Extron MediaLink™ System
Affordable, One-Touch A/V System Control

The MediaLink System is a family of easy-to-use and inexpensive products aimed for use in small classrooms and boardrooms. The MediaLink Controller is the brains of the MediaLink System; use it by itself for controlling the most basic, one-projector system or add a switcher to expand on the projector’s I/O capabilities.

Scenario: A university is incorporating presentation systems in buildings across the campus. The faculty members are apprehensive—they look forward to being able to incorporate computers, document cameras, and video source materials but don’t want the time-consuming hassle of dealing with confusing, frustrating equipment. At the same time, the university needs to be on the cutting edge of technology to vie for the best students while watching the bottom line.

What’s the solution? Extron’s MediaLink Controller (MLC) 206. The flexible MLC 206 acts as an extended remote control panel. It is not a switcher; instead, it tells the projector when to switch between its various inputs. The MLC 206 offers universal projector control; it controls a projector’s power on/off, input switching, and volume control. The MLC 206 offers intuitive equipment and room control with clearly labeled buttons and one-button functionality. For example, to select the PC image for display, push the button labeled “PC.” The room control features of the MLC 206 can be configured to control functions such as screen settings or room lights.

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Consistency and Simplicity: Intuitive Control in a Secure System

Presenters with little or no training can walk into any multimedia classroom and operate the AV system. The MLC 206 standardizes the control interface for all systems, making projection systems simple to use. No matter what type of projector is used, the control interface remains the same. Standardization makes setup and maintenance easier to support. Training and setup time and effort are minimized or even eliminated for faculty and support staff—no frantic tech support calls two minutes before class begins. (See Figure 1.)

Especially vital for high traffic areas, the MLC 206 is housed in a secure enclosure with labels that are not easily altered. It has the same look and functionality no matter where it is mounted: in a lectern, desk, wall, or rack.

Display and Room Control

Projector control is easy-to-do and requires only a one-time setup. The MLC 206 uses RS-232 or IR control drivers (These drivers are available for download at www.extron.com). A custom configuration mode is available to allow for user-defined IR or RS-232 commands. User-friendly IR learning capabilities make the MLC 206 compatible with almost every type of IR-controllable device.

Room lighting, screen settings, and other device functions may be controlled through the MLC 206’s room function, via internal relays. Input selection buttons are clearly labeled using backlit displays and plastic overlay labels. The convenient inactivity timer automatically shuts off the projector after a user-defined period of time. System volume can be adjusted using a knob on the front panel of the MLC 206.

Extron offers a variety of optional Architectural Adapter Plates (AAPs) that are completely compatible with the MediaLink System. Modular AAPs provide additional signal pass-through connections or device control. Optional mounting kits are available for mounting under a desk or in a podium, wall, rack, or wall box. The MLC 206 and most of its accessories are available in grey, black, or white for architectural integration.

Architectural Integration with the MediaLink Controller

There are a variety of mounting configurations available for the MLC 206, which ships with a three-gang wall plate for mounting in a wall, desk, or lectern. An optional five-gang wall plate is available with Architectural Adapter Plate (AAP) openings, which enable use of AAPs to add signal pass-through connections or device control. Optional mounting kits are available for mounting under a desk or in a podium, wall, rack, or wall box. The MLC 206 and most of its accessories are available in grey, black, or white for architectural integration.

Adding the MediaLink Switcher to the Mix

For larger-scale, one-projector systems, almost every Extron switcher can work with the MLC 206, including the MediaLink Switcher (MLS) Series. The six input MLS offers video, computer video, and audio switching and provides unique features such as pre-amp volume and tone control, making it and the MLC 206 a budget-conscious combination ideal for classroom or boardroom environments that require additional inputs.

There are four models of the MediaLink Switcher available: 
- MLS 306 (variable audio output) 
- MLS 506 (variable audio output) 
- MLS 506MA (mono audio amplifier)  
- MLS 506SA (stereo audio amplifier)  
Each can also be used as a stand-alone switcher.

A/V Connections of the MediaLink Switcher

**MLS 306 (Variable Audio Output)**

The MLS 306 accepts composite video, S-video, and RGB. Inputs #1-3 accept composite video or S-video. Inputs #4-6 accept RGB. The MLS 306 accepts composite video on BNCs, S-video on 4-pin mini-DIN.
connectors, and RGB on 15-pin HD connectors. The MLS 306 provides dual RGB output on BNCs and a 15-pin HD connector; composite video or S-video is output on BNCs. The MLS 306 accepts and outputs balanced or unbalanced audio on 3.5 mm captive screw connectors. Inputs #4-6 on the MLS 306 also accept unbalanced audio on 3.5 mm mini stereo audio jacks for use with Extron 15-pin HD with Audio extension cables.

**MLS 506 Models**

MLS 506 models use BNCs to accept and output all signal formats. Inputs #1-3 accept composite video, S-video, and component video. Inputs #4-6 accept RGB. MLS 506 models output composite video, S-video, component video, and RGB on BNCs. For balanced or unbalanced stereo audio inputs, they provide 3.5 mm captive screw connectors. Line level audio is output on 3.5 mm captive screw connectors.

**MLS 506MA (Mono Audio Amplifier) and MLS 506SA (Stereo Audio Amplifier)**

The MLS 506MA offers a 30 watt, mono amplified output on screw terminals for a 4 or 8 ohm load or a 70 volt, distributed audio system. (See Figure 2.) The MLS 506SA offers a 60 watt, stereo amplified output (30 watts per channel) on screw terminals for use of 4 or 8 ohm load speakers at the front of the room.

In addition, the MLS 506MA and MLS 506SA offer three significant audio benefits: an auxiliary audio input, mixing, and an effects feature. An auxiliary line-level audio input, such as a wireless mic, may be mixed with the switched audio signal with the use of the switcher’s internal mixer. Further audio processing can be applied externally via the effects loop-out. The MLS 506MA or MLS 506SA can then output the externally processed audio.

**Additional Features of the MediaLink Switcher**

The MLS models provide a variety of benefits to enhance a presentation and facilitate low-cost system integration. All models have 300 MHz (-3dB) video bandwidth to maintain signal integrity. Triple-Action Switching™ (RGB delay) blanks the screen during switching of RGB signals to eliminate visible switching transitions. Volume plus bass and treble adjustments for each audio input are available. Audio input levels may be adjusted from –15dB up to +9dB. To prevent changes by unauthorized users, an executive mode allows security lockout of front panel buttons except for input selection and volume adjustment.

Switcher control is available through front panel buttons, contact closure, or RS-232. RS-232 control is provided via Extron’s Windows-based control software and/or a third party control system using Extron’s Simple Instruction Set™. When the switcher is used with the MLC 206 for low-cost system integration, the MLC can remotely control the MLS’s I/O switching and volume control.

All MLS models are rack-mountable and include mounting brackets. The MLS 306 is housed in a one rack width, 1U high enclosure. The MLS 506, 506MA, and 506SA are housed in one rack width, 2U high enclosures.

The centerpiece of the MediaLink System is the MediaLink Controller (MLC) 206. That’s all you need to control the projector’s input switching. If required, select the appropriate mounting option and accessories for the controller. Add a MediaLink Switcher to gain additional projector inputs. There you have it: a low-cost, complete control system for a small classroom or boardroom. The MediaLink System takes the complexity of system operation and replaces it with one-touch system control.
Well, now that we all seem to have the “dot com” craze squarely in our rear-view mirrors it may be time to re-evaluate and re-assess your web strategy.

It used to be very simple—“I need a Web presence because, well, everyone has one and I don’t want to be left behind!” The craze was thick and hard to ignore. Avoidance was a sign of sluggishness and communicated that you were behind the times. A progressive site with all the bells and whistles demonstrated state of the art technology (and was very cool). This was enough for a while and served the main purpose, which was to be “in the game.”

The Web is a wonderful medium to communicate and interact through. However, the nature of the communication and interaction is different from normal, everyday direct interaction. For many in our segment of the professional A/V industry, things just haven’t been adding up. Missing was the windfall and pay-off from being present on the Web. Why? Strategy mismatch.

Where to start? All strategies are merely plans to achieve objectives. What are the objectives? What have we learned from the evaporating hype behind many Web strategies? And don’t forget, how and where does your investment in the Web pay off for you? The Web is many things to many people. The most important factor is what it means to your customer. The importance and value for you may be very different from what it is for our colleagues in the consumer world, IT world, and other industries.

One of the clear business models that remains viable is the delivery of commodity products. Commodities are products everyone needs and knows well. Inventory and price are some of the most basic things that can easily be served through Web outlets. However, we are not in the commodity business (at least most of us in the systems integration side of the professional A/V industry aren’t). The objective of our game is developing and maintaining relationships and adding value. These are not possible objectives to achieve through the simple strategy of endless lists of models and numbers. The Web can be helpful in making information available to those who are searching for it. However, the benefit of this relies on the knowledge level of those looking for the right solution. This is a key point and the dividing line between commodity product marketing and system marketing. A problem begins to build when the customers aren’t sure what they need, when new technology or products are available, how easily the system can be used, or what they may want to do in the future. This is when the system integrator needs to step in to solve those problems. Clearly this service is something that cannot be delivered through a Web page due to the myriad of variables, decisions, and advice that must come into play. It is becoming widely known that very few Business to Business (B2B) Web sites have survived, and many feel that is because none could replace the core values associated with personal relationships.

