disk(s). It also can hold graphical inserts, so multiple still stores are no longer required. The SDI video input obviates external DVEs and keyers for inserting live pictures.

XR's Cross Reality technology also allows the user to insert and interact with MPEG streams and external applications like HTML, PowerPoint and other Windows applications in real time. The technology can map applications fully into the virtual set, retaining the ability to interact in the new perspective.

- 16 sample SuperScene anti-aliasing and 3-D volumetric texturing
- Support for new OpenGL 1.3 and OpenML 1.0 specifications
- Support for DirectX 7.0

The system allows fading and wiping between all cameras, similar to the company's established virtual-set system. Since each camera's package operates independently, there is no single point of failure.

### Operator interface and control

Users interact with the virtual set through an intuitive touch-screen interface that shows the entire set from the director's chosen viewpoint. Loading and altering the inserts in the set from the control panel automatically changes the relevant objects in all of the cameras' viewpoints. Selectable parameters include source and destination of inserts, object color, luminosity, reflectivity

and transparency. Users can save and recall these settings as a simultaneous cut or fade (duration selectable), so the entire studio appearance can change smoothly and professionally on-air.

The touch screen is accompanied by an operator's control panel. The panel is a means to cut or fade from one source to another for a particular insert in the set. The operator simply touches the insert to be changed and the new source is then selectable on the panel. A new source can also be pre-selected so it is ready to be cut or faded into the set with a single key press. The touchscreen highlights the preview and program sources, so the operator knows what source is ready to appear in the set.

Operational features of the control panel itself include:

- Joystick navigation of director's view of virtual set
- Source-selection bus (live video, stills, animations, reveal)

- Pre-set source-selection bus (used for fading between sources)
- Fade-time select slider
- Camera-selection buttons for rotate-set function
- Rotary encoder for rotating the virtual set
- X-mem bank for settings storage and recall as either a cut or a fade
- Store button for X-mem bank

The company believes that its experience in virtual studios has led to a design that addresses the production studios' requirements of quality, speed, simplicity and power. It also feels that the Cross Reality kernel to Scenario XR provides rendering quality previously unavailable, at a cost that will allow broadcasters and production companies to make virtual programs and to receive returns on their investment. **BE**

*James Oliver is a product manager at Radamec.*

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# Telex and NMT connect at Super Bowl XXXVII

BY CHARLES ROBERTS

**W**hen the Oakland Raiders and the Tampa Bay Buccaneers squared off in Super Bowl XXXVII in San Diego, the action on the field was broadcast in 28 different languages to a worldwide audience of approximately 800 million viewers in 220 countries and territories.

The logistics required to pull off the broadcast production for the big event were equally far-reaching, and involved the use of a unique intercom system to interconnect remote broadcast units from National Mobile Television (NMT). The common link was the ADAM matrix intercom system from Telex.

The result was one of the largest interconnected remote intercom systems ever assembled, used for all broadcast aspects of the Super Bowl: pre-game, half-time, post-game and the game itself.

More than 60 cameras were used in this year's broadcast, and all the associated equipment that needed to in-

terface necessitated the use of more than one truck.

NMT's DX10 truck was used for the SD feed, while the DX11 handled the pre-game, half-time and post-game shows, with all audio delivered via a Solid State Logic MT Plus digital broadcast console. A third truck housed additional cameras and tape machines. Two more trucks, linked via single-bus expanders, supplied graphics and additional video distribution. The two main camera and tape trucks were equipped with Thomson Grass Valley DD35 switchers, and the host truck was equipped with a Kalypso switcher. All of the NMT production trucks at Super Bowl XXXVII were fully digital pro-

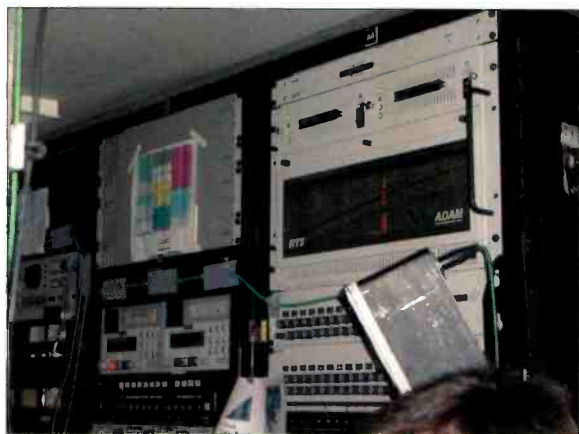


**NMT's DX11 was linked with two other trucks covering the Super Bowl via a 384-port system created by linking Telex ADAM intercom systems.**

duction environments.

together using a total of 38 ports. The 128-port matrix between two of the trucks was expanded to 192

## When three frames are tied together, the ADAM becomes one giant intercom system comprising 384 ports.



**The ADAM system played a role in a larger communications system used to connect five trucks at Super Bowl XXXVII – a system that included Intelligent Trunking technology and the TM-2000 Trunk Master.**

duction environments.

Normally, a single ADAM is 128 ports per frame. When three frames are tied together, the ADAM becomes one giant intercom system comprising 384 ports.

Three of the trucks were linked using the dual bus expanders, creating a 384-port system. Another truck was expanded by 64 ports to provide a total of 192 ports, and a system in the Bexel edit truck used the new Zeus Two trunking ability with eight trunks. The three systems were trunked

ports, and then connected with four-wire circuits, controlled by the Telex system, to the 384-port matrix in the other three trucks.

The two matrices were interconnected using Telex Intelligent Trunking technology and the TM-2000 Trunk Master. Using trunking allowed each truck to retain individual control of configuration and assignments, and also provided full automatic communications between all five trucks.

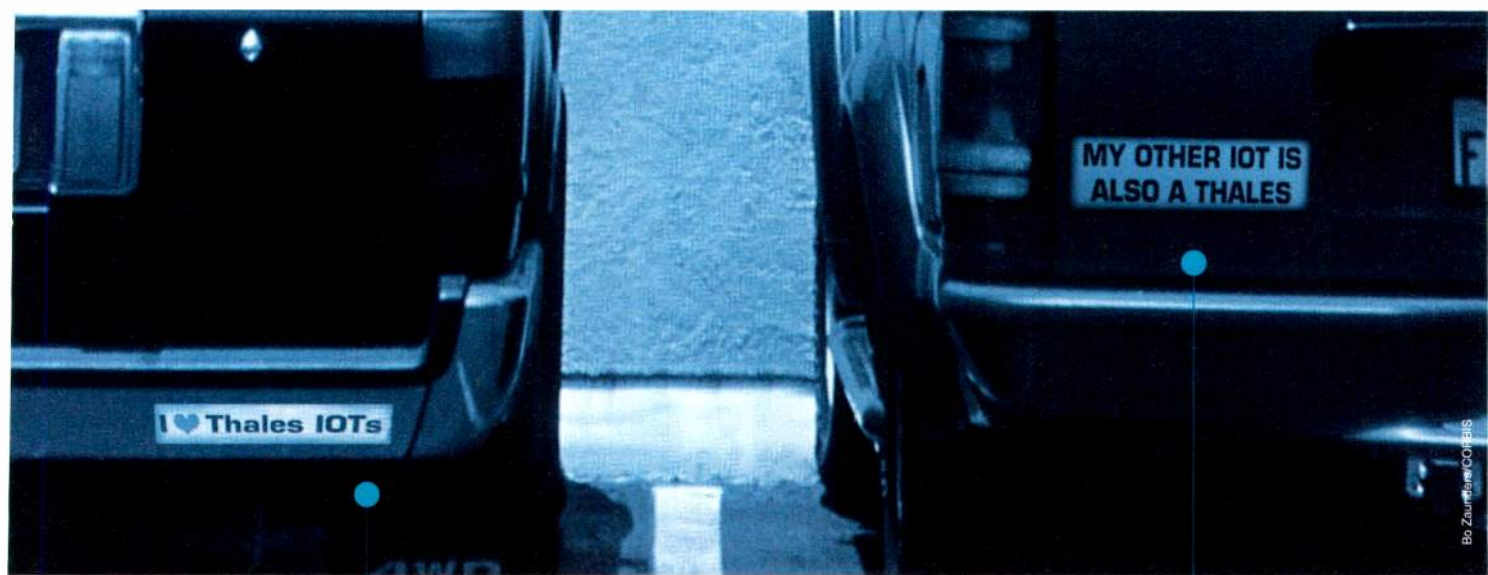
In addition to the five NMT trucks, the communications system also provided intercom feeds to various support trucks, such as those from ESPN. **BE**

*Charles Roberts is a system support engineer for Telex.*

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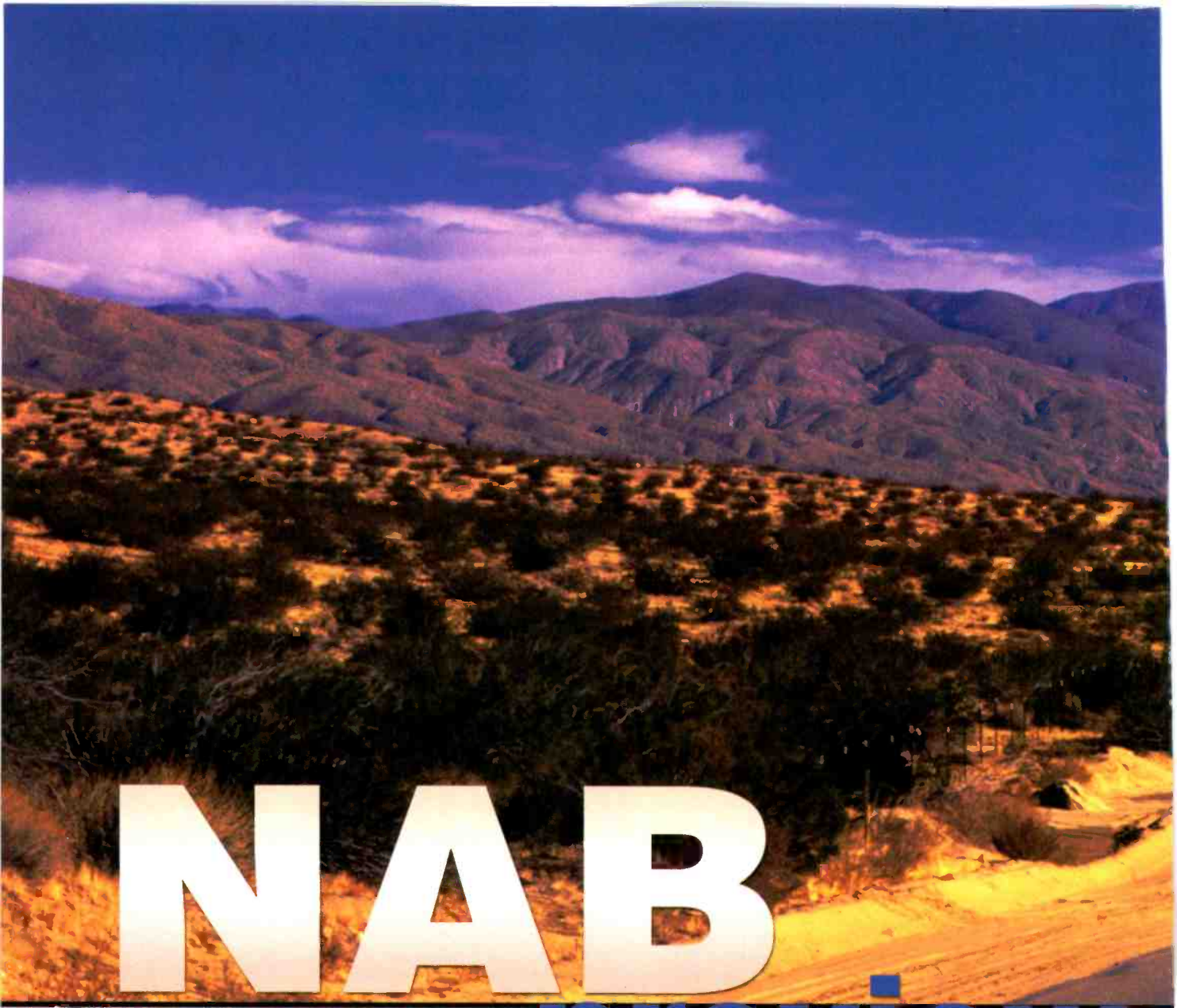
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# NAB

## preview



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**T**he NAB show is a gathering place for broadcasters wanting to learn more about their industry. Not only does it provide the opportunity to see new technology first-hand, but it also offers attendees the chance to get together and have questions answered on technology and policy. For instance, at the FCC Chairman's Breakfast, Chairman Powell and Sam Donaldson will discuss issues facing broadcasters, including the FCC's ownership proceeding and the digital transition. Another source of answers is the Regulatory Face-Off, moderated by John Cochran of ABC News, where FCC Commissioners and the NTIA Secretary of Commerce's tackle broadcasting issues.

Attendees can also take advantage of a number of conferences targeted specifically to their needs, whether their area is broadcast, television management or multimedia.

And of course, at the center of NAB is the technology. Vendors come from all across the country to display new solutions and updated favorites, giving broadcasters the chance to shop for a wide range of new tools for their stations.

Every year, the *Broadcast Engineering* staff provides

comprehensive coverage to help our readers make the most of the annual chaos.

First, we announce the winners of our second annual Excellence Awards competition. These facilities will be recognized at NAB 2003 for their achievement as a network facility, automation facility, new facility, audio facility, RF facility, or new studio.

Next, our FASTtrack section makes navigation easier. This year's show is losing the Sands Hall, but gaining space in the new South Hall. That means attendees have a lot of ground to cover, and the myriad of sights and sounds on the show floor can sometimes be overwhelming. The FASTtrack section is organized to help attendees find their way right to the vendors they want to see – whether they are looking for routers or cameras. Vendors are divided into categories, and then listed geographically for quick reference.

Finally, our DTV Marketplace puts this year's offerings into perspective. Browse more than 60 pages of products and photos (our biggest listing yet!) to build your shopping list.

**BE**



# 2<sup>nd</sup> Annual Excellence Awards

- Award-winning designs
- Top vendors and systems integrators
- Integrated HD and SD solutions
- Audio, RF, studio examples

## and the winners are...

### Network facilities

- Winner: EBU Washington Bureau by AZCAR ..... 152  
Runner-up: Telefutura operations center by The Systems Group ..... 154

### Automation facilities

- Winner: NBC ShareCasting facility by Florical ..... 156  
Runner-up: KPSP-TV studios by Sundance Digital ..... 158

### New facilities

- Winner: KMEX-TV by AZCAR ..... 160  
Runner-up: MTV Networks' central facilities by The Systems Group ..... 160

### Audio facilities

- Winner: CanWest Global studios by Wheatstone ..... 162

### New studios

- Winner: WHRO-TV studios by Miranda ..... 164

### RF facilities

- Winner: WBBH-TV transmitter site by Andrew ..... 164



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# Broadcast Engineering Excellence Awards

BY BRAD DICK, EDITORIAL DIRECTOR

**T**he second annual *Broadcast Engineering Excellence Awards*, published in the December 2002 issue, featured the work of engineering and management staffs, systems integrators and manufacturers across the world. These nominees showcased the best in today's design, innovation and construction.

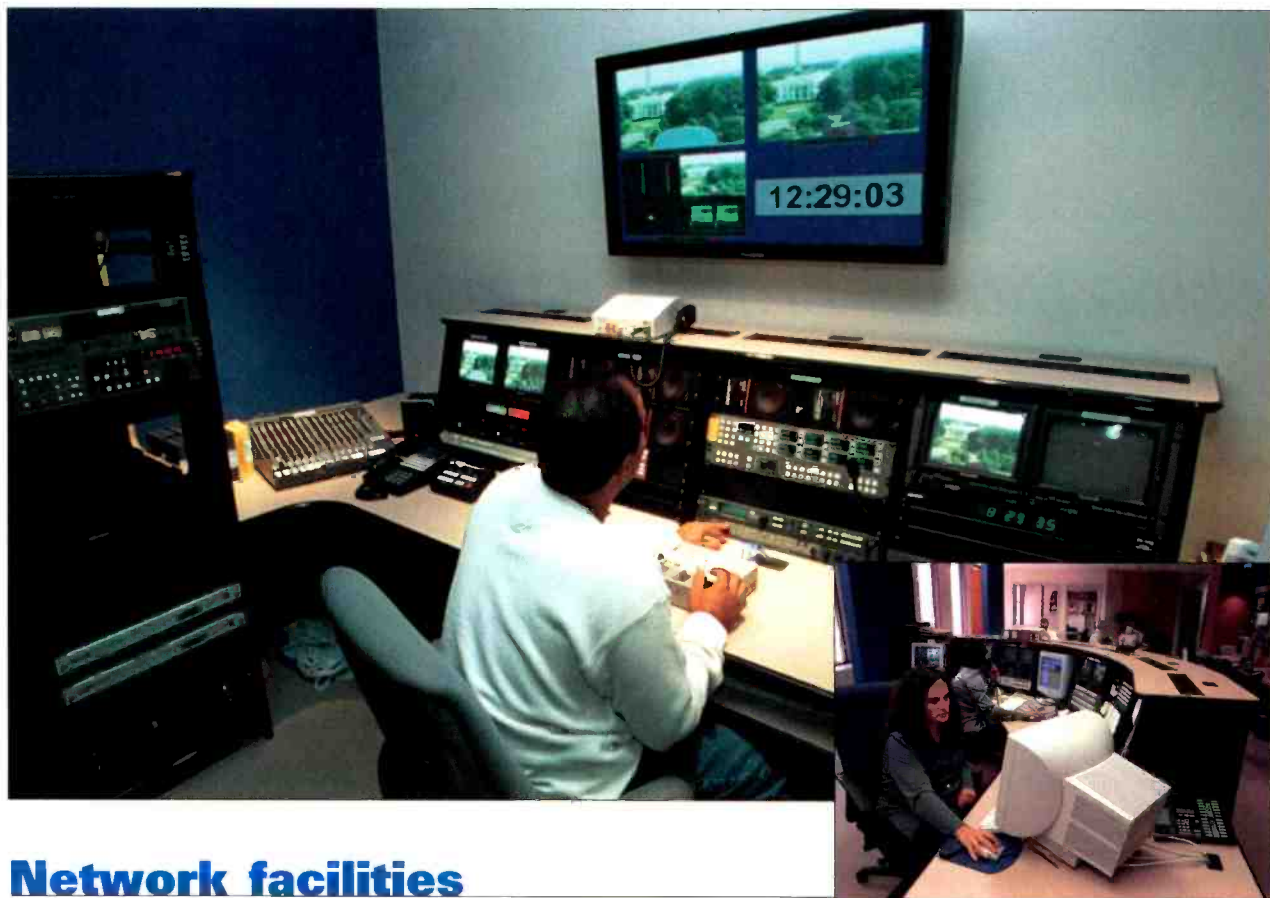
After viewing the nominees, readers were encouraged

to vote for their preferences on the *Broadcast Engineering* Web site. The votes were then tallied and reviewed by the magazine staff.

If you want to see engineering done right, go to the *Broadcast Engineering* Web site, [www.broadcastengineering.com](http://www.broadcastengineering.com), to view the complete stories detailing each facility's construction.

Congratulations to all the winners!

**BE**



## Network facilities

**Winner: EBU Washington Bureau by AZCAR**

The European Broadcasting Union, based in Geneva, Switzerland, decided in early 2001 to move from its long-time Washington bureau down the street to a building with more space appropriate for building a hub facility where all EBU members could cluster their unilateral facilities around the EBU, which would act as a central ingest and distribution for coverage of U.S.-based news for EBU members. AZCAR was selected to complete the design and installation. Immediately after the initial installation began, the Sept. 11 attacks occurred, requiring the installation of temporary expansion to handle the crush of

thousands of unilateral transmissions to countries across Europe. The studios, editing and transmission capabilities were pressed to the limit and found to be a huge success.

Key technology: Leitch NewsFlash news editing stations, Leitch VR440 server system (12 channels), Thomson Grass Valley Concerto routing, Thomson Grass Valley Encore control system, Miranda Kaleido G-2 virtual display processor, Panasonic plasma displays, VBrick video over IP system, Leitch DPS-475AV frame synchronizers, Ross CDK 104 mixer keys, Panasonic studio cameras, Brightline studio lighting

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## Network facilities

Runner-up: Telefutura operations center by The Systems Group

Key technology: Thomson Grass Valley: SMS7500WB video router, SMS7500NB audio router, SMS7000 analog audio router, PVS1024 Profile XP video server, M2100 master control system; Harris automation



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Camera Cable View



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**RCI-300:** Quickly access and control Fortel DTV products from your PC.

# T-shirt winners:

Thanks to everyone who voted for their favorite facility. Readers who voted online were eligible to win a *Broadcast Engineering* T-shirt. The following readers will receive a T-shirt:

**Julie Poirier**  
Miranda Technologies

**Gordon Rickard**  
AZCAR

**Andy Solywoda**  
Communications Engineering

**John Vasilenko**  
The Systems Group

**Matthew Holcombe**  
CNN International



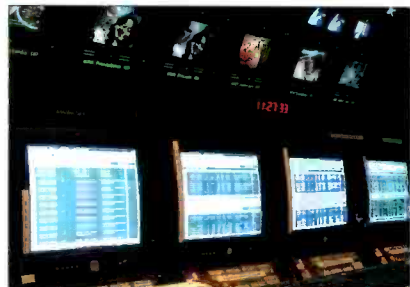
## Automation facilities

Winner: NBC ShareCasting facility by Florical

The NBC hub-spoke project features three hubs, 13 spokes and service in seven of the top ten markets. The success of the hub-spoke project has led NBC to schedule expansion of the system, adding KNTV, San Jose and multiple Telemundo stations to the system. After researching available automation solutions, NBC chose Florical ShareCasting because it easily controls equipment spread out across multiple sites (the hub and each spoke) as one cohesive system, yet allows for local control in the case of breaking news stories. At the NBC hub sites in New York, Los Angeles and Miami, the Florical ShareCasting originates all programming and commercial breaks for the individual TV stations.

Key technology: Florical AirBoss on-air automation; MediaFiler ingest to servers; MediaTimer program segmenting; MediaMaster asset management; ShowTimer satellite acquisition; Thomson Grass Valley MAN storage; E2V Technologies ASX broadband switches; TANDBERG multiplexing equipment

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#### SKP 30

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## Automation facilities

Runner-up: KPSP-TV studios by Sundance Digital

Key technology: Sundance Digital FastBreak automation; Digital ListSync, Digital Intelli-Sat, Digital MediaCacher; Thomson Grass Valley Profile servers

BE

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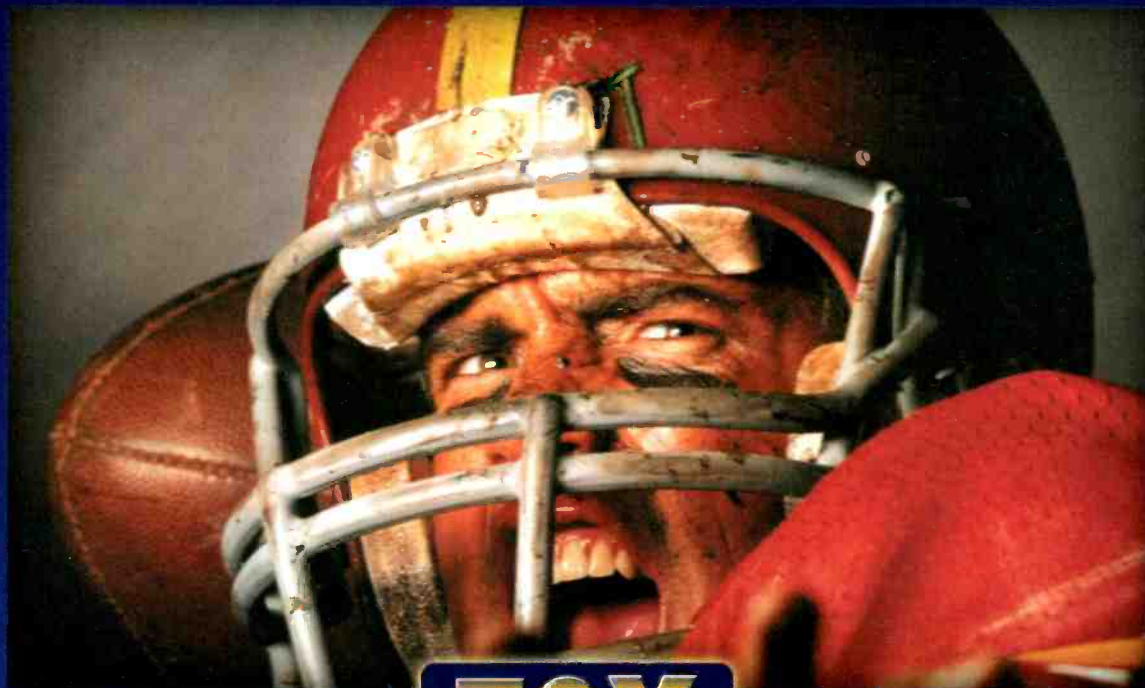
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## New facilities

### Winner: KMEX-TV by AZCAR

Univision Network constructed a new headquarters building with space to include facilities for KMEX and KFTR, the outlets for Univision and Telefutera in Los Angeles. The site presented particular challenges, as it was located immediately adjacent to one of Los Angeles' prime freeways, but the new building was completed on time and KMEX went on-air as scheduled in the spring of 2002. The station incorporated a combination of existing analog and composite digital equipment from the previous KMEX facility, requiring thoughtful integration and design strategies by AZCAR, who was selected for the detailed design and installation.

Key technology: NVision routing, 2562 video/AES, 642; AES, 128-port switching control; Thomson Grass Valley M2100 master control switcher; Thomson Grass Valley Kalypso video production switcher; Pinnacle MediaStream 700 video servers; Accom DVEous digital effects; Pinnacle Thunder disk recorder; Pinnacle FXDeko graphics; Ross CDK 104 mixer-keyer; Graham-Patten audio switcher; Avid iNews system: NewsCutter, Media Composer, Digital Studio; Avid Unity media network, Pluto servers, Apple Final Cut Pro, Panasonic DVCPRO VTRs, Sony Betacam VTRs

BE

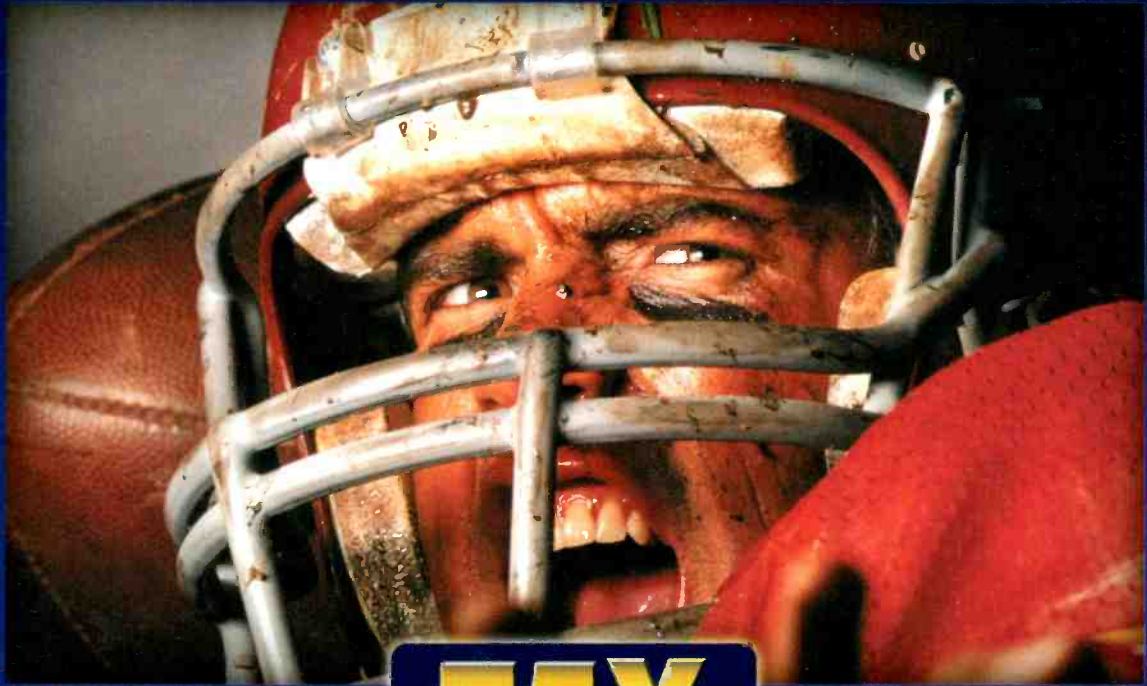


## New facilities

### Runner-up: MTV Networks' central facilities by The Systems Group

Key technology: Leitch DPS frame synchronizers, Miranda VTR-100 conversion products, Avid Unity nonlinear edit systems, Ikegami video monitoring, RTS Intercom, Audio Accessories patching products

BE



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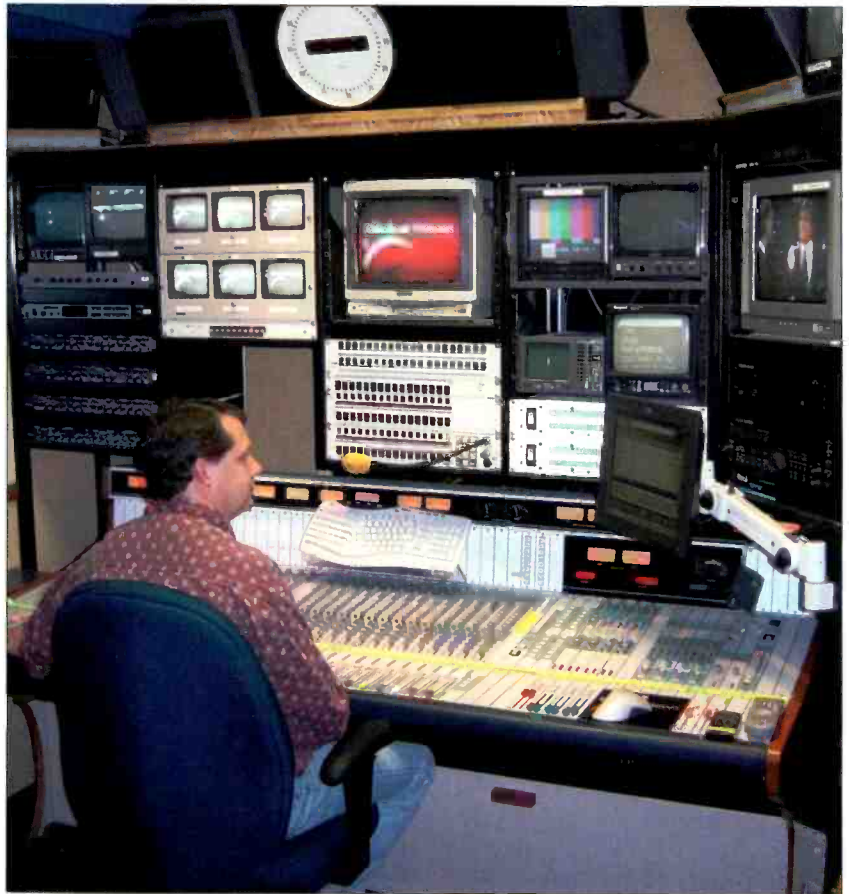
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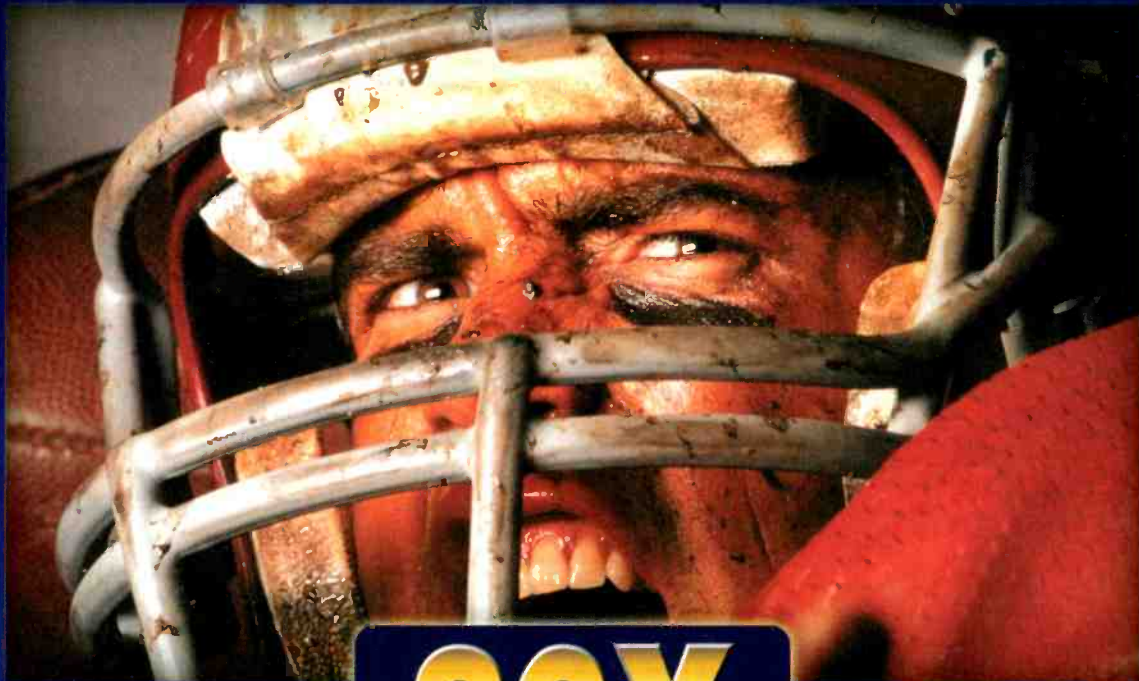
**Audio facilities**

Winner: CanWest Global studios by  
Wheatstone

CanWest Global Communications is an international media company that serves as Canada's largest publisher of daily newspapers, and owns, operates and/or holds substantial interests in a number of media outlets, including CanWest Global Toronto. CanWest Global Toronto's main audio control room underwent a significant expansion as part of a larger project to enhance the organization's live news capabilities. Their strong commitment to live news quickly determined that a stronger audio console was needed to support the growth. Thus, a Wheatstone TV-80 audio console was selected, bringing the number of Wheatstone consoles purchased by CanWest Global to five.

Key technology: Wheatstone TV-80 console, AVP Bantam patch bay, RTS/Telex telephone interfaces, DBX stereo compressors, Tektronix 760 audio monitor, Tannoy speakers, Hafler power amplifiers

**BE**



**86X**

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**HDxs**

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## New studios

### Winner: WHRO-TV studios by Miranda

WHRO-TV, the community-licensed public broadcasting station in Norfolk, VA, for over 40 years, wanted to take advantage of one of the most important and underutilized features of digital television – the ability to dynamically change the nature of the ATSC transmission and channel mix to suit the time of day. Their new master control and technical plant originates 12 channels including a five-channel HD/SD ATSC multiplex. WHRO wanted to provide high-quality, HD television during prime time, and provide multiple standard-definition and datacasting services for targeted audiences during the rest of the day. WHRO selected equipment from Miranda to help them reach their goal.

Key technology: Miranda Imagestore channel branding and Presmaster master control, Miranda Kaleido-K2 multi-image processor, Harris automation, Omneon video server, Sony Petasite archive system, Sencore ASI server, Thomson Trinix router, Miranda Densité distribution amps, Miranda Imaging video interfaces, Miranda iControl system management, Harmonic DTV encoders and stat mux **BE**



## RF facilities

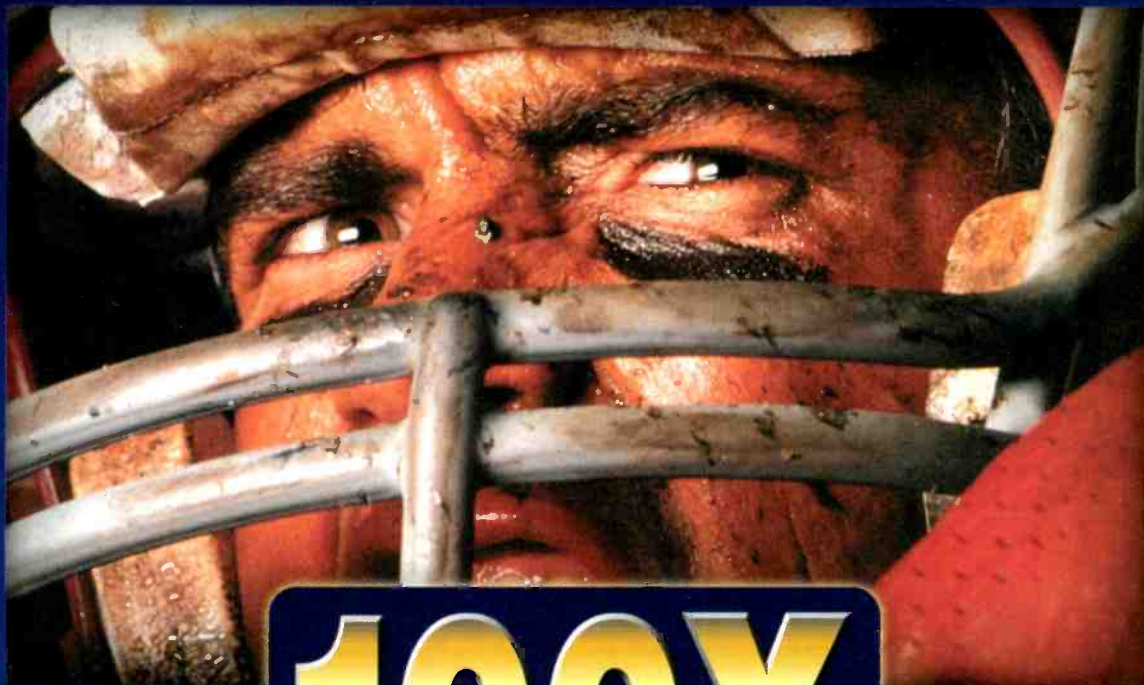
### Winner: WBBH-TV transmitter site by Andrew

NBC-affiliate WBBH-TV, owned by Waterman Broadcasting, had an NTSC tower that was 20 years old and didn't meet federal or local standards for wind loading. It wasn't economically feasible to upgrade it, and with an FCC digital deadline for channels 15 (WBBH-TV) and 41 (WZVN-TV), station management decided to construct a new tower and a new building for its digital transmitters. Contractors Kline Towers and Carolina Towers were chosen to construct the Punta Gorda, FL, tower, and contractor

Owen Ames Kimball was hired to build a 2000-square-foot facility to house the station's transmitters and extensive RF transmission system. WBBH-TV selected Andrew's RF system, transmission line and antennas for the project.

Key technology: Andrew RF system, transmission line and antennas; Thales transmitters; Nucomm microwave radios; NSI ENG antenna and control system; Cummins/Onan generator/transfer switch; APC UPS system **BE**





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# 100X

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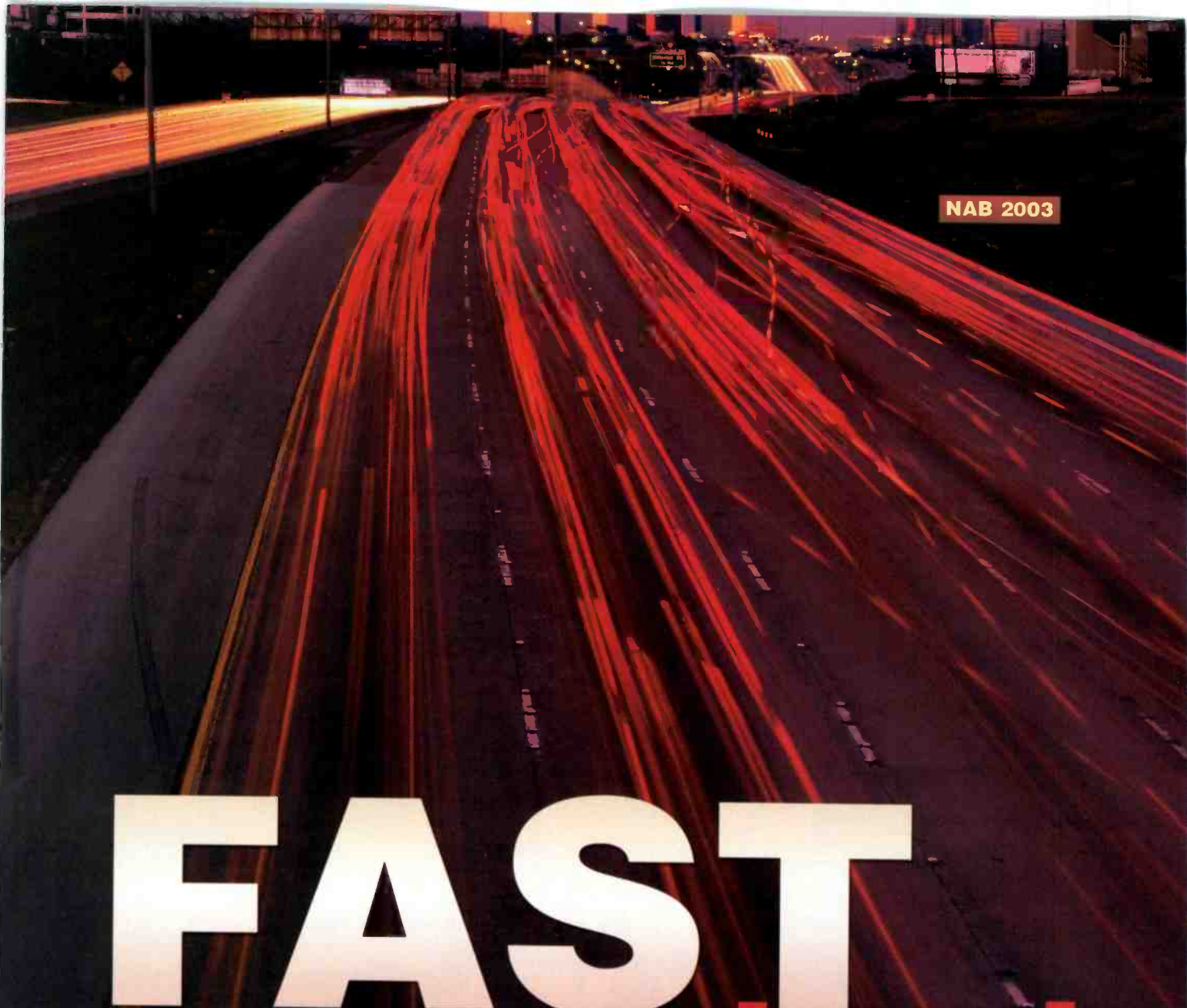
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NAB 2003

# FAST track

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**Oooh!  
What a treat!**

**Hard concrete  
very sore feet**

**S**o many vendors, so little time. This year's NAB show takes place strictly at the Las Vegas Convention Center, which means no more waiting in line for a bus to/from the Sands Convention Center. But it also means that there will be more vendors in one location, which equals more foot traffic. To help save your feet and ensure that you find the booths you're interested in visiting, *Broadcast Engineering* is offering two tracking options that will help you find exactly what you're looking for.

The first is our expanded version of the exhibitor map. We've added in a floor plan of the main meeting rooms and the mobile media exhibits between the Central and South halls. In addition, all advertisers will again be highlighted in the map index, and map advertisers have the added advantage of a large star on the map to help locate their booth. Also, due to the loss of the Sands Convention Center space, the South hall has been extended to include more vendors this year, which is reflected on the map.

The second tracking option is this year's FASTtrack section. Simply pick a category from the list at left, go to the indicated page, and you'll find a listing of the companies showcasing products from that category. For your added convenience, the exhibitors' booth numbers are listed in geographic order, making your search for vendors as efficient as possible. Issue advertisers are marked in **BLUE** in the FASTtrack section. Listings are based on information provided to *Broadcast Engineering* by manufacturers, and booth numbers are current as of the press deadline.

For additional copies of our NAB map, please visit the *Broadcast Engineering* booths in the Central (#4350) and North (#2449) halls.

Happy hunting!

**BE**

C = Central Hall  
N = North Hall  
MM = Mobile Media

SL = South Hall, lower level  
SU = South Hall, upper level

# FAST TRACK

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## Audio accessories

Sonifex .....	C133	Location Sound .....	N2032
ATI-Audio Technologies .....	C135	Sound Devices .....	N2045
Audio Accessories .....	C149	<b>Sennheiser Electronic .....</b>	<b>N2103</b>
Gepco International .....	C244	TerraSonde .....	N2149
Multidyne Video & Fiber Optic Systems .....	C276	Audio-Technica .....	N2212
Acoustical Solutions .....	C543	JK Audio .....	N2237
Adrienne Electronics .....	C566	Acoustic Systems .....	N2256
Ward-Beck Systems .....	C722	Symetrix .....	N2621
<b>DK Audio .....</b>	<b>C766</b>	RDL Radio Design Labs .....	N2637
Wireworks .....	C2309	<b>Wheatstone .....</b>	<b>N2804</b>
Hannay Reels .....	C2313	AudioArts Engineering .....	N2804A
RCS .....	C2509	RCS .....	N2831
<b>Systems Wireless .....</b>	<b>C2535</b>	TC Electronic .....	N2926
<b>Wohler Technologies .....</b>	<b>C2543</b>	Logitek Electronic Systems .....	N2931
Hamlet Video International .....	C2777	MUSICAM .....	N3022
Sierra Video Systems .....	C3336	AMS Neve .....	N3038
Whirlwind .....	C3434	<b>Henry Engineering .....</b>	<b>N3101</b>
ProSource/BMI .....	C3675	Independent Audio .....	N3201
Prime Image .....	C3980	Gefen .....	SL203
Herman Electronics .....	C4040	<b>Marshall Electronics .....</b>	<b>SL745</b>
<b>HORITA .....</b>	<b>C4362</b>	MediaSonic .....	SL1521
TAI AUDIO .....	C4372	Chief Manufacturing .....	SL1636
Comprehensive Video Group .....	C4472	MSoft .....	SL1824
Bexel .....	C4546	<b>WhisperRoom .....</b>	<b>SL2657</b>
Mager Systems .....	N1934	<b>Dolby Laboratories .....</b>	<b>SU4555</b>
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<b>ESE .....</b>	<b>SU5623</b>
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Peerless Industries .....	SU7319

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Whirlwind .....	C3434
Herman Electronics .....	C4040
TAI AUDIO .....	C4372
Klotz Digital America .....	N1825
Location Sound .....	N2032
<b>Azden .....</b>	<b>N2038</b>
Sound Devices .....	N2045
<b>Sennheiser Electronic .....</b>	<b>N2103</b>
Aphex Systems .....	N2224
Prism Media Products .....	N2346
Telos Systems .....	N2618
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<b>Calrec Audio .....</b>	<b>N2646</b>
<b>Harrison by GLW .....</b>	<b>N2666</b>
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AMS Neve .....	N3038
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<b>Dolby Laboratories .....</b>	<b>SU4555</b>
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Pixel Instruments .....	SU5219
Dalet Digital Media Systems .....	SU7137

## Audio recording, storage, playback

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RCS .....	N2831
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AMS Neve .....	N3038
<b>Henry Engineering .....</b>	<b>N3101</b>
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Gefen .....	SL 203
Alcorn McBride .....	SL1625
Digital Vision .....	SL1763
MSoft .....	SL1824
Media 100 .....	SL2856
<b>Dolby Laboratories .....</b>	<b>SU4555</b>
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## Audio routing, distribution

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Crystal Vision .....	C670



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<b>DK Audio .....</b>	<b>C766</b>
<b>Image Video .....</b>	<b>C850</b>
<b>Videotek .....</b>	<b>C974</b>
<b>360 Systems .....</b>	<b>C2024</b>
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Keywest Technology .....	C2460
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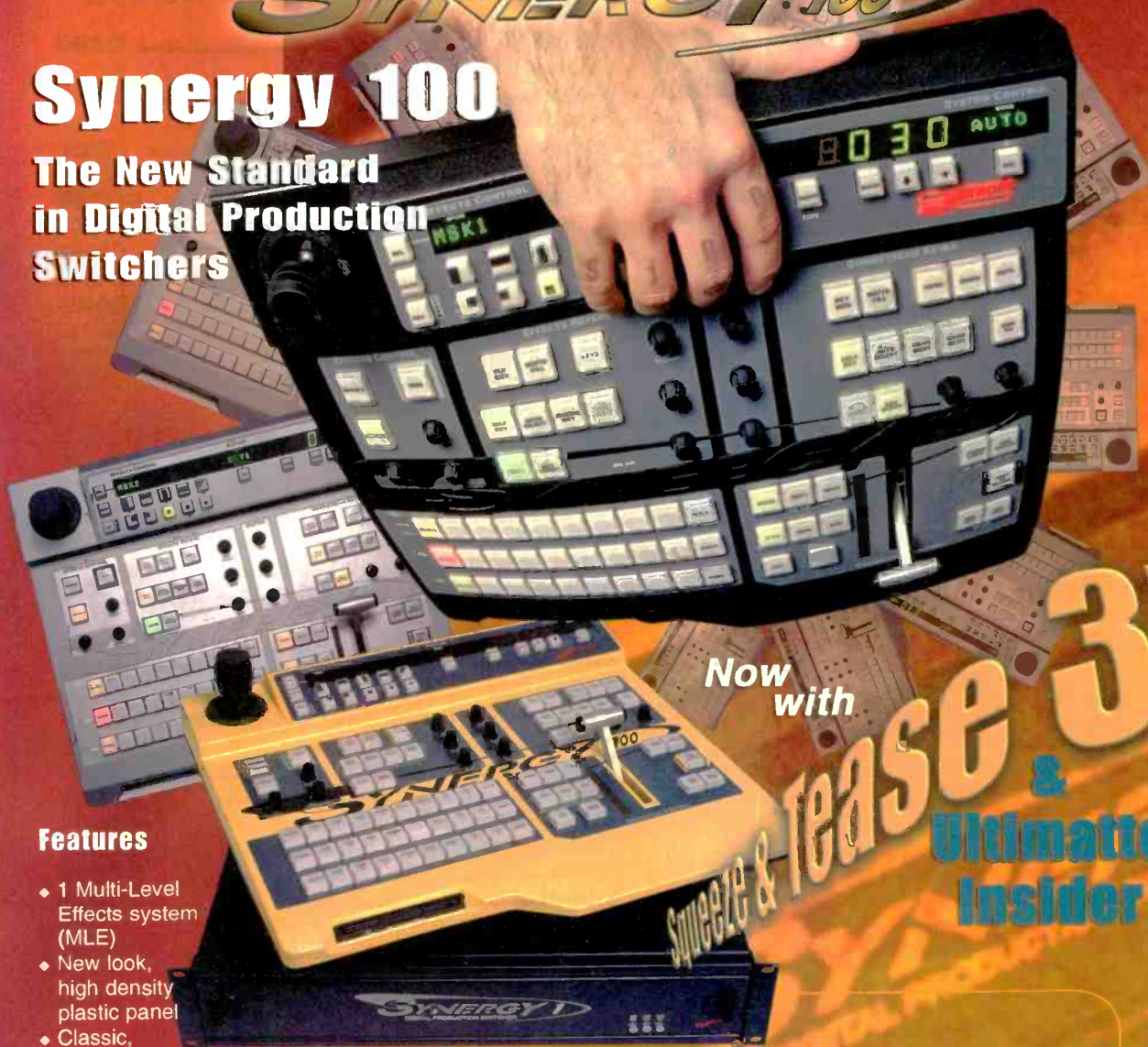
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<b>IDX System Technology .....</b>	<b>C968</b>
<b>PAG .....</b>	<b>C2376B</b>
<b>Anton/Bauer .....</b>	<b>C3650</b>
ProSource/BMI .....	C3675
Pioneer Electronics .....	C3830
Herman Electronics .....	C4040
Location Sound .....	N2032
Superior Electric .....	N2455
Kay Industries .....	N2801
Exeltech .....	SL1445
Brick House Video .....	SU5127
Frezzi Energy Systems, Division of Frezzolini .....	SU5419
Aspen Electronics .....	SU5427

## Production switchers, video effects, keyers

<b>Teranex .....</b>	<b>C462</b>
Crystal Vision .....	C670
<b>Videotek .....</b>	<b>C974</b>
<b>Utah Scientific .....</b>	<b>C2317</b>
Keywest Technology .....	C2460
<b>Bogen .....</b>	<b>C2469</b>
da Vinci .....	C2518

<b>Ikegami Electronics .....</b>	<b>C2638</b>
<b>Miranda Technologies .....</b>	<b>C2826</b>
FOR-A .....	C2838
<b>Snell &amp; Wilcox .....</b>	<b>C2860</b>
Sierra Video Systems .....	C3336
<b>Evertz .....</b>	<b>C3412</b>
Spencer Technologies .....	C3682



RGB Spectrum .....	C3728
SAV Systemes Audiofrequence	
Videonique .....	C3920
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Laird Telemedia .....	SL113
Discreet .....	SL1500
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FSR .....	SL1969
Logic Innovations .....	SL2522
NEC Solutions .....	SL3815
Mathematical Technologies .....	SL3823
<b>Sony Electronics .....</b>	<b>SU4015</b>
<b>Leitch .....</b>	<b>SU4525</b>
<b>Sigma Electronics .....</b>	<b>SU4664</b>
Focus Enhancements .....	SU4849
Brick House Video .....	SU5127
AZCAR .....	SU5166
<b>Ross Video .....</b>	<b>SU5225</b>
vizrt .....	SU5712
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<b>Astro Systems .....</b>	<b>SU6635</b>
<b>Network Electronics .....</b>	<b>SU7045</b>
<b>Thomson Broadcast and Media Solutions .....</b>	<b>SU7059</b>
Accom .....	SU7325
Extron .....	Venetian, Ballroom G



# UTAH-400

## World-Class Features World-Beating Price



The UTAH-400 High-Density Digital Routing Switcher is not just the world's most advanced switcher, it is also the world's best value with prices that are significantly lower than its competitors. *Imagine getting all of these features and saving money too!*

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<b>Maxell .....</b>	<b>C3163</b>
MATCO .....	C3476
Spencer Technologies .....	C3682
Pioneer Electronics .....	C3830
Bexel .....	C4546
MSoft .....	SL1824
Exatel Visual Systems .....	SL3433
<b>Sony Electronics .....</b>	<b>SU4015</b>
Global Media Resource .....	SU4505
Focus Enhancements .....	SU4849
Videomagnetics .....	SU5302
Crispin .....	SU5651

## Satellite equipment, services

ISIS Group .....	C362
e2V technologies .....	C544
<b>Microwave Radio Communications ..</b>	<b>C704</b>
<b>Thales Broadcast &amp; Multimedia .....</b>	<b>C2000</b>

Andrew .....	C2630
<b>Miranda Technologies .....</b>	<b>C2826</b>
Broadcast Technology .....	C2912
<b>Tandberg Television .....</b>	<b>C3711</b>
<b>Frontline Communications .....</b>	<b>C4012</b>
Winemiller Communications .....	MM309
BT Broadcast Services .....	N1038
Industrial Logic .....	N1115
Spacecom .....	N1121
Patriot Antenna Systems .....	N1130
Miteq/MCL .....	N1534
<b>Intelsat .....</b>	<b>N1546</b>
GMPCS Personal Communications .....	N1656
Logic Innovations .....	SL2522
Optibase .....	SL2623
SkyStream Networks .....	SL2831
ViACCESS .....	SL2939
<b>Irdeto Access .....</b>	<b>SL3747</b>
<b>Scientific-Atlanta .....</b>	<b>SU4543</b>
ScheduAll Software .....	SU4615
Motorola, Broadband Communications Sector .....	SU4737
AZCAR .....	SU5166
Wegener Communications .....	SU5280
<b>Floral Systems .....</b>	<b>SU5425</b>
<b>Harmonic .....</b>	<b>SU5449</b>

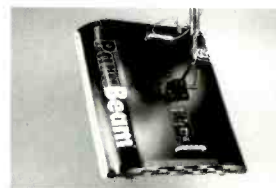


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Avitech International .....	SU6201
Alticast .....	SU6207
<b>BUF Technology .....</b>	<b>SU6301</b>
Masterclock .....	SU6329

## Studio, facility support products

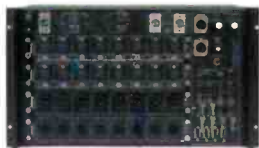
<b>Forecast Consoles .....</b>	<b>C102</b>
Fast Forward Video .....	C186
<b>Harris .....</b>	<b>C404</b>
Ward-Beck Systems .....	C722
<b>Leader Instruments .....</b>	<b>C768</b>
<b>Image Video .....</b>	<b>C850</b>
Lipsner-Smith .....	C1079
RTI-Research Technology International.....	C1079
<b>Lemo .....</b>	<b>C2433</b>
<b>Bogen .....</b>	<b>C2469</b>
<b>Wohler Technologies .....</b>	<b>C2543</b>
<b>Ikegami Electronics .....</b>	<b>C2638</b>
Hamlet Video International .....	C2777
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<b>Zandar Technologies .....</b>	<b>C3846</b>
Boland Communications .....	C3928
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<b>HORITA .....</b>	<b>C4362</b>
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<b>Sony Electronics, Vehicle Display ..</b>	<b>MM80</b>
Mager Systems .....	N1934
<b>Sennheiser Electronic .....</b>	<b>N2103</b>
Ergo 2000.....	N2260
Symetrix .....	N2621
RDL Radio Design Labs .....	N2637
<b>Wheatstone .....</b>	<b>N2804</b>
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AJA Video .....	SL536
<b>Marshall Electronics .....</b>	<b>SL745</b>
Da-Lite .....	SL927
Chapman/Leonard Studio Equipment ....	SU4509
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ScheduAll Software .....	SU4615
Focus Enhancements .....	SU4849
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<b>Omneon Video Networks .....</b>	<b>SU5437</b>
Triveni Digital .....	SU5475
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Peerless Industries.....	SU7319

## TBCs, frame syncs, conversion equipment

Sonifex .....	C133
Multidyne Video & Fiber Optic Systems .....	C276
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<b>Teranex .....</b>	<b>C462</b>
Adrienne Electronics .....	C566
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Crystal Vision .....	C670
<b>Doremi Labs .....</b>	<b>C879</b>
<b>Videotek .....</b>	<b>C974</b>
Keywest Technology .....	C2460
<b>Wohler Technologies .....</b>	<b>C2543</b>
<b>Miranda Technologies .....</b>	<b>C2826</b>
FOR-A .....	C2838
<b>Snell &amp; Wilcox .....</b>	<b>C2860</b>
Zaxcom .....	C3024
Sierra Video Systems .....	C3336
<b>Evertz .....</b>	<b>C3412</b>
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#### 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.



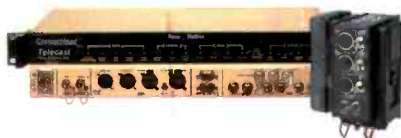
#### VIPER II

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.



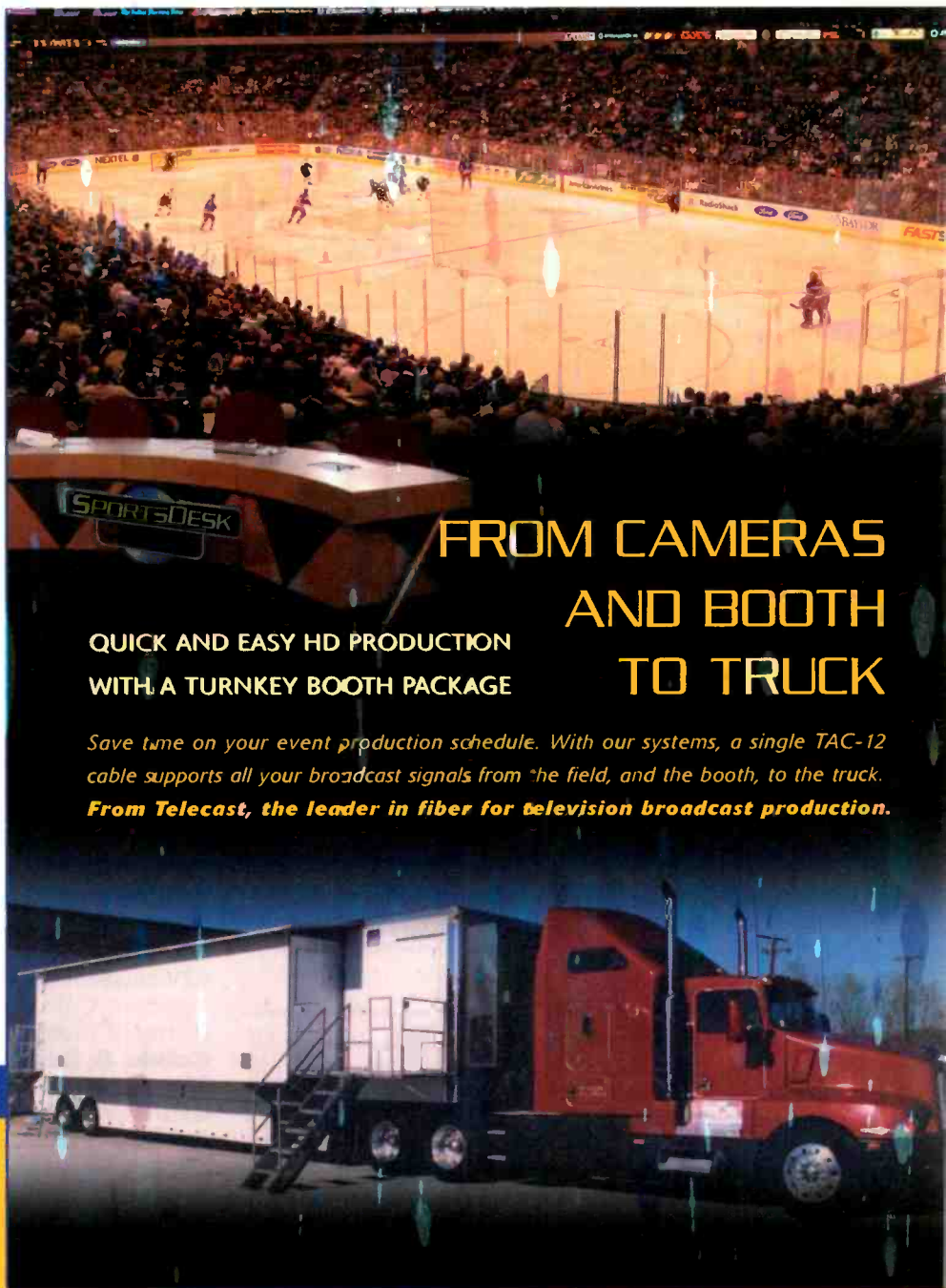
#### COPPERHEAD HD/SDI

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.



## FROM CAMERAS AND BOOTH TO TRUCK

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WITH A TURNKEY BOOTH PACKAGE**

*Save time on your event production schedule. With our systems, a single TAC-12 cable supports all your broadcast signals from the field, and the booth, to the truck.  
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#### ADDER 162 + DIAMONDBACK VIPER II 5292 + COPPERHEAD

- 24 audio to truck
- 8 audio and video to booth
- 3 PL/IFB channels
- 4 duplex data paths
- 1 HD feed to booth
- 1 full HD camera link

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<b>Ross Video .....</b>	<b>SU5225</b>
<b>Ensemble Designs .....</b>	<b>SU5258</b>
Telestream .....	SU5661
Cobalt Digital .....	SU5732
<b>Videoframe .....</b>	<b>SU6008</b>
Magni Systems .....	SU6036
<b>Fortel DTV .....</b>	<b>SU6319</b>
YEM .....	SU6323

<b>Wohler Technologies .....</b>	<b>C2543</b>
Neutrik .....	C2560
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FOR-A .....	C2838
<b>Snell &amp; Wilcox .....</b>	<b>C2860</b>
<b>Evertz .....</b>	<b>C3412</b>
Whirlwind .....	C3434
Z Technology .....	C3567
<b>Tandberg Television .....</b>	<b>C3711</b>
Hotronic .....	C4021
SignaSys .....	C4336
<b>HORITA .....</b>	<b>C4362</b>
Bexel .....	C4546
Sound Devices .....	N2045
TerraSonde .....	N2149
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Potomac Instruments .....	N2619
Logitek Electronic Systems .....	N2931
<b>Sencore .....</b>	<b>SU5035</b>
<b>Ensemble Designs .....</b>	<b>SU5258</b>
Triveni Digital .....	SU5475
<b>ESE .....</b>	<b>SU5623</b>
<b>Videoframe .....</b>	<b>SU6008</b>
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KTech Telecommunications .....	SU6121
Alticast .....	SU6207
DVB .....	SU6207
SyntheSys Research .....	SU6547
OmniTek .....	SU6565
Eyeheight .....	SU6634
<b>Astro Systems .....</b>	<b>SU6635</b>
Extron .....	Venetian, Ballroom G



Trilogy Broadcast .....	SU6457
Hi-Tech Enterprises .....	SU6471
<b>Thomson Grass Valley .....</b>	<b>SU7059</b>
<b>Axon Digital Design .....</b>	<b>SU7303</b>
Extron .....	Venetian, Ballroom G

## Test and measurement equipment

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Data Check .....	C652
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Ward-Beck Systems .....	C722
<b>Leader Instruments .....</b>	<b>C768</b>
<b>Videotek .....</b>	<b>C974</b>
<b>Thales Broadcast &amp; Multimedia .....</b>	<b>C2000</b>
Pixelmetrix .....	C2233
<b>Tektronix .....</b>	<b>C2450</b>
Keywest Technology .....	C2460
Burst Electronics .....	C2512

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<b>TRON-Tek .....</b>	<b>C280</b>
SpectraSite Broadcast Group .....	C304
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<b>Harris .....</b>	<b>C404</b>
<b>Dielectric Communications .....</b>	<b>C424</b>
e2V technologies .....	C544
Teracom Components .....	C574
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<b>Rohde &amp; Schwarz .....</b>	<b>C335</b>
<b>Microwave Radio Communications .....</b>	<b>C704</b>
<b>CPI/Eimac .....</b>	<b>C720</b>
<b>Acrodyne Industries .....</b>	<b>C958</b>
<b>Thales Broadcast &amp; Multimedia .....</b>	<b>C2000</b>
Pixelmetrix .....	C2233
EMCEE BROADCAST PRODUCTS .....	C2408
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# What else do You want in a 4U space?



The Marshall Electronics V-R82P-SDI has everything you need for video monitoring & editing. Two large 8.4" high resolution (800x600), high brightness (350 nits) LCD panels have Composite Video, S-Video & SD (601) inputs with active loop through. Additional XGA inputs have built-in scalars accepting any resolution up to 1280x1024. Built-in high quality 1C-bit SDI(601) to Composite Video down converters, Bar Generator and 4:3 to 16:9 switching are included. All this in a package only 2.65" deep, weighting less than 6Lb.

## LCD RACKS

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Ten hi-res 2.5" LCD monitors with active loop through.  
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Three hi-res 5" panels with CV, S-Video, VGA and SDI (V-R53P-SDI only) inputs per panel. Only 3U high, 2.65" deep. Weight 5Lb

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Four hi-res 4" LCD panels with CV or SDI inputs (V-R44P-SDI only) with active loop through. Only 2U high, 1.9" deep. Weight 3.5Lb



# Marshall Electronics

BROADCAST MULTIMEDIA DIVISION

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LARCAN .....	C3450
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<b>ADC .....</b>	<b>C4026</b>
Sabre Communications .....	C4554
BT Broadcast Services .....	MM312
<b>Thales Components .....</b>	<b>N1219</b>
<b>CPI .....</b>	<b>N1329</b>
Comtech Telecommunications .....	N1442
Magnum Towers .....	N2238
RF Parts .....	N2242
Bext .....	N2532
Utility Tower .....	N2538
UNIMAR .....	N2542
Shively Labs .....	N2626
Armstrong Transmitter .....	N2846
NEC Solutions .....	SL3815
Itelco .....	SU4676
Wegener Communications .....	SU5280
Radyne ComStream .....	SU5736
KTech Telecommunications .....	SU6121
DVB .....	SU6207
<b>Opticomm .....</b>	<b>SU6349</b>

## Video editing systems

<b>Teranex .....</b>	<b>C462</b>
EVS .....	C736
<b>Panasonic Broadcast .....</b>	<b>C904</b>
JVC Professional Products .....	C2050
<b>Quantel .....</b>	<b>C2612</b>
<b>Ikegami Electronics .....</b>	<b>C2638</b>
OmniBus Systems .....	C2670
FOR-A .....	C2838
Laird Telemedia .....	SL113
Canopus .....	SL121
Matrox Electronic Systems .....	SL631
Discreet .....	SL1500
Adobe Systems .....	SL2507
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<b>Avid Technology .....</b>	<b>SL300</b>
Mathematical Technologies .....	SL3823
BOXX Technologies .....	SL3832
<b>Leitch .....</b>	<b>SU4525</b>
<b>Sigma Electronics .....</b>	<b>SU4664</b>
<b>Pinnacle Systems .....</b>	<b>SU5003</b>
Brick House Video .....	SU5127
Pixel Power .....	SU5359
<b>ESE .....</b>	<b>SU5623</b>
<b>Astro Systems .....</b>	<b>SU6635</b>
Editware .....	SU7053
<b>Thomson Broadcast and Media Solutions .....</b>	<b>SU7059</b>
Accom .....	SU7325

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Multidyne Video & Fiber Optic Systems .....	C276


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Adrienne Electronics .....	C566
Crystal Vision .....	C670
Ward-Beck Systems .....	C722
<b>Image Video .....</b>	<b>C850</b>
<b>Videotek .....</b>	<b>C974</b>
Chyron .....	C2074
<b>Utah Scientific .....</b>	<b>C2317</b>
Keywest Technology .....	C2460
Burst Electronics .....	C2512
Pharos Communications .....	C2625



<b>PatchAmp .....</b>	<b>C2684</b>
<b>Miranda Technologies .....</b>	<b>C2826</b>
FOR-A .....	C2838
Sierra Video Systems .....	C3336
<b>Evertz .....</b>	<b>C3412</b>
SAV Systemes Audiofrequence Videonique .....	C3920
Hotronic .....	C4021
Force .....	C4039
E-Mediavision.com .....	C4082
<b>HORITA .....</b>	<b>C4362</b>
Comprehensive Video Group .....	C4472
RDL Radio Design Labs .....	N2637
Studer .....	N3005
Video Accessory .....	SL201
Gefen .....	SL203
Folsom Research .....	SL1919
Logic Innovations .....	SL2522
SkyStream Networks .....	SL2831
Communications Specialties .....	SL3539
<b>Leitch .....</b>	<b>SU4525</b>
<b>Scientific-Atlanta .....</b>	<b>SU4543</b>
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# Introduction

## The ADC Difference

For over 50 years, ADC has lead the industry in audio, video, and data patching products, a tradition that continues today in its state-of-the-art manufacturing facilities. Designing, engineering, and manufacturing virtually all of its own components, ADC has established itself as a premier builder of these critical industry products.

All of ADC's products are designed for outstanding performance in real world situations. ADC engineers understand typical industry applications and create products to solve the difficult problems other manufacturers prefer to overlook.



View onto manufacturing floor at Shakopee facility

It is easy to find the desired ADC product using convenient, easy-to-follow ordering information charts. The charts display all of the options available and allow for the selection of an ordering number for the product and feature sets desired. If the configuration isn't available, contact ADC for information about custom-designed products.

The Internet is also a fast and convenient avenue for getting more information about ADC's high-quality products. Simply go to [www.adc.com](http://www.adc.com) and search for a desired ordering number, or browse our online products and services area where you can order specific part numbers.



ADC's state-of-the-art facility in Shakopee, MN

From our durable patchbays and jackfields to our precision jacks and connectors, consistent quality is the hallmark of everything ADC produces. And everything at ADC is built to last, from the corrosion-resistant nickel plating on our patch plugs, to the tough steel chassis of our patch panels. ADC anticipates common failure points and overcomes them using the best available materials. ADC's strict adherence to quality standards, and careful manufacturing, assures dependable, long-lasting products.



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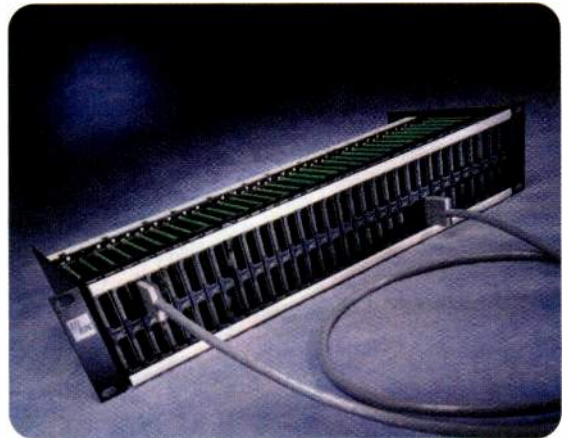
# Introduction

## Products You've Been Waiting For

ADC is the leader in innovative patching products because it listens to the needs of its customers. As a result, new and exciting products have been developed to enhance the effectiveness and durability of its existing broadcast patching products and connectors.

### UniPatch® Modular Patching System

Data, audio, and video patching in one patch panel used to be just a dream, until now. ADC's new high-performance UniPatch modular patching system features plug-in modules for RS-422 data patching, bantam audio jacks, media conversion baluns, video bulkhead connectors, and patching jacks of all types. UniPatch is ideal for mix-and-match patching applications or small applications that need to start economically and grow over time. See page 7 for details.



UniPatch® Modular Patching System

### XLR/BNC Baluns for Audio Impedance Matching

To complement its full line of connectors, ADC introduces three new individual baluns for 110 Ohm to 75 Ohm impedance matching. These precision-machined, chrome-plated brass connectors come in three new models: male XLR to female BNC, female XLR to female BNC, and female XLR to female BNC with a 10dB pad for nominal 1 volt peak to peak output. For further information, see page 41. Also see the UniPatch balun modules on page 12.



XLR Baluns

### Pro Patch™ Lite Value Series Patching

ADC now offers a quality audio patching system at an entry-level price with Pro Patch Lite. This series of patch panels features standard WECO-type longframe or bantam jacks with do-it-yourself solder tails and a built-in strain relief bar. It can even be ordered in prenormal, in half-normal and normals-strapped configurations. For more information, see page 35.



Pro Patch™ Lite Patch Panel

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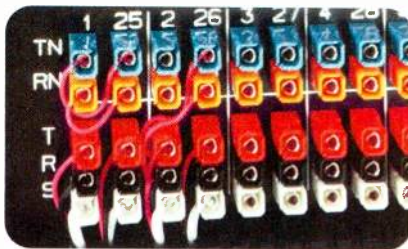


# Introduction

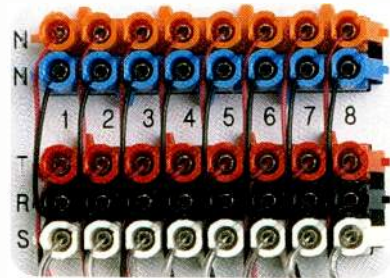
## Labor-Saving Quick Connect Punch Termination System

The original twisted pair QCP termination system set a new standard, making punchdown wiring fast and reliable. With the new QCP IV system, ADC introduces an even faster, more robust punchdown connector compatible with existing QCP tools. The new connectors come in 1x8 blocks insulated on both sides of the panel for better short protection. Because the connectors do not require the tool to be oriented before punching, the QCP IV system punches down instantly, saving you the laborious prewiring, soldering, and crimping required for connectorized panels.

Many ADC products come with a choice of QCP II or QCP IV. Both are a tremendous improvement over connectorized systems, but each has its advantages. QCP II allows greater density and individual replacement. QCP IV is a more durable connector and does not require orienting the tool before punching.



QCP II

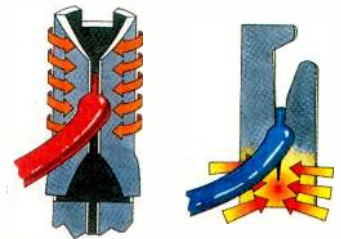


QCP IV

### Features

ADC's exclusive, patented QCP II and QCP IV split-cylinder punchdown termination system is faster and easier to install and more reliable than any other termination system, including solder.

- Dependable, durable, split-cylinder design holds up to three stranded or solid wires, 22 to 26 gauge (0.32 mm to 0.128 mm)
- No intermittents with gastight connections. Uniform split channel width holds each wire firmly, unlike telco punchdowns with V-shaped channels or soldered connections that use flux and may have unreliable solder joints
- Easy pre-lacing makes installation faster. Color-coding prevents wiring mistakes
- Labor-saving punch terminates and cuts wire in one simple motion. New QCP IV installs even faster because you don't have to orient the tool before punching
- Faster and easier changes in circuits or normals than soldered connector systems. Rated for up to 200 insertions/withdrawals
- QCP II terminations are individually mounted and insulated for easy repair or replacement
- QCP IV terminations are mounted in 1x8 blocks insulated on both sides of the panel. This design, plus the recessed conductors, eliminates shorts



QCP

Split Beam



# Introduction

## Best Jacks Available

When it comes to audio and video jack design, ADC makes them perform better, last longer and connect more reliably than anyone else. Our jacks and all of their working components are designed and manufactured in our own facilities under the strictest quality control. Every jack is identical and exceptional in quality and performance.

### Audio Jacks

**ADC audio jacks are built to perform and to last**



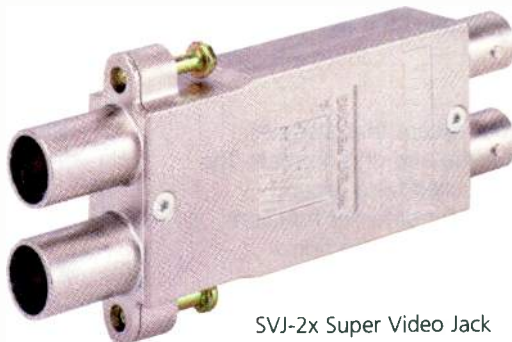
PJ339W Longframe Wire-Wrap Audio Jack  
(Exclusively used in prewired ADC Pro Patch Audio)

#### Features

- All ADC jacks are WECO-standard and military grade
- Absolutely reliable WECO Alloy #1 gold self-cleaning crossbar contacts wipe away debris with each use
- Solder-free wire-wrap tails prevent intermittents from cold solder joints or flux migration (prewired only)
- Solder style jacks provide the option of do-it-yourself installation
- Tested to withstand tough applications, including vibration, temperature, moisture, and salt air corrosion
- Extended spring beams, computer-torqued screws, and precision-molded Ultem® insulators ensure consistent quality, long life, and reliability
- Durable precision diecast (bantam) or stamped steel (longframe) frames

### Video Jacks

**True 75 Ohm jacks for today's high bandwidth services**



SVJ-2x Super Video Jack

#### Features

- True 75 Ohm for excellent high-frequency performance
- Gold-plated components assure signal quality and tarnish resistance
- Sealed switch prevents contamination from dust, etc.
- All-solderless construction eliminates solder-related failures
- Closed-entry BNC center conductor prevents damage and provides reliable contact
- Two-piece center conductor prevents RFI and EMI radiation leakage
- Tough, diecast body will not rust or flex
- Precision-tooled parts for consistent quality
- Captive mounting screws will not fall out

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3 / 0 3 • 1 1 8 0 2 7 0

# Introduction

## Understanding Audio Normalling

Normalling creates a default circuit through the patch panel to connect equipment together in the arrangement you normally or most frequently use. When you plug in a patch cord, you break this "normal" circuit and create a temporary new circuit. Pro Patch™ lets you select from a variety of normalling options.

### Selectable Normals (UniPatch only)

Selectable normals allow the user to select any typical normal configuration by setting switches on an impedance-matched dip switch located on the bantam audio card.

### Normals Strapped (fully normalled)

In a fully normalled configuration, the normals of each jack in the top row are internally strapped to the normals of the jack below it with the tip (T), ring (R), and sleeve (S) contacts brought out to the rear panel terminations. At the rear panel, equipment is wired to the two jacks, creating a normal circuit. To break this normal connection, you insert a patch cord into either jack.

### Half-Normalled

In a half-normalled configuration, the normals of the bottom jack are internally wired to the tip (T) and ring (R) connections of the top jack, and the tip, ring, and sleeve of both jacks are brought out to the rear terminations. Equipment is wired to the two jacks at the rear terminations, creating a normal circuit. Inserting a plug into the top jack monitors the circuit without breaking it, and inserting a plug into the bottom jack breaks the circuit.

### No Normals

A panel without normals has jacks that are open (no normal connection) until patched. When the patch cord is inserted, the signal flows through the cord and jack to or from the equipment connected to the jack at the rear terminations. No normal patch panels require looping plugs (u-links) or patch cords to complete the circuit.

### Normals Out

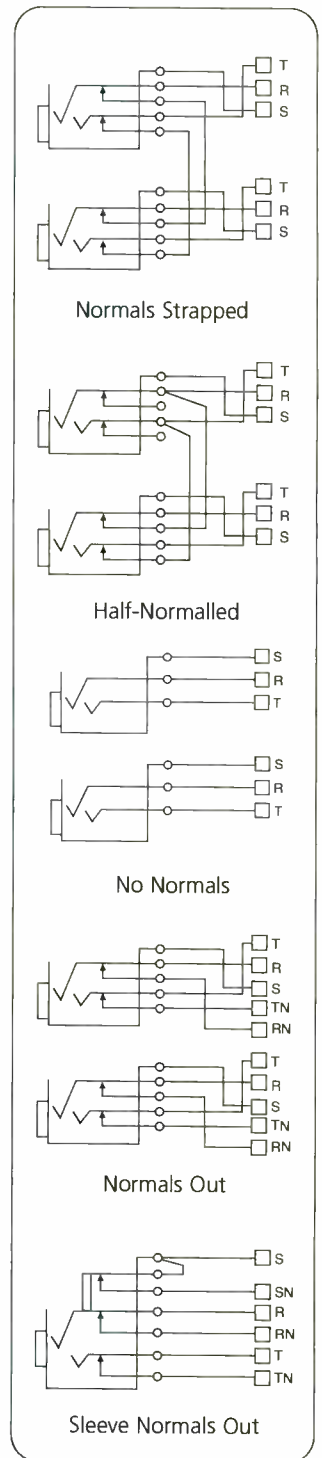
In this configuration normals are brought out to the rear terminations where you can strap them as you want them. Note that you cannot change the normalling on panels with internal normals because normalling is done at the jacks. Select the normals out option if you need the ability to change normals.

### Sleeve Normals Out

Sleeve normals out are the same as normals out except that a sleeve normal is switched inside the jack in addition to tip and ring normals. The sleeve normal is also brought out and is typically used for a ground connection. Making it switchable allows grounds for different functions to be separated to prevent ground loops that produce audio hum.

### Bussed Grounds

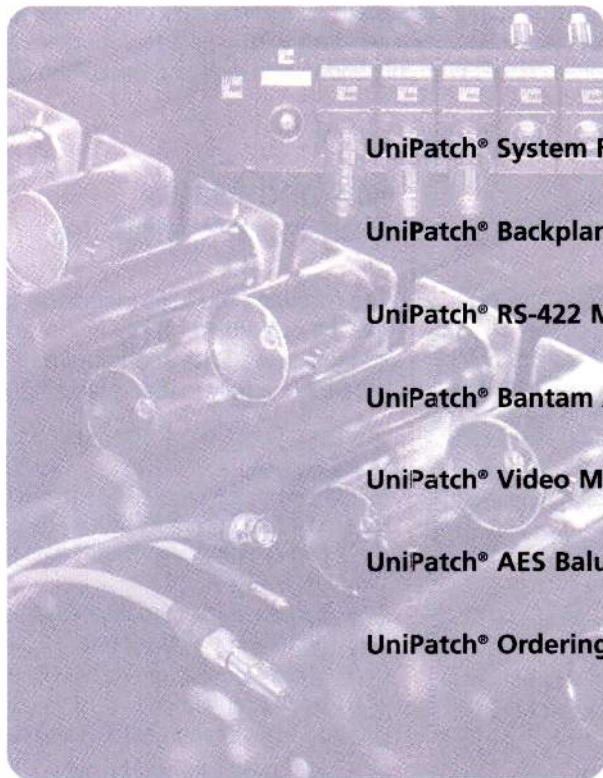
In a bussed-grounds configuration the ground connections of all jacks are brought out to the rear terminations and connected together. This provides a common ground for all jacks.





# The Revolutionary

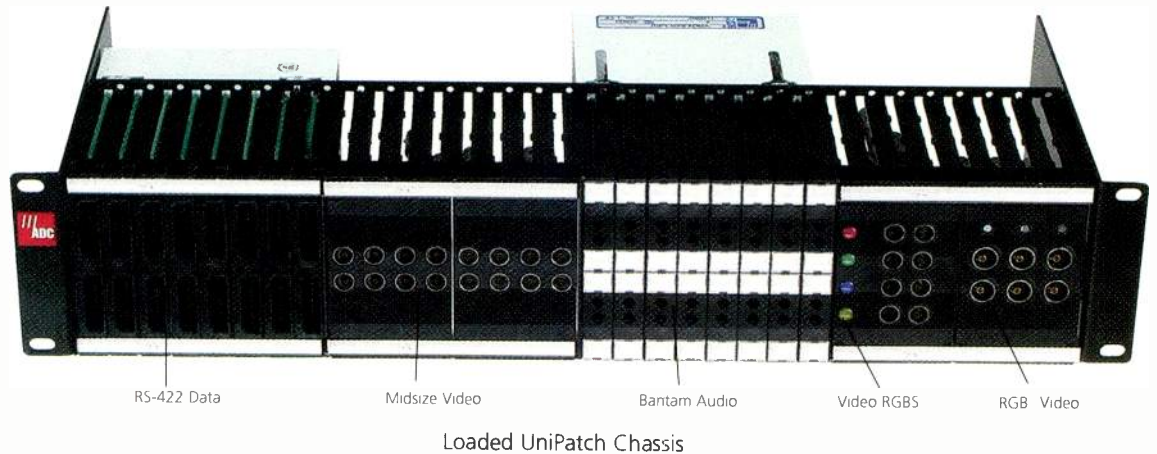
## UniPatch® System



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# UniPatch® System



Loaded UniPatch Chassis

The revolutionary new UniPatch® modular patching system with universal chassis allows you to combine data, audio, and video patching modules in a single two-rack-unit modular panel. Order a mix of jack and backplane modules to create a totally custom patching system, or order a fully preconfigured panel filled with bantam audio jacks or RS-422 data jacks. You can even start with only a few modules and add or change modules as needed. The universal chassis with mix-and-match jack and backplane modules provides the ultimate in flexibility.

## Modular Chassis for Unprecedented Flexibility

### Features

- Jacks and backplanes have a modular design and fit into the rugged high-density card cage chassis. Just plug in a module to add more jacks or backplane connectors
- Modularity lets you start small and add modules and cards as needed
- Individual circuits are easily replaced without disturbing other circuits
- Backplanes available in high-density 64 circuits (bantam audio), high-density 32-port data, standard-density 24-port data, and video options
- Gold-plated card edge connectors tested to withstand heavy use and vibration
- Shallow 7" deep chassis is perfect for mobile applications

## Mix-and-Match Plug-in Jack Modules

The following modules (details on following pages) may be assembled on site in mix and match combinations. Data and bantam modules may be ordered in a fully loaded preconfigured chassis.

### Features

- Cat 3 compliant RS-422 modules for demanding professional data patching applications
- Bantam audio modules in user-selectable normalled configurations
- Video modules for analog, SD, HD, and analog component
- AES 110 Ohm to 75 Ohm coaxial baluns
- BNC bulkhead feedthroughs
- Cat 5, Cat 5e and Cat 6 data patch
- Fiber optic bulkhead adapters in ST®, SC, LX.5® and FC types in singlemode or multimode

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# UniPatch® Mix-and-Match Backplanes

Eleven different backplane connector types are available, and because they come in modular units, they can be mixed and matched like the jack modules. Each backplane supports up to eight jack modules.

## Features

Available Modules:

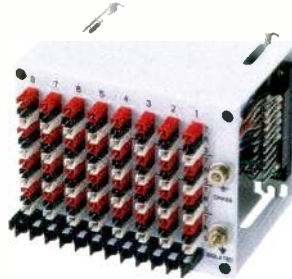
- Dsub9 connectors, 32-port, high-density (shown)  
24-port, standard-density (not shown)  
(32-port requires thin shell strain relief, sold separately, see page 15)
- DB-25 connectors
- Labor-saving QCP II Ultra Patch quick connect punchdown (see page 3 for QCP information)
- AMP Champ 50-pin receptacle
- EDAC 90-pin plug
- EDAC 3-pin plug
- RJ45 connectors
- QCP MKII for data 20x8
- QCP MKII for audio 12x8



VPRM-E90-W EDAC 90-Pin Plug Rear Module



VPRM-A50-W AMP 50-Pin Receptacle Rear Module



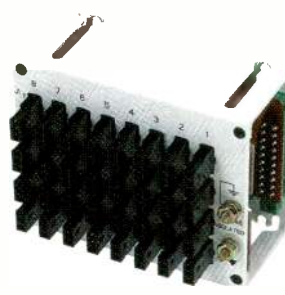
VPRM-BAN-MKII (for audio)



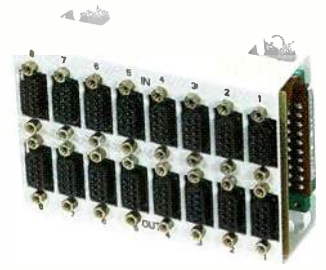
VPRM-D25-W DB-25 Rear Module



VPRM-MKII-W QCP II Rear Module (for data)



VPRM-BAN-E3 Rear Module (for audio)



VPRM-D9-W Dsub9 Rear Module



# UniPatch® RS-422 Modules



The UniPatch® Category 3 compliant RS-422 module raises the standard in machine control patching with its quality and robust design. Now you can patch machine control data properly using reliable, durable, military-grade jacks rated for 30,000 insertion/withdrawal cycles. Each circuit switches all ten pins, making the module fully SMPTE 207M compliant. Compared to other systems employing light-duty RJ45 connectors rated at fewer than 750 insertion/withdrawal cycles or bantam jacks that do not switch all signal lines, the UniPatch RS-422 module is a significant advance in machine control patching.

## Features

### A New Standard in Professional Data Patching

- Durable military-grade switch system rated for 30,000 insertions/withdrawals. Suitable for heavy daily professional use, unlike RJ45 systems
- Fully SMPTE 207M compliant circuits switch all ten pins, unlike bantam systems, which do not switch all ground pins, potentially causing problems
- Tough military-grade, gold-plated switch with long cantilever beam springs and unique self-wiping contacts ensures against premature wear and provides positive contact force
- RS-422 cards offer highest density available. Up to 32 modules in two rack units for 33 percent greater density
- Normalled or non-normalled cards available
- Modular termination options: DB-25, EDAC 90-pin plug, QCP II, Ultra Patch, Dsub9 standard-density, 24 per frame, or Dsub9 high-density, 32 per frame (requires thin shell strain relief)
- Keyed for proper patch cord orientation
- Cat 3 compliant for 10Base-T data

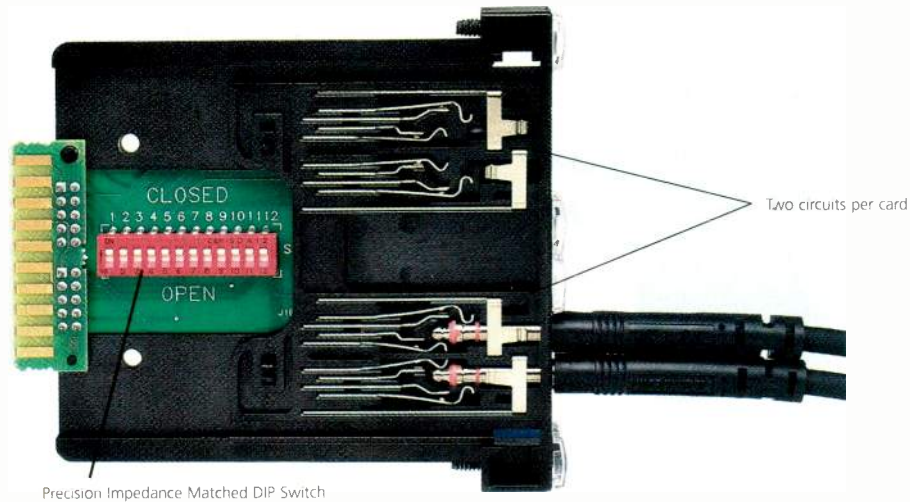
3 / 0 3 • 1 1 8 0 2 7 0 Broadcast Products





# UniPatch® Bantam Audio Modules

The bantam audio jack modules for the UniPatch® system are perfectly designed for professional digital and analog audio applications. Up to 32 modules plug into the UniPatch chassis to provide a 64-circuit (128 jacks) configuration when fully loaded, matching typical router configurations. Each module contains two circuits and four WECO-standard precision bantam jacks designed for long life. High-performance switches allow flexible normalling and grounds for each circuit. Large .440" x .325" designations provide enough room for three lines of text.



## Features

### High-Density, Selectable Normals, and Excellent Reliability

- 33 percent higher density than conventional frame-type bantam bays Up to 32 cards in a frame with 2 circuits (4 jacks) per card for a total of 64 circuits (128 jacks)
- 32-across spacing exactly matches typical router configurations and provides larger designation area
- Switch-selectable normals and grounds for each circuit: normals strapped (NS), half-normal (HN), bussed ground (BG), or no normals (NN)
- WECO-standard jacks meet or exceed MIL-STD-202 for mechanical durability as well as corrosion, salt spray, thermal shock, and moisture resistance
- Precision-molded Ultem® housing and sturdy, integrated all metal springs rated for 10,000 insertions/withdrawals. Gold crossbar, self-cleaning contacts ensure a positive connection
- Modular termination options: QCP II, EDAC 3-pin plug, EDAC 90-pin plug, DB-25, AMP Champ 50-pin receptacle, or QCP IV with 4-foot umbilical Ultra Patch panel
- Snap-on designation holders accept individual labels without tools; conventional chassis-wide designation strips are also available. Large designations provide enough room for three lines of text
- Fully compliant 110 Ohm circuit board meets demanding AES specifications



# UniPatch® Video Modules

ADC offers a full line of UniPatch® video patching modules, making it easy to assemble a custom video patch panel for any application. Modules are available for analog, SD, HD, or component video. Included in the selection of jacks are the standard size SVJ series and midsize MVJ series Super Video Jacks for outstanding performance at high-definition data rates and beyond.

## Features

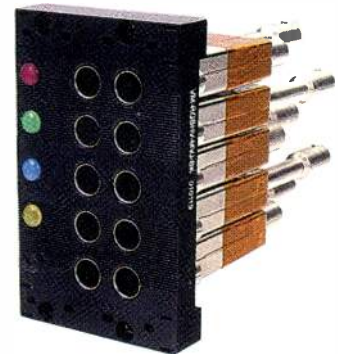
- Standard jacks mount 24 across, midsize jacks mount 32 across
- Standard-size, HD video modules contain SVJ-2x normalled-through Super Video Jacks with or without termination
- Standard size straight-through modules contain CJ2011 jacks without termination or CJ2020 jacks with termination
- Midsize HD video modules contain MVJ-3 normalled-through Super Video Jacks with or without termination
- Midsize straight-through modules contain CJ3014/4014 jacks without termination or CJ3011N-75/4011N-75 jacks with termination
- New modules are available for analog component video in the following configurations: RGB, P<sub>P</sub>B<sub>B</sub>Y, RGBS, and RGBHV
- Large designations snap on without tools providing enough space for four rows of text



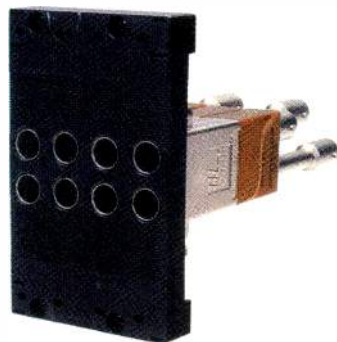
VM-2011-BK  
Standard Size Video Module  
also available with CJ2020N75  
terminated single jacks



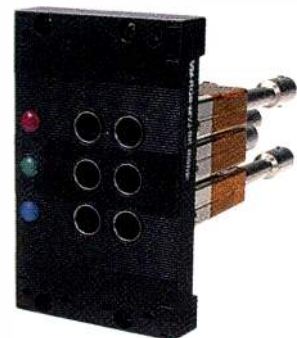
VM-SVJ-BK  
Standard Size HD Video Module



VM-RGBHV-MVJ-BK  
RGBHV Video Module



VM-MVJ-BK  
Midsize HD Video Module



VM-RGB-MVJ-BK  
RGB, P<sub>P</sub>B<sub>B</sub>Y HD Video Module

All modules provided with colored inserts to allow the user to customize for any use.

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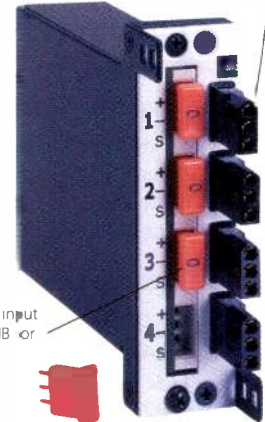
# UniPatch® AES Balun Modules

The new patent-pending AES 110 Ohm to 75 Ohm balun modules provide precision impedance matching for interfacing balanced twisted pair AES audio to unbalanced coaxial audio. Eliminate the nuisance of XLR soldering and the mess of baluns hanging from equipment. Replace them with this clean, simple solution.

## Features

- Modules contain four circuits for up to 64 circuits per 2 RU chassis
- Works with quick-to-install QCP punchdown termination modules or EDAC 3-pin plug
- 1 Vp-p plug-in pad is available for equipment that cannot accept high-input voltages. Plug-in pad feature allows each circuit to be tailored for 1 Vp-p operation in 1dB increments to -20dB
- New splitter module provides 2-in/4-out passive split/110 to 75 Ohm converter

110 Ohm twisted pair inputs, EDAC 3-pin plug or QCP II



Plug-in pads allow padding input signal down from 0 to -20dB or nominal 1 Vp-p operation

AM-411075-E3



Front View



Rear View

UniPatch System fully loaded with 16 AES balun modules for 64 110-75 Ohm circuits (allows modules to be mounted either way)

For in-line baluns, see page 42



# UniPatch® System

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## Ordering Information

Description	Ordering Number
<b>Bantam Audio Complete Systems</b>	
64-circuit loaded system QCP II, black	VP2232-BANQCP-BK
64-circuit loaded system EDAC 3-pin plug, black*	VP2232-BANE3-BK
64-circuit loaded system Dsub9, black*	VP2232-BAND9-BK
64-circuit loaded system DB-25, black*	VP2232-BAND25-BK
<b>RS-422 Data Fully Loaded Systems - normalled</b>	
24-circuit Dsub9 normalled, gray	VP2224-D9-G
24-circuit Dsub9 normalled, black	VP2224-D9-BK
32-circuit Dsub9 normalled, gray	VP2232-D9-G
32-circuit Dsub9 normalled, black	VP2232-D9-BK
32-circuit DB-25 normalled, gray	VP2232-D25-G
32-circuit DB-25 normalled, black	VP2232-D25-BK
32-circuit AMP 50-pin receptacle normalled, gray	VP2232-A50-G
32-circuit AMP 50-pin receptacle normalled, black	VP2232-A50-BK
32-circuit EDAC 90-pin plug normalled, black	VP2232-E90-BK
32-circuit EDAC 90-pin plug normalled, gray	VP2232-E90-G
32-circuit QCP II normalled, black	VP2232-MKII-BK
32-circuit QCP II normalled, gray	VP2232-MKII-G
<b>RS-422 Data Fully Loaded Systems - non-normalled</b>	
24-circuit Dsub9 non-normalled, black	VP2224-NND9-BK
32-circuit Dsub9 non-normalled, black	VP2232-NND9-BK
32-circuit Dsub9 non-normalled, gray	VP2232-NND9-G
32-circuit EDAC 90-pin plug non-normalled, black	VP2232-NNE90-BK
32-circuit EDAC 90-pin plug non-normalled, gray	VP2232-NNE90-G
32-circuit QCP II non-normalled, black	VP2232-NNMKII-BK
32-circuit QCP II non-normalled, gray	VP2232-NNMKII-G
32-circuit AMP 50-pin receptacle non-normalled, black	VP2232-NNA50-BK
32-circuit AMP 50-pin receptacle non-normalled, gray	VP2232-NNA50-G
32-circuit DB-25 non-normalled, black	VP2232-NND25-BK
32-circuit DB-25 non-normalled, gray	VP2232-NND25-G



\* Normal configurations on bantam audio cards to be set by user.  
32-circuit Dsub9 systems require the use of a thin backshell kit.

