

# POWER OF LEARNING HAS A NEW HOME

BALL PARK HOSTS A HIGH-TECH EDUCATIONAL FACILITY.



# AV LEARNING CENTER GOES UNDERGROUND

INTEGRATED LEARNING CENTER FEATURES 14 ADVANCED CLASSROOMS.

# SUPER-TEACHING'S AV TECHNOLOGY

COLLEGE, ELEMENTARY SCHOOL CAPTURE STUDENTS' ATTENTION.



# CONTENTS

Volume 48 Number 5  
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PAGE 56



PAGE 34

## FEATURES

---

- 22 AV LEARNING CENTER GOES UNDERGROUND**  
University of Arizona's Integrated Learning Center in Tucson features 14 advanced classrooms.  
*By Jim Stokes*
- 34 THE POWER OF LEARNING HAS A NEW HOME**  
The Illinois Sports Facilities Authority/Comiskey Park Conference & Learning Center hosts a high-tech educational facility.  
*By Brett Sneed*
- 46 SUPERTEACHING'S AV TECHNOLOGY**  
Teaching system used at Salt Lake Community College and Emmons Lake Elementary School captures students' attention and reinforces learning.  
*By Jim Stokes*
- 56 HIGH-TECH MEDICAL TRAINING FACILITY'S AV**  
Fort Sam Houston, San Antonio TX, has incorporated the most recent advances in medical-training technology.  
*By R. David Read*
- 62 A (MULTIMEDIA) LEARNING EXPERIENCE**  
Mater Dei High School (Santa Ana CA) teachers get ahead of the technology curve with a new switching system.  
*By Dawn Schloesser*
- 70 INFOCOMM INVADES VEGAS**  
ICIA expects about 22,000 to take advantage of new educational opportunities.  
*By Lizz Gibbons*
- SPECIAL FEATURE: INFOCOMM PRODUCT SPOTLIGHT BEGINS ON PAGE 74**
- 92 THE REVOLUTION AND EVOLUTION OF SCREENS**  
Knowing which screen materials to use is not as simple as it used to be. We offer a primer.  
*By Gary Kaye, CTS*
- 102 USITT VISITS THE BIG EASY**  
The United States Institute of Theatrical Technology, a forum for stagecraft issues, showcased an expanding interest in audio/video and lighting subjects.  
*By R. David Read*

## COLUMNS

---

- 8 WAVELENGTH**  
*By David A. Silverman*
- 14 SIGHT LINES**  
*By Gary Kaye, CTS*
- 16 SOUND ADVICE**  
*By David E. Marsh, FASA*
- 18 DOWN TO BUSINESS**  
*By David McNutt*
- 122 ON THE WEB**  
*By David A. Silverman*

**45 Sound & Communications**

## DEPARTMENTS

---

- |   |                                   |
|---|-----------------------------------|
| <b>11 NEWSLETTER</b>  | <b>111 PRODUCTS</b>               |
| <b>20 CONTRACTOR'S CORNER</b><br><i>By Randal A. Lemke, PhD</i> | <b>113 LITERATURE &amp; MEDIA</b> |
| <b>107 NEWS</b>   | <b>114 PEOPLE</b>                 |
| <b>110 CALENDAR</b>   | <b>115 CENTERSTAGE</b>            |
|   | <b>117 MARKETPLACE</b>            |

# SUPERTEACHING'S AV TECHNOLOGY

BY JIM STOKES

*Used at Salt Lake Community College and Emmons Lake Elementary School, the system captures students' attention and reinforces learning.*



*The Salt Lake Community College Technology Building, which houses the SuperTeaching classroom.*

SuperTeaching (ST) seeks to “capture students’ attention and reinforce learning,” affirmed Tom Uminn, systems engineer at ICI (Innovative Communications, Inc.), Saginaw MI. And that concept is accomplished via advanced AV technology in the ST classroom and in distance learning via audio- and videoconferencing. By accessing various visual sources, from scenic images to complex patterns, multiple images are projected, variously, onto three screens along with lesson material.

Remember how your mind tended to wander during a class comprised of “just the facts?” Your left brain strained to attention, while your right brain strayed into flights of fancy. “SuperTeaching stimulates the

right brain, helping re-capture the students’ attention,” said Uminn.

## **Developers**

SuperTeaching was developed by two organizations: the ILT (International Learning Trust) and aforementioned ICI. At ILT, a non-profit organization, Washington DC and Huntsville AL, credits go to president/developer Lynn Dohrmann and co-developer Bernie Dohrmann. In 1994, ILT experimented with and evolved a SuperTeaching model in public K-12 grades and high-school classrooms in Hawaii.