Does this mean the Web is not useful for those involved in the professional A/V integration business? Of course it doesn’t. The Web is a very powerful tool that can be used in many ways to enhance a customer relationship and provide additional information and other support. Potential customers can get the important application examples, design philosophy, support policies, and testimonials—these are much more important to a systems customer than the boxes used to construct them. Existing customers can access contact and reference information—even operating instructions and system diagrams for their systems if you choose to publish that (perhaps behind secure firewalls). Remember, it is very easy for anyone to create any image they want through the Web. Competitors can just as easily create an image for themselves that may not be completely representative of the actuality. Therefore, it is important to ensure that the impression carries through from the Web presence to reality. Above all, there must be a clear connection between the Web site and your company to help facilitate an ongoing relationship.

The Web is still deeply in a state of change and evolution. We all know there is value to the Web and that it is important to be a part of it. The part we each play depends on our objectives. The objectives of a manufacturer, like Extron, will be different from those of a dealer, consultant, integrator, installer, and so on. The main thing to remember is that the Web is not a replacement or substitute for traditional service, education, and relationships. Those are the elements that drive long-term success and truly differentiate integrators from their competitors; that is also what an end-user pays for.
As Technologies evolve and proliferate, education becomes increasingly important for professionals in the A/V industry—and our clients.

As part of our commitment to quality service, Extron respects the need for education and carries a tradition of providing valuable training resources, a tradition that continues with our offering of application and product guides. These guides can be used both for internal training and client presentations. They contain application diagrams and concise product descriptions to explain each topic.

Extron currently offers the following:

Application Guides:
- Direct Digital Technology—introduces all-digital interfacing, its technology, and emerging standards.
- Home Theater—covers signal formats and routing, home theater components, systems design, and future home theater technologies.
- Videoconferencing—describes a variety of Extron products ideal for supporting modern videoconferencing systems.

Product Guides:
- Cable Products—explains cable basics and describes Extron’s cables, adapters, and accessories.
- Matrix Switchers—describes and discusses Extron matrix switching family and relevant applications.

There are a number of ways to get the most out of these guides. New A/V professionals require training on the types of A/V systems that their businesses design and/or install. Having application guides to study as part of this training will accelerate their ramp-up time. More established A/V professionals can use an application guide to refresh their knowledge of specific A/V environments and systems. Customers need to visualize how a videoconferencing system works, so they know where their money is going and why—and what issues are involved. Extron application guides can provide the background knowledge and ideas customers need to understand about their own systems.

The Videoconferencing Application Guide pairs videoconferencing accessory product descriptions with easy-to-understand application diagrams. For product training, the product descriptions allow for easy comparison of various products. For Extron’s VSC line of scan converters, green arrows point out feature differences between the different models. Application diagrams are especially effective as a visual aid for internal training and clients. The application diagrams clearly show how different pieces of equipment—including document cameras, VCRs, and computers—are incorporated into various videoconferencing systems through the use of Extron signal processing, routing, and distribution products.

The Direct Digital Technology Application Guide is conceptual and brings the user up to speed on all-digital interfacing technologies. The core of the Home Theater Application Guide illustrates and discusses four home theater systems. For each system, the interconnections between the A/V products are well-delineated, and a potential system upgrade path is described.

The product guides for Extron cable products and matrix switchers are handy, all-in-one, product line resources. They discuss Extron solutions for A/V system applications that require cabling and/or matrix switchers. For example, the Cable Products Guide thoroughly describes each cable with a picture, illustration, and complete specifications, and the Matrix Switcher Guide depicts typical applications and how matrix switchers anchor A/V routing systems.

PDFs of these valuable resources are available for download at Extron’s Web site: www.extron.com. To have copies sent to you, call your Extron Customer Support Representative.
Deciding what, when, and how concerning signal formats used in solutions design and systems integration is a significant attribute of the professional A/V systems designer/integrator and will be even more important over the next five years.

Signal formats and transmission systems are evolving continuously. Why are there so many? Each is a tool with its own application; fathered by the need for a better solution, born of the wisdom of existing technology, and fostered into new applications until a newer, younger need comes along in challenge. But, we throw away old tools cautiously.

Conquering New Realms

We are kings of our own realm. Our realm extends out as far as we are comfortable using the tools and knowledge we have in providing solutions for our customers. I see five concentric realms as the spheres of application (Figure 1). Many people are kings of their desktop…connecting together electronic appliances regularly. The region of the desktop extends to about 15 feet, more or less. Most rooms involve from 50 to 300 feet signal runs and a typical facility installation may involve runs to 1000 feet or more. These are my numbers and are not hard rules, but the point is that most A/V system designers find themselves working in the realms of desktop to facility level. Some extend their influence beyond this, but in those cases, additional specialized knowledge is required and/or the need for consulting interface and distribution specialists.

Digital = More Bandwidth

Most graphics and video connections within integrated systems today are analog. Analog signals are the easiest and lowest cost to distribute while still delivering high quality, providing there is careful system design. But, isn’t digital distribution better? It can be. We like the idea of distributing digital signals because the reproduction of the signal is consistent and usually less prone to noise and other interference. But, our world is analog in nature. To make it digital, we must take samples of the analog information at a higher frequency, or rate, than the rate at which the analog event occurs. Each sample is a number
coded as 8, 16, or more bits representing the level of one small piece of the analog event. Each of these numbers is sent one after the other as a digital transmission. The results are that we must be able to transfer even higher frequencies in our system than with analog and the bandwidth requirement of our system goes up by a factor of between 3 and 10 typically. Understanding the concept of system bandwidth is evermore critical as we convert system designs to digital distribution. We can loosely define “digital” as: more bandwidth.

Tools For Today

Because of physical limitations with cabling, we see that high-speed digital interfaces like DVI (Digital Visual Interface), USB (Universal Serial Bus), and Firewire (IEEE 1394) are mostly limited to the realm of the desktop. These desktop connections fall within the nominal distances separating most personal digital appliances. These fast interfaces are intended for the desktop, but can they be extended? Yes, but there is associated cost with the conversion of these interfaces to and from capable transmission schemes. Conversion cost may be justified when the information MUST be moved from the desktop to another area in the same room or facility. This is one of the decisions the designer must make, and the primary reason many signal runs are still analog.

By contrast, television broadcasters regularly distribute digital signals throughout facilities. When we look at the conversion cost at the source and destination, it really makes sense considering the overall design of the infrastructure. Analog signals degrade rapidly with repeated processing and routing. Digital signals have some issues to overcome, but the overall cost of routing and processing is no worse and the quality is maintained by going digital.

What's the main difference with this approach compared to distributing computer graphics? The difference is simply clock and data rates. Remember that television signals originate within a 6 MHz channel. The video portion is actually less about 4.2 MHz. Three times over-sampling video plus two times over-sampling the subcarrier for each of the chroma difference signals plus overhead gives us a 27 MHz sample rate for digital television here in the U.S. But, that's a parallel, component digital system. When the information is serialized for transmission (an SDI信号) throughout the digital studio, it becomes a 270-megabit per second signal. In this case, it's also 270 MHz. So, you can see, in this case, that a modest digital signal increases by a factor of 10 when we

**Comparing Analog & Digital Formats**

<table>
<thead>
<tr>
<th>Format</th>
<th>Connector Style</th>
<th>Cable Type</th>
<th>Transmission Distance</th>
<th>Transmission Frequency</th>
<th>Data Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog</td>
<td>various</td>
<td>various</td>
<td>to ~350 [1]</td>
<td>to 500 [1]</td>
<td>n/a</td>
</tr>
<tr>
<td>SDTI</td>
<td>one BNC</td>
<td>coax [2]</td>
<td>~400 [1]</td>
<td>variable</td>
<td>270 or 360</td>
</tr>
<tr>
<td>SDTV [6]</td>
<td>one BNC</td>
<td>coax [2]</td>
<td>hundreds</td>
<td>n/a</td>
<td>3 to 8</td>
</tr>
<tr>
<td>HD-SDI</td>
<td>one BNC</td>
<td>coax [2]</td>
<td>~100</td>
<td>74.25</td>
<td>1500</td>
</tr>
<tr>
<td>DV [6]</td>
<td>(see IEEE 1394)</td>
<td></td>
<td>4.5</td>
<td>n/a</td>
<td>25</td>
</tr>
<tr>
<td>IEEE 1394 (FireWire)</td>
<td>&quot;1394&quot;</td>
<td>6 conductors, 2-STPs/2 pwr</td>
<td>4.5</td>
<td>n/a</td>
<td>100, 200, 400</td>
</tr>
<tr>
<td>USB 1.1</td>
<td>USB A &amp; B</td>
<td>4 conductors, 1-UTP &amp; 2 pwr</td>
<td>5</td>
<td>n/a</td>
<td>12</td>
</tr>
<tr>
<td>USB 2.0</td>
<td>USB A &amp; B</td>
<td>4 conductors, 1-UTP &amp; 2 pwr</td>
<td>5</td>
<td>n/a</td>
<td>480</td>
</tr>
<tr>
<td>DVI</td>
<td>DVI (multi-pin D)</td>
<td>Four STPs</td>
<td>10</td>
<td>to 165 [7]</td>
<td>1650</td>
</tr>
<tr>
<td>10 Base T</td>
<td>RJ-45</td>
<td>Four UTP (CAT3)</td>
<td>100</td>
<td>n/a</td>
<td>10</td>
</tr>
<tr>
<td>100 Base T</td>
<td>RJ-45</td>
<td>Four UTP (CAT5)</td>
<td>100</td>
<td>n/a</td>
<td>100</td>
</tr>
<tr>
<td>1000 Base T [2]</td>
<td>RJ-45</td>
<td>Four UTP (CAT6)</td>
<td>100</td>
<td>n/a</td>
<td>1000</td>
</tr>
</tbody>
</table>

[1] Length and frequency is only typical range; conditions vary widely.
[2] Also implemented over fiber systems.
[3] STP = shielded twisted pair; UTP = unshielded twisted pair
[4] n/a = not applicable
[5] Transmission distances vary widely depending on cabling and the specific equipment involved.
[6] These formats are MPEG II data streams.
[7] Single link system only.
convert to a long distance scheme. Why is this interface popular? Routing and interfacing is greatly simplified with all the bits on one, single-wire cable.