The thin backshell Dsub9 provides strain relief for standard Dsub9 connectors. This shell kit is recommended on 32-circuit UniPatch RS-422 systems.

The backshell kits are found on page 15.



DB-9 Thin Backshell Kit  
(does not include DB-9 connector)



# UniPatch® System

3 / 0 3 • 1 1 8 0 2 7 0 Broadcast Products

## Ordering Information

Description	Required Chassis Space	Ordering Number
<b>AES Balun Modules</b>		
AES 110 Ohm to 75 Ohm, 4-circuit BNC to QCP II	2 spaces	AM-411075-MKII
AES 110 Ohm to 75 Ohm, 4-circuit BNC to EDAC 3-pin plug	2 spaces	AM-411075-E3
2:4 splitter balun module 110 Ohm to 75 Ohm	2 spaces	AM-2110-475-E3
Plug-in pad (replace "XX" with 01 to -20db)		SCAP-XX
<b>Audio Modules</b>		
Bantam audio, adjustable normals, 2-circuit, black	1 space	AM-BAN-BK
<b>Data Modules</b>		
RS-422 data, 10-pin, normals through, black	1 space	DM-422-BK
RS-422 data, 10-pin, normals through, gray	1 space	DM-422-G
RS-422 data, 10-pin, non-normalled, black	1 space	DM-422-NN-BK
RS-422 data, 10-pin, non-normalled, gray	1 space	DM-422-NN-G
Ethernet data, Cat 5 RJ-RJ coupler, black	4 spaces	DM-RJC5-BK
Ethernet data, blank adapter, black*	4 spaces	DM-6S-BK
<b>Universal Blank Modules</b>		
Blank module, black	1 space	DM-BLANK-BK
Blank module, gray	1 space	DM-BLANK-G
<b>Video Modules'</b>		
Standard, CJ2011N straight-through, 3-circuit, black	4 spaces	VM-2011-BK
Standard, CJ2011N straight-through, 3-circuit, gray	4 spaces	VM-2011-G
Standard, CJ2020N-75 terminated single, 3-circuit, black	4 spaces	VM-2020-BK
Standard, CJ2020N-75 terminated single, 3-circuit, gray	4 spaces	VM-2020-G
Standard, Super Video Jack SVJ-2x, 3-circuit, black	4 spaces	VM-SVJ-BK
Standard, Super Video Jack SVJ-2Tx, terminated, 3-circuit, black	4 spaces	VM-SVJT-BK
Standard, Super Video Jack SVJ-2x, 3-circuit, gray	4 spaces	VM-SVJ-G
Standard, Super Video Jack SVJ-2Tx, terminated, 3-circuit, gray	4 spaces	VM-SVJT-G
Midsized, Super Video Jack MVJ-3, 4-circuit, black	4 spaces	VM-MVJ-BK
Midsized, Super Video Jack MVJ-3T, 4-circuit, terminated, black	4 spaces	VM-MVJT-BK
Midsized, Super Video Jack MVJ-3, 4-circuit, gray	4 spaces	VM-MVJ-G
Midsized, Super Video Jack MVJ-3T, 4-circuit, terminated, gray	4 spaces	VM-MVJT-G
Midsized, MVJ-3, RGB+HV, black	4 spaces	VM-RGBHV-MVJ-BK
Midsized, MVJ-3T, RGB+HV, terminated, black	4 spaces	VM-RGBHV-MVJT-BK
Midsized, MVJ-3, RGB+HV, gray	4 spaces	VM-RGBHV-MVJ-G



**Note:** Conventional XLR baluns listed on page 42.

\*Accepts (4) 6000 Series Multimedia Modules (sold separately). See pages 122 and 123 for 6000 Series Modules.

'Video circuits are supplied with designations and circuit indications.

Ordering information continues on next page.



# UniPatch® System

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## Ordering Information

Description	Required Chassis Space	Ordering Number
<b>Video Modules (continued)</b>		
Midsized, MVJ-3T, RGB+HV, terminated, gray	4 spaces	VM-RGBHV-MVJT-G
Midsized, MVJ-3, RGB, P <sub>r</sub> P <sub>b</sub> Y HD module, black	4 spaces	VM-RGB-MVJ-BK
Midsized, MVJ-3T, RGB, P <sub>r</sub> P <sub>b</sub> Y HD module, terminated, black	4 spaces	VM-RGB-MVJT-BK
Midsized, MVJ-3, RGB, P <sub>r</sub> P <sub>b</sub> Y HD module, gray	4 spaces	VM-RGB-MVJ-G
Midsized, MVJ-3T, RGB, P <sub>r</sub> P <sub>b</sub> Y HD module, terminated, gray	4 spaces	VM-RGB-MVJT-G
Midsized, MVJ-3, RGB-S, black	4 spaces	VM-RGBS-MVJ-BK
Midsized, MVJ-3T, RGB-S, terminated, black	4 spaces	VM-RGBS-MVJT-BK
Midsized, MVJ-3, RGB-S, gray	4 spaces	VM-RGBS-MVJ-G
Midsized, MVJ-3T, RGB-S, terminated, gray	4 spaces	VM-RGBS-MVJT-G
Midsized, CJ3014/4014N, 4-circuit, black	4 spaces	VM-CJMID2-BK
Midsized, CJ3011/4011N-75, 4-circuit, terminated, black	4 spaces	VM-CJMID2-BK
Midsized, CJ3014/4014N, 4-circuit, gray	4 spaces	VM-CJMID2-G
Midsized, CJ3011/4011N-75, 4-circuit, terminated, gray	4 spaces	VM-CJMID2-G
BNC bulkhead feedthrough, 15-circuit, black	8 spaces	VM-BHFT-15BK
BNC bulkhead feedthrough, 15-circuit, gray	8 spaces	VM-BHFT-15G
<b>Rear Modules</b>		
Audio QCP II, 8-circuit for bantam audio applications		VPRM-BAN-MKII
Audio EDAC 3-pin plug, 8-circuit for audio applications		VPRM-BAN-E3
Audio EDAC 90-pin plug, 8-circuit		VPRM-BAN-E90
DB-9, 32-circuit Ultra Patch, 3-foot umbilical, white, for audio applications		VPRM-3DB9-W
Universal AMP 50-pin receptacle, 8-circuit, RS-422, white		VPRM-A50
Universal DB-25, 8-circuit, RS-422, white		VPRM-D25
Universal DB-9, 8-circuit, RS-422, white		VPRM-D9-W
Universal EDAC 90-pin plug, 8-circuit, RS-422, white		VPRM-E90-W
Universal QCP II, 8x10 circuit, white, for data applications		VPRM-MKII-W
Universal RJ45, 8-circuit, white		VPRM-RJ45
<b>UniPatch Accessories</b>		
Empty UniPatch chassis, black, supplied with VP-DES-343-32 kit		VP2232-BK
Empty UniPatch chassis, gray, supplied with VP-DES-343-32 kit		VP2232-G
Dsub9 thin backshell connector kit, 1 count		DB9-TSHELL1-KIT
Dsub9 thin backshell connector kit, 16 count		DB9-TSHELL16-KIT
Dsub9 thin backshell connector kit, 64 count		DB9-TSHELL64-KIT
Patch cord kit with two RS-422 ends, 10-pin black, no cable		PC-422-KIT
Bantam audio module extraction tool		VP-BAN-TOOL
Rear cable management kit (mounts in rear rack rails), black		PPI-EXT-BAR-BK
Rear cable management kit (mounts in rear rack rails), gray		PPI-EXT-BAR-G
<b>Replacement Designation Strip Kits**</b>		
Kit of 2 pieces, 17" x .640" full-length designation strips (includes window and mounting screws)		VP-DES-680-32
Kit of 128 windows, .440" x .343" designation windows for bantam modules		VP-DES-BAN
Kit of 16 windows, 2.01" x .343" designation windows for video modules		VP-DES-VIDEO
Kit of 4 pieces, 4.174" x .289" designation strips for bantam, video or data modules (includes windows and mounting screws)		VP-DES-343-4
Kit of 2 pieces, 17" x .289" designation strips for loaded bantam or data chassis (includes windows and mounting screws. Order two kits for loaded bantam systems)		VP-DES-343-32

\*\* See UniPatch Installation Guide ADCP-75-009 for additional information on selecting the correct designation kit for your UniPatch system. Designations are supplied with chassis and system configurations; kits are for replacement only



# UniPatch® System

## Ordering Information

Description	Ordering Number
<b>UniPatch® Data Patch Cords</b>	
UniPatch RS-422 10-pin black 2'	PC-422-2BK
UniPatch RS-422 10-pin black 3'	PC-422-3BK
UniPatch RS-422 10-pin black 4'	PC-422-4BK
UniPatch RS-422 10-pin black 6'	PC-422-6BK
UniPatch RS-422 10-pin black 8'	PC-422-8BK
UniPatch RS-422 10-pin black 10'	PC-422-10BK
UniPatch RS-422 10-pin to RJ45, black 2'	PC-422-RJ45-2BK
UniPatch RS-422 10-pin to RJ45, black 3'	PC-422-RJ45-3BK
UniPatch RS-422 10-pin to RJ45, black 4'	PC-422-RJ45-4BK
UniPatch RS-422 10-pin to RJ45, black 6'	PC-422-RJ45-6BK
UniPatch RS-422 10-pin to RJ45, black 10'	PC-422-RJ45-10BK
<b>Traditional RS-422 Patch Panels</b>	
RS-422 2x12 non-normalled RJ45, black	PEM-9NCDA1-BK-NN
RS-422 2x12 non-normalled RJ45, putty	PEM-9NCDA1-NN
RS-422 2x24 non-normalled RJ45, black	S824-NN
RS-422 2x24 dual bantam to MKIV N/S	PPB3-5MKIVR422NS
RS-422 2x24 dual bantam to Dsub9 normalled	PPB3-5R422D9NS
RS-422 2x12 dual bantam to Dsub9 normalled	PPB3-5R422D9NS-12
<b>Traditional Data Patch Cords</b>	
RJ45-RJ45 1', blue	ADCPC-RR6B-BL01
RJ45-RJ45 2', blue	ADCPC-RR6B-BL02
RJ45-RJ45 3', blue	ADCPC-RR6B-BL03
RJ45-RJ45 4', blue	ADCPC-RR6B-BL04
Dual bantam to single RJ45, 36"	MPP-BCC-003
Dual bantam to dual RJ45, 36"	PAT-100900-003
Dual bantam to single RJ45, 72"	PAT-100904
Dual bantam to dual RJ45, 72"	PAT-100900-006



UniPatch Data Patch Cord

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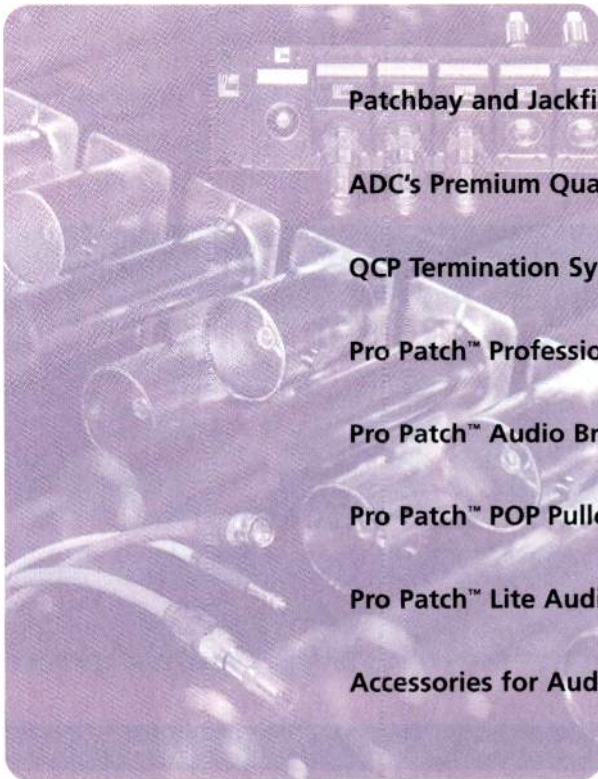






# Audio Patchbays

## Professional Audio

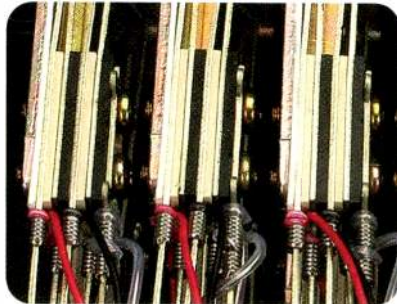


<b>Patchbay and Jackfield Features</b>	<b>19</b>
<b>ADC's Premium Quality Audio Jacks</b>	<b>21</b>
<b>QCP Termination System</b>	<b>22</b>
<b>Pro Patch™ Professional Audio Patchbays</b>	<b>23</b>
<b>Pro Patch™ Audio Broadcast Jackfields</b>	<b>28</b>
<b>Pro Patch™ POP Pullout Audio Panels</b>	<b>32</b>
<b>Pro Patch™ Lite Audio Panels</b>	<b>35</b>
<b>Accessories for Audio</b>	<b>37</b>

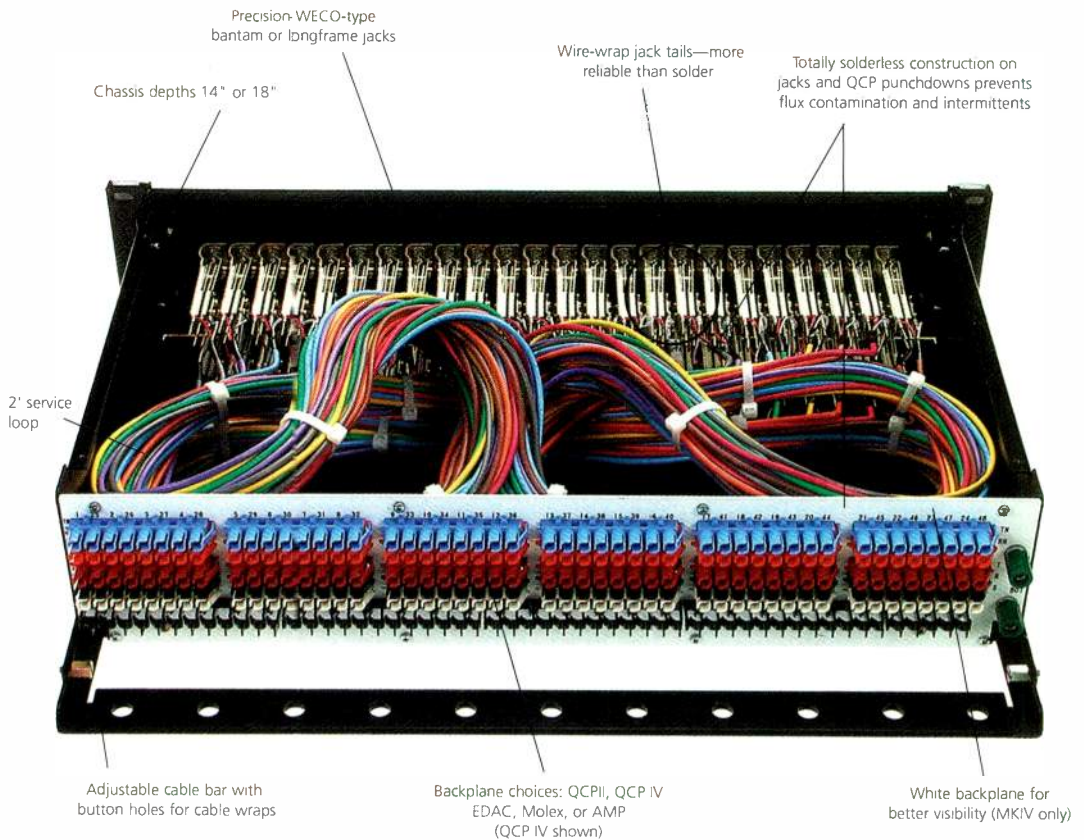


# Audio Patchbays and Jackfields

Pro Patch™ professional audio patchbays and broadcast jackfields feature an extensive selection of jacks, panel sizes, normaling options, and rear terminations. Each panel contains ADC's high-quality, WECO-standard, frame-type jacks and includes a tough powder-coated chassis with built-in cable support and termination strips. Solderless internal wiring and terminations ensure completely dependable performance without intermittents. Termination options include the extremely reliable and quick-to-wire QCP II or QCP IV punchdown system as well as EDAC, AMP, and Molex connector options.



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# Audio Patchbays and Jackfields

## Features

### Analog or Digital Wiring

- Standard analog cable (PPA/PPB/PPS)
- Precision 110 Ohm digital audio cable (DAL/DAB)

### Variety of Jack Options

- Standard longframe jacks (evenly spaced)
- High-density bantam jacks, regular or stereo spaced
- Stereo-spacing option places jacks in pairs

### Standard or Custom Sizes

- 1 RU (1.75"/44.5 mm)
- 2 RU (3.5"/88 mm)
- Custom sizes available

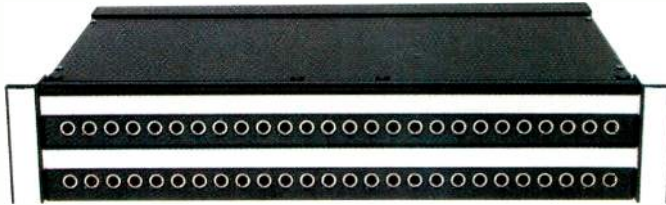
### Wide Selection of Terminations

- Patented QCP II or QCP IV punchdown connectors

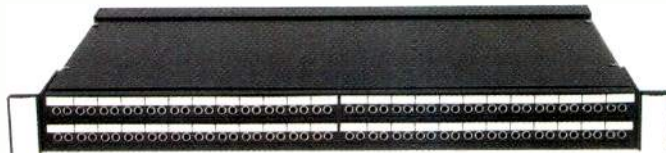
- EDAC/ELCO 90, 56, 38 and 3-pin plugs
- AMP 50-pin receptacle
- Molex 3-pin plug
- Ultra Patch panel with QCP IV, prewired umbilical (broadcast jackfields only)
- Stub end cut to length

### Full Range of Normaling Options

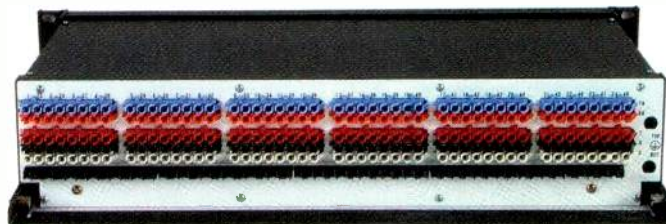
- No normals (requires looping plugs or cords for patch)
- Normals strapped (fully normalled)
- Half-normalled (monitor top row)
- Normals brought out
- Sleeve normals brought out
- Bussed grounds



PPA3-14MKII26NO  
2 RU Longframe Evenly-Spaced 2x26 Patchbay



PPB1-14MKIVENSBG  
1RU Bantam Stereo-Spaced 2x48 Patchbay



PPA3-14MKIVNO  
2 RU Longframe Evenly-Spaced 2x24 QCP IV Patchbay (Rear View)



# Audio Jacks

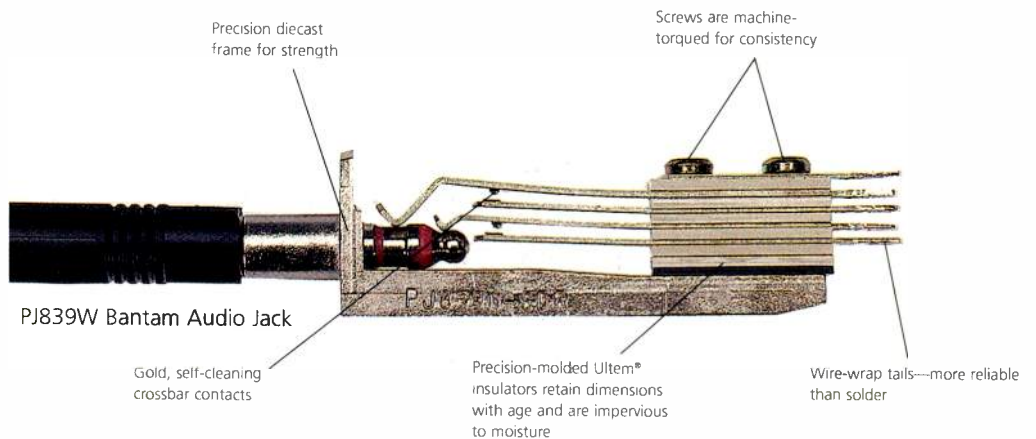
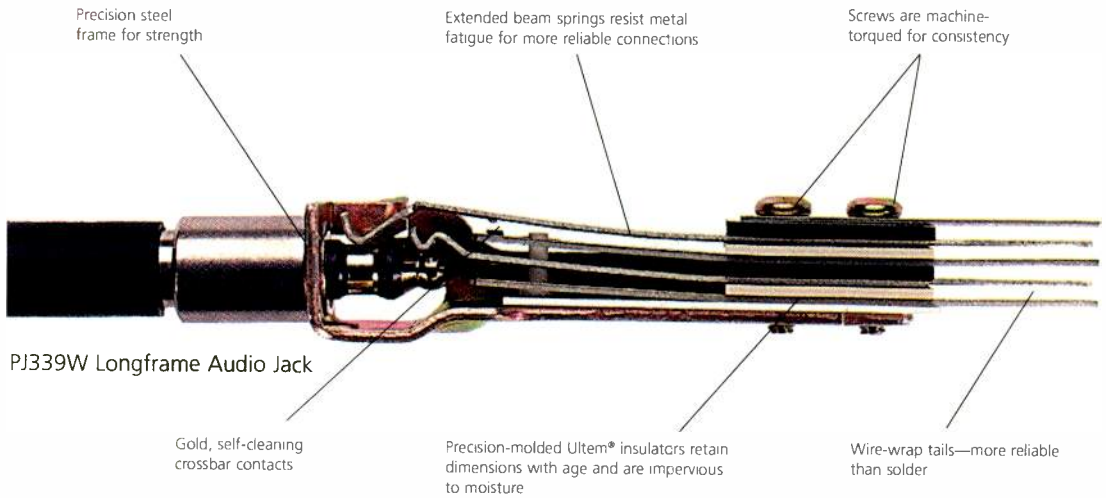
## ADC's Premium Quality Audio Jacks

The quality of an audio jack is visible in the details. For example, inside ADC's jacks, the gold, self-cleaning crossbar contacts are designed to wipe across each other at an angle that removes debris with every plug insertion. Extended spring beams provide greater resilience for long life and firm contact force. Precision-molded Ultem® insulators do not change dimensions even in tough environments, ensuring consistent spring torque and reliable performance.

### Features

- All patch panels use WECO-standard jacks that adhere to MIL-STD-202F specifications
- Absolutely reliable WECO alloy #1 gold, self-cleaning crossbar contacts wipe away debris with every insertion
- Solder-free wire-wrap tails prevent intermittents from cold solder joints or flux migration. Far more reliable than solder
- Tested to withstand tough mobile applications, including vibration, temperature (-55°C to 85°C), moisture, and salt air

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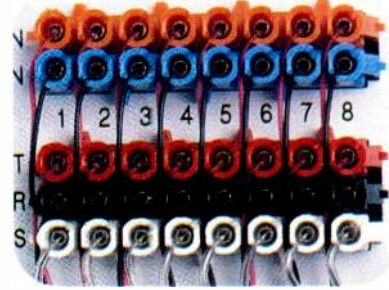


# QCP Termination System

## Time-saving QCP II and QCP IV Termination System

Innovative QCP connectors can really speed up an installation. No need to spend time prepping wires and laboriously soldering and crimping connector pins. Just insert the wire and punch. In one motion you have a reliable gastight connection, even with multiple wires. The unique patented design holds wire far more securely than telco-type punchdowns, preventing intermittents.

MKII panels use QCP II individual terminal insulators, which allow greater density and can be replaced individually. MKIV panels use QCP IV 1x8 terminal blocks insulated on both the front and back of the panel to prevent shorts.



QCP IV Connections

### Features

ADC's exclusive, patented QCP II and QCP IV split-cylinder punchdown termination system is faster and easier to install and more reliable than any other termination system, including solder.

- Dependable, durable, split-cylinder design holds up to three stranded or solid wires, 22 to 26 gauge (0.32 mm to 0.128 mm)
- No intermittents with gastight connections. Uniform split channel width holds each wire firmly, unlike telco punchdowns with V-shaped channels or soldered connections that use flux and may have unreliable solder joints
- Easy relacing makes installation faster. Color-coding prevents wiring mistakes
- Labor-saving punch terminates and cuts wire in one simple motion. New QCP IV installs even faster because you don't have to orient the tool before punching
- Faster and easier changes in circuits or normals than soldered connector systems. Rated for up to 200 insertions/withdrawals
- QCP II terminations are individually mounted and insulated for easy repair or replacement
- QCP IV terminations are mounted in 1x8 blocks insulated on both sides of the panel. This design, plus the recessed conductors, eliminates shorts



# Pro Patch™ Professional Audio Patchbays

3702 • 1182279 Broadcast Products

## Features

### Choice of Panel Sizes

- 1 RU high (1.75 inches/44 mm)
- 2 RU high (3.5 inches/88 mm)
- Depths of 14 inches (350 mm) or 18 inches (450 mm)
- Custom panel sizes available

### Longframe or Bantam Jacks

- Longframe jacks in 2x24 or 2x26 array stereo or evenly spaced
- Bantam jacks in 2x48 array stereo or regular spaced

### Wide Selection of Terminations

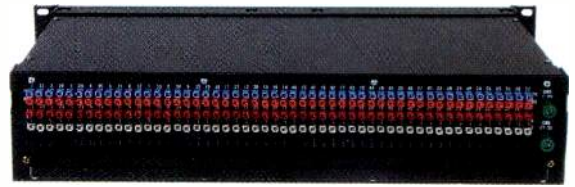
- QCP II or QCP IV punchdown connectors
- EDAC 3, 38, 56, and 90-pin plugs
- AMP 50-pin receptacle
- Molex 3-pin plug

### Full Range of Normalling Options

- No normals
- Normals strapped (fully normalled)
- Half-normalled (monitor top row)
- Normals brought out
- Sleeve normals brought out
- Bussed grounds

### Digital Audio Cable

- Precision 110 Ohm digital audio cable meets and exceeds stringent AES requirements



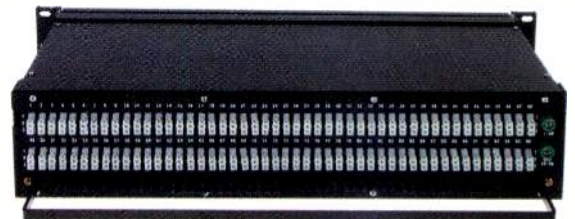
PPA3-14MKII26NO  
2 RU Longframe Evenly-Spaced 2x26 QCP II Patchbay  
(Rear View)



PPA3-14MKIIANS  
2 RU Longframe Evenly-Spaced 2x24 AMP  
50-Pin Receptacle Patchbay (Rear View)



PPB1-14MKIIENSBG  
1 RU Bantam Stereo-Spaced 2x48 EDAC  
90-Pin Plug Patchbay (Rear View)



PPB3-14MKII3EHN  
2 RU Bantam Stereo-Spaced 2x48 EDAC  
3-Pin Plug Patchbay (Rear View)

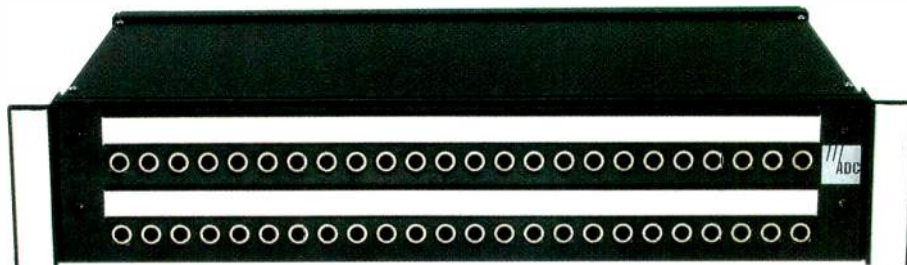


# Pro Patch™ Professional Audio Patchbays

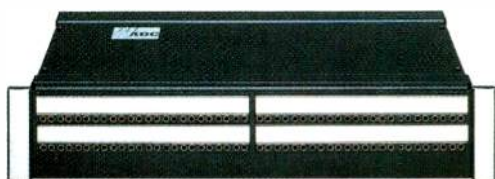
Ready to meet any analog or digital audio patching requirement, Pro Patch professional audio patchbays offer an extensive selection of options. Models are available with standard or stereo-spaced longframe jacks, bantam jacks, and a variety of backplane connector types. MKII models come with QCP II, EDAC, or AMP backplane connectors and fixed cable support bars. MKIV models include QCP IV, EDAC, or AMP backplane connectors, adjustable cable support bars and a white backplane for easier circuit visibility. All models offer a wide choice of normals, a tough powder-coated chassis, and solderless internal wiring for outstanding reliability.

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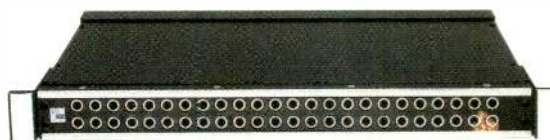
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PPA3-14MKIVNO Longframe Evenly-Spaced 2x24 Patchbay



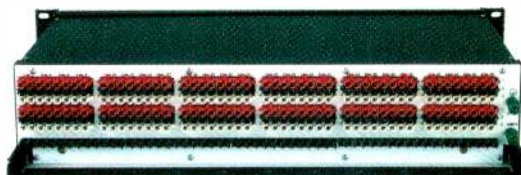
PPB3-14MKIVNS  
2 RU Stereo-Spaced Bantam 2x48 Patchbay



PPA1-14MKIVNS  
1 RU Longframe Evenly-Spaced 2x24 Patchbay



DAL3-14MKII26NS  
2 RU QCP II Digital Patchbay (Rear View)



DAB3-14MKIVNS  
2 RU QCP IV Digital Patchbay (Rear View)



DAB3-14MKIINS  
2 RU Stereo-Spaced  
Bantam/QCP II Digital Patchbay



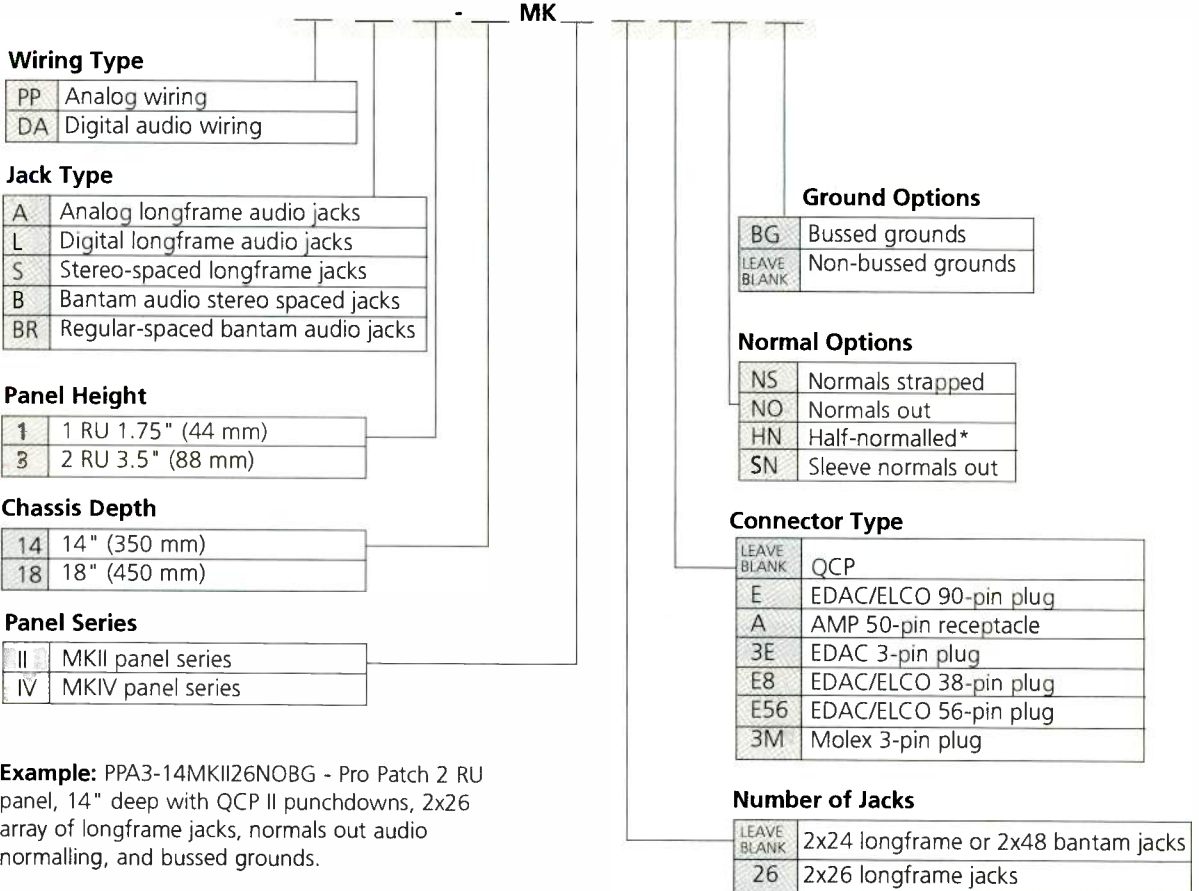
# Pro Patch™ Professional Audio Patchbays

## Pro Patch™ Patchbays Ordering Information

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### Ordering Number



#### Wiring Type

PP	Analog wiring
DA	Digital audio wiring

#### Jack Type

A	Analog longframe audio jacks
L	Digital longframe audio jacks
S	Stereo-spaced longframe jacks
B	Bantam audio stereo spaced jacks
BR	Regular-spaced bantam audio jacks

#### Panel Height

1	1 RU 1.75" (44 mm)
3	2 RU 3.5" (88 mm)

#### Chassis Depth

14	14" (350 mm)
18	18" (450 mm)

#### Panel Series

II	MKII panel series
IV	MKIV panel series

#### Ground Options

BG	Bussed grounds
LEAVE BLANK	Non-bussed grounds

#### Normal Options

NS	Normals strapped
NO	Normals out
HN	Half-normalled*
SN	Sleeve normals out

#### Connector Type

LEAVE BLANK	QCP
E	EDAC/ELCO 90-pin plug
A	AMP 50-pin receptacle
3E	EDAC 3-pin plug
E8	EDAC/ELCO 38-pin plug
E56	EDAC/ELCO 56-pin plug
3M	Molex 3-pin plug

#### Number of Jacks

LEAVE BLANK	2x24 longframe or 2x48 bantam jacks
26	2x26 longframe jacks

**Example:** PPA3-14MKII26NOBG - Pro Patch 2 RU panel, 14" deep with QCP II punchdowns, 2x26 array of longframe jacks, normals out audio normaling, and bussed grounds.

**Note:** For mobile applications rear chassis support is recommended.

#### Digital Audio

Precision 110 Ohm digital audio patch cords are listed on page 36.

Use 110 Ohm 1% resistors on normals of unstrapped jacks (normals out version only).

\* Half-normal not recommended for digital audio applications.





# Pro Patch™ Professional Audio Patchbays

## Ordering Information

Description	Ordering Number
<b>Pro Patch Audio Patchbays</b>	
<b>Normals Out</b>	
1.75" 2x24 longframe, QCP II, 14" chassis *	PPA1-14MKIINO
3.50" 2x24 longframe, QCP IV, 14" chassis	PPA3-14MKIVNO
3.50" 2x26 longframe, QCP II, bussed grounds, 14" chassis**	PPA3-14MKII26NO
3.50" 2x26 longframe, QCP II, 18" chassis**	PPA3-18MKII26NO
3.50" 2x24 longframe, QCP IV, 18" chassis	PPA3-18MKIVNO
3.50" 2x48 bantam, QCP II, 14" chassis	PPB3-14MKIINO
3.50" 2x48 bantam, QCP II, 18" chassis	PPB3-18MKIINO
3.50" 2x48 bantam, QCP II, bussed grounds, 14" chassis	PPB3-14MKIINOBG
<b>Normals Strapped (Fully Normalled)</b>	
1.75" 2x24 longframe, QCP IV, 14" chassis	PPA1-14MKIVNS
1.75" 2x26 longframe, EDAC 90-pin plug, 14" chassis	PPA1-14MKII26ENS
3.50" 2x24 longframe, QCP IV, 14" chassis	PPA3-14MKIVNS
3.50" 2x24 longframe, QCP IV, 18" chassis	PPA3-18MKIVNS
3.50" 2x26 longframe, QCP II, 14" chassis**	PPA3-14MKII26NS
3.50" 2x26 longframe, EDAC 90-pin plug, 14" chassis	PPA3-14MKII26ENS
3.50" 2x24 longframe, AMP 50-pin receptacle, 14" chassis	PPA3-14MKIIANS
3.50" 2x48 bantam, QCP IV, 14" chassis	PPB3-14MKIVNS
1.75" 2x48 bantam, EDAC 90-pin plug, 14" chassis	PPB1-14MKIENS
3.50" 2x48 bantam, EDAC 90-pin plug, 14" chassis	PPB3-14MKIENS
<b>Half-Normals</b>	
1.75" 2x24 longframe, QCP IV, 14" chassis	PPA1-14MKIVHN
1.75" 2x26 longframe, QCP II, 14" chassis**	PPA1-14MKII26HN
1.75" 2x24 longframe, EDAC 90-pin plug, 14" chassis	PPA1-14MKII24EHN
3.50" 2x24 longframe, QCP IV, 14" chassis	PPA3-14MKIVHN
3.50" 2x24 longframe, QCP IV, 18" chassis	PPA3-18MKIVHN
3.50" 2x26 longframe, EDAC 90-pin plug, 14" MKII style chassis**	PPA3-14MKII26EHN
1.75" 2x48 bantam, EDAC 90-pin plug, 14" MKII style chassis	PPB1-14MKIIEHN
3.50" 2x48 bantam, QCP IV, 14" chassis	PPB3-14MKIVHN
3.50" 2x48 bantam, EDAC 90-pin plug, 14" chassis	PPB3-14MKIIEHN
<b>No Normals</b>	
1.75" 2x24 longframe, QCP IV, 14" chassis	PPA1-14MKIVNN
1.75" 2x24 longframe, EDAC 90-pin plug, 14" chassis	PPA1-14MKII24ENN
3.50" 2x48 bantam, QCP IV, 14" chassis	PPB3-14MKIVNN
<b>Sleeve Normals Brought Out</b>	
3.50" 2x24 longframe, QCP IV, 14" chassis	PPA3-14MKIVSN
3.50" 2x26 longframe, QCP II, 14" chassis**	PPA3-14MKII26SN

\* 1 RU 2x24 normals out panel only available in QCP MKII version.

\*\* 2x26 panels only available in QCP MKII versions.

**Note:** For mobile applications, rear chassis support is recommended.

Broadcast Products

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# Pro Patch™ Digital Audio Patchbays

## Ordering Information

Description	Ordering Number
<b>Pro Patch Digital Audio Patchbays*</b>	
1.75" 2x26 longframe, EDAC 90-pin plug, MKII series panel, normals strapped, 14" chassis**	DAL1-14MKII26ENS
1.75" 2x26 longframe, QCP II, normals strapped, 14" chassis**	DAL1-14MKII26NS
1.75" 2x24 longframe, QCP IV, normals strapped, 18" chassis	DAL1-18MKIVNS
3.5" 2x26 longframe, QCP II, normals strapped, 14" chassis**	DAL3-14MKII26NS
3.5" 2x24 longframe, EDAC 3-pin plug, normals strapped, bussed grounds, MKII series, 14" chassis	DAL314MKII3ENSBG
3.5" 2x24 longframe, QCP II, normals out, 14" chassis	DAL3-14MKIINO
3.5" 2x24 longframe, QCP II, normals strapped, 14" chassis	DAL3-14MKIINS
3.5" 2x24 longframe, QCP II, normals strapped, bussed grounds, 14" chassis	DAL3-14MKIINSBG
3.5" 2x24 longframe, QCP IV, normals strapped, 14" chassis	DAL3-14MKIVNS
3.5" 2x24 longframe, QCP II, normals strapped, bussed grounds, 18" chassis	DAL3-18MKIINSBG
3.5" 2x48 bantam, EDAC 90-pin plug, MKII series panel, normals out, 14" chassis	DAB3-14MKIINO
3.5" 2x48 bantam, EDAC 90-pin plug, MKII series panel, normals strapped, 14" chassis	DAB3-14MKIENS
3.5" 2x48 bantam, QCP II, no normals, 14" chassis	DAB3-14MKIINN
3.5" 2x48 bantam, QCP II, normals strapped, 14" chassis	DAB3-14MKIINS
3.5" 2x48 bantam, QCP II, normals strapped, bussed grounds, 14" chassis	DAB3-14MKIINSBG
3.5" 2x48 bantam, QCP IV, no normals, 14" chassis	DAB3-14MKIVNS
3.5" 2x48 bantam, QCP IV, normals strapped, 14" chassis	DAB3-14MKIVNS
3.5" 2x48 bantam, QCP IV, normals strapped, bussed grounds, 14" chassis	DAB3-14MKIVNSBG
3.5" 2x48 bantam, QCP IV, normals strapped, bussed grounds, 18" chassis	DAB3-18MKIVNSBG

\* Custom panel configurations are available. Please contact ADC.

\*\* 2x26 panels only available in QCP MKII versions.

**Note:** Precision 110 Ohm digital audio patch cords are found on page 37.  
For mobile applications, rear chassis support is recommended.

Broadcast Products

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# Pro Patch™ Audio Broadcast Jackfields

ADC audio broadcast jackfields simplify the task of wiring rack-mounted panels by separating the jacks from the backplane. The jack panel mounts on the front of the rack, and the Ultra Patch termination panel mounts on the rear with an umbilical connecting the two. This arrangement makes the termination wiring more accessible so you don't have to reach into the rack to make connections. In addition, the totally solderless wiring of both panels provides more reliable connections than solder, ensuring dependable service.

Options available include panel sizes, longframe or bantam jacks, choice of normalling, standard or custom umbilical length, and QCP II, QCP IV, or EDAC rear panel connectors. AES digital audio versions are available with precision 110 Ohm low capacitance shielded twisted pair cable. MKII panels include fixed cable trays. MKIV panels have adjustable cable bars and white backplanes for better visibility.

## Features

### Choice of Panel and Umbilical Sizes

- 1 RU jack panel (1.75"/44 mm) with 2 RU (3.5"/88 mm) or 3 RU (5.25"/132 mm) Ultra Patch termination panel
- Two-rack-unit jack panel (3.5"/88 mm) with three-rack-unit (5.25"/132 mm) Ultra Patch termination panel
- Standard 4-foot (1.2 meter) umbilical or custom lengths available

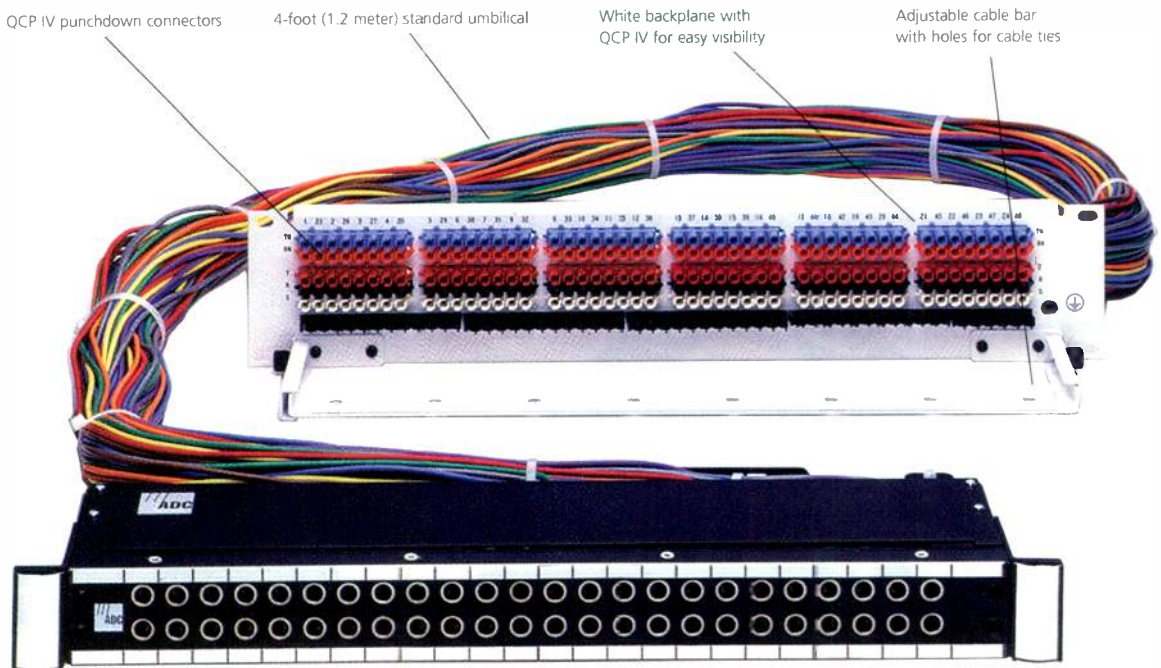
### Longframe or Bantam Jacks

- Longframe jacks in 2x24 or 2x26 array stereo or evenly spaced
- Bantam jacks in 2x48 array stereo or regular spaced

### Digital Audio Cable

- Precision 110 Ohm digital audio cable meets and exceeds stringent AES requirements

Broadcast Products  
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BJF103-4MKIV 1 RU Longframe/QCP IV Jackfield

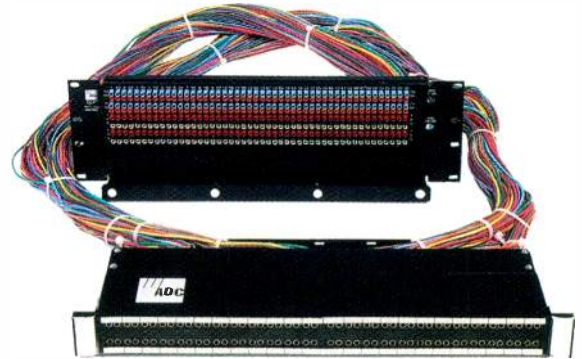


# Pro Patch™ Audio Broadcast Jackfields

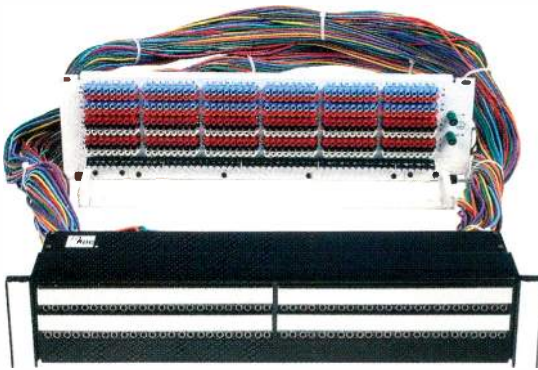
## Features

### Choice of Terminations

- QCP II or QCP IV punchdown connectors
- Stub end cut to length
- Adjustable strain relief cable bar included standard on Ultra Patch MKIV. Fixed tray on MKII



BJF303-4MKII  
1 RU Bantam/QCP II Jackfield

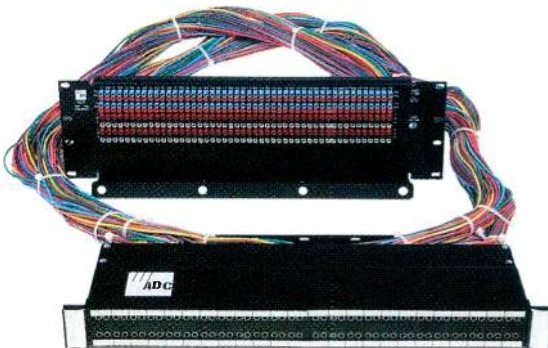


BJF403-4MKIV  
2 RU Bantam/QCP IV Jackfield

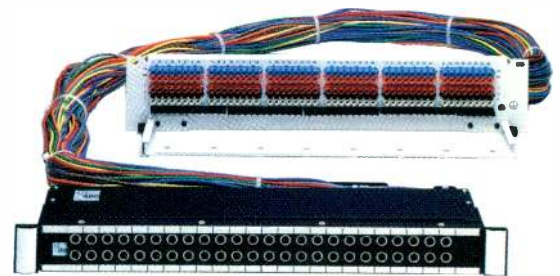
## Features

### Full Range of Normaling Options

- No normals
- Normals strapped (fully normalled)
- Half-normalled (monitor top row)
- Normals brought out
- Sleeve normals brought out
- Bussed grounds



DAB303-4MKII  
1 RU Bantam/QCP II Digital Jackfield



DAL107-4MKIV  
1 RU Longframe/QCP IV Digital Jackfield

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# Pro Patch™ Audio Broadcast Jackfields

## Pro Patch™ Audio Broadcast Jackfields Ordering Information

### Ordering Number \*

#### Panel Type

BJF	Analog wiring
DAL	Digital audio longframe
DAB	Digital audio bantam

#### Panel Height

1	1 RU 1.75" (44 mm) Longframe jacks
2	2 RU 3.5" (88 mm) Longframe jacks
3	1 RU 1.75" (44 mm) Bantam jacks, stereo-spaced
4	2 RU 3.5" (88 mm) Bantam jacks, stereo-spaced
3R	1 RU 1.75" (44 mm) Bantam jacks, regular spaced
4R	2 RU 3.5" (88 mm) Bantam jacks, regular spaced

#### Circuit Configuration

03	Normals brought out to Ultra Patch panel
07	Normals strapped or half-normalled at jacks to Ultra Patch panel
00	Normals brought out to stub end
04	Normals strapped at jacks to stub end

MK

#### Normal Options

BG	Bussed grounds
HN	Half-normalled*
SN	Sleeve normals out
NN	No normals

#### Connector Type

LEAVE BLANK	QCP
3E	EDAC 3-pin plug

#### Number of Jacks

LEAVE BLANK	2x24 longframe or 2x48 bantam
26	2x26 longframe jacks (MKII only)

#### Panel Series

II	MKII panel series
IV	MKIV panel series

#### Length of Umbilical

4	4' (1.2 m) standard length
	Specify custom length

\* Half-normal not recommended for digital audio.

**Note:** Use 110 Ohm 1% resistors on normals of unstrapped jacks. (Normals out versions only)



# Pro Patch™ Audio Broadcast Jackfields

## Ordering Information

Description	Ordering Number
<b>Pro Patch Broadcast Jackfields*</b>	
<b>Normals Out</b>	
1.75" 2x24 longframe, 4' umbilical, 3.5" QCP IV Ultra Patch	BJF103-4MKIV
1.75" 2x26 longframe, 4' umbilical, 3.5" QCP II Ultra Patch**	BJF103-4MKII26
3.50" 2x24 longframe, 4' umbilical, 3.5" QCP IV Ultra Patch	BJF203-4MKIV
3.50" 2x26 longframe, 4' umbilical, 3.5" QCP II Ultra Patch**	BJF203-4MKII26
1.75" 2x48 bantam, 4' umbilical, 5.25" QCP IV Ultra Patch	BJF303-4MKIV
3.50" 2x48 bantam, 4' umbilical, 5.25" QCP IV Ultra Patch	BJF403-4MKIV
<b>Normals Strapped (Fully Normalled)</b>	
1.75" 2x24 longframe, 4' umbilical, 3.5" QCP IV Ultra Patch	BJF107-4MKIV
1.75" 2x26 longframe, 4' umbilical, 3.5" QCP II Ultra Patch**	BJF107-4MKII26
3.50" 2x24 longframe, 4' umbilical, 3.5" QCP IV Ultra Patch	BJF207-4MKIV
3.50" 2x26 longframe, 4' umbilical, 3.5" QCP II Ultra Patch**	BJF207-4MKII26
1.75" 2x48 bantam, 4' umbilical, 3.5" QCP IV Ultra Patch	BJF307-4MKIV
3.50" 2x48 bantam, 4' umbilical, 3.5" QCP IV Ultra Patch	BJF407-4MKIV
<b>Half-Normals</b>	
3.50" 2x26 longframe, 4' umbilical, 3.5" QCP II Ultra Patch**	BJF207-4MKII26HN
3.50" 2x24 longframe, 4' umbilical, 3.5" QCP IV Ultra Patch	BJF207-4MKIVHN
1.75" 2x26 longframe, 4' umbilical, 3.5" QCP II Ultra Patch**	BJF107-4MKII26HN
1.75" 2x24 longframe, 4' umbilical, 3.5" QCP IV Ultra Patch	BJF107-4MKIVHN
1.75" 2x48 bantam, 4' umbilical, 3.5" QCP IV Ultra Patch	BJF307-4MKIVHN
3.50" 2x48 bantam, 4' umbilical, 3.5" QCP IV Ultra Patch	BJF407-4MKIVHN
<b>No Normals</b>	
3.50" 2x48 bantam, 4' umbilical, 3.5" QCP IV Ultra Patch	BJF407-4MKIVNN
<b>Sleeve Normals Brought Out</b>	
3.50" 2x24 longframe, 4' umbilical, 3.5" QCP IV Ultra Patch**	BJF203-4MKIVSN
3.50" 2x48 bantam, 4' umbilical, 5.25" QCP IV Ultra Patch	BJF403-4MKIVSN
<b>Pro Patch Broadcast Digital Audio Jackfields*</b>	
1.75" 2x48 bantam, 4' umbilical, 5.25" Ultra Patch, QCP II, normals out	DAB303-4MKII
1.75" 2x48 bantam, 4' umbilical, 3.5" Ultra Patch, QCP IV, normals strapped	DAB307-4MKIV
1.75" 2x48 bantam, 4' umbilical, 3.5" Ultra Patch, QCP II, normals strapped	DAB307-4MKII
1.75" 2x48 bantam, 4' umbilical, 3.5" Ultra Patch, QCP II, normals strapped, bussed grounds	DAB307-4MKIIBG
3.5" 2x48 bantam, 4' umbilical, 3.5" Ultra Patch, QCP II, normals out	DAB403-4MKII
3.5" 2x48 bantam, 4' umbilical, 3.5" Ultra Patch, QCP IV, normals out	DAB403-4MKIV
3.5" 2x48 bantam, 4' umbilical, 3.5" Ultra Patch, QCP IV, normals out, bussed grounds	DAB403-4MKIVBG
3.5" 2x48 bantam, 4' umbilical, 3.5" Ultra Patch, QCP IV, sleeve normalled	DAB403-4MKIVSN
3.5" 2x48 bantam, 4' umbilical, 3.5" Ultra Patch, QCP II, normals strapped	DAB407-4MKII
3.5" 2x48 bantam, 4' umbilical, 3.5" Ultra Patch, QCP II, normals strapped, bussed grounds	DAB407-4MKIINSBG
3.5" 2x48 bantam, 4' umbilical, 3.5" Ultra Patch, QCP IV, normals strapped	DAB407-4MKIV
3.5" 2x24 longframe, 4' umbilical, 3.5" Ultra Patch, QCP II, normals out	DAL203-4MKII
3.5" 2x24 longframe, 4' umbilical, 3.5" Ultra Patch, QCP IV, normals out	DAL203-4MKIV
3.5" 2x24 longframe, 4' umbilical, 3.5" Ultra Patch, QCP II, normals strapped	DAL207-4MKII
3.5" 2x24 longframe, 4' umbilical, 3.5" Ultra Patch, QCP IV, normals strapped	DAL207-4MKIV
3.5" 2x24 longframe, 4' umbilical, 3.5" Ultra Patch, QCP II, no normals	DAL207-4MKIINN
1.75" 2x24 longframe, 4' umbilical, 3.5" Ultra Patch, QCP II, normals strapped	DAL107-4MKII
1.75" 2x24 longframe, 4' umbilical, 3.5" Ultra Patch, QCP IV, normals strapped	DAL107-4MKIV

\* Custom panel configurations are available. Please contact ADC.

\*\* 2x26 panels only available in QCP MKII versions.

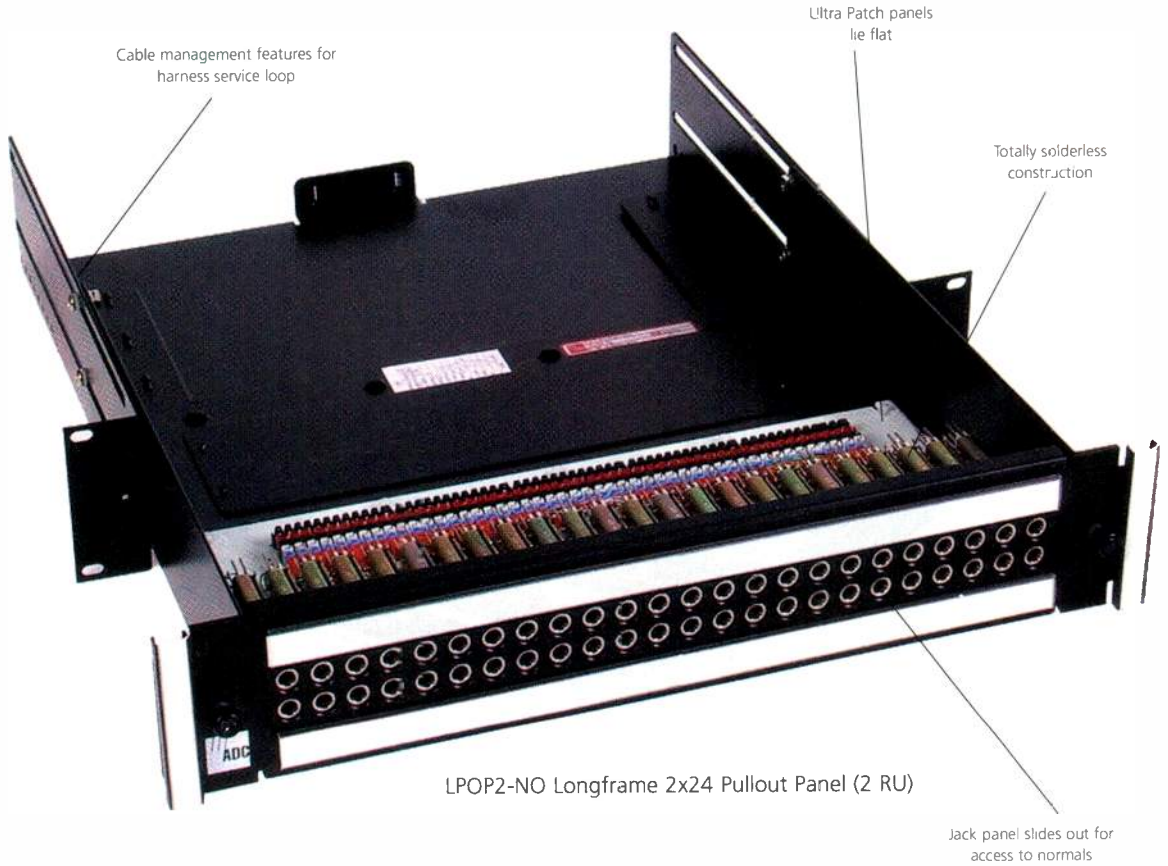
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# Pro Patch™ POP Pullout Audio Panels

ADC's exclusive pullout version of the popular Pro Patch™ audio panel is ideal for truck and studio applications because it eliminates the need for rear access. This space-saving panel slides forward like a drawer, providing front access to the terminations mounted on the bottom of the tray. A hole in the bottom of the tray provides easy access to terminations, and rear cable management options allow center, left, or right bundle installations. The chassis is made of heavy duty .090 steel with powder-coated matte black finish. Several standard options are available, or we can build a custom panel to your specifications.

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# Pro Patch™ POP Pullout Audio Panels

## Features

### Choice of Panel Sizes

- 1 RU high (1.75 inches/44 mm)
- 2 RU high (3.5 inches/88 mm)

### Longframe or Bantam Jacks

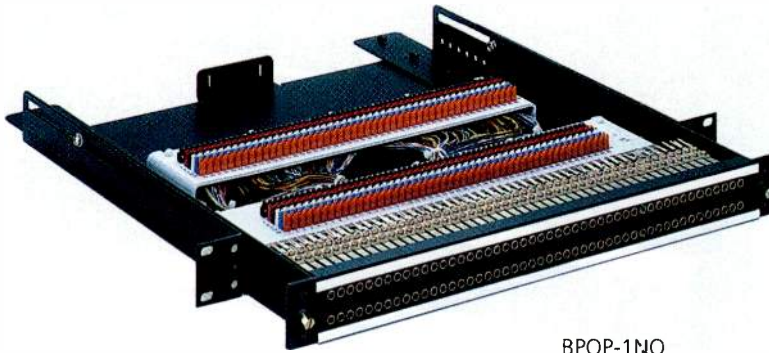
- Longframe jacks in 2x24 array
- Bantam jacks in 2x48 array

### Wide Selection of Terminations

- Time-saving QCP II punchdown connectors
- EDAC/ELCO 90-pin plug

### Full Range of Normalling Options

- No normals
- Normals strapped
- Half-normal ed
- Normals brought out
- Sleeve normals brought out
- Bussed grounds



BPOP-1NO  
1 RU Bantam 2x48 Pullout Panel

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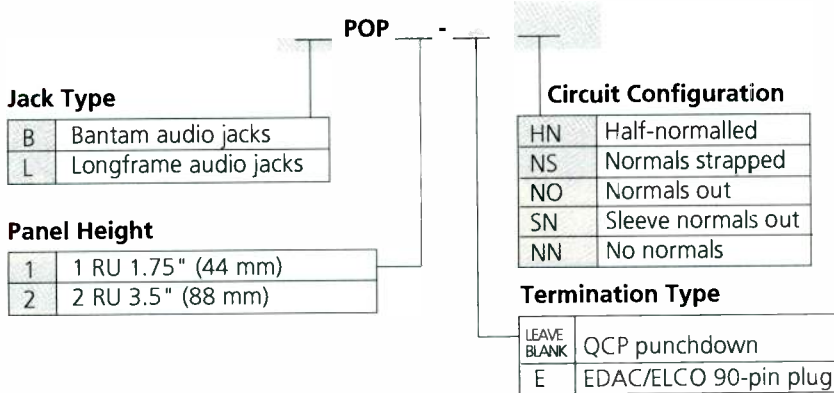




# Pro Patch™ POP Pullout Panels

## Pro Patch™ POP Pullout Panels Ordering Information

### Ordering Number



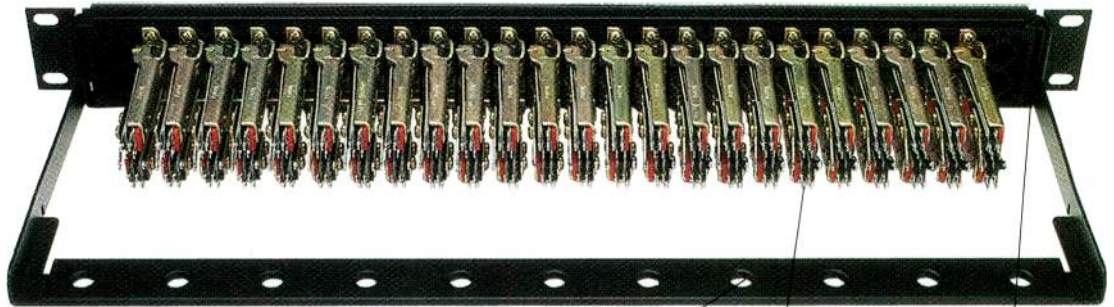
### Ordering Information

Description	Ordering Number
<b>Front Access Pull-Out Panels</b>	
1.75" 2x48 bantam, EDAC 90-pin plugs, normals out	BPOP1-ENO
1.75" 2x48 bantam, half-normalled, bussed ground	BPOP1-HN BG
1.75" 2x48 bantam, normals out	BPOP1-NO
1.75" 2x48 bantam, normals strapped	BPOP1-NS
3.50" 2x24 longframe, half-normalled	LPOP2-HN
3.50" 2x24 longframe, normals out	LPOP2-NO
3.50" 2x24 longframe, normals strapped	LPOP2-NS
3.50" 2x48 bantam, half-normalled	BPOP2-HN
3.50" 2x48 bantam, normals out	BPOP2-NO
3.50" 2x48 bantam, normals strapped	BPOP2-NS
3.50" 2x48 bantam, sleeve normals	BPOP2-SN



# Pro Patch™ Lite Audio Panels

## New Low-Cost Audio Panels



PPA1 1RU Stereo-Spaced Longframe 2x24 Panel (Rear View)

Durable cable bar with large holes for cable wraps

Offset lugs for common ground

Durable molded inserts

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Pro Patch™ Lite is ADC's new line of low-cost do-it-yourself audio patch bays. For ADC quality on a tight budget, this is the answer. Features include a steel frame with sturdy molded insert for holding jacks, a removable steel strain relief cable bar, ADC's outstanding quality WECO-standard bantam or longframe jacks with solder tails ready to wire, and choice of normalling configurations. Models are available in one and two-rack-units with designation strips and standard jack spacing.

### Features

#### Sturdy Construction

- Steel frame with durable molded insert for holding jacks
- Removable steel cable bar

#### Two Panel Sizes

- 1 RU (1.75"/44 mm)
- 2 RU (3.5"/88 mm)

#### Longframe or Bantam Jacks

- Longframe jacks, 2x24 or 2x26 array, WECO-standard with solder tails ready for wiring
- Bantam jacks, 2x48 array, WECO-standard with solder tails ready for wiring

#### Choice of Normals

- Normals Out
- Pre-half-normalled, common ground
- Pre-normals strapped, common ground
- Sleeve normal



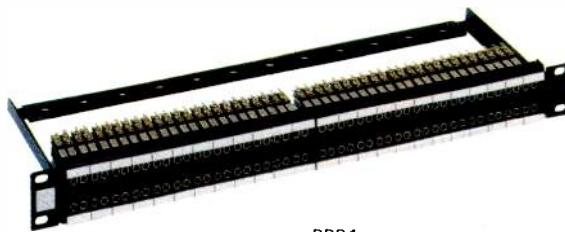
# Pro Patch™ Lite Audio Panels

Broadcast Products

3 / 0 3 • 1 1 8 0 2 7 0

## Ordering Information

Description	Ordering Number
<b>Longframe Panels</b>	
1.75" 2x24 longframe jacks with solder lugs Half-normalled, common ground Normals strapped, common ground	PPA1 PPA1-HN-CG PPA1-NS-CG
1.75" 2x26 longframe jacks with solder lugs Half-normalled, ground common Normals strapped, common ground	PPA1-26 PPA1-26-HN-CG PPA1-26-NS-CG
1.75" 2x24 longframe solder jacks with offset ground lugs	PPA1-L204
3.5" 2x24 longframe jacks with solder lugs Half-normalled, common ground Normals strapped, common ground	PPA3 PPA3-HN-CG PPA3-NS-CG
3.5" 2x26 longframe solder jacks sleeve normal	PPA3-26-SN
<b>Bantam Panels</b>	
1.75" 2x48 bantam jacks with solder lugs Half-normalled, ground common Normals strapped, common ground	PPB1 PPB1-HN-CG PPB1-NS-CG
3.5" 2x48 bantam jacks with solder lugs Half-normalled, ground common Normals strapped, common ground	PPB3 PPB3-HN-CG PPB3-NS-CG
3.5" 2x48 bantam jacks with solder lugs, sleeve normals	PPB3-SN



PPB1  
1 RU Stereo-Spaced Bantam 2x48 Panel



PPA1-24-NS-CG  
1 RU Longframe 2x24 Panel



# Accessories for Audio

Whatever the accessory you need for your audio patchbay, the quality source is ADC. Products available include patch cords, connectors and jacks, designation strip kits, and more.

## High-Performance Audio Patch Cords

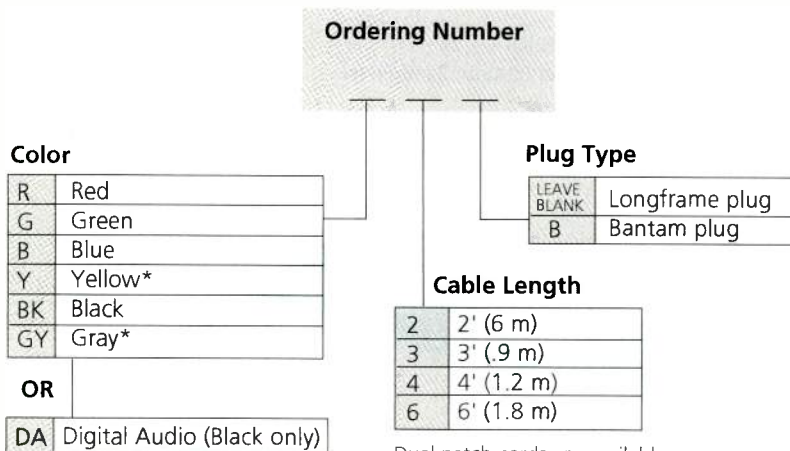
Pro Patch™ audio patch cords are engineered for flawless performance and durability. Nickel plating protects plugs against corrosion and ensures smooth insertion, and the exclusive dielectric compound between conductors provides low capacitance for the best signal performance. The flexible cord drapes neatly without kinking, and the plug is molded directly onto the cord for outstanding strain relief.



### Features

- Precision WECO 310 (longframe) and bantam plugs assure proper jack performance
- Quad star construction for low noise performance
- Models for analog or digital audio
- Standard lengths from 2 feet (.6 m) to 6 feet (1.8 m). Other lengths available on request
- Colors include red, green, blue, or black. Some cords also available in yellow or gray
- Conversion patch cords for RS-422 to RJ45 are found on page 16. (Conversion patch cords for longframe to bantam, single to dual, are also available. Please contact ADC.)

## Audio Patch Cords Ordering Information



\* Non-standard colors. Please contact ADC for these and other non-standard colors.

Dual patch cords are available. Add a 2 after length. For example, R22 = Red 2' dual longframe.



# Accessories for Audio

## Longframe and Bantam Audio Plugs

Individual longframe and bantam plugs are available featuring low capacitance injection-molded insulators and precision-machined brass or nickel-plated conductors for smooth insertion and best signal performance. Wire connections are made via miniature screw terminals. These plugs provide the best fit and performance to match ADC patch panels.

### Ordering Information

Description	Ordering Number
<b>Longframe Plugs</b>	
Three-conductor longframe plugs (field installable)	
Single red	PJ051R
Single black	PJ051B
Looping plug - internal connections tie together corresponding tip, ring and sleeve conductors to allow looping of jack circuits	PJ4
Hole plugs to fill unused jack positions, black	PJ29
<b>Bantam Plugs</b>	
Three-conductor bantam plugs	
Single plug - attachable plug; two lugs, shell mounting screw and two lug attachment screws supplied	
Red	PJ777R
Black	PJ777B
Dual plug - attachable plug; four lugs, two shell mounting screws and four lug attachment screws supplied	
Red	PJ778R
Black	PJ778B
Looping plug	PJ746
Used to "loop" or patch adjacent jack circuits; plug conductors strapped internally; wired tip to tip, ring to ring and sleeve to sleeve	
Hole plugs for bantam panels to fill unused jack positions	
Red	PJ729R
Black	PJ729B
Single bantam circuit guard plugs to identify or block entry to critical circuits; does not actuate circuit	
Red	PJ925R
White	PJ925W
Black	PJ925B

Broadcast Products

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## Accessories for Audio

### Longframe and Bantam Audio Jacks

If anything differentiates ADC patching products from the competition it is the outstanding quality of our jacks. Consistent quality and durability are built into every jack we make. Our jacks meet WECCO and MIL-STD-202F standards and include gold, self-cleaning contacts, extended spring beams to prevent metal fatigue and poor contact, and precision-molded Ultem® insulators. For a closer look at the outstanding design of our audio jacks, see the overview on page 21.

#### **PJ339 Single Longframe Jack (2 normally closed contacts)**

The PJ339 is a three-conductor, single, longframe jack with two normally closed contacts and solder tails. PJ339L has offset solder tails, and PJ339W is the wire-wrap version.



PJ339W Longframe Audio Jack

#### **PJ242 Single Longframe Jack (3 normally closed contacts)**

The PJ242 is a three-conductor, single, longframe jack with three normally closed contacts and solder tails. PJ242W is the wire-wrap version.

#### **PJ839 Single Bantam Jack (2 normally closed contacts)**

The PJ839 is a three-conductor, single, bantam jack with two normally closed contacts. The PJ839N-SDR comes with solder tails, and the PJ839WN is the wire-wrap version.



PJ839W Bantam Audio Jack  
Shown with Plug Inserted

#### **PJ824 Single Bantam Jack (3 normally closed contacts)**

The PJ824 is a three-conductor, single, bantam jack with three normally closed contacts. The PJ824N comes with solder tails, and the PJ824WN is the wire-wrap version. (Note that these jacks extend beyond the periphery of a 1.75" 1 RU panel.)



# Accessories for Audio

## Longframe and Bantam Audio Jacks

### Ordering Information

Description	Ordering Number
<b>Longframe Jacks</b>	
<b>3-conductor</b> – 2 normally closed contacts, solder tails, frame style A, stack height .531" (13.49 mm), WECO 239A equivalent	PJ339
<b>3-conductor</b> – 2 normally closed contacts, solder offset lug, frame style A, stack height .531" (13.49 mm)	PJ339L
<b>3-conductor</b> – 2 normally closed contacts, wire-wrap, frame style A, stack height .578" (14.68 mm)	PJ339W
<b>3-conductor</b> – 3 normally closed contacts, solder tails, frame style C, stack height .687" (17.45 mm), WECO 242C equivalent	PJ242
<b>3-conductor</b> – 3 normally closed contacts, wire-wrap, frame style C, stack height .687" (17.45 mm), WECO 242C equivalent	PJ242W
<b>Bantam Jacks</b>	
<b>3-conductor</b> – rear-mount bantam jack, 2 normally closed contacts, solder tails, stack height .602" (15.29 mm)	PJ839N-SDR
<b>3-conductor</b> – rear-mount bantam jack, 2 normally closed contacts, wire-wrap, stack height .675" (17.15 mm)	PJ839WN
<b>3-conductor</b> – rear-mount bantam jack, 3 normally closed contacts, solder tails, stack height .756" (19.20 mm)	PJ824N
<b>3-conductor</b> – rear-mount bantam jack, 3 normally closed contacts, wire-wrap, stack height .750" (19.05 mm)	PJ824WN

For printed circuit board jacks, see page 42.



# Accessories for Audio

## Audio Accessories

ADC manufactures accessories for use with our audio patch panels. These include connectors, adapters, tool kits designation strip kits, patch cord holders, optional cable support bars, and more.

### Humbucker

Common mode hum caused by differences in ground potential is often found in long video cables, incoming and outgoing lines, and separate power distribution systems. The ADC Humbucker eliminates 99.6 percent of a 10 Volt p-p 50/60 Hz ground-induced hum in a 200-foot (61 m) RG59 coaxial cable run. The actual amount of hum reduction depends on cable length, cable type, ground loop potential, and ground loop frequency.



HUM-1

### Designation Strip Kits

ADC produces designation strip kits for all of our patch panels. For details about kits available for your particular model, please contact the Technical Assistance Center at 1-800-366-3891.

### Audio Baluns (also see page 14)

High-quality audio baluns are available for 110 Ohm twisted pair to 75 Ohm coaxial matching. Matches BNC to male or female XLR connectors.



### QCP and EDAC Tools and Accessories

Individual punchdown tools and complete tool kits are available for both QCP II and QCP IV connections. The same punchdown tool works for both types, but the tips are different. EDAC connector kits are also available.



### Pro Patch™ Cord Holder

The Pro Patch cord holder accepts up to 75 video or audio patch cords and mounts on the wall or in a rack. (Note: does not hold CVPC-type patch cords.)







# Accessories for Audio

## Ordering Information

Description	Ordering Number
<b>Humbucker</b>	HUM-1
<b>Audio Baluns, 110 Ohm to 75 Ohm</b>	
BNC to female XLR	BAL-XLR-BNC-F
BNC to male XLR	BAL-XLR-BNC-M
BNC 1 Vp-p to female XLR	BAL-XLR-1VBNC-F
<b>QCP Tools</b>	
Impact tool for MKII panels, with tip*	QB-2
Tool for MKIV panels, with tip*	QB-4
Replacement tip for QB-2	QB-2T
Longer replacement tip for QB-2	QB-2LT
Replacement tip for QB-4	QB-4T
Manual tool for MKII panels	Q115
Manual tool for MKIV panels	QDF-114
<b>QCP Mark II Replacement Kit</b>	
Kit includes instructions and the following:	QRK-25
99 QCP contacts, 25 red, black and white insulators,	
12 blue and orange insulators	
<b>QCP Mark IV Replacement Kit</b>	
2 red, white, black, blue and orange QCP IV (8x1) punchdown assemblies	QRK-25-MKIV
<b>Sleeving Kit</b>	
Kit includes 100 pieces of 2.5" (6.35 cm) clear PVC	SLVG-1
<b>EDAC Tools and Receptacle Connector Kits</b>	
Kit for EDAC 90-pin, includes 1 shell, 90 crimp-type pins, and hood	EDAC-90-P-SHELL
Kit for EDAC 38-pin, includes 1 shell, 38 crimp-type pins, and hood	EDAC-38P-SHELL
Kit for EDAC 3-pin, includes 1 shell and 3 crimp-type pins	EDAC-3P-SHELL
Tool for crimping EDAC connector pins	EDAC-CRIMP-TOOL
EDAC pin removal tool	EDAC-EXTRACTION-TOOL
<b>Pro Patch™ Cord Holder</b>	
Holds up to 75 video or audio patch cords (bantam or longframe);	PPH
mounts on a wall or in a rack; 14"W x 3"D	
(35.56 x 7.62 cm). Note: does not hold CVPC-type patch cords	
<b>Printed Circuit Board Audio Jacks</b>	
PCB longframe jack, 3 conductor standard	AJ238-1
PCB threaded longframe jack, 3 conductor with nut and washer	AJ238-1T
PCB longframe right angle jack, 3 conductor	AJ339-1
PCB threaded longframe right angle jack, 3 conductor with nut and washer	AJ339-1T
<b>Printed Circuit Board XLR Receptacle</b>	
PCB mount female XLR receptacle with screws	PCFC-3

\* QCP II and QCP IV tools are identical but the replaceable tips are different.

Broadcast Products

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# Pro Patch™ Video

## Systems

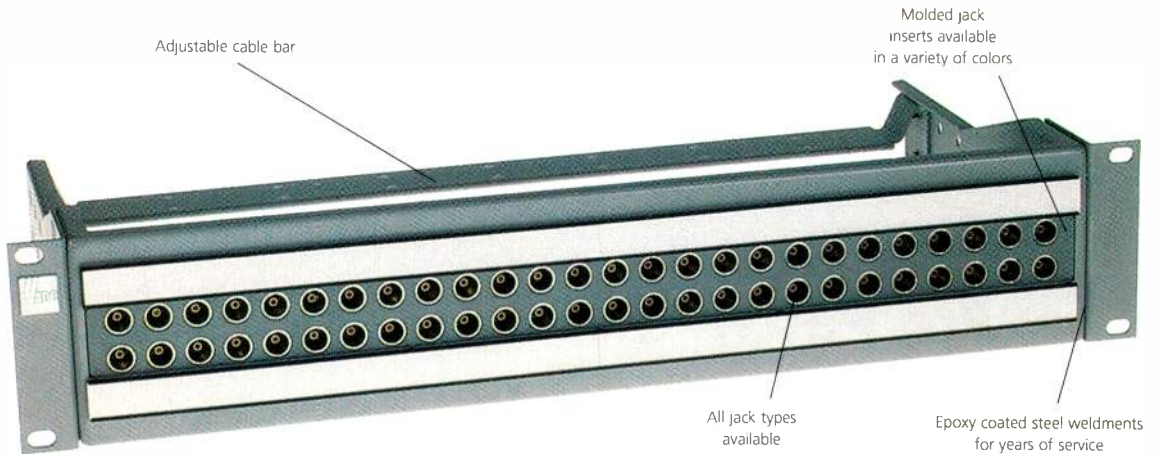


<b>Pro Patch™ Video Panels</b>	<b>45</b>
<b>Pro Patch™ WSI™ Series Video Panels</b>	<b>47</b>
<b>Pro Patch™ ASI™ Series Video Panels</b>	<b>51</b>
<b>Component Patching System (CAPS)</b>	<b>54</b>
<b>Pro Patch™ Unloaded Video Panels</b>	<b>56</b>
<b>Video Jacks</b>	<b>58</b>
<b>Video Patch Cords</b>	<b>64</b>



# Pro Patch™ Video Panels

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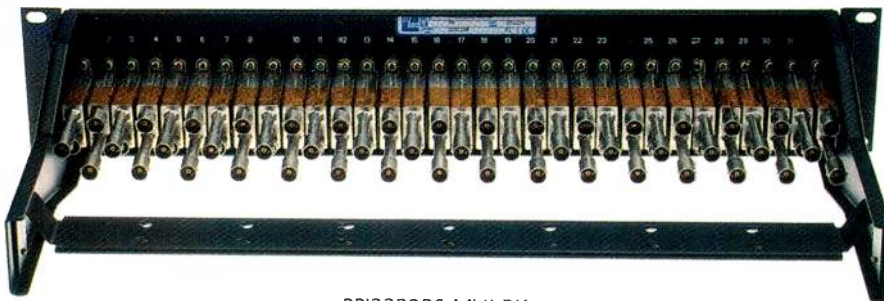


PPV2226RS-SVJ - 2 RU WSI Standard Size 2x26 Super Video Jack Panel

Pro Patch™ video panels offer a wide variety of features and options to suit virtually any patching requirement. Panels are available with an extensive selection of jack types, sizes, terminations, and spacing as well as panel heights and number of jack rows.

## WSI™ and ASI™ Series Panels

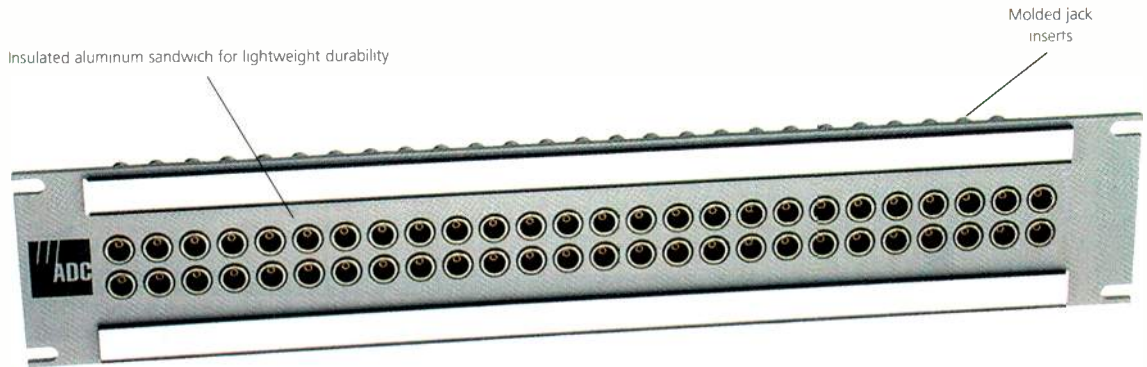
Two Pro Patch video panel models are available: the rugged and durable Pro Patch WSI series panels designed for the toughest of professional television studio and mobile use, and the low-profile and sturdy Pro Patch ASI series panels. The WSI panels consist of a welded steel frame with molded inserts for holding jacks and built-in adjustable cable support bar. WSI panels are available with midsize or standard size jacks. The low-profile ASI panels consist of a heavy aluminum faceplate and molded insert for holding jacks. This series does not include cable support and comes with standard size jacks only. Both panel types come in a variety of configurations.



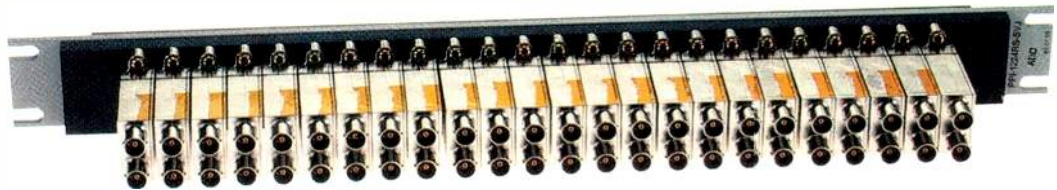
PPI2232RS-MVJ-BK  
2 RU WSI Midsize 2x32 Super Video Jack Panel  
(Rear View)



# Pro Patch™ Video Panels



PPI2226RS-SVJ - 2 RU ASI Standard Size 2x26 Super Video Jack Panel



PPI1224RS-SVJ (Rear View)  
1 RU ASI Standard Size 2x24 Super Video Jack Panel

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## Features

### Variety of Jacks

- HDTV Super Video Jacks rated to 2.4+ GHz
- Analog and SD jacks rated to 750 MHz
- Analog and HDTV straight-through jacks rated to 2.4 GHz
- Many jack types available: single or dual, self-normalling or straight-through, non-terminating or 75 Ohm terminating, and standard or group spacing

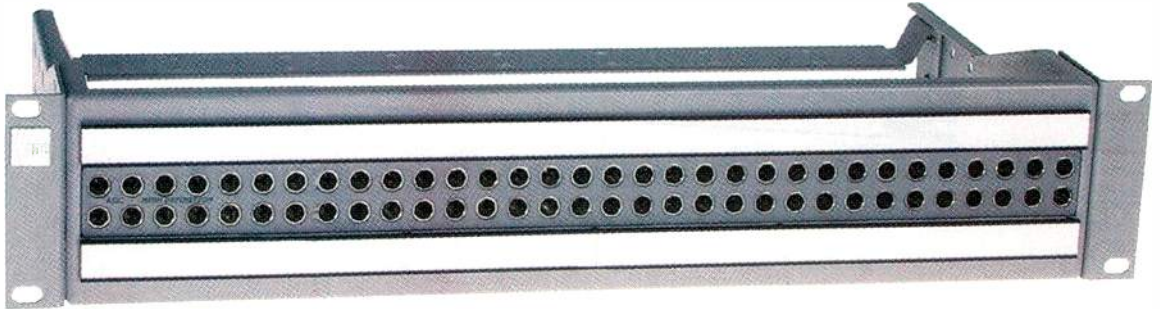
### Choice of Panel Sizes

- 1 RU, 2 RU or 3 RU high or custom sizes
- Standard jack panels in 2x24, 2x26, 3x26, or 4x26 arrays
- Midsize jack panels in 2x32 or 3x32 arrays



## Pro Patch™ WSI™ Series Video Panels

Pro Patch™ WSI™ series video panels are the ideal solution when you need a rugged full-featured panel that will stand up to the most demanding professional applications. These tough, attractive panels feature a rugged epoxy powder-coated steel weldment chassis with molded jack insert and adjustable cable bar for superior strain relief. The durable steel frame ensures against bent, cracked, or broken rack ears, and the molded inserts even come in multiple colors\*. Models are available in several panel sizes with standard or midsize jacks suitable for any analog, digital, or high-definition digital television requirement.



PPI2232RS-CJMID  
2 RU WSI Midsize 2x32 Super Video Jack Panel



Colored molded jack inserts\*

### Features

#### Tough Professional Construction

- Steel chassis with strong epoxy powder-coated steel weldments
- Adjustable steel strain relief cable bar with holes for cable ties
- Highest quality, widest bandwidth, longest lasting jacks available. True 75 Ohm impedance
- Molded jack inserts come in a variety of colors and are much stronger than phenolic inserts; screws don't break panels
- Designation strip holders for labeling jacks

\*Colored inserts available only in certain configurations. Contact ADC for details.



# Pro Patch™ WSI™ Series Video Panels

## Features

### Extensive Jack Options

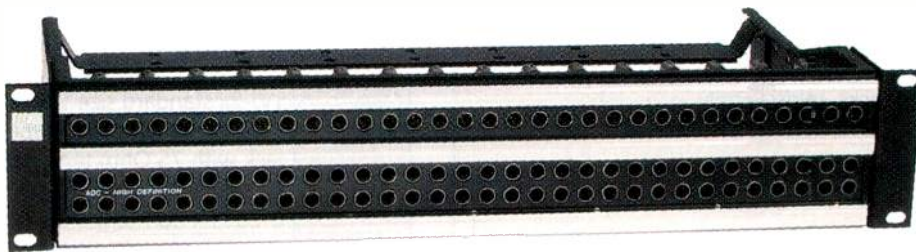
- Standard or midsize jacks
- HDTV Super Video Jacks rated to 3.0+ GHz
- Analog or SD video jacks rated to 750 MHz
- Analog to HDTV straight-through video jacks rated to 2.4 GHz
- Single or dual, self-normalling or straight through, non-terminating or 75 Ohm terminating, and standard spacing

### Panel Options

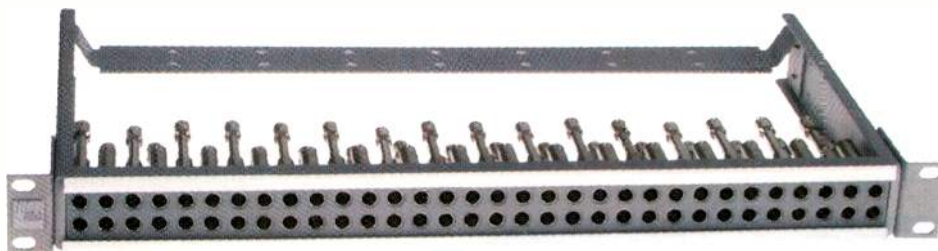
- 1 RU or 2 RU high
- Standard jack panels in 2x24, 2x26, 3x24, or 3x26 arrays
- Midsize jack panels in 2x32 or 3x32 arrays
- Colored inserts available (contact ADC)



Installation of BNCs using BT2000 installation tool. Also shows extra wide cable support bar with holes for cable wraps



PPI2332RS-MVJ-MON-BK  
WSI 2 RU Midsize 3x32 Super Video Jack Panel



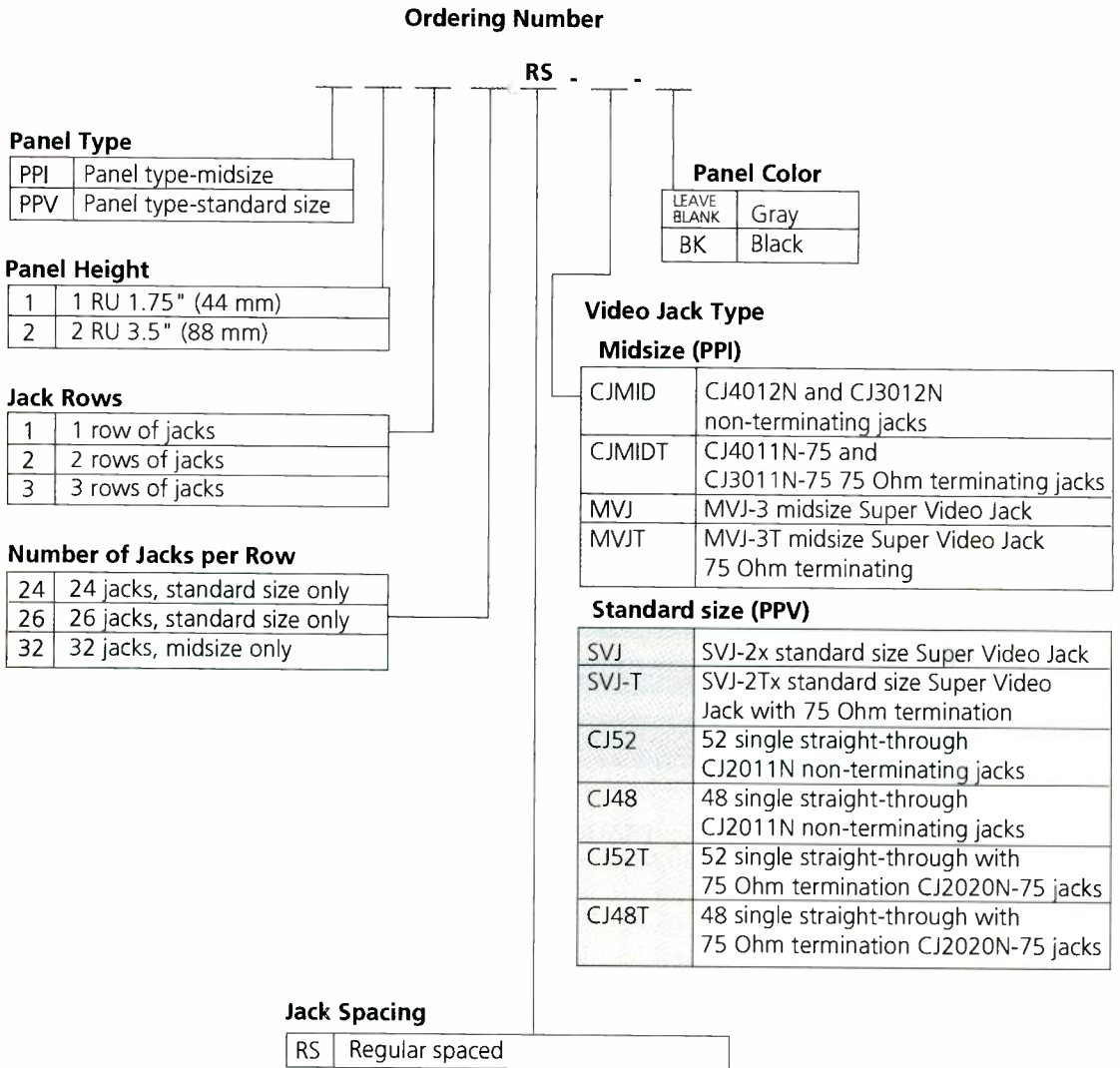
PPI1232RS-CJMID  
WSI 1 RU Midsize 2x32 Straight-Through Jack Panel



# Pro Patch™ WSI™ Series Video Panels

Pro Patch™ WSI™ Series Panels with Standard and Midsize Jack Ordering Information

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Ordering Information	
Description	Ordering Number
<b>WSI Panels, SVJ-2 Standard Size Dual Self-Normalling Super Video Jacks</b>  1.75" 2x24 SVJ-2 jacks, gray 1.75" 2x26 SVJ-2 jacks, gray 3.50" 2x24 SVJ-2 jacks, black 3.50" 2x24 SVJ-2 jacks, gray 3.50" 2x26 SVJ-2 jacks, black 3.50" 2x26 SVJ-2 jacks, gray	PPV1224RS-SVJ PPV1226RS-SVJ PPV2224RS-SVJ-BK PPV2224RS-SVJ PPV2226RS-SVJ-BK PPV2226RS-SVJ

Ordering information continues on next page.





# Pro Patch™ WSI™ Series Video Panels

## Ordering Information

Description	Ordering Number
<p><b>WSI Panels, SVJ-2T Standard Size Super Video Jacks with 75 Ohm Termination</b></p> <p>1.75" 2x24 SVJ-2Tx jacks, gray            1.75" 2x26 SVJ-2Tx jacks, gray            3.50" 2x24 SVJ-2Tx jacks, black            3.50" 2x24 SVJ-2Tx jacks, gray            3.50" 2x26 SVJ-2Tx jacks, black            3.50" 2x26 SVJ-2Tx jacks, gray</p>	<p>PPV1224RS-SVJT            PPV1226RS-SVJT            PPV2224RS-SVJT-BK            PPV2224RS-SVJT            PPV2226RS-SVJT-BK            PPV2226RS-SVJT</p>
<p><b>WSI Panels, CJ Series Midsize Straight-Through Jacks</b></p> <p>1.75" 2x32 midsize, straight-through, gray            1.75" 2x32 midsize, straight-through, black            3.50" 2x32 midsize, straight-through, gray</p>	<p>PPI1232RS-CJMID            PPI1232RS-CJMID-BK            PPI2232RS-CJMID</p>
<p><b>WSI Panels, CJ Series Midsize Straight-Through, Terminated</b></p> <p>3.50" 2x32 midsize, straight-through, 75 Ohm terminated, gray            3.50" 2x32 midsize, straight-through, 75 Ohm terminated, black</p>	<p>PPI2232RS-CJMIDT            PPI2232RS-CJMIDT-BK</p>
<p><b>WSI Panels, MVJ-3 Midsize Dual Self-Normalling Super Video Jacks</b></p> <p>1.75" 2x32 MVJ-3 jacks, gray            1.75" 2x32 MVJ-3 jacks, black            3.50" 2x32 MVJ-3 jacks, gray            3.50" 2x32 MVJ-3 jacks, black            3.50" 3x32 MVJ-3 jacks with monitor, black</p>	<p>PPI1232RS-MVJ            PPI1232RS-MVJ-BK            PPI2232RS-MVJ            PPI2232RS-MVJ-BK            PPI2332RS-MVJ-MON-BK</p>
<p><b>WSI Panels, MVJ-3T Midsize Super Video Jacks with 75 Ohm Termination</b></p> <p>1.75" 2x32 MVJ-3T jacks, gray            1.75" 2x32 MVJ-3T jacks, black            3.50" 2x32 MVJ-3T jacks, gray            3.50" 2x32 MVJ-3T jacks, black            3.50" 3x32 MVJ-3T jacks with monitor, black</p>	<p>PPI1232RS-MVJT            PPI1232RS-MVJT-BK            PPI2232RS-MVJT            PPI2232RS-MVJT-BK            PPI2332RS-MVJT-MONT-BK</p>

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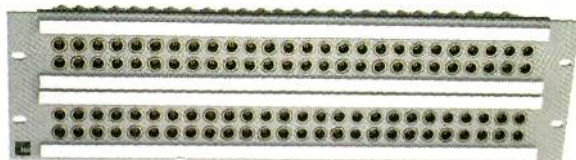


# Pro Patch™ ASI™ Series Video Panels



PPI2226RS-SVJ - 2 RU ASI Standard Size Panel

Pro Patch™ ASI™ Series video panels provide the perfect balance between features and a low profile. These panels use the same top quality jacks as our WSI panels but they are constructed using a slim-design, solid aluminum faceplate backed by a molded ABS insert for holding jacks. The solid aluminum panel prevents mounting brackets from cracking or breaking as sometimes occurs with phenolic panels in demanding environments. Models are available in an extensive variety of panel sizes and standard size jacks suitable for any analog, digital, or high-definition digital television environment.