According to ICI’s Uminn, when ILT was looking for a vendor that could develop a high-end multimedia system, do the engi-

*Jim Stokes has been involved in the AV industry for more than 30 years and is a Sound & Communications Contributing Editor.*

neering and write the large amounts of software to control the system, ILT contacted Sony, which recommended ICI. Subsequently, ICI was awarded the contract and began developmental work on the system in January of this year.

Key criteria for the ST AV system was that it be simple to operate and—most of all—allow all students to learn at the speed of thought.

SuperTeaching is now being used in day-to-day instruction at Salt Lake Community College in Salt Lake City UT, and Emmons Lake Elementary School in Caledonia MI. The ST install at the college site is in a 300-seat lecture-hall setting. In contrast, the elementary school site seats some 30 students. We'll go through the equipment used by both sites.

At ICI, credits go to president/partner Rod Kuznicki, vice president/partner Tom Spaude and systems engineer Tom Uminn. Kuznicki and Uminn were the ICI spokespersons for this report.

### **ST Use In Caledonia**

Gordie Nickels, Emmons Lake Elementary principal, commented on ST AV system use so far: "It's working fine," he said. "It really is probably too early to give you any detailed data because we've only had it up and running for just a few weeks now, and we're in the process of staff getting trained. But we're real excited about it. The kids seem really excited about it.

"We've used it twice to do some videoconferencing, hooking up with schools on the other side of the state [Michigan]. We hooked up with a school in Minnesota, one in Wisconsin and one in Canada. We did some activities together, which was really neat. And the kids seemed to really enjoy that.

"And we've used it just for some enhancements of some lessons that we're currently doing, without using video-conferencing. We're just using the equipment we have in the room, such as the document camera, the DVD and the computers.

"It certainly seems to us to have potential. We did a lot of testing this year to give us our baseline data. Then after we have an opportunity to get trained and fully utilize the room and the equipment, we'll be better able to talk about whether or not it's doing what we hope it will do."



*A touchscreen on the teacher's desk controls all system features with less than a dozen picture icons.*

### **ST AV System**

The ST control system developed by ICI provides complete integration of the LCD projectors, screens, special effects, camera selection and all other AV equipment and operations. Control access by the instructor is via an Elo, 18-inch flat panel touchscreen that's on the instructor's desk in the classroom. The GUI (graphic user interface) on the Elo screen is clearly visible to the instructor. In essence, the Elo's monitor is connected to a Dell Windows 2000 server, which is running the SuperTeaching software.

"An instructor can walk into this classroom and in five minutes be running the system," said ICI's Uminn. "There's everything they need to operate day, day out. It's very user-friendly."

Ensuring that all systems—control, audio and video—don't lose their electronics from power surges, SurgeX surge suppressors are used at ST sites.

### **AV Sources**

SuperTeaching AV input sources include a wide range of equipment, including DVD, VCR, cable TV, computer, video cameras and other display devices to aid in teaching. Five Sony EVI-D100 PTZ, automatic iris, pan/tilt/zoom, video cameras permanently mounted on ICI mounts are used at both sites. One camera is aimed at the instruc-

## Innovative Communications, Inc. (ICI)

Founded in 1991, Innovative Communications, Inc. (ICI) is headquartered in Saginaw MI, with an engineering and software development office in Byron Center MI. The principals are president/partner Rod Kuznicki, and vice president/partner Tom Spaude.

ICI's company motto is, "we make technology work." Along those lines, ICI has developed a wealth of experience in designing and installing distance-education classrooms, corporate conference rooms and portable videoconference units. Allied services include videoconferencing room rental, technical support and tech downloads.

ICI provides a complete turnkey solution to education/videoconferencing systems by combining the design of the network architecture, network resource routing/scheduling and in-room audiovisual control systems.



tor area, while the other four cameras are aimed at the students in the classroom.

The instructor's custom teaching ST workstation has space for such classroom AV equipment as a DVD player, VCR and a document camera or annotation system. Other AV equipment is installed in the Middle Atlantic equipment rack or otherwise permanently installed in the classroom.

Specifically, both sites have a Pioneer DVD-V7400D DVD player, a JVC SR-S365U VCR and a Boeckeler PVI-44D annotation system. In addition, Caledonia has a Sony VID-P110 document camera, while Salt Lake City has a Canon RE350 document camera.

"The Boeckeler gives the teacher to ability to annotate or over-write on whatever video source has been selected as the primary active source, whether it be a DVD, VCR, whatever," explained Uminn. "It has an aux input, so if the teacher were using a video microscope showing some critter, for example, he could circle or point to it on the annotator."

