



CASE STUDY

# Extron AV Technology Powers First-in-Nation K-12 Cyber Innovation Center at Canyon Springs High School

**Extron**

Moreno Valley USD in Riverside County, California opens its first-in-the-nation Cyber Innovation Center at Canyon Springs High School.

All Photos and video courtesy of Moreno Valley Unified School District and Tilden-Coil Constructors



The cybersecurity pathway program provides students with knowledge and skills that earn them six college credits and prepares them to obtain CompTIA certifications, the gold standard credentials for IT skills competency that qualify individuals for rewarding careers.

With a recent [ribbon cutting](#), the Moreno Valley Unified School District in Riverside County, California, opened its Cyber Innovation Center at Canyon Springs High School. This is the first center of its kind for a K-12 public school district, according to the [National Initiative for Cyber Education](#). The late Aaron Barnett, IT Director of Moreno Valley USD, and Donna Woods, MSc.Ed., the Center's current lead instructor, have championed the cybersecurity pathway program since its inception seven years ago. The Cyber Innovation Center is the program's permanent home. Here, students gain knowledge and skills in computer network maintenance and cybersecurity, earning six college credits and preparing to pass CompTIA A+ and Networking+ certification tests. These certifications are the gold standard for IT skills competency.

Integral to the teaching and esports competition activities at the Center is an extensive audiovisual system powered by Extron switching, distribution, control, and audio, with NAV® Pro AV over IP at the center of AV signal distribution throughout the facility.

## CHALLENGES

To create the Cyber Innovation Center, 7,687 square feet of underused auto and wood shop space was converted to a technology-rich teaching venue. The main teaching spaces are an Esports Computer Lab, a Cyber Classroom, and a Cyber Innovation Lab. These serve as classrooms and as competition venues for esports and [CyberPatriot](#) National Youth Cyber Defense contests. The center also houses mentoring conference rooms and hands-on workstations with server racks and network equipment.



Esports Computer Lab seats 36 players.

**“The Cyber Innovation Center programs inspire students to become more involved in school. Our students are excited and eager to come to class and learn new skills. Through the construction and equipment available, we hope they feel supported by everyone who had a part in this incredible milestone.”**

**Cleveland Johnson**  
Board Member and past Board President,  
Moreno Valley Unified School District  
(Remarks in address made at the Cyber Innovation Center  
dedication ceremony)

The labs feature exposed overhead cable trays that place network cables on full display, befitting the IT-centric subjects being taught. Sleek drop ceiling treatments and multicolored LED room lighting are used in the reception area, classrooms, and mentoring rooms, creating a high-tech atmosphere reflective of the Center’s STEM mission, while providing room acoustics conducive to effective teaching.

## **DESIGN SOLUTION**

### **Esports Computer Lab**

The Esports Computer Lab is equipped with 36 high-performance gaming computer workstations with 240 fps displays, three 84" flat panel displays, eight ceiling-mounted FF 120T Flat Field® speakers, and a ceiling-mounted SF 10C SUB SoundField® subwoofer.

### **NAV Pro AV over IP Network Distributes Gaming Action**

The gaming workstations are set up in six rows of six stations each. A six-input SW HD 4K PLUS HDMI switcher preselects HDMI content from among the six workstations in each row, feeding the selected HDMI via a NAV encoder to the

Six-input HDMI switcher in the foreground and NAV encoder partially visible in the background to the right of the switcher send gaming action from each row of players to the AV over IP network for distribution to viewers.



Using an iPad running the Extron Control app, users can easily select which gaming workstation content is shown on each of the large displays in the Cyber Innovation Center.

NAV Pro AV over IP network. The instructor can easily select which content is shown on the large displays throughout the Cyber Innovation Center using an Apple iPad® running the Extron Control app. Spectators can watch gaming action on any display in the building, including the three 84" flat panel displays lining the walls of the Esports Lab and an 18' x 6' videowall in the Cyber Innovation Lab. Gaming video and audio content is also sent to a Tricaster®, which is used to store gaming action for playback, mix the gaming action with content from other sources, and stream the gaming content to the Internet during competitions with other schools.

Four DTP® wallplate transmitters located around the Esports Lab accept HDMI and analog audio from mobile 86" interactive touchscreen teaching stations. Instructors and coaches use the teaching stations to create and annotate lesson material, draw gameplay diagrams, and other teaching aids. The wallplates connect to the NAV Pro AV over IP network via NAV E 101 DTP encoders, allowing content from the mobile touchscreens to be shown on other displays around the facility. A ShareLink® Pro wireless hub connects to the NAV Pro AV over IP network via a NAV encoder, allowing mobile devices to provide content wirelessly via Wi-Fi.