PPI3426-SVJ  
3RU ASI Standard Size 4x26 Super Video Jack Panel



PPI1226RS-NBK  
1 RU ASI Standard Size 2x26 SJ2000 Jack Panel

## Features

### Simple, Durable Design

- Solid aluminum milled and drilled faceplate with molded ABS insert for jack mounts
- Highest quality, longest lasting jacks available; true 75 Ohm impedance
- Horizontal designation strip holders for labeling jacks

### Extensive Jack Options

- Standard size jacks of all types
- HDTV Super Video Jacks rated to 2.4+ GHz
- Analog or SD video jacks rated to 750 MHz
- Analog to HDTV straight-through video jacks rated to 2.4 GHz
- Single or dual, self-normalizing or straight-through, non-terminating or 75 Ohm terminating

### Choice of Panel Sizes

- 1 RU, 2 RU and 3 RU high
- Standard jack panels in 2x24, 2x26, 3x26, or 4x26 arrays

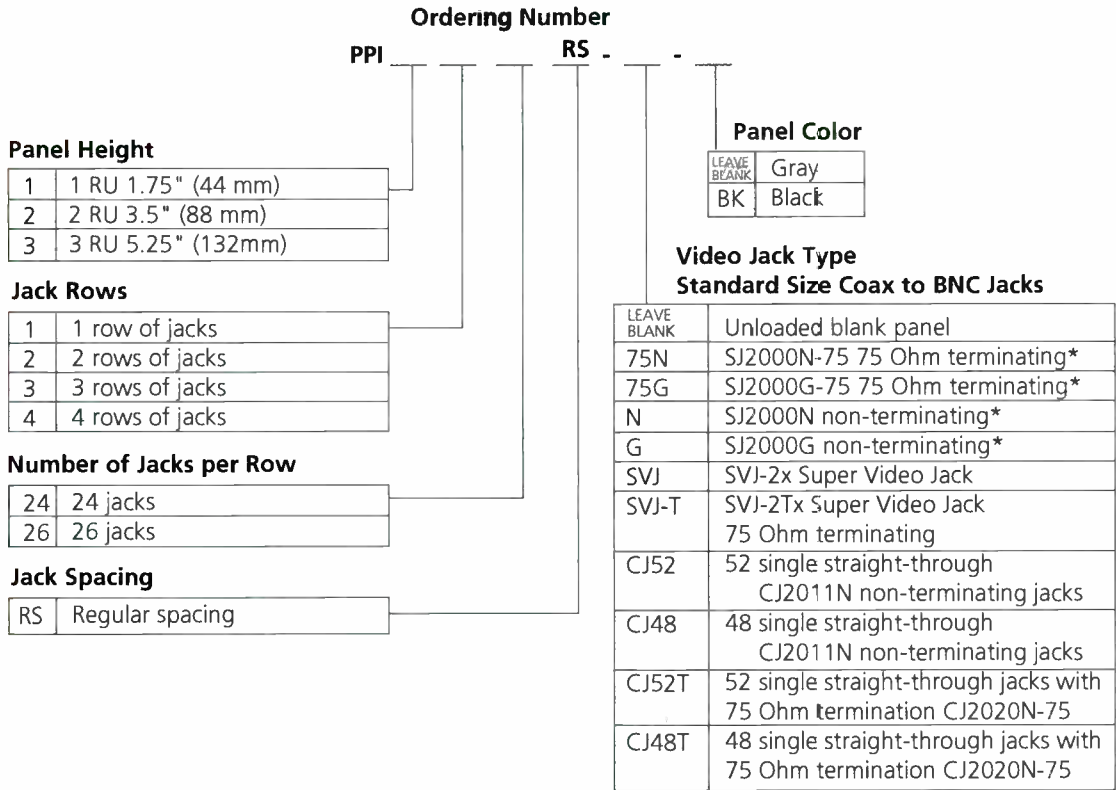


# Pro Patch™ ASI™ Series Video Panels

Pro Patch™ ASI™ Panels with Standard Size Jacks Ordering Information

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\*N = Nickel housing, G = Gold housing

## Ordering Information

Description	Ordering Number
<b>ASI Panels, CJ48/CJ52 Straight-Through Video Jacks</b>	
1.75" 2x24 48 single CJ2011N jacks, gray	PPI1224RS-CJ48
1.75" 2x26 52 single CJ2011N jacks, gray	PPI1226RS-CJ52
3.50" 2x24 48 single CJ2011N jacks, gray	PPI2224RS-CJ48
3.50" 2x26 52 single CJ2011N jacks, gray	PPI2226RS-CJ52
5.25" 2x26 CJ2011, 2x26 SJ2000N, gray	PPI3426RS-CJ52-N

Ordering information continues on next page.



# Pro Patch™ ASI™ Series Video Panels

## Ordering Information

Description	Ordering Number
<b>ASI Panels, SJ2000 Dual Self-Normalling Jacks</b>	
1.75" 2x24 SJ2000N jacks, gray	PPI1224RS-N
1.75" 2x24 SJ2000N jacks, black	PPI1224RS-NBK
1.75" 2x26 SJ2000N jacks, gray	PPI1226RS-N
1.75" 2x26 SJ2000N jacks, black	PPI1226RS-NBK
3.50" 2x24 SJ2000G jacks, gray	PPI2224RS-G
3.50" 2x24 SJ2000N jacks, gray	PPI2224RS-N
3.50" 2x24 SJ2000N jacks, black	PPI2224RS-NBK
3.50" 2x26 SJ2000N jacks, gray	PPI2226RS-N
3.50" 2x26 SJ2000N jacks, black	PPI2226RS-NBK
5.25" 4x26 SJ2000N jacks, gray	PPI3426RS-N
<b>ASI Panels, SJ2000-75 Jacks with 75 Ohm Termination</b>	
1.75" 2x24 SJ2000G-75 jacks, gray	PPI1224RS-75G
1.75" 2x24 SJ2000N-75 jacks, gray	PPI1224RS-75N
1.75" 2x24 SJ2000N-75 jacks, black	PPI1224RS-75NBK
1.75" 2x26 SJ2000N-75 jacks, gray	PPI1226RS-75N
1.75" 2x26 SJ2000N-75 jacks, black	PPI1226RS-75NBK
3.50" 2x24 SJ2000G-75 jacks, gray	PPI2224RS-75G
3.50" 2x24 SJ2000N-75 jacks, gray	PPI2224RS-75N
3.50" 2x24 SJ2000N-75 jacks, black	PPI2224RS-75NBK
3.50" 2x26 SJ2000G-75 jacks, gray	PPI2226RS-75G
3.50" 2x26 SJ2000N-75 jacks, gray	PPI2226RS-75N
3.50" 2x26 SJ2000N-75 jacks, black	PPI2226RS-75NBK
5.25" 4x26 SJ2000N-75 jacks, gray	PPI3426RS-75N
<b>ASI Panels, SVJ-2x Super Video Jacks Dual Self-Normalling</b>	
1.75" 2x24 SVJ-2X jacks, gray	PPI1224RS-SVJ
1.75" 2x26 SVJ-2X jacks, black	PPI1226RS-SVJ-BK
1.75" 2x26 SVJ-2X jacks, gray	PPI1226RS-SVJ
3.50" 2x24 SVJ-2X jacks, gray	PPI2224RS-SVJ
3.50" 2x24 SVJ-2X jacks, black	PPI2224RS-SVJ-BK
3.50" 2x26 SVJ-2X jacks, gray	PPI2226RS-SVJ
3.50" 2x26 SVJ-2X jacks, black	PPI2226RS-SVJ-BK
5.25" 4x26 SVJ-2X jacks, gray	PPI3426RS-SVJ
<b>ASI Panels, SVJ-2T Super Video Jacks with 75 Ohm Termination</b>	
1.75" 2x24 SVJ-2TX jacks, gray	PPI1224RS-SVJT
1.75" 2x26 SVJ-2TX jacks, black	PPI1226RS-SVJT-BK
1.75" 2x26 SVJ-2TX jacks, gray	PPI1226RS-SVJT
3.50" 2x24 SVJ-2TX jacks, black	PPI2224RS-SVJT-BK
3.50" 2x24 SVJ-2TX jacks, gray	PPI2224RS-SVJT
3.50" 2x26 SVJ-2TX jacks, gray	PPI2226RS-SVJT
3.50" 2x26 SVJ-2TX jacks, black	PPI2226RS-SVJT-BK
5.25" 4x26 SVJ-2TX jacks, gray	PPI3426RS-SVJT

Custom panel configurations are available. Please contact ADC.

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# Component Patching System (CAPS)

The CAPS Component Patching System for analog or digital component video provides the ideal combination of modular flexibility, durability, and preconfigurability all in one system. The steel two-rack-unit modular panel with cable tray can be preconfigured with a full complement of jacks, or you can order an empty panel and add easily installed jack modules as needed. Modules and preconfigured panels are available in a variety of configurations. Also, see the UniPatch® modular system beginning on page 11.



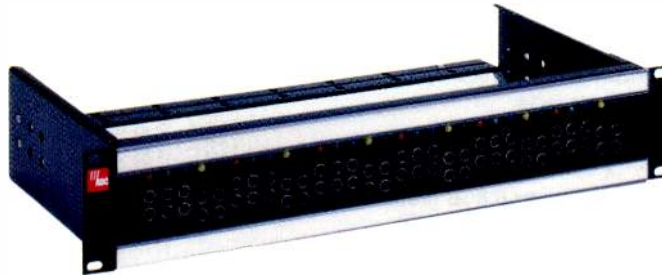
CV-M-N  
RGB Module



CV-8-N  
2 RU 8 RGB Group Patchbay



2 RU CV-8-N (Rear View)



CV-6-MHV-3T Component Patching System

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# Component Patching System (CAPS)

## Features

- 2 RU epoxy powder-coated steel panel, including top cover and cable tray with cable wrap holes for superior strain relief
- Order panel preconfigured, or order an empty panel and add modules as needed
- Jack groups for RGB, RGB + Sync, or RGB + horizontal and vertical sync
- Standard and midsize jacks of all kinds: dual self-normal, straight-through singles, straight with termination, and super (high-definition) dual self-normal
- Horizontal and vertical designation strip holders included

## Ordering Information

Description	Ordering Number
<b>Loaded Patchbays</b>	
8 RGB group panel	
SJ2000N jacks	CV-8-N
SJ2000N-75 jacks	CV-8-N75
6 RGB + Sync group panel	
SJ2000N jacks	CV-6-NS
SJ2000N-75 jacks	CV-6-N75
10 RGB + Sync group panel	
SVJ-2T jacks	CV-10-S-SVJT
CJ2011 single jacks	CV-10-S-CJ2011
8 RGB group panel	
CJ2011N single jacks	CV-8-CJ2011
6 RGB + horizontal and vertical sync	
MVJ-3T midsize jacks	CV-6MHV-3T
<b>Modular Patchbays</b>	
Chassis - 3.5" x 19" (8.89 x 48.26 cm)	
accommodates up to 8 RGB group modules	CV-CM
One RGB group module	
SJ2000N jacks	CV-M-N
SJ2000N-75 jacks	CV-M-N75
Blank module	CPPV-B
<b>Panels without Jacks</b>	
8 RGB group panel	CV-8-NJ
6 RGB + Sync group panel	CV-6-NJ
<b>RGB Video Patch Cords</b>	
Black, three conductor cable, standard size plugs	
2 ft./61 m	CVPC-2
3 ft./93 m	CVPC-3
4 ft./1.2 m	CVPC-4
6 ft./1.83 m	CVPC-6

Custom panel configurations are available. Please contact ADC.

## Ordering Information

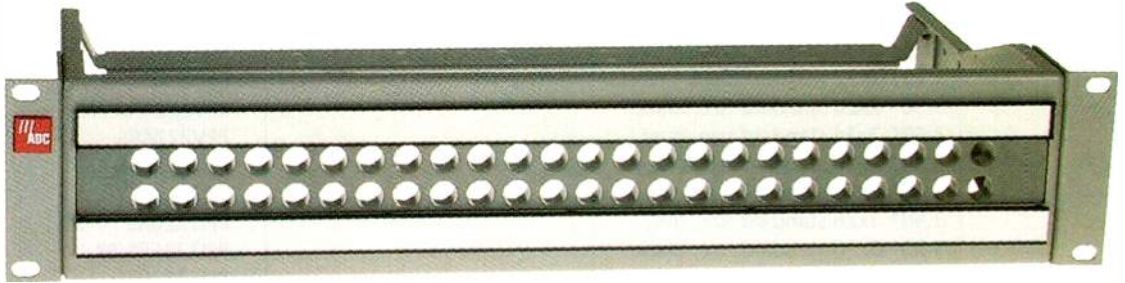
Description	Ordering Number
<b>Time Delayed Patchbay</b>	
For patching of timed analog video circuits;	
requires use of 3' patch cord only.	
2x24, delayed compensated patchbay,	
3.5" x 19" (8.89 x 48.26 cm), utilizes SJ1000N-75	
RGB 8 circuit time delay patchbay	PV-24MKII
	CPPV-8

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## Pro Patch™ Unloaded Video Panels

Create your own custom panel with ADC's complete line of unloaded video panels. Use the panel chassis and jack combination you want and assemble it yourself. You'll have ADC quality and reliability with your own personal design. As with our fully loaded video panels, WSI™ and ASI™ models are available.



PPV2224RS  
2 RU WSI Standard Size 2x24 Unloaded Panel

### Features

- Pro Patch™ WSI™ series unloaded video panels for standard and midsize jacks come in 1 RU and 2 RU models. They feature a tough steel weldment chassis with molded ABS jack insert and a strong, adjustable steel cable support bar with holes for cable ties.
- Pro Patch™ ASI™ series unloaded video panels for standard size jacks come in low profile 1 RU and 2 RU models. They feature a solid, milled, and drilled aluminum faceplate with molded ABS jack-mount insert.
- Panels are available for standard size jacks in 2x24, 2x26, and 3x26 arrays. For midsize jacks, panels are available in 2x32 and 3x32 arrays. When ordering jacks, alternating short and long jack bodies is recommended for ease of cabling.



PPI1232RS-BK  
1 RU WSI Midsize 2x32 Unloaded Panel



# Pro Patch™ Unloaded Video Panels

## Ordering Information

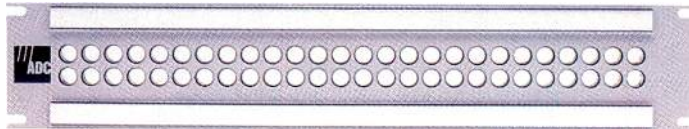
Description	Ordering Number
<b>Unloaded (Empty) WSI™ Video Panels</b>	
1.75" 2x32 midsize, gray	PPI1232RS
1.75" 2x32 midsize, black	PPI1232RS-BK
3.50" 2x24 standard size, black	PPV2224RS-BK
3.50" 2x24 standard size, gray	PPV2224RS
3.50" 2x26 standard size, black	PPV2226RS-BK
3.50" 2x26 standard size, gray	PPV2226RS
3.50" 3x26 standard size, gray	PPI2326RS
3.50" 3x26 standard size, black	PPI2326RS-BK
3.50" 2x32 midsize, gray	PPI2232RS
3.50" 2x32 midsize, black	PPI2232RS-BK
3.50" 2x32 midsize for CJ3011N/4011N terminated jacks, black	PPI2232RS-CJMIDT-BK-NJ
3.50" 2x32 midsize for CJ3011N/4011N terminated jacks, gray	PPI2232RS-CJMIDT-NJ
<b>Unloaded (Empty) ASI™ Video Panels</b>	
1.75" 2x24 standard size, gray	PPI1224RS
1.75" 2x26 standard size, gray	PPI1226RS
1.75" 2x26 standard size, black	PPI1226RS-BK
3.50" 2x24 standard size, gray	PPI2224RS
3.50" 2x24 standard size, black	PPI2224RS-BK
3.50" 2x26 standard size, gray	PPI2226RS
3.50" 2x26 standard size, black	PPI2226RS-BK

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PPI1224RS  
1 RU ASI Standard Size 2x24 Unloaded Panel



PPI2226RS  
2 RU ASI Standard Size 2x26 Unloaded Panel





# Video Jacks and Accessories

It may sound bold to say we have the best video jacks in the world, but we can say it with confidence. Just take a look inside one of our Super Video Jacks and you'll see why. Our jacks are loaded with features that make them work more reliably and last far longer than other jacks.

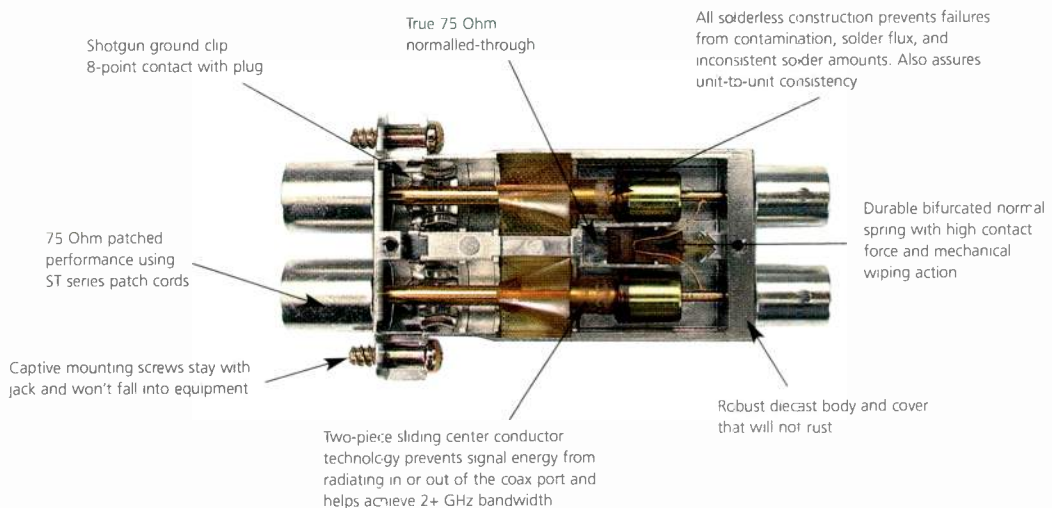
To achieve SMPTE 292M high-frequency performance and minimize signal radiation in or out, ADC standard size jacks feature a unique, patented, two-piece sliding center conductor. Also, the center conductor employs a special closed-entry design to resist insertion of a damaged connector or a test probe, preventing damage. The precision, gold-plated components preserve signal quality and resist oxidation and tarnish. Long-beam bifurcated springs ensure against spring metal fatigue, and a shotgun ground clip provides multiple contact points for a solid connection when a plug is inserted. Most importantly, our jacks provide true 75 Ohm performance when normalled or patched with ADC's patented ST series patch cords, protecting high-frequency signals from losses due to impedance mismatch.

Every component of an ADC video jack is carefully designed and solidly constructed without solder for the highest reliability. You'll feel the quality in the firm contact force every time you insert a plug.

## Features

- True 75 Ohm for excellent high-frequency performance when normalled or patched with ADC ST series patch cords
- Gold-plated components assure signal quality and tarnish resistance
- Sealed switch prevents external contamination
- All-solderless construction eliminates solder-related failures
- Long-beam bifurcated springs provide firm contact and prevent spring fatigue
- Closed-entry BNC center conductor prevents damage and provides reliable contact
- Two-piece center conductor prevents RFI radiation leakage
- Shotgun ground clip contacts plug at multiple points
- Tough diecast body will not rust or flex
- Captive mounting screws will not fall out
- Precision-tooled parts for consistent quality

## SVJ-2Tx Super Video Jack Interior View



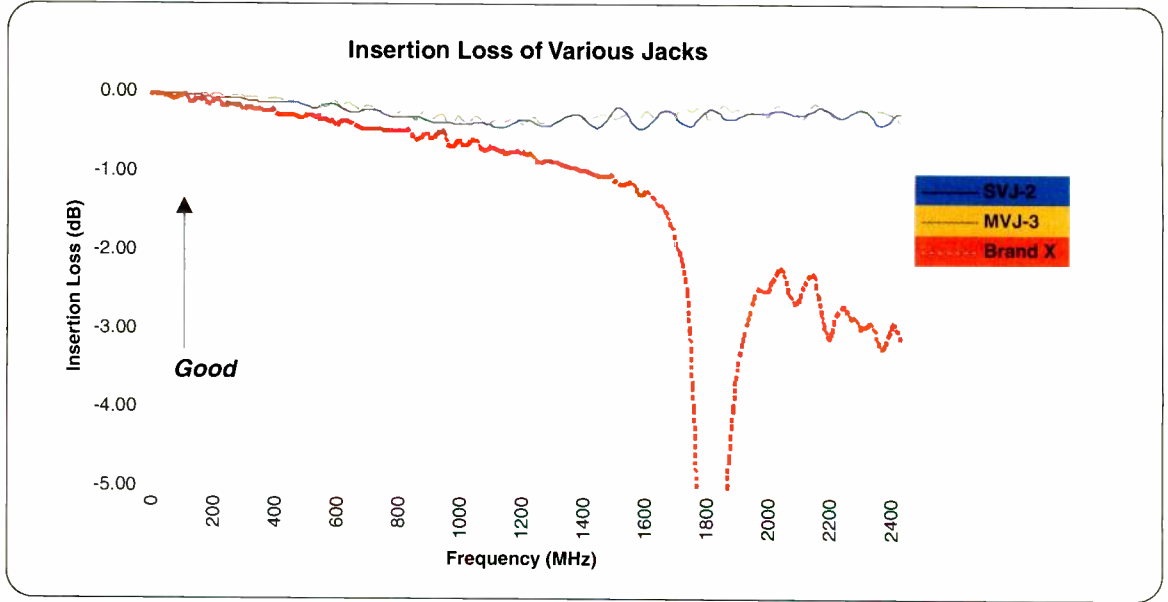
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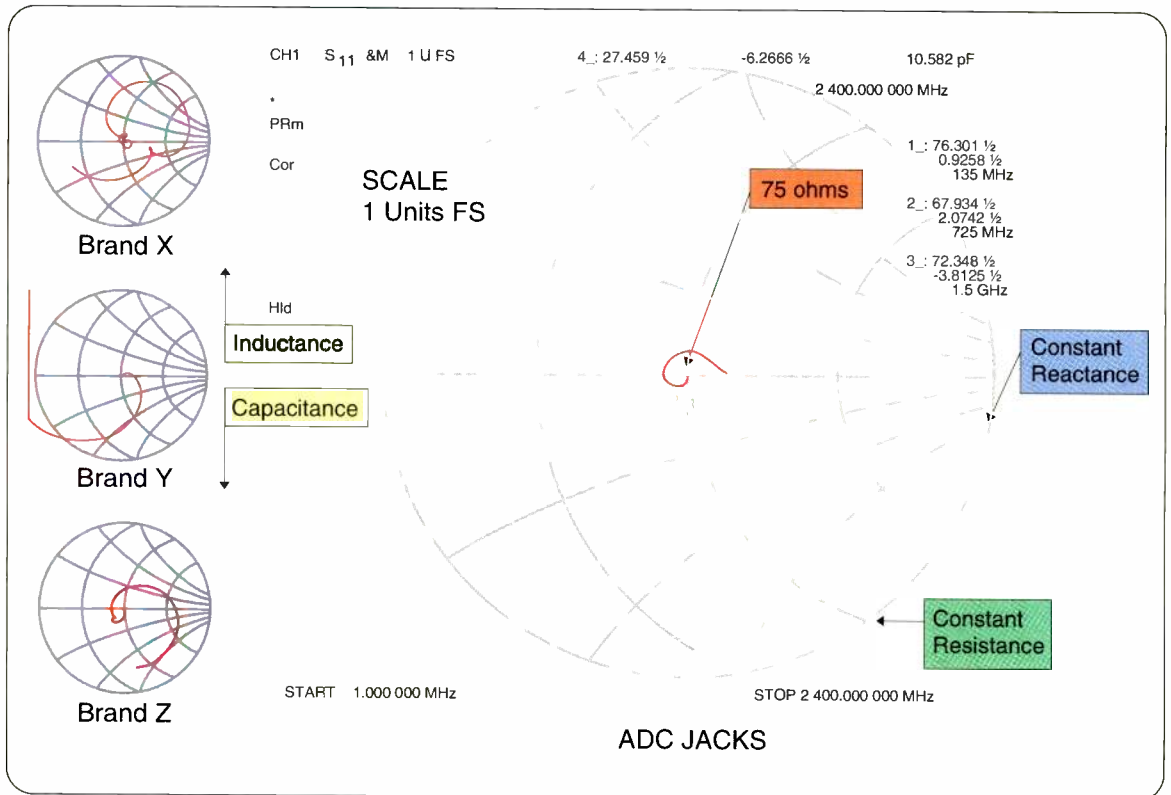


# Video Jacks and Accessories

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Insertion loss for ADC's Super Video Jacks stays less than .5 dB to 2.4 GHz.



ADC's Super Video Jacks maintain 75 Ohm impedance throughout the band. Competitive jacks spiral out of control.

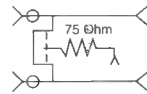
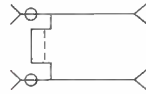


# Video Jacks and Accessories

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## Standard Size Analog/SD Video Jacks

For analog and serial digital video applications at 270/360 Mbits, ADC's improved SJ2000 is a logical choice. With a frequency response of 750 MHz, the SJ2000 has been redesigned for improved reliability and reduced cost for systems that do not require the advanced performance of ADC's super jacks. For a dual jack with monitor, see the VJ-2000.

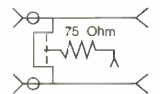
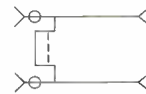
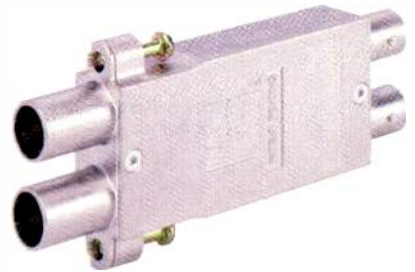


SJ2000/SJ2000N-75  
Standard Size Video Jack

## Standard Size HD Super Video Jacks

The new SVJ-2x standard size to BNC self-normalising Super Video Jack family features performance matched for data rates up to and including HDTV in the full uncompressed 1.485 Gbits/sec rate. The SVJ-2x combines the unique features of:

- 2.4 GHz bandwidth for the demanding HD data rates
- Sealed switch prevents internal contamination
- True 75 Ohm performance for a zero bit-error rate
- RFI shielding prevents radiation
- 2x26 or 2x24 mounting in one or two rack spaces
- Unique captive mounting screws

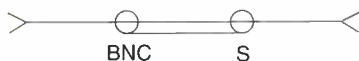


SVJ-2/SVJ-2T  
Standard Size Super Video Jack

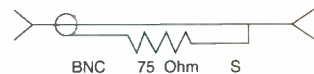
The SVJ-2x family is designed for use in high data rate applications including uncompressed HDTV, L- and lower S-Band satellite, D1 digital video and all lower data rate video transmission methods.

## Standard Size Straight-Through Video Jacks

For applications requiring independent ground such as tie line panels, the straight-through CJ2011N and the self-terminating CJ2020N-75 jacks are the logical choice. The CJ2011N and CJ2020N-75 jacks mount on standard .625" centers and have a rated bandwidth up to 2.4 GHz for analog and HDTV video applications.



CJ2011N  
Straight-through Standard Size Video Jack



CJ2020N-75  
Straight-through Standard Size Video Jack  
with 75 Ohm Termination



# Video Jacks and Accessories

## Midsized Video Jacks

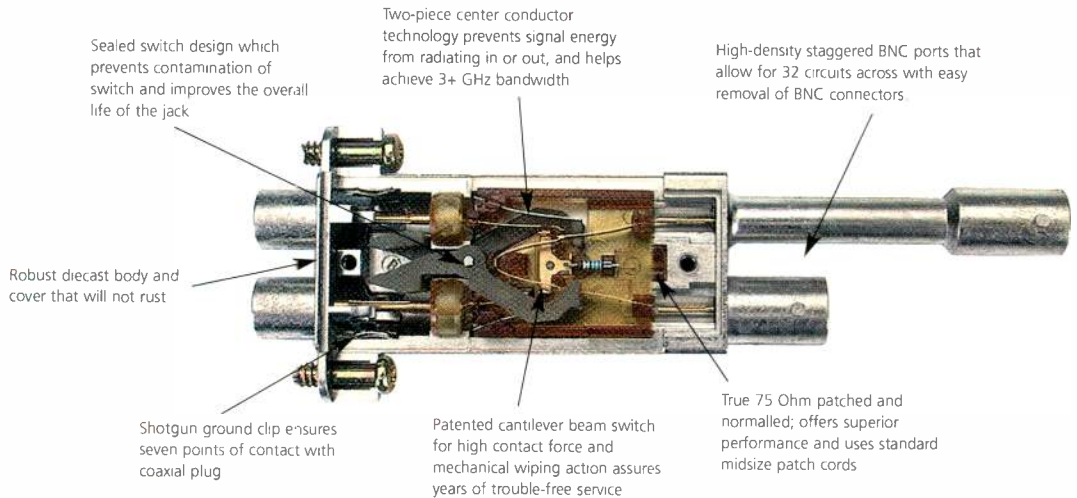
Midsized video jacks have several advantages over standard size jacks in performance and size. All standard size video jacks observing WECO (Western Electric Co.) standards are, by definition, not 75 Ohm in the patched state (with the exception of ADC's SVJ-2 standard size Super Video Jack). The physical relationship of the center conductor diameter and the coaxial port diameter creates an impedance violation that causes the video impedance to drop to 58 Ohm in the patched state. In midsized video jacks, the physical relationship has been optimized, providing a constant impedance of 75 Ohm in either the normalled-through mode or the patched mode. This impedance advantage can make a considerable difference in the elimination of bit errors in digital signals especially if the circuit is routed through several patches.

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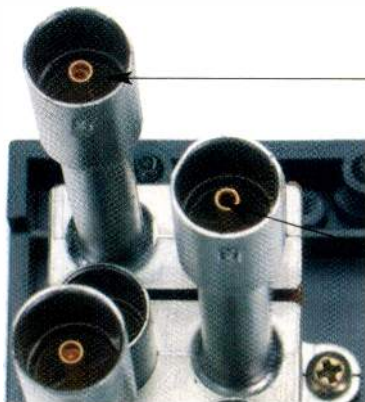
www.adc.com



MVJ-3 Midsized Super Video Jack Interior View

## Video Jacks Offer Outstanding Performance Features

ADC video jacks feature precision insulators for true 75 Ohm performance. Closed-entry center contacts are designed to resist damage from damaged plugs or test probes.



Ultem® precision insulators make true 75 Ohm performance possible

Closed entry contact features fully supported ring which is extremely durable and is not easily damaged by test probes, preventing intermittent failures.



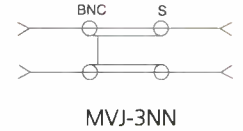
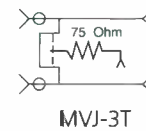
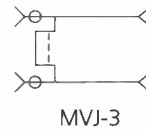
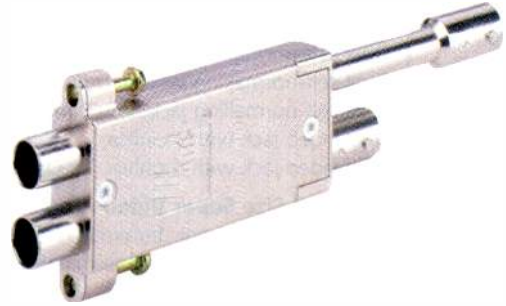
# Video Jacks and Accessories

## MVJ-3 HD Super Video Jack

The new MVJ-3 midsize to BNC self-normalling Super Video Jack family features performance matched for data rates up to and including HDTV in the full uncompressed 1.485 Gbits/sec rate. This premium jack includes a host of outstanding features highlighted in the interior view shown on the previous page.

### Features

- 3.0+ GHz bandwidth
- Sealed switch
- 75 Ohm performance
- RFI shielding
- 2x32 mounting in one or two rack spaces
- Unique captive mounting screws

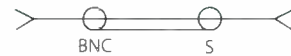


Midsize Super Video Jack

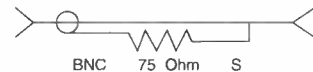
## Straight-through Midsize Video Jacks

For applications requiring independent ground such as tie line panels, the straight-through CJ3014N and CJ4014N are the logical choice. The CJ3014N/CJ4014N jacks mount on standard .500" midsize centers and have a rated bandwidth up to 2.4 GHz for analog, serial digital, and HDTV video applications. For applications requiring self-terminating jacks, the CJ3011N-75 and the CJ4011N-75 are available. The terminated versions mount on standard .500" jack to jack spacing but require a special 2 RU panel due to the termination feature.

The short body CJ3014N/3011N-75 and long body CJ4014N/4011-N75 are designed to be mounted in 32-across configurations. The short and long bodies allow a staggered mounting pattern to provide access to the BNC connectors. A BNC insertion tool such as the BT2000 is recommended for BNC installation.



Straight-through Midsize Video Jack



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# Video Jacks and Accessories

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## Ordering Information

Description	Ordering Number
<b>Standard Size Jacks</b>	
Single video jack, straight-through, non-terminated	CJ2011N
Single video jack, short body, straight-through, terminated	CJ2020N75
Dual self-normalling jack, gold-plated body, non-terminated	SJ2000G
Dual self-normalling jack, gold plated body, 75 Ohm terminated	SJ2000G-75
Dual self-normalling jack, non-terminated	SJ2000N
Dual self-normalling jack, 75 Ohm terminated	SJ2000N-75
Dual video jack with monitor	VJ2000N
Dual video jack with monitor, 75 Ohm terminated	VJ2000N-75
<b>Standard Size Super Video Jacks</b>	
Super Video Jack, non-terminated	SVJ-2x
Super Video Jack, 75 Ohm terminated	SVJ-2Tx
<b>Midsize Jacks</b>	
Single Video Jack, short body, straight-through, non-terminated	CJ3014N
Single Video Jack, short body, 75 Ohm terminated	CJ3011N-75
Single Video Jack, long body, straight-through, non-terminated	CJ4014N
Single Video Jack, long body, 75 Ohm terminated	CJ4011N-75
<b>Midsize Super Video Jacks</b>	
Dual self-normalling Super Video Jack, non-terminated	MVJ-3
Dual self-normalling Super Video Jack, 75 Ohm terminated	MVJ-3T
Dual non-normalled Super Video Jack, non-terminated	MVJ-3NN
<b>Termination and Looping Plugs</b>	
Standard size 75 Ohm termination plug, nickel	CP1040N
Midsize 75 Ohm termination plug, nickel	CP1501N
Standard size looping plug, gold	CP1063G
Standard size looping plug, nickel	CP1063N
Midsize looping plug, gold	CP1500GR
Midsize looping plug, nickel	CP1500NR
<b>Conversion Plugs and Adapters</b>	
Standard size plug to BNC adapter	CP1051N
Standard size plug to BNC adapter, gold	CP1051G
Standard size monitor plug to BNC adapter	CP1051MN
Midsize plug to BNC adapter	MBNC-3
Standard size receptacle to midsize receptacle adapter	CAX-ADPT-1
Midsize plug to standard size receptacle adapter	CAX-ADPT-2
Standard size plug to midsize receptacle adapter	CAX-ADPT-3
<b>Coaxial Patch Plugs</b>	
Standard size solder plug for RG59	PGS-100016
Standard size solder plug for 735	CP1041N
Standard size solder plug for 735, gold	CP1041G
Midsize solder plug for RG59	CP1540N
Midsize crimp plug for RG59	CP1540N-CRIMP
Midsize crimp plug for RG59, gold	CP1540G-CRIMP
Midsize solder plug for 735	PGS-100018
<b>Circuit Guard Plugs</b> sold in bags of 25	
X = color of plug: BLACK, RED, BLUE, GREEN, YELLOW	
Standard size	CJP-S-X
Midsize	CJP-M-X



CP1051N  
Standard Size Conversion Plug



CP1040N  
Termination Plug



CP1540N  
Midsize Plug



CAX-ADPT-1  
Standard to Midsize  
Conversion Adapter



CAX-ADPT-2  
Midsize to Standard  
Conversion Plug



CAX-ADPT-3  
Standard to Midsize  
Conversion Plug



MBNC-3  
Midsize Plug  
to BNC Adapter



## Video Patch Cords

ADC offers two lines of high-quality video patch cords: the patented ST series capable of handling uncompressed high-definition digital video and the VX™ series for analog and serial digital video. The ST series features a patented true 75 Ohm design that virtually eliminates bit errors. Both series are made of the highest quality materials and provide excellent performance.

### ST Series Highest Performance HD Video Patch Cords

The digital television revolution is stretching the limits of the physical plant technology designed for analog video. Cable and connectors not optimized for the digital environment can seriously degrade the digital signal being transported. The problem is that all WECO-standard jacks and patch cords exhibit an impedance violation of between 58 and 62 Ohm in the patched state. This becomes a major source of attenuation and bit errors in serial digital and high-definition video signals.

ADC's STS™ standard size patch cords feature a patented design that provides a true 75 Ohm interface in the patched state when used with ADC's SVJ-2 Super Video Jack family. The STS series maintains the WECO interface for maximum industry compatibility and provides a "nominal" 75 Ohm interface when used with jacks other than the SVJ-2 Super Video Jack. This design reduces or eliminates attenuation and bit errors in serial digital and high-definition video signals, especially in the uncompressed mode.

#### Features

- Patented design provides a 75 Ohm interface in the patched state
- Standard size compatible with all WECO .090 standard video jacks
- Performance matched for uncompressed HDTV signals (1.485 Gbit/s)
- Gastight crimp design. 100 percent solderless construction assures quality
- Precision-molded Ultem® insulators for truer impedance match and greater unit-to-unit consistency compared to machined Teflon®
- HD-rated 1505F cable with matte finish
- Full-molded strain relief defeats abuse
- Gold-plated center conductors
- Available in red, green, blue, and black in 2-foot (.6 m) to 6-foot (1.8 m) lengths





# Video Patch Cords

## Ordering Information

Description	Ordering Number			
	2 ft./ .61m	3 ft./ .93m	4 ft./1.22m	6 ft./1.83m
<b>ST Series High-Definition Video Cords</b>				
<b>ST Standard Size Plug to Standard Plug</b>				
Red, standard size plug to standard plug	R2V-ST5	R3V-ST5	R4V-ST5	R6V-ST5
Green, standard size plug to standard plug	G2V-ST5	G3V-ST5	G4V-ST5	G6V-ST5
Blue, standard size plug to standard plug	B2V-ST5	B3V-ST5	B4V-ST5	B6V-ST5
Black, standard size plug to standard plug	BK2V-ST5	BK3V-ST5	BK4V-ST5	BK6V-ST5
<b>ST Standard Size Plug to BNC</b>				
Red, standard size plug to BNC	R2V-ST5-B	R3V-ST5-B	R4V-ST5-B	R6V-ST5-B
Green, standard size plug to BNC	G2V-ST5-B	G3V-ST5-B	G4V-ST5-B	G6V-ST5-B
Blue, standard size plug to BNC	B2V-ST5-B	B3V-ST5-B	B4V-ST5-B	B6V-ST5-B
Black, standard size plug to BNC	BK2V-ST5-B	BK3V-ST5-B	BK4V-ST5-B	BK6V-ST5-B
<b>ST Midsize Plug to Midsize Plug</b>				
Red, midsize plug to midsize plug	R2V-STM	R3V-STM	R4V-STM	R6V-STM
Green, midsize plug to midsize plug	G2V-STM	G3V-STM	G4V-STM	G6V-STM
Blue, midsize plug to midsize plug	B2V-STM	B3V-STM	B4V-STM	B6V-STM
Black, midsize plug to midsize plug	BK2V-STM	BK3V-STM	BK4V-STM	BK6V-STM
<b>ST Midsize Plug to BNC</b>				
Red, midsize plug to BNC	R2V-STM-B	R3V-STM-B	R4V-STM-B	R6V-STM-B
Green, midsize plug to BNC	G2V-STM-B	G3V-STM-B	G4V-STM-B	G6V-STM-B
Blue, midsize plug to BNC	B2V-STM-B	B3V-STM-B	B4V-STM-B	B6V-STM-B
Black, midsize plug to BNC	BK2V-STM-B	BK3V-STM-B	BK4V-STM-B	BK6V-STM-B

**Note:** Standard lengths and colors shown, contact ADC for custom lengths.

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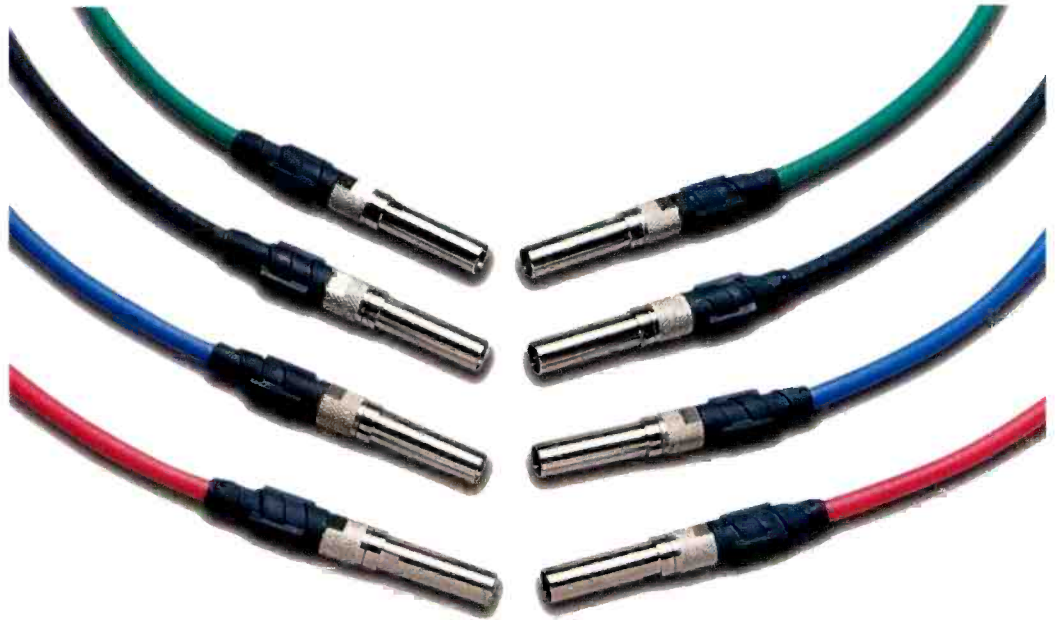
## Video Patch Cords

### VX™ Series Analog and Digital Video Patch Cords

ADC's VX™ standard and midsize video patch cords feature an all-new plug design that optimizes impedance performance during the patched state. The VX series patch cords are the ideal choice for all analog and serial digital video formats up to 360 Mbps. For high-definition applications requiring data rates in excess of 360 Mbps, the ST series is recommended. The VX series features common plug components with the patented STS™/STM™ series high-definition patch cords.

#### Features

- Gastight crimp design. 100 percent solderless construction assures quality
- Full-molded strain relief defeats abuse
- Gold-plated center conductors
- Precision-molded Ultem® insulators for truer impedance match and greater unit-to-unit consistency vs. machined Teflon®
- Available in red, green, blue, and black in 1-foot (.3 m) to 6-foot (1.8 m) lengths



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# Video Patch Cords

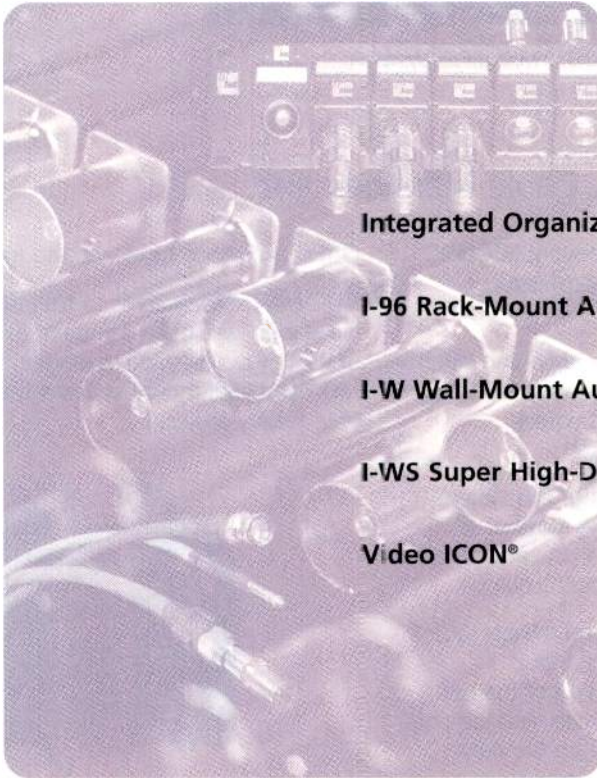
## Ordering Information

Description	Ordering Number			
<b>VX™ Series Analog/SD Video Patch Cords</b>				
<b>Standard Size Plug to Standard Size Plug</b>	<b>2 ft./.61m</b>	<b>3 ft./.93m</b>	<b>4 ft./1.2m</b>	<b>6 ft./1.83m</b>
Red, standard size plug to standard size plug	R2VX	R3VX	R4VX	R6VX
Green, standard size plug to standard size plug	G2VX	G3VX	G4VX	G6VX
Blue, standard size plug to standard size plug	B2VX	B3VX	B4VX	B6VX
Black, standard size plug to standard size plug	BK2VX	BK3VX	BK4VX	BK6VX
<b>Standard Size Plug to BNC</b>				
Red, standard size plug to BNC	R2VX-B	R3VX-B	R4VX-B	R6VX-B
Green, standard size plug to BNC	G2VX-B	G3VX-B	G4VX-B	G6VX-B
Blue, standard size plug to BNC	B2VX-B	B3VX-B	B4VX-B	B6VX-B
Black, 1 to 6 feet long, standard size plug to BNC	BK2VX-B	BK3VX-B	BK4VX-B	BK6VX-B
<b>Midsize Plug to Midsize Plug</b>				
Red, midsize plug to midsize plug	MR2VX	MR3VX	MR4VX	MR6VX
Green, midsize plug to midsize plug	MG2VX	MG3VX	MG4VX	MG6VX
Blue, midsize plug to midsize plug	MB2VX	MB3VX	MB4VX	MB6VX
Black, midsize plug to midsize plug	MBK2VX	MBK3VX	MBK4VX	MBK6VX
<b>Midsize Plug to BNC</b>				
Red, midsize plug to BNC	MR2VX-B	MR3VX-B	MR4VX-B	MR6VX-B
Green, midsize plug to BNC	MG2VX-B	MG3VX-B	MG4VX-B	MG6VX-B
Blue, midsize plug to BNC	MB2VX-B	MB3VX-B	MB4VX-B	MB6VX-B
Black, midsize plug to BNC	MBK2VX-B	MBK3VX-B	MBK4VX-B	MBK6VX-B
<b>BNC to BNC</b>				
Red, BNC to BNC	R2VX-B/B	R3VX-B/B	R4VX-B/B	R6VX-B/B
Green, BNC to BNC	G2VX-B/B	G3VX-B/B	G4VX-B/B	G6VX-B/B
Blue, BNC to BNC	B2VX-B/B	B3VX-B/B	B4VX-B/B	B6VX-B/B
Black, BNC to BNC	BK2VX-B/B	BK3VX-B/B	BK4VX-B/B	BK6VX-B/B

**Note:** Standard lengths and colors shown, contact ADC for custom lengths.

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# rackmount solutions

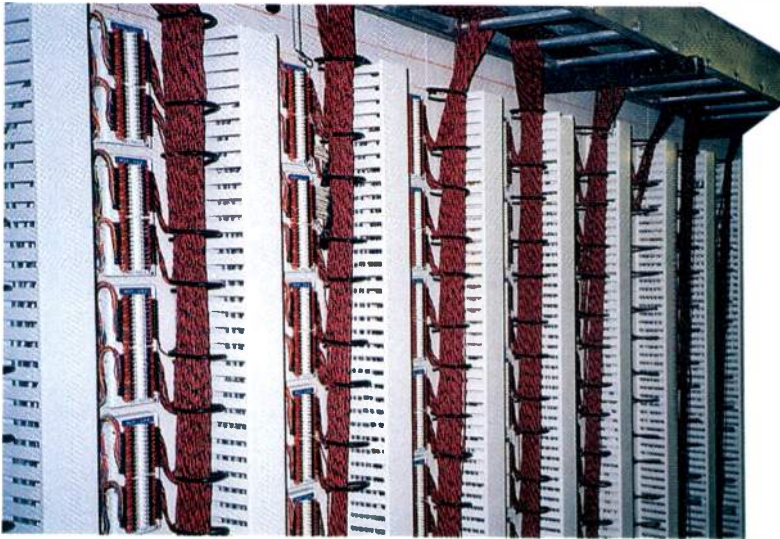


<b>Integrated Organization Network (ICON®)</b>	<b>69</b>
<b>I-96 Rack-Mount Audio Cable Management System</b>	<b>71</b>
<b>I-W Wall-Mount Audio Cable Management System</b>	<b>74</b>
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<b>Video ICON®</b>	<b>79</b>



# Integrated Cable Organization Network (ICON®)

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A Fully Functional ICON® Twisted Pair System

## Clean, Simple, Secure, Cable Management

Integrated Cable Organization Network (ICON®) brings clean, simple order to any professional audio/video production.

The ICON system pulls all of your audio and video cabling together into a neatly organized central termination and distribution point where interconnections are easily managed.

Compared to point-to-point cabling, this system saves time and money, reduces the number of cables and cable disorganization at the equipment, and allows you to change connections quickly.

ICON systems use fast-installing and reliable QCP II or QCP IV punchdown connectors. Input connections punchdown on one side of the unit, output connections on the other side, and jumpers to interconnect them punchdown on the back.

Other connector types are also available.

ADC has ICON systems to suit any application. For small jobs, we make compact rack and wall-mount units. For facility-wide management, we offer large rack- and wall-mount systems that can grow as your facility grows.



VIW-24 Video ICON® 24-connector Wall-Mount Bulkhead Panel



# Integrated Cable Organization Network (ICON®)

## ICON® Models for Every Application

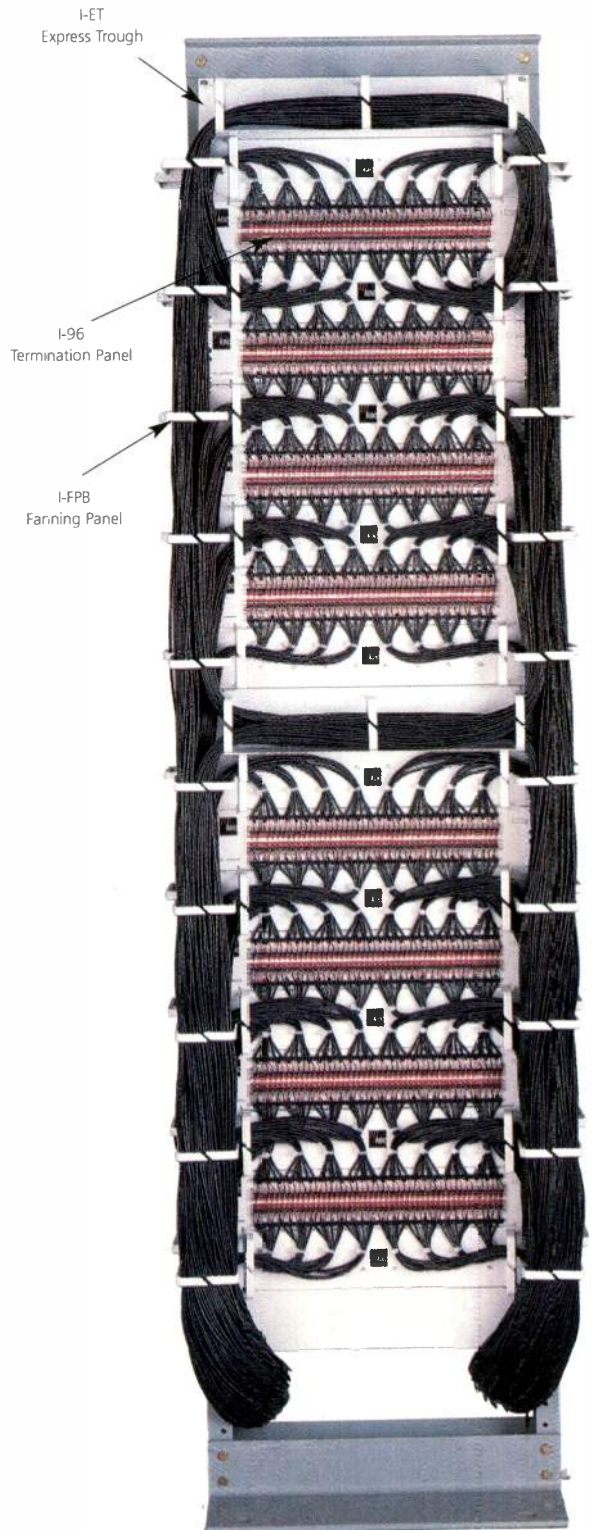
Whether your facility has abundant floor space to accommodate a rack-based ICON system or you need to fit the system into tight spaces by mounting it on the wall, ADC makes a cable management system to meet your requirements:

- I-96 series audio rack-mount system for 19-inch equipment racks
- I-W series audio wall-mount system
- I-WS space-saving super high-density audio wall-mount system
- VI Video ICON rack-mount system for 19- and 23-inch equipment racks
- VIW Video ICON wall-mount system
- Cable management hardware, such as fanning panels and cable bars and rings, are available for each ICON system to ensure all cabling is routed neatly and securely

## Labor-saving, Flexible, and Reliable QCP Audio Connections

ICON audio cable management systems feature ADC's proven punchdown cable termination system for fast, efficient, and secure interconnections. QCP offers these advantages:

- Reduced installation time with fast, easy punchdown terminals
- Reliable gastight connections because of patented QCP split-cylinder design
- Reusable contacts allow easy circuit changes without disturbing adjacent contacts
- Color-coded and numbered contacts prevent wiring mistakes



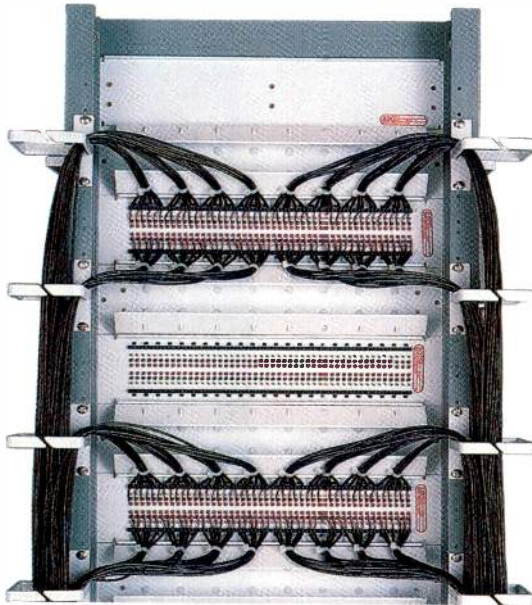
Fully Loaded I-96 Rack-Mount System with Fanning Panels and Express Troughs. Handles 768 balanced audio pairs



# Integrated Cable Organization Network (ICON®)

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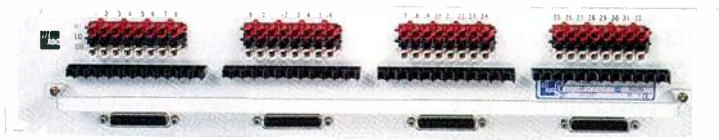


I-96 System  
(Rear View)

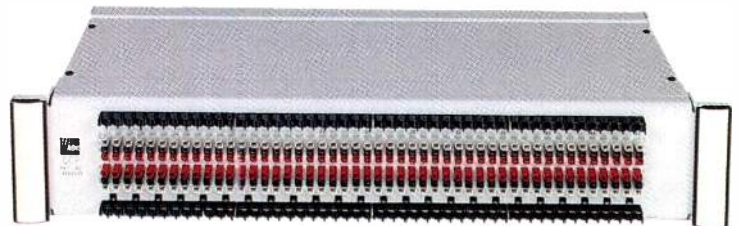
The ICON® I-96 high-density rack-mount audio cable management system installs in a standard 19-inch (48 cm) EIA equipment rack and is engineered for easy access to front and rear connections. The rack-mounted QCP II or QCP IV punchdown panels are quick to connect, and the feedthrough design allows changing of cross-connection jumpers on the front without disturbing connections on the rear. Multiple I-96 panels can be installed for up to 768 circuits in a fully loaded 7-foot rack.



I-16-D9F  
1 RU Dsub9 Feedthrough Rack-Mount Control Panel Breakout Panel



I-DB-25  
2 RU QCP IV/DB-25 Rack-Mount Panel



I-96-3E  
2 RU QCP II/EDAC 90-Pin Plug Rack-Mount Panel



I-96-AMP  
2 RU AMP 50-Pin Receptacle Panel (Rear View)

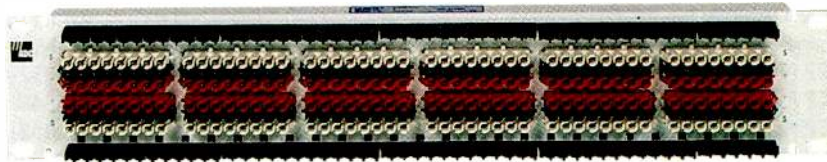


# Integrated Cable Organization Network (ICON®)

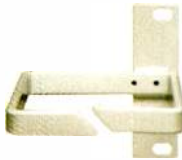
## Modular Rack-Mountable Components

The system is built around rack-mountable modular components that you can assemble in different combinations to create the system you require:

- The I-96 QCP II or QCP IV punchdown connection panel terminates and cross-connects 96 balanced audio circuits in 2 RU
- The I-FPB or I-FPD fanning panel dresses and strain relieves cables above or below the I-96 panel. Models are available in 1 RU and 2 RU
- Rack-mounted cable troughs and rings are available in various configurations to guide cables in the rack or along rack rails
- I-96 connectors available include QCP II, QCP IV, AMP 50-pin receptacle, and EDAC 90-pin plug



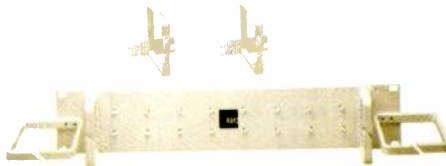
I-96B-MKIV  
2 RU QCP IV Panel



I-VR  
Vertical Ring



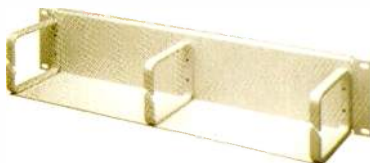
I-96B-MKIV  
Rear View Showing Jumpers



I-FPB  
Fanning Panel



I-96S 3 RU QCP II Hinged Termination Panel



I-ET  
Express Trough



I-FL  
Fanning Panel



I-FPD  
Fanning Panel

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# ICON® I-96 Rack-Mount Audio Cable System

## Ordering Information

Description	Ordering Number
<b>QCP Panels - EIA Rack-Mount 19"/48 cm</b>	
2 RU panel QCP II cross-connects, 96 balanced audio circuits	I-96
2 RU panel QCP IV cross-connects, 96 balanced audio circuits	I-96-MKIV
2 RU QCP II to ELCO/EDAC 3-pin plug, cross-connects, 96 audio circuits	I-96-3E
2 RU QCP II to AMP 50-pin receptacle, cross-connects, 96 audio circuits	I-96-AMP
2 RU QCP II to EDAC 90-pin plug, cross-connects, 96 audio circuits	I-96E
2 RU QCP II with rear jumpers, cross-connects, 96 audio circuits	I-96B
2 RU QCP IV with rear jumpers, cross-connects, 96 audio circuits	I-96B-MKIV
2 RU QCP IV hinged left, cross-connects, 96 audio circuits, black	I-96S-MKIV-BK
3 RU QCP II for 23" rack, cross-connects, 96 audio circuits	I-96S
1 RU panel Dsub9 receptacles, 1x16	I-116-D9F
2 RU hinged panel QCP II cross-connects, 96 balanced audio circuits	I-96S-19B
1 RU panel QCP IV cross-connects, 32 balanced audio circuits	I-32-DES-W
2 RU panel QCP II cross-connects, 48 balanced audio circuits	I-48
2 RU panel QCP II to AMP 50-pin receptacle, 52 circuits	I-52-AMP
1 RU panel QCP II to EDAC 90-pin plug, 52 circuits	I-52-E
1 RU panel QCP IV cross-connects, 16 balanced audio circuit and 1 video bulkhead feedthrough	I-CS-V8
<b>Fanning Panels - EIA Rack-Mount 19"/48 cm</b>	
1 or 2 RU panel with cable rings for routing cables horizontally. Used with multiple racks with I-FL (listed below) mounted between racks to route cables vertically and provide additional strain relief	I-FPD
1 or 1 RU panel with rings for horizontal or vertical cable routing Includes 2 rings to vertically route cables in the rear; to be used with a standalone channel rack	I-FPB
<b>Vertical Cable Ring/Spacers</b>	
Functions as a spacer mounted between channel racks and routes cabling from both the front and the rear of I-FPBs	I-FL
Ring for vertical cable routing; mounts on front or rear rack rails	I-VR
<b>Express Troughs - EIA Rack-Mount 19"/48 cm</b>	
2 RU express trough for horizontal cable routing between racks	I-ET-3
3 RU express trough for horizontal cable routing between racks	I-ET-5
4 RU express trough for horizontal cable routing between racks	I-ET-7

**Note:** "A" denotes no rear jumpers  
 "B" denotes strapped rear jumpers  
 "C" denotes strapped rear jumpers, common sleeve

All products listed above are white unless otherwise noted.

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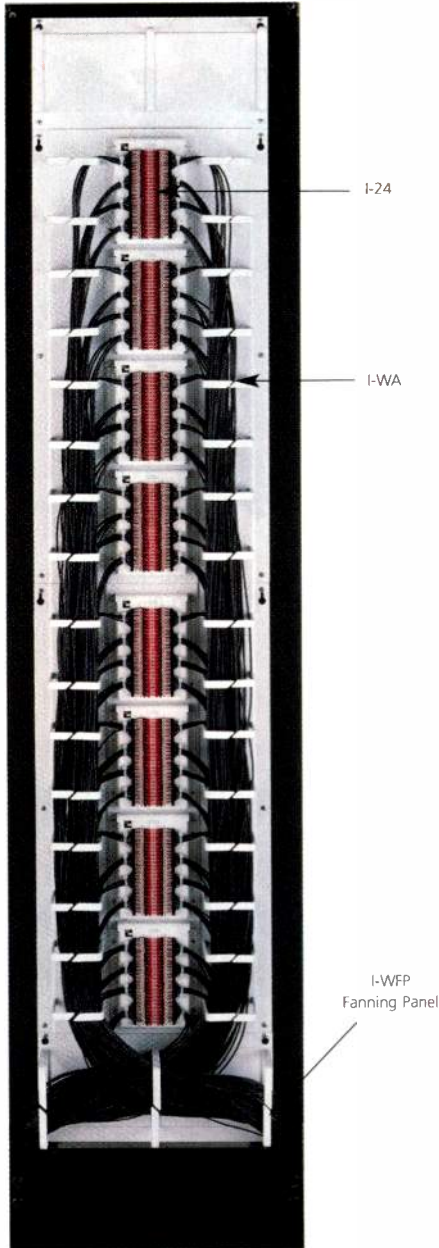




# ICON® I-W Wall-Mount System

The ICON® I-W is a wall-mount audio cable management system is ideally suited for use where floor space is at a premium but wall space is available. The convenient front-facing design mounts flat against the wall and provides two appearances of each circuit on the QCP II or QCP IV punchdown terminal blocks. Cabling to and from your equipment punches down on the right side array of contacts, and cross-connections to these circuits are made on the left side array of contacts. This makes it easy to change cross-connections without disturbing equipment wiring.

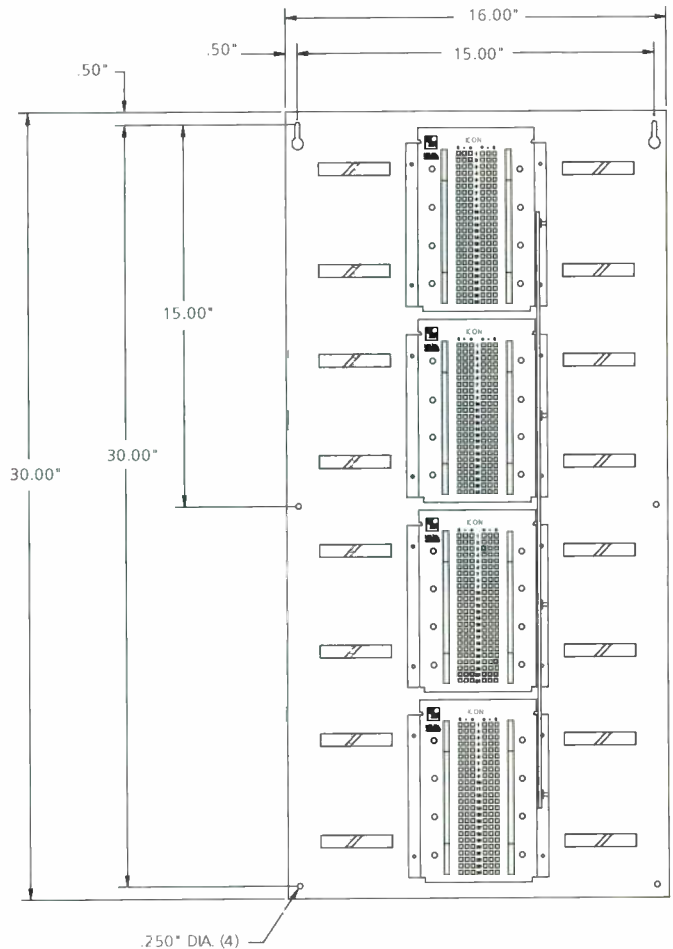
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I-W System handles 192 balanced audio pairs in 16-inches by 5-feet

### An I-W system is assembled from the following components:

- I-WA or I-WB wall-mount frame holds four I-24 QCP terminal blocks
- I-24 QCP termination block terminates or cross-connects 24 balanced audio circuits



I-W-MKII Frame Dimensions

Note: MKIV dimensions are different. See page 179 for dimensions.



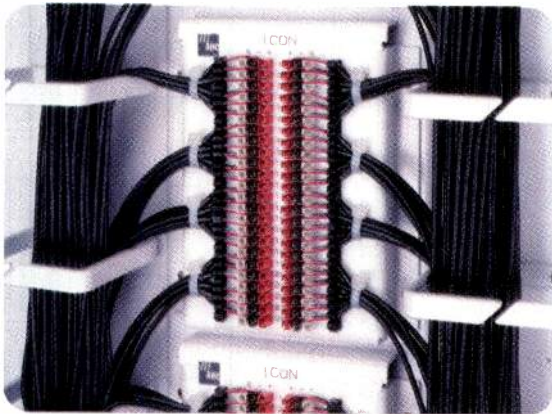
# ICON® I-W Wall-Mount System

## Expandable Component Design

Components for the I-W system come in units that allow you to start with a modest system and expand the number of circuits as you need more. A single I-W frame integrates four I-24 QCP terminal blocks for 96 balanced audio circuits in a wall unit 31-inches high (79 cm) by 16-inches wide (41 cm). Two I-W frames can be stacked for a total of 192 circuits in just over 5-feet of vertical wall space.

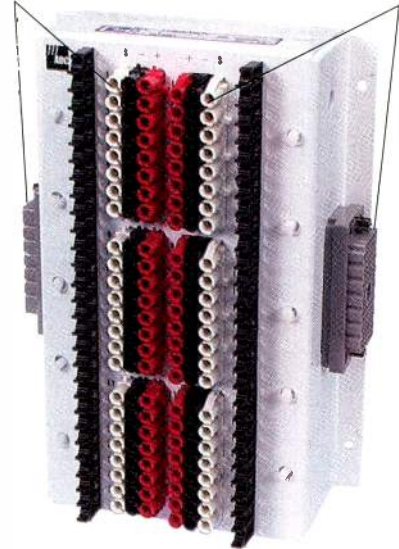
### Features

- Other termination block sizes and connectors are available, including 12, 24, 32, 48, and 52 circuits as well as QCP II, QCP IV, AMP 50-pin receptacle, and EDAC 90-pin plug
- I-WFP fanning panel mounts above or below the I-W frame to dress cables
- I-WFP-Ring cable rings for guiding cables
- Rack-mounting kit holds two I-24 termination blocks as an alternative to wall-mounting



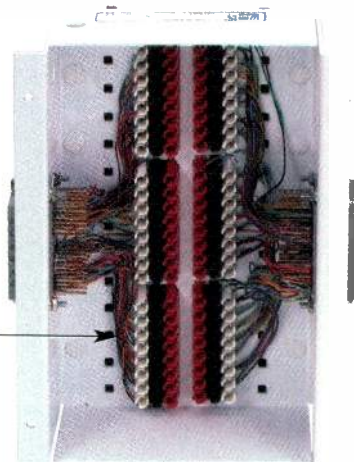
I-24A  
QCP II Termination Block

Inputs enter at left      Outputs exit on right



I-24E90-MKIV  
QCP IV to EDAC 90-Pin Plug Termination Block

Jumpers connect  
inputs to outputs



I-24E90-MKIV  
QCP IV to EDAC 90-Pin Plug Termination Block  
(Rear View)



# ICON® I-W Wall-Mount System

## Ordering Information

Description	Ordering Number
<p><b>Wall-Mount Frames</b> Wall-mount frame with four I-24A QCP II blocks for terminating or cross-connecting 96 balanced audio circuits 31"x16" (79 cm x 41 cm)</p>	I-WA
I-WA with QCP IV connectors 38.5" x 16" (97.8 x 40.70 cm)	I-WA-MKIV
I-WA with QCP IV to ELCO/EDAC 90-pin plugs 38.5" x 16" (97.8 x 40.70 cm)	I-WA-E90-MKIV
I-WA with I-24B QCP II blocks that have floating shield terminations	I-WB
I-WB with QCP IV blocks 38.5" x 16" (97.8 x 40.70 cm)	I-WB-MKIV
I-WB with QCP II to AMP 50-pin receptacles	I-WB-AMP
<p><b>QCP Termination Block</b> Terminates and cross-connects 24 balanced audio circuits; each circuit appears on two arrays (left and right) of QCP II or QCP IV on each block and are jumpered on the rear of the block; shield terminals are muted together and brought out to an insulated terminal post on the side of the block to allow grounding of the system to a common point. MKII dimensions are 7" x 6" x 1" (17.78 x 15.24 x 2.54 cm). MKIV dimensions are 8.75" x 5.9" (22.2 x 15 cm)</p>	I-24A and I-24A-MKIV
I-24A with floating shield terminals. MKIV has QCP IV	I-24B and I-24B-MKIV
I-24A with floating shield terminals and no rear jumpers MKIV has QCP IV	I-24C and I-24C-MKIV
Same as I-24A-MKIV except 16 circuits Dimensions 6.35" x 5.9" (16.13 cm x 15 cm)	I-16A-MKIV
Same as I-24A-MKII except 27 circuits Dimensions 7.5" x 5.9" (19 cm x 15 cm)	I-27A
<p><b>Fanning Panel</b> Mounts above, between or below I-WA or I-WB frames to route cabling between frames. 7.5"x16" (19 cm x 41 cm)</p>	I-WFP
<p><b>Cable Ring</b> Cable ring for use with I-WFP mounts on the wall above, between, or below frames or fanning panels. 4.5"D x 5.5"W</p>	I-WFP-RING
<p><b>Rack-Mounting Kit</b> Holds two I-24s in a standard 19" (48 cm) rack</p>	I-24R

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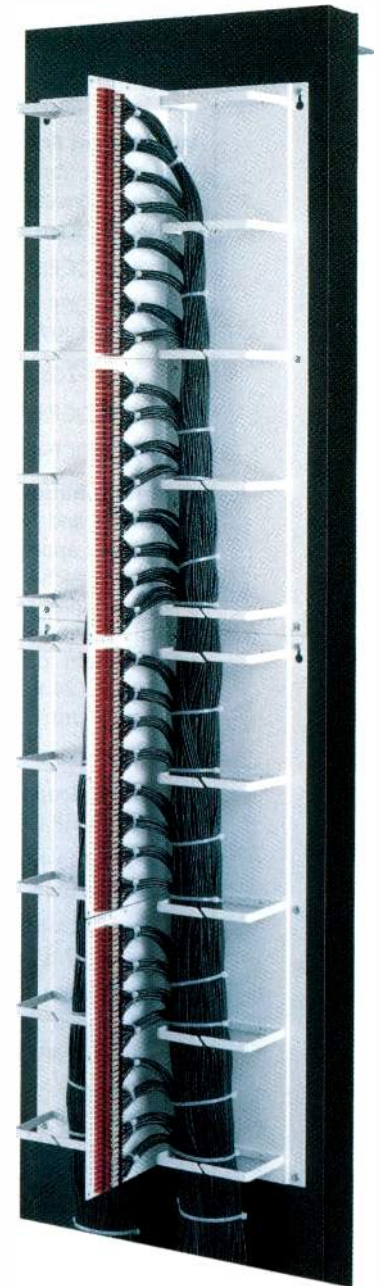
# I-WS Super High-Density Wall-Mount System

The ICON® I-WS is a super high-density wall-mount cable management system engineered for maximum space efficiency. The I-WS system terminates or cross-connects up to 192 balanced audio circuits in a 31.0 x 17.9-inch (79.0 x 45.5 cm) QCP II frame or in a 34.6 x 17.9-inch (87.9 x 45.5 cm) QCP IV frame. The I-WS frame holds two 96-circuit QCP II or QCP IV punchdown panels mounted on edge, 90 degrees relative to the wall to provide access to connections on both sides, an extremely space-efficient arrangement. Cabling from your equipment connects on the left side of the panel, and the feedthrough design allows cross-connect access to those circuits on the right side without affecting the equipment wiring. Two I-WS frames can be stacked to achieve 384 balanced audio pairs in only 62-inches of vertical wall space.

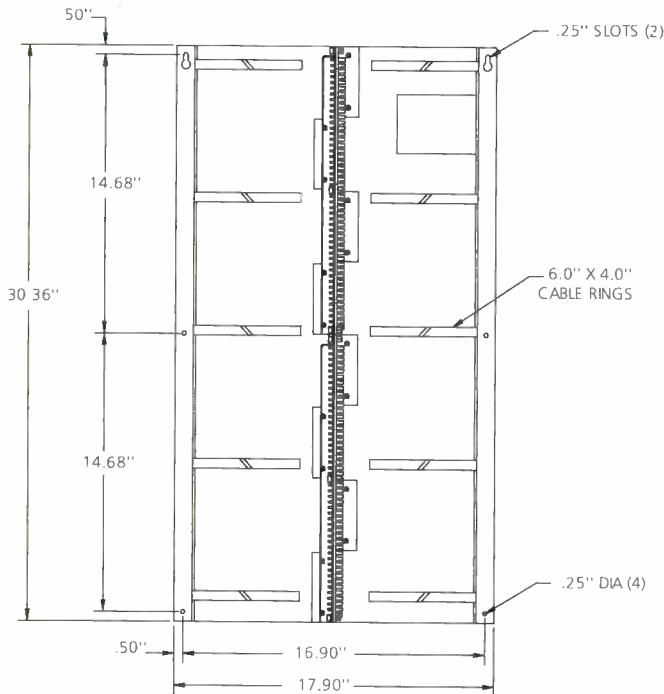
## I-WS System Components

The I-WS system consists of the following main components. You can start with a single frame and panels and expand to additional frames as needed.

- I-WS wall-mount frame holds two I-WS-PANEL assemblies and includes vertical cable rings and fanning strips terminating a total of 192 circuits
- QCP II or QCP IV 96-circuit punchdown terminal block panel mounts in the I-WS-PANEL
- I-WSSET express trough mounts above or below I-WS frame and routes cables horizontally



Two stacked I-WS frames  
Provides 384 balanced audio pairs  
in 62-inches of vertical wall space



I-WS Frame MKII Dimensions

**Note:** MKIV dimensions are different. See page 179 for dimensions.

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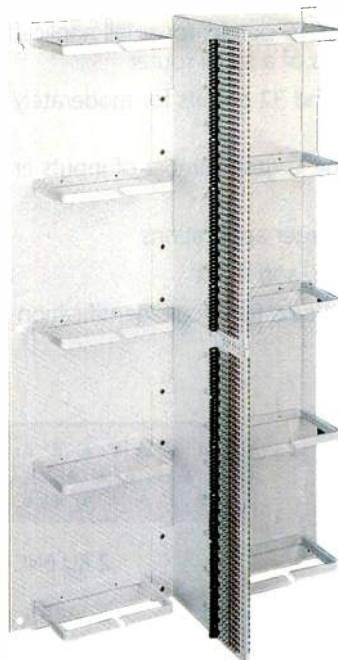
# I-WS Super High-Density Wall-Mount System

## Ordering Information

Description	Ordering Number
<p><b>I-WS Super High-Density Wall-Mount System</b></p> <p>I-WS wall-mount frame includes I-WS PANELS with QCP II or QCP IV connector blocks mounted 90° from the wall. Terminates or cross-connects 192 balanced audio circuits.            I-WS dimensions: 31" x 17.9" (79 cm x 45.5 cm)            MKIV dimensions: 34.6" x 17.9" (87.9 x 45.5 cm)</p> <p>I-WS-PANEL mounts on the I-WS frame and holds the QCP blocks.            Express trough mounts above, between, or below I-WS and routes cabling horizontally between frames.            Dimensions: 7.5" x 17.9" (19 cm x 45 cm)</p>	<p>I-WS and I-WS-MKIV</p> <p>I-WS-PANEL            I-WSET</p>

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I-WS  
Super Density Wall-Mount Frame



I-WSET  
Express Trough



# Video Integrated Organization Network (ICON®)

## The Video ICON® Cable Management

The Video ICON cable organizational system network makes installations of coaxial cable cleaner and identification of cables simpler. These panels are perfect for any application where video cables need to be gathered, such as making connections between racks or organizing cables for inputs to and outputs from a router.

ADC offers a wide variety of these durable powder-coated steel video distribution panels, featuring the outstanding quality and true 75 Ohm performance of our BNC bulkhead feedthrough connectors. These connectors are rated at 3 GHz performance, making them suitable for analog, SD, or HD video signals. Panels are available in 1 RU and 2 RU models as well as a wide range of wall-mount sizes with as few as eight and as many as 96 circuits.

## Durable Rack-Mounted Bulkhead Panels

The ICON VI series is a complete line of 19-inch (48 cm) rack-mounted bulkhead video cable management panels starting from the small 12-circuit VI-12 panel to the full-sized VI-48 with 48 bulkhead BNC circuits. Each panel is made of the same strong powder-coated steel and uses high-quality 3 GHz BNC bulkhead connectors suitable for HDTV.

- VI-12 and VI-16 2 RU panels handle 12 or 16 circuits for small applications, such as organizing monitor outputs or the inputs and outputs of a small router.
- VI-24 and VI-32 2 RU panels provide 24 and 32 circuits for moderately-sized applications, such as feeding cables to a 32-input router
- The VI-132 (2x32) 1 RU panel provides the largest number of inputs and outputs in the smallest space
- VI-48 2 RU panel handles 48 circuits for larger applications
- Colors available include white, putty white, and black
- Some models include designation strip holders for circuit identification



2 RU VI-12-PTY



2 RU BNC-BLK-48-75 Ohm



Video ICON® Bulkhead Connectors

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# Video Integrated Organization Network (ICON®)

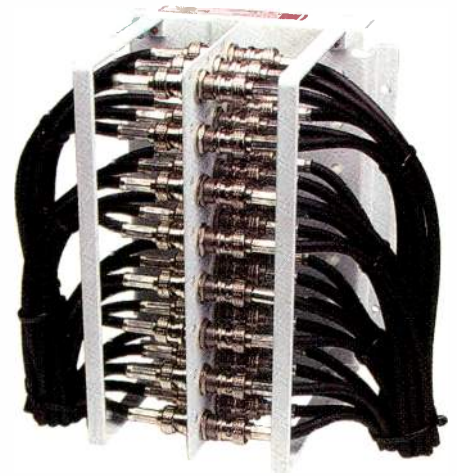
## Wall-Mount Bulkhead Panels

For facilities where rack space is at a premium but wall space is readily available, ADC offers the VIW Video ICON® wall-mount video bulkhead panel series. These tough powder-coated steel panels mount on the wall and provide from eight to 96 video bulkhead connectors for managing cables between racks or between studios. Top-quality 3 GHz bulkhead BNCs ensure the best video performance from analog to HDTV transmission rates.

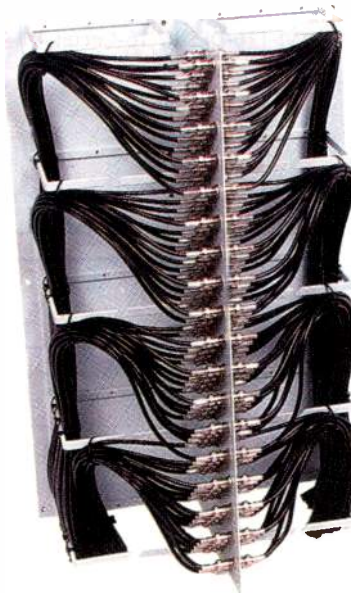
- VIW-8 (1x8) and VIW-408 (4x8) for small applications
- VIW-424 (4x24), VIW-64 (2x32), and VIW-72 for intermediate size applications. The VIW-64 is ideal for managing cables for a 64-input router matrix.
- VIW-96 (3x32) for larger uses, such as organizing inputs and outputs for a large router matrix.
- Cable support bars or rings included on most models



VIW-8  
8 Connector Bulkhead  
Wall-Mount Panel



VIW-24  
24 Connector Bulkhead  
Wall-Mount Panel



VIW-64  
64 Connector Bulkhead  
Wall-Mount Panel



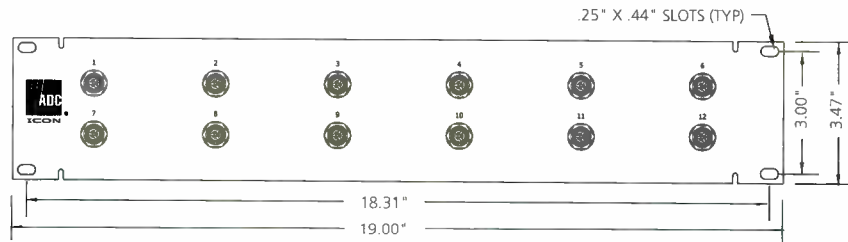
# Video ICON® Bulkhead Panels

ADC offers a wide variety of bulkhead panels featuring our exclusive impedance matched true 75 Ohm bulkhead connector.

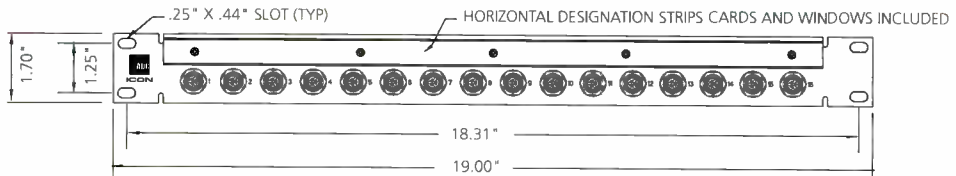
### Features:

- Rack-mount versions in 19" (48.26 cm) or 23" (58.42 cm) 1 RU or 2 RU heights
- Models from 12 to 48 circuits with or without cable trays
- Wall-mount systems from 8 to 96 circuits

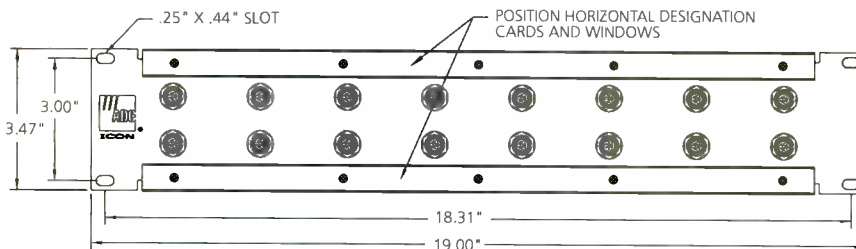
## 19" (48.26 cm) Panels



VI-12-W 12-Circuit 2 RU BNC Bulkhead Panel



VI-116-DES-W 16-Circuit 1 RU BNC Bulkhead Panel



VI-16-PTY 16-Circuit 2 RU BNC Bulkhead Panel

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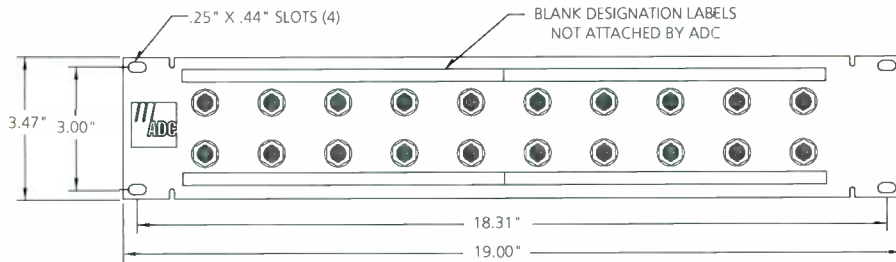


# Video ICON® Bulkhead Panels

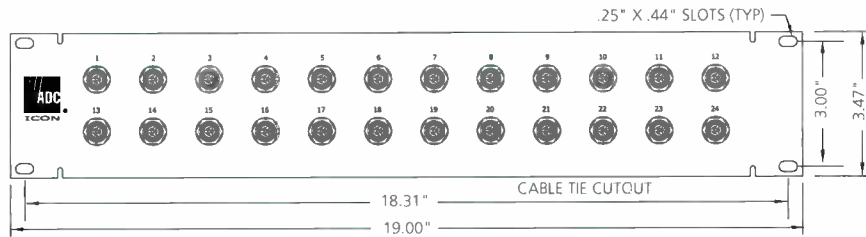
19" (48.26 cm) Panels

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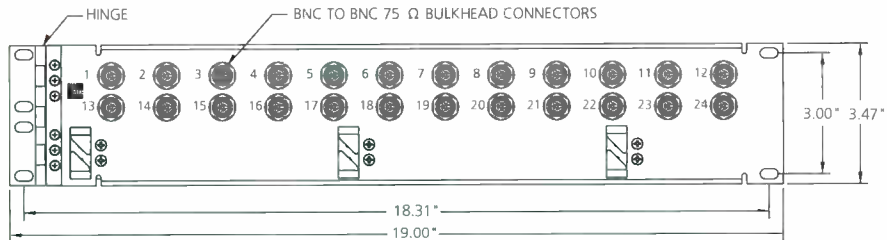
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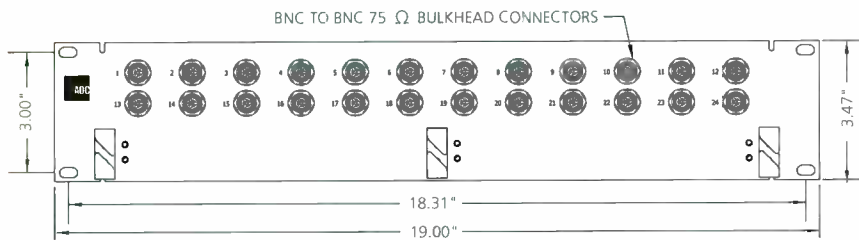
VI-20-PTY



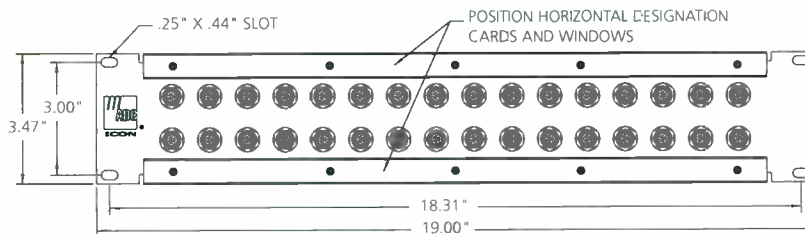
VI-24-PTY



VI-24S



VI-24VHR-BK

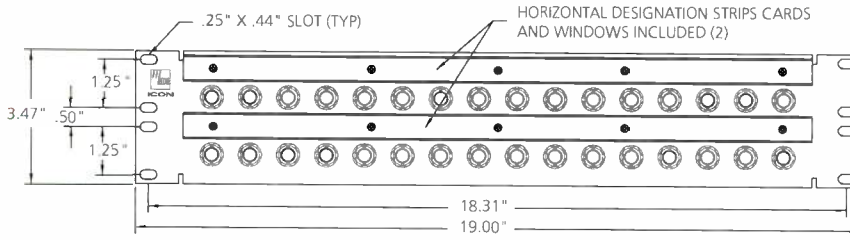


VI-32-BK

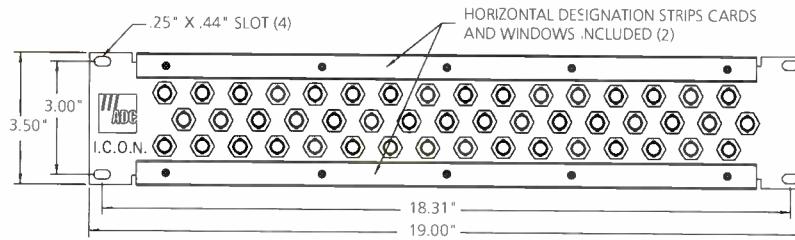


# Video ICON® Bulkhead Panels

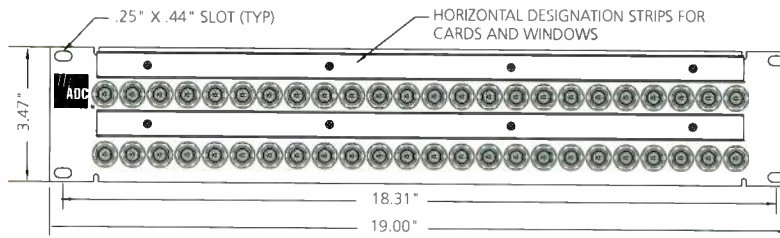
## 19" (48.26 cm) Panels



VI-32-DES-W

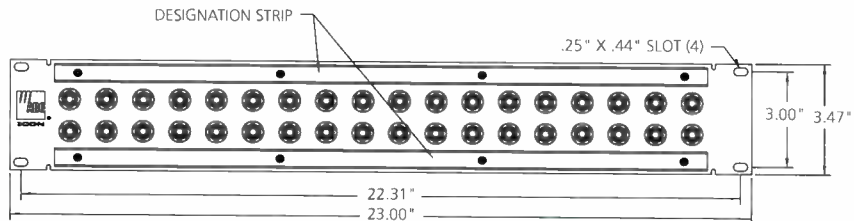


VI-48-BK



VI-48-19-TT-DES-BK

## 23" (58.42 cm) Panels



VI-36-23-DES-PTY

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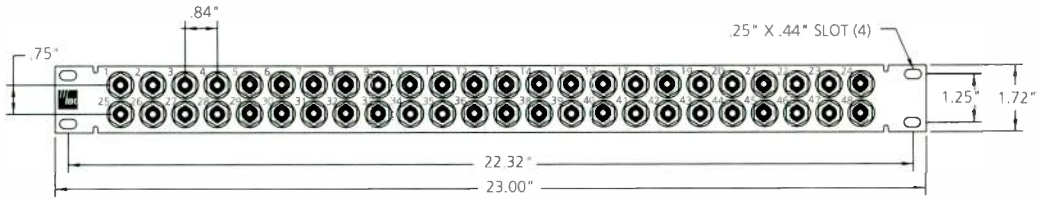


# Video ICON® Bulkhead Panels

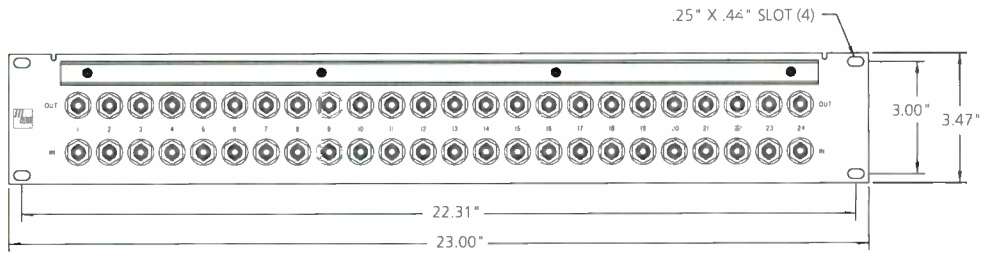
23" (58.42 cm) Panels

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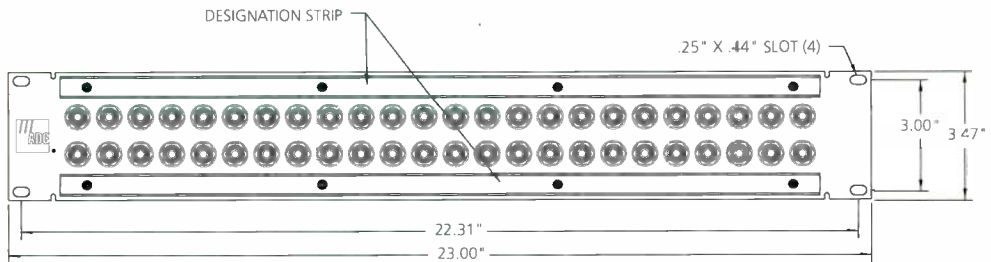
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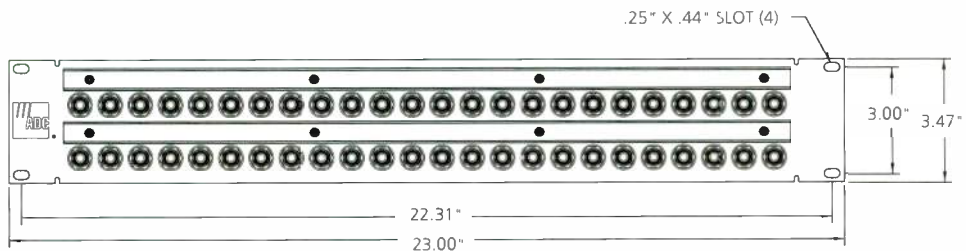
VI-148-23-PTY



BNC-BLK-48-CL



VI-48-23-DES-BK

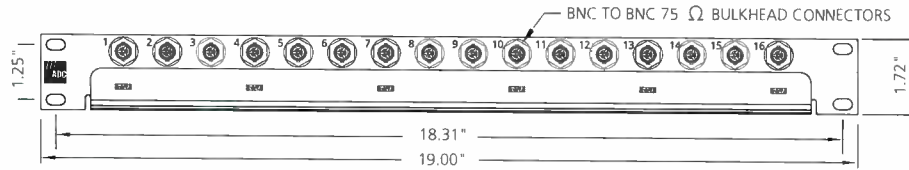


VI-48-23-TT-DES-BK

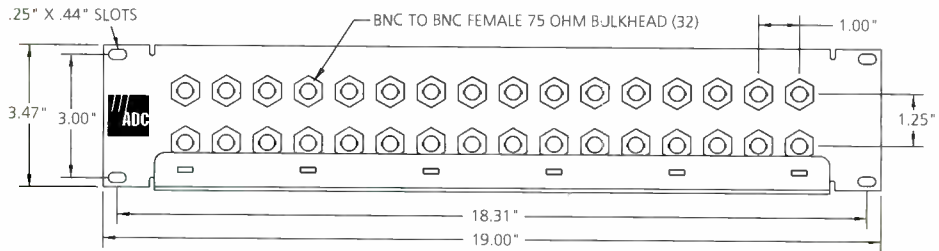


# Video ICON® Bulkhead Panels

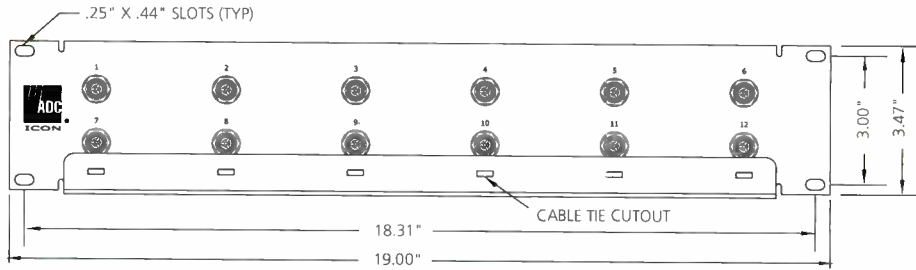
19" (48.26 cm) Panels with Cable Tray



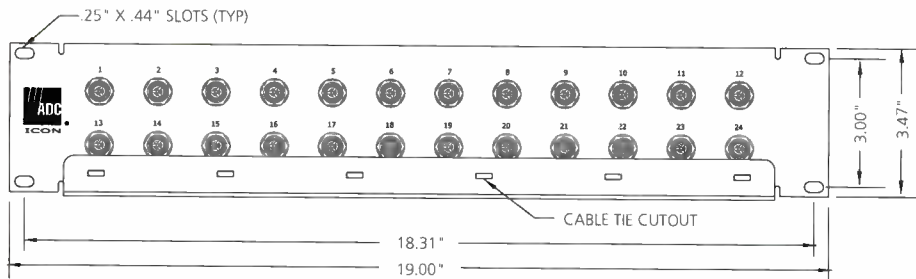
VI-132-TR-BK



BNC-BLK-32-TR75



VI-12-TR-W



VI-24-TR-W

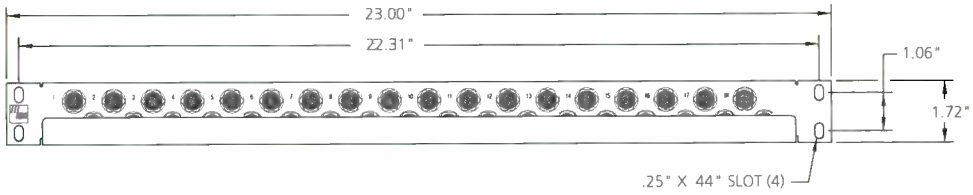
3/03 • 1180270 Broadcast Products



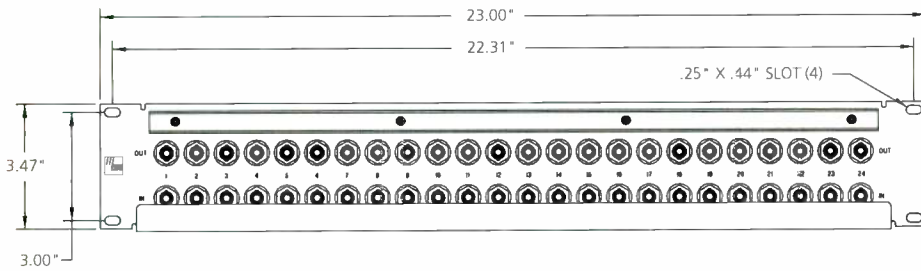
# Video ICON® Bulkhead Panels

## 23" (584.2 mm) Panels with Cable Tray

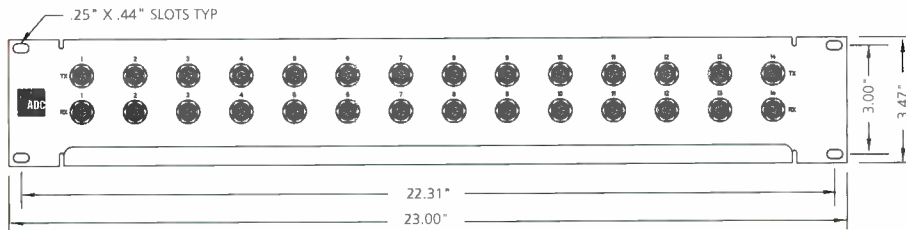
3/03 • 1180270 Broadcast Products



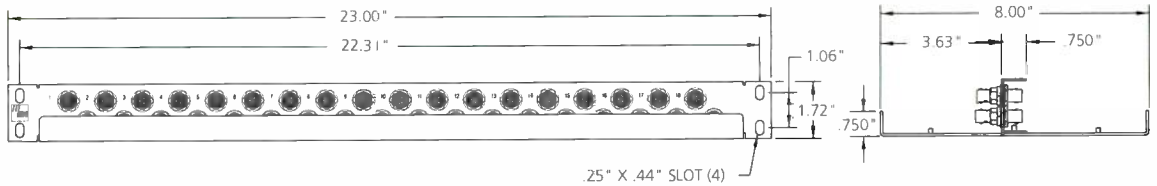
BNC-BLK-36-TR-IU-P



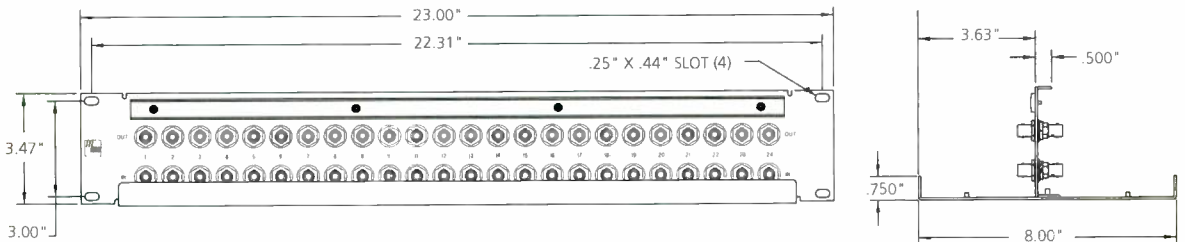
BNC-BLK-48-2U-B



VI-28-BBG



BNC-BLK-36-TR-1U-B

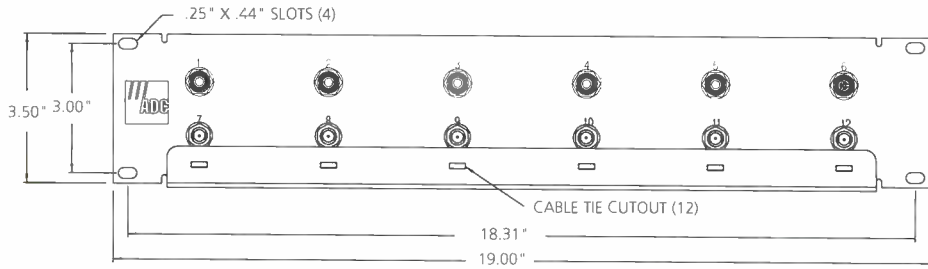


BNC-BLK-48-TR-2U-B

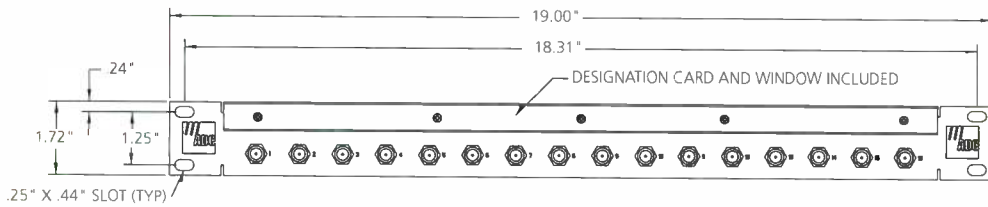


# Video ICON® F Connector Bulkhead Panels

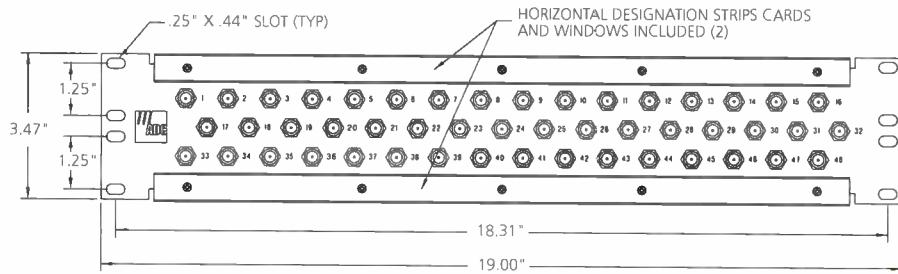
Broadcast Products  
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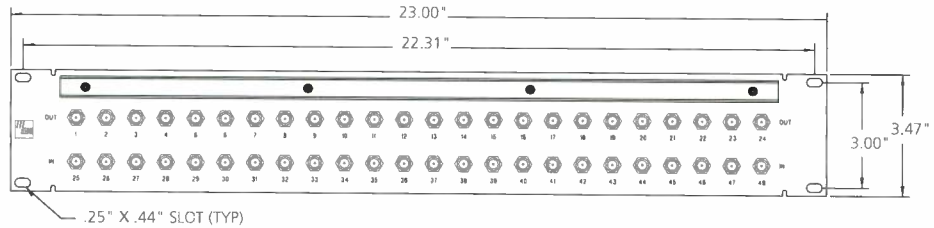
VI-12-BNC-F-W



