



## AV in Action

# REACHING FOR THE STARS

## NETWORKED CONTROL FUELS SPACE SCIENCE EDUCATION AT THE CHALLENGER LEARNING CENTER

by Don Kreski



It's a routine day...if any day on a flight to Mars can be considered routine. You're analyzing soil samples collected on the surface when—bam—your spacecraft is hit by a meteorite.

Red warning lights flash and buzzers sound. You're leaking oxygen. You lose power and the cabin grows dark. You're working frantically with flight controllers in Mars Control to reroute electricity and restore life support before you asphyxiate. Finally you get it right. The lights come on and fresh

oxygen starts flowing. Your lives are saved!

A future flight? A NASA simulator? No. These astronauts are sixth graders, and their mission is taking place at the Challenger Learning Center at Heartland Community College in Normal, Illinois.

Making this flight possible is an unusually powerful control and video system designed by Conference Technologies (CTI) in East Peoria, Illinois. Challenger Center IT staff plan to use the CTI system design as a model for upgrades across the 48 locations affiliated with the Challenger Center for Space Science Education.

### MOTIVATING CHILDREN

Founded in 1986 by the families of those who died in the space shuttle Challenger disaster, the not-for-profit organization takes a hands-on approach to education.

"The original idea was to carry on Christa McAuliffe's mission to motivate kids to learn about math and science through the excitement of space exploration," says Bill Seilnacht, Manager, Technical Support for the Challenger Center organization. There is no doubt



### info

AMX  
amx.com  
CHALLENGER  
LEARNING  
CENTER  
challengerlearning-  
center.com  
CTI  
conferencetech.com  
HEARTLAND  
COMMUNITY  
COLLEGE  
heartland.edu

PHOTOS BY CHRIS HUTCHINSON, NINE VOLT DESIGN

Challenger briefing room



staff reviews the mission with students, the ground team reports to the control room while the astronauts move to the transport shuttle. The shuttle “blasts off” and takes them to a spacecraft simulator built to resemble the International Space Station. The CLC at Heartland offers two missions: Voyage to Mars and Rendezvous with a Comet. Most groups are made up of school children in fifth through eighth grades, though younger and older groups—even adults from local corporations—occasionally visit. Whatever their age, the two teams work through their assignments, gather and analyze data, and then the astronauts return to Earth.

Although the parent organization designs the missions, local flight directors have a great deal of leeway to fit the experience to the age and ability of each group. For most groups, the Heartland flight directors will stage at least one emergency. If the students handle their assignments well, the directors may stage more, enabling the children to learn additional skills and practice working together under pressure. “We customize our missions for each group,” Shrewsbury explains. “No two visits are ever alike.”

“We really like the emergencies,” adds Jason Ketter, Technical Support Specialist for the parent Challenger organization. “It keeps the kids on their toes and helps them come together as a team.”

#### UPGRADING THE CENTERS

Although the Challenger Learning Center at Heartland Community College is new, Shrewsbury and other staff had worked at the facility when it originally existed in nearby Bloomington, IL. Seilnacht and Ketter say moving the Challenger Learning Center to Heartland offered a rare opportunity to implement ideas they had been thinking about for several years.

“Heartland was unusual in that they asked, ‘If you could build anything you could dream of, what would it be?’” Seilnacht explains. Mike Bokus, the Director of Technology Support Services at Heartland, suggested they use Conference Technologies as their AV vendor, since the College already had a long-term relationship with the company. “We sat down with CTI and went to work.”

Ketter says he and Seilnacht had three major items on their wish list.

1. “We wanted the ability to show a video to any or every kid at his or her own computer without the need for them to watch a centralized TV.”



that the group has had a huge influence, with almost 400,000 school children involved with one of the Challenger Center’s programs last year.

A visit to a Challenger Learning Center is more than a field trip. The organization provides comprehensive lesson plans and teaching materials for use prior to the visit. “How extensively teachers prepare depends on the school district,” Seilnacht says. “Some embed our material very intensively into their curriculum.”

While each of the Learning Centers is owned, funded and managed by a local college, museum

or science center, the parent organization provides software and video for the space missions as well as quality standards, and they help with IT and AV system design, installation and support.

According to Stacey Shrewsbury, the Lead Flight Director for the Challenger Learning Center based in Normal, Illinois, “By working with Heartland Community College, we are encouraging students in math and science to think about college and the fact that they can succeed in a technical field.”

