



CASE STUDY

Extron AV Technology Helps Bartow County Schools Take Esports to the Next Level in 500-Seat High School Arena

Extron

Student gamers compete at their on-stage gaming stations with the arena audience visible in the stands during 2024 GHSA Georgia esports state championship tournament.



Fans in the Esports Arena cheer-on their teams.

“After two years of planning and working with education technology solutions provider PowerUpEDU, our vision is now a reality. These truly innovative spaces will help equip students at all grade levels with the knowledge and skills necessary to set themselves apart from their peers nationwide”

Paula Camp
Director of Advanced Learning, STEM,
and Gifted Programs
Bartow County School System

Bartow County School System, located in the rural foothills of Georgia’s Appalachian Mountains, serves 14,178 students. It encompasses twelve elementary, four middle, and three high schools, as well as the Bartow County College and Career Academy. The career academy is home to the STEM Innovation Center and Esports Arena on the campus of Cass High School.

The STEM Innovation Center, which caters to students from grades K through 12, contains an [ActiveFloor](#) interactive learning floor where students navigate in various learning games using their feet, [ClassVR®](#) headsets that provide virtual reality educational content, drones, 3D printers, robots, and more.

Steps away is the 7,000-square-foot Esports Arena, with stadium seating for 500. Here, lights, sounds, and a 220-inch videowall grab the attention of players and audiences alike. Extron switching, distribution, control, and audio technology make the Esports Arena the dazzling experience that it is.

Not only will students be competing in Georgia High School Association ([GHSA](#)) and [PlayVS](#) sanctioned events from this arena, but they will get hands-on experience in game development, shoutcasting, lighting, and sound design.

CHALLENGES

Paula Camp, Director of Advanced Learning, STEM, and Gifted Programs at Bartow County School System championed creation of the STEM Innovation Center and Esports Arena to enrich the education of students at all grade levels. With support and financial backing from the school board, the vision became a reality after two years of planning and construction.

AV rack houses core AV system equipment.



“The Extron team went above and beyond to ensure the success of the project. Extron’s extensive experience outfitting esports venues with effective AV systems smoothed the way for our project. NAV Pro AV over IP is working well in the Bartow County arena, providing reliable AV distribution and switching. Extron’s assistance designing the AV control system led to an intuitive user interface that makes operation of the arena’s AV system straightforward for people of all skill levels. In my role as the technical interface between Extron and PowerUpEDU during design and construction of the Bartow County Esports Arena, I can say that Extron employees that I worked with showcased true quality of service and leadership.”

Dalton Jones
Director Of Esports
PowerUpEDU

A dedicated team of architects, builders, and education technology specialists transformed a sports equipment room at Cass High School into an engaging STEM learning environment that makes science fun and could someday lead youngsters into fulfilling, rewarding tech careers. The same design-construction team converted Cass High School’s auditorium into a venue that ranks as one of the finest esports facilities in the Southeast United States.

Georgia-based education solutions company PowerUpEDU had overall responsibility for pulling the education technology elements of the project together. For the Esports Arena, that included everything from setting up the specialized esports furniture, the high-powered gaming PCs for players, coaches, and shoutcasters, arena lighting, and the AV systems. PowerUpEDU specified Extron products for AV switching, distribution, control, and audio processing.

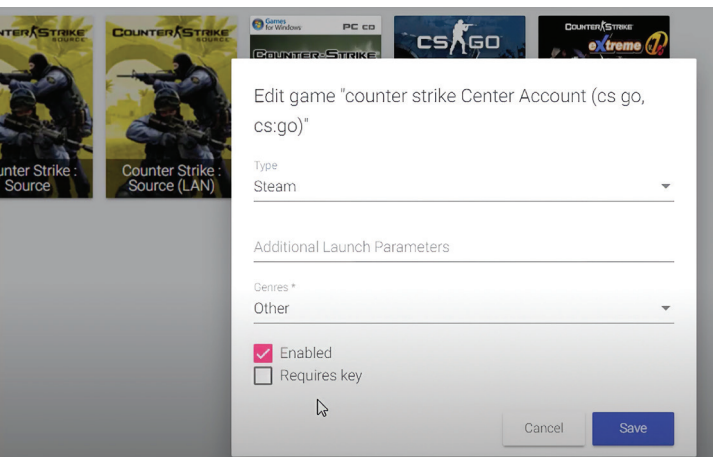
DESIGN SOLUTION

NAV Pro AV over IP for Fast and Flexible AV Signal Switching and Distribution

The design decision to build the Esports Arena AV switching and distribution infrastructure around AV over IP was a logical choice. NAV® Series provides visually lossless distribution of 4K video over 1 Gbps IP infrastructure. It’s easily scalable to accommodate many AV sources and destinations now and in the future. Near zero latency gives players a competitive edge in league play where reaction times are measured in milliseconds.