VI-16F-19-PTY



VI-48F-19-PTY

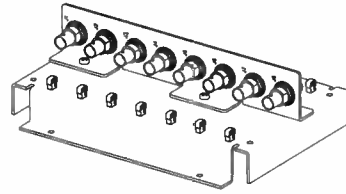
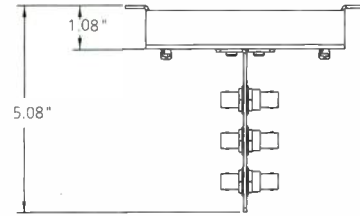
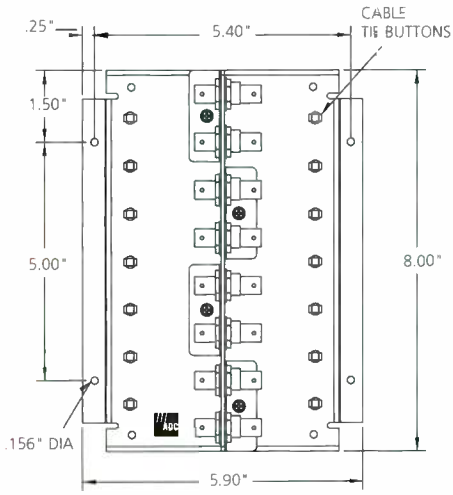


VI-48F-23-PTY

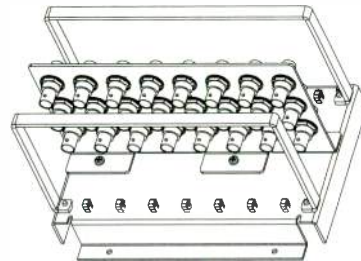
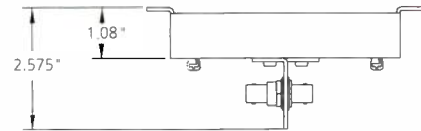
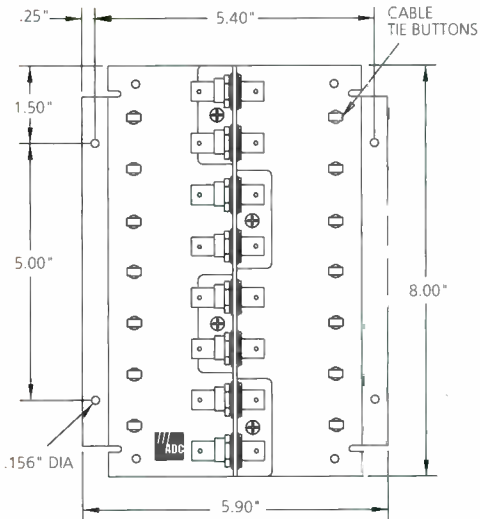


# Video ICON® Wall-Mount Panels

3/03 • 1180270 Broadcast Products



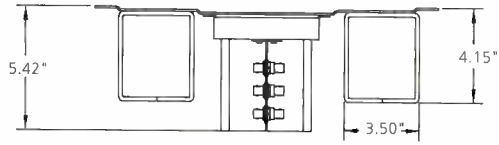
VIW-8



VIW-24



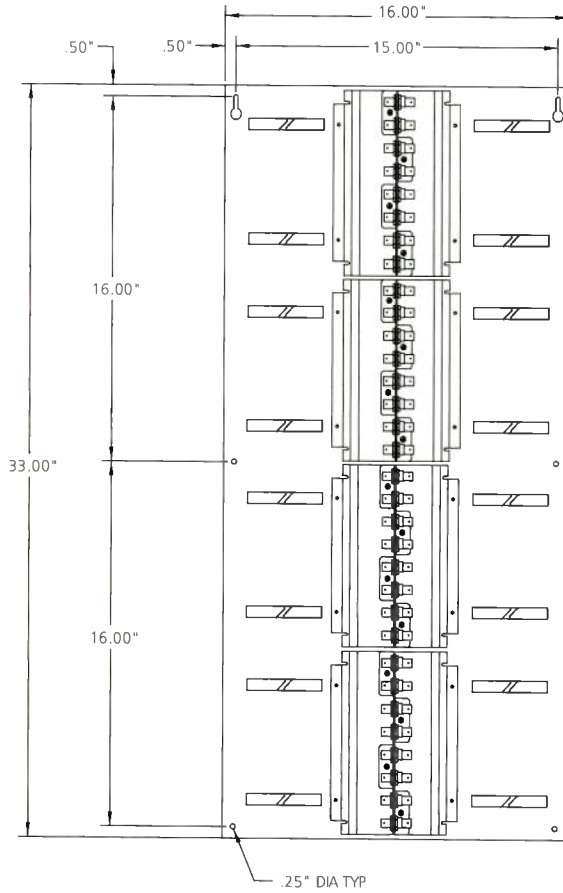
# Video ICON® Wall-Mount Panels



VIW-424



VIW-408



Video ICON VIW-424/408 Wall-Mount Panel Dimensions

3/03 • 1180270 Broadcast Products

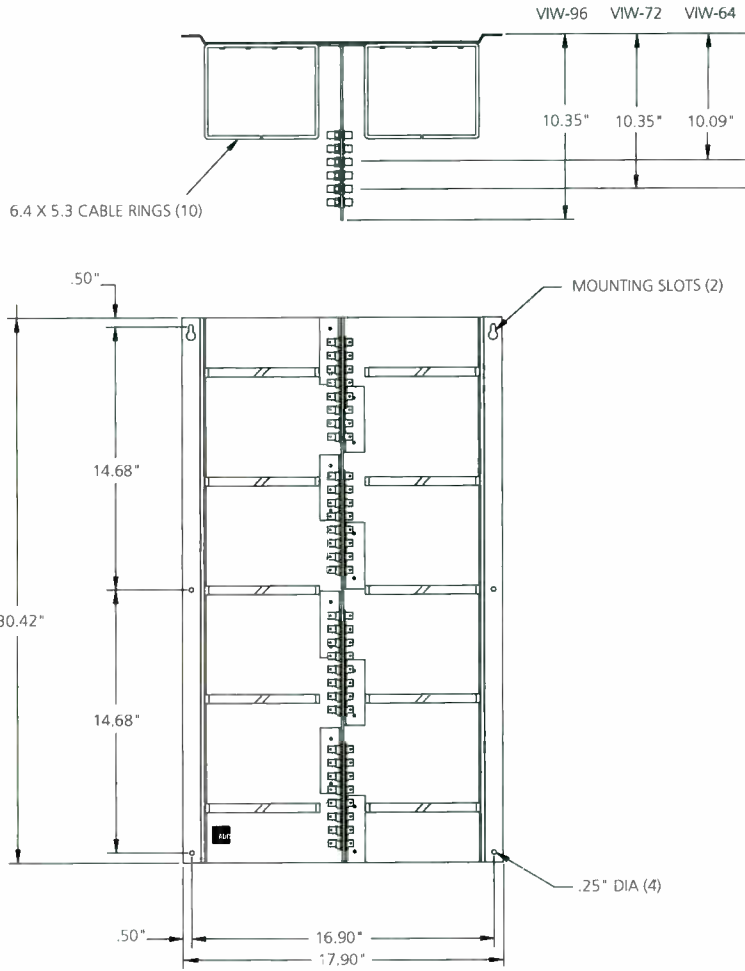




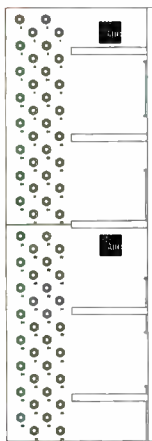
# Video ICON® Wall-Mount Panels

Broadcast Products

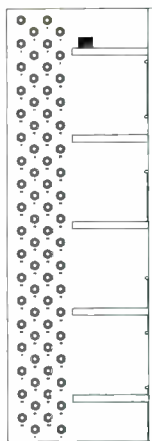
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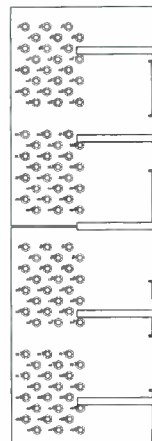
Video ICON VIW-64/72/96 Wall-Mount Panel Dimensions



VIW-64



VIW-72



VIW-96



# Video ICON®

## ICON Video BNC Bulkhead Panels

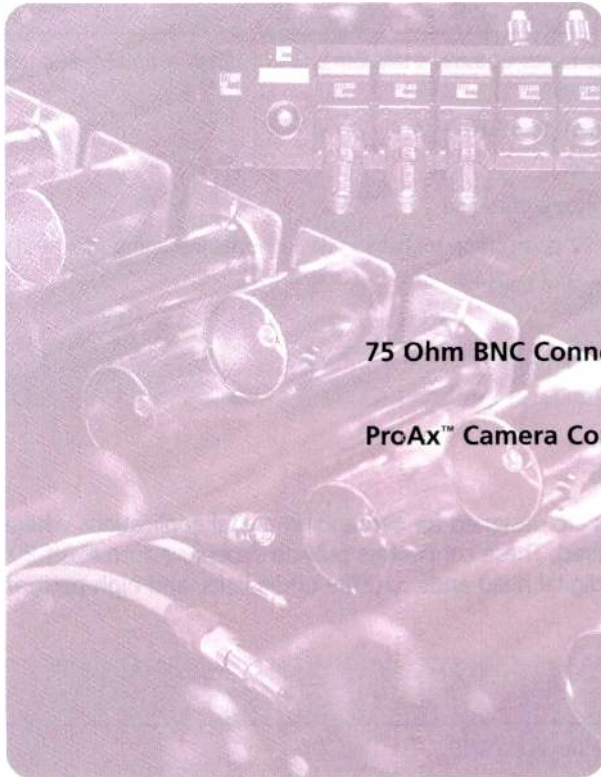
3/03 • 1180270 Broadcast Products

### Ordering Information

Description	Number of Circuits	Ordering Number
<b>75 Ohm 19" Rack Mount BNC Bulkhead Panels</b>		
2 RU 2x6, putty	12	VI-12-PTY
2 RU 2x6, white	12	VI-12-W
1 RU 1x16 with designation strips, white	16	VI-116-DES-W
2 RU 2x8 with designation strips, putty	16	VI-16-PTY
2 RU 2x10 with designation strips, putty	20	VI-20-PTY
2 RU 2x12, putty	24	VI-24-PTY
2 RU 2x12 with vertical and horizontal rings, black	24	VI-24-VHR-BK
2 RU 2x12 hinged left with rings, white	24	VI-24S
2 RU 2x16 with designation strips, black	32	VI-32-BK
2 RU 2x16 with designation strips, putty	32	VI-32-PTY
2 RU 2x16 with upper and lower designation strips, white	32	VI-32-W
2 RU 2x16 with lower and middle designation strips, white	32	VI-32-DES-W
2 RU 3x16 with designation strips, black	48	VI-48-BK
2 RU 3x16 with designation strips, putty	48	VI-48-PTY
2 RU 3x16 with designation strips, white	48	VI-48-W
2 RU 2x24 with designation strips, black	48	VI-48-19-TTDES-BK
2 RU 2x24 with designation strips, gray	48	VI-48-19-TTDES-G
<b>75 Ohm 23" Rack Mount BNC Bulkhead Panels</b>		
2 RU 2x18 with designation strips, putty	36	VI-36-DES-PTY
1 RU 2x24, putty	48	VI-148-23-PTY
2 RU 2x24 with upper designation strips, putty	48	BNC-BLK-48-CL
2 RU 2x24 with upper and lower designation strips, black	48	VI-48-23-DES-BK
2 RU 2x24 with upper and middle designation strips, black	48	VI-48-23-TT-DES-BK
2 RU 2x24 with designation strips, gray	48	VI-48-23-TT-DES-G
2 RU 2x24 with designation strips, white	48	VI-48-23-TT-DES-W
<b>75 Ohm 19" Rack Mount BNC Bulkhead Panels with Cable Tray</b>		
2 RU 2x6 with cable tray, white	12	VI-12-TR-W
2 RU 2x12 with cable tray, white	24	VI-24-TR-W
1 RU 2x16 with cable tray, black	32	VI-132-TR-BK
1 RU 2x16 with cable tray, white	32	VI-132-TR-W
2 RU 2x16 with cable tray, putty	32	BNC-BLK-32-TR75
<b>75 Ohm 23" Rack Mount BNC Bulkhead Panels with Cable Tray</b>		
2 RU 2x14 with cable tray, putty	28	VI-28-BBG
2 RU 2x18 with cable tray, black	36	BNC-BLK-36-TR-1U-B
2 RU 2x18 with cable tray, putty	36	BNC-BLK-36-TR-1U-P
2 RU 2x24 with cable tray, black	48	BNC-BLK-48-TR-2U-B
2 RU 2x24 with cable tray, putty	48	BNC-BLK-48-TR-2U-P
<b>75 Ohm Wall-Mount BNC Bulkhead Panels</b>		
1x8 wall mount bulkhead panel	8	VIW-8
3x8 wall mount bulkhead panel	24	VIW-24
24 circuit bulkhead panel	32	VIW-408
64 circuit bulkhead panel	64	VIW-64
72 circuit bulkhead panel	72	VIW-72
96 circuit bulkhead panel	96	VIW-424
96 circuit bulkhead panel	96	VIW-96
<b>75 Ohm F81 Connector Rack Mount Bulkhead Panels</b>		
2 RU 1x6 BNC, 1x6 F81 with tray, white	12	VI-12-BNC-F-W
1 RU 19" 1x16 F81 panel with designation strip, putty	16	VI-16F-19-PTY
2 RU 19" 3x16 F81 panel with designation strip, putty	48	VI-48F-19-PTY
2 RU 23" 2x24 panel with designation strip, putty	48	VI-48F-23-PTY



# 4C essories



**75 Ohm BNC Connectors and F Connectors**

**93**

**ProAx™ Camera Connectors**

**107**



# Connector Products

## 75 Ohm BNC Connectors



ADC's BNC connectors are the most reliable and universally accepted method of terminating coaxial cable in the market today. Outstanding electrical performance (up to 3 GHz) is achieved by unique design elements in the industry's truest 75 Ohm connector. Precision-molded insulators with locking gold-plated center conductors ensure true 75 Ohm characteristic impedance. Innovative features result in significant reduction of impedance mismatch throughout the network and improved transmission reliability in digital applications.

### Features

- Designed to exceed the rigorous demands of today's telecom and broadcast environment including SMPTE 259, 274, and 292M standards
- Outstanding electrical performance up to 3 GHz
- Gold-plated, locking center conductor
- True 75 Ohm characteristic impedance end-to-end
- Compatible with hex, square, and 12-point crimp tools and select competitive crimp tools and die sets
- Tarnish-resistant, nickel-plated body and bayonet
- Sizes for multiple cable types
- Meets or exceeds MIL-C39012 requirements

## New ADC F Connectors

ADC's high-performance F connectors are designed for demanding digital applications where a high-quality, high-performance F connector is required. These connectors provide superior return loss (-30 dB to 3 GHz) and are the perfect choice for use in digital head-ends, satellite down links, and high performance customer premises applications.

### Features

- All-crimp two-piece design goes together like a BNC
- Combines the superior electrical performance of a BNC with the superior RF performance of an F connector
- True-75 Ohm design for performance up to 3 GHz
- Crimp-on center pin provides superior connection rather than relying on the copper center conductor of the cable
- Gold-plated locking center pin just like a BNC connector
- Diamond-knurled crimp hub and long .500" crimp sleeve provides higher pull-off force than typical F connector types
- Long 3/8" wrench flats make for a more comfortable and easier connector to thread
- Precision machined parts for greater unit to unit consistency
- Exclusive molded Ultem center conductor insulator provides a truer impedance match over PVC and Teflon types
- Same strip and crimp dimensions as our standard BNC plugs
- Cable sizes for RG59, RG187, and RG6 available
- Precision .1% termination plugs also available



## 75 Ohm BNC Connectors

For all types of digital applications, ADC's true 75 Ohm BNC connector products ensure outstanding electrical performance, improved transmission, and enhanced reliability. ADC offers a complete line of straight, right angle, and bulkhead connectors, complemented by adapters, terminating plugs, and accessories.

- True 75 Ohm characteristic impedance through the entire connector
- Outstanding electrical performance to 3 GHz
- Tarnish-resistant, nickel-plated body and bayonet
- Compatible with select competitive crimp tools and die sets
- Sizes for multiple cable types
- Meets or exceeds all requirements in MIL-C-39012

### Straight BNC Plug Connectors

#### Features

- Designed to exceed the rigorous demands of today's broadcast environment, including SMPTE 259, 274, and 292M standards
- Gold-plated, locking center conductor
- .625" crimp sleeve for greater pulloff force
- 100 percent guided mating
- Compatible with telco 12-point crimp tools
- Strip lengths common between sizes and types (except for Belden 7731/Commscope 7530, RG11 Cable)



### Right Angle BNC Plug Connectors

#### Features

- Right angle design alleviates stress associated with bending cable
- Provides increased density
- Improves overall cable management
- Bulk packaging available
- Center conductor pins and crimp sleeves are fully interchangeable with ADC's straight plugs for same cable type



### Bulkhead Jack Connectors

#### Features

- Easier, more reliable termination; gold-plated locking center conductor ensures proper alignment during termination
- 100 percent guided mating
- Exclusive closed-entry contact prevents center conductor damage from non-standard BNCs or test probes
- Eliminates one termination point when used as a bulkhead connector





# 75 Ohm BNC Connectors

## Ordering Information

Below is an ordering guide that will help you select the BNC connectors that best meet your needs. Simply select the connector type, diameter, crimp area and cable type to determine the correct ADC ordering number.

Ordering Number	Connector Type	Cable Outer Jacket Diameter				Center Conductor Outside Diameter				
		Inch Range		MM Range		AWG (USA)	Inch Range		MM Range	
		Lower	Upper	Lower	Upper		Lower	Upper	Lower	Upper
BNC-1	Straight Plug	0.235	0.245	5.97	6.22	20	0.030	0.033	0.76	0.83
BNC-2	Straight Plug	0.220	0.242	5.59	6.15	23	0.022	0.025	0.56	0.62
BNC-3	Straight Plug	0.127	0.127	3.23	3.23	26	0.015	0.018	0.38	0.44
BNC-4	Straight Plug	0.305	0.305	7.75	7.75	20	0.030	0.033	0.76	0.83
BNC-5	Straight Plug	0.270	0.270	6.86	6.86	20	0.030	0.033	0.76	0.83
BNC-6	Straight Plug	0.199	0.212	5.05	5.38	20	0.030	0.033	0.76	0.83
BNC-7	Straight Plug	0.155		3.94		24	0.019	0.022	0.48	0.55
BNC-8	Straight Plug	0.275		6.99		18	0.038	0.040	0.97	1.02
BNC-9	Straight Plug	0.275	0.335	6.99	7.75	18	0.038	0.040	0.97	1.02
BNC-10	Straight Plug	0.280		7.11		18	0.038	0.040	0.97	1.02
BNC-11	Straight Plug	0.265		6.73		23	0.022	0.025	0.56	0.62
BNC-12	Straight Plug	0.150		3.81		25	0.017	0.019	0.43	0.47
BNC-13	Straight Plug	0.146		3.71		24	0.019	0.022	0.48	0.55
BNC-15	Straight Plug	0.193	0.232	4.90	5.89	24	0.019	0.022	0.48	0.55
BNC-16	Straight Plug	0.103	0.110	2.62	2.79	26	0.015	0.018	0.38	0.44
BNC-17	Straight Plug	0.271	0.271	6.88	6.88	20	0.030	0.033	0.76	0.83
BNC-19	Straight Plug	0.125		3.18		24	0.019	0.022	0.48	0.55
BNC-20	Straight Plug	0.249		6.32		18	0.038	0.040	0.97	1.02
BNC-22	Straight Plug	0.149		3.78		25	0.017	0.019	0.43	0.47
BNC-25	Straight Plug	0.400		10.16		14	0.064		1.63	
BNC-26	Straight Plug	0.177		4.50		23	0.024		0.61	
BNC-27	Straight Plug	0.310	0.326	7.87	8.28	16	0.051		1.30	
BNC-28	Straight Plug	0.077		1.96		26	0.018		0.46	
BNC-29	Straight Plug	0.292	0.308	7.41	7.83	18	0.040		0.97	
BNC-RA-1	Right Angle Plug	0.235	0.245	5.97	6.22	20	0.030	0.033	0.76	0.83
BNC-RA-2	Right Angle Plug	0.220	0.242	5.59	6.15	23	0.022	0.025	0.56	0.62
BNC-RA-3	Right Angle Plug	0.127	0.127	3.23	3.23	26	0.015	0.018	0.38	0.44
BNC-RA-4	Right Angle Plug	0.305	0.305	7.75	7.75	20	0.030	0.033	0.76	0.83
BNC-RA-7	Right Angle Plug	0.155		3.94		24	0.019	0.022	0.48	0.55
BNC-RA-8	Right Angle Plug	0.275		6.99		18	0.038	0.040	0.97	1.02
BNC-BHJ-8	Brkhead Jack	0.275		6.99		18	0.038	0.040	0.97	1.02
BNC-BHJ-13	Brkhead Jack	0.146		3.71		24	0.019	0.022	0.48	0.55
CF-1	F Style	0.235	0.245	5.97	6.22	20	0.030	0.033	0.76	0.83
CF-5	F Style	0.270	0.270	6.86	6.86	20	0.030	0.033	0.76	0.83
CF-8	F Style	0.275		6.99		18	0.038	0.040	0.97	1.02
CF-13	F Style	0.146		3.71		24	0.019	0.022	0.48	0.55



# 75 Ohm BNC Connectors

In addition to the .042" square pin crimp, all connectors listed are compatible with a 12-point method of crimping or .042" hex crimp. All ADC BNC connector plugs use the same crimp dimensions and crimp tools for the same cable type.

Bulk packaging in quantities of 100 is available (package includes 100 connector bodies, 100 center pins, and 100 crimp sleeves bagged separately). For bulk packaging add "B" to the end of the ordering number. Example: BNC-13B.

Cable Dielectric Outside Diameter				Connector Crimp Areas				Crimp Die Ordering Number	Cable Type Ordering Number	Ordering Number
Inch Range		MM Range		Hex Flats Distance		Center Pin				
Lower	Upper	Lower	Upper	Inch	MM	Inch	MM			
0.140	0.150	3.56	3.81	0.255	6.48	.042	1.07	WD-1, WD-2, WD-3, WD-5	73-, 1505A, VPM2000, 734A1P, VE61859M	BNC-1
0.140	0.150	3.56	3.81	0.255	6.48	.042	1.07	WD-1, WD-2, WD-3, WD-5	RG59, 9209, 8279, 8241, VJ59U	BNC-2
0.077		1.96		0.178	4.52	.042	1.07	WD-2	735, NT735	BNC-3
0.185	0.198	4.70	5.03	0.324	8.23	.042	1.07	WD-1	718, 8281B, 8281F, VP618PE, VP618M	BNC-4
0.144		3.66		0.324	8.23	.042	1.07	WD-1	1187A, HEC-2, F-HEC59	BNC-5
0.135	0.140	3.43	3.56	0.255	6.48	.042	1.07	WD-1, WD-2, WD-3, WD-5	1506A, 1824A, VPM2000TS, VPM2000TK	BNC-6
0.095		2.41		0.178	4.52	.042	1.07	WD-2	8218, 7538, 0222	BNC-7
0.180		4.57		0.278	7.06	.042	1.07	WD-4	694A, VSD2001, VSD2001TS, 9058	BNC-8
0.180	0.198	4.57	5.03	0.324	8.23	.042	1.07	WD-1	1189A	BNC-9
0.180		4.57		0.255	6.48	.042	1.07	WD-1, WD-2, WD-3, WD-5	1695A, VSD2001TS	BNC-10
0.142		3.61		0.324	8.23	.042	1.07	WD-1	9268, S-HEC 89, 6605	BNC-11
0.099		2.51		0.178	4.52	.042	1.07	WD-2	1865, 8218, 7537, RGB250	BNC-12
0.090		2.29		0.178	4.52	.042	1.07	WD-2	1855A, RGB5250, VDM250D, VDM230	BNC-13
0.122		3.10		0.255	6.48	.042	1.07	WD-1, WD-2, WD-3, WD-5	9209, 82241, 2041, V618M59TK	BNC-15
0.06	0.07	1.52	1.78	0.178	4.52	.042	1.07	WD-2	8216, 9239, 83269, RGBSC260TS	BNC-16
0.185	0.198	4.70		0.324	8.23	.042	1.07	WD-1	88281, VP618TK	BNC-17
0.078		1.98	5.03	0.178	4.52	.042	1.07	WD-2	LL79301	BNC-19
0.182		4.62		0.278	7.06	.042	1.07	WD-4	8228, 82120	BNC-20
0.098		2.49		0.178	4.52	.042	1.07	WD-2	1167A, 14188 RGB	BNC-22
0.280		7.11		0.278	7.06	.068	1.73	WD-6	7731A, 5906, VHD1100, 89292	BNC-25
0.110		2.79		0.197	5.00	.042	1.07	WD-3, WD-4	1880A, SDV-25	BNC-26
0.225		5.72		0.278	7.06	.042	1.07	WD-4	1800A, 7530, VHD7000, 7855A	BNC-27
0.120		3.05		0.178	4.52	.042	1.07	WD-2	LL92833	BNC-28
0.180		4.57		0.324	8.23	.042	1.07	WD-1	5740, 5741	BNC-29
0.140	0.150	3.56	3.81	0.255	6.48	.042	1.07	WD-1, WD-2, WD-3, WD-5	734, 9259, 1505A, 9100, VPM2000	BNC-RA-1
0.140	0.150	3.56	3.81	0.255	6.48	.042	1.07	WD-1, WD-2, WD-3, WD-5	RG59, 9209, 8279	BNC-RA-2
0.077		1.96		0.178	4.52	.042	1.07	WD-2	735, NT735	BNC-RA-3
0.185	0.198	4.70	5.03	0.324	8.23	.042	1.07	WD-1	8281B, 8281F, VP618PE, VP618M	BNC-RA-4
0.095		2.41		0.178	4.52	.042	1.07	WD-2	8218, 1855A, 7538	BNC-RA-7
0.180		4.57		0.278	7.06	.042	1.07	WD-4	1694A, VSD2001	BNC-RA-8
0.180		4.57		0.278	7.06	.042	1.07	WD-4	1694A, VSD2001	BNC-BHJ-8
0.090		2.29		0.178	4.52	.042	1.07	WD-2	1865, 1855A, RGBSC250	BNC-BHJ-13
0.140	0.150	3.56	3.81	0.255	6.48	.042	1.07	WD-1, WD-2, WD-3, WD-5	734, 1505A, VPM2000, 734A1P, VE61859M	CF-1
0.144		3.66		0.324	8.23	.042	1.07	WD-1	1187A, HEC-2, F-HEC59	CF-5
0.180		4.57		0.278	7.06	.042	1.07	WD-4	1694A, VSD2001, VSD2001TS, 9058	CF-8
0.090		2.29		0.178	4.52	.042	1.07	WD-2	1855A, RGB5250, VDM250D, VDM230	CF-13

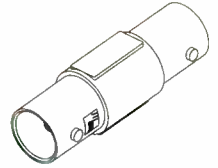


# 75 Ohm BNC Connectors

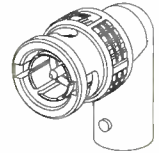
## BNC Adapters and Bulkheads

### Features

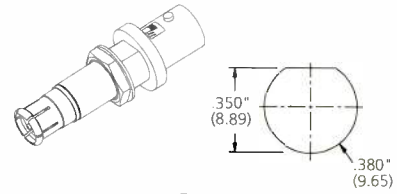
- Improved performance – true 75 Ohm character impedance
- Outstanding electrical performance to 3 GHz
- Bulkhead feedthrough available with or without panel isolation
- Meets the performance requirements of MIL-A-55339 for radio frequency coaxial adapters
- Gold-plated, closed-entry contact center conductor to prevent damage during test or mating plug termination



BNC-STRT-ADP  
Straight Adapter



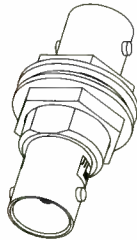
BNC-RA-ADP  
Right Angle Adapter



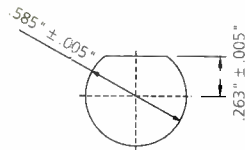
BHFT-MF

### Ordering Information

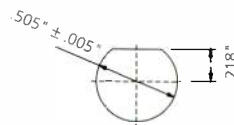
Description	Ordering Number
BNC straight adapter	BNC-STRT-ADP
BNC right angle adapter	BNC-RA-ADP
Bulkhead feedthrough, for .505"/.585" cutout	BHFT1
Bulkhead feedthrough, for .440"/.505" cutout	BHFT-I2
Bulkhead feedthrough with panel isolation washers	BHFT-I1
Bulkhead male to female	BHFT-MF



BHFT-I1



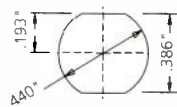
RECOMMENDED PANEL CUTOUT  
WITH INSULATING WASHER  
(MAX THICKNESS .250)



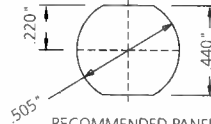
RECOMMENDED PANEL CUTOUT  
WITHOUT INSULATING WASHER  
(MAX THICKNESS .250)



BHFT-I2



RECOMMENDED PANEL CUTOUT  
WITHOUT ISOLATION WASHER  
(MAX PANEL THICKNESS: .250)



RECOMMENDED PANEL CUTOUT  
WITH ISOLATION WASHER  
(MAX PANEL THICKNESS: .250)

## BNC Terminating Plugs

### Ordering Information

Description	Ordering Number
BNC terminating plug, precision .1% 75 Ohm resistor	BNC-TP2
precision 1% 75 Ohm resistor	BNC-TP1



BNC-TP2 Terminating Plug

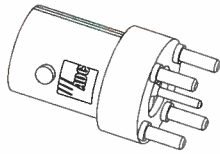


# 75 Ohm BNC Connectors

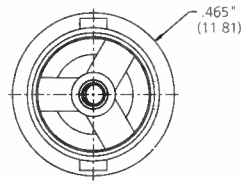
## PCB Mount BNC Connectors

### Ordering Information

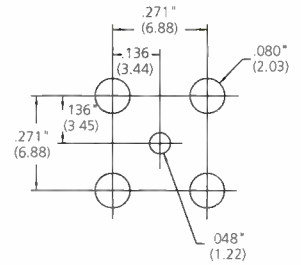
Description	Ordering Number
BNC PC mount straight staked	BNC-PC-V1
BNC PC mount threaded right angle	BNC-PC-RTRA
BNC PC mount threaded straight	BNC-PC-STRT
BNC PC mount right angle screw mount	BNC-PC-RRA
BNC PC mount right angle screw mount with screw	BNC-PC-RRA-1



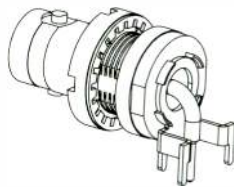
BNC-PC-V1



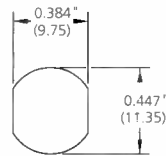
Hole Cutout



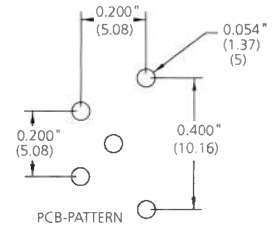
Mounting Template



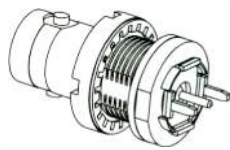
BNC-PC-RTRA



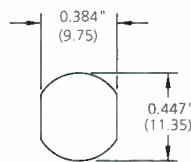
Hole Cutout



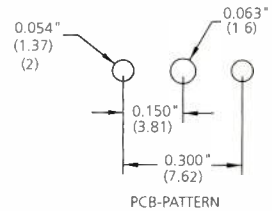
Mounting Template



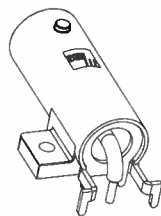
BNC-PC-STRT



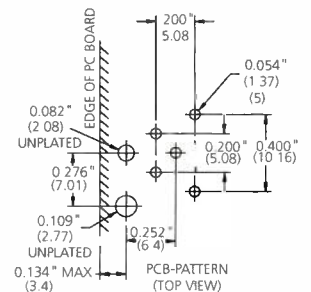
Hole Cutout



Mounting Template



BNC-PC-RRA



Mounting Template



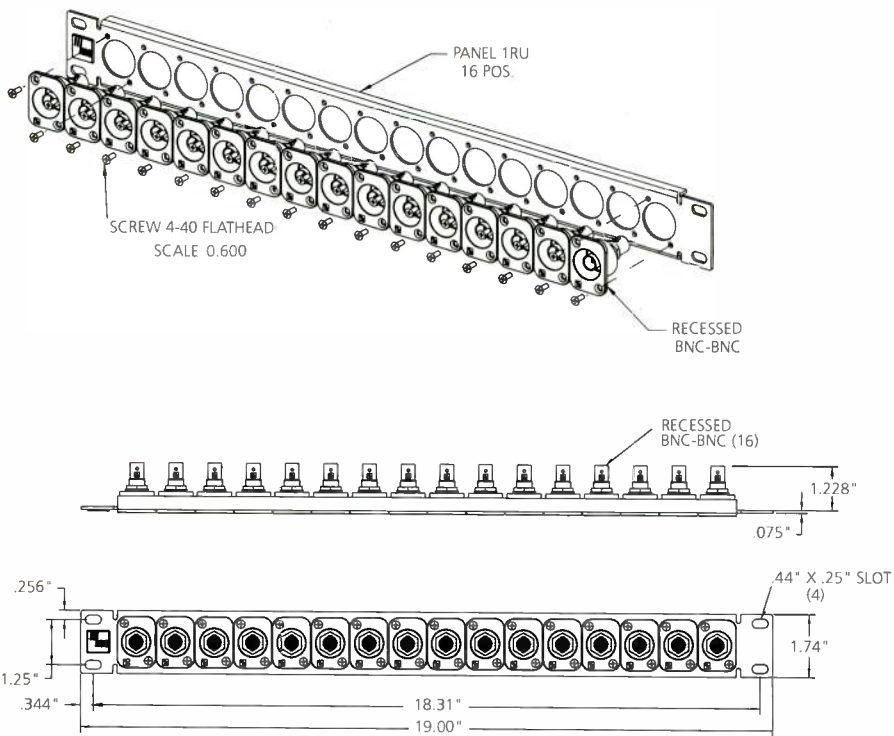
# 75 Ohm BNC Connectors

## Recessed BNC Panels and Connectors

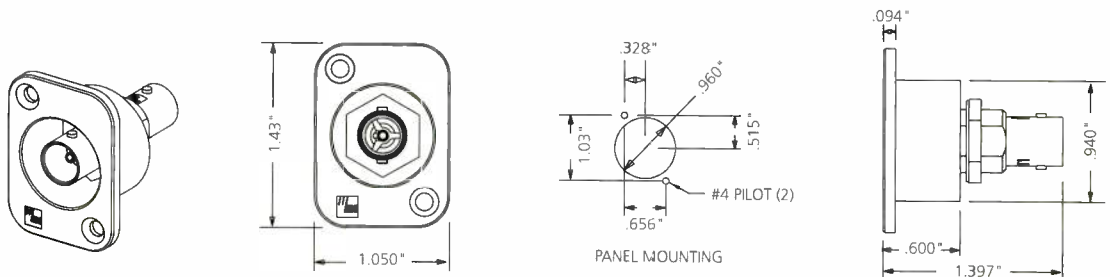
### Ordering Information

Description	Ordering Number
16-position empty, 1 RU, black - for BHFT-R-X	BHFT-PNL-16-BK
16-position empty, 1 RU, gray - for BHFT-R-X	BHFT-PNL-16-G
BNC Recessed, 75 Ohm feedthrough	BHFT-R-X*
Recessed RCA connector	RCA-R-X*
Recessed S-video connector	SV-R-X*

\* Replace X in ordering number with desired color. (G=green, R=red, B=black, BL=blue, W=white, Y=yellow)



BHFT-PNL-16-BK



BHFT-RX

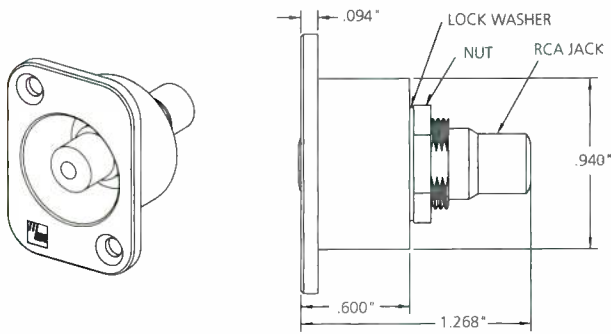
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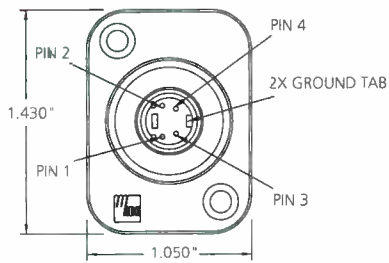
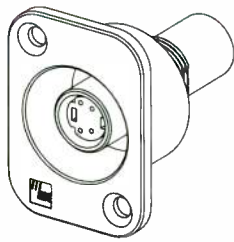


# 75 Ohm BNC Connectors

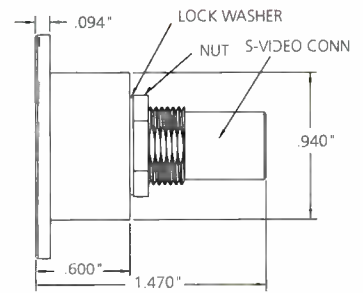
## Recessed Components



RCA-R-X



SV-R-X



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# 75 Ohm BNC Connectors

## Modular Bulkhead Panels

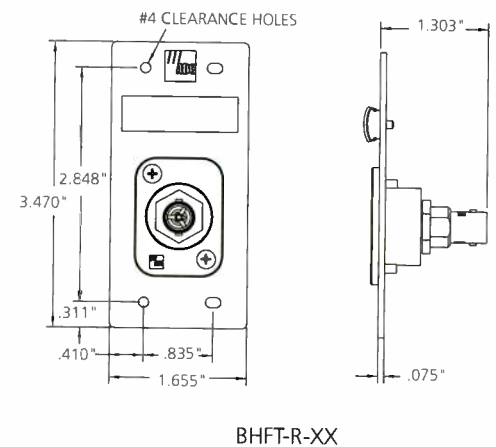
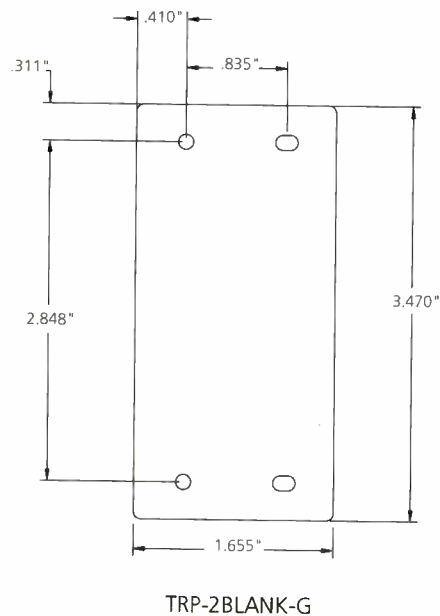
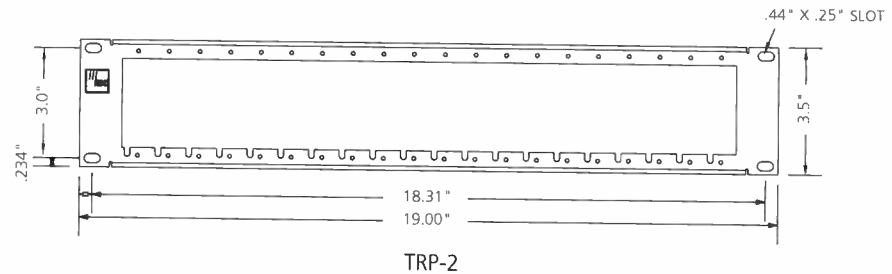
### Ordering Information

Description	Ordering Number
Empty panel, 2 RU - For triax/BNC 3.47" x 19", black	TRP-2-BK
Empty panel, 2 RU - For triax/BNC 3.47" x 19", gray	TRP-2-G
Blank mounting plate, black TRP-2	TRP-2BLANK-BK
Blank mounting plate, gray TRP-2	TRP-2BLANK-G
Module with (2) 75 Ohm BNC feedthrough, black	TRP-2BNCFT-2-BK
Module with (2) 75 Ohm BNC feedthrough, gray	TRP-2BNCFT-2-G
Module with (1) 75 Ohm BNC feedthrough, black	TRP-2BNCFT-BK
Module with (1) 75 Ohm BNC feedthrough, gray	TRP-2BNCFT-G
Mounting plate, 2 RU - For BHFT-R-X-BLACK	TRP-2RBNC-BLANK-BK
Mounting plate, 2 RU - For BHFT-R-X-GRAY	TRP-2RBNC-BLANK-G

Information on triax connectors is available beginning on page 107.

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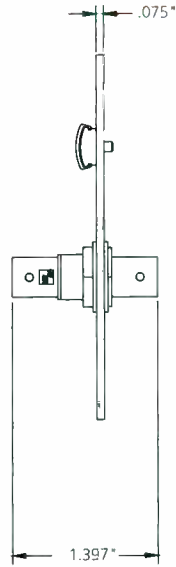
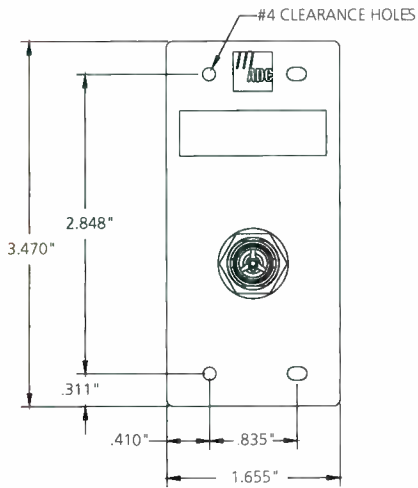




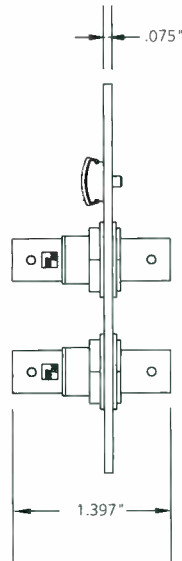
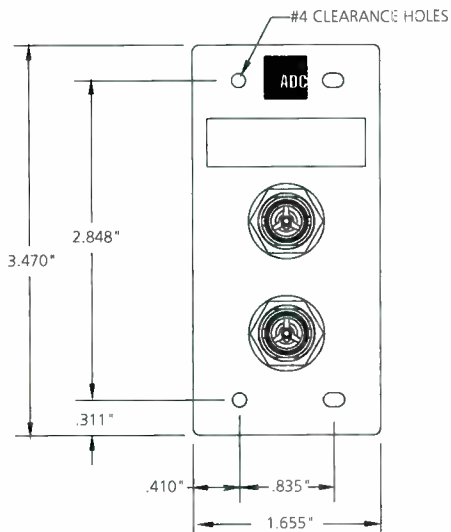
# 75 Ohm BNC Connectors

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TRP-2BNCFT-x



TRP-2BNCFT-2-x



# 75 Ohm BNC Connectors

## BNC Crimping Tool

### Features

- Durable ergonomic handle provides greater comfort
- Fully adjustable for preloading to maintain die set alignment
- Exceptional life, rated for 100 000 crimp cycles
- Available in two handle sizes
- Highest mechanical advantage in the industry, reduces fatigue during crimping



BNC Crimping Tool  
WT-2

Broadcast Products

### Ordering Information

Description	Ordering Number
Crimp tool with ergonomic handle for ADC die sets	WT-2
Crimp tool with long ergonomic handle for ADC die sets	WT-3
BNC insertion tool with 12" handle	BT2000
BNC insertion tool with 24" handle	BT2000-24



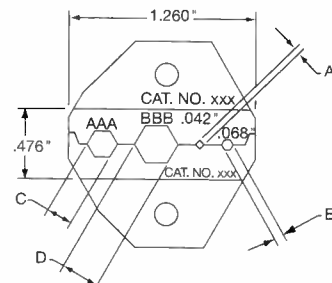
BNC Insertion Tool  
BT2000

## BNC Die Sets

### Ordering Information

Ordering Number Die Set	A Center Wire	B Center Wire	C Crimp Sleeve	D Crimp Sleeve
WD-1	.042"/1.07 mm	.068"/1.73 mm	0.255"/6.48 mm	0.324"/8.23 mm
WD-2	.042"/1.07 mm	.068"/1.73 mm	0.178"/4.52 mm	0.255"/6.48 mm
WD-3	.042"/1.07 mm	.068"/1.73 mm	0.197"/5.00 mm	0.255"/6.48 mm
WD-4	.042"/1.07 mm	.068"/1.73 mm	0.197"/5.00 mm	0.278"/7.06 mm
WD-5	.042"/1.07 mm	.068"/1.73 mm	0.255"/6.48 mm	0.278"/7.06 mm
WD-6	.068"/1.73 mm		0.384"/9.76mm	
WD-1-SER*	.042"/1.07 mm	.068"/1.73 mm	0.255"/6.48 mm	0.324"/8.23 mm
WD-2-SER*	.042"/1.07 mm	.068"/1.73 mm	0.178"/4.52 mm	0.255"/6.48 mm

\* SER units feature a unique serial number that imprints on the crimp sleeve. This is useful for tracking tooling or installation quality.



Die Set Dimensions

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# 75 Ohm BNC Connectors

## Hand Crimp Tool

### Ordering Information

Hand Crimp Tool Ordering Number	Connector Ordering Number	Die Set Ordering Number	Station Dimensions	
			Center Conductor	Crimp Sleeve
WT-2 Ergonomic Handle	BNC-1/BNC-RA-1/CF-1	WD-1, WD-2, WD-3, WD-5	.042"/1.07 mm	0.255"/6.48 mm
	BNC-2/BNC-RA-2	WD-1, WD-2, WD-3, WD-5	.042"/1.07 mm	0.255"/6.48 mm
WT-3 Long Ergonomic Handle	BNC-3/BNC-RA-3	WD-2	.042"/1.07 mm	0.178"/4.52 mm
	BNC-4/BNC-RA-4	WD-1	.042"/1.07 mm	0.324"/8.23 mm
	BNC-5/CF-5	WD-1	.042"/1.07 mm	0.324"/8.23 mm
	BNC-6	WD-1, WD-2, WD-3, WD-5	.042"/1.07 mm	0.255"/6.48 mm
	BNC-7/BNC-RA-7	WD-2	.042"/1.07 mm	0.178"/4.52 mm
	BNC-8/BNC-RA-8/BNC-BHJ-8/CF-8	WD-4	.042"/1.07 mm	0.278"/7.06 mm
	BNC-9	WD-1	.042"/1.07 mm	0.324"/8.23 mm
	BNC-10	WD-1, WD-2, WD-3, WD-5	.042"/1.07 mm	0.255"/6.48 mm
	BNC-11	WD-1	.042"/1.07 mm	0.324"/8.23 mm
	BNC-12	WD-2	.042"/1.07 mm	0.178"/4.52 mm
	BNC-13/BNC-BHJ-13/CF-13	WD-2	.042"/1.07 mm	0.178"/4.52 mm
BNC-15	WD-1, WD-2, WD-3, WD-5	.042"/1.07 mm	0.255"/6.48 mm	
BNC-16	WD-2	.042"/1.07 mm	0.178"/4.52 mm	
BNC-17	WD-1	.042"/1.07 mm	0.324"/8.23 mm	
BNC-19	WD-2	.042"/1.07 mm	0.178"/4.52 mm	
BNC-20	WD-4	.042"/1.07 mm	0.278"/7.06 mm	
BNC-22	WD-2	.042"/1.07 mm	0.178"/4.52 mm	
BNC-25	WD-6	.042"/1.07 mm	0.384"/9.76 mm	
BNC-26	WD-3, WD-4	.042"/1.07 mm	0.197"/5.00 mm	
BNC-27	WD-4	.042"/1.07 mm	0.278"/7.06 mm	
BNC-28	WD-2	.042"/1.07 mm	0.178"/4.52 mm	
BNC-29	WD-1	.042"/1.07 mm	0.324"/8.23 mm	

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# 75 Ohm BNC Connectors

## Cable Stripper Tool Kit

### Ordering Information

Description	Connector Type	Ordering Number
<b>Complete Manual Stripper Tool Kit</b> Includes stripper cassette, memory and tool	BNC-3, BNC-7, BNC-12, BNC-13	STC-13B
	BNC-1, BNC-2, BNC-6, BNC-10	STC-12B
	BNC-4, BNC-5, BNC-8, BNC-9, BNC-11, BNC-17	STC-11B

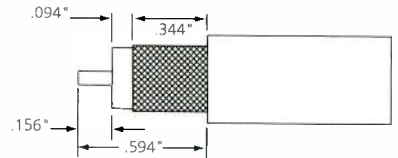


STC-12B

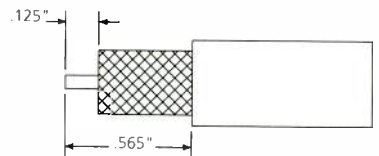
## Individual Tools

### Ordering Information

Description	Connector Type	Ordering Number
<b>Stripper Cassette</b> Replacement cutting blades for the manual Stripper Tool	All, except BNC-25	CCS-BLK
<b>Memory for Manual Stripper Tool</b> Determines how deep each blade on the stripper cassette will cut into cable. Can be adjusted for most cable types.	BNC-4, BNC-5, BNC-8, BNC-9, BNC-11	CCS-1
	BNC-1, BNC-2, BNC-6, BNC-10	CCS-2
	BNC-3, BNC-7, BNC-12, BNC-13	CCS-3
<b>Empty Tool Handle</b> Requires memory and stripper cassette	All, except BNC-25	STC-1



BNC and F Plug Strip Length  
(All BNC Plug Connectors except BNC-25)



BNC Plug Strip Length  
For BNC-25

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# 75 Ohm BNC Connectors

## Connection Tool Kit

### Ordering Information

Description	Ordering Number
<b>Connection tool kit for BNC connectors</b> Includes: <ul style="list-style-type: none"> <li>• Crimp tool (WT-2)</li> <li>• BNC crimp die set for 735, RG59 and 734 cables (WD-2)</li> <li>• Stripping tool with cassette for 735/0222 cables (STC-13B)</li> <li>• Stripping tool with cassette for RG59/734 cables (STC-12B)</li> <li>• Cable termination tray (LCA-000009)</li> <li>• Insertion/withdrawal tool for BNC connector (BT2000)</li> <li>• Carrying case</li> </ul>	BNC-TOOL-1



BNC-TOOL-1

## Accessories

### Ordering Information

Description	Ordering Number
Hex nut for .505" bulkhead connectors	TPC-1B
Locking washer for .505" bulkhead connectors	TPC-1C
Insulating shoulder washer for .505" bulkhead connectors	HDW-101611
Hex nut for .440" bulkhead connectors	BNC-HN440
Locking washer for .440" bulkhead connectors	BNC-LW440
Insulating shoulder washer for .440" bulkhead connectors	BNC-IW440
2.5 mm x 5 mm Phillips pan head screw for BNC-PC-RRA	SA1089-00

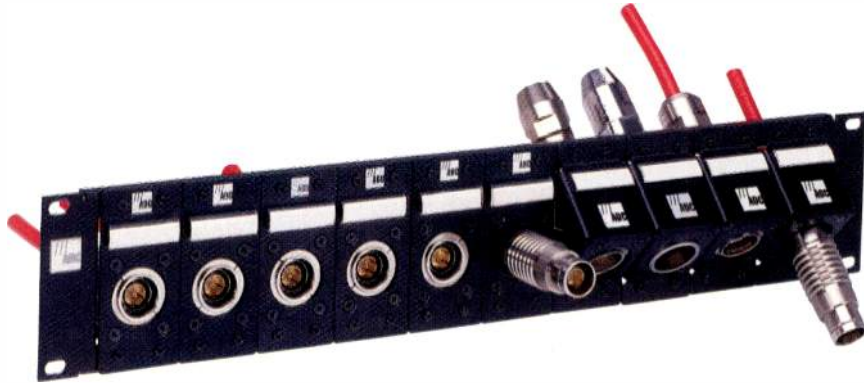


## ProAx™ Triaxial Camera Connectors

ADC's new ProAx™ Triaxial Camera Connectors provide an innovative connector solution. With both U.S. standard and global designs, ADC offers connectors with the flexibility you need.

With field repairable center conductors that eliminate the need to restrip and reterminate the entire connector, the patented ADC ProAx Triaxial Camera Connectors allow damaged center conductors to be easily replaced. All ProAx connectors are gender-reversible – allowing gender parts to be swapped back and forth between males and females in only a few seconds. In addition to its gender-reversible capabilities, ProAx connectors are also format-reversible, making it possible to switch between U.S. and global standard formats.

The global ProAx Triaxial Camera Connector features European Fischer™ standard compatibility. Retaining the patented features from the U.S. standard, the global format includes faster and less complicated termination, fewer parts, gender reversibility after termination, field-repairable center conductors, and format reversibility with U.S. standard triaxial.





# ProAx™ Triaxial Camera Connectors

## Introduction

For years, the industry has been locked into connector designs that are difficult to terminate, and even more difficult to field repair. ADC's line of ProAx™ Triaxial Camera Connectors will change the way you think about this component forever. These connectors have innovative features such as field repairable center conductors that eliminate the need to restrip, O-rings that protect the signal path against moisture, fewer parts to assemble, and compatibility with the tooling you already own.

## Field Repairable

Triax connectors can really take a beating – especially in field applications where dirt, sand and moisture are everywhere. When the female center conductor breaks, or the male latches are worn, the entire assembly must be cut off and reterminated.

Using a two-piece center conductor and housing assembly that can easily be replaced in the field without having to restrip and reterminate the entire connector, the patented ADC ProAx allows you to simply replace a damaged portion of the connector with common tools. When a repair is needed, the outer shell and insulator can be removed, next you simply unscrew the center conductor housing and replace the center conductor assembly, reversing the process to assemble. Absolutely no stripping or crimp tools are required.

## Gender-Reversible

With ADC's ProAx connectors, gender parts can be swapped back and forth between males and females in only a few seconds. This process eliminates common problems such as when you've just run a thousand feet of triax only to discover the male is where the female should be. Simply trade the male for the female and continue with your project.

## Format Reversible

With ADC's U.S. and European Fischer™ versions, O.B. vans and internationally televised events no longer mean headaches for camera technicians. ADC's patented ProAx connectors can be format reversed between U.S. and global formats in only seconds. Plus, ADC's ProAx connectors are designed to fit standard U.S. triax cables as well as global metric 8mm and 11mm cables.



Global Female Jack

Global Male Plug



# ProAx™ Triaxial Camera Connectors

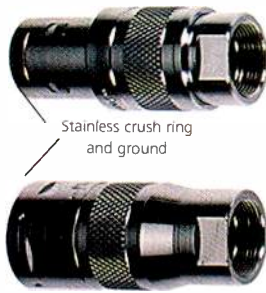
## Applications

High-Definition Digital Ready True 75 Ohm Impedance

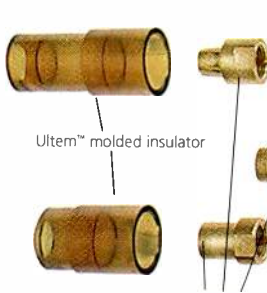
The ADC ProAx™ connector line is designed for maximum bandwidth for serial digital and high-definition digital applications while maintaining a true 75 Ohm impedance. All critical path components are gold plated for outstanding durability and connectivity.

### US Standard (Kings® Compatible) Connectors

Male Connector Assembly

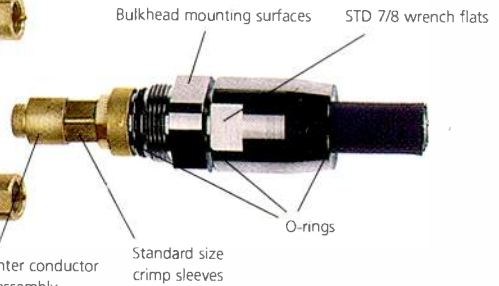


Female Connector Assembly



Gold-plated center conductor housing assembly

Universal Male/Female Body



### Global (Fischer™ Compatible) Connectors



Global Female Connector



Global Male Connector

## Solid Outer Shield Ground

The solid outer braid ground in the ProAx connectors maintains the ground no matter what the conditions. This eliminates camera shutdown from intermittent grounds, as well as the need for special conductive gaskets between the male and female connectors.

## Sturdy Construction

Each female ProAx connector is made of machined brass with a stainless steel crush ring to assure maximum crush strength. The assembly will not go out of round under normal mobile application wear and tear.

## Patented Panel-Mount System

Each ProAx connector can be either cable-mounted or panel-mounted with our patented mounting kit. The mounting kit securely fastens the male or female connector to a steel plate that is attached to standard panels. Two different mounting options are available: a unique 45° and the standard 90° straight. ADC's angled 45° mounting option reduces the weight of the cables on the connectors, providing less strain on the connectors than the traditional 90° mounting. Mounting yokes are available separately for custom metalwork applications.

## Compatibility

ProAx connectors are engineered to be compatible with other industry triaxial connectors from Kings Electronics Co., Inc., W.W. Fischer SA, and LEMO SA as well as standard industry tools and dies.

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# ProAx™ Triaxial Camera Connectors

## Ordering Information

Description	Ordering Number
<b>U.S. Standard Triax Camera Connectors, Female</b>	
.475" outer diameter cable	TCJ-A12
.360" outer diameter cable	TCJ-B38
.520" outer diameter cable	TCJ-C12
.410" outer diameter cable	TCJ-D38
.315" outer diameter cable	TCJ-E38
.246" outer diameter cable	TCJ-F14
<b>U.S. Standard Triax Camera Connectors, Male</b>	
.475" outer diameter cable	TCP-A12
.360" outer diameter cable	TCP-B38
.520" outer diameter cable	TCP-C12
.410" outer diameter cable	TCP-D38
.315" outer diameter cable	TCP-E38
.246" outer diameter cable	TCP-F14
<b>U.S. Standard Triax Camera Connector Repair Kits &amp; Tools</b>	
Repair Kit	
Front, Female	TRK-FF
Front, Male	TRK-FM
Outer, Female	TRK-FOS
Gender Change Kit	
Male to Female Kit	TRK-GCF
Female to Male Kit	TRK-GCM
Repair Kit, Rear,	
Size A	TRK-RAD
Size B	TRK-RBEF
Size C	TRK-RC
<b>Global Standard Triax Camera Connectors</b>	
Female Jack	
8mm Cables	GTCJ-G8
11mm Cables	GTCJ-H11
Male Plug	
8mm Cables	GTCP-G8
11mm Cables	GTCP-H11
<b>Global Standard Triax Camera Connector Accessories &amp; Repair Kits</b>	
Retermination Kit, Rear	
Size G 8mm	GTRK-RG
Size H 11mm	GTRK-RH
Repair Kit	
Front, Female	GTRK-FF
Front, Male	GTRK-FM
Front outer shell kit, Female	GTRK-FOS
Front outer shell kit, Male	GTRK-MOS
Gender Change	
Male to Female	GTRK-CGF
Female to Male	GTRK-CGM

Ordering information continued on the next page.

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# ProAx™ Triaxial Camera Connectors

## Ordering Information

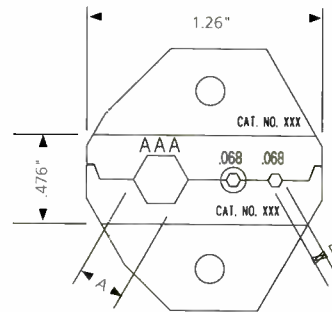
Description	Ordering Number
<b>Universal Mounting Kit and Accessories</b>	
Straight Panel Mount Kit, Universal mounts in TRP-2 rack mount	
Black	TCM-KIT-BK
Gray	TCM-KIT-G
45 Degree Panel Mount Kit, Universal	
Black	TCM45-KIT-BK
Gray	TCM45-KIT-G
Yoke Clamp for Male ProAx Plug	TCP-Y
Yoke Clamp for Female ProAx Jack	TCJ-Y
Universal Triax Installation Tool Kit	TRK-TKIT
Die set A,D,H 384 x 400, 9.75mm x 10.16mm	TD-AD
Die set B,E,F 255 x 400, 6.47mm x 10.16mm	TD-BEF
Die set C 429 x 400, 10.89mm x 10.16mm	TD-C
Die set G 278 x 500, 7.06mm x 12.7mm	WD-5
Tool Crimp, Long-Handled Pressmaster	WT-3
Wire Stripping Gauge, ProAx Triax	TRIAX-GAUGE
Empty 2 Rack Space Panel for TCM Kits (mounting kits and connectors sold separately)	
Black	TRP-2-BK
Gray	TRP-2-G
Empty 1 Rack Space Panel for 10 Connectors - requires connectors and yoke kit sold separately	
Black	TRP-1-BK
Gray	TRP-1-G
Universal Triax Adapter, adapts male to male, male to female, US to global, requires male/female parts	UTA-1

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Universal Triax Adapter  
UTA-1



Die Set Dimensions

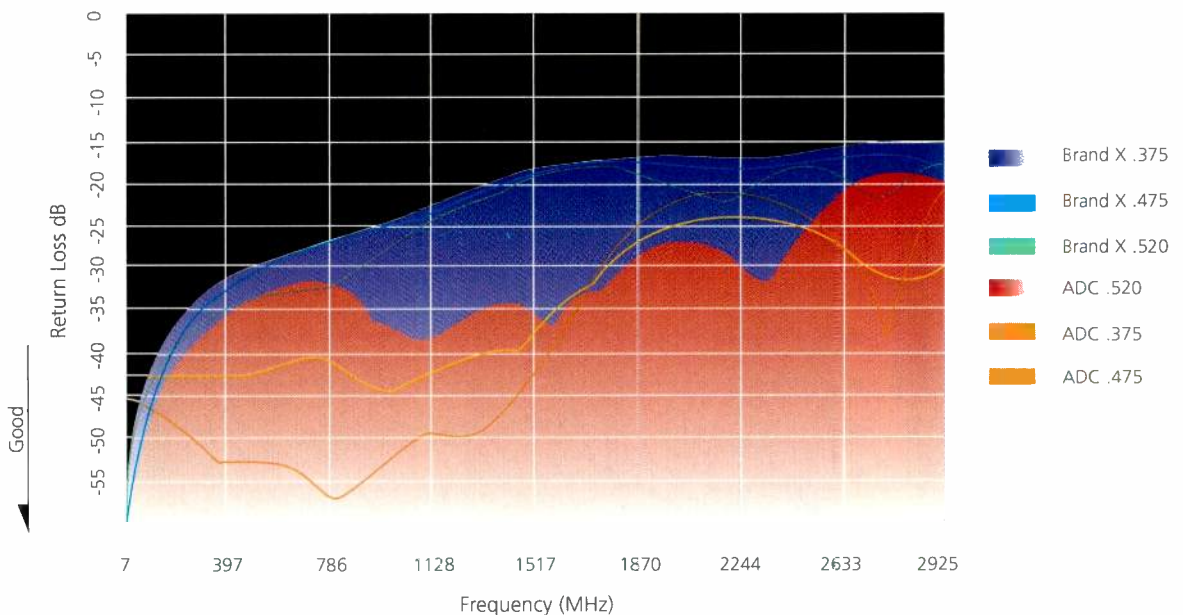


# ProAx™ Triaxial Camera Connectors

Broadcast Products

3 / 0 3 • 1 1 8 0 2 7 0

Kings Group	Kings Crimp Die	ADC Group	ADC Crimp Die	Die Set Dimensions			Cable Part Number
				Center Conductor	Crimp Sleeve	Die Width	
70	KTH-2040	A12	TD-AD	.068" 1.73 mm	.384" 9.75 mm	.400" 10.15 mm	<b>1/2" (.475) Cable Size</b> Belden 8233 Belden 8233A Gepeco VT61811 Gepeco VT61811PE Gepeco VT61811PE/AP
73	KTH-2002	B38	TD-BEF	.068" 1.73 mm	.255" 6.48 mm	.400" 10.15 mm	<b>3/8" (.360) Cable Size</b> Belden 9267 Belden 1856A Belden 1857A Gepeco VT61859 Gepeco LVT61859
74	KTH-2041	C12	TD-C	.068" 1.73 mm	.429" 10.9 mm	.400" 10.15 mm	<b>1/2" (.520) Cable Size</b> Belden 1858A Belden 9232 Belden 9192 Gepeco LVT61811
NONE	KTH-2040	D38	TD-AD	.068" 1.73 mm	.384" 9.75 mm	.400" 10.15 mm	<b>1/2" (.410) Cable Size</b> Belden 1859A
76	KTH-2002	E38	TD-BEF	.068" 1.73 mm	.255" 6.48 mm	.400" 10.15 mm	<b>3/8" (.315) Cable Size</b> Belden 8232 Belden 8232A Commscope 7810
78	KTH-2002	F14	TD-BEF	.068" 1.73 mm	.225" 5.7 mm	.400" 10.15 mm	<b>1/4" (.246) Cable Size</b> Belden 88232
KTH-1000		WT-3					<b>Hand Crimp Tool</b>





# ProAx™ Triaxial Camera Connectors

## ProAx Global Triax Connector Matrix

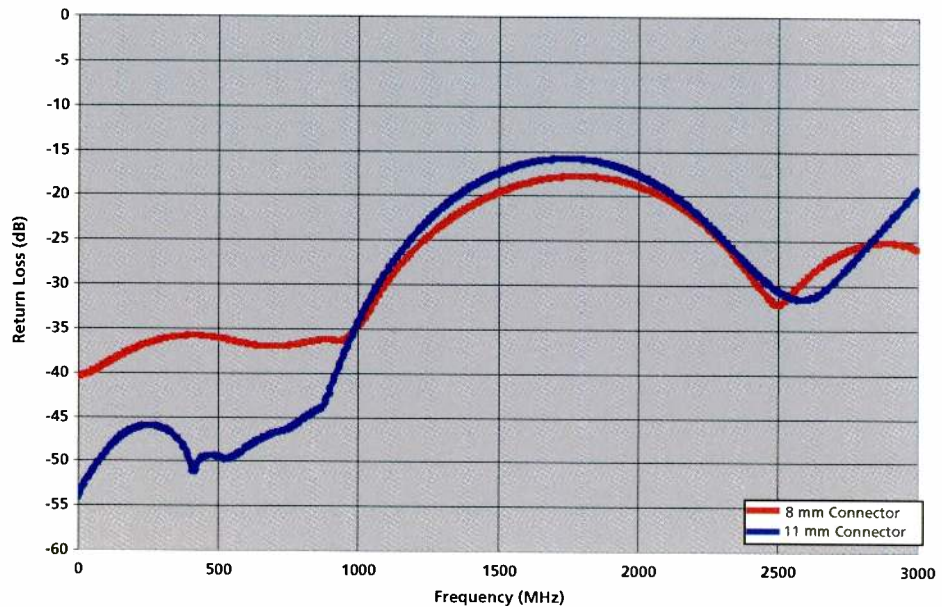
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3 / 0 3 • 1 1 8 0 2 7 0

ADC Cable Group	Cable Manufacturer and Part Number	Connector Manufacturer and Connector Number		
		Fischer Equivalent SE & KE Series	Lemo Equivalent Redel F Series	
G8	<b>8mm (3/8") Cable Size</b>			
	Intercond RX 75/55 N.E.K. 23860 Draka Triax 8 1.0s/4.5s	1051 A004-5 1.0/4.5/8.7 1051 A004-5 1.0/4.5/8.7 1051 A004-5 1.0/4.5/8.7	T75.FTCC86C (Group 2) T75.FTCC86C (Group 2) T75.FTCC86C (Group 2)	
	Bedeas Superflex 8 1.0Ls/4.5s Belden 9267 Fujikura 4.8/1.0 EFTXF Hirakava Triax 4.8/1.0 Tufret Draka Triflex 8 1.0Ls/4.5s Filotex SFP:A2 Video Fixe Filotex SFP:A2 Video Mobile	1051 A004-5 1.0/4.5/9.4 1051 A004-5 1.0/4.5/9.4 1051 A004-5 1.0/4.5/9.4 1051 A004-5 1.0/4.5/9.4 1051 A004-5 1.0/4.5/9.4 1051 A004-5 1.4/4.5/9.4 1051 A004-5 1.4/4.5/9.4	T75.FTCC90C (Group 3) T75.FTCC90C (Group 3) T75.FTCC86C (Group 2) T75.FTCC86C (Group 2) T75.FTCC90C (Group 3) T75.FTCC90C (Group 3)	
	Bedeas Std. 8 1.0s/4.5s	1051 A004-5 1.0/4.5/8.7		
	H11	<b>11mm (1/2") Cable Size</b>		
		Belden 9192 Belden 9232 Filotex SPF:B2 Video Fixe Filotex SPF:B2 Video Mobile	1051 A004-4 T1895/13.6 1051 A004-4 T1895/13.6 1051 A004-4 T1895/13.6 1051 A004-4 T1895/13.6	T75.FTCC14C (Group 7) T75.FTCC14C (Group 7) T75.FTCC14C (Group 7) T75.FTCC14C (Group 7)
		Bedeas Standard 11 1.4s/6.6s Bedeas Superflex 11 1.4Ls/6.6s BIW 91307 Intercond RX 75/56 N.E.K. 63990 Draka Triax 11 1.4s/6.6s Draka Triflex 11 1.4Ls/6.6s	1051 A004-5 1.4/6.6/11.3 1051 A004-5 1.4/6.6/11.3 1051 A004-5 1.4/6.6/11.3 1051 A004-5 1.4/6.6/11.3 1051 A004-5 1.4/6.6/11.3 1051 A004-5 1.4/6.6/11.3 1051 A004-5 1.4/6.6/11.3	T75.FTCC11C (Group 4) T75.FTCC11C (Group 4) T75.FTCC11C (Group 4) T75.FTCC11C (Group 4) T75.FTCC11C (Group 4) T75.FTCC11C (Group 4) T75.FTCC11C (Group 4)
		Draka Triax 11/1 1.4s/6.6s	1051 A004-5 1.4/6.6/12.6	

Note: Cross reference information is our best estimate and not guaranteed. Information is subject to change without notice.

### ADC Global Triax Connectors







# ProAx™ Triaxial Camera Connectors

## Specifications

Electrical performance specifications of ProAx™ triaxial camera connectors are based on a male and female connector mated together.

<b>Rated Bandwidth:</b>	1 MHz to 1.5 GHz
<b>Return Loss:</b>	Better than -20 1 GHz/-15 to 2 GHz
<b>Characteristic Impedance:</b>	75 Ω nominal
<b>Insertion Loss:</b>	Better than 0.8 dB loss 1 MHz to 1.5 GHz
<b>Dielectric Withstanding Voltage:</b>	1500 Volts AC
<b>Life Cycles:</b>	1000 cycles minimum per MIL-PFR-39012

### MECHANICAL

<b>Life Cycles:</b>	1000 cycles minimum per MIL-PFR-39012
<b>Cable Retention:</b>	100 lb. Per MIL-STD-1344A Method 2010.1

### MATERIALS

<b>Body Materials:</b>	Brass per ASTM B16, CDA Alloy 360 with electroless nickel plating per QQ-N-290
<b>Inner Bodies:</b>	Brass per ASTM B16, CDA Alloy 360 with 50 millionths inch gold plating
<b>Latching Spring:</b>	Stainless Steel 460 SE heat treated and Electro-Polished
<b>Spring Center Conductors:</b>	Beryllium Copper with 50 millionths inch Gold per MIL-G-45204 Type 1
<b>Crush Rings:</b>	303 Stainless
<b>Machined Center Conductors:</b>	Brass per ASTM B16 CDA Alloy 360 with 50 millionths inch Gold per MIL-G-45204 Type 1
<b>Ground Clip:</b>	Beryllium Copper with electroless nickel plating per QQ-N-290 and Gold per MIL-G-45204 Type 1
<b>Insulators:</b>	Ultem®, Teflon™
<b>O-Rings:</b>	Ethylene Propylene

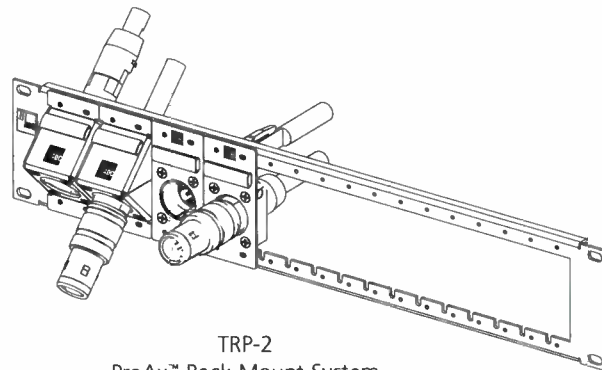
### ENVIRONMENTAL

#### Temperature

<b>Operating:</b>	-40°C to 65°C
<b>Storage:</b>	-55°C to 85°C
<b>Thermal Shock:</b>	Per MIL-STD-202, Method 107

#### Humidity

<b>Operating:</b>	0% to 95%, non-condensing
<b>Storage:</b>	0% to 95%, non-condensing
<b>Salt Spray:</b>	Per MIL-STD-202, Method 101, Test Condition B
<b>Moisture Resistance:</b>	Per MIL-STD-202, Method 106
<b>Sand and Dust Resistance:</b>	Per MIL-STD-202, Method 101
<b>Flammability:</b>	UL 94-VO Rated
<b>Crush Resistance:</b>	Per MIL-STD-1344A, Method 2008.1

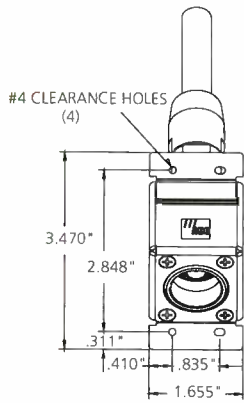


TRP-2  
ProAx™ Rack Mount System

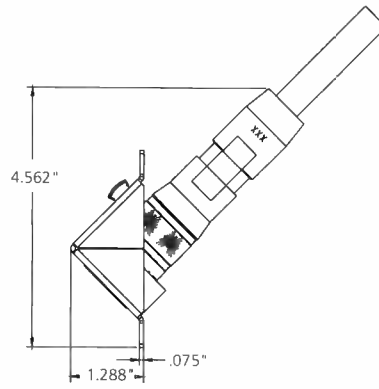


# ProAx™ Triaxial Camera Connectors

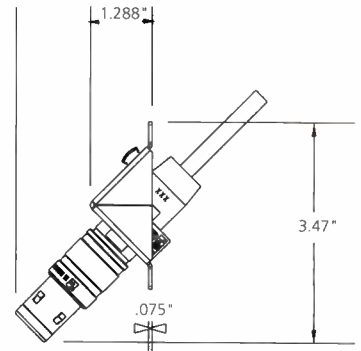
## 45 Kit



Front View

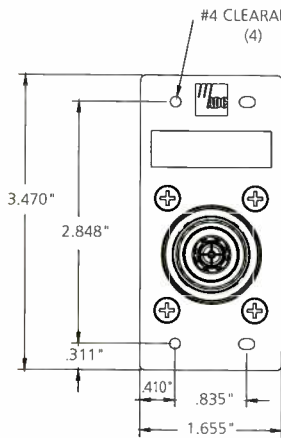


Female

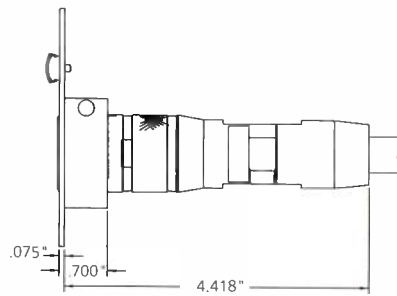


Male

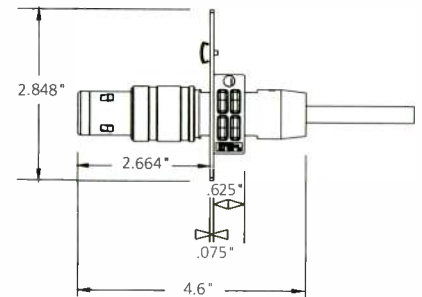
## Straight Kit



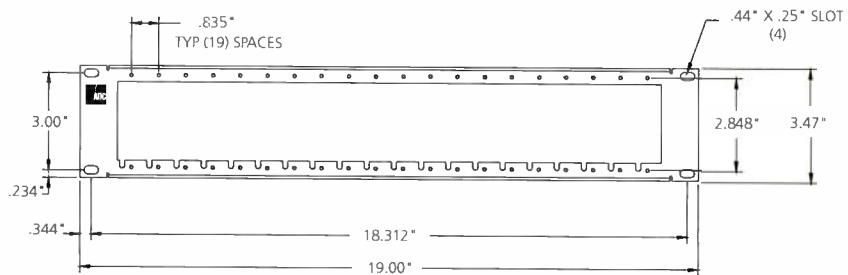
Front View



Female




Male



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# RJ45 Data Connectivity



<b>Introduction</b>	<b>117</b>
<b>6000CHC Patch Panels - Category 6</b>	<b>118</b>
<b>5000E Patch Panels - Category 5e</b>	<b>120</b>
<b>RJ45 Coupler Panel - Category 5e and 3</b>	<b>121</b>
<b>6000 Multimedia Patch Panels</b>	<b>122</b>
<b>Fast Ethernet Patch Panels</b>	<b>126</b>
<b>Patch Cords</b>	<b>127</b>
<b>25-Pair Cable Assemblies</b>	<b>128</b>
<b>Glide Cable Integrator</b>	<b>129</b>
<b>6000 Faceplates</b>	<b>132</b>
<b>Media Converters</b>	<b>133</b>



# RJ45 Data Connectivity

## Introduction

### A patch panel is a patch panel, right?

Not anymore.

For today's networks, the cable management system – and especially the patch panels – must handle more. More moves, adds and changes. More years of trouble-free service. More network uptime. More bandwidth for users.

The rugged, advanced-design of ADC patch panels can handle the demands of today's networks. If more is what you need, you'll find more is built into each ADC patch panel.

### Component Compliant Category 6 Performance

The 6000 Multimedia Patch Panel offers Category 6 performance that features backward compatibility and interoperability due to connecting hardware that is component compliant as well as link and channel compliant. With backward compatibility, Cat 6 jacks satisfy transmission requirements *simultaneously* for Cat 6, Cat 5e and Cat 5 – providing important performance protection for channels if connecting hardware rated for lower categories of service are connected to the Cat 6 channel.

And with interoperability, mating the 6000 Multimedia Patch Panel for Cat 6 with component compliant Cat 6 products such as patch cords from different manufacturers will still result in Cat 6 channel performance – delivering vendor independence for end-users.

### Angled Circuits

ADC pioneered angled ports at the cross-connect. This same innovation is evident with our data patch panels. Angled ports not only reduce stress and strain on cables, but also enforce a more orderly flow of patch cords and cables – both of which protect signal integrity and minimize downtime.

### Experience Counts

The same innovation that made ADC a leader in cable management for carrier networks applies to the ADC family of data patch panels.

Yet high-caliber, high-performance products are not enough. Just as important is ADC's commitment to service. From rigorous certification standards and training to rapid-response technical support, ADC has earned a reputation for excellent service and support before and after the sale.



# RJ45 Data Connectivity

## 6000CHC Patch Panels – Category 6

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### Features

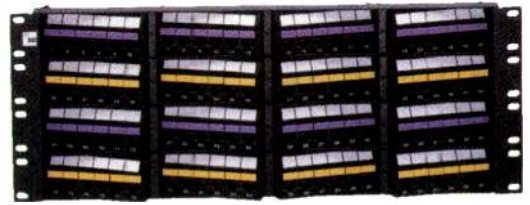
- Exceeds Category 6 channel performance for all pair combinations
- Backward compatible in component, link, and channel
- Patent-pending angle-right/angle-left port rotation feature reduces cable strain, reduces cable congestion, and enforces improved cable management with orderly flow of patch cords
- Color-coded, gas-tight 110 IDC provides sound connections for terminating stations, equipment, or tie cables
- Supports 10Base-T and 100Base-T Ethernet, 1000Base-T Ethernet, token ring, up to 155 Mbps ATM, and proposed 1000Base-TX
- Supports any next generation applications designed for TIA/EIA Category 6 transmission requirements



24-Port Patch Panel

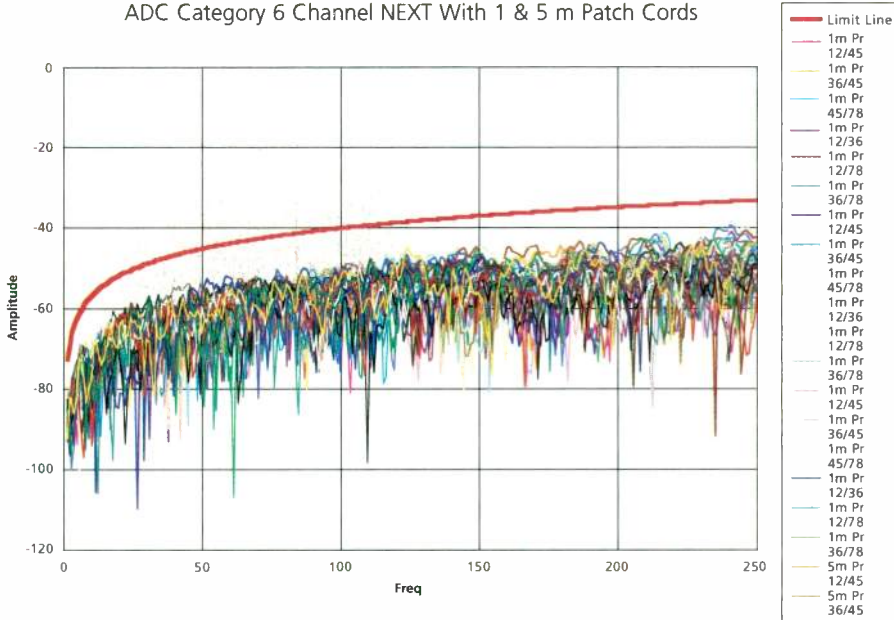


48-Port Patch Panel



96-Port Patch Panel

ADC Category 6 Channel NEXT With 1 & 5 m Patch Cords





# RJ45 Data Connectivity

## 6000CHC Patch Panels – Category 6

### Ordering Information

Description	Port Count	Category	Wiring Configuration	Rack Units	Ordering Number
6000CHC Patch Panels	24	6	T568B	1	ADCPP24CH6B110
	24	6	T568A	1	ADCPP24CH6A110
	48	6	T568B	2	ADCPP48CH6B110
	48	6	T568A	2	ADCPP48CH6A110
	96	6	T568B	4	ADCPP96CH6B110
	96	6	T568A	4	ADCPP96CH6A110

### DIMENSIONS (W x H)

- 1 RU** 19.0" x 1.75" (48.26 x 4.45 cm)
- 2 RU** 19.0" x 3.50" (48.26 x 8.89 cm)
- 4 RU** 19.0" x 7.0" (48.26 x 17.78 cm)



6000CHC – 48-ports

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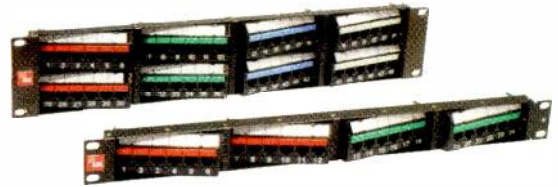


# RJ45 Data Connectivity

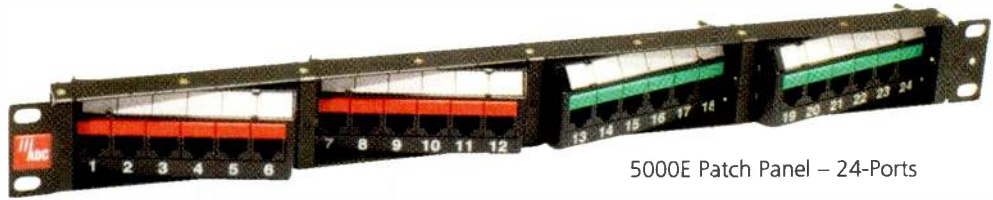
## 5000E Patch Panels – Category 5e

### Features

- Exceeds Category 5e requirements
- Durable construction for maximum performance
  - Steel frame with black corrosion-resistant finish
  - High-impact UL 94 V-O polycarbonate used for all plastic parts
  - Modular 8-pin, 4-pair jacks
- Advanced features of 5000E include:
  - Patent-pending angle-right/angle-left ports
  - Color-coded icons for quick port identification
- Includes labeling for front and rear
- Supports 10Base-T, 100Base-T, and 1000Base-T Ethernet, token ring, 155 Mbps ATM
- Supports network speeds up to 1000 Mbps



5000E Patch Panels



5000E Patch Panel – 24-Ports

### Ordering Information

Description	Port Count	Category	Wiring Configuration	Rack Units	Ordering Number
5000E Patch Panels	24	5e	T568B	1	ADCPP245EB110
	24	5e	T568A	1	ADCPP245EA110
	48	5e	T568B	2	ADCPP485EB110
	48	5e	T568A	2	ADCPP485EA110
	96	5e	T568B	4	ADCPP965EB110
	96	5e	T568A	4	ADCPP965EA110

### DIMENSIONS (W x H)

- 1 RU** 19.0" x 1.75" (48.26 x 4.45 cm)
- 2 RU** 19.0" x 3.50" (48.26 x 8.89 cm)
- 4 RU** 19.0" x 7.0" (48.26 x 17.78 cm)



# RJ45 Data Connectivity

## RJ45 Coupler Panel – Category 5e and Category 3

ADC's RJ45 Coupler Panel provides feed-through data and voice connectivity on the front and rear for Cat 5 and Cat 3 applications. Connectivity on the front of the panel accommodates standard RJ45 patch cords. Connectivity for hubs, routers and other active equipment on the back of the panel is also designed for RJ45 patch cords—creating a convenient connection field for data applications. Includes port labeling for front and rear. Width is 48.26 cm (19").

### Ordering Information

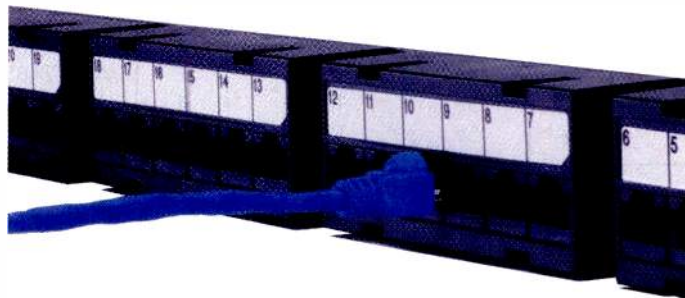
Description	Port Count	Category	Rack Units	Ordering Number
RJ45 Coupler Panel, Cat 5	16	5	1	ADCPP16KSRJRJ
	24	5	1	ADCPP24505
	32	5	1	ADCPP32KSRJRJ
	48	5	2	ADCPP48505
	96	5	4	ADCPP96505
RJ45 Coupler Panel, Cat 3	24	3	1	ADCPP24303

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RJ45 Coupler Panel (Front View)



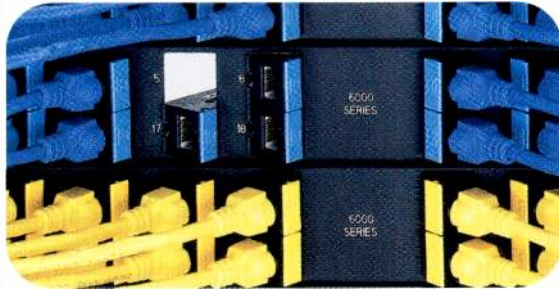
RJ45 Coupler Panel (Rear View)





# RJ45 Data Connectivity

## 6000 Multimedia Patch Panels



6000 Multimedia Patch Panels Feature Single Circuit Access



48 Port Panel with Angled 6000 Modular Jacks and Flat 6000 BNC Media Adapters

### Features

- Provides component compliant Category 6 performance
- Front or rear loading, single-circuit access saves time in moves, adds, and changes
- The highest density panel available
- Build each patch panel for twisted pair, fiber, and coax applications using any mix of 6000 modular jacks and 6000 media adapters
  - Jacks and media adapters installed and removed in single circuits
  - For Category 6 and Category 5e modular jack applications
  - Singlemode and multimode fiber applications using LX 5®, SC, duplex SC, and ST® media adapters
  - Handles applications for BNC, F-adapter, RCA-adapters, and S-Video adapters
- Creates angle-right/angle-left or conventional flat panel profile
- Simple installation and removal of individual jacks/adapters allows for rapid changeover and minimized downtime
- Supports 10Base-T, 100Base-T, and 1000Base-T Ethernet, token ring, up to 155 Mbps ATM, and proposed 1000Base-TX
- Includes port numbers or row identification and write-on panel labels
- Jacks and adapters install without panel faceplates or pairing of jacks/adapters
- Available in standard and high-density port sizes
  - Standard sizes – 24-ports/1 RU, 48-ports/2 RU, 72-ports/3 RU, 96-ports/4 RU
  - High-density sizes – 32-ports/1 F.U and 72-ports/2 RU



# RJ45 Data Connectivity

## 6000 Multimedia Patch Panels

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Ordering Information			
Description	Port Count	Rack Units	Ordering Number
6000 Multimedia Patch Panel Chassis	24	1	ADCPP246SUM
	32	1	ADCPP326SUM
	48	2	ADCPP486SUM
	72	2	ADCPP726SUM2U
	72	3	ADCPP726SUM
	96	4	ADCPP966SUM

Ordering Information			
Description	Port Count	Rack Units	Ordering Number
6000 Multimedia Recessed Patch Panel Chassis with cover with locking cover	24	1	ADCPP246SUMR3
	48	2	ADCPP486SUMDCT
	48	2	ADCPP486SUMDCL

**Note:** Order modular jacks and media adapters separately. See pages 124 and 125 for information.

### DIMENSIONS (W x H x D)

- 1 RU 19.0" x 1.72" x 0.50" (48.26 x 4.37 x 1.27 cm)
- 2 RU 19.0" x 3.47" x 0.50" (48.26 x 8.81 x 1.27 cm)
- 3 RU 19.0" x 5.22" x 0.50" (48.26 x 13.26 x 1.27 cm)
- 4 RU 19.0" x 6.97" x 0.50" (48.26 x 17.70 x 1.27 cm)



24-Port Panel with Flat 6000 Modular Jacks



48-port/2 RU Recessed Patch Panel  
Shown with Modular Jacks and  
BNC Media Adapters



# RJ45 Data Connectivity

## 6000 Multimedia Patch Panels – 6000 Modular Jacks

### Features

- Exceeds Category 5e and Category 5 component performance requirements
- Exceeds Category 5e and Category 5 link and channel requirements
- Backward compatible in component, link, and channel
- Supports 10Base-T and 100Base-T Ethernet, 1000Base-T Ethernet, token ring, up to 155 Mbps ATM, and proposed 1000Base-TX
- Supports any next generation applications designed for TIA/EIA Category 6 transmission requirements
- Available in flat profile or angled version for bend radius protection in T568A and T568B wiring schemes
- Includes one jack with color-coded 11D IDC connections and clear stuffer cap
- Universal T568A/B wiring



Angled



Flat

6000 Modular Jacks

### Ordering Information

Description	Jack Type	Wiring Configuration	Category	Ordering Number
<b>6000 Modular Jacks</b>	Angled	T568A/B	6	ADCJA6XX*
	Angled	T568A/B	5e	ADCJA5XX*
	Flat	T568A/B	6	ADCJF6XX*
	Flat	T568A/B	5e	ADCJF5XX*
<b>Blank Inserts</b> ( <i>Ships in pack of 10</i> )				
Office white				ADC6SADUMBK01
Black				ADC6SADUMBK02

\*Replace the XX in the ordering number with choice of color, below:



Electrical Ivory 00



Black 02

Broadcast Products

3 / 0 3 • 1 1 8 0 2 7 0

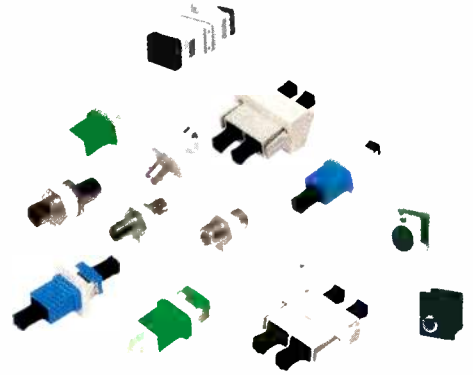


# RJ45 Data Connectivity

## 6000 Multimedia Patch Panels – 6000 Media Adapters

### Features

- Fully supports fiber, coax, RCA, and S-Video applications
- Available in angled or flat profiles
- Blank inserts available to fill unused ports on 6000 Multimedia Patch Panels



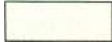

6000 Media Adapters

Broadcast Products  
3 / 0 3 • 1 1 8 0 2 7 0

### Ordering Information

Description	Ordering Number
<b>Flat Media Adapters</b> Singlemode LX.5® Multimode LX.5® Singlemode SC Singlemode Duplex SC Multimode SC Multimode Duplex SC Singlemode ST® Multimode ST® BNC F-adapter RCA-adapter S-Video*	ADC6SADUMSMLX5XX ADC6SADUMMMLX5XX ADC6SADUMSMSCXX ADC6SADUMSMDSCXX ADC6SADUMMMSCXX ADC6SADUMMDSCXX ADC6SADUMSMSTXX ADC6SADUMMMSTXX ADC6SADUMBNCXX ADC6SADUMFCNXX ADC6SADUMRCAFXX ADC6SADUMSVHSFXX
<b>Angled Media Adapters</b> Singlemode LX.5® Multimode LX.5® Singlemode SC Singlemode Duplex SC Multimode SC Multimode Duplex SC Singlemode ST® Multimode ST®	ADC6SADANSMLX5XX ADC6SADANMMLX5XX ADC6SADANSMSCXX ADC6SADANSMDSCXX ADC6SADANMMSCXX ADC6SADANMDSCXX ADC6SADANSMSTXX ADC6SADANMMSTXX
<b>Blank Inserts</b> ( <i>Ships in pack of 10</i> ) Office white Black	ADC6SADUMBK01 ADC6SADUMBK02

Ordering notes: Replace XX in ordering number with choice of color, below.

-  Office White 01
-  Black 02



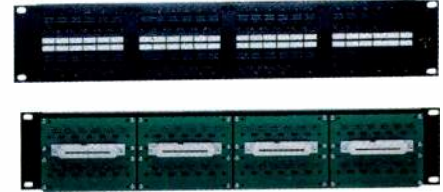
# RJ45 Data Connectivity

## Fast Ethernet Patch Panels

Broadcast Products  
3703 • 1180270

### Features

- Durable, quality construction for maximum performance
- Saves time in moves, adds, and changes
- Features secure and convenient 25-pair connections on the rear
- Modular 8-pin, 4-pair jacks on the front
- 5100 pin-out is 1,2-3,6
- 5800 has all pairs wired
- Includes write-on labels on front
- Exceeds Category 5e requirements for individual panel circuits
- Supports 10Base-T and 100Base-T Ethernet
- Optional icons speed circuit identification



5100 Patch Panel, 48-port

The first step to integrate Fast Ethernet traffic into a twisted pair network is to terminate both station side and equipment side connections on high performance ADC patch panels.

For the Ethernet switching system, 5100 and 5800 Patch Panels provide convenient 25-pair (50-pin) female RJ21x connections on the rear with rugged 8-pin modular jacks on the front. Port identification is accomplished with write-on port labels and optional icons.