Likewise, with DVI, we are taking parallel data generated by the computer graphics card and serializing each of the color channels plus the clock signal. While the coding scheme for DVI is very efficient, the resulting data rate maximum for a single-link connection hits 1.65 gigabits per second per channel. This number represents the transmission rate for 1600 x 1200 graphics at a 60-Hertz refresh rate. Lower resolution graphics will operate at lower clock speeds. However, note that this interface is more than five times faster than SDI for television. What would it take to route a single-link DVI connection around a facility like we do with SDI? The answer is simply 4 times 1.65 Gbps, which yields a 6.6 gigabits per second transmission system. For the typical graphics resolution of 1024 x 768, we could survive nicely on about 5 Gbps. Now, it doesn’t seem so much like “pie in the sky” when we hear people talking about interfaces evolving into the 10-gigabit range. Seems we could all get behind that effort.

Meanwhile, it’s possible to move DVI up to about 300 feet on coax with modestly priced conversion systems. Can it run farther? Yes, we could use fiber. The data rate puts us into the laser-based single-mode designs with a commensurate speed and cost increase. Quickly, one can begin to see the complications in developing and using ultra-high speed digital interfaces. System design with analog routing suddenly seems like the easiest and most cost effective… at least for the near term.

The UTP Alternative

Recently, video and graphics over CAT 5-type UTP (unshielded twisted pair) cable seems like the new trend in systems distribution. Is it the answer? I see it as an option, but not necessarily the means to an end. UTP cable does not possess capabilities that defy the laws of physics where signal cable attenuation is concerned. Cable loss is cable loss regardless. But, what is making it attractive? Mostly it’s the lower cost of the cable, which is augmented by the huge market for computer networks. Lots of UTP wire is being installed. But, computer networks are not operating at the same data rates we need to support digital video. So, how are these CAT 5-type graphics systems delivering computer graphics?

Analog. Yes, good ol’ analog transmission over one of the industry’s most well known methods: balanced line transmission. Twisted pair wire has one distinct attribute in favor of this interface method. It can transfer signals between balanced transmitter and receiver while mostly canceling noise and interference. The challenge is signal recovery in the face of lesser-controlled cable impedance and varying return loss. The signal at the receiver must be equalized in order to recover the primary frequencies transmitted.

Further, UTP cable is designed to have different physical lengths between the internal pairs so as to minimize crosstalk between pairs where the computer data network is concerned. Differences in bit delay for a data network fall within appropriate margins that allow the network to recover the data in proper sync. However, with computer graphics, a 10-nanosecond delay causes a one-pixel shift in the presentation at 1280 x 1024 resolution. Thus, as the graphics resolution becomes higher and cable runs are longer, timing delay is more noticeable. So, this method is not without its own issues, which must be accounted for. But, it is a real solution. If you have only UTP cable available to work with, then you can pull this solution from your toolbox. Would you want to design a facility to use only UTP cable? Good question. I think the answer is: You, as a good designer, must be knowledgeable of its advantages and disadvantages plus have an in-depth knowledge of the customer’s long range needs.

System Integrator’s Crystal Ball

Where are system integration tools headed? Are they digital? Are they analog? The answer is YES. Both digital and analog methods have their day in the sun where your applications are concerned. Since I’m doing the writing here, I’ll take my shot at predicting the future for system integration tools over the next five years… maybe sooner.

Analog Transmission

Let’s start here. Analog distribution will continue to represent lower cost, but a high quality value overall. Analog interfacing will decrease significantly for desktop connection, but will remain
TECHNICALLY SPEAKING...

embedded within systems at levels where the cost to quality-and-complexity are attractive.

Key inventions will allow analog amplifiers to near perfectly adapt to the loss curve of cable technologies, thus extending the compensation range by a factor of five to ten times. Improvements in coaxial cable design will decrease skin effect losses. This could mean transmission of 1280 x 1024 graphics over distances of more than 1,000 feet depending on the cable type.

Digital Transmission

Having just been to the NAB show, I have a very specific feeling about the future of standard definition video. Streaming video of many compression level types will precipitate new adaptations into the standards, much as the MP3 format has affected music. Decoders capable of handling many data formats and variations, like MPEG 4, will emerge. MPEG II video over coax and twisted pair will replace composite and S-video for low cost, single-wire applications.

I expect to see new components that will support DVI over UTP cable for hundreds of feet. Good termination hardware will be critically important. Movement of graphics in this way will require the design of multi-gigabit matrix routers capable of supporting facility expansions. UTP cable will continue to expand our connectivity and uses for it will accelerate. Compressed video and system control for displays can be merged into one data stream.

SDI and HD SDI will take on everyday use. The SDTI (serial digital transport interface) and HD SDTI (same but for HD rate at 1.485 Gbps) will become the “Amtrak” of data hauling. Both standards are capable of moving large amounts of data cheaply from one place to another by substituting that data for the video information. For example, several FireWire sources could be packetized and transported within one SDTI connection. Many more could be hauled by an HD SDTI connection over coax, UTP, or fiber.

And, there’s the blue laser. Nearing reality as each day passes, the blue laser opens up a whole new realm of digital storage and data transmission. The blue laser diode wavelength is less than half that of the current red lasers used for most applications like DVD players. This means more data packing density. It means much higher speed and data density transmission over fiber. Meanwhile, the cost of older lasers will fall and make fiber transmission at what we now consider high rates more viable for smaller system designs. Fiber Channel is now in the 2-gigabit per second realm. The blue laser will mean larger strides in Fiber Channel as well. The 10-gigabit interface system is not far behind as a chipset for use with optical networks was just announced. The blue laser will change many things, including projection display technology.

Wireless Transmission

Wireless LAN connections exist now. The future is wide open here and limited only by regulations and spectrum space. Continued developments in spread-spectrum technology will fuel many more wireless appliances. MPEG II video and streaming video at lower rates will become a normal transmission method along with high speed data interconnect. Satellite connection will extend our desktops to the realm of the world for data, voice, and video connection.

More Tools, More Choices

Over the next five years, many more interfacing tools will emerge; each with its own advantages. The advantage of analog over digital, and vice versa, will depend more specifically on the application and cost. Designers and integrators must maintain contact with technology trends, absorb product training, and “network” to gain the experience of others. Your toolbox will run over with possibilities. The difference will be to know when all that is needed is a simple pair of pliers.
Extron Products at Mercedes Event Center: High-End Media Technology on the Move

Everybody knows the famous German cars with the “star” radiator insignia. The largest production plant of the DaimlerChrysler group—located in Sindelfingen, near the Mercedes headquarters in Stuttgart, Germany—produces the “C,” “E,” and “S-Class” models and employs over 30,000 people.

The dome-shaped building located within the plant, and now home of the new Mercedes Event Center (MEC), was erected in the late 1960s. This building was traditionally used to hold larger presentations for the design and development center of DaimlerChrysler. Along with improvements completed at the Mercedes-Benz Technology Center, the former “Kuppelbau” (German for the word “dome”) was totally reconstructed in only 16 months. Mercedes’ goal was to showcase the latest standards in audio and video technology. The MEC offers enough room for 1,300 people in the dome and can be used for internal and external events such as workshops, conventions, and concerts.

The media equipment installed in the MEC is worth about $3 million (US dollars). In the autumn of 1999, the whole installation took place as a partnership of an A/V system integrator, mevis.tv located in Stuttgart, Germany (formerly Ziegler-Elektronik); a manufacturer of videowall and cube-wall products, Synelec; and a manufacturer of audio products, AVM-IRP.

The visual flagship of the MEC is a cube-wall consisting of 48 Synelec LiteMaster 800 cubes. The split controller of a cube-wall is capable of displaying an image in any size over all cubes of the cube-wall. The Stargate split controllers are capable of displaying up to four different sources simultaneously in the highest and most brilliant quality.