Lineup of PC gaming stations on one of the 5-player gaming tables.



Cloud-based esports venue management software helps system administrators run things smoothly and securely. This screen enables/disables game licenses.

A 48-port 1 Gbps Ethernet switch is at the center of the AV over IP network. AV content sources feed into the network via NAV E 121 compact encoders. AV content destinations are fed by NAV SD 101 scaling decoders. A NAVigator system manager with a 48 endpoint LinkLicense® (expandable to 240) configures, manages, and controls the AV over IP network. With 25 initial endpoints, there's lots of room for growth if more gaming stations, cameras, and displays are added in the future.

Gaming Stations, Coaching Stations, PTZ Cameras Feed into the AV over IP Network

On the arena stage, ten Lenovo Legion gaming tower PCs are set up on two five-player gaming desks that are tricked-out with ergonomic gaming chairs, keyboards, mice, mousepads, and high refresh rate gaming monitors. Two coaches sit at similar gaming station rigs positioned behind each of the five-player desks. Each gaming PC has an HDMI connection to a NAV E 121 compact encoder that feeds gaming action into the AV over IP network for audience viewing. Two tracking PTZ cameras located stage left and stage right capture the sights and sounds of players at their gaming stations. The cameras connect to the AV over IP network via NAV E 121 encoders which handle both HDMI content and RS-232 camera control signals.

Esports Venue Management Software Eases Administrative Work, Heightens Cyber Security

A cloud-based third-party esports venue management software package simplifies administration of user accounts, game licenses, and other aspects of venue operations. An on-site Preboot Execution Environment (PXE) server takes care of downloading, installation, and updating of game software



Two line array speaker systems, reinforced by more speakers and stage lighting on overhead rigging, pump-up the excitement. Animated pattern lights dance across the stage while gaming action appears on the videowall above the stage and on two on-stage displays.

packages from the cloud and applying them to all of the arena's PCs at once. This eliminates the labor intensive alternative of maintaining every PC individually. The PXE environment also bolsters network security. All PCs operate as diskless clients, booting their operating systems from the PXE server. Any changes made at individual PCs by gamers or other operators are overwritten by the server image on reboot, ensuring that the software baseline is maintained and guarding against unauthorized changes at individual PCs which otherwise might propagate.

Big Displays + Big Sound + Pro Stage Lighting = Immersive Excitement

Behind the players up on stage are two 98" 4K digital signage flat panel displays. A 75" interactive flat panel display is used for coaching. High up above the stage is a 220" 1080p direct view LED videowall display. These displays connect to the AV over IP network through NAV SD 101 scaling decoders. Any AV source can be routed to any display by the NAV AV over IP network. For more dramatic presentations, up to four sources are displayed in split screen arrangements on the videowall above the stage, produced by an MGP 641 xi multi-window processor. It is fed by four NAV SD 101 scaling decoders over the AV over IP network from the NAV E 121 encoders. The split screen can show views of the gaming action from multiple players and can also display the body language of the players themselves, caught by the on-stage PTZ cameras.

Pro Sound: A DMP 128 Plus audio DSP processor with acoustic echo cancellation receives network audio from the NAV endpoints over AES67 connectivity. The conditioned audio from



A student-producer in the sound booth controls sound routing, sound mixing, and stadium special effects lighting.