### Ordering Information

Description	Pin-out	Port Count	Rear Connector	Rack Units	Ordering Number
5100 Patch Panel	1,2-3,6	24	RJ21x	2	ADCPP245100TEL
5100 Patch Panel	1,2-3,6	48	RJ21x	2	ADCPP485100TEL
5800 Patch Panel, T568B	1-8	24	RJ21x	2	ADCPP245800BTEL
5800 Patch Panel, T568B	1-8	48	RJ21x	2	ADCPP485800BTEL

### DIMENSIONS (W x H)

**2 RU** 19.0" x 3.50" (48.26 x 8.89 cm)



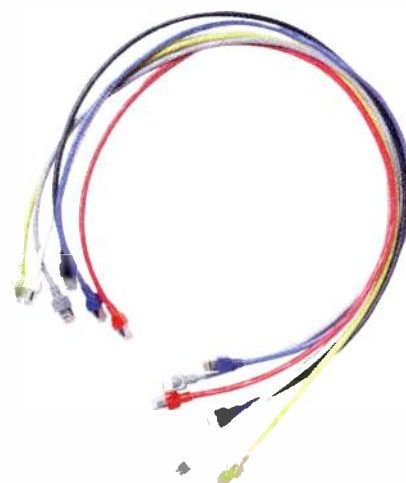
# RJ45 Data Connectivity

## 6000 High Performance Patch Cords

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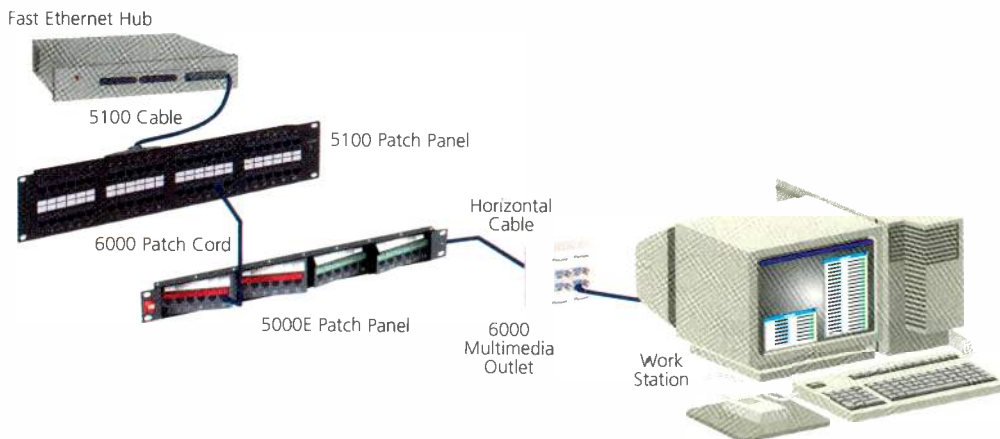
### Features

- Exceeds Category 5e requirements as well as ISO/IEC 11801 Telecommunications Standards
- Insert and remove patch cord without pulling back strain relief boot
- Every patch cord is tested to guarantee quality
- High-performance plugs preserve signal integrity and minimize crosstalk
- Fully supports data rates up to 1000 Mbps
- Wide variety of lengths and colors promotes simple, inexpensive installation and easy identification.
- Strain-relief boot limits bend radius and increases durability



Patching between 5100 or 5800 Fast Ethernet Patch Panels and 5000E/5500 Patch Panels is accomplished with ADC 6000 High Performance Patch Cords. 6000 Patch Cords offer Category 5e performance with a plug design that minimizes crosstalk and endures hundreds of moves, adds, and changes. In addition, RJ45 plugs can be inserted and removed without pulling back strain relief boots – another time-saver for technicians.

The result of this combination of patch panels, patch cords, and cables is highly reliable, 100 Mbps half duplex data transmission. Additionally, using separate patch panels for station side and equipment side connections means patching is done from panel to panel – delivering continuous performance and significant savings for technicians performing moves, adds, and changes.



### Ordering Information

Description	Category	Color	Ordering Number
6000 Patch Cord, with boots	6	White	ADCPC-66CHB-WTXX*
	6	Gray	ADCPC-66CHB-GYXX*
	6	Blue	ADCPC-66CHB-BLXX*
6000 Patch Cord, with boots	5e	White	ADCPC-RRC6B-WTXX*
	5e	Gray	ADCPC-RRC6B-GYXX*
	5e	Blue	ADCPC-RRC6B-BLXX*

\*Ordering Notes: Replace XX in ordering number with desired length in feet: 03, 05, 07, 10, 15, 20, 25 or 50 feet. Custom colors and lengths available upon request.



# RJ45 Data Connectivity

## 25-Pair Cable Assemblies

### Features

- Convenient 25-pair/50-pin RJ21x connections
- Connectors available in:
  - 180° exit angle
  - Hydra terminated with 12 numbered RJ45 plugs
- Exceeds Category 5 PowerSum requirements
- Supports 10Base-T and 100Base-T Ethernet



The second step to integrate Fast Ethernet into a network is to use ADC patch cords and RJ21x cable assemblies to complete the connections from station side patch panels to equipment side patch panels, and from the equipment side patch panels to the Fast Ethernet switch.

The 25-pair cable assemblies are Category 5 PowerSum telco cables that provide precise connectivity between Fast Ethernet switches and 5100 or 5800 Patch Panels.

With the convenience and precision of RJ21x connectors, 25-pair cable assemblies easily handle even high density Fast Ethernet switch configurations. In addition, the durable connectors feature a lock-down system that eliminates intermittency often associated with other telco cables.

### RJ21x/RJ21x

#### Ordering Information

Description	Connector 1	Connector 2	Ordering Number
<b>25-pair cable assemblies</b>	Straight Exit 180°	Straight Exit 180°	ADCPC-T3T3-5100-XX*

\*Replace XX in ordering number with desired length in feet: 05, 10, 15, 20, 25, 30, 35, 40, 45, or 50 feet.

### RJ21x/Hydra

#### Ordering Information

Description	Connector 1	Connector 2	Ordering Number
<b>25-pair cable assemblies</b>	Straight Exit 180°	Hydra, longest to shortest plug : 1-12	ADCPC-T3H1-5100-XX*
	Straight Exit 180°	Hydra, longest to shortest plug : 12-1	ADCPC-T3H2-5100-XX*
	Straight Exit 180°	Hydra, plugs same length	ADCPC-T3H3-5100-XX*

Ordering Notes: Hydra connectors consist of 12 RJ45 plugs pinned 1,2-3,6. \*Replace XX in ordering number with desired length in feet: 06, 10, or 15 feet.



# RJ45 Data Connectivity

## Glide Cable Integrator

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### The New Standard for Cable Management

Today's networks have grown up. And today's network managers face common issues. How do you grow your network, continually increase bandwidth, leverage your investment in copper, and handle more applications while – at the same time – ensuring reliable network performance without adding staff, without robbing floor space, and without spending a fortune?

The key is effective cable management. And the solution for today's network managers is found in the Glide Cable Management System.

The Glide Cable Management System features revolutionary, patent-pending designs that set new standards for performance, efficiency, and cost savings in network cable management.



Integrator  
shown in cabinet

### Double the Density of Your Racks

With conventional cable management systems, each patch panel is often paired with a horizontal system for handling patch cords and cables. And for good reason – kinks, sharp bends, and cuts in patch cords and cables create unhappy users. Conventional systems use rings and loops that can cause a jumbled mess of patch cords that easily snag and make it hard to remove, reroute, and add patch cords.

That's the way it has always been – until ADC rewrote the book on cable management with the Glide Cable Integrator.

The patent-pending Integrator provides unique patch cord and cable support using a vertical, open cage of radius-protected support arms on the front and rear of racks. This rib cage of support arms extends from top to bottom, mounted on both sides of the rack, and can be installed on single racks or as inter-rack units.

With the Integrator, horizontal trays and rings are eliminated. That means you install more patch panels and hubs on the same rack while maintaining proper support for patch cords and cables. That means up to 1,512 ports on a single rack.

There is, of course, always a need to route patch cords and rear horizontal cables from one side of the rack to the other, or between racks. The Integrator handles crossover routing with smart, space-saving efficiency, too. Choose from radius-protected Integrator Crossover Troughs for the top, bottom, or center of a rack, as well as Horizontal Cable Managers in five configurations to meet any requirements.

The same system for managing patch cords and horizontal cables for the front of racks is used in the rear. An open rib cage of arms mounted on the left and right of the rack provides ample support for horizontal station cable. Access is greatly enhanced by eliminating the need for a horizontal cable bar for each patch panel or hub. Optional EIA-standard cable support bars are available, yet not required.

By reducing the use of valuable rack space for horizontal cable management, the Integrator allows you to nearly double the density of your racks – and provide more service without adding real estate.





# RJ45 Data Connectivity

## Glide Cable Integrator

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3/03 • 1180270

### Features

- Integrated front, rear, horizontal, and vertical cable management
- Patent-pending rib cage design eliminates horizontal support trays and bars
- Supports up to 1,512 ports on a single rack
- Built-in bend radius protection ensures network integrity
- Designed for quick and easy moves, adds, and changes
- Optional slack managers available for 8", 10", and 12" widths
- Fits standard EIA rack with 3" channel
- Used for single rack or as inter-rack unit
- Optional crossover troughs and horizontal cable managers available
- Optional EIA-standard horizontal support bars available



Integrator with slack managers

### Ordering Information

Description	Ordering Number
<b>Integrator – ships 2 per pack</b>	
41" x 6.18"	ADCCM-06
41" x 8.38"	ADCCM-08
41" x 10.18"	ADCCM-10
41" x 12.18"	ADCCM-12
with slack managers, 41" x 8.38"	ADCCMS-08
with slack managers, 41" x 10.18"	ADCCMS-10
with slack managers, 41" x 12.18"	ADCCMS-12

Notes: Order two 2-packs to equip both sides of a 7' rack. Use larger widths for interrack applications.



# RJ45 Data Connectivity

## Glide Cable Integrator

Broadcast Products  
3 / 0 3 • 1 1 8 0 2 7 0

### Ordering Information

Description	Ordering Number
<b>Integrator, cabinet mount – ships 4 per pack</b> 6.0" x 10 RU 6.0" x 20 RU	ADCCMVIB-CB10-4 ADCCMVIB-CB-4
<b>Integrator, cabinet mount, with cable retention – ships 4 per pack</b> 3.0" x 20 RU 6.0" x 20 RU	ADCCMVIB-3CB20-4 ADCCMVIB-6CB20-4

Notes: Equips standard 7' cabinet with front or rear cable management. Order two 4-packs to equip front and rear of cabinet.



Integrator, cabinet mount

### Ordering Information

Description	Ordering Number
<b>Integrator – crossover troughs</b> 2 RU, black 4 RU, black, 23" rack 4 RU, black	ADCCMTG02 ADCCMTG04-23 ADCCMTG04
<b>Integrator – horizontal cable managers</b> 2 RU 3 RU 4 RU with slack managers, 3 RU with slack managers, 4 RU	ADCCMHIB-2U ADCCMHIB-3U ADCCMHIB-4U ADCCMHIBS-3U ADCCMHIBS-4U
Rear cable management bar, 19", 1" extension	ADCCMRSB
Rear cable management bar, 19", 4" extension	ADCCMRSB-4



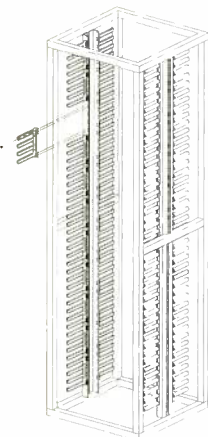
Crossover Trough



Crossover Trough



Horizontal Cable Manager



Installation Drawing for Integrator,  
Cabinet Mount



# RJ45 Data Connectivity

## 6000 Faceplates

3 / 0 3 • 1 1 8 0 2 7 0 Broadcast Products

### Features

- Patent-pending design provides unique appearance for outlets
- Used for twisted pair, fiber, and coax applications
- Patent-pending fingertip access for easy removal and installation of designation windows
- Designed for use with 6000 Modular Jacks and 6000 Media Adapters
- For Category 6, and Category 5e modular jack applications
- For singlemode and multimode fiber applications using LX.5®, SC, duplex SC, and ST® media adapters
- Supports applications requiring BNC, F-adapters, RCA-adapters and S-Video adapters
- Accepts angled or flat jacks and media adapters
- Jacks and media adapters can be loaded from the front or the rear of the faceplate. Front loading only on 1 to 3-port faceplate
- All jacks and media adapters totally interchangeable on the faceplate
- Includes one faceplate, fingertip access designation windows, designation cards, and screws

### Ordering Information

Description	Jack/Adapter Type	Port Count	Ordering Number
<b>6000 Faceplate - Single Gang</b> Dimensions: 4.53" x 2.76" x 0.31" (11.51 x 7.01 x 0.79 cm)	Flat	1 to 3	ADC6SFPUM031XX
<b>6000 Faceplate - Single Gang</b> Dimensions: 4.53" x 2.76" x 0.31" (11.51 x 7.01 x 0.79 cm)	Angled or Flat	1 to 4	ADC6SFPUM041XX
<b>6000 Faceplate - Single Gang</b> Dimensions: 4.53" x 2.76" x 0.31" (11.51 x 7.01 x 0.79 cm)	Flat	1 to 6	ADC6SFPUM061XX
<b>6000 Faceplate - Double Gang</b> Dimensions: 4.53" x 4.60" x 0.31" (11.51 x 11.68 x 0.79 cm)	Angled or Flat	1 to 8	ADC6SFPUM082XX
<b>6000 Faceplate - Double Gang</b> Dimensions: 4.53" x 4.60" x 0.31" (11.51 x 11.68 x 0.79 cm)	Flat	1 to 12	ADC6SFPUM122XX

Ordering notes: Replace XX in ordering number with choice of color, below.



01 = Office White



02 = Black

### Related Products

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Media Adapters .....	125



# Data Connectivity

## Media Converters

### Work Area Media Converter



Work Area Media Converter

#### Features

- Reduces work area clutter by placing media conversion circuitry behind the faceplate.
- Eliminates external power adapter and fiber jumper in workstation applications.
- Improves protection of circuits by securing circuitry behind the faceplate.
- Streamlines installation and troubleshooting with built-in intelligence for optical link integrity and UTP link integrity indicators at work area.
- Supports 10Base-T and 100Base-TX UTP and 10Base-FL, 100Base-SX, and 100Base-FX multimode fiber with auto negotiation.

### Rack Mount Media Converter



Rack Mount Media Converter

#### Features

- Superior cable management maintains separation between fiber, copper and power supply cables, protecting data integrity.
- Centralized command and control center streamlines installation and troubleshooting with full view of up to 16 ports from one consolidated LED display.
- Unique Distributed Power Architecture ensures improved performance, reliability and system availability.
- Supports 10Base-T and 100Base-TX UTP and 10Base-FL, 100Base-SX, and 100Base-FX multimode fiber with auto negotiation.



# Media Converters

## Work Area Media Conversion

ADC's solution for media conversion at the work area is simple, uncluttered and cost-effective. Traditional solutions typically consist of an outlet optical interface, fiber jumper for connection to the media converter, a media converter on floor or desk, and a power supply that plugs-in to a wall outlet. Unlike the cluttered approach, the ADC work area solution consists of two simple components:

- An integrated media converter with conversion circuitry behind the faceplate. Tx and Rx fiber cables connect on the rear of the media converter – behind the faceplate and protected from the office environment – and RJ45 station cord for the NIC connects on the front. Each single port media converter fits into any 6000 Multimedia Outlet with a 2-port opening.

Built-in intelligence for optical link integrity and UTP link integrity indicators at the work area streamline installation, troubleshooting, and maintenance. In addition, installation is simple because there are no DIP or crossover switches to adjust.

- Local power supply through a compact power adapter that mounts behind the PC or on the desk, obtaining power through a standard PS/2 mouse interface with a RJ45 patch cord. The media converter can also be powered through the USB port of the PC by means of a simple patch cord or through a conventional AC/DC wall outlet power adapter.

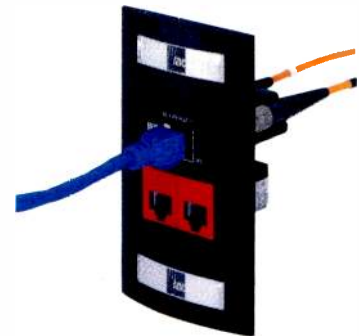
With ADC Media Converters, there is no jumble of components at the desktop – just a simple and logical approach to work area media conversion. And media conversion is just one part of the complete line of ADC work area solutions that provide one work area platform for all outlet requirements, including modular jacks and media adapters for fiber, coax, RCA and S-Video applications.



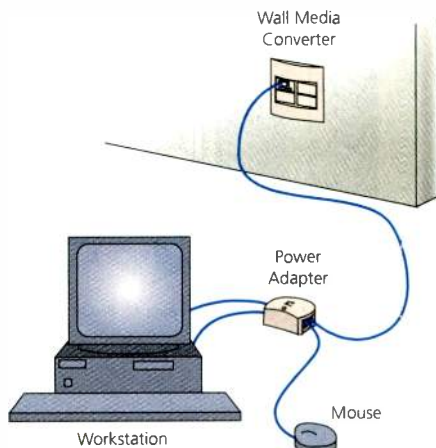
Front view of Media Converter shows convenient front location of indicators for UTP and optical link integrity.



Power adapter mounts behind PC or on the desk and provides power to media converter through the mouse port.



Media Converter shown with 6000 Modular Jacks in 6000 Faceplate.





# Media Converters

## Rack Mount Media Conversion

The one word that describes ADC Media Converters is innovation. From the management of data and power cables to a sophisticated Distributed Power Architecture, ADC Media Converters combine unique design and functionality with space and time saving efficiencies.

Unlike competitive offerings, the ADC media conversion chassis for equipment room applications maintains separation not only for fiber and copper cables but also for power and data cables. On the front of the 16-port, 1 RU chassis, optical interfaces are clearly separated from RJ45 interfaces – ensuring that fiber jumpers and copper patch cords stay apart. And power for all 16 ports is delivered by a standard RJ45 patch cord to the rear of the chassis from a single, separate power supply, saving space, controlling costs, and reducing rack clutter.

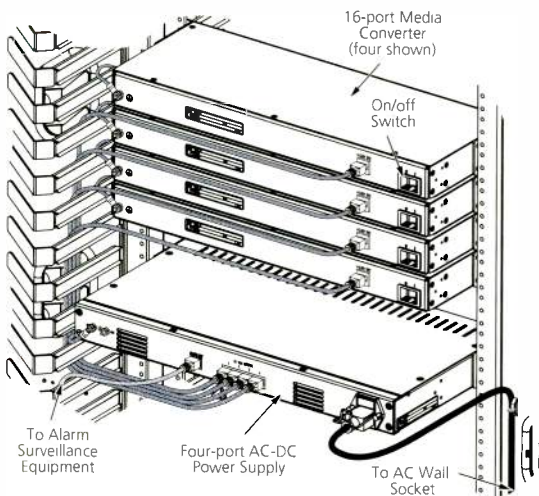
In addition, the rack mount chassis features a unique central command and control center for troubleshooting, power indication and protocol negotiation. The single display for all 16 ports shows individual port diagnostics with a simple toggle for each port. The display flashes the specific port in a fault mode. Unlike other media converter solutions that may have 90+ LEDs for a single chassis, the ADC chassis requires only five simple indicators for all ports: UTP link integrity, UTP link activity, optical link integrity, optical link activity, and power status.

Most important, the cost and time for troubleshooting is reduced because of the built-in intelligence and chipset that allows clear status and alarm monitoring from the chassis command center – avoiding the usual end-to-end visual inspection often required for the optical and copper links.

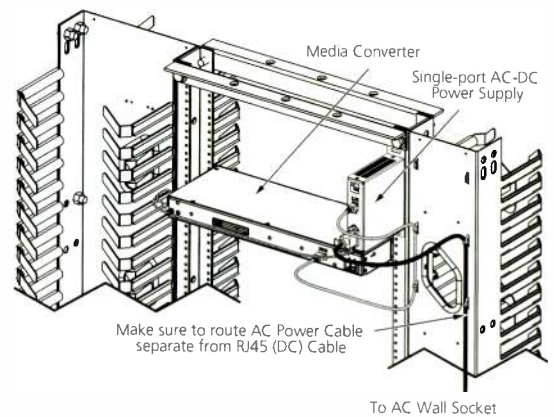
The rack mount media converter chassis is a contained 16-port unit. It requires no insertion of individual port cards, avoiding damage from electrostatic shock, and no complicated setting of DIP or crossover switches because the copper negotiated crossover is built-in. The media converter mounts on any EIA standard 19" or 23" rack with options for flush mounting or 2" or 5" recessed mounting.



Rack Mount Media Converter



Four Rack Mount Media Converters with Multiple Chassis Power



Rack Mount Media Converter with Single Power Supply

Broadcast Products

3/03 • 1180270



# Media Converters

## Rack Mount Media Conversion

ADC's power solution utilizes Distributed Power Architecture (DPA), which is used commonly by telecommunications switching systems for power requirements and is the developing standard of IEEE P802.3af, Data Terminal Equipment via Media Dependent Interface. Because DPA offers improved performance, reliability and system availability, it is the standard power architecture for such organizations as EIA and ISO. Available for AC or DC applications, power supplies include the following:

Single chassis power. This compact power supply uses no rack space because it mounts vertically on the rear rack channel, providing AC or DC power delivered by a RJ45 patch cord for individual 16-port rack mount media converter chassis. With a special mounting bracket, up to 11 single chassis power units can be mounted on a standard 19" rack. Additional brackets allow the power unit to be mounted so that cables can easily route behind the power supply.



Single Chassis Power for Rack Mount Media Converters

Multiple chassis power. This rack mount power unit supplies up to 4 media converters chassis – a single AC or DC power source for up to 64 ports that can be mounted at the top or bottom of a rack, ensuring proper separation of power from low-voltage data cables. Each media converter chassis receives power by individual RJ45 patch cords from the rear, providing for clear separation of data and power cables. The multiple chassis power unit mounts on a standard 19" or 23" rack with options for flush mounting or 2" or 5" recessed mounting.



Multiple Chassis Power for Rack Mount Media Converters

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# Media Converters

3/03 • 1180270 Broadcast Products

## Ordering Information

Description	Ordering Number
<b>Work Area Media Converter Kits</b> Mouse port power option 850 nm 1300 nm <i>kit includes media converter, power adapter, 3' PS/2 jumper, and 3' blue RJ45 patch cord</i>	ADC6S1SXSTMM1XX* ADC6S1FXSTMM1XX*
Wall outlet power option 850 nm 1300 nm <i>kit includes media converter, power adapter, AC/DC wall outlet power adapter, and 3' blue RJ45 patch cord</i>	ADC6S1SXSTMM2XX* ADC6S1FXSTMM2XX*
USB port power option 850 nm 1300 nm <i>kit includes media converter and USB patch cord</i>	ADC6S1SXSTMM3XXYY** ADC6S1FXSTMM3XXYY**
<b>Rack Mount Media Converter Kits</b> 16 port chassis with ST connectors AC power DC power <i>kit includes rack mount media converter, AC or DC single chassis power supply, and power cord for AC unit only. Chassis connects to power supply with RJ45 patch cord, ordered separately</i>	ADC1SXST160201 ADC1SXST160202
16 port chassis with SC connectors AC power DC power <i>kit includes rack mount media converter, AC or DC single chassis power supply, and power cord for AC unit only. Chassis connects to power supply with RJ45 patch cord, ordered separately</i>	ADC1SXSC160201 ADC1SXSC160202
<b>Rack Mount Media Converters</b> 16 port chassis (order power supply separately) ST connectors SC connectors	ADC1SXSTMM1602 ADC1SXSCMM1602
Power supply for up to four 16 port chassis, N+1 redundancy AC power DC power <i>includes power cord for AC power only</i>	ADC04PSUAC02 ADC04PSUDC02
<b>Accessories</b> RJ45 patch cord, Cat 5e with boots Work area – for optional station cable Rack mount – for connecting to power supply White Gray Blue	ADCPC-RR6B-WTZZ*** ADCPC-RR6B-GYZZ*** ADCPC-RR6B-BLZZ***

### Ordering notes:

\* Replace XX in ordering number with choice of color for media converter below

	00 = Electrical Ivory		02 = Black		07 = Snow White
	01 = Office White		06 = Gray		

\*\* To order USB port power cable, replace YY in ordering number with desired length in meters: 02, 05, 07, or 10. Replace XX in ordering number with choice of color for media converter

\*\*\* To order optional RJ45 station cable, replace ZZ in ordering number with the desired length in feet: 03, 05, 07, 10, 15, 20, 25, or 50. Custom colors and lengths available.



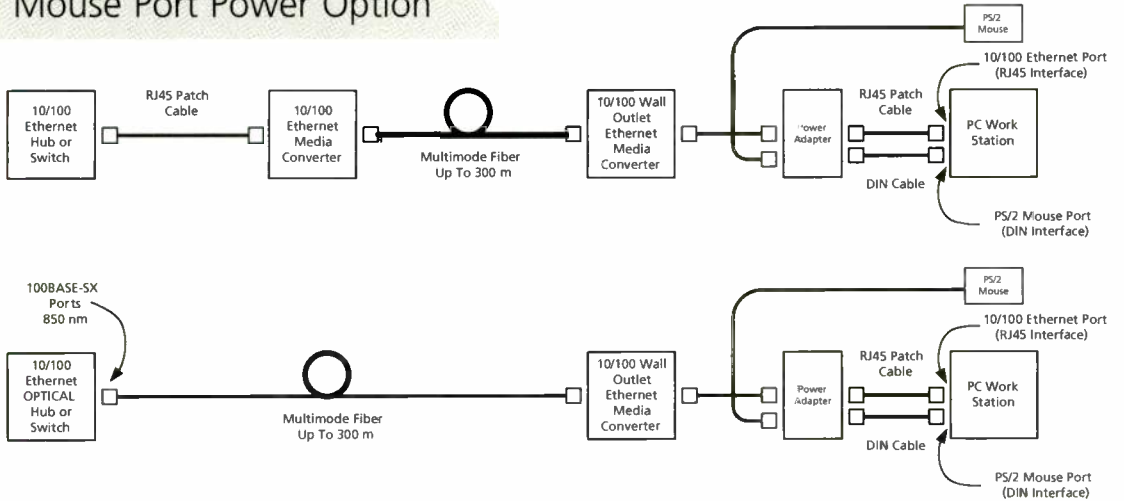


# Media Converters – Work Area

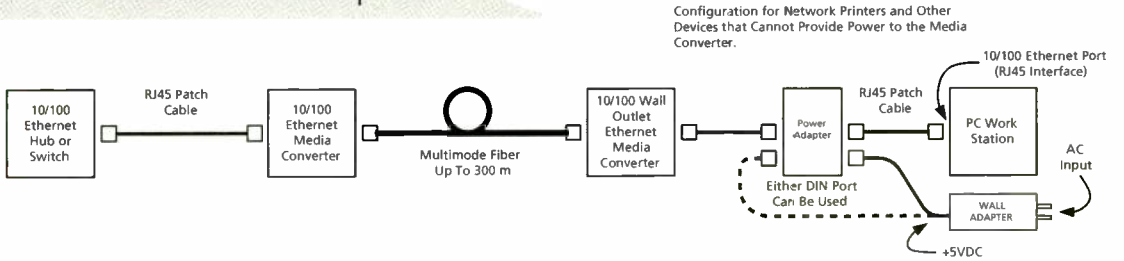
## Applications and Powering Options

Broadcast Products 3 / 0 3 • 1 1 8 0 2 7 0

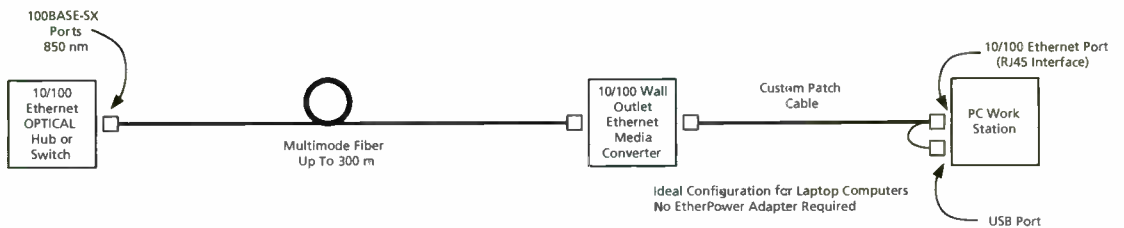
### Mouse Port Power Option



### Wall Outlet Power Option



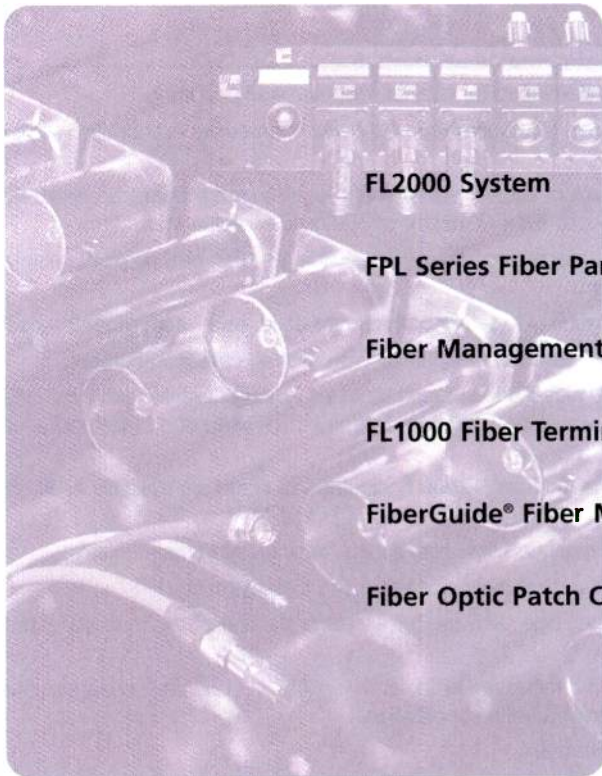
### USB Port Power Option





# Fiber Connectivity and

## Product Line Overview



<b>FL2000 System</b>	<b>141</b>
<b>FPL Series Fiber Panels</b>	<b>153</b>
<b>Fiber Management Tray</b>	<b>157</b>
<b>FL1000 Fiber Termination Products</b>	<b>163</b>
<b>FiberGuide® Fiber Management System</b>	<b>168</b>
<b>Fiber Optic Patch Cords</b>	<b>169</b>

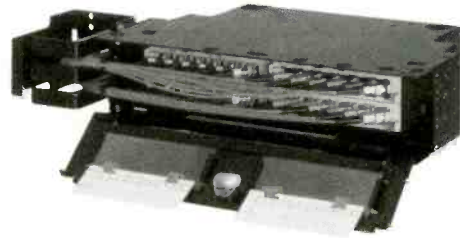


# FL2000 System

## Introduction



FL2000 Rack Mount Chassis



FL2000 Rack Mount Chassis (door open)

The economical and flexible FL2000 series of fiber optic products is ideal for small fiber counts and can be used in moderate fiber count applications as well by combining various panels. This leading fiber optic panel is now available in black.

### Features

- A complete line of modular panels developed for cabinet, rack and wall mounting.
- Fully adaptable for large or small main distribution frame (MDF), intermediate distribution frame (IDF) or telephone closet (TC) applications.
- Designed for 19" (48.26 cm) EIA rack or cabinet environment found in many broadcast networks; optional brackets are available to accommodate 23" (58.42 cm) or ETSI rack or cabinet mounting.
- Provides termination, splicing and storage capabilities for in-building cables, outside plant cables and fiber optic terminal (FOT) equipment patch cords.
- Modular design offers maximum flexibility to satisfy both current needs and future growth requirements.
- A full line of options and accessories ensures compatibility with existing optical equipment.
- FL2000 systems accommodate the Value-Added plug-in modules, adding flexibility and functionality to the optical transport systems. Splitters, wavelength division multiplexers (WDMs) and other optical components can be easily incorporated.
- All FL2000 panels accommodate the modular FL2000 6pak plug-ins. 6paks are available in all connector styles and can be ordered as needed.
- ADC's patented removable angled retainers allow easy access for single fiber maintenance.
- FL2000 panels and feature superior vertical cable protection and management.
- Rack mount panels are hinged on one side, allowing full access to the rear of the front plate and the interior of the panel.
- Rack mount panels are equipped with mounting brackets to provide 5" (12.7 cm) recess mounting; mounting brackets are available for virtually any mounting application.
- Rack mount panels can be wall mounted.
- The new FL2000 splice wheel allows easy roll-up of pigtail and buffer tube lengths and superior bend radius protection.
- The FL2000 splice deck is available to complete existing installations.



# FL2000 System

## Rack or Cabinet Mount Termination/Splice Panels

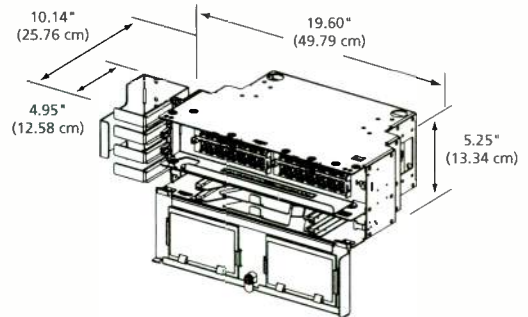
### Preconfigured Panels with Pigtails, Black

#### Features

FL2000 panels can also be shipped with 6paks and/or pigtails pre-installed at the factory.

- Reduce installation time
- Simplify ordering process

Use this configuration guide to determine the ordering number right for your application.



#### Ordering Number

FL2 - 1 2 3 4 5 6 7 8 9 10 11 12

#### Panel Type

C	Termination/Splice
---	--------------------

#### Nominal Capacity Panel Height

Nominal Capacity	Panel Height
A 12 position	3.5" (8.89 cm) (2 RU)
B 24 position	5.25" (13.34 cm) (3 RU)
D 48 position	8.75" (22.23 cm) (5 RU)
E 72 position	14.00" (35.56 cm) (8 RU)
F 96 position	17.50" (44.45 cm) (10 RU)

#### Connector Style

Multimode	
9	SC
D	Duplex SC
5	ST®
Y	LX.5® <sup>1</sup>
Singlemode	
2	Ultra PCFC
L	FC with zirconia adapter
F	FC 8° angled polish
7	Ultra PCSC
N	SC with zirconia adapter
J	SC 8° angled polish
E	Duplex SC
4	Ultra PCST
P	ST® with zirconia adapter
K	E-2000 8° angled polish
X	LX.5® <sup>1</sup>
1	FC Hybrid (FC connector on front; SC connector on back of bulkhead)
3	ST® Hybrid (ST® connector on front; SC connector on back of bulkhead)

#### Number of Ports Loaded

#### Pigtail or Adapter Type

A	Adapters only
P	6 fiber softwall bundle
H	6 fiber Maxi-Strip
R	12 fiber ribbon
K	12 fiber softwall bundle <sup>2</sup>
Y	12 fiber Maxi-Strip

#### Splice Type

0	None or N/A
M	Mechanical (Wheel)
W	Heat Shrink Fusion (Wheel)
1	Bare Fusion (Deck)
2	Heat Shrink Fusion (Deck)
3	Mechanical (Deck)
7	Raychem Universal (Deck)
8	Nortel (Deck)

#### Splice Type<sup>2</sup>

M	Mechanical (Wheel)
N	Nortel (Wheel)

#### Number of Splice Decks

#### Latch Type

0	Latch
1	Hole Plug
2	Screwdriver
5	K1 Lock
6	K2 Lock

#### Number of Cable Clamps

0	1 clamp (standard)
2	2 clamps

#### Mounting Style<sup>3</sup>

A	19" (48.26 cm) standard (19.6" [49.78 cm] overall)
B	19" (48.26 cm) maximum (19" [48.26 cm] overall)
C	19" (48.26 cm) flush mount
D	23" (58.42 cm) centered
E	23" (58.42 cm) with oversized VCG
F	ETSI flush mount

<sup>1</sup> LX.5® connectors and adapters double the capacity of the panel by terminating two fibers at each adapter.

<sup>2</sup> For use with LX.5® only.

<sup>3</sup> Mounting kit shipped unattached if other than standard mounting style.



# FL2000 System

## Rack or Cabinet Mount Termination Panels

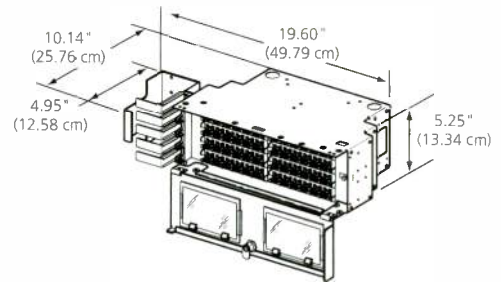
### Preconfigured Panels with Pigtails, Black

#### Features

FL2000 panels can also be shipped with 6paks and/or pigtails pre-installed at the factory.

- Reduce installation time
- Simplify ordering process

Use this configuration guide to determine the ordering number right for your application.



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#### Ordering Number

FL2 - 1 2 3 4 5 6 7 8 9 10 11 12

**Panel Type**

R	Termination only
---	------------------

**Nominal Capacity**    **Panel Height**

A	12 position	1.75" (4.45cm) (1 RU)
B	24 position	3.5" (8.89 cm) (2 RU)
C	36 position	5.25" (13.34 cm) (3 RU)
D	48 position	5.25" (13.34 cm) (3 RU)
E	72 position	8.75" (22.23 cm) (5 RU)
F	96 position	10.5" (26.67 cm) (6 RU)

**Connector Style**

Multimode	
9	SC
D	Duplex SC
5	ST®
Y	LX.5® <sup>1</sup>
Singlemode	
2	Ultra PCFC
L	FC with zirconia adapter
F	FC 8° angled polish
7	Ultra PCSC
N	SC with zirconia adapter
J	SC 8° angled polish
E	Duplex SC
4	Ultra PCST
P	ST® with zirconia adapter
K	E-2000 8° angled polish
X	LX.5® <sup>1</sup>
1	FC Hybrid (FC connector on front; SC connector on back of bulkhead)
3	ST® Hybrid (ST® connector on front; SC connector on back of bulkhead)

**Number of Ports Loaded**

**Pigtail or Adapter Type**

A	Adapters only
P	6 fiber softwall bundle
H	6 fiber Maxi-Strip
R	12 fiber ribbon
K	12 fiber softwall bundle <sup>2</sup>
Y	12 fiber Maxi-Strip

**Mounting Style<sup>3</sup>**

A	19" (48.26 cm) standard (19.6" [49.78 cm] overall)
B	19" (48.26 cm) maximum (19" [48.26 cm] overall)
C	19" (48.26 cm) flush mount
D	23" (58.42 cm) centered
E	23" (58.42 cm) with oversized VCG
F	ETSI flush mount

**Latch Type**

0	Latch
1	Hole Plug
2	Screwdriver
5	K1 Lock
6	K2 Lock

**Number of Cable Clamps**

0	1 clamp (standard)
2	2 clamps

<sup>1</sup> LX.5® connectors and adapters double the capacity of the panel by terminating two fibers at each adapter.

<sup>2</sup> For use with LX.5®

<sup>3</sup> Mounting kit shipped unattached, if other than standard mounting style.



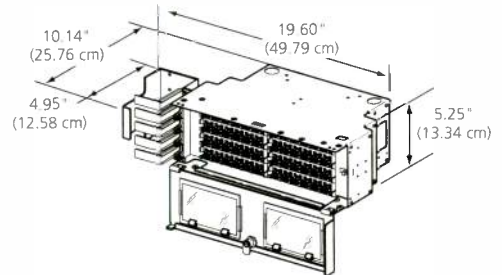
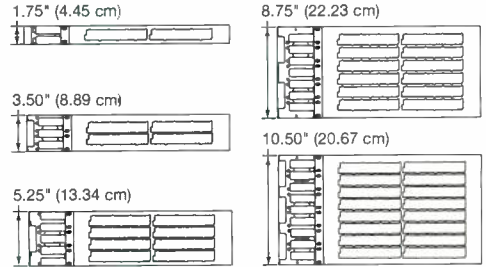
# FL2000 System

## Empty Panels

### Rack or Cabinet Mount Termination Panels

#### Features

- Mounting
  - 19" (48.26 cm) EIA rack or cabinets, standard 5" (12.7 cm) recess
  - Wall mounting option available
  - Other mounting kits available
 Please see pages 145-148
- Hinged on left front side<sup>1</sup>; allows full access to rear of front plate and interior of panel
- FL2000 6pak adapter plug-ins ordered separately
- Constructed of high strength aluminum
- Equipped with removable metal doors with Plexiglas windows
- Designation labels included with each panel
- Complete line of accessories including locks for security



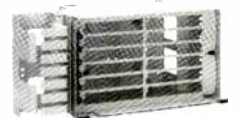
All panels can double capacity with LX.5<sup>®</sup> adapters  
<sup>1</sup> Right hinged also available

#### Ordering Information

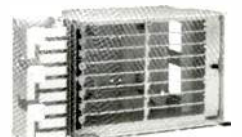
Description	Panel Height	Ordering Number
<b>Rack or Cabinet Mount Panel, black</b> <i>Includes vertical cable management trough</i>		
12 fiber capacity	1.75" (4.45 cm)	FL2-12RPNL-B
24 fiber capacity	3.50" (8.89 cm)	FL2-24RPNL-B
36 fiber capacity	5.25" (13.34 cm)	FL2-36RPNL-B
48 fiber capacity	5.25" (13.34 cm)	FL2-48RPNL-B
72 fiber capacity	8.75" (22.23 cm)	FL2-72RPNL-B
96 fiber capacity	10.50" (26.67 cm)	FL2-96RPNL-B
<b>Accessories</b>		
<b>Wall mount bracket, black</b> - needed for 12 fiber capacity panel only		FL2-ACC008-B
<b>Cable clamp kit</b> - One per cable recommended Outer diameter .2" to .8" Outer diameter .7" to 1.0" Cable Clamp kit for 12 fiber capacity panel only		FL2-ACC007 FL2-ACC021 FL2-ACC033
<b>Bonding/grounding kit</b> For mounting kits see pages 149-152		FL2-ACC006



24 Fiber Capacity



72 Fiber Capacity



96 Fiber Capacity

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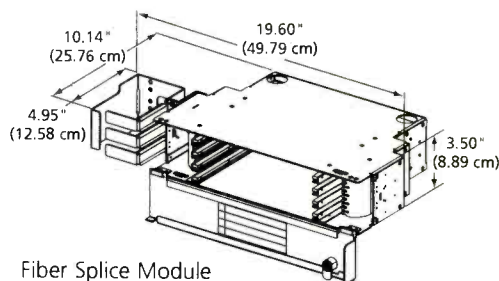
# FL2000 System

## Empty Panels

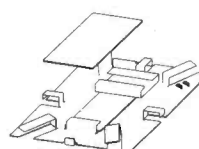
### Rack or Cabinet Mount Splice Panels

#### Features

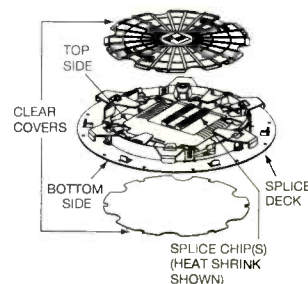
- Offers combination of splicing protection and associated fiber/pigtail storage
- Splice panel can be mounted in conjunction with any FL2000 termination panel or as a stand-alone splice panel
- Occupies same footprint and offers same mounting options as FL2000 termination panels
- Accepts the new ADC splice wheel for efficient management of fiber cable and splice protection
- Accepts the traditional ADC splice deck



Fiber Splice Module  
(48 Fiber Capacity  
Module Shown)



Splice Deck with  
Splice Chip (Black)



Splice Wheel with  
Splice Chip (Black)

#### Ordering Information

Description	Panel Height	Ordering Number
<b>Splice Panel for Splice Wheel, black</b> (Accepts splice wheel only) 48 fiber capacity 96 fiber capacity 144 fiber capacity	3.5" (8.89 cm) 7" (17.78 cm) 8.75" (22.23 cm)	FL2-48SPNL2-B FL2-96SPNL2-B FL2-144SPNL2-B
<b>Splice Wheel with Splice Chip</b> Heat shrink fusion Mechanical Nortel		FST-DRS12-HS FST-DRS12-MT FST-DRS24-NT
<b>Splice Panel for Splice Deck for Existing Installations, black</b> (Also accepts splice wheel) 48 fiber capacity 96 fiber capacity 144 fiber capacity	3.5" (8.89 cm) 7" (17.78 cm) 8.75" (22.23 cm)	FL2-48SPNL-B FL2-96SPNL-B FL2-144SPNL-B
<b>Splice Deck with Splice Chip for Existing Installations</b> Heat shrink fusion Mechanical Bare fusion Nortel QPAK		FL2-RSPLCE-HS-B FL2-RSPLCE-MT-B FL2-RSPLCE-FT-B FL2-RSPLCE-NT-B
<b>Cable Clamp Kit (kit of 1)</b> Outer diameter .2" to .8" Outer diameter .7" to 1.0"		FL2-ACC007 FL2-ACC021
<i>For mounting kits see pages 149-152</i>		

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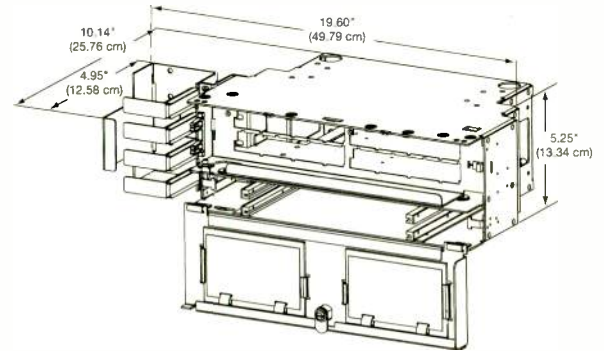
# FL2000 System

## Empty Panels

### Rack or Cabinet Mount Termination/Splice Panels

#### Features

- Mounting
  - 19" (48.26 cm) EIA racks or cabinets, standard 5" (12.7 cm) recess
  - Wall mounting option available
  - Other mounting kits available. Please see pages 146-149
- Hinged on left front side<sup>1</sup> for complete access to interior of termination section
- Ability to quickly and easily configure, utilizing the 6pak assemblies (ordered separately)
- Complete line of accessories including locks for security
- Uses ADC splice wheels or splice decks



Termination/Splice Panel

<sup>1</sup> Right hinged also available

#### Ordering Information

Description	Panel Height	Ordering Number
<b>Termination/splice Panel, black</b>		
12 position	3.5" (8.89 cm)	FL2-12TS350-B
24 position	5.25" (13.34 cm)	FL2-24TS525-B
48 position	8.75" (22.23cm)	FL2-48TS875-B
72 position	14" (35.56 cm)	FL2-72TS140-B
96 position	17.5" (44.45 cm)	FL2-96TS175-B
<b>Splice Wheel with Splice Chip</b>		
Heat shrink fusion		FST-DRS12-HS
Mechanical		FST-DRS12-MT
Nortel		FST-DRS24-NT
<b>Splice Deck with Splice Chip</b>		
Heat shrink fusion		FL2-RSPLCE-HS-B
Mechanical		FL2-RSPLCE-MT-B
Bare fusion		FL2-RSPLCE-FT-B
Nortel		FL2-RSPLCE-NT-B



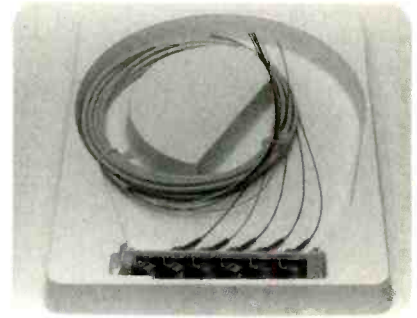
# 6pak Connector Plug-Ins

## With Adapters and Pigtails

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### Features

- Available with pre-terminated 3 meter (9.84') or 5 meter (16.4') pigtails
- Pigtails consist of a single outer jacket containing six color-coded 900 μm fibers
- One end of pigtail terminated to chosen connector style and installed into the 6pak plug-in adapters
- ADC recommends specific breakouts for panel and wall mount box products
- Saves installation time



FL2000 6pak plug-in with SC adapters and pigtails

### Multimode Pigtails and Adapters

**Ordering Number**

FL2 - 6P    B    C    6

Multimode Connector Style	
5	ST®
9	SC
A	FC
D	Duplex SC
Y	LX.5® <sup>1</sup>

Fiber Size	
B	Multimode 62.5/125
C	Multimode 50/125

Length (in meters)	
03W	3 m (9.84') pigtail for wall mount boxes
05R	5 m (16.4') pigtail for rack mount panels

Note: 6paks are putty in color  
<sup>1</sup> LX.5® 6paks are loaded with 12 fiber pigtails

### Singlemode Pigtails and Adapters

**Ordering Number**

FL2 - 6P    S    6

Singlemode Connector Style	
E	Duplex SC
2	Ultra PCFC
4	Ultra PCST
7	Ultra PCSC
F	PCFC 8° angled polish
J	PCSC 8° angled polish
K	E-2000 angled polish
X	LX.5® <sup>1</sup>
Q	PCSC 9° angled polish
1	FC Hybrid (FC connector on front; SC connector on back of bulkhead)
3	ST® Hybrid (ST® connector on front; SC connector on back of bulkhead)

Fiber Size	
S	Singlemode

Length (in meters)	
03W	3 m (9.84') pigtail for wall mount boxes
05R	5 m (16.4') pigtail for rack mount panels

Fiber Type	
C	Stranded
D	Maxi-Strip

Note: 6paks are putty in color  
<sup>1</sup> LX.5® 6paks are loaded with 12 fiber pigtails



# 6pak Adapter Plug-Ins

For all FL2000 Termination Products

Broadcast Products

3 / 0 3 • 1 1 8 0 2 7 0

## Features

- Completely interchangeable between FL2000 panel and wall box products
- Can be ordered with all standard types of simplex and duplex single and multimode adapters and connectors
- Feature ADC's patented removable angled retainers which provide superior fiber management
- No tools required to install into FL2000 boxes or panels
- Can be ordered with adapters only, or for quick and easy installation, with pre-terminated 3 meter (9.84') or 5 meter (16.4') pigtails



6pak Plug-In (shown with singlemode simplex adapters)



6pak Plug-In (shown with multimode simplex adapters)



6pak Plug-In (shown with singlemode LX.5<sup>®</sup> adapters)



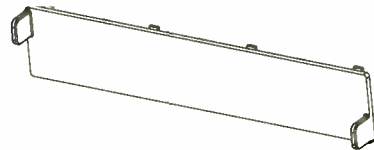
6pak Plug-In (shown with multimode LX.5<sup>®</sup> adapters)



6pak Plug-In (shown with singlemode duplex adapters)



6pak Plug-In (shown with multimode duplex adapters)



6pak Blank Plug-In

## Ordering Information

Description	Ordering Number
<b>Multimode</b>	
SC	FL2-6PMMSC
ST <sup>®</sup>	FL2-6PMMST
FC	FL2-6PMMFC
SC (duplex)	FL2-6PMMDSC
SC, zirconia	FL2-6PMMSC-Z
ST <sup>®</sup> , zirconia	FL2-6PMMST-Z
FC, zirconia	FL2-6PMMFC-Z
LX.5 <sup>®</sup>	FL2-6PMLX
<b>Singlemode</b>	
SC	FL2-6PSMSC
ST <sup>®</sup>	FL2-6PSMST
FC	FL2-6PSMFC
SC (duplex)	FL2-6PSMDSC
FC with 8° angled polish	FL2-6PSMAFC
SC with 8° angled polish	FL2-6PSMASC
SC, zirconia	FL2-6PSMSC-Z
ST <sup>®</sup> , zirconia	FL2-6PSMST-Z
FC, zirconia	FL2-6PSMFC-Z
E-2000, angled polish	FL2-6PSMAE-2
LX.5 <sup>®</sup>	FL2-6PSMALX
Hybrid: FC front, SC back	FL2-6PSMFC/SC
Hybrid: ST <sup>®</sup> front, SC back	FL2-6PSMST/SC
<b>6pak blank plug-in</b>	FL2-6PBLNK



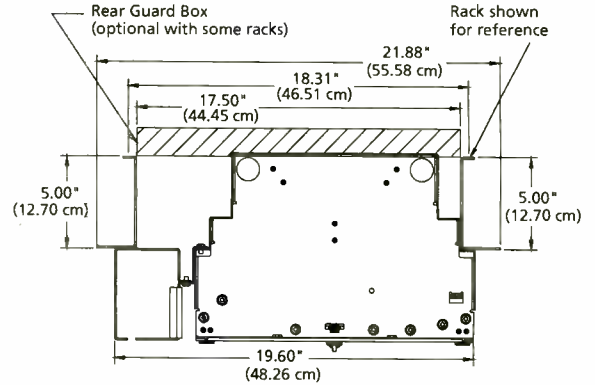
# FL2000 System

## Mounting Options – 19" (48.26 cm) Rack Mounting

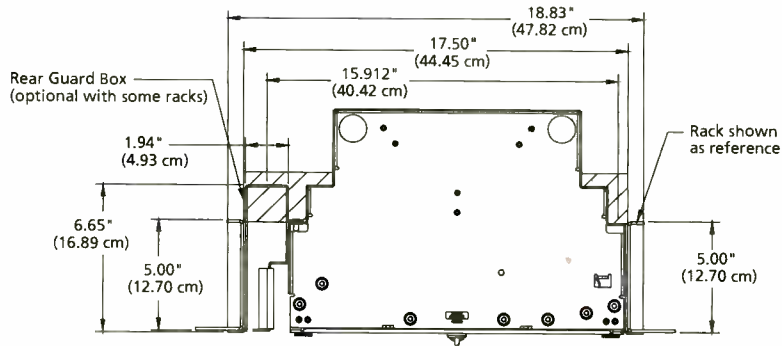
### Standard Mount (as shipped)

#### Features

- Panels typically shipped from factory equipped for this mounting
- Panels shipped with
  - Left-side "L" bracket
  - Left-side 2.5" (6.32 cm) wide vertical cable guide (VCG)



### Flush Mount



#### Ordering Information

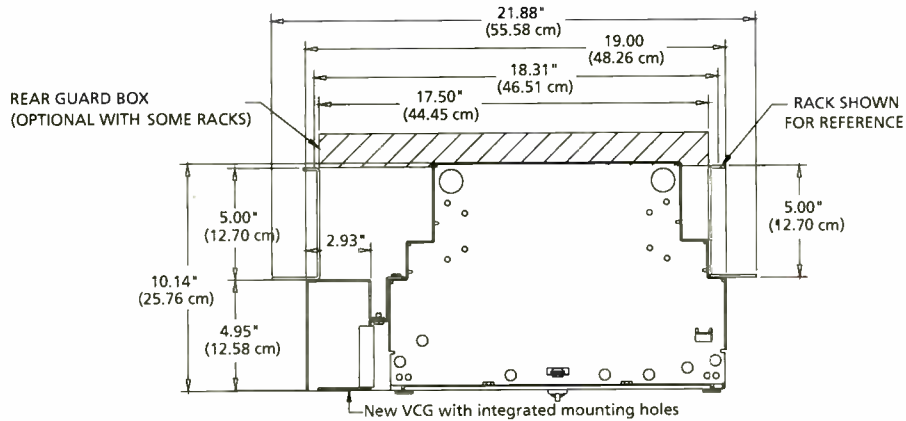
Description	Panel Height	Ordering Number
<b>Flush Mount</b>	1.75" (4.45 cm)	FL2-FLMT0175-B
Allows 1", 2" or 4" (2.54, 5.08 or 10.16 cm) recess mounting	3.5" (8.89 cm)	FL2-FLMT0350-B
Kit includes: new vertical cable guide and mounting flanges	5.25" (13.34 cm)	FL2-FLMT0525-B
	7" (17.78 cm)	FL2-FLMT0700-B
	8.75" (22.23 cm)	FL2-FLMT0875-B
	10.5" (26.67 cm)	FL2-FLMT1050-B



# FL2000 System

## Mounting Options – 19" (48.26 cm) Rack Mounting

### 19" (48.26 cm) Maximum Mounting



### Ordering Information

Description	Panel Height	Ordering Number
<b>19" Maximum, black</b>	1.75" (4.45 cm)	FL2-19MAX0175-B
Allows entire panel to be contained within frame footprint Kit includes: new vertical cable guide with integrated mounting holes	3.5" (8.89 cm)	FL2-19MAX0350-B
	5.25" (13.34 cm)	FL2-19MAX0525-B
	7" (17.78 cm)	FL2-19MAX0700-B
	8.75" (22.23cm)	FL2-19MAX0875-B
	10.5" (26.67 cm)	FL2-19MAX1050-B
	14" (35.56 cm)	FL2-19MAX1400-B
	17.5" (43.18 cm)	FL2-19MAX1750-B

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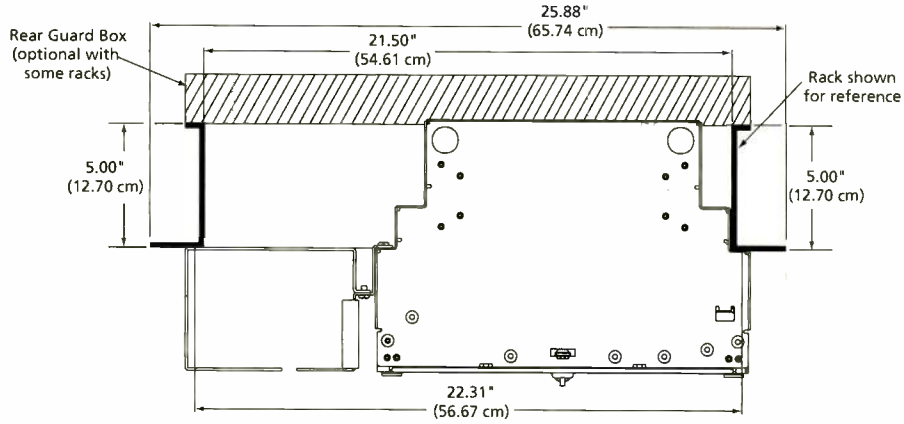
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# FL2000 System

## Mounting Options – 23" (58.42 cm) Rack Mounting

### 23" (58.42 cm) Wide VCG Mounting



### Ordering Information

Description	Panel Height	Ordering Number
<b>23" with Large VCG, black</b> Kit includes: new vertical cable guide with integrated mounting holes	1.75" (4.45 cm)	FL2-23VCG0175-B
	3.5" (8.89 cm)	FL2-23VCG0350-B
	5.25" (13.34 cm)	FL2-23VCG0525-B
	7" (17.78 cm)	FL2-23VCG0700-B
	8.75" (22.23cm)	FL2-23VCG0875-B
	10.5" (26.67 cm)	FL2-23VCG1050-B
	14" (35.56 cm)	FL2-23VCG1400-B
	17.5" (43.18 cm)	FL2-23VCG1750-B

Broadcast Products

1-800-270-3703

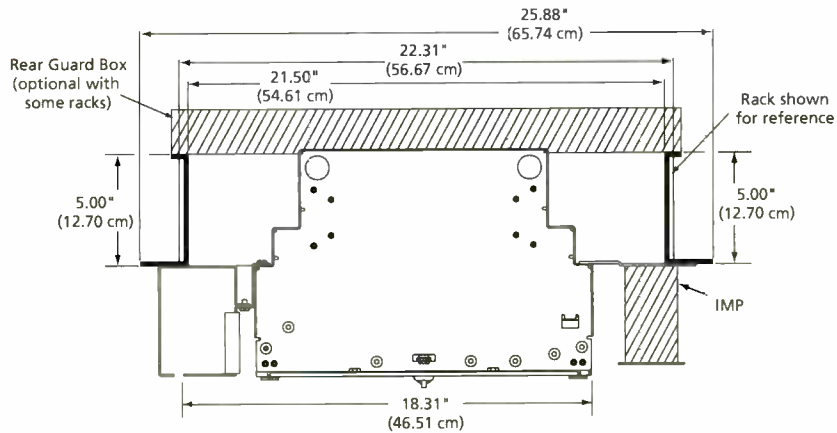


# FL2000 System

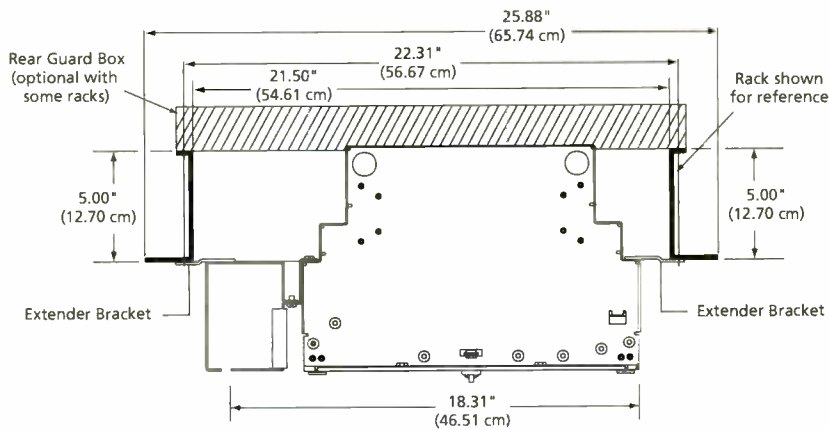
## Mounting Options – 23" (58.42 cm) Rack Mounting

### Inner IMP Mounting

Note: Standard mounting in a rack equipped with inner-IMP



### 23" (58.42 cm) Centered (Extender Bracket Mounting)



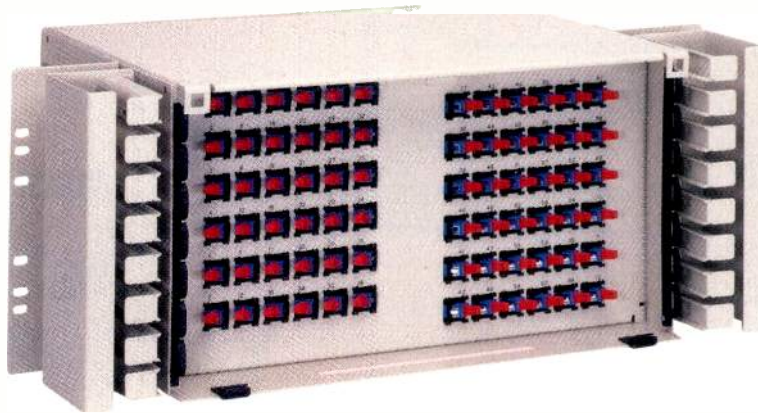
### Ordering Information

Description	Panel Height	Ordering Number
<b>23" Rack Centered (with extender brackets)</b> This kit can be used with flush mount brackets (see page 149) to achieve 23" flush mounting, as well as 1", 2", or 4" recess mounting	1.75" (4.45 cm)	FL2-EB0175P-B
	3.5" (8.89 cm)	FL2-EB0350P-B
	5.25" (13.34 cm)	FL2-EB0525P-B
	7" (17.78 cm)	FL2-EB0700P-B
	8.75" (22.23 cm)	FL2-EB0875P-B
	10.5" (26.67 cm)	FL2-EB1050P-B
	14" (35.56 cm)	FL2-EB1400P-B
17.5" (43.18 cm)	FL2-EB1750P-B	



## FPL Series

Fiber Panels For Termination, Splice and Storage



Broadcast Products

3/03 • 1180270

With a variety of fiber termination, splicing and storage solutions ADC's FPL Series fiber panels allow customers to optimize rack space and the dollars that go with it. The FPL panels combine the unique features of vertical cable guides and angle-left/angle-right adapters. This results in diverse cable routing options and a complete cable management solution. The panel's rear access splicing provides a high-density termination/splice solution maximizing rack space. And with a wide range of fiber capabilities and options, the panels are designed to meet growing network application needs.

ADC now introduces the 144-position High-Density Termination/Splice panel. The 144-position panel maintains all existing FPL panel capabilities – in the space of just five rack units (8.75").

### Features

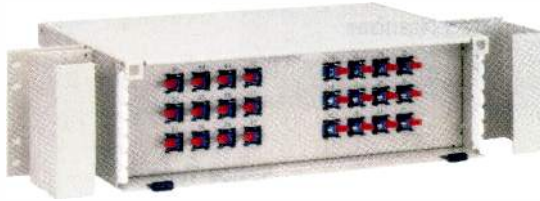
- Panels are equipped with adjustable mounting brackets to provide either 19" or 23" rack or cabinet mounting (EIA or WECCO) as well as 4" or 5" recess mounting.
- Available preterminated with pigtails to simplify ordering and reduce installation time.
- ADC's patented removable angled retainers allow easy access for single fiber maintenance.
- Vertical cable guides on either side of the panel provide bend radius protection and management of fibers exiting the panel.
- Using ADC's LX.5® connector will double the capacity of each panel.



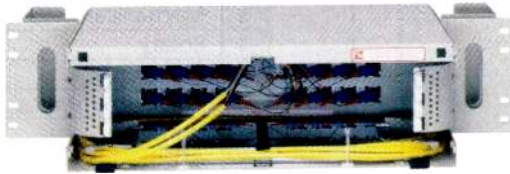


# FPL Series Fiber Panels

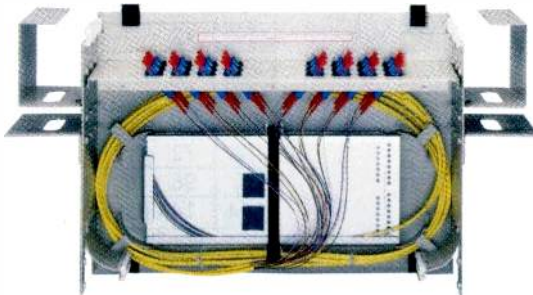
## Termination and Splice



Front View



Rear View



Top Cover Removed with Pigtail Routing Shown

### Features

- Available in 24, 48, 72, and 96 termination densities
- Provides termination and splice of pigtails as well as associated fiber/pigtail storage
- Rear splice area saves space by reducing panel height
- ADC recommends completely splicing all OSP/IFC cables during initial installation to maintain minimal disturbance of the interior of the panel.
- Splice area provides up to a total of 7 meters of slack storage for pigtails and OSP/IFC buffer tubes.
- Optional lock for both front and rear doors (available separately)
- Removable front polycarbonate door
- Designation labels included with each panel
- Mounting brackets included with panel may be flipped to accommodate 19" or 23" mounting and 4" or 5" recess.
- Each panel includes 2 cable clamps

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Panel Size	Splice Tray Type	Number of Splice Trays included for a fully loaded panel
24	Single Height	2
48	Dual Height	2
72	Dual Height	3
96	Dual Height	4



# FPL Series Fiber Panels

## Termination and Splice

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### Ordering Number

FPL- R 0 -

Nominal Capacity		Dimensions Height
24	24-position	5.25" (3RU)
48	48-position	8.75" (5RU)
72	72-position	8.75" (5RU)
96	96-position	8.75" (5RU)

Adapters/Pigtails	
P	Stranded pigtails and adapters
R	Ribbon pigtails and adapters

Connector Style (Panel/Stub)	
9	MMSC
D	MMSC duplex
5	MMST
Y	MMLX.5*
2	SMFC
L	SMFC (zirconia adapter)
F	SMFC (8° angle polish)
7	SMSC
N	SMSC (zirconia adapter)
J	SMSC (8° angle polish)
E	SMSC duplex
4	SMST
P	SMST (zirconia adapter)
K	SME-2000 (8° angle polish)
R	SME-2000 (flat polish)
X	SMLX.5*

Splice Type	
0	None or N/A
1	Bare fusion
2	Heat shrink fusion
3	Mechanical
4	Rotary
5	FibrLok®
7	Raychem Universal (RU)
8	Nortel
9	AFL

Number of Pigtailed Terminations	
12	12
24	24
36	36
48	48
72	72
96	96
144	144 (LX.5° only)

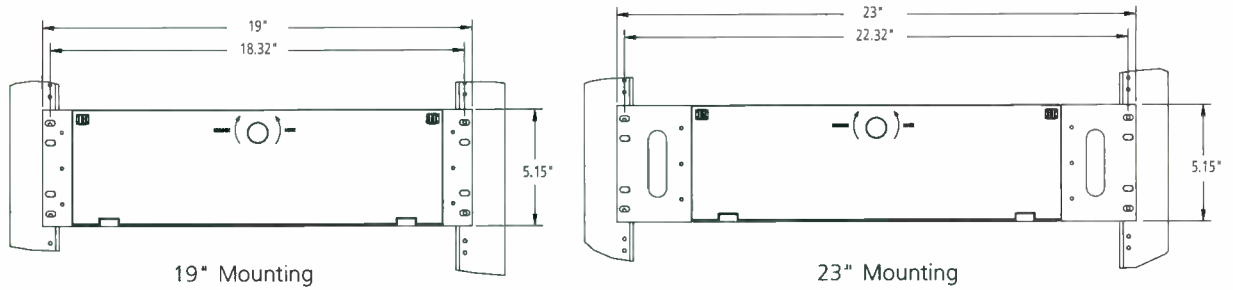
\* LX.5° is not available in 96-position panel



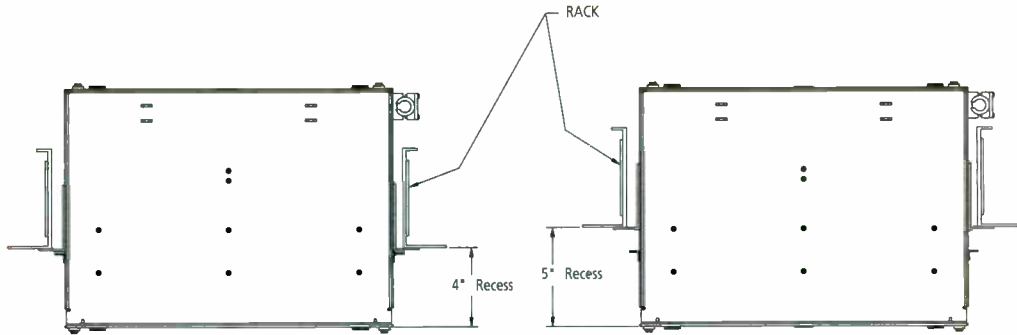
# FPL Series Fiber Panels

## Mounting Options for FPL Panels

The following mounting bracket options are available with all FPL panels except the single-drawer storage panels: (Vertical cable guides removed to show mounting brackets.)



Mounting brackets may be flipped to provide either 19" or 23" mounting.



Mounting brackets may be adjusted for 4" or 5" recess mounting.

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# Fiber Management Tray

## Introduction

ADC's Fiber Management Trays provide a flexible, economical approach to handling your network's most vital elements by offering four different designs. Termination, termination/splicing, termination/storage, and slack storage designs are offered with ADC's modular, all-front-access design.

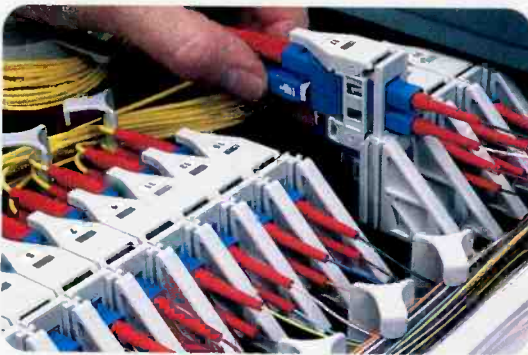
### Features:

#### All-Front-Access Design



Sliding radius limiters provide ultimate fiber management by addressing one of the most critical elements of fiber cable management: bend radius protection.

By controlling the movement of fibers into the tray, error-proof slack loop management is maintained, ensuring 30 mm bend radius protection. This is crucial to protecting fiber, eliminating service failures and decreasing costs.



#### Sliding Adapter Packs

Sliding adapter packs allow easy access for connecting jumpers and cleaning connectors, ensuring that any fiber can be installed or removed without disturbing adjacent fibers. That can mean the difference between a network reconfiguration time of 20 minutes per fiber and one of over 90 minutes per fiber.



#### Modular Design

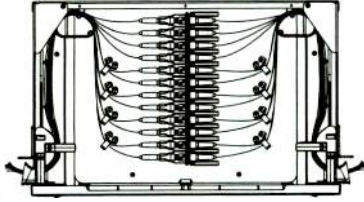
ADC's modular design offers the value of a single interface for performing multiple tasks in your network. By employing a one-rack-unit, modular tray, network technicians have familiar access to terminating, splicing, and storing fiber. This cable management approach translates to time and money saved, for moves, adds and changes.



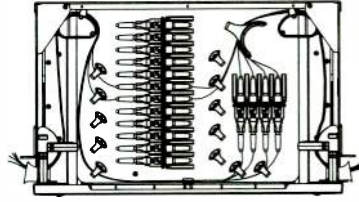
# Fiber Management Tray

## Termination Only

The termination only Fiber Management Tray provides termination for 24 or 32 fibers in an all-front-access design. This tray mounts in 19-inch, 23-inch, or ETSI racks, while sliding radius limiters provide cable management for incoming and outgoing fibers.



24-Termination Only



32-Termination Only

### Ordering Number

FMT-D 0 0A0 -

#### Drawer Configuration

RT	Termination only
----	------------------

#### Connector/Adapter Style

Multimode	
5	ST®
9	SC
Singlemode	
1	FC hybrid (FC connector on front; SC connector on back of bulkhead)
2	FC ultra polish
3	ST® hybrid (ST® connector on front; SC connector on back of bulkhead)
4	ST® ultra polish
7	SC ultra polish
F	FC angled polish
J	SC angled polish
K	E-2000 angled polish
L	FC with zirconia adapter
M	MTRJ feedthrough adapter
N	SC with zirconia adapter
P	ST® with zirconia adapter

#### Faceplate Color

B	Black
P	Putty

#### Number of Ports

24
32

#### Mounting Style

A	19" EIA 5" recess
C	19" EIA 2.2" recess
E	19" EIA 40 mm recess
F	ETSI 40 mm recess
S	23" WECCO 2.2" recess

#### Lock Type

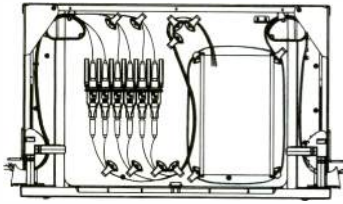
0	No lock
1	Lock, key type 1
2	Lock, key type 2



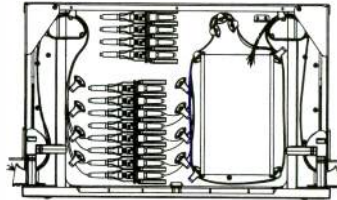
# Fiber Management Tray

## Termination and Splice

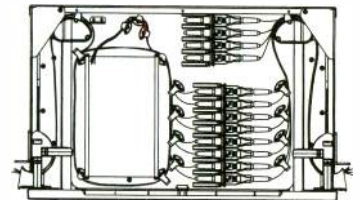
The termination and splice Fiber Management Tray accommodates 12, 16, or 24 fibers in an all-front-access design. This tray mounts in 19-inch, 23-inch, or ETSI racks, while sliding radius limiters provide cable management for incoming and outgoing fibers. Panels loaded with pigtails come with 900 micron pigtails, color coded with different colors.



12-Termination/Splice  
(right splice entry)



24-Termination/Splice  
(right splice entry)



24-Termination/Splice  
(left splice entry)



12-Termination/Splice  
(right splice entry)



24-Termination/Splice  
(right splice entry)

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### Ordering Number

FMT - D

0 0 -

#### Configuration

TL	Termination/splice with splice tray (left splice entry)
TR	Termination/splice with splice tray (right splice entry)

#### Connector/Adapter Style

Multimode	
5	ST®
9	SC
Singlemode	
1	FC hybrid (FC connector on front; SC connector on back of bulkhead)
2	FC ultra polish
3	ST® hybrid (ST® connector on front; SC connector on back of bulkhead)
4	ST® ultra polish
7	SC ultra polish
F	FC angled polish
J	SC angled polish
K	E-2000 angled polish
L	FC with zirconia adapter
N	SC with zirconia adapter
P	ST® with zirconia adapter

#### Cable or Adapter Type

A	Adapters only
K	Multimode pigtails
U	Singlemode maxistrrip pigtails

#### Faceplate Color

B	Black
P	Putty

#### Number of Ports

12
16
24

#### Mounting Style

A	19" EIA 5" recess
C	19" EIA 2.2" recess
E	19" EIA 40 mm recess
F	ETSI 40 mm recess
S	23" WECCO 2.2" recess

#### Lock Type

0	No lock
1	Lock, key type 1
2	Lock, key type 2

#### Chip Style (mini splice tray)

0	N/A
2	Heat shrink
3	Mechanical



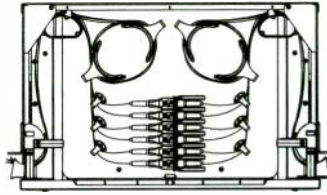
# Fiber Management Tray

## Termination and Storage

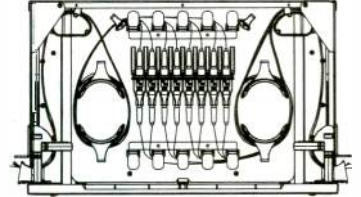
The termination and storage tray terminates and stores 12, 16, or 24 fibers in an all-front-access design. This tray mounts in 19-inch, 23-inch, or ETSI racks, while sliding radius limiters provide cable management for incoming and outgoing fibers.



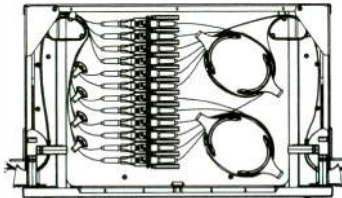
12-Termination/Storage  
(universal storage)



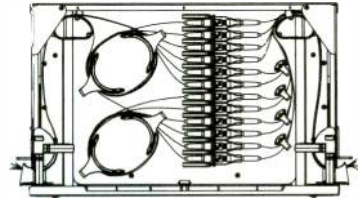
12-Termination/Storage  
(universal storage)



16-Termination/Storage  
(universal storage)



24-Termination/Storage  
(right storage)



24-Termination/Storage  
(left storage)

### Ordering Number

FMT-D 0 OA0 -

#### Configuration

SL	Termination/storage (left storage)
SR	Termination/storage (right storage)
ST	Termination/storage (universal storage)

#### Connector/Adapter Style

##### Multimode

5	ST®
9	SC

##### Singlemode

1	FC hybrid (FC connector on front; SC connector on back of bulkhead)
2	FC ultra polish
3	ST® hybrid (ST® connector on front; SC connector on back of bulkhead)
4	ST® ultra polish
7	SC ultra polish
F	FC angled polish
J	SC angled polish
K	E-2000 angled polish
L	FC with zirconia adapter
M	MTRJ feedthrough adapters
N	SC with zirconia adapter
P	ST® with zirconia adapter

#### Faceplate Color

B	Black
P	Putty

#### Number of Ports

12	Available with ST configuration only
16	Available with ST configuration only
24	Available with SR and SL configurations only

#### Mounting Style

A	19" EIA 5" recess
C	19" EIA 2.2" recess
E	19" EIA 40 mm recess
F	ETSI 40 mm recess
S	23" WECCO 2.2" recess

#### Lock Type

0	No lock
1	Lock, key type 1
2	Lock, key type 2

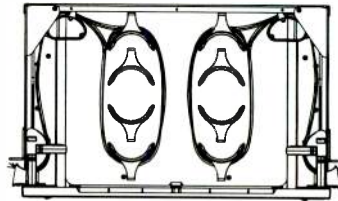


# Fiber Management Tray

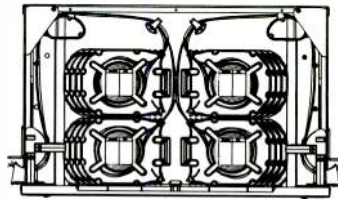
## Slack Storage Panels

The slack storage tray offers bulk storage for up to 60 fibers, and discrete slack storage for up to 16 fibers. This all-front-access tray mounts in 19-inch, 23-inch, or ETSI racks, while sliding radius limiters provide cable management for incoming and outgoing fibers.

### Bulk/Storage Drawer



### Discrete/Storage Drawer



Slack storage type	Capacity		
	3 mm cable	2 mm cable	1.7 mm cable
Bulk	32 cables, 2.5 m each	48 cables, 2.5 m each	60 cables, 4 m each
Discrete	16 cables, 1.7 m each	16 cables, 2 m each	16 cables, 2.5 m each

### Ordering Number

FMT - D 0 0 0 0 0 - 00

#### Drawer Configuration

BS	Bulk storage
DS	Discrete storage

#### Lock Type

0	No lock
1	Lock, key type 1
2	Lock, key type 2

#### Faceplate Color

B	Black
P	Putty

#### Mounting Style

A	19" EIA 5" recess
C	19" EIA 50 mm recess
E	19" EIA 40 mm recess
F	ETSI 40 mm recess
S	23" WECO 2.2" recess

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# Fiber Management Tray

## Specifications

### PHYSICAL

**Approximate Weight:**

8 lbs (3.7 kg)

**Configuration Options and Capacity:**

Termination only (24 or 32 fibers)

Termination/storage (12, 16, or 24 terminations)

Bulk Storage

3 mm outer diameter cable: 32 cables, length 2.5 m each

2 mm outer diameter cable: 48 cables, length 2.5 m each

1.7 mm outer diameter cable: 60 cables, length 4 m each

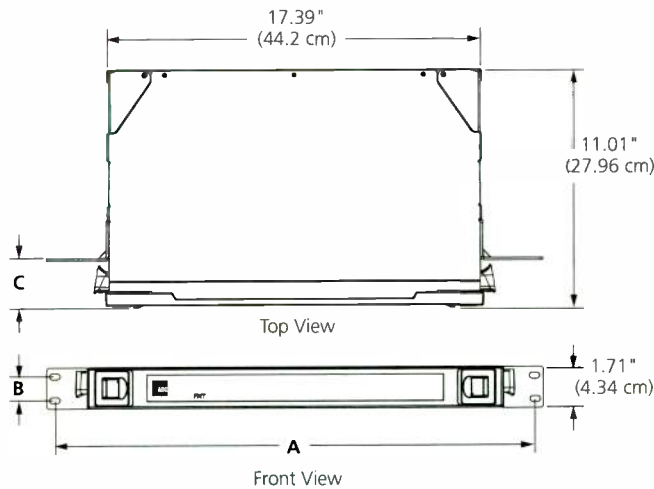
Discrete storage

3 mm outer diameter cable: 16 cables, length 1.7 m each

2 mm outer diameter cable: 16 cables, length 2 m each

1.7 mm outer diameter cable: 16 cables, length 2.5 m each

Termination/splicing (12, 16, or 24 splices)



Configuration	A	B	C
19" EIA (2.2" recess)	18.31" (46.5 cm)	1.25" (3.2 cm)	2.25" (5.7 cm)
19" EIA (40 mm recess)	18.31" (46.5 cm)	1.25" (3.2 cm)	1.54" (3.9 cm)
19" EIA (5" recess)	18.31" (46.5 cm)	1.25" (3.2 cm)	5.0" (12.7 cm)
ETSI (40 mm recess)	20.28" (51.5 cm)	0.98" (2.5 cm)	1.54" (3.9 cm)
23" WECO (2.2" recess)	22.31" (56.7 cm)	1.0" (2.5 cm)	2.25" (5.7 cm)
23" WECO (5" recess)	22.31" (56.7 cm)	1.0" (2.5 cm)	5.0" (12.7 cm)
23" EIA (2.2" recess)	22.31" (56.7 cm)	1.25" (3.2 cm)	2.25" (5.7 cm)
23" EIA (5" recess)	22.31" (56.7 cm)	1.25" (3.2 cm)	5.0" (12.7 cm)



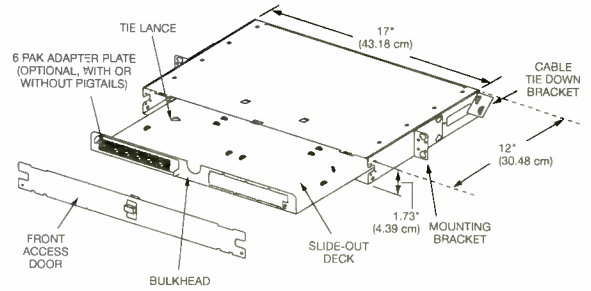
# FL1000 Fiber Termination Products

## Rack Mount

Limited floor space and smaller fiber counts often dictate that multiple pieces of communications apparatus share common equipment racks. The FL1000 is designed to be mounted within standard 19-inch or 23-inch EIA equipment racks. Standard flush mount capability also makes this panel well-suited to cabinet installations.

The left/right orientation of the individual angled adapters and retainers allows the easy exit of the jumpers from the panel. A removable rear door on the 24 termination panels allows efficient access the interior of the panel for the routing and termination of fiber cables. The 12 position panel is 1.75" high and features a sliding bulkhead drawer to accommodate easy access within the panel.

The FL1000 fanning panel, used in conjunction with the FL1000 rack mount panels and their left/right orientation, offers an effective and safe means of routing jumpers within a multi-use communications rack.



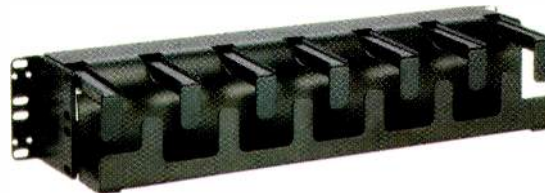
12 Position Rack Mount Panel



12 Position Rack Mount

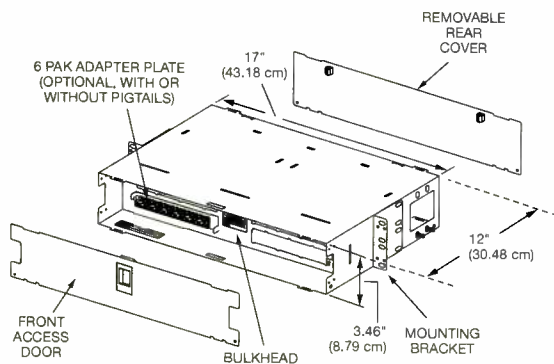


24 Position Rack Mount

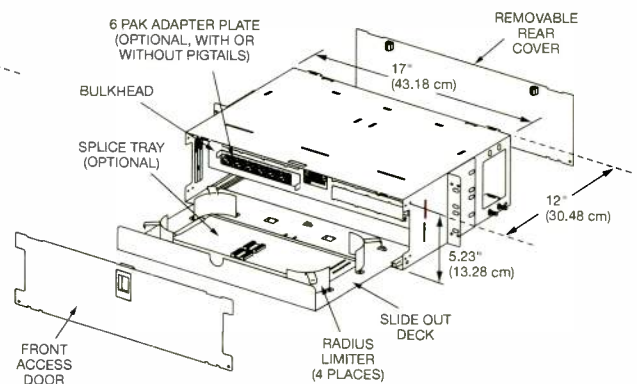


FL1-FPL

Designed to route optical cables left and right from the front of the FOT to the FL1000 6paks



24 Position Rack Mount Panel



24 Position Termination/  
Splice Rack Mount Panel

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3 / 0 3 • 1 1 8 0 2 7 0



# FL1000 Fiber Termination Products

## Ordering Information/Rack Mount Panels

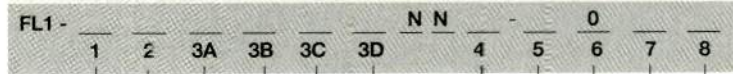
### How to order

To order an FL1000 rack mount panel:

1. Select panel type
2. Select 6pak (with or without fiber) **not installed** in panel

OR

3. Select 6pak adapter type **installed** in panel
4. Select splice tray with chip **(if factory installed, choose placement in the panel)**
5. Select number of cable clamps (0-9)
6. Select number of compression fittings (0-9)
7. Select number of bonding grounding kits (0-9)
8. Select number of radius limiters (0-9). Not used in flush mount applications.



#### 1 Select Panel Type

##### Panel Type

D	12 Position termination rack mount panel
E	24 Position termination rack mount panel
F	24 Position termination/splice rack mount panel

#### 2 6paks (with or without fiber) not installed into panel

1	Adapters with pigtails (2.0 mm x 3.0 m)
2	Adapters only
N	None/NA

OR

#### 2 6paks (with or without fiber) installed into panel

3	Adapters with pigtails pre-installed into panel (2.0 mm x 3.0 m)
4	Adapters pre-installed into panel

##### Rack Mount Front View



6pak placement ordering guide in panel is factory installed

#### 4 Select Splice Tray with Chip

1	Bare fusion
2	Heat shrink
3	Mechanical
4	Rotary
6	FibrLok®
7	Nortel QPAK
N	None/NA

##### If selecting a splice tray:

- (1-2) 6paks: you will receive 1 splice tray
- (3-4) 6paks: you will receive 2 splice trays

Select number of each needed (0-9)

##### Accessories

5	Cable clamp
6	Compression fittings
7	Bonding grounding kit
8	Radius limiters (set of two)

#### 3 6pak Adapter/Connector Type Multimode (62.5/125)

9	SC
D	Duplex SC
5	ST®
A	FC
0	Blank plug-in
N	None/NA

OR

##### Singlemode

7	PCSC
E	Duplex PCSC
4	PCST
2	PCFC
R	PCSC-HP (zirconia sleeves)
C	Duplex FCSC-HP (zirconia sleeves)
P	PCST-HP (zirconia sleeves)
L	PCFC-HP (zirconia sleeves)
J	PCSC 8° angled polish
F	PCFC 8° angled polish
K	E-2000 8° angled polish
B	Duplex SC 8° angled polish
3	FCD4*
0	Blank plug-in
N	None/NA

\* = 3.0 mm x 3.0 m pigtails



# FL1000 Fiber Termination Products

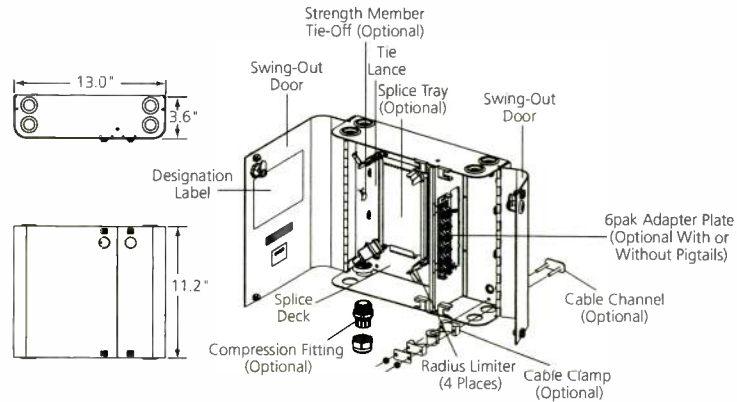
## Two-Door Wall-Mount Boxes

The FL1000 two-door, wall-mount boxes feature a unique design and many integrated features such as:

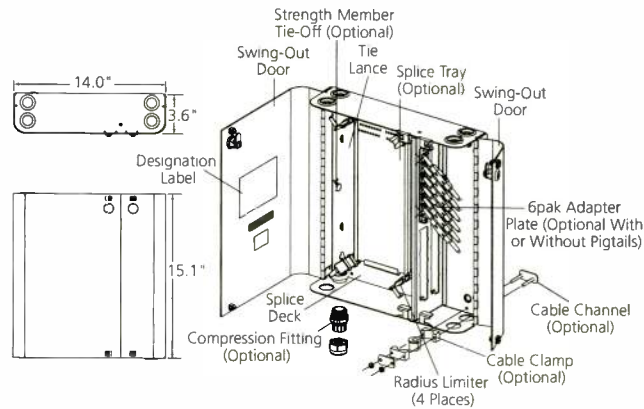
- Multiple, configurable locking options that allow users and service providers separate access for security
- Acceptance of strength member tie-off hardware
- Acceptance of cable clamps at each corner

Grounding screws, mounting screws, and dust caps are included with each panel. More accessories are available.

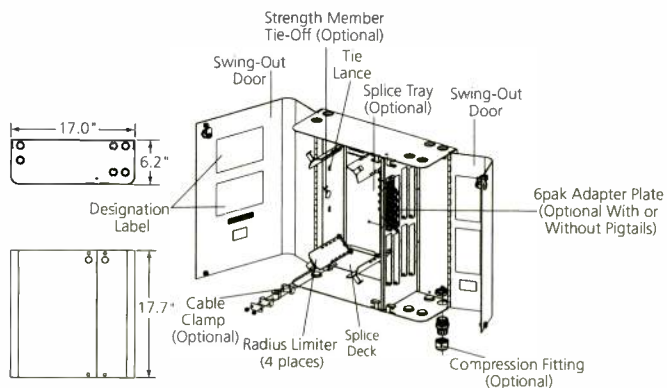
### 12-Position Termination/Splice Wall Box



### 24-Position Termination/Splice Wall Box



### 48-Position Termination/Splice Wall Box





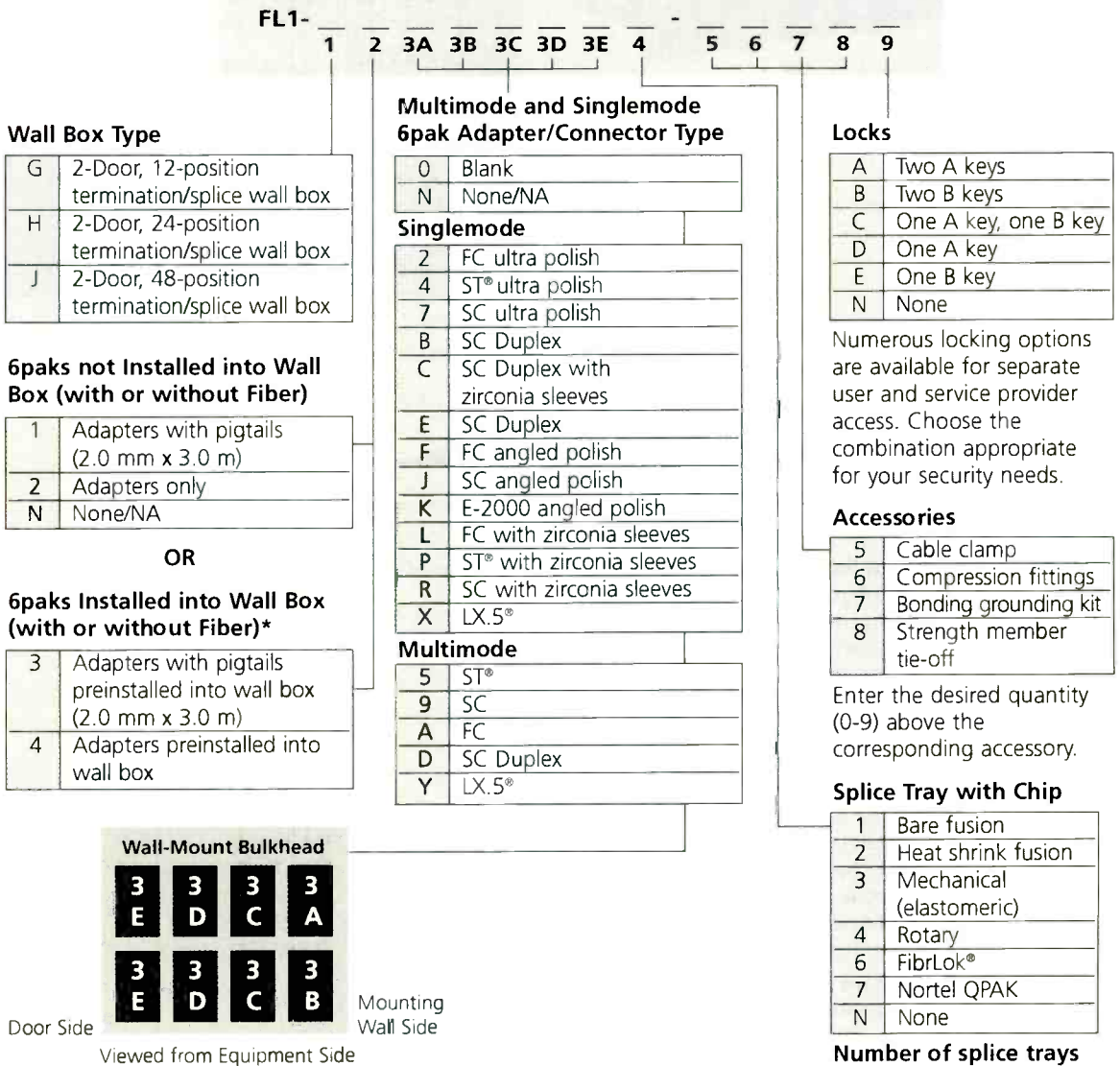
# FL1000 Fiber Termination Products

## Two-Door Ordering Information

### How to order an FL1000 two-door wall-mount box

1. Select wall box type
2. Select 6pak (with or without fiber) **not installed** in wall-mount box (recommended for quicker availability) **OR** Select 6pak (with or without fiber) **installed** in wall-mount box
3. Select 6pak adapter type (if factory installed, choose placement in the wall-mount box)
4. Select splice tray with chip
5. Select number of cable clamps (0-9)
6. Select number of compression fittings (0-9)
7. Select number of bonding grounding kits (0-9)
8. Select number of strength member tie-off kits (each wall box accepts 2, maximum (0-9)
9. Select locks

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\* Use the guide above for placement of factory-installed 6paks. Place the desired connector or adapter type (from guide above) above the corresponding location designation of 3A, 3B, 3C, 3D or 3E. The diagram illustrates the location of each 6pak within the bulkhead.

**Number of splice trays received depends on amount of 6paks used:**  
 (1-2) 6paks = 1 splice tray  
 (4) 6paks = 2 splice trays  
 (6) 6paks = 3 splice trays  
 (8) 6paks = 4 splice trays



# FL1000 Fiber Termination Products

## 6pak Adapter Packs

Flexibility for future growth:

To add capacity to an existing FL1000 panel, simply order the appropriate 6pak.



6pak without fiber



6pak with fiber

### 6paks without fiber

Multimode (62.5/125)	Ordering Number
SC	FL2-6PMMSC
Duplex SC	FL2-6PMMDSC
ST*	FL2-6PMMST
FC	FL2-6PMMFC
LX.5*	FL2-6PMLLX
Singlemode	
SC	FL2-6PSMSC
Duplex SC	FL2-6PSMDSC
ST*	FL2-6PSMST
FC	FL2-6PSMFC
SC (with zirconia sleeve)	FL2-6PSMSC-Z
Duplex SC (with zirconia sleeve)	FL2-6PSMDSC-Z
ST* (with zirconia sleeve)	FL2-6PSMST-Z
FC (with zirconia sleeve)	FL2-6PSMFC-Z
SC Angled 8°	FL2-6PSMASC
FC Angled 8°	FL2-6PSMAFC
E-2000 Angled 8°	FL2-6PSMAE-2
Duplex SC Angled 8°	FL2-6PSMDASC
LX.5*	FL2-6PSMLX

### 6paks with fiber

Multimode (62.5/125)	Ordering Number
SC	FL1-6P9BC003
Duplex SC	FL1-6PDBC003
ST*	FL1-6P5BC003
FC	FL1-6PABC003
LX.5*	FL1-6PYBC003
Singlemode	
SC	FL1-6P7SC003
Duplex SC	FL1-6PESC003
ST*	FL1-6P4SC003
FC	FL1-6P2SC003
SC (with zirconia sleeve)	FL1-6PRSC003
Duplex SC (with zirconia sleeve)	FL1-6PCSC003
ST* (with zirconia sleeve)	FL1-6PPSC003
FC (with zirconia sleeve)	FL1-6PLSC003
SC Angled 8°	FL1-6PJSC003
FC Angled 8°	FL1-6PFSC003
E-2000 Angled 8°	FL1-6PKSC003
Duplex SC Angled 8°	FL1-6PBSC003
LX.5*	FL1-6PXC003

## Accessories

### Ordering Information

Description	Ordering Number
<b>Compression fitting</b>	FL1-ACC001
<b>Radius limiters</b> (set of 2 for use with rack-mount panels)	FL1-ACC002
Strength member tie-off kit	FL1-ACC003
NEMA box access tool	FL1-ACC004
Cable clamp	FL2-ACC007
Bonding grounding kit	FL2-ACC006
Lock and Key Type A	IPA-K1
Lock and Key Type B	IPA-K2
<b>Mini-splice tray</b>	
(used <b>only</b> in 12-position, wall-mount box)	
Bare fusion	FL1-M-FT
Heat shrink fusion	FL1-M-HS
Mechanical (Elastomeric)	FL1-M-MT
Rotary	FL1-M-RT
FibrLok®	FL1-M-3M
Northern Telecom QPAK	FL1-M-NT
<b>Standard splice tray</b>	
Bare fusion	FST-FT
Heat shrink fusion	FST-HS
Mechanical (Elastomeric)	FST-MT
Rotary	FST-RT
FibrLok®	FST-3M
Northern Telecom QPAK	FST-NT
Raychem universal chip	FST-RCM



# FiberGuide® Fiber Management System

## Introduction

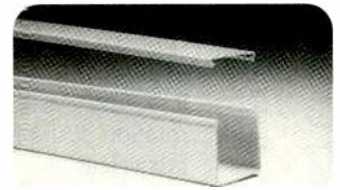
### The Industry's Most Comprehensive Optical Raceway System

ADC's FiberGuide® Fiber Cable Management System is a trough system designed to protect and route fiber optic patch cords, multifiber cable assemblies, and intrafacility fiber cable (IFC) to and from fiber splice enclosures, fiber distribution frames, and fiber optic terminal devices. The FiberGuide system is designed to ensure a 2-inch minimum bend radius is maintained throughout the system.