This DLP rear projection system has a projection surface of 26 x 15 ft (8 x 4.5 m) with a minimal depth of only 3 ft (90 cm). It weighs 6.5 tons (14,330 pounds) and is mounted on an air cushion that allows the entire cube-wall to move across the 2,150 square ft (200 square m) stage with only the force of a fingertip. Each of the 50 in. cubes has a native resolution of 800 x 600 pixels; thus, the total resolution of the cube-wall is 6,400 x 3,600 pixels—enough to satisfy even the highest demands of today’s CAD systems.
Matrix Switching

The “heart” of the system is in the central control room, where eight of eleven 19 in. racks hold the main equipment. Extron equipment plays a key role here. The Extron Matrix 3200 and 6400 Switchers link the inputs to the outputs. The larger Matrix 6400 is used for composite and component video sources, such as Digital Betacam signals in PAL and NTSC formats from a DVD players, multi-format VCRs, as well as videoconferencing and various studio cameras. This type of matrix switcher was chosen for two reasons: 1) its immense flexibility to configure virtual inputs and outputs for any signal type with just a few mouse clicks and 2) the simplicity of its remote control. The Matrix 3200 is the source for six preview monitors located in the control room and interpreter cabins. Other outputs go directly to large patch fields for custom wiring during individual events.

The outputs of the Matrix 6400 go to four high-end, RS-232 remote controlled signal converters. These signals are converted to RGBHV, line-doubled, and then routed to the Matrix 3200, which is used as an RGBHV switcher with 16 inputs and 12 outputs. The Matrix 3200 serves as the main source for the cube-wall. Because true 430 MHz (-3dB) video bandwidth was needed to meet the high resolution demands of the cube controllers, Extron used, upon request, special pre-selected parts to meet that challenge. Bandwidth measurements and controls confirmed that this was truly a custom designed switcher. “Extron Europe knew about the importance of our project and supplied us with top quality parts,” says the project manager at mevis.tv. He continues, “After some minor start-up problems with the matrix switchers, the system worked perfectly.”

The Extron Matrix 3200 and 6400 Series Switchers are designed for large-scale routing applications that require up to 64 inputs and 64 outputs. They provide customizable and modular switching of RGB, HDTV/component video, S-video, composite video, and/or two channel audio. These matrix switchers may be controlled by the front panel and RS-232/422. Additional remote control convenience may be provided by the MKP 1000 remote keypad and/or MCP 1000 remote control panel.

Over 98,000 ft (30 km) of video, audio, and control cables were installed to connect external inputs from 68 floor boxes to the Extron matrix switchers in the control room and with the cube-wall. Cable lengths of 500 ft (150 m) carrying the high resolution RGBHV signals were standard, so the Extron PA 250 line drivers were an ideal solution to cover these distances. No other device

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continued on next page
number of buttons and menus on a touchscreen to control the whole installation. With the virtual menu software, the menus can be easily adapted for each unique event, so the screen shows a small number of buttons—the ones that are actually needed for that specific show. From the perspective of the software engineer programming the whole system, the Matrix 3200 and 6400 had the tremendous advantage of offering Simple Instruction Set (SIS™) commands for RS-232. SIS uses short, easy-to-use commands instead of long strings of code, so it was much easier and clearer to program the software using SIS.

The whole installation had a very tight schedule. All eleven, fully pre-configured and pre-cabled racks, as well as the other media equipment, had to be installed in the MEC in only four weeks. The official opening took place on February 18, 2000, with a wide array of political and economic representatives in attendance. Since then, the MEC has been almost fully booked and holding events 8-10 hours a day.

For more information, please visit: www.mevis.tv.

Audio

On the audio system, there were 33 Frazier loudspeakers installed in the dome-shaped building. These loudspeakers were custom designed to meet the difficult acoustic conditions. These loudspeakers plus 48 Bose loudspeakers work together to offer digital Dolby Surround 5.1.

Over 200 conferencing microphones and 20 wireless microphones can be used for any type of event. The wired conferencing mics can be plugged into the floor system, which consists of approximately 70 floor boxes. In addition, there is a four-channel interpreter system for international conventions. A digital audio LCS 32 x 32 matrix system, in combination with an Extron MAV 1616 Matrix Switcher for switching two channel stereo audio (balanced/unbalanced) signals, link the input sources to a series of IRP automatic mixers.

The Extron MAV Series Matrix Switchers are designed for audio and/or video applications that route HDTV/component video, S-video, and/or composite video with or without stereo audio. Different models are capable of routing different signal formats. The MAV Series provides off-the-shelf switching solutions in a range of fixed configurations from six inputs by two outputs up to sixteen inputs by sixteen outputs. These matrix switchers may be controlled by the front panel and RS-232/422.

Control

The whole system is operated by a Panja remote system with a 15 in. TFT touchpanel and two 10.4 in. wireless touchpanels. This system showcases virtual menu software, which allows specific menu content to be sent from the master panel to its clients—and enables one person to run the entire operation. Typically there is a huge number of buttons and menus on a touchscreen to control the whole installation. With the virtual menu software, the menus can be easily adapted for each unique event, so the screen shows a small number of buttons—the ones that are actually needed for that specific show. From the perspective of the software engineer programming the whole system, the Matrix 3200 and 6400 had the tremendous advantage of offering Simple Instruction Set (SIS™) commands for RS-232. SIS uses short, easy-to-use commands instead of long strings of code, so it was much easier and clearer to program the software using SIS.

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For more information, please visit: www.mevis.tv.
The Extron MediaLink System is a family of easy-to-use and affordable products that work together to control A/V equipment in any small classroom or boardroom. The MediaLink Controller 206 is the cornerstone of the MediaLink System; use it by itself for controlling simple A/V systems. The flexible MediaLink Controller (MLC) 206 is an intuitive, extended remote control panel that provides universal projector/plasma and room control. For expansion of an A/V system’s capabilities, the MLC 206 can be coupled with the MediaLink Switcher (MLS). For low-cost system integration, there are four, simple-to-use models of the MLS available: MLS 306 (variable audio output), MLS 506, MLS 506MA (mono audio amplifier), and MLS 506SA (stereo audio amplifier).

**MediaLink Controller (MLC) 206**

For universal projector and room control, the flexible MLC 206 acts as an intuitive, extended remote control panel; it controls a projector’s power on/off, input switching, and volume control. The MLC 206 conveniently offers clearly labeled buttons and one-button functionality for intuitive operation. It is also capable of controlling source equipment such as a VCR or DVD player using IR control modules.

Especially vital for high traffic areas, the MLC 206 is housed in a secure enclosure, with labels that are not easily altered by unauthorized users. It offers many options for mounting in a lectern, desk, wall, rack, or wall box. For simple, one-time setup, the MLC 206 provides universal projector/plasma and room control. For low-cost system integration, there are four, simple-to-use models of the MLS available: MLS 306 (variable audio output), MLS 506, MLS 506MA (mono audio amplifier), and MLS 506SA (stereo audio amplifier).

**MediaLink Switchers**

Extron MediaLink Switchers may be used as stand-alone switches or as add-ons for the MediaLink Controller (MLC) 206.

**MLS 306 Switcher (Variable Audio Output)**

MediaLink Switchers are rack-mountable MLS 306 six input, one output, multi-format A/V switchers. The MLS 306 provides composite video, S-video, and computer-video switching. For balanced or unbalanced stereo audio switching, the MLS 306 conveniently offers pre-amp volume control as well as bass and treble control.

The MLS 306 provides these input connectors: three BNCs, three 4-pin mini-DIN connectors, three 15-pin HD connectors, three 3.5 mm mini stereo audio jacks, and six 3.5 mm captive screw connectors. Dual RGB output is provided. The MLC 306 uses BNCs for all video and RGB outputs.

**MLS 506 Switcher (Variable Audio Output)**

The MLS 506 provides composite video, S-video, component video, computer video, and balanced or unbalanced stereo audio switching. It offers pre-amp volume control plus bass and treble control. For its audio inputs and outputs, the MLS 506 provides 3.5 mm captive screw connectors.

**MLS 506MA Switcher (Mono Audio Amplifier)**

The MLS 506MA offers all the features of the MLS 506 and includes additional audio benefits. The MLS 506MA provides 30 watt, amplified mono audio output for a 4 or 8 ohm load or a 70 volt output to use in a distributed audio system. An auxiliary line-level audio input, such as a wireless mic, may be mixed with the switched audio signal with the use of the switcher’s internal mixer. Further audio processing can be applied externally via the effects loop-out.

**MLS 506SA Switcher (Stereo Audio Amplifier)**

MLS 506SA provides all the features of the MLS 506MA. The sole difference is in the type of amplified output. The MLS 506SA provides a 60 watt, amplified stereo audio output (30 watts per channel) for use of 4 or 8 ohm load speakers.

**MediaLink Accessories**

Extron offers a variety of accessories for use within the MediaLink System, such as multiple mounting kits for the MLC 206, IR remote control, Architectural Adapter Plates (AAPs), including IR control modules for a VCR or DVD player, and wall plates to facilitate signal connectivity.