**Powerful Gaming Audio.** Audio is an important part of the gaming experience. The players hear the gaming action through their headphones. Spectators listen to the same gaming action, plus shoutcaster commentary, with immersive sound coming through the Esports Lab's eight full range ceiling speakers and the powerful in-ceiling subwoofer. The sound is mixed,



Cyber Classroom

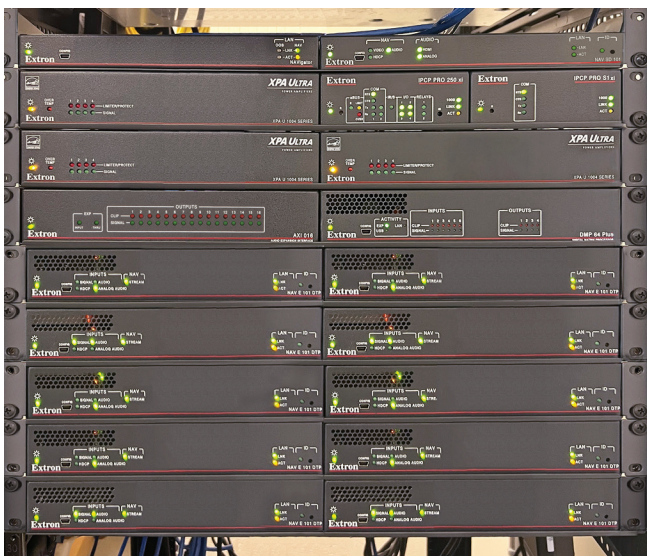


tailored for room acoustics, and distributed by a DMP 64 Plus audio DSP processor, which drives the ceiling speakers through an XPA® 4-channel amplifier with 100 watts per channel. A separate 800-watt NetPA® amplifier with integrated DSP drives the subwoofer. Audio is delivered to the DSP processor and the subwoofer amplifier digitally via the AES67-compatible NAV Pro AV over IP network.

### Cyber Classroom

The Cyber Classroom has 48 computer workstations organized in rows of six, four 84" flat panel displays, and eight SF 26PT SoundField pendant speakers. The classroom also has mentoring conference rooms, each with a 75" flat panel display for collaboration sessions.

The Cyber Classroom AV system is essentially the same as the Esports Computer Lab system described earlier. There are more computer workstations and displays in the Cyber Classroom, so there are more HDMI switchers and more NAV Pro AV over IP endpoints. This is where NAV proves its versatility, allowing AV installations to grow by simply adding encoders and scaling decoders. Users control the AV system from a TouchLink GUI on an iPad, just as in the Esports Lab. The same DSP-equipped sound system that drives the Flat Field speakers in the Esports Lab drives the pendant speakers in the Cyber Classroom, via a separate XPA Ultra amplifier. Similar to the Esports Lab, the Cyber Classroom has DTP wallplates where mobile interactive touchscreen teaching stations can plug into the NAV Pro AV over IP network to share lesson content to other screens around the building.



Top Photo: All of the Center's displays connect to the AV over IP network via NAV scaling decoders mounted behind the displays.

Bottom Photo: Core components of the AV system are located in the Intermediate Distribution Frame (IDF) equipment room. Included are AV over IP Ethernet switches, ten NAV E 101 DTP encoders and NAV scaling decoders, control processors, and audio amplifiers.



Cyber Innovation Lab

### Cyber Innovation Lab

The Cyber Innovation Lab includes 24 computer workstations on two tables, with six workstations on either side of each table. The primary display in this room is the videowall comprised of a 5x3 matrix of 49" flat panel displays. Adjoining the Cyber Innovation Lab is a Tech Training Room.

The AV system in the Cyber Innovation Lab follows the same design as the other rooms: HDMI switches pre-selecting HDMI content from each group of six workstations feeding into the NAV Pro AV over IP network. That network supports the videowall with NAV WindoWall® technology, feeding the 15 flat panel displays through 15 NAV scaling decoders. Four pendant speakers hang from the ceiling and are driven by their own separate amplifier located in the Intermediate Distribution Frame (IDF) equipment room. There are three DTP wallplates where mobile interactive touchscreen teaching displays can plug into the NAV Pro AV over IP network.

The tech training room includes tabletop demonstration equipment that students can practice on to gain hands-on experience. The demo equipment varies according to the lesson plan, but a NAV AV over IP encoder/decoder pair and a ShareLink Pro are dedicated units in this room.

### Lobby

The lobby houses the Center Director's office and is where staff greets students and visitors. An 82" display shows a rotating array of scheduling information, content from classrooms and labs, and esports gaming action, all supplied via the NAV Pro AV over IP network.