The FiberGuide system is a complete set of products designed and manufactured to ensure total off-frame protection. Basic components include horizontal and vertical straight sections, horizontal and vertical elbows, downspouts, junctions, and numerous support hardware and flex tube kits.

The FiberGuide system is available in a variety of sizes:

**2x2** — Ideal for smaller installations or for vertical routing into fiber bays. It has the trough capacity to support (400) 2 mm fiber optic patch cords. All 2x2 FiberGuide products are shipped with covers.



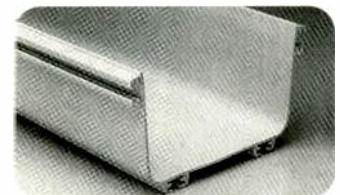
**2x6** — Designed for height-restricted environments, this robust system provides the same support and system flexibility of the traditional 4-inch-high system while saving 2 inches of overhead space. It features a maximum capacity of 1,200 2 mm patch cords.



**4x4** — Features the maximum capacity to support 1,600, 2 mm patch cords. It has been engineered to allow straight sections to be self-supporting over a span of up to 6 feet (1.83 m).



**4x6** — Features the same benefits of the 4-inch system and a maximum trough capacity of 2,400 2 mm patch cords.



**4x12** — The largest system in the FiberGuide family, this 12-inch-wide trough has a maximum capacity to support nearly 5,000 2 mm patch cords. Perfect for runs over fibre frame lineups and perimeter routes.



For complete ordering information, see ADC ordering guide 100569.



# Fiber Optic Patch Cords

## Singlemode

All patch cords undergo stringent testing for both insertion loss and return loss at the factory before shipment to ensure that only quality product is delivered to the customer.

ADC offers ultra physical contact polish on the SC, ST®, FC, and LC connector styles. Typical insertion loss is 0.1 dB.

Angled polish is available on the new LX.5® small form factor connector, SC, FC, and the E-2000 connector styles. Angled polish should be used in applications that require better control of return loss. ADC has tight tolerances regarding the rotation of the ferrule to maintain low insertion loss values.



Singlemode Patch Cord

Broadcast Products

3/03 • 1180270

### Ordering Number

- - S - M

#### Cable Option

FPC	Connector on both ends (patch cord)
FPT	Connector on one end (pigtail)

#### Length

X Length in meters

#### Cable Type

Leave Blank	3 mm single
M	2 mm single
F	1.7 mm single
9	900 micron
Z	3 mm dual zip
2	2 mm dual zip
T	1.7 mm dual zip

#### Connector Type\*\*\*

SPSC	SC ultra polish
SPST	ST® ultra polish
SPFC	FC ultra polish
APSC	SC angled polish
APFC	FC angled polish
ALX5	LX.5® angled polish*
AE2	E-2000 angled polish
SPLC	LC ultra polish*
SDSC	SC duplex**
ADLX	LX.5® angled polish duplex*

\*Requires 900 micron or 1.7 mm cable.

\*\*One connector per end; requires zip cable.

\*\*\*For hybrid patch cords, enter both connector types in this field, separate them with a slash mark and remove the "S" from the second connector.

#### Ordering Example

FPC2-SPFC-10M: Patch cord with ultra polish FC connectors on both ends, 2 mm dual zip cable, 10 meters in length with standard breakout length of 12" on both ends.

FPC-SPST/PSC-S-10M: Patch cord with ST® ultra polish connector on one end and SC ultra polish connector on the other end, 10 meters in length.



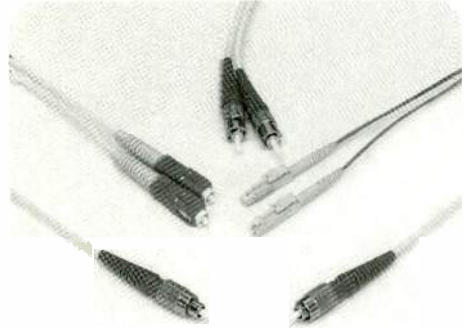


# Fiber Optic Patch Cords

## Multimode

Multimode patch cords are available with the new LX.5® small form factor connector and the traditional SC, ST®, and FC connector styles.

Multimode patch cords are assembled using the same advanced manufacturing processes as the singlemode, ensuring the highest quality standards.



Multimode Patch Cord

### Ordering Number

- - - M

#### Cable Option

FPC	Connector on both ends (patch cord)
FPT	Connector on one end (pigtail)

#### Cable Type

Leave Blank	3 mm single
M	2 mm single
F	1.7 mm single
9	900 micron
Z	3 mm dual zip
2	2 mm dual zip
T	1.7 mm dual zip

#### Length

X Length in meters

#### Fiber Size

A	50/125
B	62.5/125

#### Connector Type\*\*\*

MSC	SC ultra polish
MST	ST® ultra polish
MFC	FC ultra polish
MLX5	LX.5®*
MDSC	SC duplex**
MDLX	LX.5® duplex*

\*Requires 900 micron or 1.7 mm cable.

\*\*One connector per end; requires zip cable.

\*\*\*For hybrid patch cords, enter both connector types in this field and separate them with a slash mark.

#### Ordering Example

FPC-MST/MSC-B-7M: Patch cord with ST® ultra polish connector on one end and SC ultra polish connector on the other end, 62.5/125 fiber size, 7 meters in length.





# Working in a Clean Room



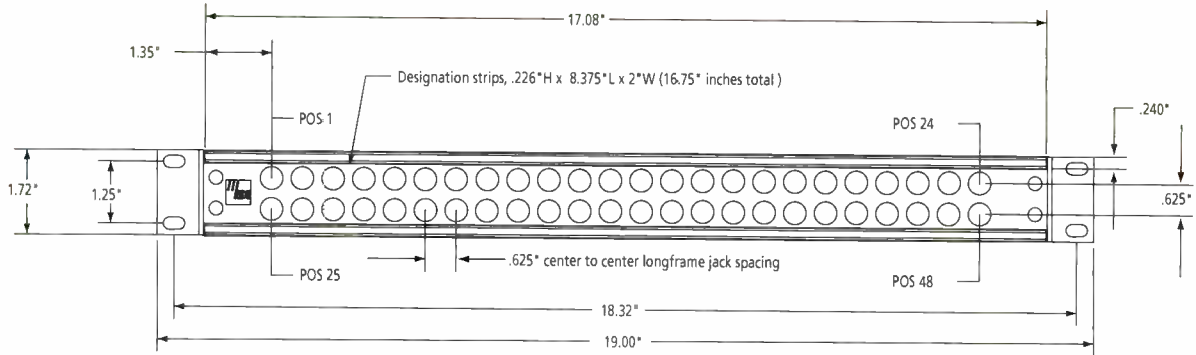


# Drawings and Specifications

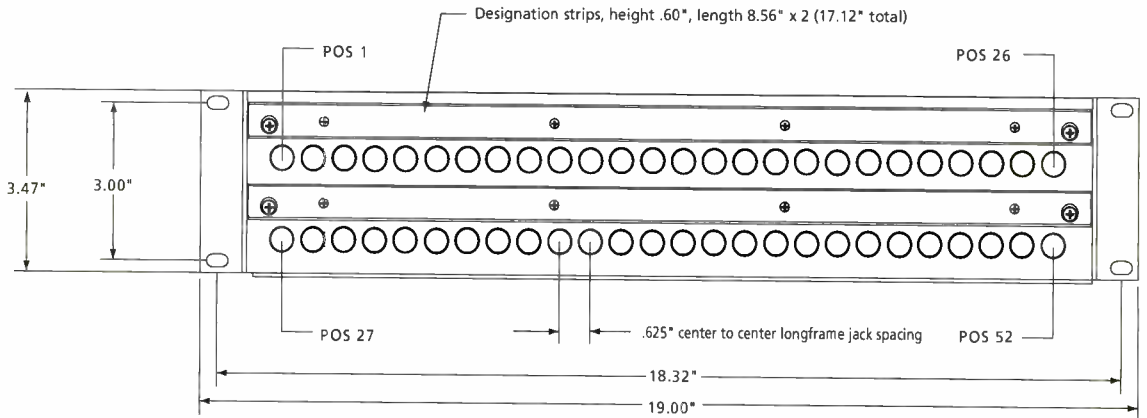
## Longframe Audio Products

This section presents drawings and specifications for typical products. For additional information or for information about products not presented here, please see the ADC web site at [ADC.com](http://ADC.com) or consult our Technical Assistance Center at 1-800-366-3891 or 952-938-8080

3 / 0 3 • 1 1 8 0 2 7 0 Broadcast Products



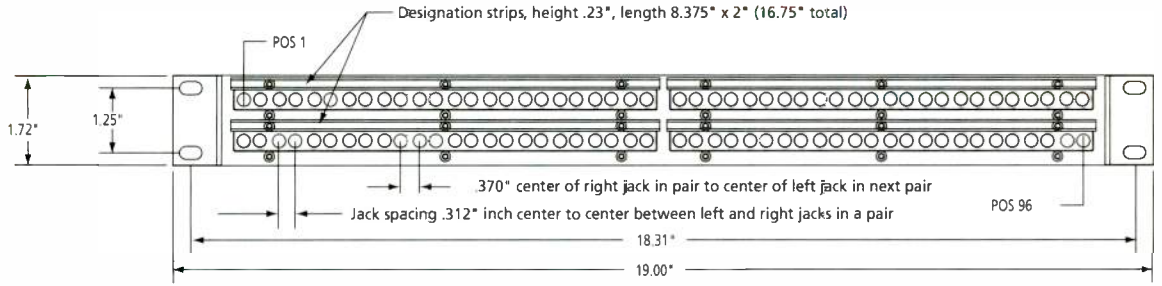
Typical 1 RU 2x24 Longframe Audio Panel Dimensions



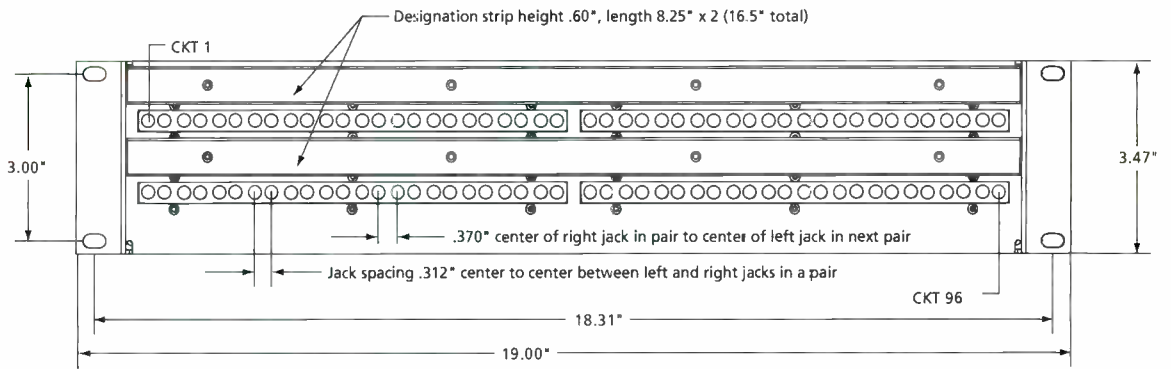
Typical 2 RU 2x26 Longframe Audio Panel Dimensions

# Drawings and Specifications

## Bantam Audio Products



Typical 1 RU 2x48 Stereo Spaced Bantam Audio Panel Dimensions



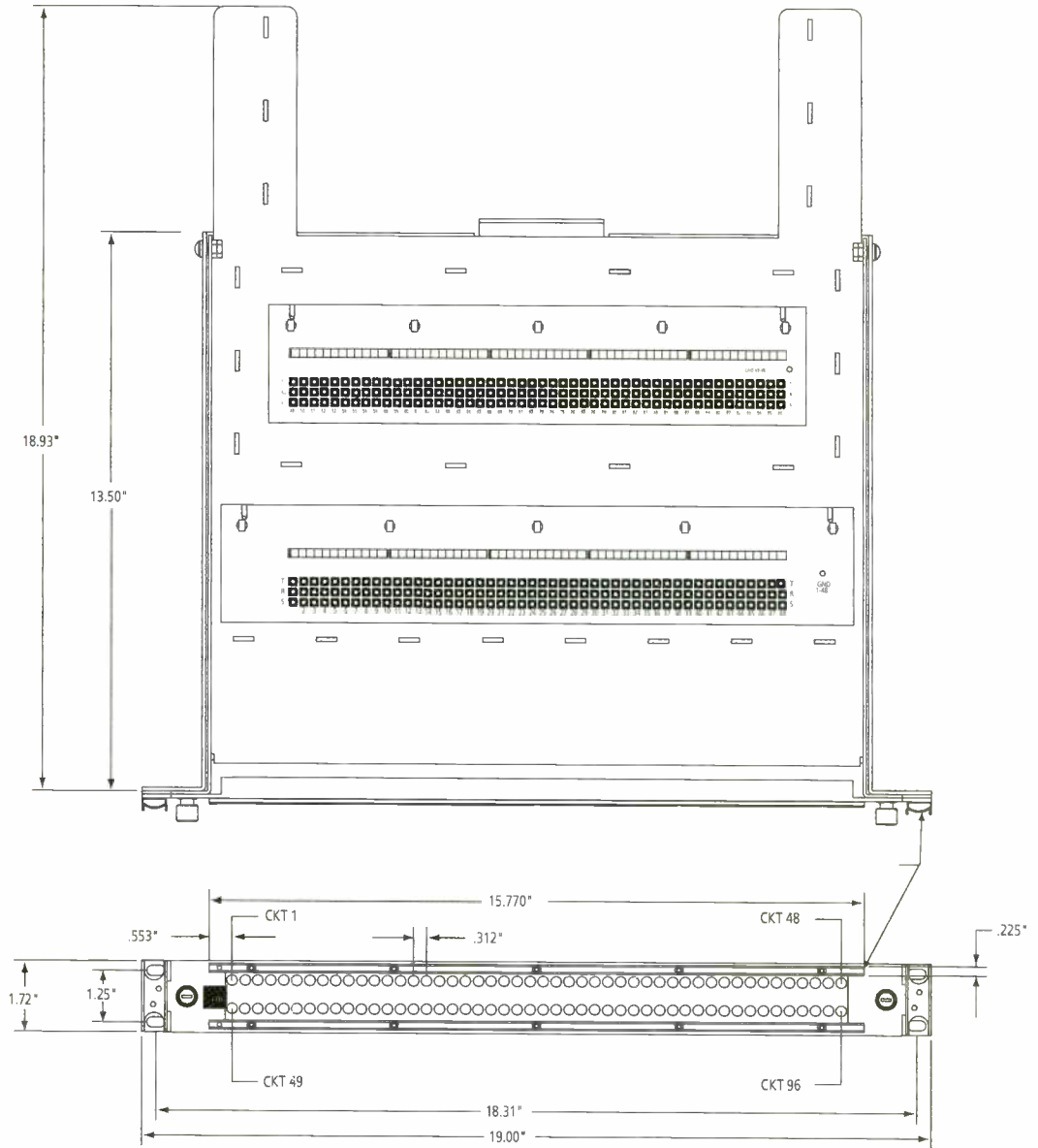
Typical 2 RU 2x48 Stereo Spaced Bantam Audio Panel Dimensions



# Drawings and Specifications

POP Audio Products

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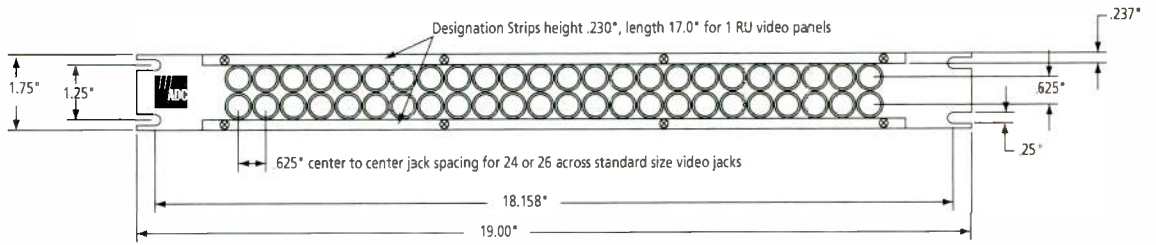


Typical 1 RU Bantam POP Pullout Audio Panel Dimensions

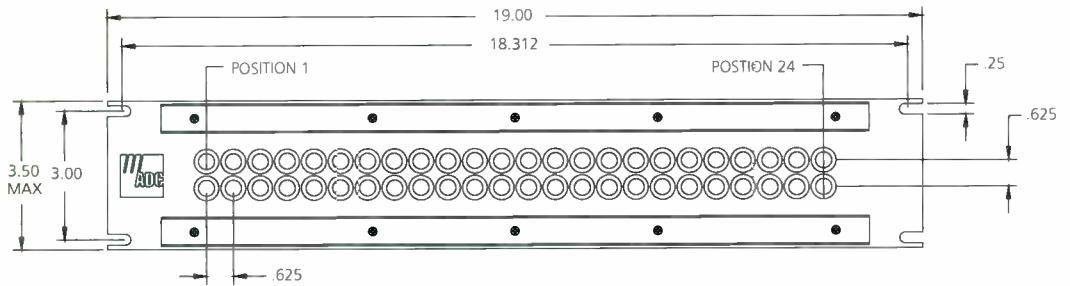


# Drawings and Specifications

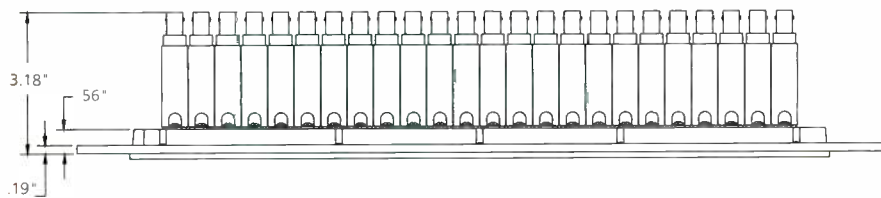
## Video Products



Typical 1 RU ASI Series 2x24 Standard Size Video Panel Dimensions



Typical 2 RU ASI Series 2x24 Standard Size Video Panel Dimensions



ASI Top View

Typical 2 RU ASI Series 2x24 Standard Size Video Panel Dimensions

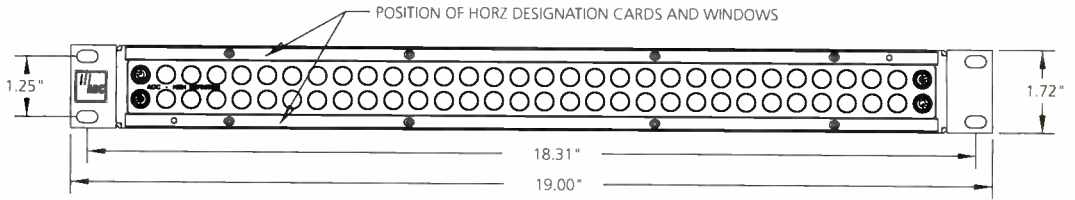
Broadcast Products

3 / 0 3 • 1 1 8 0 2 7 0

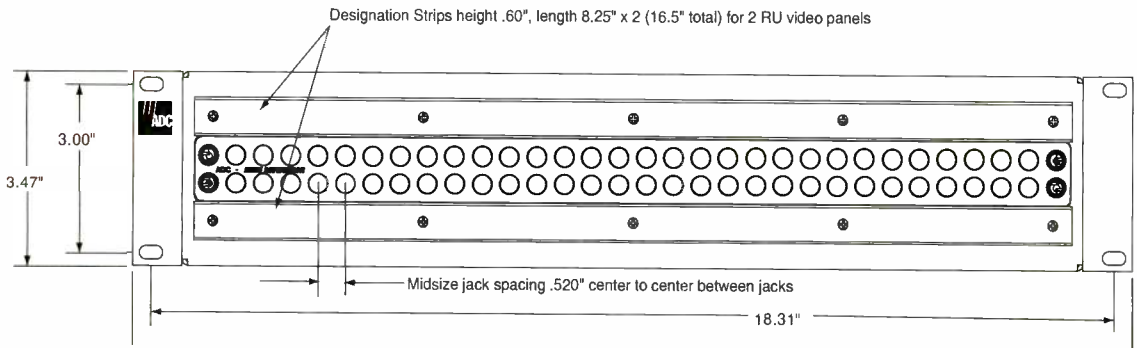


# Drawings and Specifications

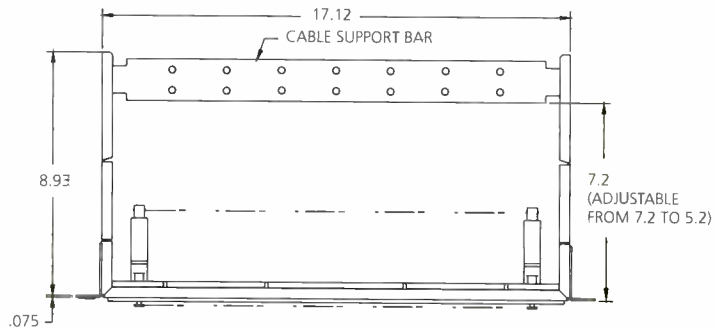
## Video Products



Typical 1 RU WSI 2x32 Midsize Video Panel Dimensions



Typical 2 RU WSI 2x32 Midsize Video Panel Dimensions



WSI Top View

Typical 2 RU WSI Series 2x32 Midsize Video Panel Dimensions

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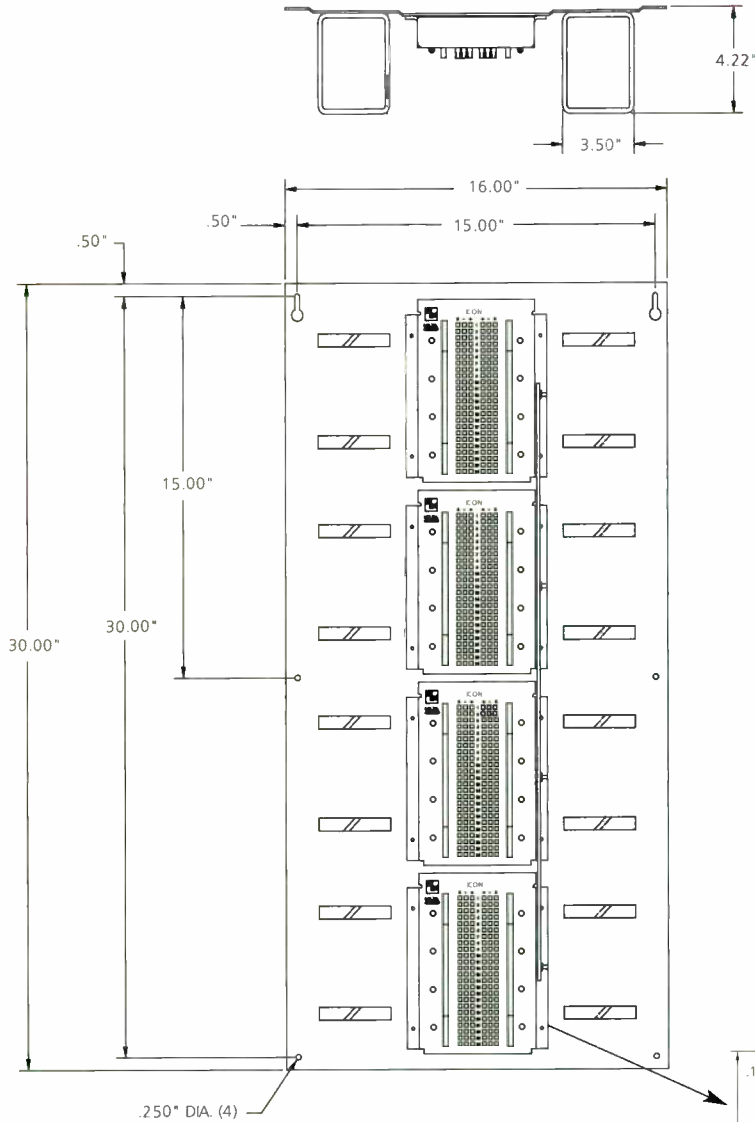




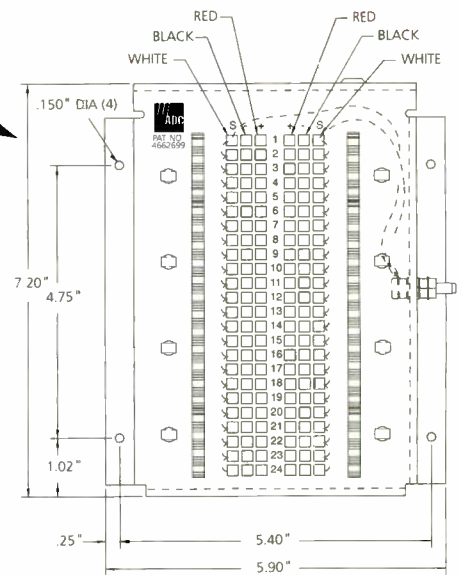
# Drawings and Specifications

ICON Audio Products

3 / 0 3 • 1 1 8 0 2 7 0 Broadcast Products



ICON I-WA-MKII Audio Wall-Mount Frame Dimensions



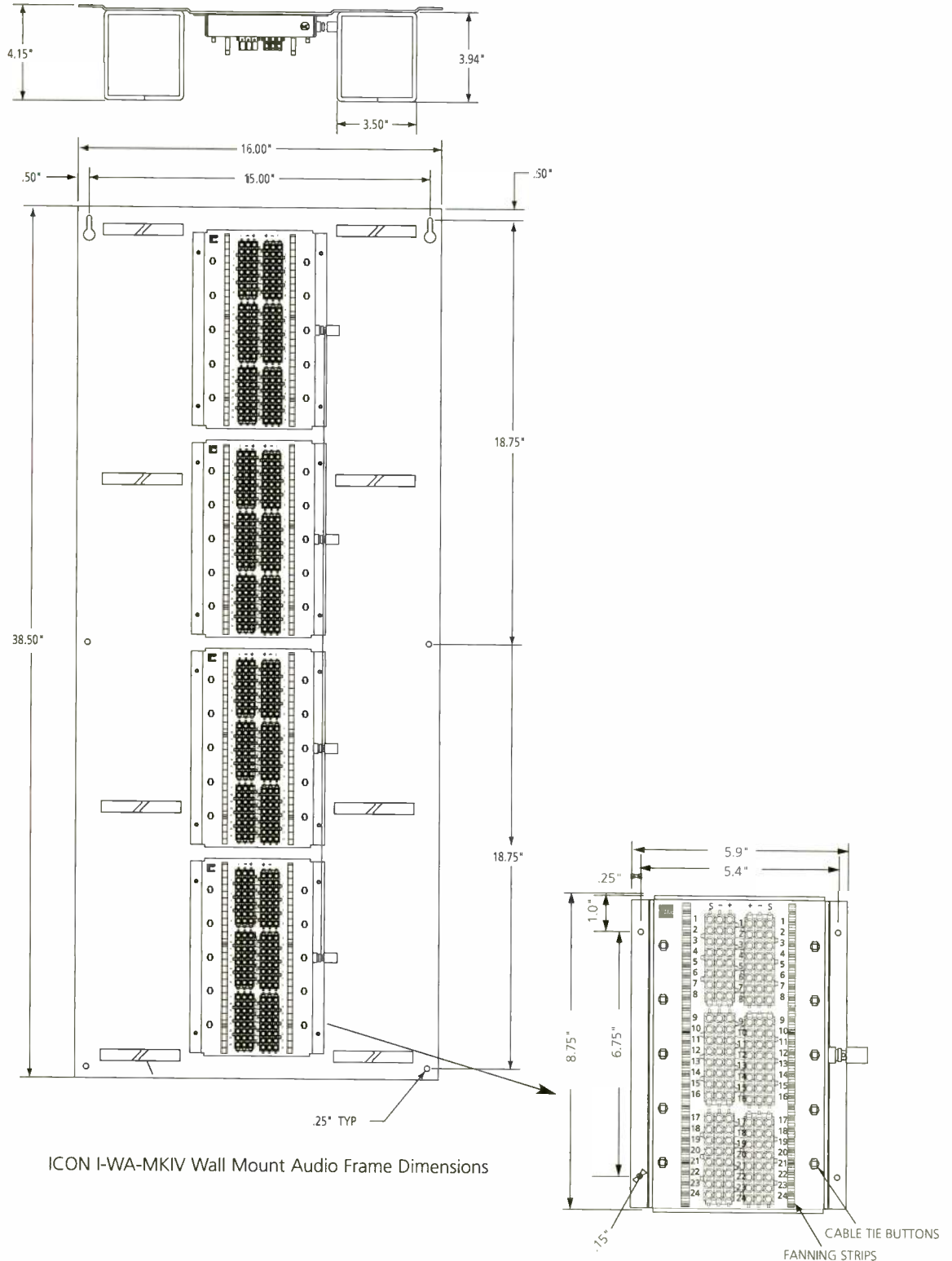
I-24-MKII



# Drawings and Specifications

ICON Audio Products

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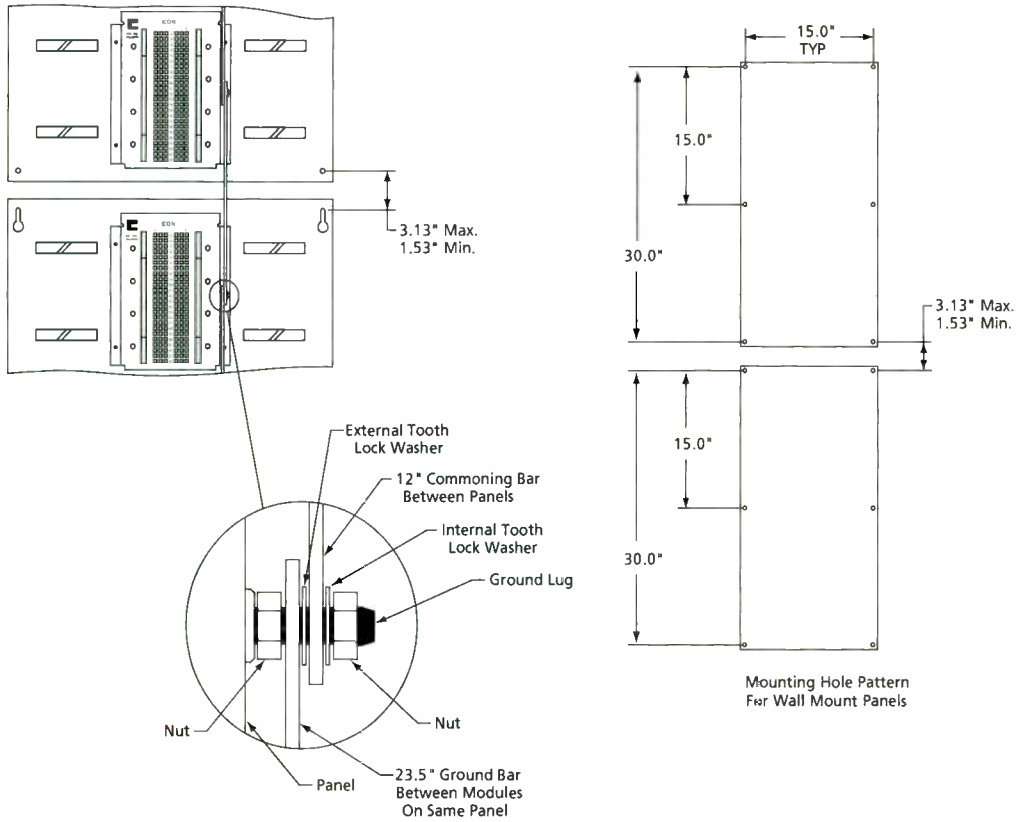


# Drawings and Specifications

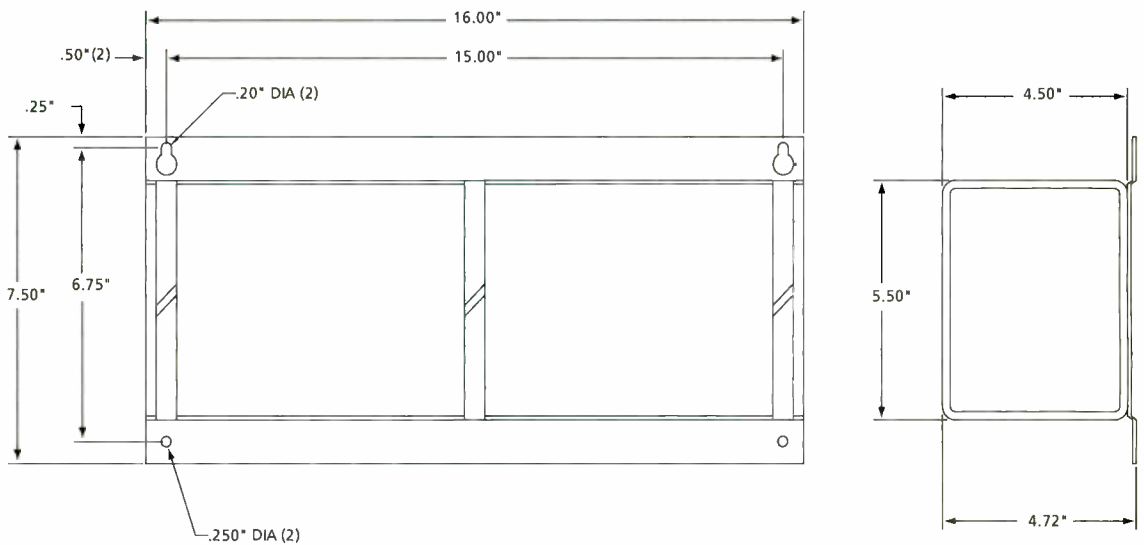
## ICON Audio Products

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I-WA Mounting Details



ICON I-WFP Fanning Panel Dimensions

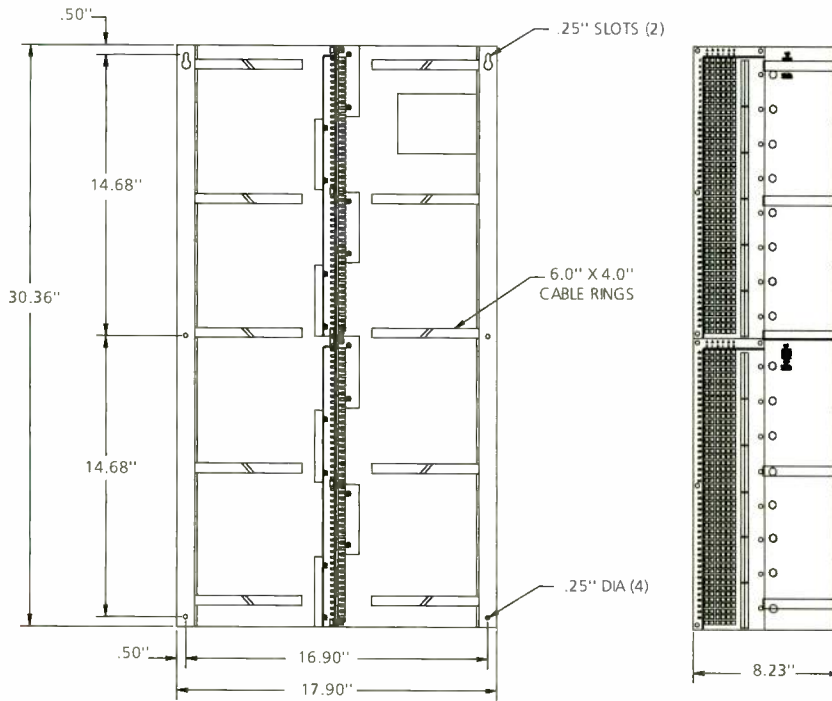


# Drawings and Specifications

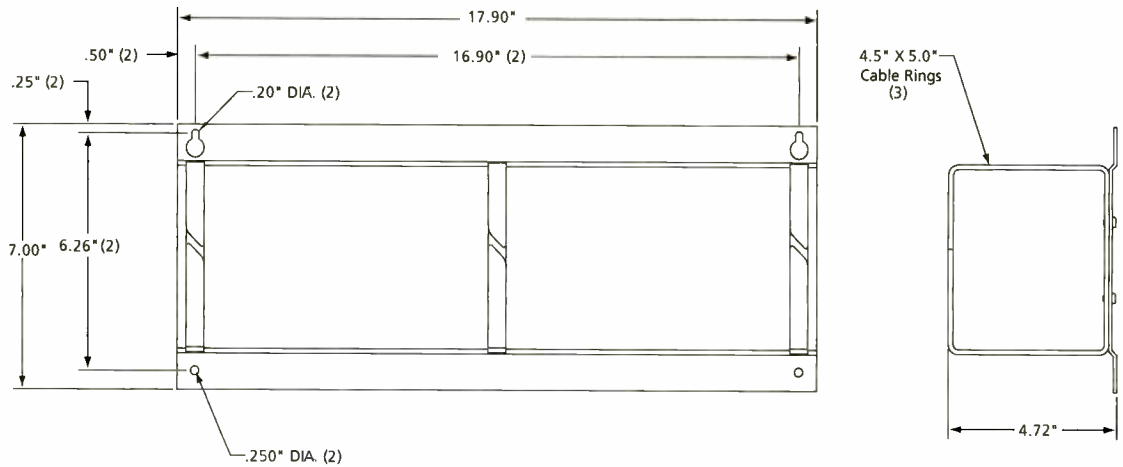
## ICON Audio Products

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ICON I-WS-MKII Wall-Mount Audio Panel Dimensions



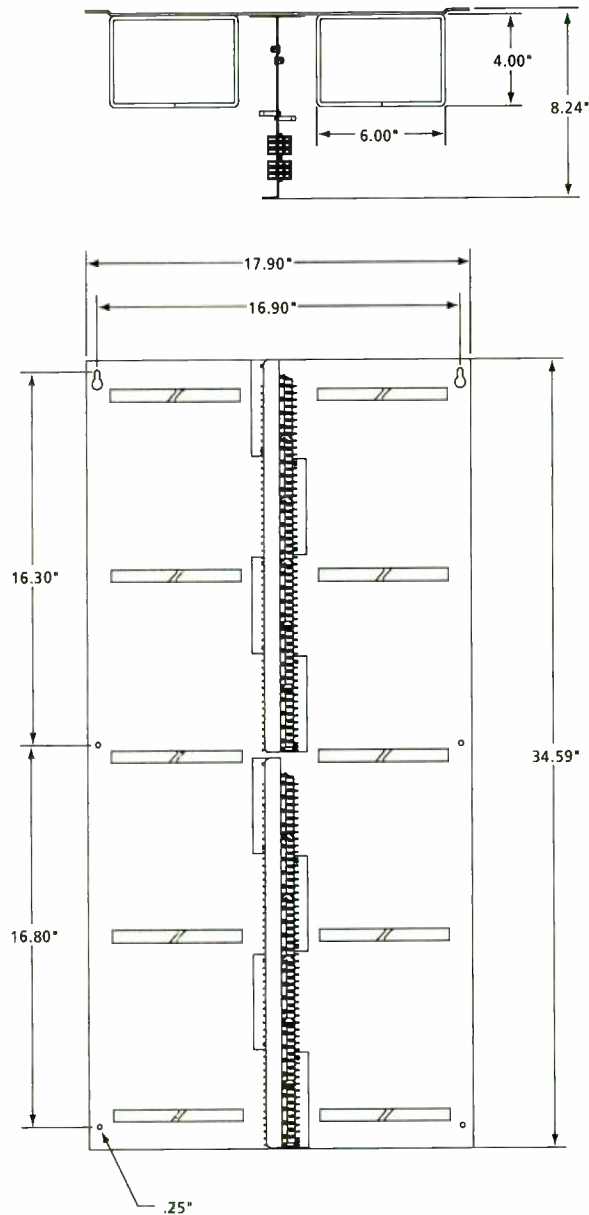
ICON I-WSET Express Trough Dimensions



# Drawings and Specifications

ICON Audio Products

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ICON I-WS-MKIV Wall-Mount Audio Frame Dimensions



# Drawings and Specifications

## Component Audio Products

### PJ339 and PJ482 Longframe Audio Jack Specifications

#### ELECTRICAL

<b>Contact Resistance:</b>	0.020 Ohm maximum (initial) 0.020 Ohm maximum (after life cycling) 0.10 Ohm maximum (after salt spray)
<b>Insulation Resistance:</b>	10,000 megohms minimum (initial) 1,000 megohms minimum (after moisture resistance test)
<b>Dielectric Withstanding:</b>	Voltage: 500 Vac
<b>Contact Rating:</b>	Maximum: 100 mA + 130 Vdc; Minimum: -40 dBm

#### MECHANICAL

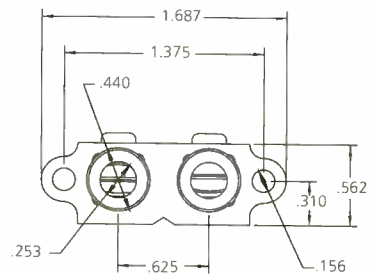
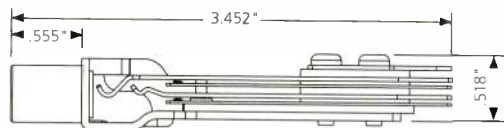
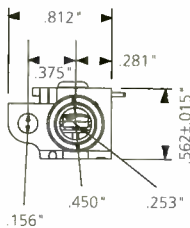
<b>Mechanical Shock:</b>	Per MIL-STD-202F, Method 213B, test condition H
<b>Vibration:</b>	MIL-STD-1344, Method 2005, test condition I
<b>Insertion Force:</b>	7 lbs. (3.17 kg) maximum
<b>Withdrawal Force:</b>	1.5 lbs. (.679 kg) minimum
<b>Life:</b>	20,000 insertion/withdrawal cycles minimum

#### ENVIRONMENTAL

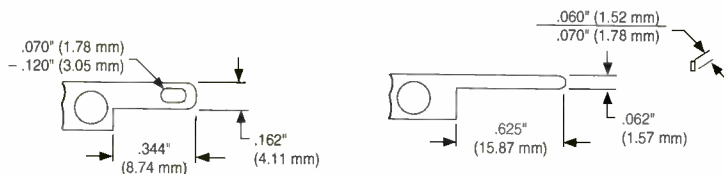
<b>Operating Temp:</b>	-40°C to 65°C
<b>Storage Temp:</b>	-55°C to 85°C
<b>Thermal Shock:</b>	Per MIL-STD-202F, Method 107G, test condition A
<b>Operating Humidity:</b>	0% to 95% (no condensation)
<b>Storage Humidity:</b>	0% to 95% (no condensation)
<b>Salt Spray:</b>	Per MIL-STD-202F, Method 101D
<b>Moisture Resistance:</b>	Per MIL-STD-202F, Method 106E

#### MATERIALS

<b>Frame:</b>	Steel, zinc plated with electroless nickel plating
<b>Sleeve:</b>	Brass, nickel plated
<b>Insulators:</b>	Unreinforced polyetherimide resin rated UL 94-V0 for flammability
<b>Springs:</b>	Nickel-silver
<b>Contacts:</b>	WECO No. 1 gold crossbar alloy welded to springs
<b>Solder Lugs:</b>	Hot tin dipped



PJ482



Single Longframe Audio Jack

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# Drawings and Specifications

## Component Audio Products

### PJ839 and PJ889 Bantam Audio Jack Specifications

#### ELECTRICAL

<b>Contact Resistance:</b>	0.020 Ohm maximum (initial) 0.020 Ohm maximum (after life cycling) 0.10 Ohm maximum (after salt spray)
<b>Insulation Resistance:</b>	10,000 megohms minimum (initial) 1,000 megohms minimum (after moisture resistance test)

#### Dielectric Withstanding:

<b>Voltage:</b>	500V RMS
<b>Contact Rating:</b>	Maximum: 100 mA ± 130 Vdc, Minimum: -40 dBm

#### MECHANICAL

<b>Mechanical Shock:</b>	Per MIL-STD-202F, Method 213B, test condition H
<b>Vibration:</b>	MIL-STD-1344, Method 2005, test condition I
<b>Insertion Force:</b>	7 lbs. (3.17 kg) maximum
<b>Withdrawal Force:</b>	1.5 lbs. (.679 Kg) minimum
<b>Life:</b>	20,000 insertion/withdrawal cycles minimum

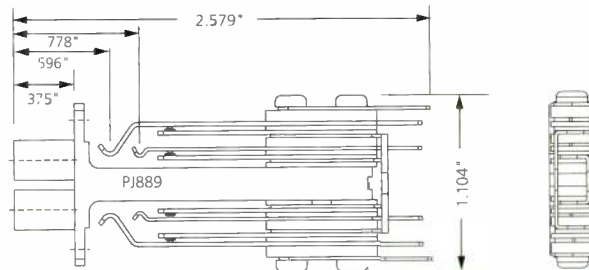
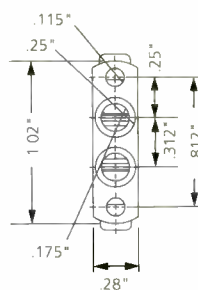
#### ENVIRONMENTAL

<b>Operating Temp:</b>	-40°C to 65°C
<b>Storage Temp:</b>	-55°C to 85°C
<b>Thermal Shock:</b>	Per MIL-STD-202F, Method 107G, test condition A
<b>Operating Humidity:</b>	0% to 95%, non-condensing
<b>Storage Humidity:</b>	0% to 95%, non-condensing
<b>Salt Spray:</b>	Per MIL-STD-202F, Method 101D
<b>Moisture Resistance:</b>	Per MIL-STD-202F, Method 106E

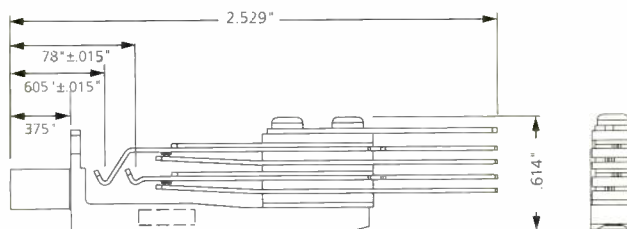
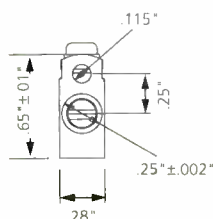
#### MATERIALS

<b>Frame:</b>	Zinc die-cast zinc plated with electroless nickel plating
<b>Insulators:</b>	Unreinforced polyetherimide resin rated UL 94-V0 for flammability
<b>Springs:</b>	Nickel-Silver alloy
<b>Contacts:</b>	WECO No. 1 gold crossbar alloy welded to springs

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Three-Conductor Dual Bantam Jack



Three-Conductor Single Bantam Jack

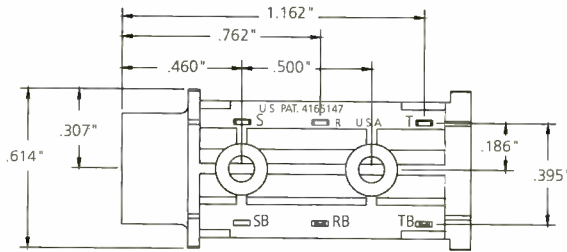
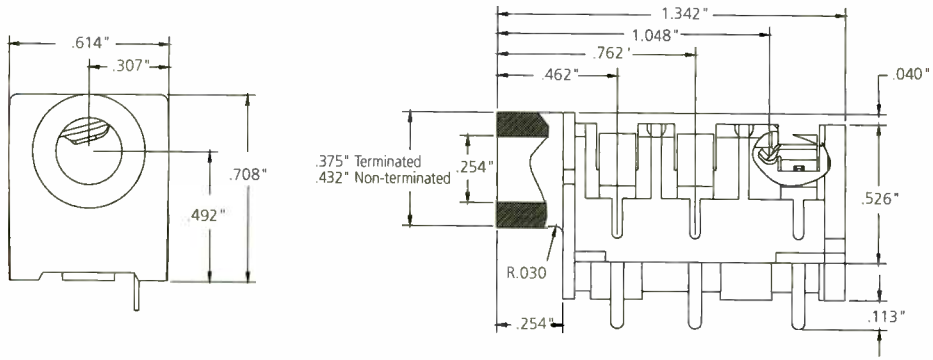


# Drawings and Specifications

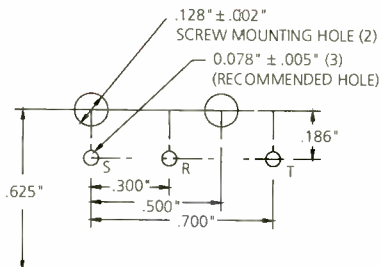
## Component Audio Products

Broadcast Products

3/03 • 1180270



AJ238/AJ339

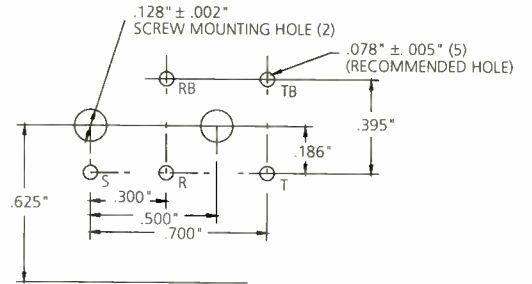


PC BOARD DRILL GUIDE  
AS SEEN FROM COMPONENT  
SIDE OF BOARD

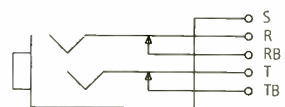


REFERENCE SCHEMATIC

AJ238



PC BOARD DRILL GUIDE  
AS SEEN FROM COMPONENT  
SIDE OF BOARD



REFERENCE SCHEMATIC

AJ339



# Drawings and Specifications

## Video Products

### CJ2011 and CJ2020N-75 (terminated) Standard Size Coaxial Video Jack Specifications

#### ELECTRICAL

<b>Characteristic Impedance:</b>	62.5 Ohm nominal
<b>Return Loss:</b>	> -20 dB; 1 MHz to 2 GHz
<b>Contact Resistance:</b>	0.030 Ohm maximum change post environment

#### MECHANICAL

<b>Mechanical Shock:</b>	Per MIL-STD-202, Method 213
<b>Vibration:</b>	Per MIL-STD-202, Method 201
<b>Insertion Force:</b>	7 lbs. (3.17 kg) minimum
<b>Withdrawal Force:</b>	1.5 lbs. (0.675 kg) minimum
<b>Life:</b>	10,000 insertion/withdrawal cycles minimum

#### ENVIRONMENTAL

<b>Operating Temperature:</b>	-40°C to +65°C
<b>Non-operating Temperature:</b>	-55°C to +85°C non-operating
<b>Thermal Shock:</b>	Per MIL-STD-202, Method 107
<b>Humidity:</b>	0% to 95% non-condensing, operating and non-operating
<b>Salt Spray:</b>	Per MIL-STD-202, Method 101
<b>Moisture Resistance:</b>	Per MIL-STD-202, Method 106

#### MATERIAL

**Jack Sleeve & Frame:** Brass per ASTM B16 with electro-deposited nickel plating per QQ-N-290 or electro-deposited gold plating per MIL-G-45204

#### Center Conductors

**.090" (.23 cm):** Beryllium copper per QQ-C-533 with electro-deposited gold plating per MIL-G-45204 on contact areas only

#### Outer Conductor Contacts:

Phosphor bronze QQ-B-746 with electro-deposited gold plating per MIL-G-45204 or electro-deposited nickel plating per QQ-N-290  
 Rated UL 94V-0 for flammability  
 Brass per ASTM B16 with tin plating per MIL-T-10727

#### Insulators:

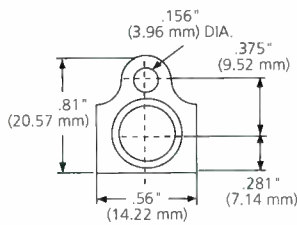
#### Crimping Sleeves:

#### INTERFACE DIMENSIONS:

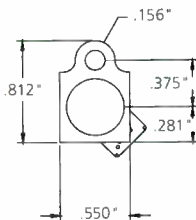
Outer diameter of mating plugs must be .375" (.95 cm) with pin diameter of .090" (.23 cm) or .070" (.18 cm)

#### MOUNTING INFORMATION:

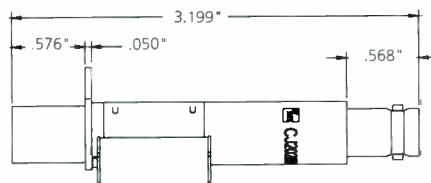
All jacks are supplied with 6-32, 5/16" Phillips head screws



CJ2011



CJ2020-N75



Dimensions for CJ2020N-75 and CJ2011N (except CJ2011N has no termination can)



# Drawings and Specifications

## Video Products

### SJ2000 Switching Coaxial Jack Specifications

The SJ2000 family is rated to handle analog, digital and video data rates up to 360 Mbps

#### ELECTRICAL

<b>Insertion Loss:</b>	0.4 dB DC to 200 MHz
<b>Characteristic Impedance:</b>	75 Ohm nominal
<b>Return Loss:</b>	Better than 15 dB 1 MHz to 600 MHz relative to 75 Ohm for .090" (.23 cm) diameter center conductor
<b>Contact Resistance:</b>	0.030 Ohm maximum change post environment
<b>Termination Resistor Values:</b>	75 Ohm commercial, 1/8 watt, 5%

#### MECHANICAL

<b>Mechanical Shock:</b>	Per MIL-STD-202, Method 213, Test Condition I
<b>Vibration:</b>	Per MIL-STD-202, Method 201
<b>Insertion Force:</b>	7 lbs (3.17 kg) minimum
<b>Withdrawal Force:</b>	1 lb (0.452 kg) minimum
<b>Life:</b>	10,000 insertion/withdrawal cycles (single port) minimum

#### ENVIRONMENTAL

<b>Operating Temperature:</b>	-40°C to +65°C operating
<b>Non-operating Temperature:</b>	-55°C to +85°C non-operating
<b>Thermal Shock:</b>	Per MIL-STD-202, Method 107
<b>Humidity:</b>	0% to 95% non-condensing, operating and non-operating
<b>Salt Spray:</b>	Per MIL-STD-202, Method 101
<b>Moisture Resistance:</b>	Per MIL-STD-202, Method 106

#### MATERIAL

**Outer Shell, Jack Bodies and Rear Connectors:**

Zinc die-casting with electro-deposit gold plating per MIL-G-45204 or electro-deposited nickel plating per QQ-N-290  
0.090" (.23 cm) Beryllium copper per QQ-C-533 with electro-deposited gold plating per MIL-G45204 on contact areas only  
Unreinforced polyetherimide resin rated UL94V-0 for flammability  
Beryllium copper per QQ-C-553 with electro-deposited gold plating per MIL-G-45204

#### Center Conductors:

#### Insulators:

#### Springs:

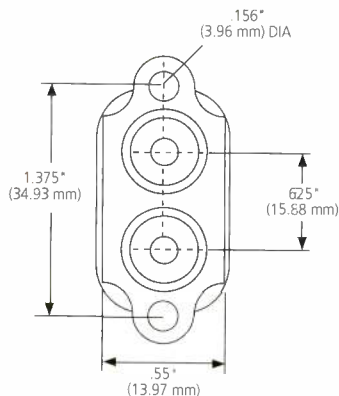
#### INTERFACE DIMENSIONS

##### Standard Size:

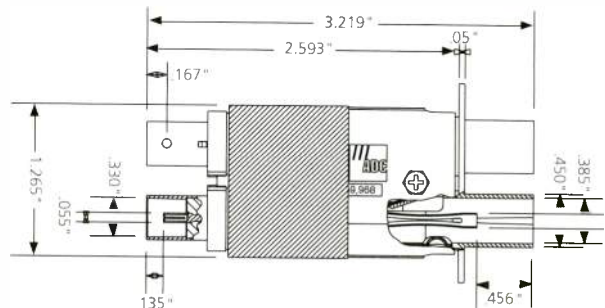
Outside diameter of mating plugs must be .375" (.95 cm) with pin diameter of .090" (.23 cm) or .070 (.18 cm)

#### MOUNTING INFORMATION

All jacks are supplied with two 6-32, round head, 5/16" Phillips head screws



SJ2000 Standard Size Switching Coaxial Video Jack



REFERENCE SCHEMATIC

3703 • 1130270 Broadcast Products

# Drawings and Specifications

## Video Products

### SVJ-2x Standard Size Video Super Jack Specifications

The SVJ-2x family is rated to handle digital video data rates up to and including uncompressed HDTV SMPTE 292M 1.485 Gbps.

#### ELECTRICAL

<b>Rated Bandwidth:</b>	2.4 GHz
<b>Return Loss:</b>	Better than -20 dB to 2.4 GHz
<b>Characteristic Impedance:</b>	75 Ohm
<b>Insertion Loss:</b>	<.5 dB Loss to 2.4 GHz
<b>Center Conductor Diameter:</b>	Accepts .09 center conductor
<b>Contact Resistance:</b>	Less than 20 milliohms
<b>Termination Resistor:</b>	75 Ohm, ± 1%

#### MECHANICAL

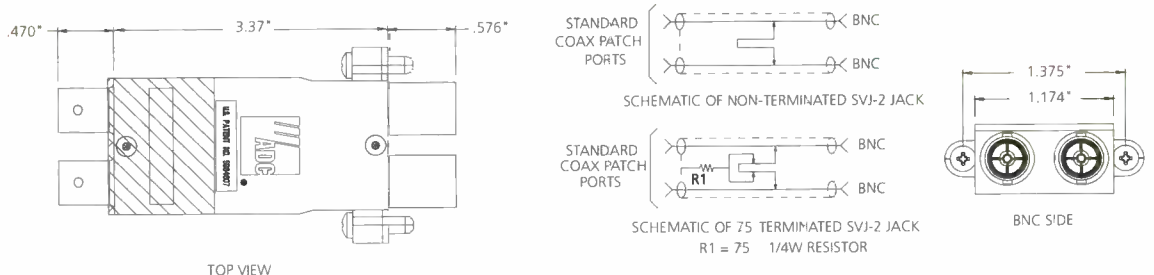
<b>Mechanical Shock:</b>	Per MIL-STD-202, Method 213 Test condition G
<b>Vibration:</b>	Per MIL-STD-202, Method 201
<b>Insertion Force:</b>	12 lbs. maximum
<b>Withdrawal Force:</b>	3 lbs. minimum
<b>Life Cycles:</b>	20,000 insertion/withdrawal cycles minimum

#### MATERIAL

<b>Body and Cover:</b>	Zinc diecast per ASTM B86
<b>Front and Rear</b>	
<b>Center Conductors:</b>	Phosphor Bronze per ASTM B139
<b>Insulators:</b>	Polyetherimide resin rated UL 94V-0
<b>Switching Springs:</b>	Beryllium Copper per ASTM B196

#### ENVIRONMENTAL

<b>Temperature</b>	
<b>Operating:</b>	-40°C to 65°C
<b>Storage:</b>	-55°C to 85°C
<b>Thermal Shock:</b>	Per MIL-STD-202, Method 107
<b>Humidity</b>	
<b>Operating:</b>	0% to 95%, non-condensing
<b>Storage:</b>	0% to 95%, non-condensing
<b>Salt Spray:</b>	Per MIL-STD-202, Method 101
<b>Moisture Resistance:</b>	Per MIL-STD-202, Method 106
<b>Dust Resistance:</b>	Per MIL-STD-202, Method 110A



SVJ-2x Standard Size Video Super Jack

Broadcast Products 3103 • 1180270



# Drawings and Specifications

## Video Products

### CJ Series Midsize Single Coaxial Jacks to BNC Specifications

The SJ2000 family is rated to handle analog and digital video data rates up to and including 360 Mbps.

#### ELECTRICAL

<b>Characteristic Impedance:</b>	75 Ohms nominal
<b>Return Loss:</b>	> 19 dB; 300 KHz to 2.4 GHz
<b>Contact Resistance:</b>	10 milliohms typical
<b>Termination Resistance (3014N-75/4014N-75):</b>	75 Ohms commercial, 1/8 watt 5%

#### MECHANICAL

<b>Mechanical Shock:</b>	Per MIL-STD-202, Method 213
<b>Vibration:</b>	Per MIL-STD-202, Method 201
<b>Insertion Force:</b>	7 lbs. maximum
<b>Withdrawal Force:</b>	1.5 lbs. minimum

#### ENVIRONMENTAL

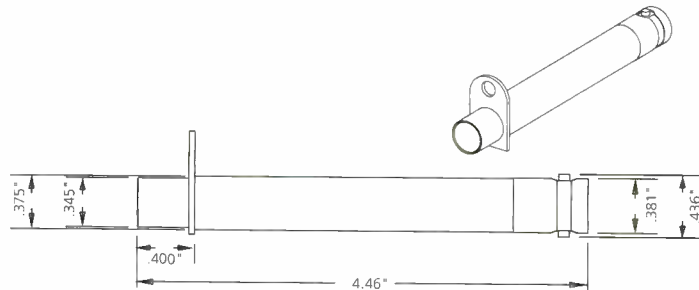
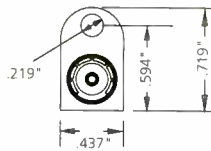
<b>Operating Temp:</b>	-40°C to 65°C
<b>Storage Temp:</b>	-55°C to 85°C
<b>Thermal Shock:</b>	Per MIL-STD-202, Method 107
<b>Humidity:</b>	0% to 95% non-condensing, operating and non-operating
<b>Salt Spray:</b>	Per MIL-STD-202, Method 101
<b>Moisture Resistance:</b>	Per MIL-STD-202, Method 106

#### MATERIAL

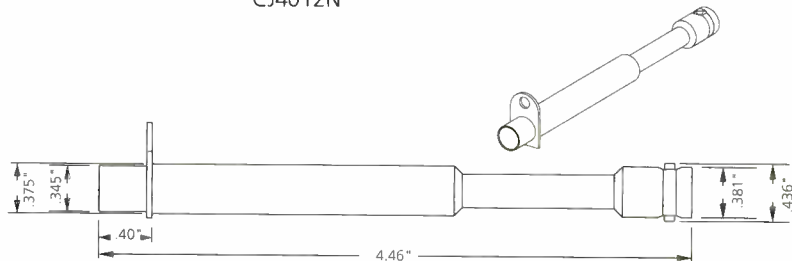
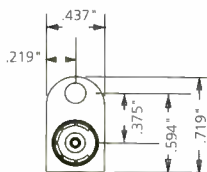
<b>Jack Sleeve &amp; Frame:</b>	CDA 360 brass rod per ASTM B16 with electro-deposit nickel plating per QQ-N-290
<b>Center Conductors:</b>	Phosphor bronze per ASTM B139 with electro-deposited gold plating per MIL-G-45204
<b>Insulators:</b>	TFE-Fluorocarbon per ASTM D1710

#### OTHER

<b>Interface Dimensions:</b>	Outside diameter of mating plugs must be .298" (.75 cm) with pin diameter of .048" (.12 cm)
<b>Mounting Details:</b>	Jacks supplied with a 6-32 UNC-2A 5/16" Phillips head screws (zinc chromate plated)



CJ4012N



CJ4014N

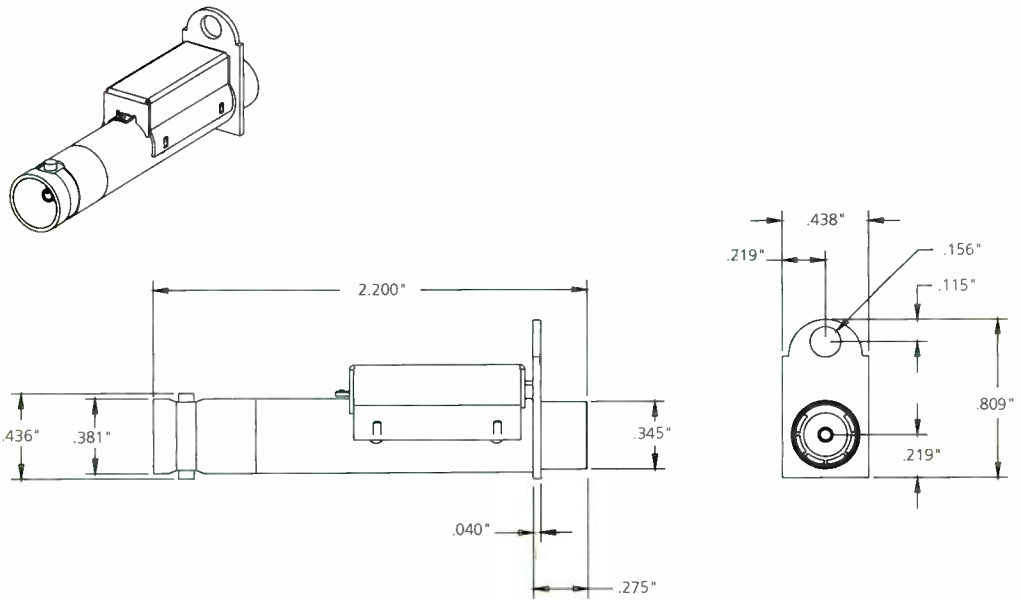
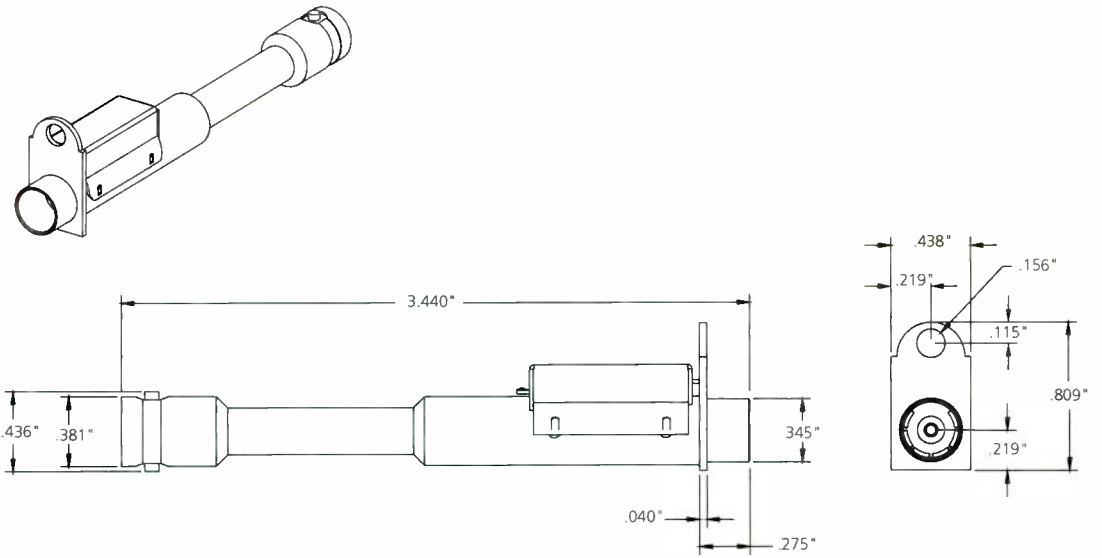
Video Jacks Midsize Coaxial to BNC (short and long)

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# Drawings and Specifications

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Video Jacks Midsize Coaxial to BNC (short and long)



# Drawings and Specifications

## Video Products

### MVJ-3 Midsize Video Super Jack Specifications

#### ELECTRICAL

The MVJ-3 Family is rated to handle digital video data rates up to and including uncompressed HDTV SMPTE 292M 1.485 Gbps.

<b>Rated Bandwidth:</b>	1 MHz to 3 GHz
<b>Return Loss:</b>	Better than -17 dB 1 MHz to 3 GHz
<b>Characteristic Impedance:</b>	75 Ohms
<b>Insertion Loss:</b>	0.3 dB Loss to 3 GHz
<b>Center Conductor Diameter:</b>	0.048 (.12cm)
<b>Contact Resistance:</b>	0.01 Ohm maximum change
<b>Termination Resistor:</b>	75 Ohm, MVJ-3T only

#### MECHANICAL

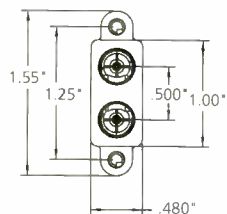
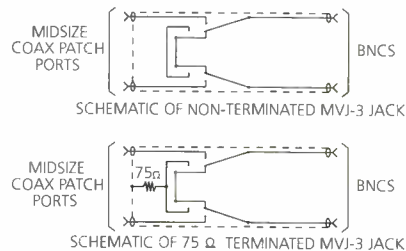
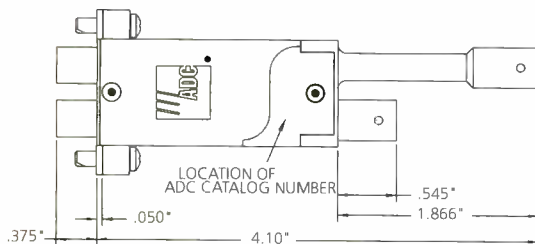
<b>Mechanical Shock:</b>	Per MIL-STD-202, Method 213
<b>Vibration:</b>	Per MIL-STD-202, Method 201
<b>Insertion Force:</b>	7lbs (3.17 Kg) maximum
<b>Withdrawal Force:</b>	1 lb. (.452 Kg) minimum
<b>Life Cycles:</b>	20,000

#### MATERIAL

<b>Body and Cover:</b>	Zinc alloy per ASTM B86
<b>Front and Rear Center Conductors:</b>	Beryllium Copper per ASTM B196
<b>Insulators:</b>	Unreinforced polyetherimide resin rated UL94-VO for flammability
<b>Switching Springs:</b>	Beryllium copper per ASTM B196
<b>ENVIRONMENTAL</b>	
<b>Operating Temperature:</b>	-40°C to 65°C
<b>Storage Temperature:</b>	-40°C to 65°C
<b>Thermal Shock:</b>	Per MIL-STD-202, Method 107
<b>Operating Humidity:</b>	0% to 95%, non-condensing
<b>Storage Humidity:</b>	0% to 95%, non-condensing
<b>Salt Spray:</b>	Per MIL-STD-202, Method 101
<b>Moisture Resistance:</b>	Per MIL-STD-202, Method 106
<b>Dust Resistance:</b>	Per MIL-STD-202, Method 110

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MVJ-3 Midsize Video Super Jack



# Drawing and Specifications

## 75 Ohm BNC Connectors

### Straight BNC Connectors

#### ELECTRICAL

<b>Characteristic Impedance:</b>	75 Ohm
<b>Voltage Rating:</b>	1000 Volts RMS
<b>Insertion Loss:</b>	< 0.6 dB 1 MHz to 1 GHz (measured with 1 meter of 728 cable)
<b>Return Loss:</b>	Better than 35 dB to 1 GHz; 30 dB to 2 GHz; 26 dB to 3 GHz
<b>Contact Resistance:</b>	.030 Ohm maximum change post environmental
<b>Insulation Resistance:</b>	200 megohms minimum change

#### MECHANICAL

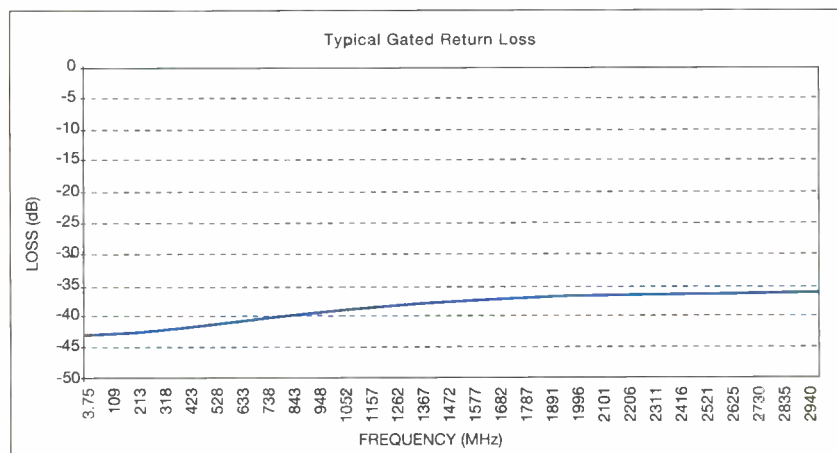
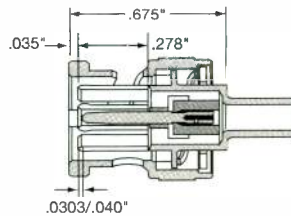
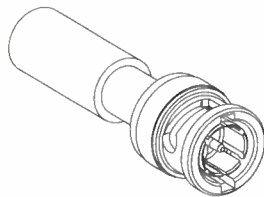
<b>Mechanical Durability:</b>	500 cycles minimum
<b>Center Contact Retention:</b>	6 lbs. minimum
<b>Coupling Mechanism:</b>	100 lbs. minimum
<b>Cable Pulloff Force:</b>	Dependent on cable size
<b>Cable Bend and Twist:</b>	500 cycles minimum
<b>Force to Engage/Disengage:</b>	Torque 2.5 in/lb maximum; longitudinal force 3 lbs. maximum
<b>Interface Dimension:</b>	MIL-C-39012 except 75 Ohm

#### ENVIRONMENTAL

<b>Thermal Shock:</b>	-40°C to 65°C operating; -55°C to 85°C, non-operating
<b>Moisture Resistance:</b>	0% to 95%; MIL-STD-202 Method 106
<b>Corrosion (Salt Spray):</b>	MIL-STD-202 Method 101, Test Condition B
<b>Flammability:</b>	UL 94-VO rated (center conductor insulator)
<b>Vibration:</b>	MIL-STD-202 Method 201
<b>Solvent Resistance:</b>	MIL-STD-202 Method 215

#### FINISH

<b>Body/Bayonet:</b>	Tarnish-resistant electroless nickel plating
<b>Center Conductor:</b>	50 millionths inch gold plating MIL-G-45204 Type 1, Grade C, Class 1; requires .042" crimp station die





# Drawings and Specifications

## 75 Ohm BNC Connectors

### Right Angle BNC Connectors

#### ELECTRICAL

<b>Characteristic Impedance:</b>	75 Ohm
<b>Voltage Rating:</b>	1000 Volts RMS
<b>Insertion Loss:</b>	< 0.6 dB 1 MHz to 1 GHz (measured with 1 meter of 728 cable)
<b>Return Loss:</b>	Better than 30 dB to 1 GHz; 26 dB to 2 GHz; 20 dB to 3 GHz
<b>Contact Resistance:</b>	.030 Ohm maximum change post environmental
<b>Insulation Resistance:</b>	200 megohms minimum change

#### MECHANICAL

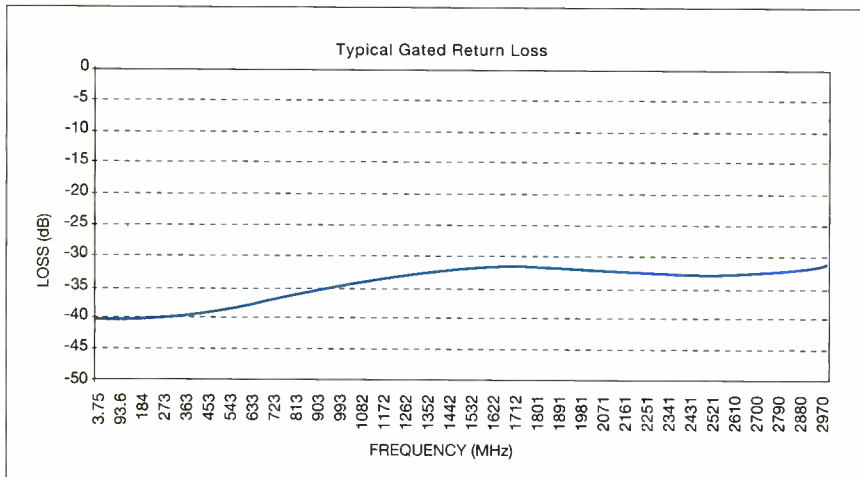
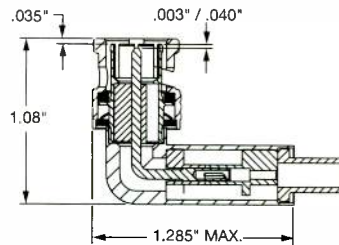
<b>Mechanical Durability:</b>	500 cycles minimum
<b>Coupling Mechanism:</b>	100 lbs. minimum
<b>Cable Bend and Twist:</b>	500 cycles minimum
<b>Force to Engage/Disengage:</b>	Torque 2.5 in/lb maximum; longitudinal force 3 lbs. maximum
<b>Interface Dimension:</b>	MIL-C-39012 except 75 Ohm

#### ENVIRONMENTAL

<b>Thermal Shock:</b>	-40°C to 65°C operating; -55°C to 85°C, non-operating
<b>Moisture Resistance:</b>	0% to 95%; MIL-STD-202 Method 106
<b>Corrosion (Salt Spray):</b>	MIL-STD-202 Method 101, Test Condition B
<b>Flammability:</b>	UL 94-VO rated (center conductor insulator)
<b>Vibration:</b>	MIL-STD-202 Method 201
<b>Solvent Resistance:</b>	MIL-STD-202 Method 215

#### FINISH

<b>Body/Bayonet:</b>	Tarnish-resistant electroless nickel plating
<b>Center Conductor:</b>	50 millionths inch gold plating MIL-G-45204 Type 1, Grade C, Class 1; requires .042" crimp station die



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# Drawings and Specifications

## 75 Ohm BNC Connectors

### Bulkhead Jack Connectors

#### ELECTRICAL

<b>Characteristic Impedance:</b>	75 Ohm
<b>Voltage Rating:</b>	1500 Volts RMS
<b>Insertion Loss:</b>	Better than 0.20 dB 1 MHz to 2 GHz
<b>Return Loss:</b>	Better than 26 dB to 1 GHz; 18 dB to 2 GHz; 16 dB to 3 GHz
<b>Contact Resistance:</b>	.030 Ohm maximum change post environmental
<b>Insulation Resistance:</b>	5000 megohms minimum change

#### MECHANICAL

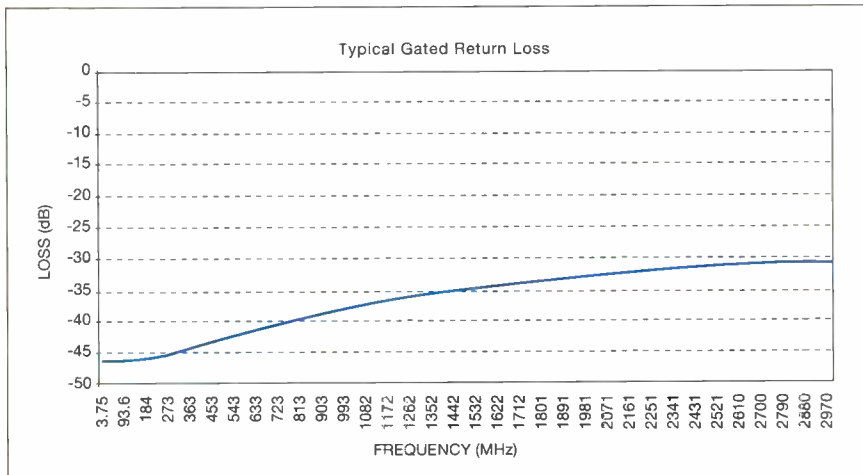
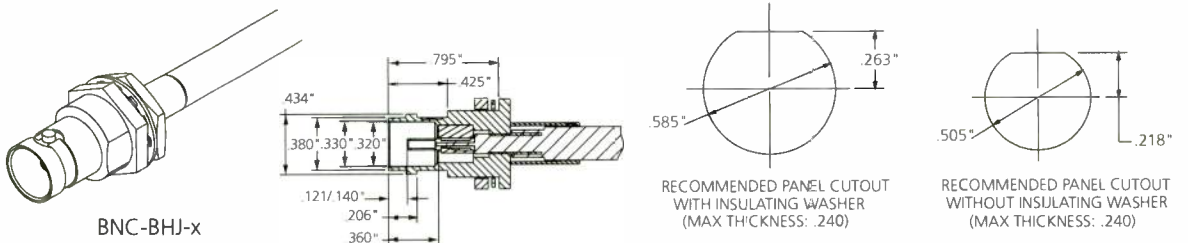
<b>Mechanical Durability:</b>	500 cycles minimum
<b>Center Contact Retention:</b>	6 lbs. minimum
<b>Coupling Mechanism:</b>	100 lbs. minimum
<b>Cable Bend and Twist:</b>	500 cycles minimum
<b>Force to Engage/Disengage:</b>	Torque 2.5 in/lb maximum; longitudinal force 3 lbs. maximum
<b>Interface Dimension:</b>	MIL-C-39012 except 75 Ohm

#### ENVIRONMENTAL

<b>Thermal Shock:</b>	-40°C to 65°C operating; -55°C to 85°C, non-operating
<b>Moisture Resistance:</b>	0% to 95%; MIL-STD-202 Method 106
<b>Corrosion (Salt Spray):</b>	MIL-STD-202 Method 101, Test Condition B
<b>Flammability:</b>	UL 94-VO rated (center conductor insulator)
<b>Vibration:</b>	MIL-STD-202 Method 204, Test Condition B
<b>Solvent Resistance:</b>	MIL-STD-202 Method 215

#### FINISH

<b>Body/Bayonet:</b>	Tarnish-resistant electroless nickel plating
<b>Center Conductor:</b>	50 millionths inch gold plating MIL-G-45204 Type 1, Grade C, Class 1



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# Drawings and Specifications

## 75 Ohm BNC Connectors

### BNC Adapters

#### ELECTRICAL

<b>Characteristic Impedance:</b>	75 Ohm
<b>Voltage Rating:</b>	1500 Volts RMS
<b>Insertion Loss:</b>	Better than 0.20 dB 1 MHz to 2 GHz
<b>Return Loss:</b>	Better than 40 dB to 1 GHz; 30 dB to 2 GHz; 26 dB to 3 GHz
<b>Contact Resistance:</b>	.030 Ohm maximum change post environmental
<b>Insulation Resistance:</b>	5000 megohms minimum change

#### MECHANICAL

<b>Mechanical Durability:</b>	500 cycles minimum
<b>Center Contact Retention:</b>	6 lbs. minimum
<b>Coupling Mechanism:</b>	100 lbs. minimum
<b>Cable Bend and Twist:</b>	500 cycles minimum
<b>Force to Engage/Disengage:</b>	Torque 2.5 in/lb maximum; longitudinal force 3 lbs. maximum
<b>Interface Dimension:</b>	MIL-C-39012 except 75 Ohm

#### ENVIRONMENTAL

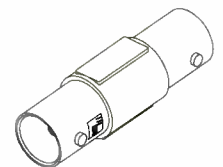
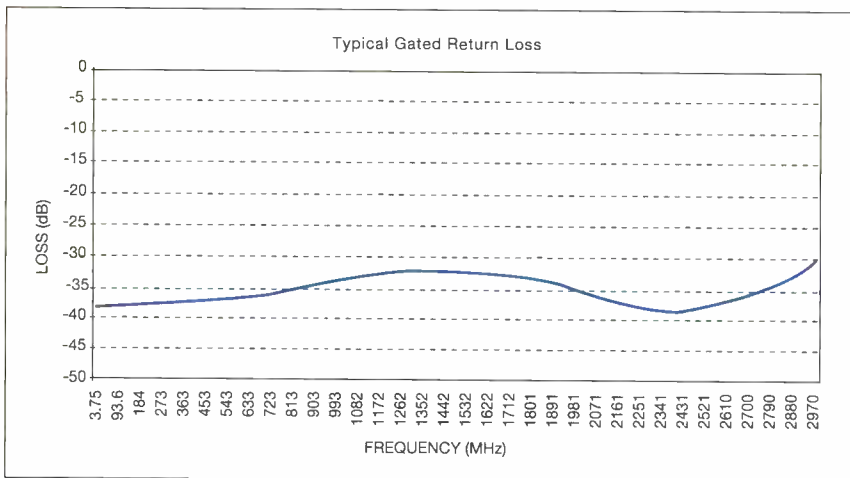
<b>Thermal Shock:</b>	-40°C to 65°C operating; -55°C to 85°C, non-operating
<b>Moisture Resistance:</b>	0% to 95%; MIL-STD-202 Method 106
<b>Corrosion (Salt Spray):</b>	MIL-STD-202 Method 101, Test Condition B
<b>Flammability:</b>	UL 94-VO rated (center conductor insulator)
<b>Vibration:</b>	MIL-STD-202 Method 204, Test Condition B
<b>Solvent Resistance:</b>	MIL-STD-202 Method 215

#### FINISH

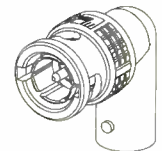
<b>Body/Bayonet:</b>	Tarnish-resistant electroless nickel plating
<b>Center Conductor:</b>	50 millionths inch gold plating MIL-G-45204 Type 1, Grade C, Class 1

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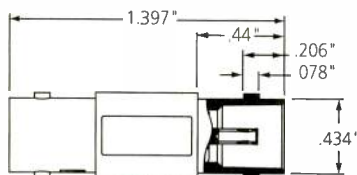
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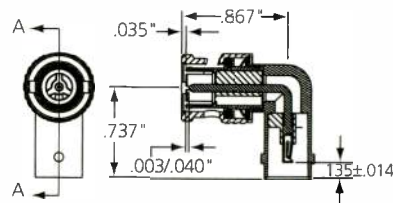
BNC Straight Adapter



BNC Right Angle Adapter



BNC Straight Adapter



BNC Right Angle Adapter



# Drawings and Specifications

## 75 Ohm BNC Connectors

### Recessed BNC

#### ELECTRICAL

<b>Characteristic Impedance:</b>	75 Ohm
<b>Voltage Rating:</b>	1500 Volts RMS
<b>Insertion Loss:</b>	Better than 0.20 dB 1 MHz to 2 GHz
<b>Return Loss:</b>	Better than 40 dB to 1 GHz; 30 dB to 2 GHz; 26 dB to 3 GHz
<b>Contact Resistance:</b>	.030 Ohm maximum change post environmental
<b>Insulation Resistance:</b>	5000 megohms minimum change

#### MECHANICAL

<b>Mechanical Durability:</b>	500 cycles minimum
<b>Center Contact Retention:</b>	6 lbs. minimum
<b>Coupling Mechanism:</b>	100 lbs. minimum
<b>Cable Bend and Twist:</b>	500 cycles minimum
<b>Force to Engage/Disengage:</b>	Torque 2.5 in/lb maximum; longitudinal force 3 lbs. maximum
<b>Interface Dimension:</b>	MIL-C-39012 except 75 Ohm

#### ENVIRONMENTAL

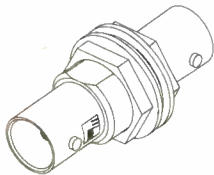
<b>Thermal Shock:</b>	-40°C to 65°C operating; -55°C to 85°C, non-operating
<b>Moisture Resistance:</b>	0% to 95%; MIL-STD-202 Method 106
<b>Corrosion (Salt Spray):</b>	MIL-STD-202 Method 101, Test Condition B
<b>Flammability:</b>	UL 94-VO rated (center conductor insulator)
<b>Vibration:</b>	MIL-STD-202 Method 204, Test Condition B
<b>Solvent Resistance:</b>	MIL-STD-202 Method 215

#### FINISH

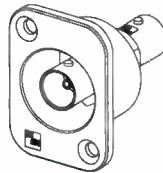
<b>Body/Bayonet:</b>	Tarnish-resistant electroless nickel plating
<b>Center Conductor:</b>	50 millionths inch gold plating MIL-G-45204 Type 1, Grade C, Class 1

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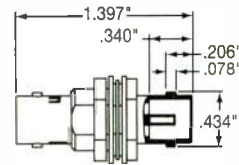
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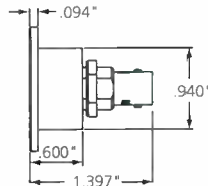
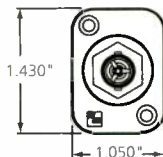
BNC Bulkhead Feed Through



Recessed BNC



Bulkhead Feed Through



Recessed BNC



# Drawings and Specifications

## 75 Ohm BNC Termination Plugs

### BNC Terminations Plugs

#### ELECTRICAL

- Characteristic Impedance:** 75 Ohm
- Termination Resistance:** BNC-TP-2, 75 Ohm + 0.1% (resistor value); BNC-TP-1, 75 Ohm + 1.0% (resistor value)
- Return Loss:** BNC-TP-2, better than -29 dB return loss to 3.0 GHz; BNC-TP-1, better than -16 dB return loss to 2.0 GHz

#### MECHANICAL

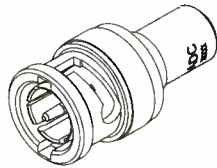
- Mechanical Durability:** 500 cycles minimum
- Coupling Mechanism:** 100 lbs. minimum
- Mechanical Shock:** MIL-STD-202, Method 213
- Interface Dimensions:** MIL-C-39012 except 75 Ohm

#### ENVIRONMENTAL

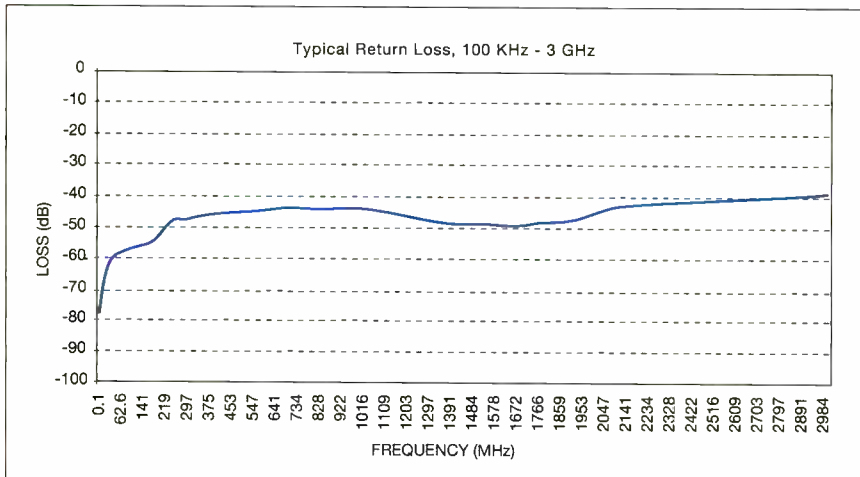
- Thermal Shock:** -40°C to 65°C -55°C to 85°C, non-operating;
- Moisture Resistance:** 0% to 95% relative humidity, tested to MIL-STD-202 Method 106
- Corrosion (Salt Spray):** MIL-STD-202 Method 101, Test Condition B
- Vibration:** MIL-STD-202 Method 201

#### FINISH

- Body/Bayonet:** Tarnish resistant electroless nickel plating
- Center Conductor:** 50 millionth inch gold plating MIL-C-45204 Type 1, Grade C, Class 1



BNC TP-2 Terminating Plug





## ADC Patents for Products in This Ordering Guide

Product	Patent
UniPatch®, High Density Patching System RS-422	US06186798 US06345986
ProAx™ Triax Connectors	US06109963 US05967852
ProAx™ Triax Bulkhead Panels	US06146192 US06231380
MVJ-3 Video Jack	US06045378 US05885096
SVJ-2 Video Jack	US05964607

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Shop the **NAB2003** exhibit floor and discover 1,200 dynamic exhibits — the most comprehensive display of broadcast studio equipment and digital audio, video and film technology on the planet.



Join us Wednesday, April 9 for the **Technology Luncheon** featuring noted futurist and author **George Gilder, Chairman, Gilder Group**

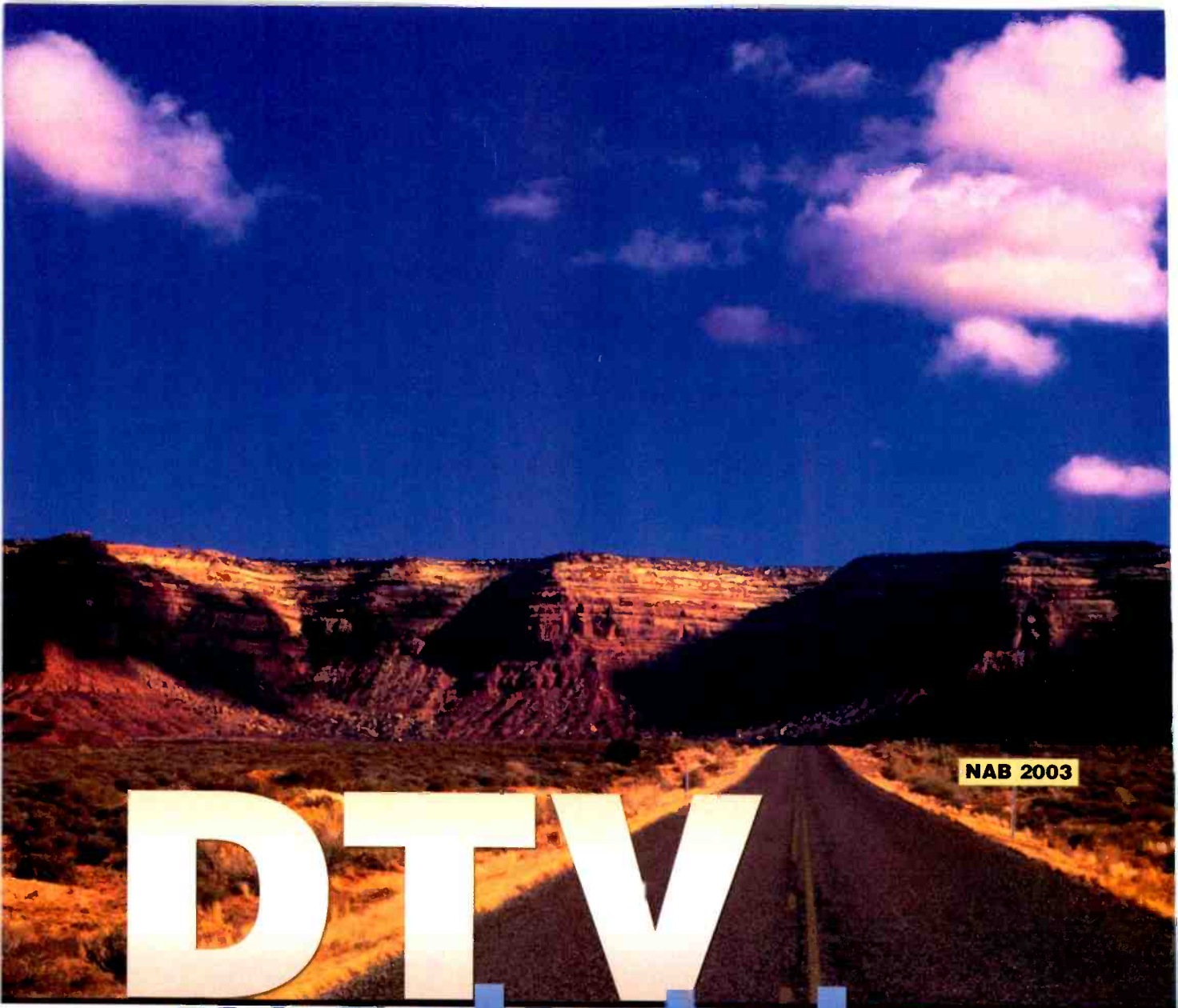
# **NAB**

**THE WORLD'S LARGEST  
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April 5-10, 2003 • Las Vegas, NV

**BEC: Saturday, April 5 – Thursday, April 10 • NAB2003: Conferences: April 5-10 • Exhibits: April 7-10**  
**For more information, log on to: [www.nab.org/conventions/nab2003](http://www.nab.org/conventions/nab2003)**

Produced in Partnership with the Society of Broadcast Engineers (SBE) and IEEE Broadcast Technology Society.




**NAB 2003**

# DTV marketplace

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**So many products  
too many to see!!**

**Trucks,  
transmitters  
and TVs**

It's that time of the year again – time for broadcasters from stations large and small to converge on Las Vegas to browse the latest offerings from industry vendors. There will be a lot of products and services represented in the Las Vegas Convention Center this year, as always. Technology is at the heart of NAB – the momentum that draws us all to Vegas year after year, and drives the activity on the show floor.

On display will be old favorites updated with new features and functionality, and new tools to make broadcasters' jobs easier. As always, *Broadcast Engineering* is here to provide attendees with a sneak peek. And this year's coverage is the largest ever – more than 60 pages with hundreds of products to make shopping easier!

So turn the page for details on products from audio accessories to cameras, and video routers to wire and cable. The products are divided into categories for easy reference, and include contact information and booth numbers to make finding vendors easy – before, during and after the show.

The table of contents at the left lists page numbers to let you turn directly to the category of your choice. Issue advertisers are listed in blue.

Dive in and enjoy the selection!

**BE**



## Audio consoles, mixers, microphones and accessories

### DIGITAL AUDIO MIXING CONSOLE

#### Klotz Digital VADIS D.C.II

Mid-priced console designed for live broadcasting and production applications; has four stereo buses with various mix-minus DSP options; monitoring outputs include cue, studio, control room and headphone, each with their own source selects.

678-966-9900; [www.klotzdigital.com](http://www.klotzdigital.com)

**Booth N1825**



### AES DIGITAL AUDIO SIGNAL MANAGEMENT SYSTEM

#### Sigma Electronics OctaStream family

Consists of the DA5320 mixer and subframe router, the DA5315 variable delay compensator, the DA5325 sample rate converter and the SG5605 audio reference generator; the 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.

801-575-8801; [www.sigmaelectronics.com](http://www.sigmaelectronics.com)

**Booth: SU4664**

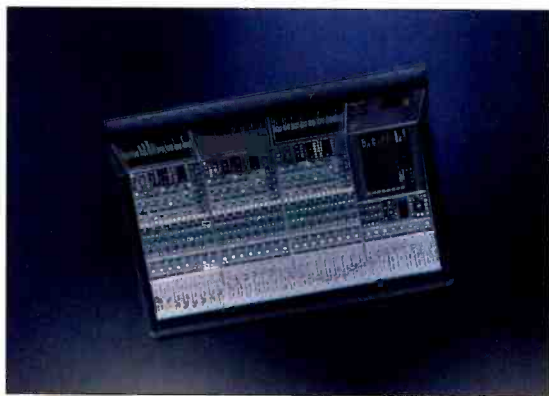
### DIGITAL BROADCAST CONSOLE

#### Solid State Logic Avant Plus

Has the HS control processor implemented on the Avant Plus; features premix masters, where six or eight premix channels can be stacked beneath individual premix master faders; allows for multiple sets of rotary, switched and fader-driven controls and surround panning using a pen and tablet surface.

212-315-1111; [www.solid-state-logic.com](http://www.solid-state-logic.com)

**Booth: N2512**



### DIGITAL BROADCAST CONSOLE

#### Solid State Logic C100

Features Centuri processing technology which includes fault tolerance, self healing DSP and hot swappable components; through the master control channel users have access to all channel controls; control linking enables a range of configuration functions to be linked to a specific input or output.

212-315-1111; [www.solid-state-logic.com](http://www.solid-state-logic.com)

**Booth: N2512**

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\*At NAB – Booth SU4543



## MICROPHONE

### Sennheiser MKH418S

Allows adjustable M-S stereo imaging via an independent dual capsule system; has rugged brass housing; facilitates consistent and accurate performance over temperature extremes; makes recordings future-proof by documenting directional information for use in future stereo mixes.

860-434-9190; [www.sennheiserusa.com](http://www.sennheiserusa.com)

**Booth: N2103**



## DIGITAL MIXING CONSOLE

### Studer D950 M2 V3.0

Features AutoTouch Plus automation and an enhanced router; faders and knobs are touch-sensitive and can be automated; audition modes allow a control value to be first auditioned and then punched into automation record, either locally or globally; the mix edit facility permits the editing and copying of automation data of faders.

416-510-1347; [www.studer.ch](http://www.studer.ch)

**Booth: N3005**



## MICROPHONE

### Sennheiser MKE Platinum

Reduced size subminiature condenser lavalier has an ultra thin cable, with only 1mm thickness and low capacitance manufactured with Kevlar wrapped copper core; optimized high-end response provides more headroom at the bodypack; has improved rejection of handling noise and an embossed "umbrella" diaphragm that protects the microphone against moisture and sweat.