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**New Products from Extron**

NEW<br>Extron MediaLink™<br>System:<br>MLC 206 Controller<br>MLS 306 (Variable Audio Output)<br>MLS 506 (Variable Audio Output)<br>506MA (Mono Audio Amplifier)<br>506SA (Stereo Audio Amplifier)
Extron Hideaway Surface Access products are UL listed architectural solutions for inconspicuous computer-video interface and connector access and control. Designed to mount in conference room or boardroom tabletops, the models in this series make AC power, display, and network connections easily accessible while keeping them out of sight until needed.

There are two versions of the Hideaway HSA enclosures: the 400 series (HSA 400 and HSA 402) and the 800 series (HSA 800 and HSA 802). Both are accessed by pressing down on the top of the enclosure, thereby releasing a mechanical latch. The main difference between the 400 and the 800 series is the way the connectors are presented to the user. The 400 series pivots open, presenting the connectors at a 49° to the tabletop. The 800 series rises vertically from the installation surface, presenting the connectors straight-on to users.

**HSA 400 Series**

The tilt-up HSA 400 offers one grounded AC plug, one RJ-45 (CAT 6) data connector, and one RJ-11 phone connector on its faceplate; the HSA 402 offers mirrored access to those same connectors on both sides of its faceplate for simultaneous hook-up to two laptop PCs. In addition to the AC plug, RJ-45, and RJ-11 connectors, the faces of both the HSA 400 and HSA 402 include room for four single-space Extron Architectural Adapter Plates (AAPs).

**HSA 800 Series**

Similarly, the HSA 800 offers a single faceplate with a grounded AC plug, one RJ-45 (CAT 6) data connector, and one RJ-11 phone connector; the HSA 802 offers two faceplates on opposite sides of the product, each with a grounded AC plug, one RJ-45 (CAT 6) data connector, and one RJ-11 phone connector for simultaneous hook-up to two laptop PCs. In addition to the AC plug, RJ-45, and RJ-11 connectors, the faceplates of the HSA 800 and HSA 802 include room for four single-space Extron Architectural Adapter Plates (AAPs).

Additionally, the Hideaways can be optimized with the unique Extron RGB 580xi remote interface. The RGB 580xi is a universal, computer-video interface with audio and Advanced Digital Sync Processing (ADSP™) that is the size of a double-space AAP.

All Hideaway Surface Access Products are available in a variety of surface top materials, including black anodized finish, brushed aluminum, brushed brass, polished aluminum, and polished brass.

Router guides are available to aid installation for each Hideaway product.

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**HSA 400 & 800 Series**

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URL: [www.extron.com/hideaway](http://www.extron.com/hideaway)

* Prices listed in US Dollar, valid for US sales only.
Extron has added two new transmitter models to our existing line of twisted pair (TP) products: the **TP T 460** and the **TP T 468**. The Extron TP T 460 Twisted Pair Interface Transmitter for two-gang wall box installation and the TP T 468 Twisted Pair Interface Transmitter for four-gang wall box installation accept computer analog video and PC audio and transmit them up to 1,000 feet via twisted pair cable (CAT 5, 5e, CAT 6) to an Extron Twisted Pair (TP) receiver. The TP T 468 also includes four spaces for Architectural Adapter Plates (AAPs) to provide cable pass-through connectors. The TP T 460 and TP T 468 Interface Transmitters let A/V professionals take advantage of the smaller size, increased flexibility, and lower cost of twisted pair cable.

Both Twisted Pair interface transmitters input computer-video on a 15-pin HD female input connector and transmit the video on an RJ-45 female connector. They are compatible with nearly every computer and signal type, including VGA-UXGA, Mac, Sun, and SGI. The transmitters include a buffered local monitor output on a 15-pin HD female connector. Audio is input via a 3.5 mm mini jack. Output connection is on one female RJ-45 connector. The TP T 460 and TP T 468 fit in a two and four-gang wall box, respectively, for easy installation. Both products are available in grey, black, white, and EC versions. EC versions are designed to be compatible with Euro Channel mounting systems.

In addition to the two new transmitters, **Extron has changed the name of our family of CAT 5 Transmitter and Receiver products to Twisted Pair Transceivers, or TP Transceivers**. The cable standards that enable distribution of high-quality audio and video signals over twisted pair cabling are changing rapidly. Today there are standards for CAT 5, CAT 5e, and CAT 6 types of twisted pair cable. This “TP” name change more accurately reflects this technology and its different standards. Extron’s re-named product line consists of the following seven transmitters: TP T 460, TP T 468, TP T AV, TP T 15HD A, TP T 15HD AV, TP T BNC, and TP T BNC DA4. The Extron Twisted Pair product line consists of these three receivers: TP R AV, TP R BNC A, and TP R BNC AV.

Extron’s Twisted Pair Transceivers are a versatile family of products that permit long-distance distribution of RGB video, component video, S-video, composite video, and stereo audio over twisted pair cable. A pairing of one of the high resolution TP transmitters with a high resolution receiver provides high quality video performance, transmitting 640 x 480 video up to 1,000 feet (304.8 m) or 1600 x 1200 video up to 200 feet (60.96 m) without loss of signal integrity.

### Twisted Pair Transceivers

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* Prices listed in US Dollar, valid for US sales only.

URL: [www.extron.com/twistedpair](http://www.extron.com/twistedpair)
NEW PRODUCTS FROM EXTRON

EXTRON'S ISS SERIES ARE INTEGRATION SEAMLESS SWITCHERS THAT PROVIDE TRULY SEAMLESS, GLITCH-FREE SWITCHING BETWEEN EIGHT INPUTS, EACH OF WHICH IS FULLY CONFIGURABLE FOR ALL VIDEO TYPES. THE ISS SERIES COMBINES FLAWLESS SWITCHING BETWEEN EVERY TYPE OF VIDEO SIGNAL AND SUPERIOR SCALING TECHNOLOGY. SCALING IS ENHANCED BY EXTRON'S PROPRIETARY SCALING TECHNOLOGIES, INCLUDING DYNAMIC MOTION INTERPOLATION (DMI™), ACCU-RATE FRAME LOCK (AFL™), AND 3:2, 2:2 PULLDOWN, MAKING IT THE PERFECT SOLUTION FOR PROFESSIONAL A/V APPLICATIONS THAT INCORPORATE DIGITAL PROJECTORS AND DISPLAYS. THERE ARE TWO MODELS IN THE ISS SERIES—ISS 108 AND ISS 408. THE ISS 108 ACCEPTS 17 DIFFERENT SCALED OUTPUT RATES UP TO 1024 X 768; THE ISS 408 ACCEPTS HDTV AND SUPPORTS 33 DIFFERENT RATES UP TO 1365 X 1024 AND INCLUDING 480P, 720P, 1080P, AND 1080I. ALL OTHER FEATURES ARE IDENTICAL.

Both seamless switchers/scalers offer eight inputs configurable for RGBHV, RGBS, RGsB, component video, S-video, and/or composite video on female BNCs and two high resolution RGB outputs on female BNCs and/or 15-pin HD connectors. Stereo audio (balanced/unbalanced) comes in via eight, 3.5 mm captive screw connectors and is output (balanced/unbalanced) on two, 3.5 mm captive screw connectors. Both seamless switchers/scalers in this series also are available with optional output boards for Digital Visual Interface (DVI).

Housed in a rack mountable, 3U high metal enclosure, the ISS series includes RS-232 capability featuring Extron’s easy-to-use Simple Instruction Set (SIS™).

The Extron USP 405 Universal Signal Processor is the one-box solution for all your video signal conversion needs. The USP 405 is an all-in-one high-performance scaler, scan converter, transconverter, and transcoder. The USP 405 accepts a wide range of video input signals and transcodes them or converts them up or down into a number of different signal formats to meet the video signal requirements of virtually any system. For example, the USP 405 is the ideal solution for taking in multiple video signal formats, processing them, and outputting them in one format directly to a digital projector or plasma. The applications for the USP 405 are virtually limitless and include rental and staging environments, boardrooms, conference rooms, classrooms, auditoriums, and much more.

The USP 405 accepts many types of inputs, including RGB, HDTV, component, S-video, composite (NTSC and PAL), and optional SDI video signal formats—either NTSC or PAL. Video signals that are input as component, S-video, composite, and SDI video signal formats—either NTSC or PAL. Video signals that are input as component, S-video, composite, and SDI can be transcoded by the USP 405 and output on all video connectors in each format simultaneously or these video signals can be scaled to one of 35 resolutions and output on 15-pin HD connectors and BNCs.

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* Prices listed in US Dollar, valid for US sales only.
A cardinal rule for successfully staging a live event is that age-old Boy Scout motto, “Always be prepared.” A/V professionals who work live venues must anticipate the unexpected. This means having the right equipment on hand to display any kind of video signal a client may bring you. If the VP of European Operations walks up carrying his PAL VCR and says he has to show the video he’s brought from 15,000 miles away, fifteen minutes from now, you’ll have little time to rig a solution. Being prepared for anything that may come your way is a challenge. Throw into the mix the wide use of digital displays in professional A/V environments and the situation becomes more complicated. Digital display devices have a lot of merits—such as high light output and easy setup. They also have some drawbacks. Digital displays aren’t the easiest devices to work with when switching between RGB and video inputs. Imagine a CEO giving the company’s annual report to investors, and she switches from her PowerPoint presentation to a video. Now, if the A/V guy in the back of the room ran two separate wires to the projector—one for RGB and one for video—he’s going to have to manually switch between the two at the display. When the video signal comes up, it may not be properly sized or centered for optimal image viewing.