Once they arrive at Heartland, students begin their mission in a briefing center. After the CLC



(Above) An AMX touchpanel; (Right) Challenger spacecraft

2. "We wanted an easier way to control the AV in the center and, ideally, a way to control the individual computers."

3. "We wanted the centers to be able to interact with each other, so a group at Mission Control in Normal might fly a mission with a group in Hawaii, and vice versa."

"In a real shuttle mission," Seilnacht adds, "Mission Control and the spacecraft are thousands of miles apart, and it's rare that the crews have ever met their controllers face-to-face, yet they learn to work together." If the centers could be connected in this way, students might learn lessons in teamwork that they could not learn anywhere else.

Matt Childs, the project manager for CTL, says he and his team looked at these goals and recommended a networked control system using AMX processors and 12-inch AMX Modero touchpanels. "The piece that folds the

whole concept together is the system's ability to do a VNC (virtual network computer) session to remotely control any computer on the network. From the touchpanel, an instructor can pull up the computer, view its monitor, and take over its mouse and keyboard controls from a keyboard and mouse plugged into the panel's USB ports."

The touchpanels also control all audio and video sources within the center, including 15 IP cameras and microphones, together with room lighting and special effects, such as the flashing lights used at the start of an emergency. They are able to switch any source to any TV, projector, or computer monitor in the center, in any combination.

Shrewsbury says that the new system helps her staff run better missions. "Now, with this new setup solution, if one flight director is busy with a student, the other flight director can control the video or trigger an emergency. We also find that students may try to work ahead on their computers, get lost within the software or even restart the machine by mistake. Now we can check on them easily and

make sure they are where they should be."

"We didn't realize that an AMX system could do this," Seilnacht adds, "but Matt said yes, it had this capability. We tried it and it was like magic. This is the way it needs to be from now on," we said."

Most of the video and audio sources within the new Learning Center are digital, with the local area network handling all signal transport. CTI used an AMX Cat5 distribution hub and receiver to convert signals from analog sources—including a VCR, DVD player and CD changer—for distribution over the network.

With this network-based AV system, Heartland's Challenger Learning Center will be able to tie into other similarly upgraded Challenger Centers without the need for a video conferencing codec. "How the connection will be made depends on the center," Ketter adds. "Some will need significant

## moreonline

Take off with a Challenger launch simulation by visiting [avtechnologyonline.com/nov11](http://avtechnologyonline.com/nov11)





upgrades to connect in this way, but others, like Heartland, will be able to tie into the connectivity their host organizations already have available."

### "I HAVE TO DO MY JOB"

For the Heartland Challenger Learning Center, CTI worked mainly as a design consultant, while Seilnacht and Ketter provided most of the installation labor. "It really was very fluid," Seilnacht explains. "We all had the same goals, and while sometimes CTI supported us, sometimes we supported them."

Ketter adds that "the coolest thing about this project was that no one ever said, 'That's not my job.' Instead they'd come over and ask, 'How did you do that?' or they might suggest, 'Why don't you try it this way?' That was a real game changer for us."

The process fit well within the Challenger culture, which Seilnacht and Ketter say helps create the best career experience they've ever had. "It

comes down to impacting kids' lives, reaching out and helping them see the adventure that life can be," Seilnacht explains.

"Jason and I can tell you, it's all worthwhile when you watch a group of kids come into the center, talking and joking and busy with everything except what they're supposed to be doing. Then all of a sudden it gets quiet. They get sucked into it like a vortex," he adds.

"We had a PR person come through once and try to interview some of the kids during a mission," Seilnacht recalls. "Finally one boy turned to her and said, 'Look. I have to do my job or somebody out there might get hurt. Go away.'"

"It was pretty breathtaking when this installation was complete," Ketter says. "It was fit and finished and polished, a complete package. If I could wrap up this whole building and ship it to the other centers, I would."

Don Kreski is president of Kreski Marketing Consultants in Mt. Prospect, Illinois.

## KEY ELEMENTS // FOR THE END USER

### EASE OF USE:

"From the touchpanel, an instructor can pull up the computer, view its monitor, and take over its mouse and keyboard controls from a keyboard and mouse plugged into the panel's USB ports." —Matt Childs, CTI

### ROI:

The process fit well within the Challenger culture, which Seilnacht and Ketter say helps create the best career experience they've ever had. "It comes down to impacting kids' lives, reaching out and helping them see the adventure that life can be," says Bill Seilnacht, Manager, Technical Support for the Challenger Center organization. There is no doubt that the group has had a huge influence, with almost 400,000 school children involved with one of the Challenger Center's programs last year.