860-434-9190; [www.sennheiserusa.com](http://www.sennheiserusa.com)

**Booth: N2103**

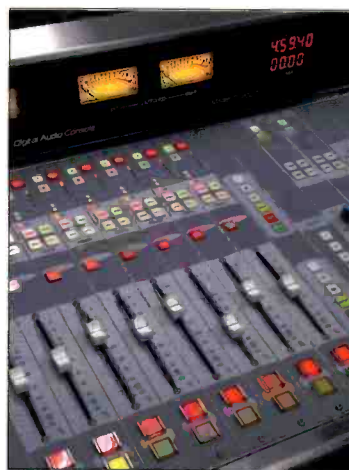
## DIGITAL CONSOLE

### Wheatstone D-9TV

Has four to 52 faders with sample rate converters on each input, onboard 24-bit A/D conversion; can route any source to any fader, integral dynamics EQ functions and snapshot recalls; includes mix-minus, monitoring and talkback capability with stereo, mono and subgroup outputs.

252-638-7000; [www.wheatstone.com](http://www.wheatstone.com)

**Booth: N2804**



## DIGITAL CONSOLE

### Wheatstone D-4000

Four-bus; has 28 or 32 mainframe inputs, A&D I/Os, VU metering, dual source inputs, optional line selectors phone modules and open bus architecture; features full logic, opto-isolated machine control, built-in TB, cue, head-phone, clock and timer; switchable daughter cards allow varying sources and signal rate within the same mainframe.

252-638-7000; [www.wheatstone.com](http://www.wheatstone.com)

**Booth: N2804**

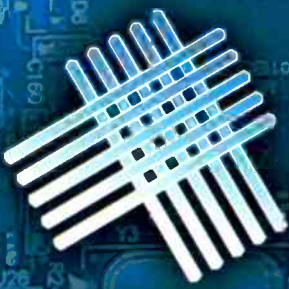
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WWW.SIGMAELECTRONICS.COM



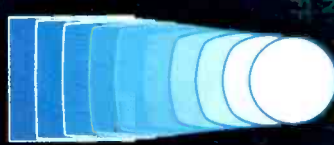
ROUTING



GENERATION



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CONVERSION

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Booth #SU4664

April 7-10



THE WORLD'S LARGEST  
ELECTRONIC MEDIA SHOW

## DIGITAL BROADCAST CONSOLE

### AMS Neve Libra Live series

Features new XSP DSP processing for more processing power; new channel module option with a 30mm fader pitch allows 64 faders to be fitted in the same space as a traditional 48-fader console; new console frame offers space in the meterbridge for more meter options.

212-965-1400; [www.ams-neve.com](http://www.ams-neve.com)

**Booth: N3038**



## DIGITAL AUDIO ROUTER

### Audioarts Engineering ADR-32

Compact rackmount digital audio router features front-panel X-Y control and a built-in monitor speaker; designed to interface with Wheatstone and Audioarts digital console source display strips; can be populated with modular I/O cards for up to 32x32 matrix; two RS-485 ports provide links for communications, consoles and automation systems; optional event scheduler software available.

252-638-7000; [www.wheatstone.com](http://www.wheatstone.com)

**Booth: N2804**



## TUBE MICROPHONE

### Audio-Technica AT3060

Operates on standard 48V phantom power – eliminating the need for a separate power supply and cable; features a new large-diameter diaphragm cardioid condenser element and a precision-machined, nickel-plated brass acoustic element; tubes are hand-selected and aged, and shock-mounted to dampen mechanically induced vibration.

330-686-2600; [www.audio-technica.com](http://www.audio-technica.com)

**Booth: N2212**



## FIELD MIXER

### Azden FMX-2

Portable, two-channel field mixer; battery-operated mixer can be attached directly to a camera; features XLR inputs and outputs for larger cameras, in addition to a mini-plug output for mini-DV cameras; also features two balanced XLR mic/line switchable outputs.

516-328-7500; [www.azden.com](http://www.azden.com)

**Booth: N2038**



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North Billerica, MA USA 01862-1256  
+1-978-671-5700



## DIGITAL AUDIO CONSOLE Calrec Alpha 100

Console features up to 96 stereo/48 mono channels; two-layer design allows for channel path per fader or dual path arrangement; provides eight stereo or mono groups, four main outputs (configurable for 5.1, LT/RT or stereo) and mix-minus output per channel; console offers 48 multi-track/IFB outputs and 20 auxiliary outputs.

+44 142 284 2159; [www.calrec.com](http://www.calrec.com)

**Booth: N2646**



## DIGITAL AUDIO CONSOLE Calrec Sigma 100

Available in four cost-effective processing/input configurations, three frame sizes and a variety of optional input and output interfaces; four-band EQ and high and low pass filters on all channels; other features include surround panning and monitoring, and comprehensive metering and talkback facilities.

+44 142 284 2159; [www.calrec.com](http://www.calrec.com)

**Booth: N2646**

**Color indicates advertiser**



## DIGITAL AUDIO MIXING CONSOLE Euphonix Max Air

96-channel digital mixing system; designed for on-air, live-to-tape broadcast and OB applications; includes hardware redundancy and software diagnostics; uses the same DSP core and converters as the System 5-B and also shares much of the same control surface software.

650-855-0400; [www.euphonix.com](http://www.euphonix.com)

**Booth: N3014**

## MIXING CONSOLE

### Audioarts R-90

Plug-in modular design houses up to 23 input channels with dual-caller support; two studios, two headphones, built-in CUE speaker clock and timer, VU meter pairs, two stereo and two mono outputs; hinged meterbridge provides instant DB-25 I/O and programming dipswitch access.

252-638-7000; [www.wheatstone.com](http://www.wheatstone.com)

**Booth: N2804**



## AUDIO ROUTING SWITCHER Thomson Grass Valley Apex

Multiformat capabilities include support for AES digital audio, multiple audio distribution interface and Dolby E formats; features a redundant TDM matrix card system to keep signals moving through a facility without interruption, a silent-switching design to minimize unwanted clicks and pops, support for multiple control systems, and proactive monitoring based on SNMP.

530-478-3000; [www.thomsongrassvalley.com](http://www.thomsongrassvalley.com)

**Booth: SU7059**



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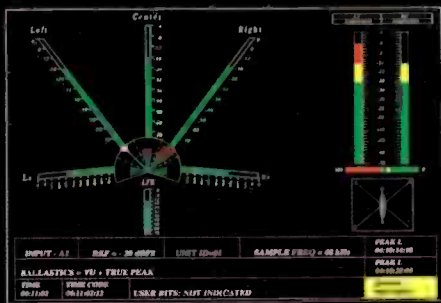
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Dolby® Digital and Dolby® E are registered trademarks of Dolby Laboratories.

## LOUDNESS METER

### Dolby Laboratories LM100

Measures the loudness of "speech" contained within broadcast programming; four digital sources, the unit indicates the measured loudness level in dB, relative to 0dBFS; for analog signals, the measured loudness level is relative to a user-definable operating level; new intelligent dialog measurement allows more accurate loudness control, as well as a software remote control.

415-645-5000; [www.dolby.com](http://www.dolby.com)

**Booth: SU4555**



## DIGITAL LIVE ON-AIR CONSOLE

### Harrison by GLW TVD-SL

Offers 33mm fader spacing and an eight-character channel display; up to 21 optional high-resolution 6.4-inch LCD monitors can display a station's video sources; all signal processing is full 40-bit floating point with 40-bit internal architecture, 24-bit A-D/D-A conversion (96kHz capable).

615-641-7200; [www.harrisonconsoles.com](http://www.harrisonconsoles.com)

**Booths: N2666, SU502**

## SURROUND SOUND ENCODER

### Dolby Laboratories Pro Logic II

Provides viewers 5-channel matrix surround sound experience over any stereo medium; the DP563 Dolby surround encoder now can be upgraded to include real-time encoding capability for Pro Logic II; a plug-in solution for audio workstations also will be available to support the rollout of Pro Logic II encoding.

415-645-5000; [www.dolby.com](http://www.dolby.com)

**Booth: SU4555**

## WIRELESS MIC SYSTEM

### Lectrosonics 700 series

Offers CD-quality audio with response to 20kHz, a digital RF link operating on standard UHF frequencies and encryption for applications requiring a high level of security.

505-892-4501; [www.lectrosonics.com](http://www.lectrosonics.com)

**Booth: N2120**

## ANALOG BROADCAST CONSOLE

### Harrison by GLW Pro-950EX

Six frame sizes are available; features include 16 dual 8x1 mono input preselectors, mono or stereo patch insert switch per input module, four electronically switched mix-minus feeds with talkback, and balance or pan per input module; all console inputs and outputs are differentially balanced with all main signals interfaced via XLR connectors.

615-641-7200; [www.harrisonconsoles.com](http://www.harrisonconsoles.com)

**Booths: N2666, SU502**

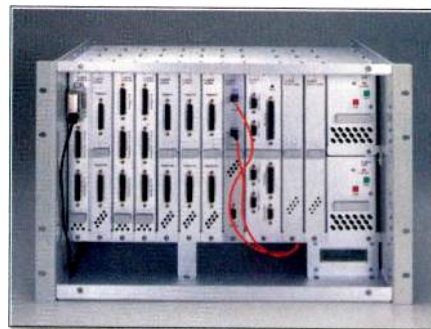
## DIGITAL AUDIO ROUTER

### NVISION NV7256-Plus

Offers mixed digital and analog I/O, 256x256 building block, and linear expansion to 2048x2048 channels; supports mono channel switching.

530-265-1000; [www.nvision1.com](http://www.nvision1.com)

**Booth: C2650**



## ROUTER

### Logitek Electronic Systems Audio Engine

Upgrade to Version 3 firmware; implements direct routing capabilities of new audio cards; provides more stand-alone router functions; expands mix-minus buses to 24; now provides eight stereo mix buses.

800-231-5870; [www.logitekaudio.com](http://www.logitekaudio.com)

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## Automation and newsroom systems



### OFF-AIR DTV CHANNEL MANAGER

#### Triveni Digital StreamBridge AG

Grooms both programs and metadata from terrestrial DTV streams and customizes them for cable headend delivery; optimizes streams to decrease the bandwidth used for PSIP; supports multiple inputs and outputs simultaneously; merges, filters and translates ATSC PSIP and MPEG-2 PSI tables; is now shipping.

609-716-3500; [www.TriveniDigital.com](http://www.TriveniDigital.com)

**Booth: SU5475**



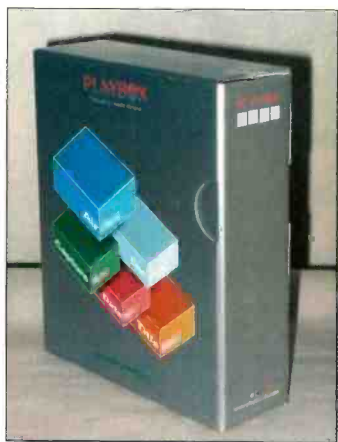
### DTV DATACASTING SYSTEM

#### Triveni Digital Skyscraper

Manages data to be broadcast through the digital television infrastructure; includes new features for receiver targeting, encryption and support for multi-station networks; schedule content for distribution simultaneously through many DTV broadcast streams in a multi-station network.

609-716-3500; [www.TriveniDigital.com](http://www.TriveniDigital.com)

**Booth: SU5475**



### AUTOMATION SYSTEM

#### Digital Media Technologies PLAYBOX

Software product line for file-based TV workflow implementation; different PLAYBOX modules handle the MPEG-2 capturing, metadata insertion, playlist creation, 24/7 on-air playout and interactive CG management.

+359 88 510272; [www.playbox.tv](http://www.playbox.tv)

**Booth: N/A**

### TV NEWS MANAGEMENT

#### Dalet Digital Media Systems DaletPlus News Production

Delivers real-time access and editing of video, audio, wires, stills, feeds and CGs to journalists' desktops over a standard IT network; enables news directors to monitor stories from planning to broadcast; supports MPEG-2, DV and DVCPRO.

212-825-3322; [www.dalet.com](http://www.dalet.com)

**Booth: SU7137**

### MANAGEMENT SYSTEM

#### Pharos Communications Almanac

Scheduled event-based management system that is Web-enabled to allow clients to make bookings; the system offers timed switching, automated record and playback; it also allows switching, archiving and duplication from the desktop.

+44 0 118 950 2323; [www.pharos-comms.com](http://www.pharos-comms.com)

**Booth: C2625**

### DATABASE TOOLS

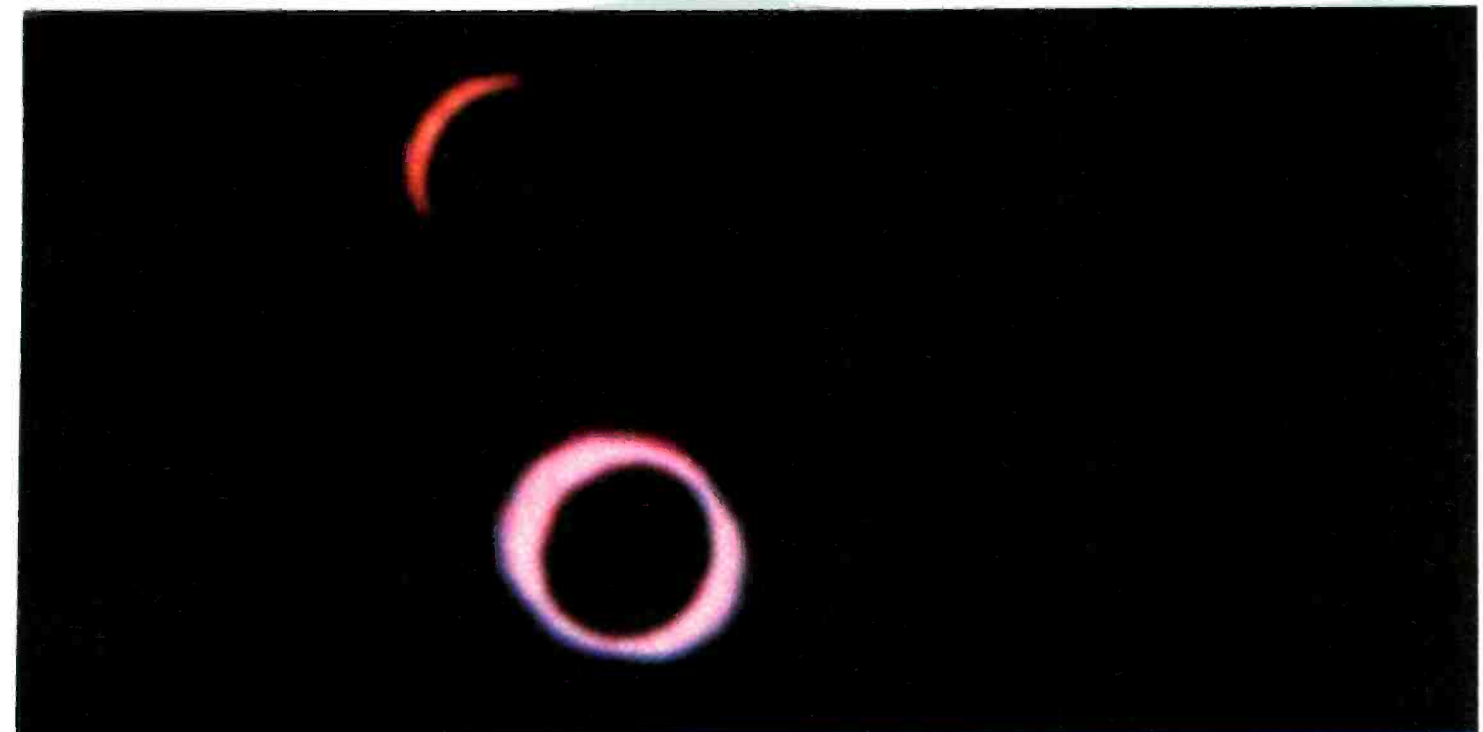
#### Sundance Digital solution for asset management

Enable facility users to classify, disseminate, organize and manage their media asset management information; available for Fast Break Automation, Titan and Newslink.

972-444-8442; [www.SundanceDigital.com](http://www.SundanceDigital.com)

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**NAB #C3526**

[www.clearcom.com](http://www.clearcom.com)



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## GRAPHICS SYSTEM

### AccuWeather NewsRider

PC-based product delivers graphics to support breaking news stories; optimized for urban traffic and public safety stories; includes high-resolution photographic urban maps of a station's DMA, as well as schematic base maps showing major highways, rivers and political boundaries; can be updated instantly with new information.

814-237-0309; [www.accuweather.com](http://www.accuweather.com)

**Booth: C3534**

## GRAPHICS ARCHIVE

### AccuWeather Feature Graphics Archive

CD features more than 1200 high-resolution graphics that can be used to enhance television weather presentations, categorized for easy retrieval; reusable, customizable graphics cover a number of weather events, including tornados, thunderstorms, hurricanes, winter storms, holidays and marine weather; available via subscription.

814-237-0309; [www.accuweather.com](http://www.accuweather.com)

**Booth: C3534**

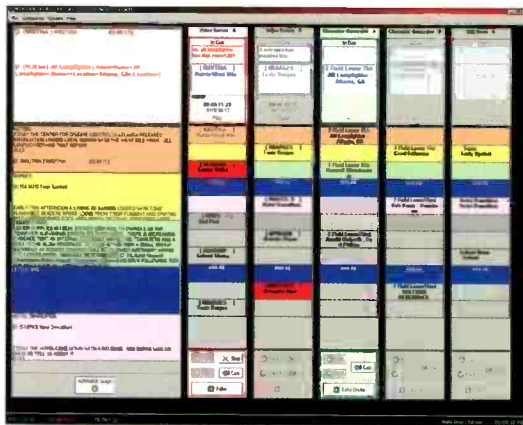
## ASP APPLICATION

### Encoda MART

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

303-237-4000; [www.encodasystems.com](http://www.encodasystems.com)

**Booth: C3211**



## DIGITAL NEWSROOM

### Sundance Digital Newslink

Integrated with Avid, it manages newsroom workflow and live, on-air broadcast; includes a Producer's Rundown functionality to facilitate manual story list creation and on-air device management.

972-444-8442; [www.SundanceDigital.com](http://www.SundanceDigital.com)

**Booth: SU537**

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## **AUTOMATION SYSTEM**

### **ParkerVision PVTV NEWS CR4000**

Features advanced software that simplifies the user interface for single operator control; capabilities include expanded video, and keyer, audio and control features; improves upon the Transition Macro timeline management and workflow processes of previous PVTV systems.

800-532-8034; [www.parkervision.com](http://www.parkervision.com)

**Booth: SU5246**

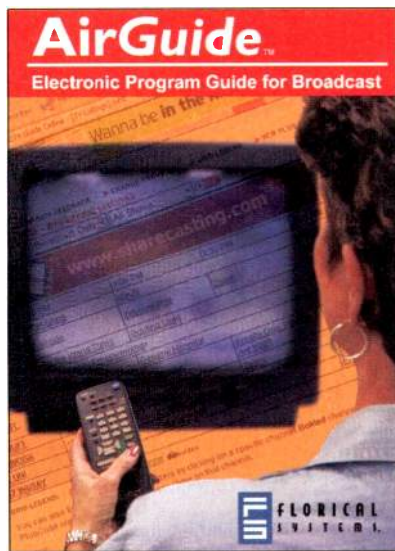
## **NEWS ANALYSIS TOOL**

### **Telestream Media Capture**

Automates recording of multiple live video feeds and metadata; search, organize, view and share media from the user's desktop; encodes and stores media in Windows Media 9 format; includes a single, multi-function tool that provides easier access to all aired content.

530-470-1300; [www.telestream.net](http://www.telestream.net)

**Booth: SU5661**



## **ELECTRONIC PROGRAM GUIDE**

### **Florical Systems AirGuide**

Information from the AirBoss on-air presentation system is automatically passed to AirGuide, which then distributes the information to a PSIP encoder to be added to the DTV transmission or a program guide on the station's Web page on the Internet; designed to facilitate the multichannel environment.

352-372-8326; [www.florical.com](http://www.florical.com)

**Booth: SU5425**

## **NEWSROOM SYSTEM**

### **Pathfire Digital Media Gateway (DMG)**

The DMG platform allows broadcasters to aggregate content from a variety of sources; minimizes the need to schedule or monitor satellite feeds, reduces the need for tape, integrates with other station gear and streamlines station workflow.

770-619-0801; [www.pathfire.com](http://www.pathfire.com)

**Booth: SU5019**



## **CONTROL PANEL**

### **Radamec Broadcast Systems ARC 2000**

Provides a clear, distinctive visual display with interactive touch-screen operation; comprises of a 19 inches x 3U operator control panel, a touch-screen monitor and a 19 inches x 4U panel control unit; flexible architecture allows interfacing to studio automation systems or control of camera CCU functions.

877-RADAMEC; [www.RadamecBroadcast.com](http://www.RadamecBroadcast.com)

**Booth: SU5667**

## **AUTOMATION SYSTEM**

### **MicroFirst DAS-CE-16**

Smaller multichannel automation controller designed for systems where the number of controlled devices is limited and multichannel operation is required; full-featured, but limited to controlling six program schedules.

201-651-9300; [www.microfirst.com](http://www.microfirst.com)

**Booth: SU5638**

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# DTV marketplace

## AUTOMATION SYSTEM

### MicroFirst DAS-CE-32

Expandable control of all television and cable broadcast functions; multichannel scheduling and logging, record schedule control, video server ingest and clip trimming, and remote control via IP and full centralcasting control.

201-651-9300; [www.microfirst.com](http://www.microfirst.com)

**Booth: SU5638**

## GRAPHICS SYSTEM

### AccuWeather Galileo

Upgrade offers new graphic elements for severe weather reporting; new enhanced infrared satellite views allow meteorologists to customize the colorization on storm cloud images; new CityVision capability allows stations to present next-day forecasts through photographic-quality animations of weather conditions against a backdrop of their DMA's skyline; improved system can record up to 12 time-lapse movies simultaneously from different locations; automated Web module enables stations to publish multiple Web images and movies in any desired format, compression rate and resolution.

814-237-0309; [www.accuweather.com](http://www.accuweather.com)

**Booth: C3534**



## AUTOMATION SYSTEM

### Sundance Titan

Reassign playlist control via its graphical user interface; includes new ProgramView Lo-Res; with Telestream, it automatically converts all media ingested to the video server into browseable MPEG-1 proxy format, which may then be frame-accurately trimmed or converted into sub-ID clips.

972-444-8442; [www.SundanceDigital.com](http://www.SundanceDigital.com)

**Booth: SU5337**

## CONTENT BROWSER

### Pixel Power PixelBrowser

Web-based browser is an open standards-based software solution to the problem of browsing and searching still picture, video clip and character generator page assets in a broadcast environment; using only a common Web browser, staff can search the library of stills, clips and pages, and drag and drop images to create a playlist; "Location Scripting" feature can be used to automate asset ingest and conversion, still number allocation and will send e-mail or SMTP messages to newsroom staff when a new still is available; no per set license fee.

954-943-2026; [www.pixelpower.com](http://www.pixelpower.com)

**Booth: SU5359**

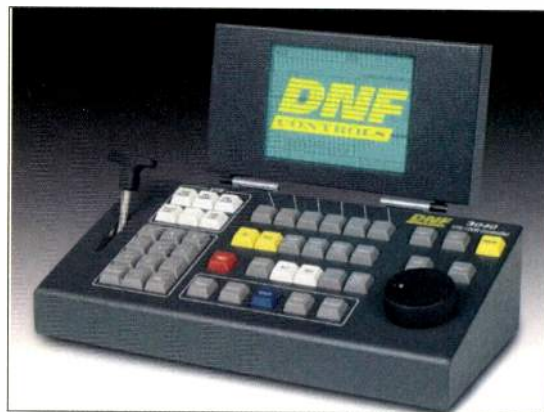
## MEDIA MANAGEMENT SOLUTION

### BBC Technology Broadcast Network Control

Provides control across all areas of distributed broadcast operations from one uniform interface; enables control of equipment in remote areas; runs on standard PC hardware and operating systems; system is modular, configurable and scalable.

+44 20 776 52295; [www.bbc.co.uk](http://www.bbc.co.uk)

**Booth: SU5047**



## PLAYLIST PLAYOUT SYSTEM

### DNF Controls 3040P

Provides a means to create, download, edit and control playback of video clip sequences; in the event of an on-air automation failure, it takes control of the server and continues the playlist from the point of failure; new option allows playlists to be downloaded from traffic systems.

818-898-3380; [www.dnfcontrols.com](http://www.dnfcontrols.com)

**Booth: SU6127**

Color indicates advertiser



# A NEW BROADCAST LEADER THE AZDEN 1000 SERIES

Recently selected by Ikegami and Panasonic for their new "Slot-in" cameras, the 1000 Series is the result of years of development by Azden in the field of high quality audio for video.

The 1000 receiver is available in the following configurations:

1000URX-AB: pre-assembled with the Anton Bauer "Gold Mount"

1000URX-Si: slot-in receiver for special Ikegami and Panasonic cameras

1000URX: basic Azden receiver for all cameras.

- 121 user-selectable UHF channels (723-735MHz), with LCD readout.
- True diversity system with 2 complete front-ends and high-gain antennas,
- Proprietary DLC (Diversity Logic Control) circuitry for reduced dropouts.
- State-of-the-art dielectric filters throughout, for improved image rejection and superior diversity isolation
- High (5th) order filters for improved S/N ratio.
- Multi-function LCD shows channel number, frequency, battery info, AF level, and diversity operation.
- Earphone-out with level control.



1000URX-Si



1000URX-AB



1000URX



Bodypack transmitter (1000BT) with reduced current-drain for improved battery life, is available with Azden EX-503H, Sony ECM-44H or ECM-55H.



Plug-in XLR transmitter (1000XT) works with dynamic or phantom-powered mics.

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E-Mail - AZDENUS@AOL.COM • web site: [www.azdencorp.com](http://www.azdencorp.com)



# DTV marketplace

## MEDIA MANAGEMENT SOLUTION

### BBC Technology Broadcast News and Sports

Scalable, enterprise and collaborative solution; automates the production and playout process for newsrooms, sports production centers and other real-time environments; provides access to material within a few frames of ingest; central and local news teams can access media at the same time; combines tools from BBC Technology with Quantel storage and editing systems and other third-party systems; allows ingest, encoding and management of video in a variety of resolutions; features live access to archive material at the desktop.

+44 20 776 52295; [www.bbc.co.uk](http://www.bbc.co.uk)

**Booth: SU5047**



## AD REVENUE SOFTWARE

### AgentSmith RevenueMax

Software links together all sales functions using a media company's network; eliminates the need to manually enter historic or pending business data; system components sync with the station's flow of advertising traffic.

410-327-4084; [www.agent-smith.com](http://www.agent-smith.com)

**Paris Hospitality Suite**

## MEDIA PLATFORM

### Encoda Deluxe: Paradigm

Media platform features the ability to customize according to each client's practices; provides real-time integration of critical departments.

303-237-4000; [www.encodasystems.com](http://www.encodasystems.com)

**Booth: C3211**

*Color indicates advertiser*



## PACKAGED TV AUTOMATION SYSTEMS

### Floral Systems L100 and LT200

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; LT200 combines commercial insertion and program playback for one or two channels; both systems include two computer workstations.

352-372-8326; [www.floral.com](http://www.floral.com)

**Booth: SU5425**

## NEWSROOM SYSTEM

### Avid iNEWS

Offers advanced machine control, the ability to store CGs with the script, and the synchronicity of words with pictures inside NewsCutter and Media Browse systems; ControlAir system controls up to 32 on-air playback devices.

978-640-6789; [www.avid.com](http://www.avid.com)

**Booths: RT606, SL300**

## MEDIA MANAGEMENT SYSTEM

### Encoda Broadcast Master

Pre-packaged Windows-based business system manages the entire media process; can be implemented in approximately four weeks.

303-237-4000; [www.encodasystems.com](http://www.encodasystems.com)

**Booth: C3211**

## AUTOMATION SYSTEM

### Chyron Pro-Bel Phantasia

Unit is based on industry-standard components, rather than on specialist hardware; flexible, multichannel solution is MPEG- and DV-compatible; can manage up to eight channels; additional eight-channel groups may be added.

631-845-2000; [www.chyron.com](http://www.chyron.com)

**Booth: C2074**

Photo courtesy of Comcast Digital Media Center



# What's the difference between automation systems?



## The people behind them.

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- Our years in broadcast provide stability
- Our scalability creates affordability
- And, our dedication to your success makes it a reality

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See us at NAB Booth #C3211

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[www.encodasystems.com](http://www.encodasystems.com)

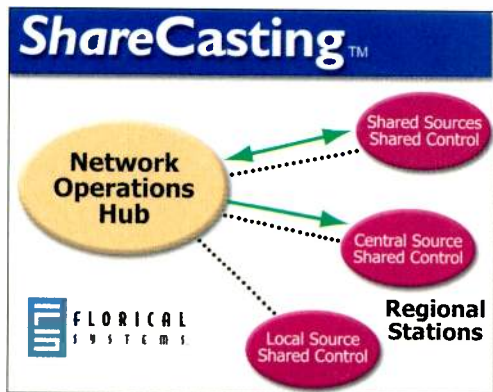
## NEWSROOM SYSTEM

### Pinnacle DekoMOS

Allows users to configure Avid iNews and Associated Press NCS to communicate with Deko via the MOS protocol; allows Deko graphics to be included in the newsroom's automated rundown.

650-526-1600; [www.pinnaclesys.com](http://www.pinnaclesys.com)

Booth: SU5003



## CENTRALCASTING SYSTEM

### Florical Systems ShareCasting

Can share broadcast control and origination between regional stations and a central control site; enhancements include "High Availability" system configurations designed to ensure against interruptions to the on-air program stream and "AutoSense" switching systems that automatically switch between control systems when contact with control components is lost.

352-372-8326; [www.florical.com](http://www.florical.com)

Booth: SU5425

## AUTOMATED CLOSING SYSTEM

### Broadcast Software Solutions SchoolTouch

Users can create custom prompts for school or business; works with all major CGs; WebView function automatically puts closings on station Web site; WebEntry function allows users to provide closing information via the Web.

800-273-4033; [www.broadcastsoftware.tv](http://www.broadcastsoftware.tv)

Booth: C651

## MULTICHANNEL CONTENT DELIVERY SYSTEM

### OmniBus Systems TX>Play

Fully scalable; offers a straightforward user interface, full integration with all broadcast processes, server and VTR control, and schedule creation.

+44 8705 004300; [www.omnibus.tv](http://www.omnibus.tv)

Booth: C2670

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## Cameras, lenses, support products



## WIRELESS CAMERA SYSTEM

### Sony Electronics WLL-CA50

Converts a camcorder's digital video signal into a DVB-ASI MPEG-2 MP@ML bitstream and transmits it at 2.4GHz; transmission range is up to 2000 feet from a stationary camcorder or 650 feet from a camcorder moving at 35mph; pictures are encoded into an MPEG-2, 12Mb/s stream and then transmitted using an OFDM and error-correcting scheme.

201-930-1000; [www.sony.com/professional](http://www.sony.com/professional)

Booth: SU4015



## OPTICAL DISC RECORDING SYSTEM

### Sony Electronics Optical family

Consists of two camcorders and three decks; from the camcorder, newsgathering 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; field engineers will be able to transfer the high-resolution footage either as video or as a data file over IP networks; in the case of compact decks or studio decks, this proxy material will transfer at up to 50 times faster than real time; offers the choice of recording video with the DVCAM codec at 25Mb/s or the MPEG IMX codec at 30Mb/s, 40Mb/s or 50Mb/s.

201-930-1000; [www.sony.com/professional](http://www.sony.com/professional)

Booth: SU4015

# The future is unlimited where you find the Thales point

Wherever you find the Thales point, you'll find award-winning innovation for all your digital transmission and distribution needs. We're helping broadcasters and service providers benefit from the unlimited potential of the digital age with complete end-to-end solutions. And that's the whole point. Thales. Great people behind great solutions.

# THALES



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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.

## Television

Thales offers today's broadcasters the most reliable and cost-effective path to digital compliance for high- and low-power television. An Emmy winner for transmitter innovation, Thales' solutions are helping customers achieve optimal DTV performance with lower operating costs.

## Multimedia

Thales' experience and innovation in transport stream management is allowing multimedia providers to optimize their bandwidth investment and offer the latest in interactive and customized services. Our digital solutions comply with all open standards for DTV, cable and satellite distribution networks.

## TRIPOD

### Vinten Fibertec

Reduces the risk of wind buffeting and camera shake; "channel" leg sections are made of carbon/glass composite; is lightweight; lever action clamps are positioned adjacent to each other; ensures more secure locking; minimizes cable snags and accidental breaks.

888-284-6836; [www.vinten.com](http://www.vinten.com)  
Booth: SU4723



## PORTABLE CAMERA

### Sony Electronics HDC-F950

Captures a 1920x1080 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; facilitates the picture capture rates of 23.98p, 24p, 25p, 29.97p, 50i and 59.94i; optional Windows PC software enables users to visually hand-tailor gamma curves via a graphical user interface on their computer; up to five distinct gamma curves can be saved onto Memory Stick media for immediate transfer to the camera.

201-930-1000; [www.sony.com/professional](http://www.sony.com/professional)  
Booth: SU4015

## LI-ION BATTERY SYSTEM

### IDX ENDURA E-80

Digital Lithium ion battery system incorporates IDX's PowerLink feature – which allows two battery packs to 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.

310-891-2800; [www.idx.com](http://www.idx.com)  
Booth: C968

## BATTERY MANAGEMENT SYSTEM

### IDX ENDURA

Software provides detailed information on E-80 batteries; will soon provide information on E-50 batteries; each E-80 includes Digital Data Protocol, which stores complete battery information, including charge cycles, operating temperatures and high loads, in nonvolatile form.

310-891-2800; [www.idx.com](http://www.idx.com)  
Booth: C968



## LENSES

### Thales Angenieux Optimo 24-290 and Optimo 12x9.7HD

Optimo 24-290 has a focal range of 24-290mm and an aperture of T2.8, which provides for a large depth of field; produces contrast and color reproduction; Optimo 12x9.7HD incorporates an advanced optical design and proprietary high resolution glass; has an aperture speed of F1/4.

973-812-4326; [www.angenieux.com](http://www.angenieux.com)  
Booth: C2425

## SERVO-CONTROLLED PAN/TILT HEADS

### Telemetrics PT-CP-S2, PT-LP-S2 and PT-HP-S2

PT-CP-S2 is a compact pan/tilt head available with either top or side mounting platforms; PT-HP-S2 is an H-shaped pan/tilt head that's available with extended arms and yoke, and an optional slip ring to provide unimpeded and continuous 360-degree panning; PT-LP-S2 is an L-shaped pan/tilt head that works with applications using a teleprompter; a Virtual Studio option is available for PT-LP-S2 AND PT-HP-S2 only.

201-848-9818; [www.telemetricsinc.com](http://www.telemetricsinc.com)  
Booth: C3726

## DUTCH HEAD

### OConnor Engineering 2060Z

Capable of counterbalancing a 53-pound camera with an eight-inch center of gravity; ideal for use with the OConnor 2575.

714-979-3993; [www.ocon.com](http://www.ocon.com)  
Booth: C2223

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## **CAMERA CRANE**

### **Sachtler CamCrane EFP**

For cameras up to 39.7 pounds; four towers and four outriggers stabilize the CamCrane EFP; tower and outrigger cables can be adjusted; the main pipe is telescopic; can be setup at a variety of lengths; adjustable in both the horizontal plane as the top and bottom views; scaling on the spindle enables the cameras to be moved or repositioned at the same angle.

**516-867-4900; [www.sachtler.com](http://www.sachtler.com)**

**Booth: C2660**

## **CAMERA REMOTE CONTROL**

### **Bogen Manfrotto 522 LANC**

Remote control puts essential controls for most miniDV cameras – such as focus, record, zoom, backlight and fader – within easy reach; camera movement and recording controls can be operated with the same hand; allows switching between on and standby mode.

**201-934-8500; [www.bogenphoto.com](http://www.bogenphoto.com)**

**Booths: C2469, C2369**



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## **BATTERY**

### **Anton/Bauer Dionic battery**

Can be charged on any Interactive 200 or new TITAN series charger; time and state of charge indications are integrated into a single full-time display; determines remaining runtime regardless of battery capacity; automatically compensates for load and environmental conditions.

**800-422-3473; [www.antonbauer.com](http://www.antonbauer.com)**

**Booth: C3650**



## **HD STUDIO CAMERA**

### **Sony Electronics HDC-910**

Comforms to the multiformat strategy of the HDC-900/950 camera family; uses camera control units that feature optional digital converter boards that can simultaneously deliver the alternative 1280x720@59.94p HDTV output; features a combination of the switchable 50/60 HD camera head and optional downconverter plug-in boards in the camera CCU; can facilitate a cost-effective switchable 525/59.94 and 625/50 SD system; uses a Power HAD image sensor; vertical smear is held to -125dB.

**201-930-1000; [www.sony.com/professional](http://www.sony.com/professional)**

**Booth: SU4015**



# small wonder

EXPERIENCE  
THE C100 LIVE  
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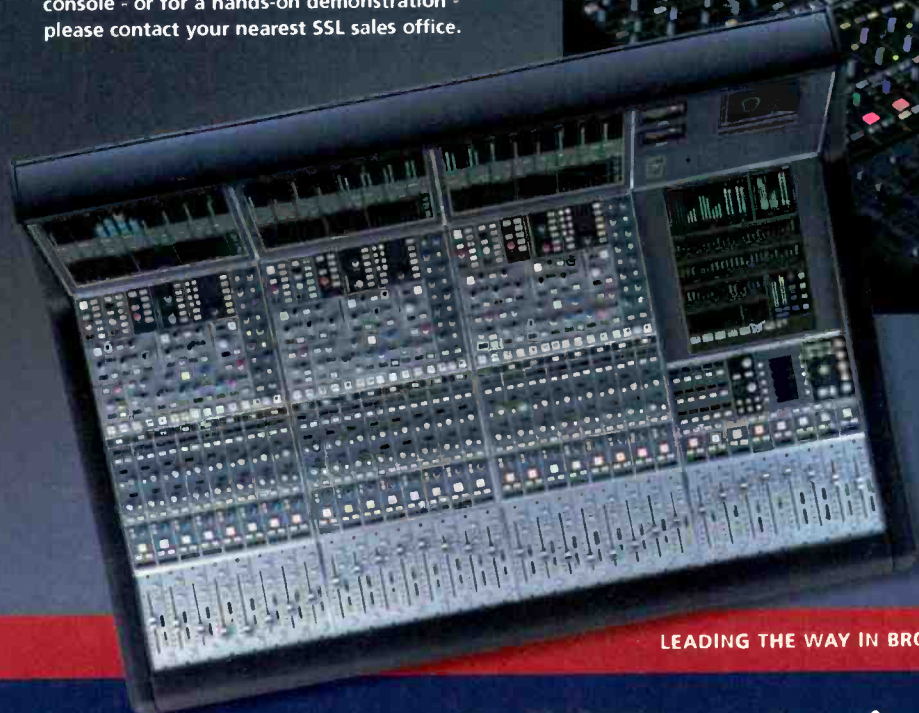
## C100 DIGITAL BROADCAST CONSOLE

Introducing the all-new C100 digital broadcast console. Compact, scalable and extremely cost-effective, the C100 delivers the ultimate in operational efficiency for demanding live and live-to-tape broadcast operations. Combining unrivalled SSL ergonomics and benchmark audio quality with outstandingly robust operation, the C100 is the broadcast solution that's affordable today and expandable tomorrow.

### C100 Features include:

- ▶ Up to 128 input channels
- ▶ More than 80 output mix busses
- ▶ Simultaneous 5.1, stereo & mono signal paths
- ▶ Intuitive, freelance-friendly control surface
- ▶ Mix of dedicated and assignable controls
- ▶ Offline graphical show setups
- ▶ Self-healing DSP, hot-swappable components and redundancy
- ▶ Scalable control surface, DSP and I/O
- ▶ Studio or mobile configuration
- ▶ Exceptional SSL service and support

For more details of the C100 digital broadcast console - or for a hands-on demonstration - please contact your nearest SSL sales office.



# C100

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# DTV marketplace



## POWER PRODUCTS

Aspen Electronics Aspekt chargers and Nexus battery system

New systems complement the NP format NHP-50 and NP-35 batteries, and the V-mount NHP-65 and NHP-100 batteries, along with the Phantom hot-swap accessory.

866-615-1690; [www.aspenelectronics.com](http://www.aspenelectronics.com)

Booth: SU5427



## CAMERA SYSTEM

**N Systems (NSI) Cam Pac**

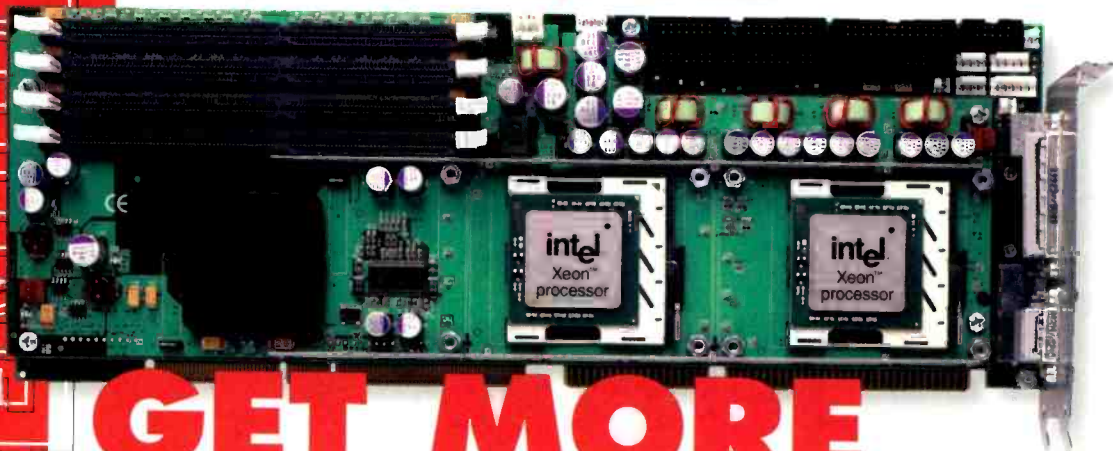
Improved version of the full-featured broadcast quality remote control camera system; provides all the functionality of a high-end broadcast camera and control unit when used in conjunction with NSI's MC5 remote control system.

800-SPEC-NSI; [www.nsystems.com](http://www.nsystems.com)

Booth: C2049

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[www.TrentonProcessors.com](http://www.TrentonProcessors.com)



## ALUMINUM TRIPOD

### Bogen Manfrotto 515MV

Features a die-cast aluminum crown with a built-in 100mm bowl interface, adjustable leg clamp levers and a floor spreader to aid tripod leg angle setting adjustments.

201-934-8500; [www.bogenphoto.com](http://www.bogenphoto.com)

Booths: C2469, C2369



## TRIPLE-DIGIT ZOOM LENS

### Canon Digi Super 100xs

Features HD/SD capability, a speed of f/1.7 and Image Stabilizer technology; offers a focal length of 9.3mm to 930mm (18.6mm to 1860mm using the 2x extender).

516-328-5000; [www.canonbroadcast.com](http://www.canonbroadcast.com)

Booth: C2040

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[www.broadcastsoftware.tv](http://www.broadcastsoftware.tv)

## WIRELESS CAMERA SYSTEM

### Link Research LinkXP2

Compact design operating at low power; uses MPEG diversity to maintain a robust signal; offers reduced end-to-end signal delay between the camera and the studio to 40ms.

**+44 0 1923 244 233; [www.linkres.co.uk](http://www.linkres.co.uk)  
Booth: C390**



## CAMCORDER

### Panasonic AJ-SDX90

Operator-controllable selection of EFP-quality 4:2:2 sampled DVCPRO50 or classic 4:1:1 sampled DVCPRO recording, and native 16:9 widescreen or conventional 4:3 aspect ratios; first broadcast-grade standard-definition camcorder to offer filmlike 24fps progressive scan (480/24p) acquisition, in addition to 30fps progressive (480/30p) and 60 fields-per-second interlace scan capture; combines the "look and feel" of electronic film while maintaining low-cost NTSC compatible news and high-performance 525-line field production modes.

**201-392-4127; [www.panasonic.com](http://www.panasonic.com)  
Booth: C904**

## CAMCORDER

### Panasonic AG-DVC80

New 3CCD DV Proline camcorder featuring precision wide-angle Leica Dicomar lens; offering the same body style and many of the same features as the AG-DVX100 24p/30p/60i camcorder; focuses on 480i/60 (NTSC) applications; ultra-compact 4.2-pound unit is equipped with 1/3" 410,000-pixel 3CCD imagers that deliver more than 500 lines of horizontal resolution.

**201-392-4127; [www.panasonic.com](http://www.panasonic.com)  
Booth: C904**

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## LENSES

### Thales Angenieux studio and remote/sports lenses

New line of six studio and sports lenses includes a new 70x HD lens with a focal range of 9.5mm to 665mm (22mm to 1330mm with a 2x extender); lenses feature Advanced Display System (ADS) allowing users to easily monitor lens settings and adjust digital functions including an anti-breathing, f-stop and focus/zoom sensitivity; ADS indicates focal length, aperture, focus distance and depth of field.

**973-812-4326; [www.angenieux.com](http://www.angenieux.com)  
Booth: C2425**



## LENSES

### Canon Digi HJ21x7.8B IRSD/IASD (shown above), HJ21x7.5B IRSD/IASD, and HJ11x4.7B IRSD/IASD

Lenses provide portable ENG/EFP production in HD or SD; features DigitalDrive.

**516-328-5000; [www.canonbroadcast.com](http://www.canonbroadcast.com)  
Booth: C2040**



## DIGITAL CAMERA

### Ikegami HL-60W

ENG/EFP camera for SDTV; features 38-bit internal processing, 65dB signal-to-noise ratio and 750 TVL resolution, sensitivity of F11, low vertical smear of -135dB, and 10W power consumption; available with either component triax or two-channel triax configurations.

**201-368-9171; [www.ikegami.com](http://www.ikegami.com)  
Booth: C2638**



## DUTCH HEAD

### OConnor Engineering 2575Z

Weighs 20 pounds; can counterbalance an 87-pound camera with an 8-inch center of gravity through a full +/-90-degree movement in the Z axis; cameras up to 150 pounds can be counterbalanced provided they have a lower center of gravity.

**714-979-3993; [www.ocon.com](http://www.ocon.com)  
Booth: C2223**



## Multi-Channel Video Server

- Provides up to 4 video channels
- Link servers for additional video channels
- Compatible with popular automation systems
- External RAID-5 option provides over 200 hours of storage
- Affordable & Reliable. Base system starts at under \$14,000



▶ See our Video Servers - DDRs - Broadcast Delay Servers - MPEG2 HD Servers  
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## THREE-CMOS HIGH-DEFINITION CAMERA

### JVC Professional HD-CMOS

Uses the next generation of Rockwell CMOS chips to deliver 1080i high-definition performance; features a compact size and remote control capability; ideal for studio situations or field broadcasting where unmanned cameras play a critical role.

973-317-5000; [www.jvc.com/pro](http://www.jvc.com/pro)  
Booth: C2050



## HIGH-DEFINITION ENG LENS

### Fujinon HA13x4.5BERM/BERD

2/3-inch format wide-angle lens; features an angle of 4.5mm with a 93.6-degree horizontal field of view; the BERM version has a 2x extender and manual focus servo zoom; the BERD version features a 2x extender, servo focus and servo zoom.

973-633-5600; [www.fujinon.com](http://www.fujinon.com)  
Booth: SU4710

## CINE-STYLE ZOOM LENS

### Fujinon HA13x4.5B

Features a 4.5mm focal length at its widest end; provides a 93.6-degree horizontal field of view and focus rotation up to 280 degrees for easier and more exact focusing, with little focus breathing.

973-633-5600; [www.fujinon.com](http://www.fujinon.com)  
Booth: SU4710

## CGs, prompters, captioning, logo inserters

## GENERATORS AND LOGO INSERTERS

### Leitch LogoMotion II

Next generation of LogoMotion products available in analog, SD and HD formats; can insert up to four logos at once; layers may be static logos, animated logos, digital clock, analog clock or an external key/fill source; layers may be any size and positioned anywhere on the screen, and up to 999 logos can be instantly accessible online; other features include four-channel AES capability, support of multiple graphics formats, Ethernet network connectivity for logo interchange and full CCS compatibility; card-based product using the NEO Platform.

757-548-2300; [www.leitch.com](http://www.leitch.com)  
Booth: SU4525

## SUBTITLING/CAPTIONING SYSTEM

### SysMedia WinCaps software

Has multi-language capabilities; offers a time-saving automatic DVD output and support for the latest nonlinear browse video formats; features speech recognition tools, automatic newsroom system interfaces, text/subtitle conversion and on-air timing rules.

+44 1293 814 200; [www.sysmedia.com](http://www.sysmedia.com)  
Booth: SU6660



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## PROMPTING SOFTWARE

### BDL-Autoscript WinPlus

New version can operate as a stand-alone system or can be networked to a range of automated newsroom systems, including ENPS, NewStar, Dalet/A.N.N. Open Media, Avid iNews and AP Newscentre; able to operate in any language supported by Windows and Unicode; prompter text can be output as data for closed captioning; new PCI PromptCard has full NTSC or PAL color capability.

+44 207 538 1427; [www.bdlautoscript.com](http://www.bdlautoscript.com)

Booth: C4476

## CHARACTER GENERATOR

### Pinnacle FXDeko II

New features include integration with MOS and NRCS, clip sizing and DV file import, and improved automation and template focus.

650-526-1600; [www.pinnaclesys.com](http://www.pinnaclesys.com)

Booth: SU5003

## STUDIO PROMPTER

### Listec Video ST-2020 SpectraLite

Lightweight composite flat-panel studio prompter features a wide-angle mirror/hood assembly and can be configured to support portable style or full-size studio cameras; complementary 15-inch or 20-inch below-prompter video return assembly.

561-683-3002; [www.listec.com](http://www.listec.com)

Booth: C2350

## CHARACTER GENERATOR AND GRAPHICS SYSTEM

### Broadcast Software Solutions CGXPress+

Allows the creation of time and temperature graphics, EAS, logos and continuous crawls; features an XPress automation interface so station automation system can control the CGXPress; provides support for 16 Digital pcCodi GPIs; all GPIs are user-assignable; provides support for the new EAS codes; iTEMP! feature allows station to get official NWS temperature data.

800-273-4033; [www.broadcastsoftware.tv](http://www.broadcastsoftware.tv)

Booth: C651



**Cables Bite.**

**See us Live at NAB!  
Booth C138**

## CARRY-CODER Field Proven!



At the Grand Opening of *The Big Dig* in Boston, only one station got a live shot from deep inside the tunnel! Only the CARRY-CODER could make it happen!

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Web: [www.bms-inc.com](http://www.bms-inc.com)





## CHARACTER GENERATOR

### Pinnacle Deko1000

Single-channel CG suited for local broadcasters or larger facilities needing additional Deko seats; delivers layer-based motion controls; supports options including the ClipDeko internal clip player and the new DekoObjex option; features intelligent capabilities such as shrink-to-fit and design features like fonts and details.

**650-526-1600; [www.pinnaclesys.com](http://www.pinnaclesys.com)**  
**Booth: SU5003**

## CHARACTER GENERATOR

### Pixel Power Clarity2

New enhanced I/O capability for dual-channel Clarity2 includes eight audio channels, full support for embedded and AES/EBU audio, relay bypass for the dual downstream keyers on video and key, and dual SDI preview outputs with keys.

**954-943-2026; [www.pixelpower.com](http://www.pixelpower.com)**  
**Booth: SU5359**

## VIDEO TIME/DATE INSERTER

### ESE ES-206U

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.

**310-322-2136; [www.esweb.com](http://www.esweb.com)**  
**Booth: SU5623**

## Editing systems

### SERVER PLUG-IN

#### Pinnacle Vortex LN

Includes two I/O stations and two SuiteEdit edit stations offering tape-to-timeline live editing, RT simple effects, and metadata logging and search; provides 80 hours of RAID-protected storage; options include Liquid craft editing, MOS, browsing and playout GUI.

**650-526-1600; [www.pinnaclesys.com](http://www.pinnaclesys.com)**  
**Booth: SU5003**

## EDITING SYSTEM

### Avid NewsCutter Effects

Supports DV25, DV50 and D10 MPEG formats; can interface with both SDI and SDTI protocols; integrates with linear acquisition systems such as Betacam, Betacam SP, Betacam SX, DVCPRO or S-VHS; fits into any existing linear or nonlinear news production environment when connected to Avid Unity for News.

**978-640-6789; [www.avid.com](http://www.avid.com)**  
**Booths: RT606, SL300**

## NLE SOFTWARE

### Canopus Edius NLE

Software for use with DVREx RT Professional and DVStorm2 editing solutions; offers multitrack editing, transition support and voice-over recording; features three- and four-point editing, real-time output and comprehensive clip management.

**408-954-4500; [www.canopus.com](http://www.canopus.com)**  
**Booth: SL121**



## EDITING CONTROLLER

### BUF Technology VTC-400

New firmware for the multi-VTR editing controller features arming of eight audio tracks for insert edits; new auto switch mode grabs control of six VTRs for jog/shuttle, then automatically switches control back to another external controller; new GPI backspace editing feature allows backspace editing on up to 10 VTRs via GPI contact closures during hands-on control of others.

**858-451-1350; [www.buftek.com](http://www.buftek.com)**  
**Booth: SU301**

*Color indicates advertiser*





## FINISHING SOFTWARE

### Media 100 844/X version 2 finishing release

Expands 844/X on many fronts with new tool sets for color correction, unlimited-layer compositing, editing and audio; features a newly engineered color correction tool set that delivers high precision and real-time speed, enabling users to view and interactively adjust and match the color values of clips instantly and accurately; GenesisEngine color correction employs 10-bit quantization throughout and computational precision up to 31 bits while processing in real time up to four uncompressed video streams simultaneously.

800-773-1770; [www.media100.com](http://www.media100.com)

Booth: SL2856

## EDITING WORKSTATION

### Canopus CWS-30

Professional mobile editing solution designed for remote location production; provides three streams of real-time DV output and the Rextor NLE.

408-954-4500; [www.canopus.com](http://www.canopus.com)

Booth: SL121

## NETWORKED EDITING SYSTEM

### Pinnacle Thunder-Liquid purple

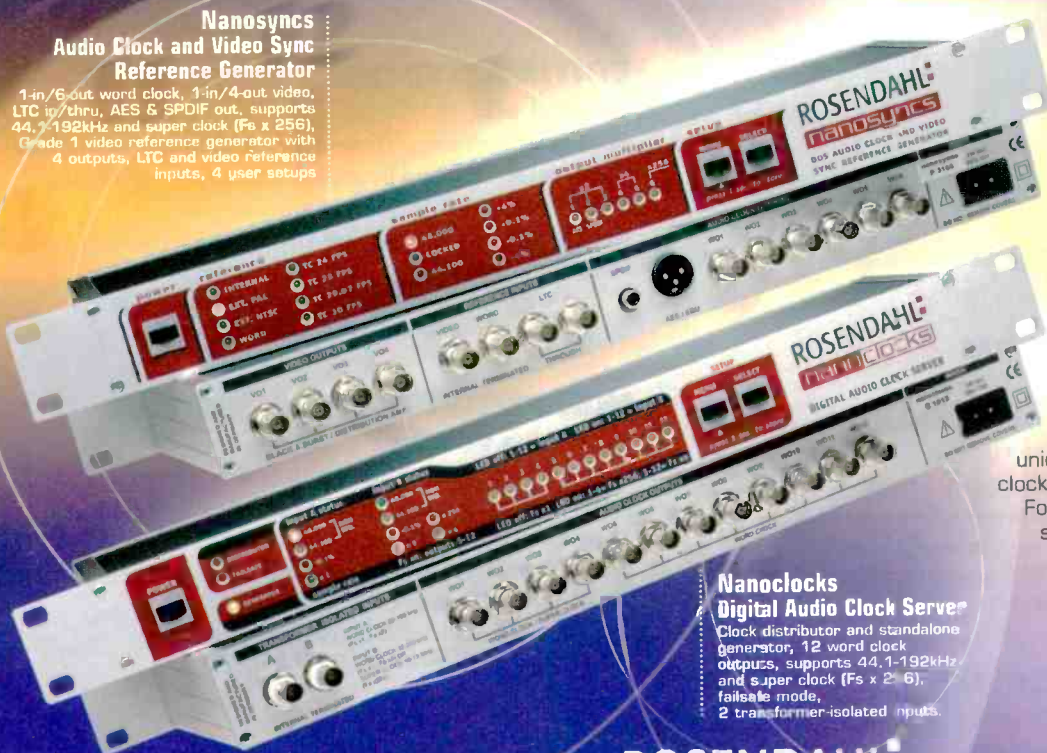
Networked solution for editing, composing, finishing and playing on-air in DV25 mode; several Liquid purple editing solutions are integrated with a Thunder server to provide access to clips and stills online for the production of promos, news, live sports coverage and graphics.

650-526-1600; [www.pinnaclesys.com](http://www.pinnaclesys.com)

Booth: SU5003

### Nanosyncs Audio Clock and Video Sync Reference Generator

1-in/6-out word clock, 1-in/4-out video, LTC in/thru, AES & SPDIF out, supports 44.1-192kHz and super clock (Fs x 256), Grade 1 video reference generator with 4 outputs, LTC and video Reference inputs, 4 user setups



### Nanoclocks Digital Audio Clock Server

Clock distributor and standalone generator, 12 word clock outputs, supports 44.1-192kHz and super clock (Fs x 256), failsafe mode, 2 transformer-isolated inputs.

Precision engineered in Germany, Rosendahl audio and video sync generators and distributors deliver ultra-low clock jitter synchronization at refreshingly affordable prices. In the broadcast and post production studio, the new V3 Nanosyncs combines comprehensive audio clock and video sync capabilities, while support for 192kHz and super clock makes the new Nanoclocks unique amongst digital audio clock distributors/generators. For full details of Rosendahl sync products, contact an HHB dealer or visit the HHB web site.



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[www.hhbusa.com](http://www.hhbusa.com)

[www.nanosyncs.com](http://www.nanosyncs.com)  
[www.nanoclocks.com](http://www.nanoclocks.com)

# ROSENDAHL

Precision synchronization for broadcast and post

## **NLE**

### **EVS CleanEdit**

Editing solution for news and sports production; both Gigabit-based online systems and 100baseT "browse-editing" configurations are available; users can edit using drag-and-drop functions, or record voice-overs at desktop workstations; provides local preview.

**973-575-7811; [www.evs.tv](http://www.evs.tv)  
Booth: C736**



## **EDITING ROUTER**

### **Laird Telemedia LTM-ER2**

Enhancements include improved bandwidth, built-in VTR dubbing and a completely modular design; provides TV studios and post facilities with a solution for switching multiple source devices into NLE systems; offers editors an alternative to patchbays or multiformat routers.

**845-339-9555; [www.lairdtelemedia.com](http://www.lairdtelemedia.com)  
Booth: SL113**



## **MEDIA PLATFORM**

### **Quantel iQ**

Capable of real-time 2K performance; delivers open-standard platform and performance of dedicated hardware; allows iQ systems to share and integrate workflow with other systems; allows future hardware development without rewriting existing applications.

**203-972-3199; [www.quantel.com](http://www.quantel.com)  
Booth: C2612**

## **NONLINEAR EDITOR**

### **OmniBus Systems HeadLine Media Editor Series**

Intuitive user interface allows operators to cut packages quickly and easily; voice-over and audio level control options are available.

**+44 8705 004300; [www.omnibus.tv](http://www.omnibus.tv)  
Booth: C2670**

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## **LAPTOP EDITOR**

### **Editware Fastrack**

Graphic user interface and control allows nonlinear editing with as few as one server channel, up to 80 channels from multiple servers and VTRs; includes applications for sports highlighting, simultaneous acquisition, playout for news and sports, creation of sub-clips and sequences for automation systems, multi-screen multimedia presentations, and reformatting of syndicated shows.

**530-477-4300; [www.editware.com](http://www.editware.com)  
Booth: SU7053**



## **EDITING SYSTEM**

### **Quantel eQ**

Resolution Coexistence allows material of any resolution, color space and bit depth to be loaded without the need to restart or partition the disk; timeline interface provides easy access to editing tools; comes with RAID disk protection; supports 16-bit processing with Quantel's Dynamic Rounding.

**203-972-3199; [www.quantel.com](http://www.quantel.com)  
Booth: C2612**

## **NONLINEAR EDITING SYSTEM**

### **Leitch dps VelocityQ**

Features include real-time, full-quality playback of four video streams, six graphics streams and four channels of real-time 3-D DVE; highlights include a new interface style, over 100 editing refinements and enhanced integration with Leitch VR servers.

**757-548-2300; [www.leitch.com](http://www.leitch.com)  
Booth: SU4525**

## VIDEO EDITOR

### Matrox RT.X100

"The Power of X" architecture leverages the scalable power of the CPU for real-time video editing; features real-time DV and MPEG-2 output, three-way color correction, chroma keying, and motion control, and an array of Matrox Flex 3D-powered real-time effects.

**514-822-6000; [www.matrox.com](http://www.matrox.com)**

**Booth: SL631**

## EDITING SYSTEM

### Panasonic AJ-DE10

An IEEE 1394-equipped laptop computer-based news editing system; consists of a specially configured Panasonic TOUGHBOOK laptop computer with news editing software developed from the newsBYTE news NLE system; news-oriented software includes an easy-to-use "direct command" GUI, Edit Decision List (EDL) and title generator; system options include external jog pad and audio fader modules connected via USB interface to the TOUGHBOOK.

**201-392-4127; [www.panasonic.com](http://www.panasonic.com)**

**Booth: C904**

## Graphics, virtual sets, film systems

## CHARACTER ANIMATION SOFTWARE

### Discreet character studio 4

Advancements include dynamics-based mixing, which provides propagation of dynamic balancing from the upper body to the lower body; constraint-based mixdowns, which allow animators to mix down nonlinear sequences into a single clip while satisfying feet IK and knee-joint motion constraints; and Quaternion function curves, which give users a more exact method of fluidly controlling character joint rotation.

**514-393-1616; [www.discreet.com](http://www.discreet.com)**

**Booth: SL1500**

Considering everything you've seen.  
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In 1920, Englishman John Baird and American Clarence Hansell patented the idea of using glass rods and fibers to transmit images for television at the speed of light. Little did they know that over 80 years later their collective idea would carry more than 60 percent of today's broadcast transmissions worldwide over fiber. Today, Fiber Options is helping to make that a reality. So with crystal clear transmissions, you can see what we are talking about . . . even at 186,000 mph.

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# DTV marketplace

## GRAPHICS SYSTEM

vizrt | conductor

Allows multiple clients to render graphics on a shared cluster of viz | engine servers; viz | engine servers in the cluster can be dynamically configured from a remote graphical interface; monitor the progress of the render jobs in the queue.

646-746-0010; [www.vizrt.com](http://www.vizrt.com)  
Booth: SU5712

## GRAPHICS DESIGN INTERFACE

vizrt iz | artist 3.0

Features an extended Plug-in API, scripting language support, an advanced animation editor, font style editor and extended remote control capabilities; graphic files may be transferred to any platform for modeling and or playback display of video.

646-746-0010; [www.vizrt.com](http://www.vizrt.com)  
Booth: SU5712

## GRAPHICS AUTOMATION SYSTEM

VertigoXmedia Product X

Build professional on-air graphics, link on-air elements to live data sources and create fully customized operator control screens, in one step; features a gallery of professional broadcast elements; supports CG platforms; generates broadcast graphics for multiple devices automatically; integrates with multiple simultaneous live data sources, including data feeds, network databases and Internet Web pages.

514-397-0955; [www.vertigoxmedia.com](http://www.vertigoxmedia.com)  
Booth: SL2121

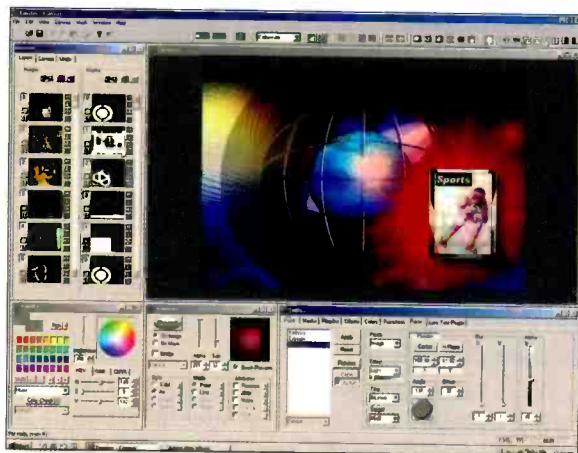


## RESTORATION SYSTEM

Snell & Wilcox Archangel Ph.C

Provides real-time restoration of a variety of film and video impairments, including providing noise reduction in areas of high movement; uses Ph.C Phase Correlation motion estimation technology; other features include a customized tool set for archive retrieval, including motion-compensated recursive and transversal filtering to reduced broadband noise and film grain.

408-260-1000; [www.snellwilcox.com](http://www.snellwilcox.com)  
Booth: C2860



## BROADCAST PAINTER

Video Design Software Twister Paint Station

Features R/W Photoshop layers; available in either a rack-mount or tower configuration; has direct connection/file support for devices such as Chyron, Aprisa, Pinnacle, Avid and Quantel.

631-249-4399; [www.videodesignsoftware.com](http://www.videodesignsoftware.com)  
Booth: C2074



## GRAPHICS SYSTEM

Chyron MicroScribe

Single-channel system uses Lyric software to deliver graphics as a fully integrated Digital pcCODI in a 1RU chassis; provides the ability to create and playback 2-D and 3-D graphics; can be configured to run as a stand-alone, rack-mounted, automated NewsCrawl station.

631-845-2000; [www.chyron.com](http://www.chyron.com)  
Booth: C2074

## SOFTWARE

Proximity Group Xenostore

Based on technology for managing broadcast graphics; enables the tracking of graphical assets within and between each television and cable franchise and for the retrieval and format conversion of these assets by any authorized user.

646-452-5820; [www.proximitygroup.com](http://www.proximitygroup.com)  
Booth: SU5639

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## VIRTUAL STUDIO SYSTEM

### FOR-A digiWarp-EX II

New version of the digiWarp; enhanced feature set includes expanded masking and chroma key capabilities; operates with a VPS-400D digital switcher; features a software-based image processor, a controller with software and a camera tracking or sensor system.

**352-371-1505; [www.for-a.com](http://www.for-a.com)**

**Booth: C2938**

## MATTE EXTRACTION TOOLS

### Ultimatte AdvantEdge

Includes Ultimatte's Video Correction filter; features separate shadow mattes, smart matte sizing and roto-screen correction; create and edit blue screen composites by simply scrubbing the cursor within different areas of the foreground, background and matte; automatically calculates optimum settings for several different parameters simultaneously.

**818-993-8007; [www.ultimatte.com](http://www.ultimatte.com)**

**Booth: C3131**

## GRAPHICS PROCESSOR

### Panasonic AV-CGP500

Multi-application, multi-format real-time graphics processor; offers real-time rendering of broadcast quality graphics, including widely-implemented HD formats (1080i, 720p/60 and 1080/24p), as well as SD video (480i); PC-based system with a two RU size external graphics unit; designed for on-air sports/live graphics and virtual set applications; anti-aliasing generates images using 16 sub-pixels, with no performance degradation; defocus image generation, bump mapping, cube environment mapping and soft shadow all contribute to the realization of rich CG rendering in real time.

**201-392-4127; [www.panasonic.com](http://www.panasonic.com)**

**Booth: C904**

## VISUALIZATION GRAPHICS SYSTEM

### SGL Infinite Reality4

Can display more than eight million pixels of visual information; has 1GB of texture memory; will deliver a high level of photo-realistic virtual sets; increases multi-layer high resolution interactivity to inferno5 and fire.

**949-224-4566; [www.sgi.com](http://www.sgi.com)**

**Booth: SL3868**

## SOFTWARE

### REALVIZ ImageModeler 3.5

Work with Windows XP/2000; ImageModeler 3.5 extracts 3D information from photographs and helps users measure and recreate accurate 3D models; ability to make point-to-point measurements and create texture per object.

**415-615-9800; [www.realviz.com](http://www.realviz.com)**

**Booth: SU5313B**

**See us at NAB Booth# C3846**

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**[www.zandar.com](http://www.zandar.com)**



## VIRTUAL SET SYSTEM

### Orad Hi-Tec Systems CyberSet Lite

Stand-alone virtual set system; powered by Orad's DVG, a graphical computer comprising a built-in chromakeyer, clean cut switcher, two full resolution video inputs and foreground video delay; requires no calibration or additional hardware.

212-931-6723; [www.orad.co.il](http://www.orad.co.il)  
Booth: SL2114

## VISUAL EFFECTS SYSTEM

### Discreet flame 8

Offers keying, tracking and color correction tools and a sophisticated 3-D compositing environment; Colour Warper feature allows accurate color isolation and manipulation.

514-393-1616; [www.discreet.com](http://www.discreet.com)  
Booth: SL1500



## REAL-TIME, 3-D PRODUCTION SYSTEM

### Kaydara KAYDARA ONLINE

Includes everything needed to produce broadcast-quality graphics, including 3-D overlays, animations for game show scoreboards, info graphics for sporting or news events, and animated talking heads; can be used for ITU-R-601 or HDTV-resolution production.

888-842-6842; [www.kaydara.com](http://www.kaydara.com)  
Booth: SU5281

## TELESTRATOR

### E-Mediavision.com POINT

Allows presenters to draw, point, annotate or place custom graphics over moving or still video by using a touch screen and finger stylus; upgrade provides animation of graphics and a new set of effects, such as pixel spray paint.

+44 2087552014; [www.e-mediavision.com](http://www.e-mediavision.com)  
Booth: C4301

## 3-D TEXT, EFFECTS AND MULTI-LAYER COMPOSITING OPTION

### Inscriber TitleMotion Pro for dpsVelocity

Option for Inscriber's TitleMotion graphics and titling plugin; provides access to animated textures over time, animated kerning over time and the ability to apply 3-D effects to text and graphics over time; ships with more than 175 3-D text styles and includes more than 100 new titling templates.

519-570-9111; [www.inscriber.com](http://www.inscriber.com)  
Booth: SL1715

## Intercoms

### WIRELESS INTERCOM

#### Systems Wireless HME PRO850

Features two-channel wireless intercom operation between 470MHz and 740MHz; automatically selects frequencies or can be programmed by a front panel LCD on the base station or an attached PC; remotes support independent communications for two channels with individual listen adjusts; supports simultaneous 2-wire and 4-wire interfacing.

800-542-3332; [www.swl.com](http://www.swl.com)  
Booth: C2535

### DIGITAL MATRIX INTERCOM SYSTEM

#### Systems Wireless Drake Series 4000 II

The 4222RBL LCD display station provides users with up to a 10-character label on each of its 24 keys; the Supervisor Software can monitor and control any other LCD panel in a system; interface up to 48 telco lines without using a single port in the frame; supports up to 256 ports in a single frame.

800-542-3332; [www.swl.com](http://www.swl.com)  
Booth: C2535

### INTEGRATED WIRELESS INTERCOM

#### Drake Electronics FreeSpeak

Provides users with digital audio-quality sound; offers all the functions found on a traditional desk-mounted intercom; allows users greater mobility and freedom of movement through wireless connectivity.

+44 1727871214; [www.drake-uk.com](http://www.drake-uk.com)  
Booth: C386

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## WIRELESS BELTPACK

### Telex TR-825

Has a "Dual Listen" operation; includes dual volume controls, one for each intercom channel; allows for individual control; can be used in either stereo or mono mode; is available in A4M/A5M and A4F/A5F headset configurations.

800-392-3497; [www.telex.com](http://www.telex.com)

Booth: C3711

## Lighting, camera lights



## LIGHT

### ARRI Sky Panel

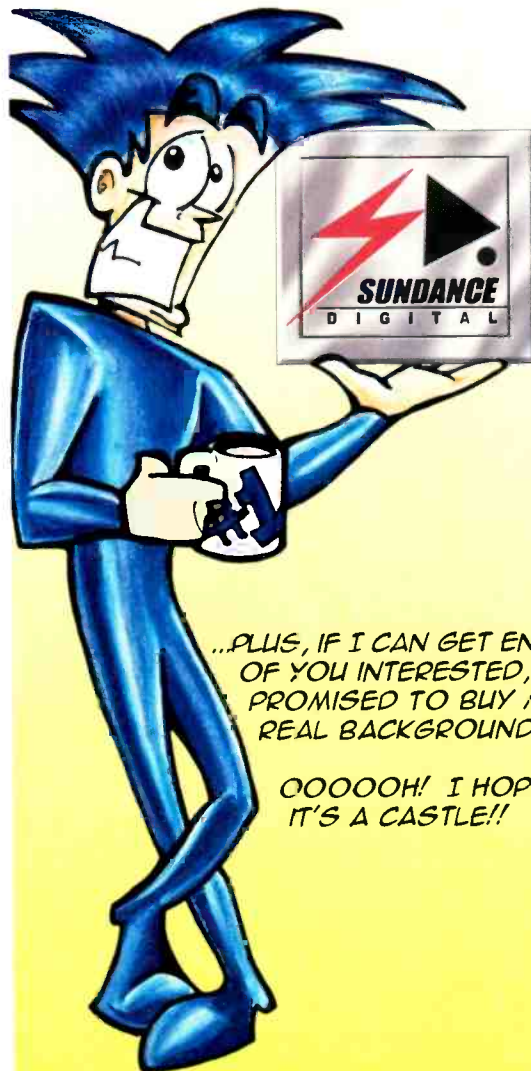
Light source is based on OSRAM's flat Planon source; optimized to match true daylight on film without using mercury; no color correction is required; modules are approximately 17 inches by 14 inches — but only two inches deep; intelligent docking system allows quick setup in multiple configurations.

845-353-1400; [www.arri.com](http://www.arri.com)

Booth: C3862



HI, I'M CONTROL PHREAK, SUNDANCE DIGITAL'S SPOKES-TOON, ASKING YOU TO CHECK OUT OUR BROADCAST AUTOMATION PRODUCTS. THEY'RE REALLY GOOD!



...PLUS, IF I CAN GET ENOUGH OF YOU INTERESTED, THEY PROMISED TO BUY ME A REAL BACKGROUND!

OOOOOH! I HOPE IT'S A CASTLE!!

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## BROADCAST AUTOMATION SOLUTIONS

Sundance Digital's automation products are designed to streamline workflow. Our products cover all areas of station automation, including:

- ✓ Digital Asset Management ↩ **NEW!**
- ✓ Satellite Recording ✓ Spot Insertion
- ✓ Master Control Automation
- ✓ Large, Multi-channel Operations
- ✓ Digital Newsroom Integration
- ✓ Archive Management

[www.SundanceDigital.com](http://www.SundanceDigital.com)

**NAB '03 SU5337 South Hall**

# DTV marketplace

## ON-CAMERA LIGHTING

### Frezzi Energy Systems

Micro-fill dimmer controlled on-camera lighting; designed for use with mini-DV cameras used for news and field operations.

**973-427-1160; [www.frezzi.com](http://www.frezzi.com)**

**Booth: SU5419**



## FILL LIGHT

### PAG USA Paglight M

Ultra-compact 12V fill light designed for use with smaller digital camcorders; hot-shoe type power base that allows the light to be quickly connected to the camera mounting; has thermo-plastic housing and a patented heat-dissipation system that ensures they are cool-running; focusable beam angle and an even spectral distribution.

**818-760-8290; [www.pagusa.com](http://www.pagusa.com)**

**Booth: C2376B**

## MINIATURE LIGHT

### PAG USA Paglight C6

6V miniature light supplied as part of an all-inclusive lighting kit, including a multi-function AC charger and a 6V 7Ah Ni-Cd battery that provides two-and-a-quarter hours run-time; has thermo-plastic housing and a patented heat-dissipation system that ensures they are cool-running; has a focusable beam angle and an even spectral distribution.

**818-760-8290; [www.pagusa.com](http://www.pagusa.com)**

**Booth: C2376B**

## LIGHTING SYSTEM

### Kino Flo Flathead 80

Lamps are operated in half f-stop increments by a pair of high output, flicker-free select 4Bank ballasts; a removable center mount allows the fixture to be mounted directly to set walls or ceilings.

**818-767-6528; [www.kinoflo.com](http://www.kinoflo.com)**

**Booth: C4258**

## Microwave, ENG, fiber optic, signal transport systems



## FLYAWAY SYSTEMS

### Microwave Radio Communications Vislink Advent Mantis

Intended for any application in which a satellite earth station needs to be quickly deployed for transmission of digital or analog traffic; any digital transmission standard can be provided as well as digital broadcasting standards such as MPEG-2 DVB.

**978-671-5700; [www.mrcbroadcast.com](http://www.mrcbroadcast.com)**

**Booth: C704**

## AUDIO, VIDEO AND DATA TRANSPORT

### Harris NetVX

One-box solution used to transport audio, video and data; supports IP routing, ATM switching, E-3 and DS-3 microwave transport and more, simultaneously.

**513-459-3400; [www.harris.com](http://www.harris.com)**

**Booth: C404**

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# Analog television may disappear someday...



## in the meantime you've got to keep it working.

**We're looking at the digital future without losing sight of the analog PRESENT.**

Our innovative engineers are working on leading edge products for the digital age. But having introduced the very first BTSC stereo TV generator in 1985—the one that is recognized today as the best in the industry—we are firmly committed to supporting all of our analog TV products with factory service at a fair price, spare parts, and first class customer support. And we will, of course, continue to manufacture and supply analog products for as long as the need exists.

With the emergence of DTV, you can count on Modulation Sciences to offer products that will help you profit from it. But unlike other stereo TV suppliers, until the last NTSC station signs off, you can count on us to support our installed analog equipment. And that's not just a promise. **It's a guarantee.**

Modulation Sciences has been under the same private ownership for more than twenty years and we have the long-term technical and financial stability to back up our guarantees.

We'll be with you when the last analog station signs off.

**Call Modulation Sciences, your sound authority**

**See us at NAB Booth # C125**



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# DTV marketplace

## FIBER-OPTIC CONNECTORS

### Lemo USA

Features include security of the push-pull latching system, singlemode and multimode fibers, two parts plug and socket connection system, protection against damage to the fiber end face, wide range of models and hybrid configurations.

707-578-8811; [www.LemoUSA.com](http://www.LemoUSA.com)  
Booth: C2433

## VIDEO TRANSPORT MODULE

### Miranda Technologies DV-45

Provides MPEG-2 4:2:2 encode and decode and is 100 percent plug-compatible with existing Nortel DV-45 Shelves; cost-effective way to upgrade video transport networks to 601/SDI and improve bandwidth utilization without replacing the entire network infrastructure.

514-333-1772; [www.miranda.com](http://www.miranda.com)  
Booth: C2826



## RAISED ROOF BROADCAST VAN

### Frontline Communications ENG-350 HT

Features include a modular rack design with 19-inch wide rack units and a centrally ducted air conditioning system; can be configured for ENG, DSNG or as a combination ENG/DSNG.

727-573-0400; [www.frontlinecomm.com](http://www.frontlinecomm.com)  
Booth C4012

## FIBER OPTIC TRANSPORT SYSTEM

### Multidyne RGB-2000

Provides a long-haul transport system for high-resolution RGB or VGA video sources via fiber optic cable; provides a total analog bandwidth of up to 500 MHz; supports loop-through BNC coaxial inputs as well as HD15 XVGA input.

800-4TV-TEST; [www.multidyne.com](http://www.multidyne.com)  
Booth: C276



## ENCODER/MODULATOR

### Scopus Network Technologies CODICO E-1710

Integrated 1U DSNG/DENG encoder for mobile contribution newsgathering applications; includes within a compact 1U unit an advanced professional broadcast-quality encoder and a software-modifiable QPSK, 8PSK, 16QAM and a COFDM modulator; requires low power consumption and affords optimal utilization of limited rack space.

609-987-8092; [www.scopus.net](http://www.scopus.net)  
Booth: SU6411

## ATM SERVICE

### BT Broadcast BT MediaNet

ATM service for broadcasters and media companies; lets users create a single network to carry all broadcast content and related material (MPEG compressed video and data, etc.), as well as linking all their company sites together; BT MediaNet local access circuits are connected to the BT network at core network access points (CNAPs); creating permanent virtual circuits (PVCs) running over the local access and core network circuits enables users to create a network with multi-site connectivity.

202-721-8880; [www.broadcast.bt.com](http://www.broadcast.bt.com)  
Booth: N1038



Color indicates advertiser

## DIGITAL VIDEO SYSTEM

### Opticomm DVX-104

Uncompressed 1-bit serial digital video system at 270Mb/s data rate is free of adjustment over a wide dynamic range, and 24 bits per channel at 18.432Mb/s digital, four audio AES/EBU; all signals are multiplexed into one SDI stream transmission.

**858-450-0143; [www.opticomm.com](http://www.opticomm.com)**

**Booth: SU6349**

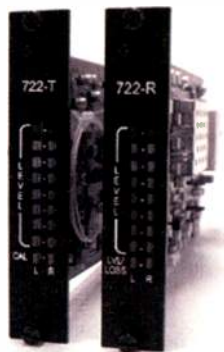
## MODEM

### Nucomm MM200

Solution for both new and retrofit microwave link installations; maximum flexibility is achieved by an internal data multiplexer that combines up to four user selectable data paths into a single data stream; provides the ability to send multiple digital signals over a single RF microwave channel; interface for each includes OC3 Optical, DS3, E3, STS-1, STM-1, SMPTE, DVB, ASI, Parallel, Overhead and T1/E1; the IF can be field-configured with one to four channels providing total flexibility.

**908-852-3700; [www.nucomm.com](http://www.nucomm.com)**

**Booth: C104**



## TWO-CHANNEL AUDIO FIBER LINK

### GE Interlogix B722A

Offers 24-bit processing combined with 48kHz sampling; features a built-in test tone generator function and the ability to measure the actual optical loss in the fiber run by switching the receiver audio level display into an optical power meter.

**631-567-8320; [www.fiber@ge-interlogix.com](mailto:www.fiber@ge-interlogix.com)**

**Booth: SU6501**

## ENG ANTENNA SYSTEM

### Nucomm Sky Master II

A 2GHz band, all-solid state, airborne antenna for digital and analog video downlink applications; electronically steerable pod antenna system with an integral GPS receiver that provides fully automated steering in airborne applications including broadcast ENG, law enforcement and military applications; electronic steering feature eliminates moving parts, which can be a source of failure, and replaces them with time-tested electronic steering technology, similar to that used in today's radar antennas.

**908-852-3700; [www.nucomm.com](http://www.nucomm.com)**

**Booth: C104**



## FIBER-OPTIC LINK

### Communications Specialties Pure Digital Fiberlink Flex system

Supports a range of signal combinations; offers the capability to transmit one channel of video in one or two directions or four independent audio channels — four in one direction or two in each direction; available in one- and two-fiber versions for use with either single-mode or multimode fiber; system operates at wavelengths of 850, 1310 or 1550nm; video channel features 8MHz bandwidth and is compatible with NTSC, PAL and SECAM video standards; audio channels are user-configurable to have either balanced or unbalanced I/O.

**631-273-0404; [www.commspecial.com](http://www.commspecial.com)**

**Booth: SL3539**

## BI-DIRECTIONAL VIDEO AND DATA LINK

### Telecast Fiber Systems HD/POV

Available as either a rack-mounted or "throw-down" module that transports broadcast-quality HD/SDI video from a remote POV camera; has a simultaneous NTSC/PAL video; return video/genlock/tri-level sync back to the camera; tally/closure signals and two full duplex control data signals for both camera and PTZ platforms.

**508-754-4858; [www.telecast-fiber.com](http://www.telecast-fiber.com)**

**Booth: SU4688**

**Color indicates advertiser**

# DTV marketplace

## ADAPTER

### Telecast Fiber Systems SMPTE Hybrid Elimination Device

Supports all bi-directional camera signals on standard single-mode fiber cables; cameras can communicate over common single mode fiber; consists of two adapters, which convert from hybrid wire/fiber connectors to standard all-fiber connectors.

508-754-4858; [www.telecast-fiber.com](http://www.telecast-fiber.com)

Booth: SU4688

## DSNG SOLUTION

### TANDBERG Television with Raytheon and Vocality International Newsgathering

A fully integrated 2U digital flyaway; is capable of bi-directional transmission of audio, video and data feed from a remote transmission site; provides two-way phone, data and IP communications between the satellite downlink and remote transmit site; features L-Band diversity reception and HD DSNG.

407-380-7055; [www.tandbergtv.com](http://www.tandbergtv.com)

Booth: C3711

## MICROWAVE AMPLIFIER

### L-3 Communications Electron Devices Microwave Power Module (MPM)

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.

570-326-3561; [www.L-3com.com](http://www.L-3com.com)

Booth: C344

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## Production/MC: switchers, effects, keyers, still-store

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## MASTER CONTROL SYSTEM

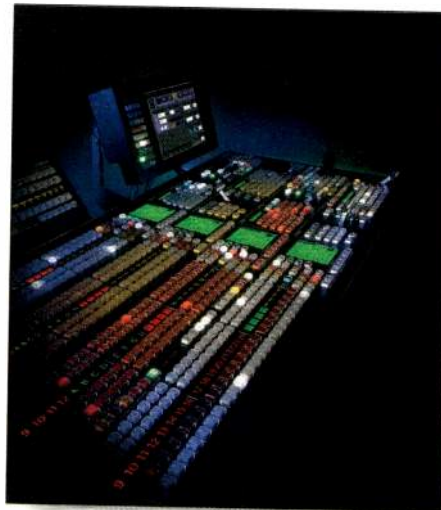
### Pinnacle DekoCast

System integrates a real-time character generator, multiple-channel video and audio clip player, 24-track audio mixer and router, multichannel DVE, and an advanced compositing engine within a unified hardware platform; new features include an authoring station, tools to integrate DekoCast with traffic systems and a scheduler; system can be controlled by a single operator or automated through an automation control system or any device supporting a GPI interface.

650-526-1600; [www.pinnaclesys.com](http://www.pinnaclesys.com)

Booth: SU5003

Color indicates advertiser



## HD SWITCHER

### Thomson Grass Valley Kalypso HD

Provides native support for 1080i and 720p production; offers the same user interface, feature set and effects-generation capability as the SD Kalypso system; designed to support seamless native switching between SD and HD formats from the same frame.

530-478-3000; [www.thomsongrassvalley.com](http://www.thomsongrassvalley.com)

Booth: SU7059



## SLOW-MOTION CONTROLLER

### BUF Technology VTS-5000

New "sport" option adds fast playlist and lopping to the VTS-5000; full-time record support feature allows users to mark cue points during live events and immediate playback while recording.

858-451-1350; [www.buftek.com](http://www.buftek.com)

Booth: SU301



## DIGITAL PRODUCTION SWITCHER UPGRADE

### Ross Video Squeeze & Tease 3-D DVE and Ultimatte Insider

Two new additions to the Synergy 100; Squeeze & Tease 3-D option provides two channels of 3-D DVE; enables transitions, over-the-shoulder boxes and the ability to fly and transition any type of key; program effects using the memory area and recall effects either as snapshots or using effects dissolves; the Ultimatte Insider provides advanced keying in critical operations.

**613-652-4886; [www.rossvideo.com](http://www.rossvideo.com)  
Booth: SU5225**



## SWITCHER

### Snell & Wilcox HD3060

Features 12 keys, three available on MEs 1 and 2 and six available on ME3; has four HD frame stores, with still store backup; has four timed aux., plus 12 non-timed aux.; includes five border generators, 11 RGB/YUV color correctors and five chroma keys.

**408-260-1000; [www.snellwilcox.com](http://www.snellwilcox.com)  
Booth: C2860**

## MODULAR MASTER CONTROL SYSTEM

### Eyeheight presTX

New features include user-configurable system software, squeeze-and-tease digital video effects; embedded/AES audio lead/lag (manual or automated); command stacking; touch-screen controller and 1080-line HD compatibility.

**+44 1923 256 000; [www.eyeheight.com](http://www.eyeheight.com)  
Booth: SU6632**

## WORKSTATION-BASED SOLUTION

### Mathematical Technologies CORRECT

Workstation-based (Intel and SGI), resolution independent (data, HD and SD) product offering image processing correction such as DRS, automatic dirt concealment, noise and grain reduction, cadence repair and audio pitch correction.

**800-566-6544; [www.mathtech.com](http://www.mathtech.com)  
Booth: SL3823**



## PRODUCTION SWITCHER

### Brick House Video VTB-2D

New features include frame-store synchronizers that allow the user to work with asynchronous sources such as satellite downlinks; allows for digital audio processing including slave mixes; eight-input switcher has program and preview SDI outputs and an assignable composite output; it also features six auxiliary outputs that can be used for source, program or preview distribution; in addition to standard wipes and mixes, switcher offers soft and variable width/hue border and variable-rate auto fade to black; desk-mount panel controls the rack-mount unit via an RS-422 cable; this link also supplies power to the unit, eliminating the need for a separate power supply.

**+44 23 8067 6026; [www.brickhousevideo.com](http://www.brickhousevideo.com)  
Booth: SU5127**

*Color indicates advertiser*

# DTV marketplace

## MINI MASTER CONTROL SWITCHER

**Evertz PKGHD9625SW**

Allows the user to control up to 12 input video signals and up to 48 AES audio inputs; voice-overs, wipes, fades, fade to black and several other features can be performed, all from the single remote control panel.

905-335-3700; [www.evertz.com](http://www.evertz.com)  
Booth: C3412

## VIDEO SWITCHER

**Image Video 9540**

Standalone 40x20 video switcher in three rack units; one or more units can be combined with 9541 audio switchers to provide a maximum of seven switching levels; a redundant power supply is optionally available.

416-750-8872; [www.imagevideo.com](http://www.imagevideo.com)  
Booth: C850

## VIDEO SYSTEM

**ParkerVision PVTV NEWS CR2000**

Multiple DVE system; allows for effects such as triple and quad boxes; provides 24 SDI direct video inputs; six key inputs; five key layers; 32 analog or AES/EBU digital audio inputs; 16 device control ports for VTRs, video servers, character generators, still stores, robotic camera systems and other ancillary production equipment.

800-532-8034; [www.parkervision.com](http://www.parkervision.com)  
Booth: SU5246

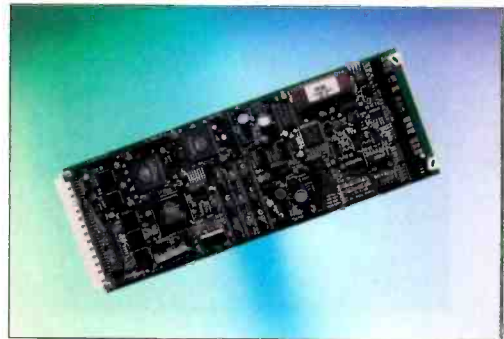


## VIDEO PRODUCTION SYSTEM

**Broadcast Pix Broadcast Pix Studio**

System includes a range of functions for creating live video, including DV/MPEG/uncompressed digital disk recorder, character generator, Pinnacle DVE, still store, logo store, switching, color corrector and keyers; features a tactile unified control system that allows a single person to handle live studio functions including on-the-fly switching, titles, logos, special effects and picture-in-picture; system provides 10-bit digital video and a control panel that can be scaled to accommodate a network of operators in the studio or remotely.

781-221-2144; [www.broadcastpix.com](http://www.broadcastpix.com)  
Booth: SU6023



## DIGITAL CHROMA KEYS

**Crystal Vision Safire**

Uses external key function to restrict chroma keying to the area that contains the graphics by forcing foreground everywhere else in the picture; features new Force FB mode, which uses different levels of a single key input to force foreground and background in different areas of the same picture; offers extended luma keying capability.

+44 1223 497049; [www.crystalvis.com](http://www.crystalvis.com)  
Booth: C670

*Color indicates advertiser*



## DUAL SD/HD SWITCHER

### FOR-A Hanabi

A 24p progressive scan version is now available; features multiple channel DVE; 3RU high and suited for OB vans and live applications; easily upgradeable from standard to high definition with a quick board replacement.

**352-371-1505; [www.for-a.com](http://www.for-a.com)**

**Booth: C2938**



## 1-M/E DIGITAL PRODUCTION SWITCHER

### Thomson Grass Valley Kayak

Designed for live production and editing applications; includes four keyers and complete machine control; its networking capability enables several switchers to be combined and controlled via a single panel; offers an intuitive GUI with an integrated touch-screen display; supports both SDI 525- and 625-line formats.

**530-478-3000; [www.thomsongrassvalley.com](http://www.thomsongrassvalley.com)**

**Booth: SU7059**

## REDUNDANCY UNIT

### ParkerVision XSWITCH

Stand-alone version with more powerful features and a wider scope of applications; allows multiple video, audio and control lines to be switched in a matrix fashion with the touch of a button; in a PTV news environment it provides system redundancy during critical live news production applications.

**800-532-8034; [www.parkervision.com](http://www.parkervision.com)**

**Booth: SU5246**

## DIGITAL STILL STORE

### Fast Forward Video Alpha One

Stores up to 2500 still images with the ability to record full-motion video; features include composite and component video inputs and outputs, optional SDI video inputs and outputs, balanced audio in and out, genlock, timecode in and out, RS-422 machine control, and native mode PC control.

**949-852-8404; [www.ffv.com](http://www.ffv.com)**

**Booth: C186**

## Satellite, cable, encoders

## MOTORIZED INTEGRATED SATELLITE TERMINAL

### Microwave Radio Communications Vislink Advent NewSwift

Designed for rapid deployment; operates in C, X, Ku, DBS, Ka and extended bands; antenna mount system allows for two upconverters, two HPAs and an associated variable power combiner/switcher assembly to be located within the antenna assembly, close to the feed.

**978-671-5700; [www.mrcbroadcast.com](http://www.mrcbroadcast.com)**

**Booth: C704**

## CABLE MODEM

### Scientific-Atlanta WebSTAR DPX2100

Incorporates the Broadcom BCM3348 DOCSIS 2.0 cable modem IC; gives the network operator the ability to offer symmetrical bi-directional data services as well as the ability to offer speeds hundreds of times faster than are available through standard dial-up telephone modems.

**770-236-6190; [www.scientificatlanta.com](http://www.scientificatlanta.com)**

**Booth: SU4543**

*Color indicates advertiser*

# DTV marketplace

## DIGITAL PROCESSING CARDS

### Broadcast Technology 3000 series

Additional cards complement existing receiver cards for COFDM DVB-T, QPSK DVB-S and QAM DVB-C, along with the professional 4:2:0 and 4:2:2 MPEG-2 decoder module; new modules include the DTCA-3000 conditional access module, which is capable of descrambling multiple services per module; the DTDA-3000 DVB-ASI distribution module, which provides redundancy with three switched inputs and six outputs; and the DTCC-3000 control card, which allows communication with external network management systems via RS-232, RS-422 and Ethernet.

**+44 1264 332 633; [www.btl.uk.com](http://www.btl.uk.com)  
Booth: C2912**

## CONDITIONAL-ACCESS SYSTEM

### Irdeto Access Plsys

New features include dual decoder support, Chinese GUIs, a schedule editor, support for 24 transport streams; Ordered Pay Per View (OPPV); smart card marriage control.

**858- 668-4800; [www.irdetoaccess.com](http://www.irdetoaccess.com)  
Booth: SL3747**



## UPCONVERTER

### Patriot Antenna Systems 1.5W and 2W BUCs

The new block upconverters will be bundled with its line of transmit 75 cm, 90 cm, 1.0-, 1.2-, 1.8- and 2.4-meter VSAT antennas; these bundled systems will comprise antenna, block upconverter and LNB.

**800-470-3510; [www.sepatriot.com](http://www.sepatriot.com)  
Booth: N1130**

# SAVE A BUNDLE

## ON DIGITAL MASTER CONTROL AND ROUTING

Even if your DTV transmitter is bought and paid for, that's just the tip of the iceberg. Sooner or later, you're going to need to upgrade your entire station to digital. And chances are, that includes a new master control switcher and router.

Our new NV5128-MC Master Control/Router is a fully integrated system that can save you 50% or more over the cost of separate master control and routing switchers. Plus, if you have a mix of digital and analog sources, its multiformat input capability will save you the cost of external converters.

Planning to originate more than one program stream? The NV5128-MC may be configured to handle up to four independent channels. The system is automation ready, and a variety of manual control options are available.

**NVISION®**

*Masters in Digital Audio, Pioneers in HDTV*



## MPEG-2 DECODER

### Broadcast Technology DTVD-1000

Features include dual DVB-ASI inputs, DVB-CI conditional access descrambling, firmware upgradeable in service, composite video output, and dual SDI with embedded audio outputs; reset/status port provides alarm monitoring via contact closure.

+44 1264 332 633; [www.btl.uk.com](http://www.btl.uk.com)  
Booth: C2912

## DIGITAL PROGRAM INSERTION SUPPORT

### Harmonic

Enables broadcasters to regionalize content; core of the solution is the DiviCom MV50 MPEG-2 video encoder, which has been enhanced to support "Digital Cue Tones" as defined in the SCTE 35 standard; the complete solution allows for both long- and short-form content.

408-542-2500; [www.harmonicinc.com](http://www.harmonicinc.com)  
Booth: SU5449



## DIGITAL BROADCAST SYSTEM

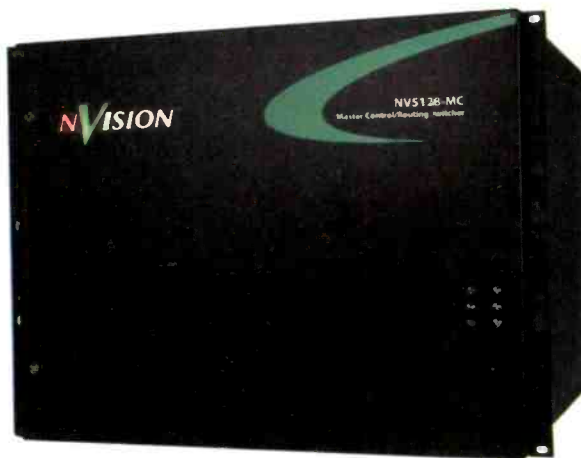
### TANDBERG Television and Irdeto Access Earlybird

Provides a complete solution from content encoding through to the set top box; features TANDBERG'S E5710 encoding solution, the MX5600 MPEG video, audio and data multiplexer and the SM5600 is a compact, satellite modulator; has Irdeto Access' Conditional access, scrambling and smart cards; also supports a range of set top boxes including models from Zinwell and Xcom.

407-380-7055; [www.tandbergtv.com](http://www.tandbergtv.com)  
Booth: C3711

## Features

- ◆ 128 system inputs - digital, analog, or mixed
- ◆ Supports up to four independent channels
- ◆ Provides mixing, keying, and voice-overs
- ◆ Built-in squeezeback and logo store
- ◆ Up to 96 router buses - digital, analog, or mixed
- ◆ HD ready
- ◆ Compact 8RU frame



[www.nvision1.com](http://www.nvision1.com)

For more information about this and other NVISION products, contact your nearest NVISION sales representative, or visit us on the web at [www.nvision1.com](http://www.nvision1.com).

NAB Booth #2650



## CONTENT PROTECTION

### Irdeto Access CypherCast for IPTV

Designed for operators requiring secure deployment of premium video over DSL and FTTH; features real-time encryption; session-based encryption includes limited-life keys and encryption of individual VOD sessions.

**858- 668-4800; [www.irdetoaccess.com](http://www.irdetoaccess.com)  
Booth: SL3747**



## CONTROL AND MONITORING SOLUTION

### TANDBERG Television nCompass

For large MPEG-2 broadcast headends for configuration, system monitoring and redundancy; gives broadcasters control over a range of TANDBERG headend equipment for satellite, cable and terrestrial markets; allows for simple 1+1 systems up to complex N+M redundancy solutions.