Top Photo: The Cyber Innovation Lab videowall.

Bottom Photo: The Tech Training Room hosts hands-on sessions where students gain experience working on demo equipment.

Lobby flat panel display provides public messaging and can also give visitors a view into class sessions or esports action taking place within the Cyber Innovation Center.



View looking into the IDF equipment room entrance.

### IDF Equipment Room

This room houses network switching equipment, NAV Pro AV over IP equipment, audio amplifiers, and AV system control equipment.

**AV System Control.** Two control processors manage operation of the AV system in response to user selections entered from TouchLink® touchpanels or wirelessly from iPads running the Extron Control app. A NAVigator System Manager configures, manages, and controls NAV Pro AV over IP endpoints.

**Student Access to IDF.** Under supervision of IT staff technicians, students participate in network maintenance and are exposed to the stress of working on a live network, where any mistakes would impact network users. It's a valuable real-world experience for students in their journey to becoming certified IT professionals.

## RESULTS

Over 700 students at four middle schools and three high schools are enrolled in the Cyber Academic Pathway program. As the hub of the program, the Cyber Innovation Center serves as an education facility, an esports and National Youth Defense competition venue, and a cybersecurity training resource for the community's small businesses, veterans, and others.

Moreno Valley USD is a member of the [CompTIA Academic Partner Program](#), which assists schools in recruiting, training, and certifying students in IT. Alumni of the Cyber Academic Pathway program are employed in well-paying software security and IT positions at firms such as CrowdStrike, Google, Yahoo, and the U.S. Space Force, to name a few.

**“The AV systems provide a high-level impact and excellent impression to visitors and participants engaged in our community outreach programs.”**

Donna Woods, MSc.Ed  
Career Technical Education Cyber Pathway Instructor  
([Inaugural Presidential Cybersecurity Educator Awardee](#))  
Moreno Valley Unified School District

Under supervision of IT staff, students are allowed into the IDF equipment room to get hands-on experience with IT and AV hardware in a “live” operational environment.



**“Extron collaborated with our instructors during AV system design to understand specific uses and applications for each course. As Extron customized the AV systems, they provided training and support during and after installation. They were exemplary in follow-up as instructors began using the system verifying everything was running effectively.”**

Donna Woods, MSc.Ed  
Moreno Valley Unified School District

Such student successes are all the more impressive because Moreno Valley USD qualifies for the federal Title I education program that supports low-income students. Beyond that, Donna Woods, teachers Ana Velazquez and Mary Baez elaborate that, “Successes are not limited to the top academic students. We have cyber career pathway students from special-ed and English as a second language learners. It’s amazing when you see them working together. Every child feels welcome and participate in the Cyber Education Center educational offerings regardless of their academic knowledge or wherewithal.”

Extron is proud of its role in contributing to this success story with its industry-leading switching, distribution, control, and audio products that are at the heart of the Cyber Innovation Center AV systems.

## FEATURED EXTRON PRODUCTS

Model	Description
NAV E 101	1G Pro AV over IP Encoder - HDMI
NAV E 101 DTP	1G Pro AV over IP Encoder with DTP Input
NAV SD 101	1G Pro AV over IP Scaling Decoder - HDMI
NAVigator	Pro AV over IP System Manager
SW6 HD 4K PLUS	Six Input 4K/60 HDMI Switcher
DTP T HWP 4K 331 D	Long Distance DTP Transmitter for HDMI - Decorator-Style Wallplate
ShareLink Pro 500	Wired and Wireless Presentation Gateway
DMP 64 PLUS C AT	6x4 ProDSP Audio DSP Processor with AEC and Dante
AXI 016	Sixteen Output Audio Expansion Interface for DMP Plus Series system
XPA U 1004	Four Channel Low and High Impedance Amplifiers - 100 Watts Per Channel
NetPA U 8001 SUB	Mono Subwoofer Amplifier with Dante and DSP - 800 watts
FF 120T	Full-Range Flat Field Speakers with Low Profile Enclosure and 70/100 V Transformer
SF 26PT	SoundField 6.5" Two-Way Pendant Speaker
SF 10C SUB	SoundField In-Ceiling Subwoofer
IPCP Pro 250 xi	IPCP Pro xi Control Processor
IPCP Pro PCS1 xi	IPCP Pro xi Power and Device Control Processor
TLP Pro 1225MG	12" Wall Mount TouchLink Pro Touchpanel
Extron Control App	Control App for TouchLink, eBUS, Network Button Panels, and MediaLink

## CYBER INNOVATION CENTER VIDEO

Facility tour fly-through by Tilden-Coil Constructors

<https://www.extron.com/Video/Play?id=146205>

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