To eliminate these problems of signal format compatibility and switching inputs to a digital display, Extron has created a high performance, user-friendly signal processing device. Introducing the USP 405 Universal Signal Processor—the skeleton key for A/V professionals.

The Extron USP 405 Universal Signal Processor is the one-box solution to have on hand at every rental and staging event. This Universal Signal Processor converts virtually any video signal—from composite to RGB—including SDI (Serial Digital Interface)—up or down and outputs the signal format needed by any video system. The USP 405 is an all-in-one high performance scaler, scan converter, transconverter, and transcoder. Using proprietary Extron signal processing technologies, the USP 405 generates the flawless video signals required for professional staging events. With its back-lit, tactile front panel buttons and easy-to-read LCD menu, the USP 405 combines user-friendly operation with the superior signal processing technology expected by A/V professionals.

One-box Solution

To meet the diverse needs of today’s professional presentation environments, the USP 405 accepts a wide range of video inputs, including: RGB, HDTV, component, S-video, composite (NTSC 3.58, NTSC 4.43, PAL, and SECAM), and optional SDI (Serial Digital Interface). RGB signals that are input to the USP 405 undergo one of two signal conversion processes: they can be scaled to one of 35 output resolutions, or they can be scan converted to component, S-video, composite, and SDI video signal formats—either NTSC or PAL. Video signals that are input as component,
S-video, composite, and SDI can be transcoded by the USP 405 and output on all video connectors in each format simultaneously, or video signals can be scaled up to one of 35 resolutions and output on 15-pin HD connectors and BNCs.

The USP 405 has the versatility to process virtually every type of video signal. It also has the leading edge technology to deliver the ultimate in output image quality. The USP 405 incorporates several proprietary Extron signal processing technologies: Dynamic Motion Interpolation (DMI™), 3:2 and 2:2 pulldown, and Accu-RATE Frame Lock (AFL™). The USP 405 features a four-line adaptive comb filter to decode NTSC 3.58, NTSC 4.43, PAL, and SECAM, resulting in minimal visible noise on transcoded video signals. Additionally, the USP 405 features high-performance genlock capability. This lets NTSC and PAL video outputs synchronize with an outside reference signal for use in systems that require synchronized timing.

The front panel of the USP 405 provides easy access to a range of special features, letting users customize and configure the signal processor for specific applications. These features include: executive mode to lock out all menus and picture controls on the front panel (no more accidental “reconfigurations”); a freeze button that lets the USP 405 freeze a frame of video; back-lit and labeled input select buttons (no more fumbling in the dark for controls); zoom button (up to 200%); picture adjustment buttons; menu buttons; and two rotary adjustment knobs.

To ensure proper display setup, the USP 405 supports seven test patterns: cross hatch, crop, color bars, 16 bar grey scale, alternating pixels, 4 x 4 cross hatch, and a film aspect ratio pattern for setting up letterbox DVDs. The USP 405 also features a blue-only mode to ensure proper setup of the signal processor’s decoder.

This versatile, flexible, easy-to-use signal processor is an ideal solution for an unlimited number of applications. Here, we take a look at two different ways the USP 405 can improve the professionalism of your A/V events.

The Transcoder

One application for the USP 405 Universal Signal Processor is transcoding. Figure 1 represents an A/V application using an analog production switcher. The production switcher is taking in multiple video inputs, mixing them, and outputting...
them to a projector. The three analog video signals—from the video camera, DVD player, and VCR—are input directly to the controller. The fourth input is an SDI (Serial Digital Interface) signal from a digital camera. To be compatible with the analog mixer, that SDI signal has to be transcoded. This is where the USP 405 enters the scene.

The USP 405 can take in an SDI signal and transcode it to virtually any video signal format. In this application, the USP 405 is transcoding the SDI signal to a component video signal. That component signal is then run into the production switcher, enabling the video captured by the digital camera to be used by the production switcher and output to the projector with the other video sources.

The Multi-Purpose Tool

Now, let’s go back to the VP of European Operations with his PAL VCR. Say you’re running the A/V for a multinational corporation’s annual report. This client has four video sources: a PAL video camera, an NTSC DVD player, the PAL VCR, and a desktop PC. The client wants to record the presentation on videotape for distribution to employees and shareholders in the US. That means the four video inputs are each being input to an NTSC recording VCR. He could just as easily have chosen to record the presentation for distribution in Europe by connecting a PAL recording VCR...but to keep the story short we’ll go with NTSC. (See Figure 2.)

In order to meet the client’s needs, you’ll have to do ALL of the following at the same time:

- Standards conversion and transcoding of the PAL video camera output so its video output is compatible with the S-video input on the NTSC VCR;
- Standards conversion of the video input from the PAL VCR so its video output is compatible with the NTSC VCR;
- Scan convert the RGB computer video input from the PC so it’s compatible with the S-video input on the NTSC VCR.

The USP 405 can successfully perform all these video signal conversion processes while ensuring high quality, professional video outputs. This total flexibility of taking in multiple video standards and converting them to a single standard for recording (or viewing) makes the USP 405 the multi-purpose tool that’s essential to have on hand at every professional A/V event.

To learn more about the USP 405 Universal Signal Processor, go to the Extron Web site at: www.extron.com/usp405.

Figure 2.
**Part 4: Getting to the Nitty-Gritty of Videoconferencing:**
**Acoustics, Room Layout, Point Of View**

In the past three articles we have built a complex videoconferencing environment. In Part 4 of our Videoconferencing series for ExtroNews, we’ll address some concerns you may have experienced while building videoconference rooms of your own.

**Acoustics, room layout, and point of view** may seem like details, but they are big players in a videoconferencing environment. They all need to be given serious consideration when designing, building, and using a videoconference room (VC room).

**To Hear Clearly, Listen to Acoustics**

Let’s start with acoustics. During an actual videoconference, near-end ambient sounds are forgiving to the human ear. While little noises that originate in your videoconference room may not disrupt you, they’ll probably disrupt people at the far end of the conference. Seemingly harmless sounds like coughing and paper shuffling come amplified across the transmission lines. Therefore, when planning a VC room, acoustical integrity should be a major consideration.

That said, the use of acoustical sound panels on walls in VC rooms will help muffle unwanted ambient sounds so they aren’t distributed to the far end. Some examples of sounds that wreak havoc during videoconferences include air conditioning and noises coming from outside the room.

At Extron, we learned about the benefits of sound panels the hard way. When we built two dedicated videoconference rooms in our new training facility, we thought we had installed all the appropriate equipment—including tailor-made, sound-absorbing ceiling tiles. The walls were double dry-walled and insulated. The insulation and ceiling tiles kept the sound out from the other side of the walls. But they didn’t take care of the mixture of sounds from inside the room. It didn’t take us long to figure out we needed some sound panels. Once those were installed, they made a world of difference to the level of intelligibility and overall comfort.

Since we’re talking acoustics, microphones are another topic to consider. Here are some pointers about dealing with microphones:

- Microphone placement will help you achieve the sound you want.
- The standard desktop mics are popular, but be aware! These microphones are very sensitive! Close talking/breathing may hinder the quality of audio transmissions.
- Desktop mics should be located closer to participants with soft voices and farther from those with strong voices to even out the level for your audience.
- And—placing a microphone on top of anything electronic may cause feedback. Don’t do it.

**Room Layout—How Will It Be Used?**

The next category to be addressed is room layout (which leads right into point of view). Before the room is designed, find out all the ways the client plans to use it. Some specific questions to ask:

- Will it be a multi-purpose room or used strictly for videoconferencing?
- Is there a particular style/color of tables and chairs to be used?
- What type of display device will be used?
- How high is the ceiling?
- What type of lighting will you be dealing with?
Point of View—What do They See?

Once those questions are answered, you can begin to address point of view (POV). When designing a videoconference environment, POV is the single most important element to focus on.

The bottom line is, all design factors in a videoconference room should be driven by how the far end participants will see you. Different VC rooms use different room layouts and different types of equipment—front projectors, rear projectors, monitors, in-wall screens—the list is endless. The location of display devices relative to the main camera can play a major role in the audience’s perception.

For example, let’s say the near end site has two in-wall screens: one is used for seeing the far end and the other is a confidence or preview monitor. For aesthetic/room layout reasons, the main camera ends up right above the screens in the center or smack in between the two. Looks nice for the near end, right? Now let’s see how it affects the far end.

You are now the audience receiving a presentation, but you feel like the presenter is a bit detached. Why? Because during the presentation you are viewing the profile of the presenter. He’s not looking directly at you. The reason: at his end he’s looking at one of the in-wall screens, which is displaying your image, but the camera angle is capturing him from the side because it’s placed between the two screens (Figure 1).

If he turned his face and looked at the camera, it would make all the difference in the world (Figure 2). The audience would feel like the presenter was communicating with them, and as if information was being shared. This power of comfortable communications should not be underestimated! The POV of the audience is crucial when designing room layout to achieve the best, most effective videoconference environment possible.