**407-380-7055; [www.tandbergtv.com](http://www.tandbergtv.com)  
Booth: C3711**

## SATELLITE

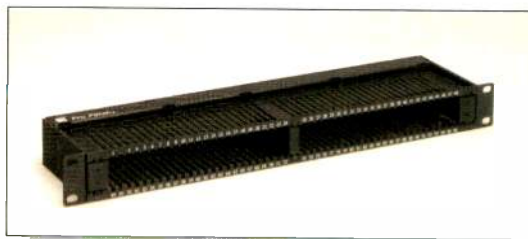
### Intelsat IS-907

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; features a selectable split uplink with independent gain control in Channel 12 of global beam.

**202-944-6800; [www.intelsat.com](http://www.intelsat.com)**

**Booth: N1546**

**Color indicates advertiser**



## AUDIO PATCHING SYSTEM

### ADC UniPatch

High-density Bantam audio patching system designed for mobile truck applications; new system provides a normalised adjustable high-density 2x48 patch panel in a one-rack space; features selectable normals and grounds so engineers can change configurations on the fly without Berg straps or removing panels from the rack; easily upconverts to a 1.5RU panel with larger destination strips.

**800-366-3891; [www.adc.com](http://www.adc.com)  
Booth: C4026**



## TRANSPORT MULTIPLEXER

### Motorola TMX-2010

New functionality includes statistical multiplexing for multiple SE-2000 or SE-1010 digital video encoders, bit-rate transcoding, MPEG-2 video slicing and DVS-253/380 compliant digital program insertion capability; supports local ATSC PSIP service table generation.

**858-455-1500; [www.motorola.com](http://www.motorola.com)  
Booth: SU4737**

## SATELLITE RECEIVER

### Wegener UNITY4600

Provides the cable headend with both digital and analog outputs; can be equipped with a bandwidth 8PSK turbo demod; available in a 1RU package, with standard digital ASI output plus analog video output; features two stereo audio outputs, built-in four-way RF switch, integrated graphics, overlay and VBI support.

**770-814 4000; [www.wegener.com](http://www.wegener.com)  
Booth: SU5280**



## TRANSPORT DECODER

### Scientific-Atlanta D9010

The latest addition to the Continuum DVP family; when combined with the D9020 encoder, this decoder creates a dynamic headend transport solution for efficiently delivering MPEG-2 video between headends; offers a space-efficient method for recovering programs from the MPEG-2 transport stream at remote hubs for the analog tier.

888-949-4786; [www.scientificatlanta.com](http://www.scientificatlanta.com)

Booth: SU4543

## KU-BAND OUTDOOR UP-LINK AMPLIFIER

### e2v technologies Stellar

Enhanced features include an integral linearizer, which gives the user increased usable power in the same compact package; covers all of the primary satellite frequency bands — C, X, Ku, Dual and Tri-band, DBS and Ka-Band; can be supplied in standard or custom configurations covering frequencies from 5.85GHz to 31GHz, with saturated output powers of up to 3kW.

914-592-6050; [www.e2vtechnologies.com](http://www.e2vtechnologies.com)

Booth: C544



## DTH SYSTEM EARTH STATION MONITORING AND CONTROL SYSTEM

### Andrew Earth Station Antenna Management Software:

Provides real-time network management and earth station equipment management; combines operations into one location for a more efficient use of resources; open system operates on a standard PC using standard hardware interfaces; GUI allows real-time operator control or creation of programmable events that execute as needed; provides event calendars, maintenance logs and status reports; offers a direct interface to monitored devices via communications ports or control relays.

708-349-3300; [www.andrew.com](http://www.andrew.com)

Booth: C2630

## Studio accessories, systems integrators



## LEVEL AND IMPEDANCE CONVERTER

### Henry Engineering MATCHBOX

Permits consumer or semi-pro audio equipment to be used in a professional studio system; features direct-coupled active circuitry for audio performance with more than 100dB of dynamic range; AC power supply is built-in; measures 1/3-rack width by 1RU high.

626-355-3656; [www.henryeng.com](http://www.henryeng.com)

Booth: N3101

## TECHNICAL FURNITURE

### Forecast Consoles MasterRail Dynamic Device Management System

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; upper bridge is independent of the lower console structure; completely modular.

631-253-9000; [www.forecast-consoles.com](http://www.forecast-consoles.com)

Booth: C102

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# DTV marketplace

## CONTROL PANEL SYSTEM UPGRADE

### Videoframe VTECS Control Panel System with PROXY VNODES

PROXY VNODES are control interfaces used to control modular equipment from companies such as Thomson, Grass Valley and Leitch; configurable; allows for multiple vendor control; has a universal operator interface, full router integration and a channel-based operation.

530-477-2000; [www.videoframesystems.com](http://www.videoframesystems.com)  
Booth: SU6008



## DEMODULATORS/DECODERS

### Videotek DDM-520 (shown above) and DDM-540

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

800-800-5719; [www.videotek.com](http://www.videotek.com)  
Booth: C974



## HIGH-RESOLUTION DISTRIBUTION AMPLIFIER

### FSR RGB-HV-2

Provides 595MHz of bandwidth at -3dB; two individually adjustable output channels of the unit will restore the video bandwidth of 150 feet of cable to 180MHz; multi-pole filtering maintains a flat +/-0.5dB response out to 150MHz at the end of the 150-foot cable run.

973-785-4347; [www.fsrinc.com](http://www.fsrinc.com)  
Booth: SL1969

Color indicates advertiser

## INTERFACE MODULES

### MediaSonic FrEND series

Allows users to control their equipment from anywhere on a standard network, within a facility or across a WAN; small hardware device that can easily be located in wiring closets with the network switches and wiring patch equipment right next to the device to be controlled; with driver support for ESCAN control software, a FrEND can be part of an audiovisual control network or a simple stand-alone controller; with a built-in timecode reader and generator; can be driven by ESCAN or from any control PC on a network via standard Ethernet connections; the series consists of the Digital FrEND, Serial FrEND, Mini FrEND and SD Video FrEND.

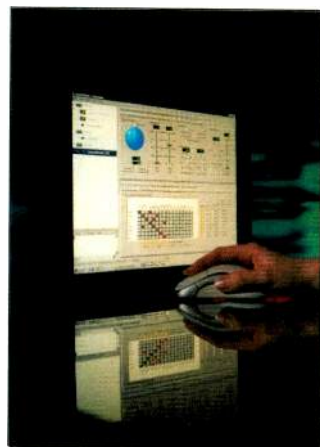
818-566-3054; [www.mediasonic.com](http://www.mediasonic.com)  
Booth: SL1521

## EXPRESS REMOTE

### Fortel DTV RCP-303

Provides rapid access control of Integrity system modules on a large, multi-color display with intuitive, context-sensitive controls; features user macro keys plus password-protected engineering functions.

770-806-0234; [www.fortelDTV.com](http://www.fortelDTV.com)  
Booth: SU6319



## CONTROL SYSTEM

### Crystal Vision Statesman 2

New features include Ethernet control via TCP/IP and composite modules that allow users to design their own control panels by placing controls from several different boards on one screen; alarm prioritization allows high-priority alarms to mask those with a lower priority; new engineering mode allows system builders to select settings off-line for later uploading.

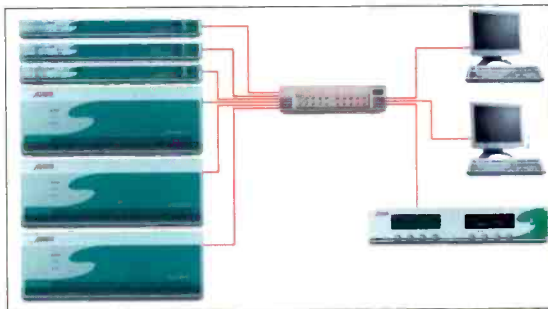
+44 1223 497049; [www.crystalvis.com](http://www.crystalvis.com)  
Booth: C670

## MONITORING SYSTEM

### Miranda Technologies Densité

Provides video and audio signal measurement and alarm profiling, as well as visual confidence monitoring with low latency, low bit rate video, and audio streaming over standard IP networks; the range has been extended to include digital and analog video and audio probe cards for the Densité DA range; a new option providing remote waveform/vectorscope over IP has been added to further improve the diagnostic capabilities of the probes.

514-333-1772; [www.miranda.com](http://www.miranda.com)  
Booth: C2826



## REMOTE CONTROL PANEL

### Axon Digital SCP08

Ethernet-based, stand-alone remote control panel can be used to control multiple synapse frames at the same time; TCP/IP; can control eight different parameters on one screen; can use up to 64 screens to control up to 512 parameters.

+31 13 511 6666; [www.axon.tv](http://www.axon.tv)  
Booth: SU7303



## SCAN CONVERTER

### Magni Systems MCP-601

Seamlessly integrates digital DVI and XGA content with a SDI 601 or analog signal; builds on the graphics and keying functions proven with its other scan converters, with the addition of three features; offers true chroma key based on the input video, split screen and alpha key.

503-615-1900; [www.magnisystems.com](http://www.magnisystems.com)  
Booth: SU6036



## CONTROL SOFTWARE

### Logitek Electronic Systems Supervisor

Upgrade for Audio Engine; features a UDP network connection; able to address color modes of control surface graphic screens; allows a hardware temperature sensor to be decoded and sent to control surfaces for real-time temperature indication.

800-231-5870; [www.logitekaudio.com](http://www.logitekaudio.com)  
Booth: N2931



## VGA SWITCHERS

### FSR SN-4100 series

Are four-input to one-output high-resolution units; can be used as stand-alone units or as upstream switchers for standalone scalars; can be used to route four high-resolution signals to a downconverter; includes front-panel controls with LEDs that illuminate the selected input.

973-785-4347; [www.fsrinc.com](http://www.fsrinc.com)  
Booth: SL1969

## MODULAR CONSOLE SYSTEM

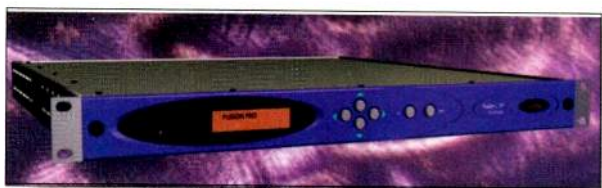
### Winsted Matrix

Incorporates an overhead dimmable Xenon lighting system, an anti-glare monitor bezel with acrylic optical shield and a monitor positioning system; has a tube steel frame; side panels come in a variety of materials and colors.

800-447-2257; [www.winsted.com](http://www.winsted.com)  
Booth: SU5421

*Color indicates advertiser*

# DTV marketplace



## VIDEO DISPLAY PROCESSOR

**Zandar Technologies FusionPro**

Combines input formats in one system; cards can be used in 3RU or 1RU frames; supports up to 13 dual-channel input cards; 3RU chassis has a dual redundant power supply; 1RU unit (shown above) has accessible front-loading processing cards and support for local and remote control.

**+35 31 280 8945; [www.zandar.com](http://www.zandar.com)**

**Booth: C3846**

## ASI AMPLIFIER

**Logic Innovations ASI-DA**

PCI card that provides ASI transport stream repeat/distribution while conserving equipment rack space and power; helps broadcasters streamline their existing equipment setup; PCI "short card" form factor eliminates the need for mounting a traditional, self-contained distribution amplifier in an equipment rack; installed in an existing PC residing in a rack; draws its power from the PCI connector so there is no need for a separate power outlet; operates without special driver software.

**858-455-7200; [www.logicinnovations.com](http://www.logicinnovations.com)**

**Booth: SL2522**



## EVENT CONTROLLER

**LEIGHTRONIX MINI-T-NET**

Event controller combined with a built-in 8x1 video/audio switcher featuring loss-of-video detection; features include date selection, comprehensive logging, e-mail notifications and "all hours" events, all controlled by a real-time clock.

**800-243-5589; [www.leightronix.com](http://www.leightronix.com)**

**Booth: C3081**

## MULTICHANNEL AUDIO MONITOR

**Wohler Technologies AMP-S8**

Features eight 26- or 53-segment high-resolution tri-color LED level meters showing simultaneous VU and PPM; output limiter circuits are incorporated to protect the speakers; has an extra AES input.

**650-589-5676; [www.wohler.com](http://www.wohler.com)**

**Booth: C2543**



## AUTOMATIC SWITCHER

**Henry Engineering SUPERELAY**

Used in broadcasting and recording studios to operate "On the Air" warning lights when a live microphone is turned on; can control up to 200W of warning lights; provides six relay outputs for utility use.

**626-355-3656; [www.henryeng.com](http://www.henryeng.com)**

**Booth: N3101**



## AUDIO AND VIDEO MONITOR

**Wohler Technologies, PANORAMA dtv VAMP2-SDA**

Monitor audio and video from two selectable SDI digital and two composite analog video sources in a 2U unit; a composite video monitor output from the selected SDI is included for use with larger, external video monitors; analog audio section features four channels and level meters.

**650-589-5676; [www.wohler.com](http://www.wohler.com)**

**Booth: C2543**

## CONSULTING SERVICES

**Digital System Technology**

Provides architectural support and systems design, project management and coordination, installation, and equipment from a wide range of manufacturers; specializes in the development of television production and technical operation centers, satellite and microwave systems, Internet streaming systems and digital conversion of broadcast television stations.

**626-472-7701; [www.dstech.com](http://www.dstech.com)**

**Booth: Marriott Residence Inn  
Hospitality Suite**

**Color indicates advertiser**



## LCD MONITOR

### Marshall Electronics V-R71PA-SDI

Three rack unit high and 2.65 inches deep; 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; two stereo pairs of analog/digital audio can be inputted via SDI embedded, two AES/EBU or four balanced analog XLR inputs; simultaneous visual monitoring of up to four audio channels is obtained using a high-resolution LED bar graph, while one selectable pair of audio is monitored via the full range stereo speakers.

**800-800-6608; [www.lcdracks.com](http://www.lcdracks.com)**

**Booth: SL745**

## SYSTEMS INTEGRATION SERVICES

### The Systems Group integration services

Consults, designs, engineers, integrates the electronics backbone that supports modern broadcasting facilities; has completed centralized monitoring, multichannel origination and master control consolidation projects (WJLA facility shown).

**201-795-4672; [www.tsg-hoboken.com](http://www.tsg-hoboken.com)**

**Booth: Las Vegas Hilton, Suite 1850**



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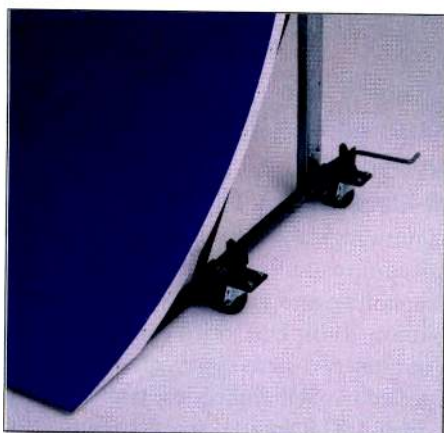
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 from Harris Broadcast.

\*Deadline to enter is March 30, 2003

**HARRIS**

[www.broadcast.harris.com](http://www.broadcast.harris.com)



## CASTER SET

### Pro Cyc caster set for System 4 QS

Integral set of two casters bolt to each assembly of the virtual reality cyclorama (System 4 QS); the casters lower or lift the cyc off the studio floor; when the caster set is engaged the cyc can be moved with no damage to the seams.

**503-231-1211; [www.procyc.com](http://www.procyc.com)  
Booth: C3324**

## SYSTEMS INTEGRATION SERVICES

### A.F. Associates

Services include design and integration of turnkey systems for broadcast, cable satellite and corporate applications; AFA's Systems and Technology organization offers design and construction services for earth stations and satellite networks, digital encoding systems and support, "mission-critical" field service, and network management.

**201-767-1200; [www.afassoc.com](http://www.afassoc.com)  
Booth: C950**

## SYSTEMS INTEGRATION SERVICES

### Rees Associates Facility Business Plan

Planning tool used to analyze the personnel, equipment, budgetary, visibility and image requirements for Texas station KOSA's relocation; Rees matched facility requirements with a new 16,000-square-foot location.

**214-522-7337; [www.rees-associates.com](http://www.rees-associates.com)  
Booth: C3430**

## VIDEO PROCESSOR

### FOCUS Enhancements CenterStage CS-HD

Designed to bring high-quality video to front- or rear-projection, plasma, CRT and LCD displays used in today's home theaters; accepts interlaced or progressive analog for processing and scaling to HDTV formats.

**408-866-8300; [www.focusinfo.com](http://www.focusinfo.com)  
Booth: SU4849**

**Color indicates advertiser**

## INTEGRATION SERVICES

### AZCAR

Provides design, engineering and construction services for content delivery systems for the broadcast and communications industries; company also develops solutions to support networking and information technology demands of clients; engineering and project management teams operate throughout the world.

**905-470-2545; [www.azcar.com](http://www.azcar.com)  
Booth: SU5166**

## MONITORING CARD

### Evertz Microsystems Analog Quattro

Analyzes and displays video, audio and data status information and fault condition alerts for four video inputs simultaneously in a 2x2 matrix format.

**905-335-3700; [www.evertz.com](http://www.evertz.com)  
Booth: C3412**

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## TBCs, frame sync, conversion equipment

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## CONVERSION PRODUCT LINE

### ISIS-Group conversion products

Targets the need of compact systems tools; gives broadcasters the ability to keep analog source equipment in service while dealing with the need to convert core facilities to digital operation; product line includes a GUI with comprehensive control and signal customization abilities.

**530-477-2984; [www.isis-group.com](http://www.isis-group.com)  
Booth: C362**

## DOWNCONVERTER

### Miranda Technologies DVC-800

Designed to enhance electronic acquisition of material using HD cameras such as the Sony HDCAM or Panasonic AJ-HDC27A; provides outputs and functionality to facilitate monitoring, rough cut editing and the preparation of dailies on-site.

**514-333-1772; [www.miranda.com](http://www.miranda.com)  
Booth: C2826**

## UPCONVERTER AND NOISE REDUCER

### Teranex Volare 210

Includes proprietary PixelMotion, and advanced noise reduction; features 3:2 detection and scene change detection algorithms; includes analog and digital interfaces and dual hot-swappable power supplies.

**407-517-1086; [www.teranex.com](http://www.teranex.com)  
Booth: C462**





## VIDEO STABILIZERS

**FOR-A IVS-500 and IVS-300 (shown above)**

IVS-500 has digital input and output; the IVS-300 has analog composite I/O; both stabilizers electronically correct movement up to 20 percent from a still picture down to the sub-pixel level for both recorded and live images.

**352-371-1505; [www.for-a.com](http://www.for-a.com)  
Booth: C2938**

## ANALOG-TO-SERIAL DIGITAL OPTICAL AND ELECTRICAL CONVERTER

**Ensemble Designs BrightEye I**

Accepts composite, Y/C, SMPTE, Beta, RGB and SDI 601 as video inputs in PAL/NTSC; output is simultaneously available in both electrical and optical form.

**530-478-1830; [www.ensembledesigns.com](http://www.ensembledesigns.com)  
Booth: SU5258**

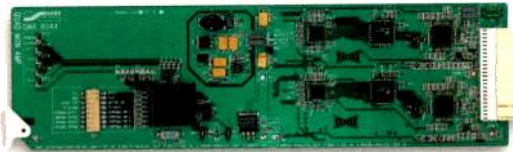


## AUDIO TRANSCODER

**Pixel Instruments UMAT-1200**

Provides reference-quality A/D and D/A conversion, digital sample rate conversion and audio monitoring through internal speakers and external headphones; stereo analog, AES/EBU balanced digital, SMPTE unbalanced digital and S/PDIF inputs and outputs are standard; all outputs are generated simultaneously from the selected input; the output sample rate can be locked to a video reference, the input digital audio or an internal crystal; optional voice-over mode provides a one-button automatic fade between the selected digital input and the analog input for voice-over capability.

**408-871-1975; [www.pixelinstruments.tv](http://www.pixelinstruments.tv)  
Booth: SU5219**

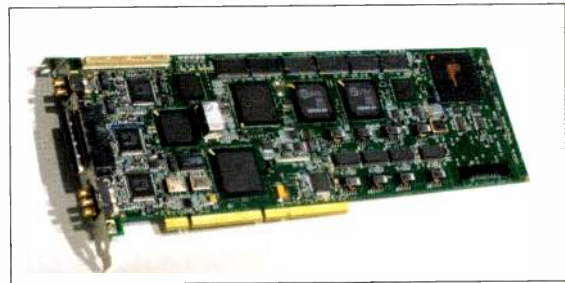


## QUAD SDI-TO-ANALOG COMPOSITE VIDEO MONITORING AMPLIFIER

**Ross Video QMA-8044**

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.

**613-652-4886; [www.rossvideo.com](http://www.rossvideo.com)  
Booth: SU5225**



## FORMAT CONVERTER

**Media 100 HDX**

First-step expansion of its GenesisEngine media processor providing support for HD and SD applications in a single 844/X system; comprises new software and a high-density HDX PCI card that add 10-bit format conversion to the GenesisEngine.

**800-773-1770; [www.media100.com](http://www.media100.com)  
Booth: SL2856**

## HDTV SCAN RATE CONVERTER

**YEM SCR-1080i**

Can convert DVI output of the active display area to HD-SDI at 1920x1080; graphics, images, characters or anything else on the PC display that are equipped with DVI graphics board are directly mapped into HD-SDI 1080i signal with genlock to master sync.

**+81 46 228 8883; [www.yem.com](http://www.yem.com)  
Booth: SU6323**

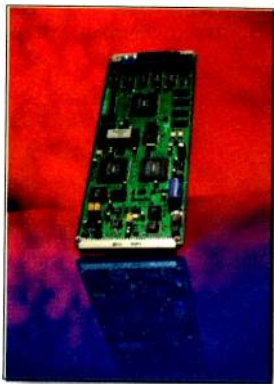
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# DTV marketplace

## MASTER SYNC/CLOCK GENERATOR Evertz 56000MSC

Provides a range of synchronizing signals while solving the problem of locking the in-house master clock system to the master video sync pulse generator; features include six independently phasable reference outputs, two independent LTC time code outputs, 5MHz/10MHz frequency reference input, GPS option for frequency and time reference, and 10MHz frequency reference output.

905-335-3700; [www.evertz.com](http://www.evertz.com)  
Booth: C3412



## FRAME/LINE SYNCHRONIZER

### Crystal Vision SYNAD124

Includes tracking audio delay for up to two groups of embedded audio; allows video feeds containing embedded audio to be retimed; eight mono channels of audio can be delayed to match the video from any two audio groups, with SYNAD de-embedding, resampling and then re-embedding the audio.

+44 1223 497049; [www.crystalvis.com](http://www.crystalvis.com)  
Booth: C670

## SDI SYNCHRONIZER/LEGALIZER

### Fortel DTV FS-415

For applications in which analog I/O is not needed; features a modular design and up to nine A/V synchronizers or 18 video-only in one 4RU frame with redundant power supplies.

770-806-0234; [www.fortelDTV.com](http://www.fortelDTV.com)  
Booth: SU6319

## HD CARDS

### Axon Digital Synapse

A range of high-definition cards now available for the Synapse conversion system; new HD products include the HDR07 distribution amplifier, the HEB10 audio embedder and the HDB10 audio de-embedder.

+31 13 511 6666; [www.axon.tv](http://www.axon.tv)  
Booth: SU7303

## STANDARD CONVERTER

### Snell & Wilcox DEFTplus

Upgrade to the Alchemist Ph.C and Alchemist Platinum standard converters; convert SD material to 24p and integrate SD and HD material within the same program; can reorder the television field sequence so that the new PAL fields are produced only from the original film fields.

408-260-1000; [www.snellwilcox.com](http://www.snellwilcox.com)  
Booth: C2860

## TIME CODE READER/GENERATOR

### Adrienne Electronics time code boards

Universal 5.0V/3.3V PCI plug-in reader and generator boards for personal computers and servers; surface-mount, third-generation boards come with optional on-screen time code display and caption (and V-chip) reading capabilities; all boards include a high-performance on-board processor, advanced diagnostics and in-system electronic software updates; 24fps film and HDTV support available for all PCI-LTC and PCI-VLTC plug-in time code boards.

702-896-1858; [www.adrielec.com](http://www.adrielec.com)  
Booth: C566

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## Test and measurement, monitoring

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## MULTI SDI MONITOR

### Leader Instruments LV 5700

Features an XGA TFT color LCD in an adjustable tilt front panel; tests 14 HD-SDI and SD-SDI formats with digital processing compliant to SMPTE 259M, SMPTE 292M and SMPTE 296M; input format, colorimetry, and trilevel or black burst external reference inputs are automatically detected.

714-527-9300; [www.LeaderUSA.com](http://www.LeaderUSA.com)  
Booth: C768

## MONITORING SYSTEM

### Pixelmetrix DVStation-Remote

Smaller version of Pixelmetrix's DVStation "Preventative Monitoring" solution; consists of one of four book-sized Pod modules and a single 1U rack-mounted remote controller; the system is operated through a LAN or dial-up telephone, allowing database or user access from a personal computer; designed for either the smaller facility that might not need the full 21-module capability of the DVStation, or a complex digital network that requires simple single source monitoring at multiple locations; provides the same level of in-depth signal monitoring and analysis as the full DVStation.

954-472-5445; [www.pixelmetrix.com](http://www.pixelmetrix.com)  
Booth: C2233

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## MONITORING SYSTEM

### Tektronix WVR600 series rasterizer

Offers high-resolution output to external displays; monitors both analog and digital video signals in an advanced all-digital architecture; includes two standard-definition SDI inputs and two composite inputs for analog audio, digital AES/EBU audio or both.

503-627-7111; [www.tektronix.com](http://www.tektronix.com)  
Booth: C2450

## REMOTE MONITORING SYSTEM

### PatchAmp PA-RMS

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 with audible alert, send e-mails and/or trigger paging and phone dialing with WAV file playback.

201-457-1504; [www.patchamp.com](http://www.patchamp.com)  
Booth: C2684



## WAVEFORM MONITOR SERIES UPGRADE

### Tektronix WFM700

Advanced video measurement tool features an optional audio monitoring module to validate standards and document compliance; offers audio monitoring of four channel pairs (up to eight separate channels); the four BNC inputs can be reconfigured to output a de-embedded audio signal; supports audio error checking, audio CRC error checking and a channel status display.

503-627-7111; [www.tektronix.com](http://www.tektronix.com)  
Booth: C2450

## HD WAVEFORM MONITOR

### Astro Systems WM-3001

Supports 17 HD formats; six-inch LCD compact size allows for portability; provides picture, waveform, vector and status display.

818-848-7722; [www.astro-systems.com](http://www.astro-systems.com)  
Booth: SU6635



## TEST AND MONITORING PLATFORM

### Pixelmetrix DVStation-IP

Real-time test and monitoring tool for MPEG over IP that addresses the emerging market for video transport over IP networks; a 1RU stand-alone platform; provides MPEG-2 transport stream analysis and monitoring over an IP connection and supports 10-, 100- and 1000Mb/s Ethernet ports; both the ad hoc MPEG over UDP and RTP encapsulations are supported; also, once connected, the system can be set to sniff out video traffic on any set of IP address pairs, extract the MPEG-2 transport stream and perform extensive MPEG-2 verification.

954-472-5445; [www.pixelmetrix.com](http://www.pixelmetrix.com)  
Booth: C2233

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## HD ON-SCREEN MONITOR

### Videotek VTM-450E

Includes high-definition-SDI, standard definition-SDI and analog, and analog composite measurements; features an eye pattern, jitter measurement, gamut display, pixel locator and data word analyzer; introduces A/D relative timing display; offers analysis and display of EIA-708 and EIA-608 closed captioning and auto detection of HD or SD input format.

**800-800-5719; [www.videotek.com](http://www.videotek.com)  
Booth: C974**



## MULTIFORMAT AUDIO MONITOR

### Videotek ASM-100

Monitors many audio formats in one unit; is a 1RU instrument; displays up to eight channels of analog or AES/EBU audio; for video, options enable de-embedding the SD and HD-SDI inputs, and full Dolby Digital and Dolby E decoding.

**800-800-5719; [www.videotek.com](http://www.videotek.com)  
Booth: C974**

## STEREO LOUDNESS METER

### Ward-Beck Systems POD 22

Displays both VU and peak program information simultaneously; a pair of "sticky" peak LEDs can be set to display peaks that exceed a preset limit; also included is a seven-segment phase correlation meter and six status LEDs to display sample rate, lock to signal and error.

**800-771-2556; [www.ward-beck.com](http://www.ward-beck.com)  
Booth: C722**

## CAMERA TEST SYSTEM

### DSC Laboratories Ambi/Combi

Consists of an Ambi illuminator and two Combi test targets; allows the user to run conventional test signals through the entire camera path, from optics to output amplifier, and to use these signals to align their cameras.

**905-673-3211; [www.dsclabs.com](http://www.dsclabs.com)  
Booth: C3422**

## SIGNAL MONITOR

### Trilogy Broadcast Sentinel

Improved networked connectivity and alarm masking; includes VTR/server data, subtitles and AFDs; In-Vision display of monitored data and additional PC status monitoring.

**+44 01264 384000; [www.trilogy-broadcast.com](http://www.trilogy-broadcast.com)  
Booth: SU6457**

## REMOTE CONTROL PANEL

### Videotek RCU-101

For the SDC-101 serial digital video color corrector; provides connections and controls for up to eight SDC-101s through the use of eight dedicated nine-pin connectors on the rear panel; communicates via individual serial ports that are selectable through front panel controls.

**800-800-5719; [www.videotek.com](http://www.videotek.com)  
Booth: C974**



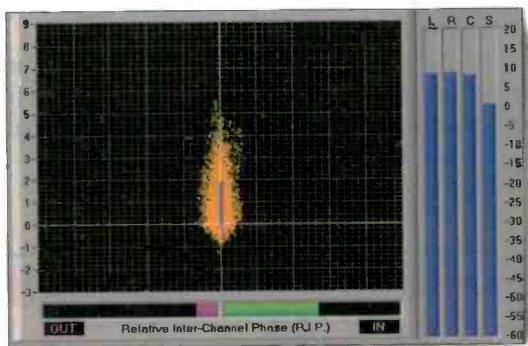
## ATSC TRANSPORT STREAM MONITOR AND ANALYZER

### Triveni Digital StreamScope MT-25

Monitors, measures and analyzes DTV streams and signals to ensure they are error-free and comply with the ATSC standards; includes an at-a-glance transport stream summary display, support for closed captioning and tools for cable headend display.

**609-716-3500; [www.TriveniDigital.com](http://www.TriveniDigital.com)  
Booth: SU5475**

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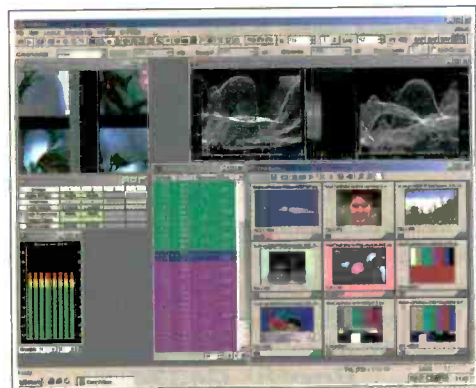


## AUDIO ANALYZER

### Modulation Sciences SpiderVision

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.

732-302-3090; [www.modsci.com](http://www.modsci.com)  
Booth: C125



## TEST SUITE

### OmniTek OmniLab

Integrated test suite of OmniView (analysis package for image data) and OmniGen (test signal generator); complete digital video test laboratory providing the capability to compare video input signals with reference test images.

661-718-2534; [www.omnitek.tv](http://www.omnitek.tv)  
Booth: SU6565

## ELECTRICAL CINEMATOGRAPHY

HD/SD LCD  
Waveform Monitor  
wm-3004



6" HD/SD LCD Monitor  
dm-3005



Bi-Directional  
Fiber Optics  
Transmitters  
of-912/ of-913



HD SDI Repeater  
sd-1645

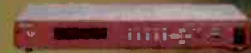


## HDTV POST-PRODUCTION

HD Dual-Link  
Color Corrector  
hc-7038



HD Graphics  
Scan Converter  
sc-2045



HD SDI  
PCI-64 Board  
gg-161



HD SDI  
Audio/ Video  
Multiprocessor  
hc-7039



2003  
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Developed by  
ASTRO

### OTHER PRODUCTS AVAILABLE

- HD/SD Tri-Level Sync Generator - SL-7036
- HD SDI Test Signal Generator - SG-7802
- HD Down Converter - MD-101
- HD UP & Down Converter - MD-1000
- Flexible Scan Converters supporting YPbPr, RGB & DVI - SC-2040 T/B/W

**NAB**  
Booth #SU6635

**ASTRO SYSTEMS, INC.**  
[www.astro-systems.com](http://www.astro-systems.com)

## ATSC TESTING AND CERTIFICATION LAB

### SignaSys model developed by MBA

HD/SD multichannel ATSC broadcast environment, which is predicated by the Multichannel Alliance (a diverse, open alliance of vendors whose primary goal is to ensure collaborative multichannel ATSC broadcast topologies); SignaSys has been working with a number of stations to address cohesive and efficient multichannel ATSC broadcast environments that decrease risk of deployment as well as operational workflow impact.

408-998-8037; [www.signasys.com](http://www.signasys.com)  
Booth: C4336

## MULTIMEDIA RF-VIDEO GENERATOR

### Sencore VP301 VideoPro

Features HDTV and SDTV video format outputs, 4:3 and 16:9 aspect ratios, NTSC RF TV-channel output, composite and S-video NTSC/PAL outputs, and component and RGB signal outputs.

605-339-0100; [www.sencore.com](http://www.sencore.com)  
Booth: SU5035

## TEST SOFTWARE

### Alticast AltiFusion

Software allows users to test and debug any third-party MHP application, in addition to applications created with AltiComposer 2.0 using a TV, PC and set-top box; eliminates the need for multiplexers, modulators or other headend equipment; features AltiCaptor set-top box middleware compliant with DVB-MHP 1.0.2.

512-225-6665; [www.alticast.com](http://www.alticast.com)  
Booth: SU6207

## AUDIO DESCRIPTION MONITOR

### Eyeheight AD-2

Decodes audio description audio and control data from AES input; displays audio level, fade and pan information; provides an AES output mix of program and audio description with correct fade and pan response.

+44 1923 256000; [www.eyehight.com](http://www.eyehight.com)  
Booth: SU6632

## DIGITAL TEST

### Hamlet Video International VidScope

Software-only measurement package designed for the desktop editing market; provides precise waveform and vectorscope displays of DV video as well as level and phase displays of embedded audio.

+44 1494 793763; [www.hamlet.co.uk](http://www.hamlet.co.uk)  
Booth: C2777

Color indicates advertiser

## SIGNAL MONITORING SYSTEM

### Evertz Microsystems MVP

Features a multi-image display; does not limit users to a single type of input; handles up to 48 video inputs per frame; decodes and displays two audio groups per video input.

905-335-3700; [www.evertz.com](http://www.evertz.com)  
Booth: C3412

## Transmitters, antennas, RF products



## REMOTE MONITORING SYSTEM

### RFS Broadcast antenna system monitor

Comprises a user-friendly touch screen connected to a programmable logic controller interfaced with a transducer and analog/digital converter; provides an active mimic panel and interactive graphical displays depicting parameters such as forward/reflected power, voltage standing wave ratio and temperature.

203-630-3311; [www.rfsworld.com](http://www.rfsworld.com)  
Booth: C3012

## CONSULTING SERVICES

### Dielectric Communications

Designs, engineers and manufactures broadcast antennas for DTV and NTSC, FM antennas, combiners, switches, transmission lines, waveguides and dehydrators; provides custom solutions for its customers' unique requirements.

207-655-4555; [www.dielectric.com](http://www.dielectric.com)  
Booth: C424



## TRANSMITTER NETWORK

### Axcera Distributed Transmitter Network

Signal distribution method allows the use of multiple on-channel DTV transmitters in place of a single high-power transmitter to target population centers and improve coverage in weak signal or shadowed areas while minimizing power consumption.

**724-873-8100; [www.axcera.com](http://www.axcera.com)  
Booth: C367**



## TRANSMITTER

### Ai Quantum

MSDC IOT-equipped television transmitter offers a single-cabinet version for power levels up to 30kW; features high-performance LDMOS driver amplifiers; transmitters can be monitored through a standard Internet connection with RPM (Remote Parameter Monitoring and Control system); incorporates solid-state technology from Rohde & Schwarz.

**888-881-4447; [www.acrodyne.com](http://www.acrodyne.com)  
Booth: C335**



## MSDC IOT TRANSMITTER

### Thales Broadcast & Multimedia DCX Paragon

Uses multi-stage depressed collector (MSDC) IOT technology; for better transmission efficiency, it offers up to 2 times conventional IOT and 4 times that of a solid-state transmitter; has a low distortion.

**413-998-1100; [www.thales-bm.com](http://www.thales-bm.com)  
Booth: C2000**



## DIGITAL IOT TRANSMITTER

### Axcera Visionary DT

Features an integrated Statmon-based GUI for remote monitoring and control; system uses a DT2B-based exciter driving LDMOS IPAs for continuous linear and nonlinear adaptive pre-correction; offers broadband operation across the UHF band without requiring tuning; power level up to 180kW is available, in air- or liquid-cooled configurations; precise frequency control allows the exciter to be locked to any precision 10MHz standard for a  $\pm 2$ Hz frequency stability.

**724-873-8100; [www.axcera.com](http://www.axcera.com)  
Booth: C367**

*Color indicates advertiser*

# DTV marketplace

## MONITORING SYSTEM

### Rohde & Schwarz EFA-NET

Introduces the real-time and historical, graphical/analytical reporting of transmitters and transmission systems; provides remote access via private LAN/WAN or by Internet; can access key transmitter site parameters including real-time full-power VSWR monitoring through use of the ECHO display; SNMP-based.

410-910-7800; [www.rohde-schwarz.com](http://www.rohde-schwarz.com)

Booth: C335



## OIL-COOLED CONSTANT EFFICIENCY AMPLIFIER

### L-3 Communications Electron Devices L-3 CEA 130

Operates in the UHF-TV frequency range of 470MHz to 810MHz; designed for use in digital transmitters; by combining a multi-stage depressed collector with an inductive output amplifier, DC input power is made almost proportional to RF output over a wide power range.

570-326-3561; [www.L-3com.com](http://www.L-3com.com)

Booth: C344



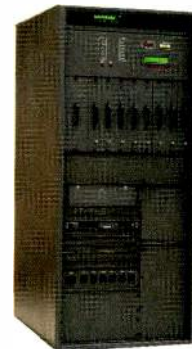
## IOT

### e2v technologies EEV

Energy-saving collector IOT uses either water or oil as the collector cooling fluid; includes compact plug-in systems for both analog and digital broadcast applications.

914-592-6050; [www.e2vtechnologies.com](http://www.e2vtechnologies.com)

Booth: C544



## IOT

### CPI/Eimac Division K3D130W

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

800-414-8823; [www.cpii.com](http://www.cpii.com)

Booth: C720

## DIGITAL SOLID-STATE UHF TRANSMITTER

### Larcan Mangum

Offers 2.5kW to 20kW of power; features include a fully redundant design, intuitive advanced diagnostics and an extensive monitoring system designed to simplify maintenance.

905-564-9222; [www.larcan.com](http://www.larcan.com)

Booth: C3450

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## REMOTE CONTROL AND FACILITY MANAGEMENT SYSTEM

### Harris ReCon

Communications with broadcast, network and facility control equipment; can handle an unlimited number of status, analysis and control channels; is Web-enabled; monitors SNMP; handles EAS logging.

513-459-3400; [www.harris.com](http://www.harris.com)

Booth: C404

## REMOTE MANAGEMENT SYSTEM

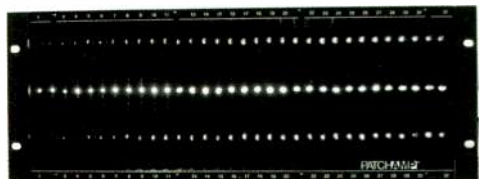
### Harris eCDi

Links Harris TV and Z series FM radio transmitters to standard Web browsers, wireless PDAs, Web-enabled cell phones and SNMP network managers; converts Harris-protocol RS-232 serial connections into an SNMP management information base that enables Web-based monitoring and control; allows the transmitter to be connected to a central network management system.

513-459-3400; [www.harris.com](http://www.harris.com)

Booth: C404

## Video routing



### DA FRAME

#### PatchAmp PA-3200HD

Super-density DA frame; accommodates 32- 1x9 or 64- 1x4 DAs; 3GHz multiformat system can be used with any coaxial signal including high-definition and AES audio.

201-457-1504; [www.patchamp.com](http://www.patchamp.com)

Booth: C2684

### DIGITAL VIDEO ROUTER

#### NVISION NV8256-Plus

Supports any mix of SD and HD; expands to 2048x2048; offers a 256x256 building block and redundant crosspoint architecture.

530-265-1000; [www.nvision1.com](http://www.nvision1.com)

Booth: C2650



### DV VERTICAL INTERVAL SWITCHER

#### Laird Telemedia FireCut

4x1 IEEE-1394 unit; designed to deliver seamless DV vertical interval switching without the delays caused by re-initialization; enables locking and switching of up to four asynchronous DV sources without glitches.

845-339-9555; [www.lairdtelemedia.com](http://www.lairdtelemedia.com)

Booth: SL113

### GUI FOR ROUTING SWITCHERS

#### BUF Technology BUFMC

GUI for routing switchers now features network support; equipment represented by pictorial icons for simple point-and-click routing; salvo system recalls partial or entire routing setups; controls multiple routers and supports up to 32 levels.

858-451-1350; [www.buftek.com](http://www.buftek.com)

Booth: SU301



### CONTROL PANEL

#### Quartz Electronics QMC-FS

Offers quick and easy access to all of the facilities of the QMC; a full-function master control panel, assignable to any one channel or an entire bank of channels to be controlled simultaneously; provides an extra row of utility buttons, a lever arm, rotary shaft encoders, and dynamic button and function assignments.

888-638-8745; [www.quartzus.com](http://www.quartzus.com)

Booth: SU6435

### ENG/SNG SWITCHER

#### ISIS-Group S8400

Contained within 2RU (plus a 2RU control panel); includes an 8x8 SDI/analog audio switcher, and SPG, color bar, tone and ID generators required for ENG/SNG truck applications; can be used in packaged fly-away applications.

530-477-2984; [www.isis-group.com](http://www.isis-group.com)

Booth: C362

**Color indicates advertiser**



## CONTROL SYSTEM

### Network Electronics VikinX.128

Cost-effective range of control panels featuring full TCP/IP connectivity between routers and control panels allowing use of standard Ethernet LAN; existing LANs can be used as hardware platform for routing system; long-distance remote control possible via TCP/IP Internet connections.

**631-928-4422; [www.network-electronics.com](http://www.network-electronics.com)  
Booth: SU7045**



## ROUTING SWITCHER

### PESA Switching Systems Cheetah 448X Flexi-Frame

Incorporates a 27RU frame designed to support SD and HD, as well as other non-standard digital signals simultaneously; internal backplanes are programmable for either input or output connection; utilizes PESA's 3500Pro control system.

**256-726-9200; [www.pesa.com](http://www.pesa.com)  
Booth: SU6625**

## DIGITAL ROUTER

### Leitch Integrator Gold

Comes in standard-definition digital and wideband digital multi-rate formats; will route digital video signals from 30Mb/s to HDTV at 1.485Gb/s, while re-clocking most standard data rates; expandable from 8x8 to 128x128 in a single 8RU chassis.

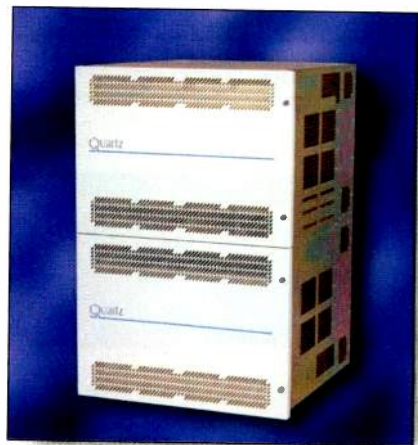
**757-548-2300; [www.leitch.com](http://www.leitch.com)  
Booth: SU4525**

## DIGITAL ROUTING SWITCHER

### Utah Scientific 400/64

Uses a three-board architecture consisting of an input board, a crosspoint board and an output board; contains 36 I/O slots; features signal presence detection, low-power consumption, redundant power supplies and control cards, and an internal monitor matrix.

**801-575-8801; [www.utahscientific.com](http://www.utahscientific.com)  
Booth: C2317**



## VIDEO ROUTER

### Quartz Electronics Q256-SD/HD

Multiformat video router supports both digital and HD video inputs and outputs; each of the I/O modules can handle both serial digital video and HD video; can be scaled in steps of 32 from 32x32 to 128x128 in a single 8U frame; integral monitoring and diagnostics allow the signal to be checked at the input and outputs.

**888-638-8745; [www.quartzus.com](http://www.quartzus.com)  
Booth: SU6435**

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## **ROUTING APPLICATION**

### **Chyron Pro-Bel Procion 2**

Enables creation of customized control interfaces; integrates with Chyron's existing router control systems, including Aurora; 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.

**631-845-2000;**

**[www.chyron.com](http://www.chyron.com)**

**Booth: C2074**

## **MULTIFORMAT ROUTER**

### **Chyron 4U Sirius**

Incorporates built-in analog and digital signal conversion for video and audio signals – enabling different formats to be housed within the same frame; design also allows cross routing between formats; available formats include SDI/HD/analog video and AES audio; unit is scaleable from 8x8 to 64x64; supports Ethernet and SNMP management and control.

**631-845-2000;**

**[www.chyron.com](http://www.chyron.com)**

**Booth: C2074**

## **MASTER CONTROL/ROUTING SWITCHER**

### **NVISION NV5128-MC**

Supports up to four independent channels; provides mixing, keying and voice-overs; features 128 system inputs (digital, analog or mixed), built-in squeezeback and logo store, and up to 96 router busses (digital, analog or mixed); HD ready.

**530-265-1000;**

**[www.nvision1.com](http://www.nvision1.com)**

**Booth: C2650**

## **ROUTING EQUIPMENT**

### **ISIS-Group INNOVATION by ISIS**

Includes router sizes from 16x1 to 32x32 for broadcast television applications, and 8x8 up to 32x32 RGBHV routers for multimedia applications; a range of control panels and accessories are available to complement the routers.

**530-477-2984; [www.isis-group.com](http://www.isis-group.com)**

**Booth: C362**

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**[www.esweb.com](http://www.esweb.com)**

## Video storage



### TAPE RECYLING AND REJUVENATION SYSTEM FOR BETACAM CASSETTES

Research Technology International TapeChek Pro Line 4100DLS

Removes dust, dirt and loose particles that cause dropouts; performance is improved and tapes can be reused.

**800-323-7520; [www.rtico.com](http://www.rtico.com)  
Booth: C1079**

### ARCHIVING TOOL

#### Dalet Digital Media Systems ActiveLog

Software for large-scale media ingesting, cataloging, distributing and archiving; user-friendly interface emulates standard recording and transcoding functionality while providing search and retrieval capabilities; users can quickly access, edit and distribute their audio and video, even while recording.

**212-825-3322; [www.dalet.com](http://www.dalet.com)  
Booth: SU7137**

### FAMILY OF SERVERS AND SUPERCLUSTERS

#### SGI Altix 3000

Uses "brick modules" consisting of Titanium two micro-processors and up to 8GB of memory; can scale up to 64 processors on a single SGI shared-memory node.

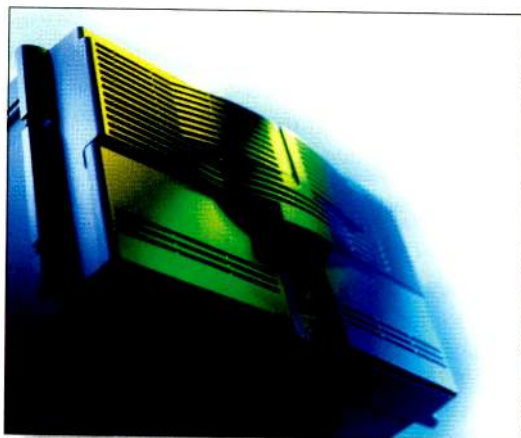
**949-224-4566; [www.sgi.com](http://www.sgi.com)  
Booth: SL3868**

### DESKTOP HD PLAYER

#### MediaSonic MS9100D

Brings HD playback technology to the desktop for ease of use in screening rooms and classrooms; sends "digital cinema" quality images to plasma or LCD displays, or projectors; operation is through a standard Windows Media Player control application; the simple interface makes it easy for anyone who is familiar with Windows to operate an HD playback system.

**818-566-3054; [www.mediasonic.com](http://www.mediasonic.com)  
Booth: SL1521**



### SERVER

#### Thomson Grass Valley Profile XP PVS3000

Offers simultaneous and independent SD and HD operation, playback of back-to-back SD and HD clips on the same dedicated timeline, and built-in decoders and encoders; designed to fit into any architecture; existing XPs can be upgraded to a PVS3000; asynchronous serial interface I/O is optional.

**530-478-3000; [www.thomsongrassvalley.com](http://www.thomsongrassvalley.com)  
Booths: SU7059, MR7050**



### TRANSPORT STREAM SERVER

#### Doremi Labs TSS-100

Performs time delay of any ATSC digital television format, including HD and SD formats; a SMPTE 310M signal fed to the input BNC on the back of the unit can be delayed up to 13 hours; all video, audio and ancillary data on the signal are fully preserved; all functions are controlled by a Java-based software application via 100BaseT Ethernet.

**818-562-1101; [www.doremilabs.com](http://www.doremilabs.com)  
Booth: C879**

*Color indicates advertiser*



## STUDIO EDITING VTR

### Sony Electronics SRW-5000

Can record and play back the 1920x1080 HD format at 23.98p, 24p, 25p, 30p, 50i or 59.94i; can also record and play back the 1280x720@59.94p HD format; can play back all existing HDCAM tapes; captures all of these formats at 10-bit depth, records 12 channels of 24-bit audio; features dynamic tracking playback, pre-read, and edit confidence and record monitoring.

**201-930-1000; [www.sony.com/professional](http://www.sony.com/professional)  
Booth: SU4015**



## COMPACT, HIGH-DEFINITION VTR

### Sony Electronics J-H1

Plays back HDCAM material recorded at 1080 29.97PsF/59.94i and 25PsF/50i modes; with an optional HKJ-101 board, it offers DV encoding and an i.LINK-compatible digital interface, enabling connection to compatible DVCAM equipment for offline editing; as an alternative to an HD or SD studio monitor, a new PC interface via a standard 15-pin D-sub connector allows HD playback in XGA resolution on a computer screen.

**201-930-1000; [www.sony.com/professional](http://www.sony.com/professional)  
Booth: SU4015**



## ASSET MANAGEMENT SYSTEM

### Florical Systems MediaMaster

Now controls the contents of most broadcast-quality video servers using LAN-based asset management; increases the number of commands used to control the contents of video servers.

**352-372-8326; [www.florical.com](http://www.florical.com)  
Booth: SU5425**



## ON-AIR SERVER

### SeaChange Broadcast MediaCluster 24000

Contains up to 35TB; provides fault resilience, multichannel I/Os and standards-based IP network performance; uses 24 drives per server chassis in clusters comprising of three to seven nodes; stores and plays media encoded at 8- to 30Mb/s.

**978-897-0100;  
[www.seachangeinternational.com](http://www.seachangeinternational.com)  
Booth: SU5459**

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# DTV marketplace



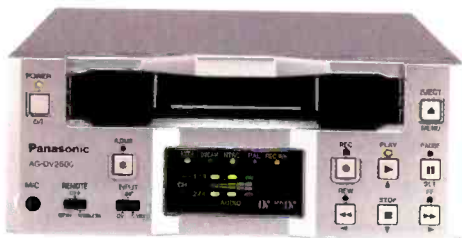
## RECORDING CASSETTE

### Maxell DV-PRO

Newly developed for use in Mini DV and DV systems; offers almost seven times the recording density of VHS tape; reliable for ENG/EPF operations under environmental stresses; offers high picture quality; unique cassette design.

201-794-5900; [www.maxell.com](http://www.maxell.com)

Booth: C3163



## VIDEOTAPE RECORDER

### Panasonic AG-DV2500

Studio or portable VTR, suitable for IEEE-1394-based non-linear editing applications; offers playback compatibility with 1/4-inch-tape-based DV compression video formats and can operate in both NTSC and PAL television standards; can either be AC- or DC-powered, and records on miniDV cassettes or full-sized DV cassettes without the need for an adaptor; the maximum recording time is 276 minutes on a single cassette.

201-392-4127; [www.panasonic.com](http://www.panasonic.com)

Booth: C904

## VIDEOTAPE RECORDER

### Panasonic AJ-HD1700

DVCPRO HD extended-record (EX) format VTR delivering extended recording times, superior low motion and low tape costs for HD program production; records for up to 126 minutes in 60 fields per second 1080i, or 60fps 720p HD video on a single XL size DVCPRO HD cassette.

201-392-4127; [www.panasonic.com](http://www.panasonic.com)

Booth: C904

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## PLAYER/RECORDER

### Panasonic AJ-DX225

Player/recorder suited for high-speed IEEE-1394 based computer editing, dubbing and archiving applications; can support 50Mb/s bandwidth IEEE-1394 play and record of DV Proline and DVCPRO format cassettes at two times normal speed with an appropriately equipped IEEE 1394-based personal computer, server or second AJ-DX225 videotape recorder, providing high-speed lossless dubbing; can also support DVCPRO50 cassette play and record at one time normal speed to an appropriately configured non-linear editing device, increasing its flexibility for newsgathering applications.

201-392-4127; [www.panasonic.com](http://www.panasonic.com)

Booth: C904



## DIGITAL VIDEO RECORDER

### Fast Forward Video Omega Deck

Designed to deliver all the advantages of clean digital video and nonlinear random access with the same controls, inputs and outputs found on current tape decks; whether input is analog or digital, the image date is maintained inside the deck as standard CCIR 601 4:2:2 digital data.

949-852-8404; [www.ffv.com](http://www.ffv.com)

Booth: C186



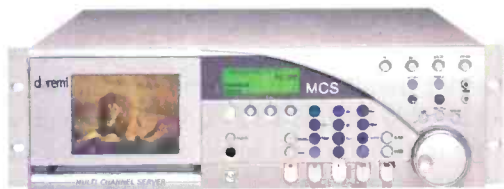
## STORAGE CONTROLLER

### DataDirect Networks SDA3000

Offers eight full duplex FC Fibre Channel host connections, 12 FC drive loops to storage, built-in hardware RAID, full redundancy, an internal bandwidth of 4GB/s, up to 6GB of cache, storage virtualization and parallel port technology, and up to 14TB of storage.

818-700-7600; [www.datadirectnet.com](http://www.datadirectnet.com)

Booth: SL2933



## MULTICHANNEL VIDEO SERVER

### Doremi Labs MCS

Designed for small- to medium-market TV stations and cable facilities; housed in a 3RU chassis; available with different record and playback combinations; video inputs and outputs include composite, S-video, YUV and optional SDI.

818-562-1101; [www.doremilabs.com](http://www.doremilabs.com)

Booth: C879

## SPORTS CONTROLLER

### DNF Controls DMAT-O

Designed for video servers using the Odetics broadcast protocol; allows users to easily generate slow-motion instant replay as well as build and manage highlight playlist playout; features simultaneous recording and playback capability.

818-898-3380; [www.dnfcontrols.com](http://www.dnfcontrols.com)

Booth: SU6127



## MINIATURE DIRECT DV RECORDER

### Laird Telemedia CapDiv

Designed for recording directly to its integrated hard drive from any DV camcorder while shooting; eliminates the lengthy capture process; clips are instantly accessible by the user's NLE system for post production.

845-339-9555; [www.lairdtelemedia.com](http://www.lairdtelemedia.com)

Booth: SL113



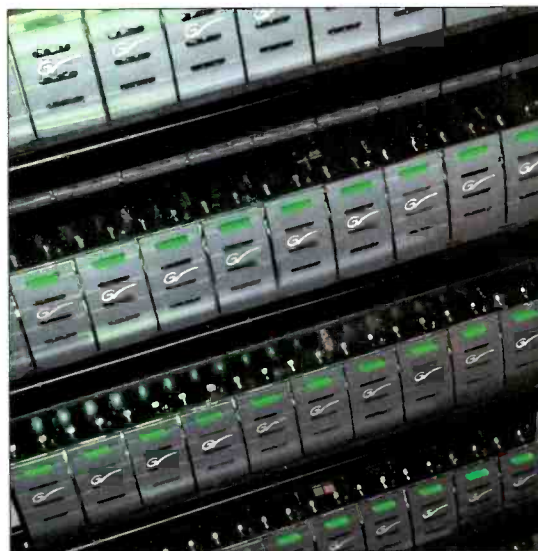
## VIDEO SERVER

### 360 Systems ImageServer 7000

MPEG-2 video server provide up to six video channels, 24 audio channels, and up to 330 hours of storage; file transfer uses the MXF file format over dual Gigabit Ethernet ports; system encodes to 15Mb/s in Main Profile, and to 50Mb/s in 4:2:2 profile; standard features include dual composite and SDI video ports on each channel.

818-991-0360; [www.360systems.com](http://www.360systems.com)

Booth: C2024



## STORAGE ARCHITECTURE

### Thomson Grass Valley Cohera

Features QoS NewsShare technology, which manages bandwidth so that more channels can be squeezed into a given storage configuration; offers open systems capability for easy third-party integration, a common security model for secured engineering log-in access, and broadcast-ready availability and redundancy.

530-478-3000; [www.thomsongrassvalley.com](http://www.thomsongrassvalley.com)

Booths: SU7059, MR7050

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# DTV marketplace



## DV RECORDER

### JVC Professional BR-DV6000

Provides editing functionality and MPEG-4 encoding; compatible with full-size DV tapes for long-time recording or miniDV tapes; can record and play back in NTSC/PAL; has optional XLR audio inputs.

973-317-5000; [www.jvc.com/pro](http://www.jvc.com/pro)

Booth: C2050



## DIGITAL DISK RECORDER

### Accom wsd/HDi

Uncompressed HDTV recording solution features a video disk storage array integrated into its chassis; features new import/export utility for easy interface with graphics networks; stores both SD and HD uncompressed video formats, and optional uncompressed digital audio in the same box.

650-328-3818; [www.accom.com](http://www.accom.com)

Booth: SU7325

## VIDEO SERVER

### 360 Systems ImageServer 2000

New model provides two independent video output streams and simultaneous program ingest; each video channel has two stereo AES/EBU channels, with analog audio I/O included; stores up to 140 hours of video at 12Mb/s, and includes many of the standard features found on the larger 7000 server.

818-991-0360; [www.360systems.com](http://www.360systems.com)

Booth: C2024



## VIDEO LOGGING SYSTEM

### Axon Digital TX-Compliance

Windows Media Player-based logging system can now record four channels of audio and two selectable lines of VBI information in a Windows Media Player format; standard version has a composite video input with two analog audio inputs, and the VBI option provides two lines of Teletext recording and four analog audio inputs; system can record up to 250 days of programming in a RAID-5 configuration.

+31 13 511 6666; [www.axon.tv](http://www.axon.tv)

Booth: SU7303



## NETWORK STORAGE SERVER

### Pinnacle MediaStream

Handles multiple formats, including SD and HD, simultaneously within a single unit; new mirrored storage provides additional fault protection and duplication of content for use in separate offline or on-air applications; new features include a dual-input encoder and import of Avid DV and Liquid blue media, as well as a 900SI server.

650-526-1600; [www.pinnaclesys.com](http://www.pinnaclesys.com)

Booth: SU5003

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## FIBRE CHANNEL-TO-SCSI BRIDGE

### ATTO Technology FibreBridge 1290E

Bridge received SANmark qualification; provides 2Gb performance and quick adaptation to convert products from SCSI to Fibre Channel; available as a standard PCI form factor board for integration into SCSI-based tape libraries.

716-691-1999;  
[www.attotech.com](http://www.attotech.com)  
Booth: SL3033

## NETWORKED MEDIA ARCHITECTURE

### Pinnacle Palladium

Integrates MediaStream, Thunder, Liquid blue and Vortex news systems using fault-tolerant shared storage and common file format; features the Palladium Exchange Gateway to allow Pinnacle and third-party products to coexist in a shared environment; further enhancements will include new storage, management and interconnectivity options; Store 100 version provides over 80 hours of DV25 video storage on a RAID-protected single chassis unit and supports up to 20 editing stations simultaneously; Store 1000 version provides nearly a terabyte of RAID-protected storage.

650-526-1600;  
[www.pinnaclesys.com](http://www.pinnaclesys.com)  
Booth: SU5003

## STORAGE SOLUTION

### Ciprico DiMeda 3600

Addition to the DiMeda line features a Fibre Channel back end, Gigabit Ethernet transport and an embedded software layer on top of the filer head; also enables heterogeneous file sharing, as well as real-time ingest and playback of captured and stored content.

763-551-4000;  
[www.ciprico.com](http://www.ciprico.com)  
Booth: Las Vegas  
Hilton, Suite 5112

## PRODUCTION SYSTEMS

### EVS tapeless sport production systems

Networked/integrated live production solution; provides disk recording and the security and mobility of networking or removable media; covers complete production workflow, from capture of cameras and feeds to nonlinear editing to playout; includes archiving function.

973-575-7811; [www.evs.tv](http://www.evs.tv)  
Booth: C736

## Web, streaming, encoders, ITV

### MPEG-2 ENCODER

#### Vela Argus MX

Features 4:2:2 encoding up to 50Mb/s, 4:2:0 encoding up to 15Mb/s; has an embedded hardware multiplexer for reduced host CPU use; includes an LTC time code input; features four-channel analog and digital audio and four-channel embedded audio in SDI.

727-507-5352; [www.vela.com](http://www.vela.com)  
Booth: SU5704



A PRIMEDIA Publication

# BroadcastEngineering

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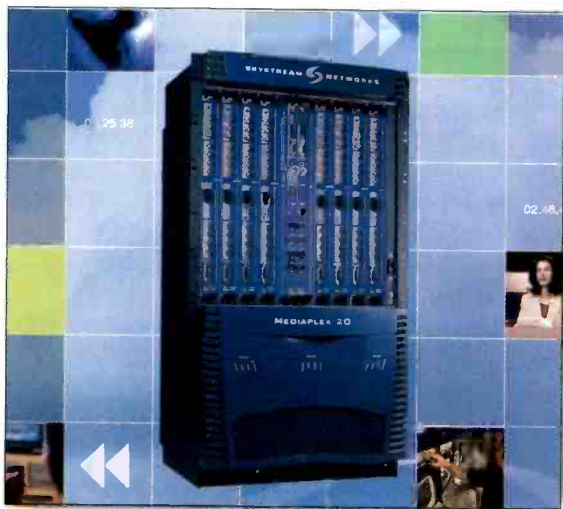
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## SSL's C100 digital broadcast console

BY NIALL FELDMAN

Digital technology has brought us an era in which productivity and operational efficiency have become the keystones that support the modern broadcast operation. These are also the essential criteria by which equipment investment is now measured. A scalable solution is the most efficient way to meet these challenges, while providing development potential for the future.

The issues of audio quality and reliability are, and always will be, of paramount importance in critical broadcast operations. The multichannel, interactive future requires new tools and a new approach from the console. Equally important now, however, is the versatility and user-friendliness of the equipment.

Freelancers are now commonly required to perform complex broadcast operations at short notice.

These were some of the primary considerations that were considered by Solid State Logic (SSL) three years ago. The new C100 digital broadcast console is the its

operation by providing a way for the operator to create dedicated controls for the functions that the production dictates. Essentially, assignable controls – with single functions in the case of this console – save valuable real estate where size is an issue. For some operations though, assignable

### The multichannel, interactive future requires new tools and a new approach from the console.

answer to these requirements. Designed specifically for on-air and live-to-tape applications, the console represents a departure from traditional SSL console control surface philosophy in that the console incorporates assignable, as well as dedicated, controls. We have achieved a compromise between the two modes of

control isn't fast enough. This is where dedicated controls are necessary.

#### A new approach

The console's main control section features an interactive touch screen that is used with associated hardware controls to allow control of the console's

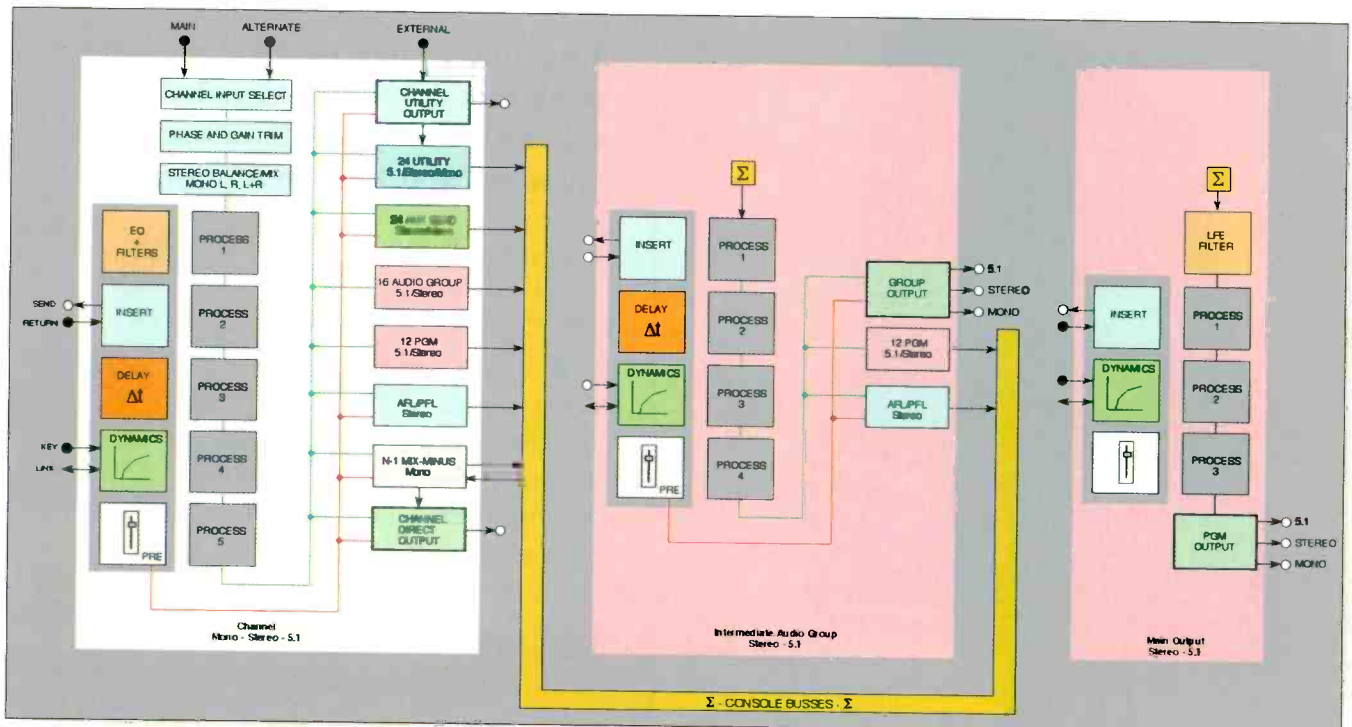


Figure 1. Advanced broadcast architecture is designed to provide the numerous mixes that are now a standard requirement in broadcast production.

80 mix busses within a single bay width. This also means an operator is aware and in control of the system status at every move. Graphical displays guide the operator through the bussing options.

To further decrease setup time, the console's Netbridge interface allows offline console setup over a network from a simple graphical template. An operator can configure setups for shows or segments, and freelancers can work faster and more efficiently.

At the heart of the console is the new Centuri processing core, a fast, built-for-purpose processing engine designed for live use. The processing and all major system components are designed to address the demanding requirements of on-air operation. The self-healing DSP enables continued operation through intelligent processing monitoring, while key system components including fader cassettes have been designed to be hot-swappable. Redundant power supplies with automatic takeover have been incorporated and the system boots from cold in a matter of seconds.

Further operational stability is provided by the 15U airflow-mapped chassis and the ability of the bays to be powered down for servicing without affecting audio continuity.

### Advanced broadcast architecture

The C100 addresses broadcasting's demand for inputs and outputs by providing up to 128 input channels and more than 80 output mix busses, including 48 busses designed to provide the numerous talent, production area and communication mixes that are now a standard requirement in program creation. (See Figure 1.) Productivity is further enhanced with 5.1, stereo and mono signal path configurations on all channels from source through to destination, which simplify reversioning. The console's program, audio subgroup and aux busses all have dedicated processing, and any channel may be used as a bus master. Broadcast-specific features on the master channel include two independently configurable channel outputs for simultaneous N-1 feeds and parallel multichannel recording, fully adjustable signal delay, and separate talkback and tone buttons for channel outputs.

As broadcasters require their stand-alone equipment purchases to be readily integrated into complete production systems, comprehensive GPI tools on the console meet a

wide range of practical integration applications, including audio-follow-video and advanced control to and from external equipment. A complex sports mix can now accurately follow the vision mixer for camera angle changes, while the operator retains control of the camera/mic level, commentators and all of the other production sources.

### Audio-follow-video

The C100 incorporates the advantages of instant reset and takes this feature to a new level with SSL's proprietary control linking technology. This feature allows per-channel recall of default settings for a source when routed to an input, including format, bussing, GPI control and audio processing parameters. Control linking enables operators to save time by using previously stored setups and templates.

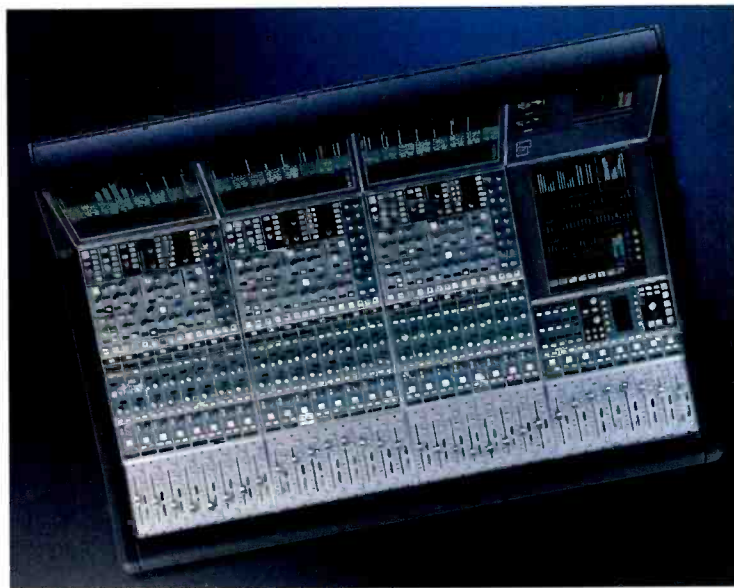
Furthermore, the advanced project management system provides further productivity benefits by combining control linking with snapshot automation for the storage and recall of global settings. Offline setup capability en-

ables engineers to pre-configure the console for forthcoming sessions more comprehensively than before—including the Internet transfer of setup session templates via the Netbridge TCP/IP interface or by disk. Netbridge additionally facilitates optional full remote diagnostics over private or public networks.

In busy production environments, the C100's monitor section is fully equipped for fast and flexible monitoring of many different sources with dual independent monitor signal paths for main (5.1) and mini (stereo) outputs, and integral 5.1-to-stereo downmix for format checking with mono compatibility assurance.

One of the most significant broadcast advantages of the console lies in its scalability. While each console is built to order and tailored to specific technical and budgetary requirements, future expansion to the control surface, DSP and I/O may be accommodated through a clearly defined path. In this way, the productivity and working life of the console is readily extendable. This adds to the potential value of the investment while minimizing the initial cost. The C100 is designed for the digital broadcast challenges ahead. **BE**

*Niall Feldman is director of product marketing for Solid State Logic.*



The new C100 digital broadcast console represents SSL's interpretation of modern broadcasting requirements.

# Wavelength division multiplexing

BY RONNY SLETTENG

Throughout the last decade, optical fiber has gained more and more popularity as a transmission medium. The unprecedented capacity of the fiber makes it an ideal medium for transport of digital video or other high-bandwidth signals. An increasing number of TV stations use fiber instead of coaxial cable even for in-house applications. A fiber cable typically consists of a number of individual fibers. Four, 12, 24, 48 or more fibers in a cable are common. Today the majority of installed fiber is so-called single-mode fiber, even for in-house distances. Multimode fibers are mostly used for short-haul data applications.

If you have reached a stage where you have used all your installed fibers, the time has come to consider putting more signals on the same fiber instead of deploying a new fiber

of the same type are multiplexed together electrically before they are put on a single wavelength. An alternate solution is to transmit each optical signal on a different wavelength, known as wavelength division multiplexing (WDM). This is analogous to transmitting different radio channels on different frequencies

It is quite common to talk about different colors of light instead of wavelengths when describing WDM systems. A number of different wavelengths will, in this case, be denoted as a set of colors. A WDM channel is a signal running on a unique wavelength. Each WDM channel is completely independent of the other

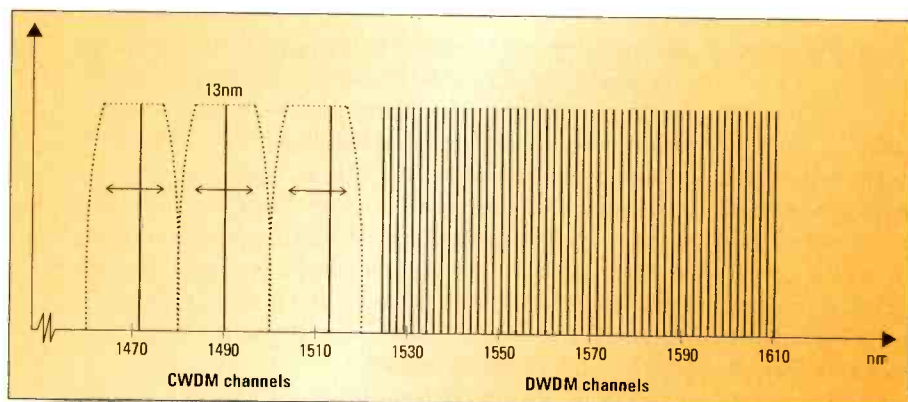
**It is quite common to talk about different colors of light instead of wavelengths when describing WDM systems.**

through air. Recalling the school experiments with white light and prisms is also useful in understanding WDM. The visible white light can be split (demultiplexed) into its components by a prism in the same

channels, both with regards to bit rates, as well as protocols, so running a mixture of SDI, HD-SDI, SDH/SONET, Gigabit Ethernet and Fast Ethernet on the same fiber is easy to do with WDM.

Multichannel WDM exists in two flavors; one is called dense WDM (DWDM) and the other is called coarse WDM (CWDM). When it comes to transporting lots of digital video over a single fiber, DWDM as a technology is very effective. On the other hand, if you have a short fiber span and need a few channels more, CWDM, with its lower cost per channel, can be a good alternative to laying new fiber cable.

Let us take a closer look at the two implementations of the WDM technology. DWDM uses temperature-stabilized lasers in order to fix the center wavelength and narrowband filters, giving many densely spaced channels. Typical channel spacing for broadcast-class DWDM equipment is 100GHz, corresponding to a channel spacing of approximately 0.8nm, thereby avoiding the need for wavelength lockers. The wavelengths



**Figure 1. Comparison of bandwidth needed for coarse WDM and dense WDM. The CWDM channels are spaced 20nm apart due to the drift of the laser wavelengths (max 13nm peak to peak) and will fit a maximum of eight channels in the range from 1470nm up to 1610nm. The DWDM channels are spaced about 0.8nm apart, and due to temperature stabilization can be put close together. Only 1/3 of the DWDM channels possible are shown in the figure.**

cable. There are different ways to transport more data on a single fiber. One can use time division multiplexing (TDM), where many signals

way as the invisible WDM wavelengths on the fiber can be demultiplexed at the receiving end by an optical filter.

used are specified in ITU-T recommendation G.694.1 and the technology is well proven.

CWDM, on the other hand, uses non-stabilized lasers in combination with broadband filters, which gives a coarse spacing of 20nm between channels. CWDM transmitter cards have lower power consumption than DWDM transmitter cards since there is no need for temperature control of the laser diodes. The CWDM wavelengths are standardized in ITU-T Rec. G.694.2. The difference in bandwidth usage between CWDM and DWDM is shown in Figure 1.

Network Electronics' flashlink system offers efficient solutions for both

frame and one upgrade port allow a four-channel system to be upgraded to more channels in the future. The

practical distance for CWDM systems with more than eight channels. Most current systems use the wavelengths

from 1470nm up to 1610nm. Fiber reducing the water peak attenuation is available for new installations, but more than 99 percent of the already installed fiber is standard single-mode fiber. CWDM is, therefore, best suited for in-house applications and shorter distances with a low channel count. If the future

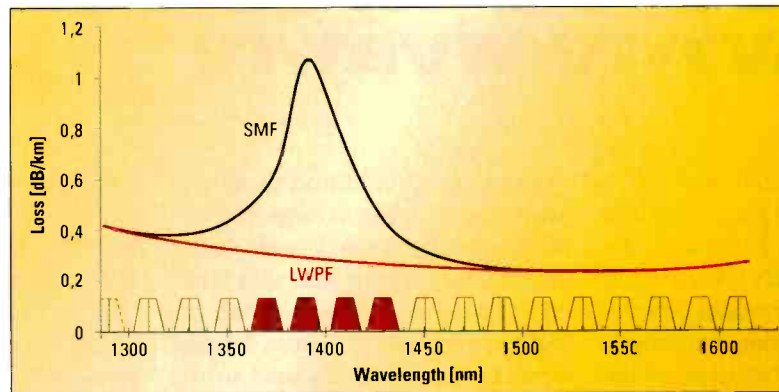
bandwidth need is expected to exceed eight channels per fiber, DWDM would be a better solution. It offers several tens of available channels in the range from 1530-1610nm

(see Figure 1). The uniformity of the fiber attenuation over the DWDM wavelengths is better than the CWDM range, as seen in Figure 2, so for medium- and long-haul applications DWDM would be the best solution, even for low channel counts.

The flashlink system has solutions for both CWDM and DWDM, and offers the flexibility to upgrade a CWDM system with a number of DWDM channels, as shown in Figure 3, for the best of both worlds. Multichannel WDM is a technology that will be part

of optical networks for many years to come.

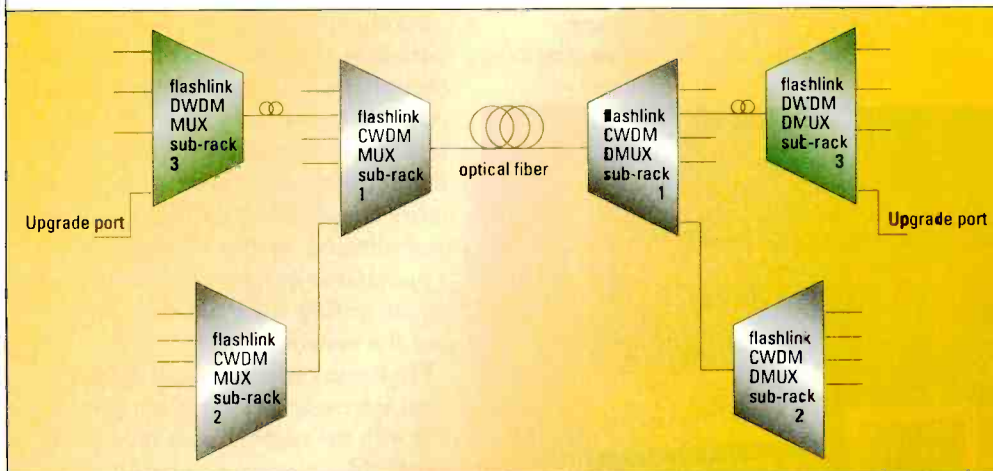
BE



**Figure 2. Example of single-mode fiber attenuation for the wavelength-range 1280-1620nm. The CWDM channels proposed by the ITU are indicated at the bottom of the figure. As indicated, four channels around the water peak of standard single-mode fiber cannot be used due to the high attenuation of the fiber. Use of all channels needs a special low-water-peak fiber.**

architecture also offers added design flexibility.

The new ITU specification opens for 18 CWDM channels on a special type of fiber, using wavelengths spanning



**Figure 3. Example of a combined CWDM and DWDM system, incorporating the 4+1 system architecture. A single CWDM channel is replaced with a set of DWDM channels, thereby increasing the number of channels on the fiber in a cost-efficient way. This can be done with several CWDM channels in the 1530-1610nm range. Here, as well as for all optical systems, the optical transmission budget must be calculated and verified before the installation of equipment.**

CWDM and DWDM applications.

The flashlink CWDM architecture is based on the well-established 4+1 architecture used in the flashlink DWDM system. Four channels per

from 1270-1610nm (see Figure 2). The difference in fiber attenuation over the wavelength range, including the water peak at 1383nm of the standard single-mode fiber, limits the

## Vinten AutoCam at WAVY-TV/WVBT-TV

BY LES GARRENTON

**N**BC affiliate WAVY-TV and FOX affiliate WVBT-TV, cover the Norfolk/Virginia Beach, VA, television market from the same studio complex and share all production equipment. With a typical week consisting of the production of well over six hours a day of live news, news production and breaking news coverage, the two stations needed a way to improve on one of the more expensive and labor-intensive aspects of their operation.

Prior to the installation of Vinten AutoCam robotics, studio cameras were always operated in a completely manual mode with a full studio crew. In addition, logistical issues would often pop up – for instance, the separate productions of two late newscasts would occasionally overlap due to network overruns on one of the

stations. So, in addition to simply pursuing the labor savings that automating camera movements would provide, the stations were also looking for a better way to deal with the logistics of producing news for two separate stations co-located in the same facility.

In the process of shopping for robotics

went quickly and smoothly. Prior to the arrival of the manufacturer's technicians, we had measured all cable lengths and had them shipped in, ready for installation. We had also determined the location of the control positions and were prepared for the necessary equipment. This made it easy for the technicians to get the hardware assembled and begin

**Viewers were no doubt completely unaware that there had been any change at all.**

systems, we quickly narrowed the field down to two potential suppliers, with totally different types of systems. We chose the AutoCam solution because it would allow us to continue to use our existing Sony BVP-500 cameras.

The actual installation and training

the setup process. They placed the cameras on the new X-Y pedestals, and aligned and balanced them. The support equipment was placed in racks at the control position.

We chose to locate the control positions within the two studios, although it would certainly have been possible to locate them in the control room. Locating the controls in the studio seemed to provide a more intuitive feel for the operator, and allowed operators to glance at a pedestal to quickly reorient themselves during the process of learning the system.

The transition from manual to robotic went extremely well. We planned to go live with the system over a three-week period. In fact, we went live within two weeks because of the initiative of the crew and how quickly they learned to reliably control the system. There was only a short interim period during which camera operators were physically in place behind the cameras, operating the new robotic pedestals in a manual mode until the robotic operations were practiced to the point where everyone was confident that a show could be produced without error.



The control positions were located within the two studios to provide a more intuitive feel for the operator.



Viewers were no doubt completely unaware that there had been any change at all; we programmed all the same camera shots that we had been using before in order to provide continuity. Gradually new camera shots and angles were added to take advantage of the system's ability to store



**WAVY-TV and WVBT-TV selected Vinten AutoCam robotic camera controls because the new systems allowed the stations to preserve their investment in Sony BVP-500 studio cameras.**

many events.

When scripting a show using robotic camera operation, it is necessary to be sure that the shots being called for are technically and physically feasible. Camera position conflicts have to be resolved, and the time required for the X-Y pedestals to maneuver over a certain distance has to be taken into account. These would be issues for facilities using manual camera control as well, but with automation control any errors in planning are more difficult to correct at the last second.

### System performance

The shows produced using camera automation look cleaner and more consistent, due to pre-programmed shots being used day in and day out. Using the same shot library across all shifts results in more consistency.

After the better part of a year, the system has proven to be reliable. Customer service personnel have quickly dealt with any small problems that have arisen. For the best results, the system does require a clean studio floor surface, and we have found that bits of old floor paint enamel have occasionally clogged up the optical sensor positioning mechanisms. We are planning to strip the enamel paint from the floors and repaint them with hard, epoxy-based paint. This should result in an even more reliable system that requires less frequent targeting to maintain accurate positioning.

**BE**

*Les Garrenton is director of engineering for WAVY-TV/WVBT-TV.*

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# Starz Encore automates with OmniBus' Colossus

BY RAY MILIUS

**W**hen the Starz Encore Group, a U.S. provider of cable- and satellite-delivered premium movie channels, moved to a new purpose-built facility in Denver, CO, it decided to replace its existing tape-based system with a server-based operation. This transition demanded a solution that met specific operational requirements, while also providing the scalability needed for future expansion. It needed an automation system that could control all its primary channels – including time-zone variations – as individual schedules in real time while offering full parallel backup of all streams and preview channels. The solution also had to move material between servers, accommodate the transfer of material from the data tape archive system into

the servers, and allow extra channels to be added at little extra cost.

The group commissioned OmniBus Systems to provide the technology to handle not just the movie playout but also the ingest process, asset and me-

channels, focus in on any single stream and quickly identify any specific problems in terms of missing media or failed devices.

A single Colossus system handles a total of 52 channels (26 primary chan-

**One of the challenges the group faces is the sheer amount of material the master-control operators have to process.**

dia management, and the movement of material around the facility. OmniBus' Colossus – a multichannel, multiformat content delivery and control system – provides a timeline-based display that allows the operator to monitor the status of multiple

channels and 26 backup channels) and can accommodate the East and West Coast feeds of all Starz Encore's primary channels. This master-control operation is manned 24 hours a day by a team of three: two master control operators and one supervisor.

At its previous facility, Starz Encore contracted its playout operations through a separate company. With the relocation, the group brought the operation in-house, resulting in a savings of millions of dollars. In addition to controlling movie and interstitial playout, the system also controls Pinnacle MediaStream 700 and 1600 servers for media acquisition, global asset and media management (GAMMA), and the system infrastructure.

One of the challenges the group faces is the sheer amount of material the master control operators have to process. One screen of the automation system's user interface accommodates a large number of channels, giving the operator a quick idea of what's going on, where the next break is coming up and what's happening on the system. (See Figure 1.)

Much of the quality-control process, which was previously carried out



Operators at Starz Encore's broadcast operations center monitor 26 primary channels and 26 backup channels using the Omnibus Colossus automation system.



## HDTV equipment

BY JOHN LUFF

A decade ago, would any of us have guessed that today we would see a rapidly expanding market for HDTV programming and a demand for HDTV hardware? Perhaps some might have, but few of us would have foreseen the wide range of equipment and features now offered.

We can make some generalizations about HDTV equipment. It is almost always digital. Any analog equipment is likely to be interfaces or monitoring products (CRT or plasma displays). It is likely to be more expensive than 525/625 equipment, though by a margin narrower than many think. It is likely to use slightly more power than standard-definition hardware, and likely to support multiple standards. It is probably only slightly larger or heavier than SD hardware, and probably provides features similar to its SD counterpart. With these characteristics in mind, let's review some key product categories in a bit more detail and see how they stack up against SD equivalents.

### Cameras and lenses

The price of professional camcorders and lenses has fallen steadily for years. Full-featured 480i news camcorders are available for under \$20,000. Indeed, some consumer camcorders are better than the EFP cameras of a few years ago. One need only remember the first CCD cameras (the RCA Hawkeye, for instance) to

see just how far we have come. The Hawkeye, a vintage 1984 camera, had no recorder and was 525, not HDTV. By contrast, the Sony HDW-700A has approximately four times the resolution, vastly superior performance,

and weighs considerably less than the Hawkeye did. And the Sony camera costs less in depreciated dollars than the RCA did almost 20 years ago. Now that's progress!

### Image sensors

All television (at least the picture portion) starts and ends with light. The camera we need for HDTV acquisition has the same fundamental objectives as an SDTV camera. But the

**HDTV equipment is likely to be more expensive than 525/625 equipment, though by a margin narrower than many think.**

lens focuses the light onto a different kind of sensor – different in resolution and aspect ratio and, in some cases, different in structure.

All SDTV sensors operate in interlace mode. But not all HDTV

sensors do. The momentum behind progressive-scan systems (1080p24 and 720p60) is real. Thomson Grass Valley offers a camera with a sensor that can be reformatted for anything from 480i to 1080p in many different aspect ratios. The company does this by substantially oversampling the sensor to the tune of 9.2 million pixels. By combining rows of pixels from the 1920x4320 sensor, the camera can produce almost any number of lines you might want. This is a significant benefit for mobile companies, many of whom recently flocked to this camera to enable multi-standard native imaging. By combining



**HDTV production switchers like the Kalypso production center from Thomson Grass Valley include the full range of features and effects found in equivalent digital 525/625 models.**

columns of pixels, the horizontal "scan" can accomplish native 1280 imaging, or 720 for 480 applications, though that would be gross overkill. Hitachi, Ikegami, JVC, Panasonic, Sony, Thomson Grass Valley and others have HDTV camera systems with a variety of options and image formats.

### Fiber optics

What's most interesting is that today these cameras can operate on standard triax camera cable, though at a shorter distance than a native fiber-optic camera cable system. Until recently, it was assumed that HDTV cameras would have to use fiber-optic camera cable, and SMPTE diligently worked to establish a common standard for all manufacturers to use for fiber camera cable. Lenses also have become so good that the difference between SDTV and HDTV versions is slight. One lens manufacturer simply says all of their ENG lenses are HDTV compatible.

### Recorders

HDTV acquisition without recording would be a throwback to the early days of television, when there were no recorders. Contrast the Ampex AVR-1 to the Panasonic AJ-HD130DC DVCPRO HD recorder. Keep in mind that the AVR-1 weighed over 2000 pounds more than the AJ-HD130DC, while the HD recorder consumes about one percent of the power and produces obviously higher performance. An hour of quad tape weighed over 20 pounds. A single DVCPRO HD tape (currently less than an hour) weighs about a percent or two of the quad tape weight. The DVCPRO's effective writing speed is much lower, but the information density on the tape is far higher.

Recently, JVC announced a consumer camcorder that weighs a pound or so that can shoot 720p footage. That shows the phenomenal changes in the technology in 30 years.

HD recorders come in several fla-

the picture to as few as 1280 pixels horizontally from 1920 in the native picture. That is important because mastering should be performed with a minimum of filtering and compression. Finally, don't miss the Sony op-

**Today, many HDTV cameras can operate on standard triax camera cable, though at a shorter distance than a native fiber optic camera cable system.**

vors. Some record and play HD only. Others record and play HD and SD formats, and a third group records and plays HD, but also plays SD. Perhaps the most versatile VTR on the market today is the Panasonic AJ-HD3700H. This system records and plays all HDTV formats, as well as all 525/625 formats, at multiple frame rates (23.98, 24, 25, 29.94, 30, 50, 59.94). It can be

tical storage camcorder that uses MPEG-4 compression.

### Switchers

But having outstanding shooting and recording capability without switching would be like having cappuccino without the foam. Fortunately, HDTV production switchers have significantly grown in capability over the last several years. At this year's NAB, we will see HDTV production switchers with the full range of features and effects that we have come to expect in 525/625 digital equivalent models. Sony has a multiple-standard switcher (MVS-8000) that supports the most popular HDTV formats (1080i, 1080p24, and 720p60) as well as SMPTE 259M SDTV formats. Only a few years ago, this would have been complicated technically, and

extremely expensive. Also, Thomson Grass Valley will introduce its HD Kalypso production center.

This versatility is important to the implementation of HDTV production studios and mobile units. Though the cost of serious production switchers has come down considerably since the first "large" HDTV switchers (which might have cost almost \$1 million with DVE)



**The Panasonic AJ-HD3700H records and plays all HDTV formats, as well as all 525/625 formats, at multiple frame rates.**

used for mastering in an HDTV format and releasing in many formats and many standards. Like HDTV VTRs from Hitachi, Ikegami, JVC, Panasonic, Sony, Thomson Grass Valley and others, it includes an internal downconverter.

Significantly, the VTR does not pre-filter the signal, preserving detail and color fidelity. Some VTRs subsample

debuted a few years ago, \$500,000 is still a major investment. The ability to switch to 525 production at will gives producers the freedom to seek revenue wherever it exists in the waning years of SDTV origination.

### The whole enchilada

A complete range of HDTV products is available today. In addition to conversion products (which were the subject of this column recently), you can purchase test-and-measurement products, master-control switchers, routing switchers (wide-bandwidth and HDTV-specific), character generators, keys, closed-caption inserters,

analog-to-digital converters, video servers and, of course, monitors. At

HDTV facility if the hardware is ubiquitous and modestly priced?

Mostly, you must research the features you need and compare them with those the manufacturers support. Take care not to shoot too high because, at the upper end, HDTV can still be very expensive. But you can bet that the cost of tomorrow's HD equipment will be nearly as low as

BE



FOR-A offers three high-definition versions of its compact Hanabi DVE/switcher.

the beginning of the transition to HDTV, it was hard to find some types of equipment at all. Now you have an array of equipment for most needs, and a range of prices and feature sets.

So what do you need to design an

that of SDTV systems today.

John Luff is senior vice president of business development at AZCAR. To reach him, visit [www.azcar.com](http://www.azcar.com).



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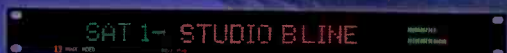


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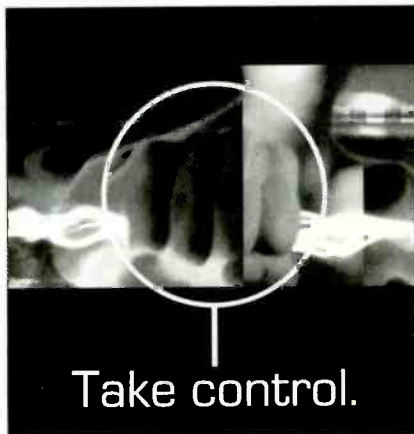
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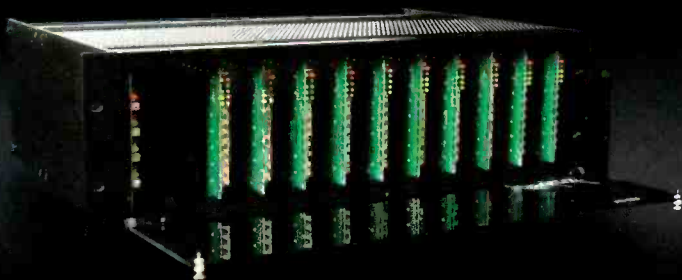
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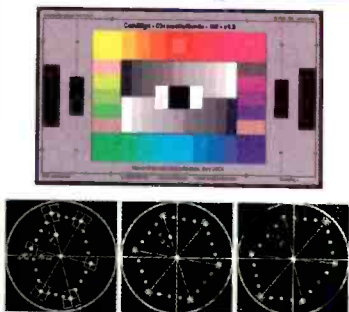
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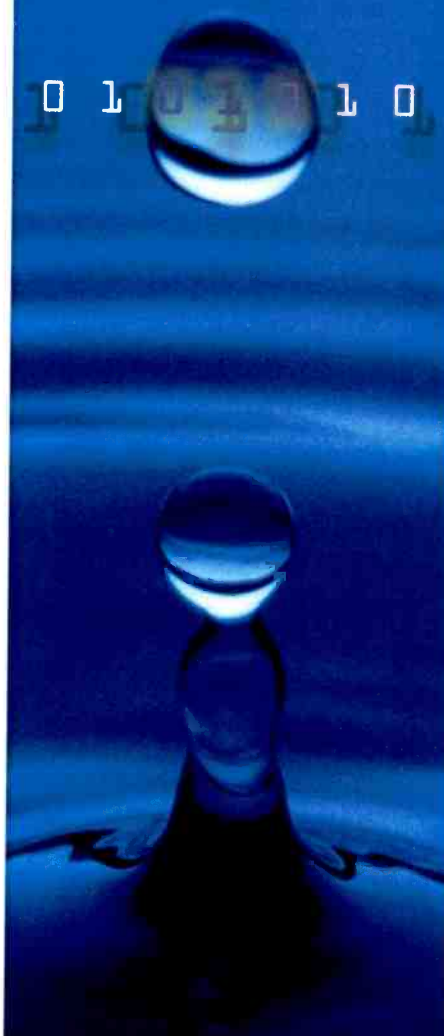
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# Deck the halls

BY PAUL MCGOLDRICK



**F**or the first time in many a year – certainly since before the death of the Rotunda and the old North Hall (where the South Hall now is) – it will be possible to stay in the same air-conditioned space for the whole of this year's NAB in Las Vegas. This has not been achieved by some geographical miracle, like switching points of the compass again, but by eliminating the Sands Convention Center from this year's show and squeezing everybody into LVCC space. If you are staying in the Las Vegas Hilton, you can use the bridge between the Hilton and the convention center and avoid the sun and desert air for six days.

But don't get lost in the South Hall! There are now five ways into the building and shuttles will unload at both the east and west ends, although it should take attendees only a day or so to work out which end is fastest for them. And if you have to get to a meeting room you'd better leave extra time if you don't know whether the room is in the old building or in the space wedged mid-air between it and the South Hall – they're probably 15 minutes apart across the main TV/Video/Film convention floor.

RTNDA gets help in driving visitors by opening its exhibit space in the Hilton the Sunday afternoon before the main exhibit halls open. But in general, of course, most people will not arrive until that Sunday, as all the hotels with casinos strictly limit Saturday arrivals, catering to their frequent Friday/Saturday night gambling guests from southern California.

The Chairman and three of the four FCC Commissioners will be on hand for the Chairman's breakfast and a "Regulatory Face-Off," and one hopes that attendees will bring some tough, but real, questions to that event. Spectrum allocation is going to get hairier

in the next few years, from the suggestion (in this column) that the Commission is angling for ways to charge broadcasters for spectrum, to the way it implements the suggestions in its own internal reports for making better use of spectrum that is allocated, but not actually occupied, in some areas of the country.

terrestrial TV broadcasting has increased slightly over previous years (to 85.3 percent, from 84.1 percent the previous year) – but only because the number of U.S. households has increased – while advertising revenues continue to fall (from \$41 billion in 2000 to \$36 billion in 2001), as has viewer share (from a 63 prime-time share in the 2000-2001 season to a 59

**Bring your checkbook and your shopping list and enjoy the annual working party that is NAB.**

2003 is likely to be pivotal in the broadcasting industry. Whatever doom and gloom about the economy you've read in your daily newspaper is really not factual. Everybody in the technology business knows that the economy has been ticking up every month since about April 2002 and, as of this writing, most companies are seeing numbers that look like late 2000. We effectively seem to have gone through the busting stage and are now on the slowly rising gradient that we were on before. With the pressure on for DTV, with rules eased on power levels, and with a need for a new generation of equipment to replace the old, broadcasters at NAB will be in a buying mode.

High on the shopping list will be more NTSC transmitter replacements. Sales in this arena are already quite high, and there is an incredible amount of equipment currently in service that is truly hanging on by its tube bases. The stations who are in the market for analog will be looking for equipment that they can either get value out of for 10 years or so, or they will be looking for product that can be converted for DTV when the time is right.

The number of TV stations in operation is still growing, from 1678 in 2001 to 1712 in 2002, and the penetration of

share in 2001-2002).

But while TV broadcasting is certainly not a license to print money, and hasn't been for quite a few years, that 15 percent of the population that uses terrestrial services should still be a good base for the industry to keep investing for some years ahead. It will be difficult for this country to accept the disappearance of "free" broadcasting services and the industry needs to play on that by always being in the vanguard of content delivery.

But while this should be a bumper NAB, there are some negatives. The organization tells us that the floor will be occupied by two dozen "related industries." Who are they, why are they at our convention, and how do you avoid them? Nevertheless, bring your checkbook and your shopping list and enjoy the annual working party that is NAB. Maybe we can turn our newly acquired halls into a much better controlled space than previous years, and we can rejoice at all those inter-convention center shuttles we don't have to line up for in the hot sun. **BE**

*Paul McGoldrick is an industry consultant based on the West Coast.*



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