Because right-brain stimulating imagery abounds in SuperTeaching, a rack-mounted Pioneer DV-F07 DVD, 300-disc changer provides an abundance of scenic footage. "We chose the DVD changer so we can have that many more hours of media available, so we're not repeating the same infor-

# Equipment\*

- 1 AutoPatch 8Y-XL, 24x48 video switcher (BOTH)
- 1 Boeckeler PVI-44D annotation system (BOTH)
- 1 Canon RE350 document camera (SLC)
- 1 Contemporary Research 232-STA TV tuner/demodulator (BOTH)
- 6 Crown CM31 ceiling mics (CAL)
- 1 Custom instructor workstation (BOTH)
- 3 Da-Lite 84300 Advantage Electrol screens 69x92 inches (SLC)
- 3 Da-Lite Electrol screens 60x80 inches (CAL)
- 1 Dell Windows 2000 server (BOTH)
- 3 Draper SL10 projector lifts (SLC)
- 6 EAW L8CX2X0 speakers w/Atlas Sound backboxes (CAL)
- 1 Elo 18" LCD touchscreen (BOTH)
- 2 Extron 26-173-01 HD15/RGBHV adaptors (SLC)
- 1 Extron 60-210-01 RGBHV dist. amp (SLC)
- 1 Extron 60-350-02 RGBHV AV receiver (SLC)
- 3 Extron RGBHV/VGA adaptor (SLC)
- 3 Extron SVS-100 effects switcher (BOTH)
- 1 Gentner PSR-1212 digital signal processor (BOTH)
- 1 Gentner XAP-800 digital echo canceller (BOTH)
- 1 ICI CM30B18 ceiling camera mount (BOTH)
- 4 ICI WM100B camera mounts (BOTH)
- 2 JBL Control 25 speakers (CAL)
- 1 JVC SR-S365U VCR (BOTH)
- 1 Middle Atlantic 5-8 Slim 5 equipment rack (BOTH)
- 1 Pioneer DVD-V7400D DVD player (BOTH)
- 1 Pioneer DV-F07 DVD changer (BOTH)
- 1 Polycom VS4000 H.323/H.320 video CODEC (BOTH)
- 3 Premier PBM-136L projector mounts (BOTH)
- 1 QSC CX-254 amp (BOTH)
- 3 Sanyo PLC-XP30 projectors (BOTH)
- 1 Shure UC14/83 lavalier wireless mic (BOTH)
- 1 Shure UC24/58 handheld wireless mic (BOTH)
- 1 ICI/ILT SuperTeaching control software (BOTH)
- 5 Sony EVI-D100 PTZ cameras (BOTH)
- 1 Sony VID-P110 document camera (CAL)
- 1 SurgeX SX20-NE surge suppressor (BOTH)
- 1 SurgeX SX2120 surge suppressor (BOTH)
- 2 Zandar MX-16 MultiViewers (BOTH)

\* This Equipment list is for both SuperTeaching sites covered here. (Quantity is per each site, as indicated. Abbreviations: CAL = Caledonia; SLC = Salt Lake City; BOTH = Both sites, same equipment.)



*Instructor Todd Dejong makes a presentation in Salt Lake Community College's SuperTeaching classroom. Each SuperTeaching classroom features a three-screen, super-bright projected image system that sets up a virtual theater surrounding classroom instructors, as well as audio- and videoconferencing for distance-learning applications.*

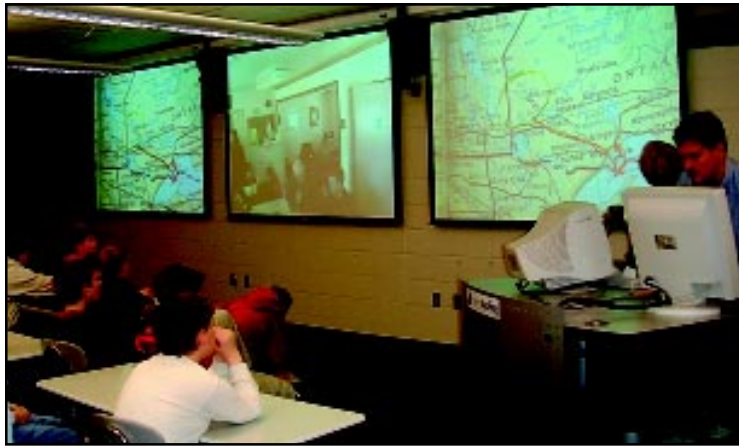
mation and after two days the students get bored with the system," said Uminn.

Whatever channels happen to be on the cable network in the local building can be accessed via a Contemporary Research 232-STA TV tuner/demodulator.

The Polycom CODEC is an output and an input device because it allows outputting videoconferencing to a remote site, as well as inputting the remote site to the local classroom. Then, anything viewed on the Polycom can be inputted to the Sanyo PLC-XP30 projectors and onto the Da-Lite Electrol screens in the classroom.