Hopefully, this article has given you some insight into other areas to be considered when building a videoconferencing environment. This article didn’t discuss product; it talked about how participants perceive their environment. These environmental aspects might be a new approach for you—but don’t undervalue these issues. They may prove to be extremely helpful in the future.

Stay tuned for our next issue of ExtroNews, where we’ll cover videoconference standards.
Scaling Misconceptions

Is a scaler a scaler regardless of the brand? Experience teaches us otherwise—the quality of a scaler can vary considerably from one manufacturer to the next. But, don’t all scalers use the same “scaling chip?” Don’t they all use the same scaling techniques? Don’t they provide the same video quality? In a word: “no.” Scalers can vary greatly in the scaling techniques they use. Scaling is not a one step process, but a sequence of processes, and the final image quality can be considerably affected by the way any one of these processes is done. Surprisingly, the actual scaling part of the process may have the least effect on final image quality.

Video Scalers Versus RGB Scalers

Before getting into the common misconceptions, it should be pointed out that there are two main types of scalers: video scalers and computer scalers. A video scaler will typically accept NTSC/PAL/SECAM and decode it and upscale it to a variety of rates. Extron’s DVS 150, the System 7SC, and the new DVS 406 are examples of video scalers. A computer scaler will accept RGB/computer video and scale it up or down to another computer resolution (or HDTV or plasma resolution depending on the scaler). Extron’s new DDS 402 and new USP 405 are examples of computer scalers.

A video scaler will first decode and de-interlace a signal before actually scaling the video. Therefore, the way the decoding and de-interlacing is done is extremely important because the scaling section can’t improve on the quality of the video it receives. If the decoder or de-interlacing section compromises the video quality, that quality is lost forever. Many of the following misconceptions specifically apply to a video scaler.

A computer scaler doesn’t need a decoder or de-interlacer since the incoming video is already in a form the scaling section can process. The quality of a computer scaler is more dependent on the scaling engine itself than is a video scaler, but other factors can affect the output image quality. For instance, mismatches between the input and output video refresh rates may cause glitches with even the best scaling engine. Extron Electronics created its patent pending Accu-Rate Frame Lock (AFL™) technique to eliminate such glitches.

Scaler Topology

As Figure 1 shows, the major steps in a video scaler are decoding, A/D conversion, de-interlacing, scaling and finally, D/A conversion. The first stage of scaling is the decoding stage. This is the most important stage of the process in that any image degradation that occurs here cannot be improved or overcome by later stages.

The decoder will take an incoming composite signal and break it into its components, chroma and luma. Usually the decoding process includes the conversion from an analog to a digital signal. Keep in mind that a manufacturer has a choice in the types of decoder and A/D chips (and methods).

Another consideration with a decoder is stability, that is, how well it locks to incoming signals. Stability varies from decoder to decoder. If a decoder with low stability is used in a scaler, the image may break up while using poor quality videotape in a VCR or while viewing a tape during fast forwarding or rewinding. Again, the selection of the right type of decoder in a
De-Interlacing

The second stage in a video scaler is the de-interlacing stage. Like the decoding stage, the de-interlacing stage can have a significant effect on overall image quality. In this stage the interlaced video signal is de-interlaced, that is, converted from two fields into one progressive field. There are a number of ways to do this conversion—and each method has its own advantages and disadvantages. The de-interlacing stage can be used to correct potential image problems by altering the way de-interlacing is done, according to the type of video the scaler detects. Two examples of this are the ways a scaler handles video that originated from film and motion.

The scalers in many Extron products, such as the ISS Series and the ISM Series, System 75C, DDS 402, USP 405, and DVS 406 all have a feature called 3:2 and 2:2 pulldown detection. When film is converted to video a process is used called 3:2 pulldown (for NTSC) and 2:2 pulldown (for PAL). This process matches the film speed to the video speed. The problem is 3:2 and 2:2 pulldown introduces artifacts into the video such as jagged/uneven diagonal lines. A scaler with 3:2 and 2:2 pulldown detection will recognize that the incoming signal was originally made on film, and will use a special algorithm in the de-interlacing stage to compensate for the artifacts caused by that process.

Motion is another issue: a good scaler will take it into account. If a scaler does not properly recognize and process video with motion, artifacts, such as jaggies, will be introduced into the image. The key is how the video is de-interlaced. For instance, the simplest way to de-interlace is to combine the two video fields into one full frame. This will work fine for still images, but if there is motion in the video there will be jaggies because the position of the lines will shift between the fields, due to the motion. Other de-interlacing techniques work better for motion. The scaler needs to recognize the motion content and still content of each field and apply the correct technique, as needed. Extron has developed Dynamic Motion Interpolation (DMI™), a technique which allows the scaler to compensate in order to avoid motion artifacts.

Now that we have covered the basics of scalers and their operation, the common misconceptions can be discussed:

Misconception #1: A Scaler is the Same as a Scaling Chip

A common misconception is that a scaler and a scaling chip is almost the same thing. As has already been shown, scaling is only a small part of what a common video scaler does. The scaling stage is only one of several stages within a scaler. Currently no manufacturer makes a single chip that accepts composite video and outputs a high resolution PC rate.

Misconception #2: The Scaling Chip is the Most Important Part of a Scaler

You might think that since a scaling chip does the actual scaling in a scaler, the scaling chip is the most important part of a scaler. However, in a video scaler the video is first decoded and then de-interlaced before it before it ever gets to the scaling engine (see figure 1). If video quality is lost in the decoding or de-interlacing stage, the scaling chip can’t improve on the quality. The decoding and de-interlacing processes are significantly more complicated than the scaling process. Therefore, the actual scaling engine has very little effect on the overall image quality compared to decoding and de-interlacing.

Misconception #3: There is One Type or Brand of Scaling Chip

Another common misconception is that there is one company that makes a scaling chip that all manufacturers use. In fact, several companies make scaling chips, and they’re not all the same. They vary in terms of the algorithm they use (the way they add lines), sampling rates, and so on. The chip that is used will affect final output quality—especially depending on the particular scaler application. It is also possible for a scaler manufacturer to create its own scaling hardware. In many cases the scaling hardware a manufacturer creates for its own requirements can provide a better solution than the off-the-self scaling chip that most manufacturers use.

Misconception #4: Use an External Scaler to Bypass the Internal Scaler?

Since the actual scaling operation has the least effect on image quality, chances are the scaler in a projector won’t compromise the image quality. When you use an external scaler with a projector you can, in some cases, bypass the scaler in the projector. However, it is bypassing the decoding and de-interlacing processing of the projector (going into the projector as RGB) that offers a better chance of improving image quality. Therefore, if you use a scaler with decoding and/or de-interlacing, you can improve the image quality, even though you’re not actually bypassing the scaling section of the projector.

TECH CORNER
JVC announces the DLA-M2000LU D-ILA projector, designed to meet the needs of large audiences in the corporate and education marketplaces. It weighs 35 lbs (15.9 kg), offers a resolution of 1365 x 1024 pixels, and has 2,000 ANSI lumens. Some of the features offered by the DLA-M2000LU include digital keystone correction, 12x digital zoom, freeze function, and 40-channel presets for automatic and specialized setups. The projector is compatible with DTV formats and almost any input signal including UXGA. The DLA-M2000LU lists for $16,995 (USD).

Recommended Extron products:
The new Extron ISS Series integration switchers will add eight additional inputs to the DLA-M2000LU projector and offer two scaled signal outputs for “program” and “preview” simultaneously on BNCs and 15-pin HD connectors. The ISS Series integration seamless switchers provide truly seamless, glitch-free switching between eight universal inputs as well as provide superior up/down scaling technology. The ISS 108 supports 17 scaled output rates up to 1024 x 768, and the ISS 408 accepts HDTV and supports 33 output rates up to 1365 x 1024 and including 480p, 720p, 1080p, and 1080i. Please refer to the New Products section of this newsletter for more information on the ISS Series switchers.

Fujitsu introduces the LPF-7700 XGA LCD projector offering 3000 ANSI lumens. The projector displays 1024 x 768 native resolution, and it is compatible with HDTV and DTV video and computer sources up to UXGA resolution. The LPF-7700 features video inputs and convenience features such as a wireless remote with remote mouse functionality, power focus and zoom, built-in stereo speakers, digital keystone, and lens shift correction. It weighs 17.2 lbs (7.8 kg) and lists for $12,999 (USD).

Recommended Extron products:
Adding the new Extron MediaLink System will allow easy remote control of the Fujitsu LPF-7700 projector. The MediaLink Controller (MLC 206) is the cornerstone of the MediaLink System. The flexible MLC 206 is an intuitive, intelligent remote control panel that provides power on/off, input switching, and volume control for the LPF 7700 as well as room control. For expansion of the A/V systems, the MLC 206 can be coupled with a variety of versatile MediaLink Switchers (MLS), which allow six additional inputs to be added to the LPF-7700. Please refer to the feature article of this newsletter for more information on the MediaLink System.