Uminn explained how the ICI ST software works with regard to the screens. "Say an instructor selects cable TV. At first, that's put up on all three screens. Then, after a predetermined amount of time, it goes to just one of the screens, and the two other screens are used for other images to get the kids' attention and reinforce

*Children in Emmons Lake Elementary School, Caldeonia MI, have the opportunity to take advantage of today's technology in their own SuperTeaching classroom.*



learning.”

When the ST system is in distance-learning mode, the remote site is put up on one local classroom screen as well.

## **Audio**

Microphone criteria differs between the Caledonia and the Salt Lake City classrooms. At the Caledonia site, the instructor has one Shure UC14/83 lavalier wireless. Student responses are picked up on six ceiling-mounted Crown CM31 mics. In Salt Lake City, the lecture hall necessitated one Shure UC24/58 handheld wireless used for students, while the instructor has one Shure lavalier wireless.

All audio signals pass through a Gentner XAP-800 digital echo canceler. All mic sources go directly into the XAP-800. In addition, a Gentner PSR-1212 DSP (digital signal processor) feeding into the XAP supplies needed audio inputs from all other AV sources. Thus, the combined Gentners offer mixing, echo canceling, processing and routing for the local classroom as well as audio conferencing for distance learning. Although the Gentner is a matrix but not a stereo unit, per se, the matrix is set up to pass left/right stereo audio for the ST application.

For outputs, the XAP-800 drives a QSC CX-254 power amplifier, which in turn drives a bevy of speakers. At Caledonia, there are six EAW L8CX2X0 speakers in Atlas back-boxes. The EAWs are on a 15- to 20-millisecond delay, which localizes the sound to the screens at the front of the room. Left/right stereo JBL Control 25s are mounted at the screens. “By keeping the volume down coming out of the two JBLs, it’s a little easier for gain before feedback on the microphones,” said Uminn.

The Salt Lake City site uses pre-existing loudspeakers.

In addition to room amplification, the Gentner outputs feed a VCR for recording and the Polycom VS4000 CODEC for distance-learning applications.

*Salt Lake  
Community  
College's  
auditorium-style  
room.*



## **Video**

Just as all audio runs through the Gentner, all video is routed through an AutoPatch 8Y-XL, 24x48 video switcher. Special-effects devices, which include Zandar MultiViewers and Extron effects switchers, interface with the AutoPatch to capture and focus students' attention on the projec-

tion screens.

Specifically, 32 of the AutoPatch's 48 video outputs drive two Zandar MX-16 MultiViewer 16/1 units. The MX-16 delivers video-screen splitting, displaying up to 16 asynchronous video windows in real time.

"So at times while you're watching the three screens, you'll see a pattern

come up," explained Uminn. "It could be a 3x3 matrix with a couple of students in it, video from the remote site, a couple of PowerPoints and whatever else—all on the same screen. The three Zandars are accessed occasionally to capture the students' attention."

The AutoPatch output goes into three separate Extron SVS-100 4/1 video-effects switchers. "Because the AutoPatch doesn't do any transitions, we use these transition units specific to each of the three screens," Uminn pointed out. "So there's one Extron effects switcher per screen." The SVS-100 can produce a total of 44 digital effects, such as wipes, dissolves and fades.

Finally, the AutoPatch feeds video to the VCR for recording and the Polycom CODEC for videoconferencing/distance learning. Videoconferencing is done over ISDN lines, which allows placing calls up to 384 kilobits per second. Full-motion video, 30 frames per second, is viewed.

The video that leaves the Extrons in three video streams goes through a time-base corrector (TBC) to make sure that the video is really clean before sending it to the three Sanyo projectors in the local classroom.

Regarding projector mounts, Premier mounts are used at both sites. However the Salt Lake City install has a high ceiling, so the Premier mount is mounted to a Draper lift to facilitate that projector's servicing.

The three Da-Lite projection screens are a bit different at the sites because of room size. Caledonia has 60x80-inch screens; Salt Lake City has 69x92-inch screens.

### ***Cat5 To The Rescue***

Uminn noted that the Salt Lake Community College site wanted to be able to do special events on the lecture hall stage. "In order to make everything as removable as possible and have minimal wiring, one of the things we did was transmit the VGA and



***A "teaching" station at Emmons Lake Elementary School.***

other audio and video over Cat5 cabling.

"So, it was just a matter of plugging in a couple of Cat5 connectors instead of VGA cables. An Extron RGBHV AV receiver receives and converts the incoming signal over Cat5." Other Extron RGBHV-related equipment is in the accompanying equipment list.

In summary, the future for SuperTeaching is hopeful with its emphasis on capturing students' undivided attention via multimedia AV technology. "Right now, we're working with schools in Hawaii, California and Australia," said ICI's Kuznicki, looking toward future ST sites. That's in addition to the school locations we've explored here. ■