Barco is offering the 5500 lumens BarcoReality 6500 DLC projector for applications such as boardrooms, training centers, conference rooms, and rental and staging events. The 1280 x 1024 projector is compatible with analog and digital sources from VHS video up to 2000 x 1280. It also offers an SDI input. Additionally, an Ethernet 10/100-BaseT interface option allows the projector to become an IP addressable device. The BarcoReality 6500 DLC weighs 39 lbs (17.7 kg) and lists for $29,995 (USD).

Recommended Extron products:
For rental and staging events, the SGS 408 seamless graphics switcher can be combined with the BarcoReality 6500 DLC to complete the show. The seamless cuts, dissolves, wipes, and titles of the SGS 408 bring professionalism and style to live presentations. The SGS 408 incorporates two video scalers plus a digital video mixer and can manage component as well as any type of RGB input from video sources up to 1600 x 1200 resolutions. When using the SDI input of the 6500 DLC projector, Extron’s new Digital XPoint line of Serial Digital Interface (SDI) matrix switchers will allow multiple SDI signals to be routed to the projector. Currently, there are two models available in the Digital XPoint line: an 8 x 8 model (DXP 88 SDI) and a 4 x 4 model (DXP 44 SDI).
Plus Corporation  
www.plus-americca.com

PLUS Corporation introduced their new series of 2 lbs (.9 kg) digital projectors at INFOCOMM. The PLUS V Series has a footprint of 5.6“ x 7“ (14 x 18 cm) and is 1.8“ (4.5 cm) thin, which makes it one-third smaller than the palm-sized PLUS U3 Series. There are two projectors in this line: the XGA resolution V-1080SF offering 800 ANSI lumens, and the SVGA resolution V-807SF with 700 ANSI lumens. Both projectors feature a short throw lens. Pricing has not yet been released.

Recommended Extron product:  
For either of these 2 lb projectors, the P/2 DA1, also known as “The Peaker,” is the ideal product to ensure a high quality presentation. The P/2 DA1 peaks or drives the video output of the laptop or PC. It also restores the low level sync found on many laptops and compensates for long cable runs and poor quality cable. The P/2 DA1 is available in a 110V, 220V, and USB version. The USB version obtains its power from the USB port on the laptop or PC. The Peaker or P/2 DA1 gives added confidence to the presenter on the go.

Sharp Electronics Corp  
www.sharp.com

Sharp unveiled the XG-P20XU LCD projector featuring 3300 ANSI lumens and a native XGA resolution. Among its applications are design/build, boardrooms, entry level custom installations, and rental and staging. It weighs 20 lbs (9 kg) and is able to handle images up to UXGA resolutions. The XG-P20XU is compatible with NTSC, PAL, SECAM, and DTV/HDTV video signals and offers an optional DVI input. It lists for $12,995 (USD).

Recommended Extron products:  
For design/build, boardrooms, and entry level custom installations, the System 5cr Plus adds additional inputs to the XG-P20XU projector and provides room control. The System 5cr Plus is a five input, one output, A/V integration switcher with an internal audio amplifier. It provides a total of five inputs—two for composite or S-video, two for RGBHV, and one that is configurable for composite, S-video, or RGBHV. The System 5cr Plus can control power on/off, mute, and input selection for the Sharp. This is an inexpensive solution for projector and room control of smaller-scale A/V installations.

Toshiba  
www.toshiba.com

Toshiba is now showing their 50-inch TheaterWide HD plasma monitor display, the 50HP81. The 1366 x 768 plasma is housed in a cabinet less than four inches deep to allow placement on the wall and offers aspect ratios of 16:9 and 4:3 formats. It is compatible with HDTV and has RGB and S-video inputs as well as composite video inputs and outputs. The Toshiba 50HP81 plasma monitor will be available in July with a USD list price of $17,999.

Recommended Extron products:  
For switching and distribution of HDTV/component and S-video sources to the 50HP81, Extron offers a selection of switchers and distribution amplifiers (DAs). For HDTV/component applications, the SW 6 Component switcher allows multiple HDTV images to be switched to one plasma, and the ADA 6 Component distribution amplifier allows one HDTV image to be displayed on six plasmas. For S-video applications, the SW 6 SV MX can be used to switch up to six S-video sources, and the SV DA 6 MX can be used to distribute one S-video source to six plasmas.
New Extron Team Member

Bert de Groot
Managing Director of European Sales

As Extron’s Managing Director of European Sales and Marketing, Bert de Groot is responsible for all sales and marketing activities in Europe. He implements sales and marketing programs, develops dealer relationships, and manages training and support efforts. In addition, he participates at major AV tradeshows in Europe. During his fourteen years at Sony Broadcast & Professional Europe, The Netherlands, Bert held a variety of management positions, most recently as Business Unit Manager for the Projection & Display Group. He is based at Extron Europe’s office in Amersfoort, The Netherlands.

Internal Extron Promotion

David Kroeger
Regional Applications Specialist, West

David Kroeger has been promoted to Regional Applications Specialist, West. Based in the San Francisco Bay Area, he is responsible for the training and support of Extron’s dealers in the Western US region. David also instructs at Extron Institute, regional dealer shows, and tradeshows and industry seminars. David began at Extron as an Applications Engineer for the Sales Team, Midwest region. He earned his bachelor’s degree in Electrical Engineering Technology from California State University, Long Beach.

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Extron Product Catalog and ExtronCD 2001-2002 – Now Available!

Extron Product Catalog 2001-2002

Extron debuts the newly updated Extron Product Catalog and ExtronCD. The new catalog features all of Extron’s current product lines, including products introduced at INFOCOMM 2001.

Also included is useful support and technical information:
- Extron resource and product introduction articles
- Troubleshooting guide
- Reference list of graphics card pin configurations
- Cross-references of direct view displays and projectors
- Glossary of AV industry terms

ExtronCD 2001-2002

The ExtronCD includes the product catalog as well as brochures, user’s manuals, full specifications, RS-232 control programs and projector drivers for use with Extron products, and more. For AV professionals around the world, the ExtronCD offers navigation in six different languages: Chinese, English, French, German, Italian, Japanese, and Spanish.

The Extron Product Catalog and ExtronCD are in the mail. For additional copies, please contact your local Extron Customer Support Representative at: 800.633.9876 (Extron USA); +800.EXTRON.S3 (Extron Europe); +65.383.4400 (Extron Asia); or +81.3.3511.7655 (Extron Japan).
The Extron MediaLink Controller (MLC 206) is a low-cost self-contained remote controller for universal projector/plasma and room control in any small-scale, one-projector classroom or boardroom. The intuitive MLC 206 standardizes the control interface for all rooms, making projection systems easy-to-use for anyone. With one-button functionality, the flexible MLC 206 acts as an extended remote control panel, controlling room functions such as lighting and screen settings—as well as the projector’s power on/off, input switching, and volume control. The MediaLink Controller removes the complexity of system operation and replaces it with one-touch, complete system control. The MLC 206 is part of Extron’s new MediaLink System and can be combined with one of the new MediaLink Switchers to provide flexible solutions for small systems.

The Extron MediaLink Controller provides these advantages:

- Easy, affordable one-touch system control
- Universal IR or RS-232 projector control
- Room control (lighting, screen settings, or other functions) via internal relays
- Input selection buttons securely labeled using blue, backlit displays and clear overlay labels
- Inactivity timer automatically shuts off projector after user-defined period of time
- Variety of kits offered for mounting in lectern, desk, wall, rack, or wall box; some kits also provide Architectural Adapter Plate (AAP) openings

MediaLink Switchers:
When more inputs are required than what the projector has available, add an Extron MediaLink Switcher (MLS). The six input, one output MLS switchers provide video, computer-video and audio switching, as well as 30 watts per channel audio amplification in the “MA” and “SA” versions.

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Sausage Cooker

Apex AV's Jeff Faber of Calgary, Alberta, Canada, played the role of chef at his company's Stampede Breakfast. Jeff says, "I used the Extron Tweeker to poke holes in the sausages so the fat will run out. They cook MUCH nicer, and they taste MUCH better that way!" Culinary utensil extraordinaire—another use for the multi-purpose Tweeker!

Send us your photograph of how you use the Tweeker. If we publish it in a future issue of ExtroNews, we'll give you a free VTG 150. Please send entries along with an explanation and photo to:
Extron Tweeker Contest
1230 South Lewis Street
Anaheim, CA 92805.
Or e-mail a high resolution photo and explanation to tweeker@extron.com

Extron Institute Upcoming Schedule, 2001

July 16-17 .................................................................Seattle, WA
August 2-3 ...............................................................Singapore
August 16-17 ............................................................Anaheim, CA
August 20-21 .........................................................Dallas, TX
August 22-23 ..........................................................Dallas, TX
September 13-14 ....................................................Anaheim, CA
September 17-18 .................................................Chicago, IL
September 19-20 ....................................................Chicago, IL
October 1-2 .............................................................The Netherlands

Upcoming Tradeshows, 2001

August 29-31 ..............INFOCOMM Japan ....................Tokyo, Japan
September 7-9 ..............CEDIA ..................................Indianapolis, IN
September 10-12 .........INFOCOMM Europe .............Köln, Germany
September 14-18 ............IBC .....................................The Netherlands
October 22-25 ..............SATIS ..................................Paris, France
October 23-25 ............TeleCon West ..........................Anaheim, CA