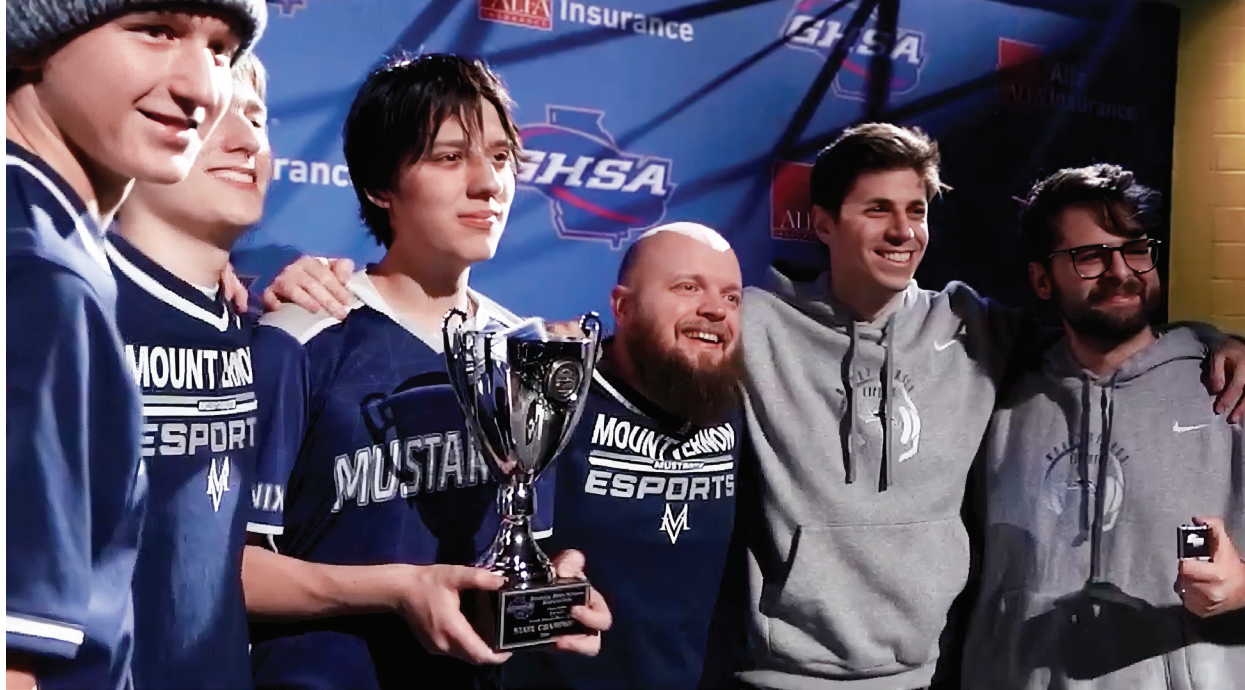


Students work at the shoutcaster mic with play-by-play commentary as they follow gameplay action on the shoutcaster booth flat panel display.

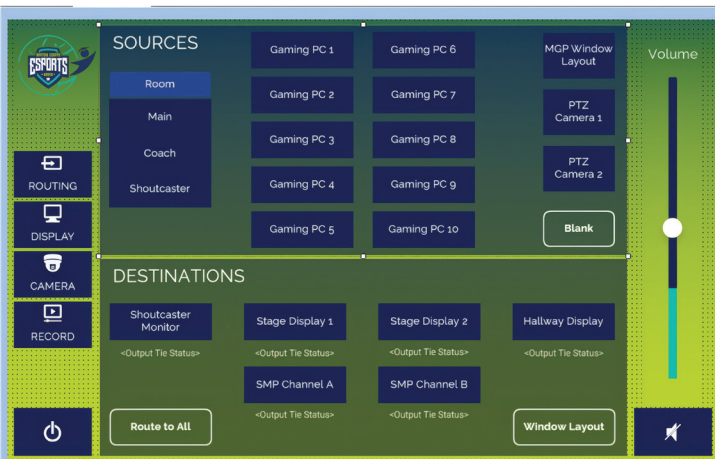
the DMP 128 Plus drives column array speakers on the stadium rigging, subwoofers, and stage monitor speakers using five amplifiers pumping out a combined 56,000 watts. A condenser mic in the shoutcaster booth allows announcers to provide their high-energy commentary. A wide selection of handheld and beltpack wireless mics allows people roaming the arena, on-stage or off, to be heard over the sound system. Selection, routing, and blending of audio is controlled from a sound booth equipped with a 16 channel digital mixing console and a 10" TouchLink® Pro touchpanel.

Pro Stadium Lighting: Spotlights, washlights, and gobo pattern lights, programmed from a professional lighting console, create excitement for players and audiences with the dramatic lighting effects that are a hallmark of pro esports tournaments.

AV System Controls for Event Producers. Two 10" tabletop touchpanels in the shoutcaster booth and one in the sound booth enable the shoutcasters and the event producers to take control of the AV system for routing and production. The touchpanel user interface gives program producers tools to create engaging esports broadcasts with polished, professional production values. They can control split screen selections performed by the MGP 641 xi multi-window processor and routing of video from any NAV encoder to any decoder. They can also stream and record audiovisual content with the AV system's SMP 351 streaming media processor, which can create two-window layouts in composite mode.



Competitors and coaches celebrate wins at GHSA Fall 2024 statewide esports championships held at Bartow County Esports Arena.



TouchLink Pro touchpanels with an intuitive operator interface control the arena AV system.

Shoutcaster Booth

The shoutcaster booth is occupied by a two-person student production staff. A PC gaming station connected to the gaming network allows the shoutcasters to tap into the action at any of the competition gaming stations or coaching stations and view what those stations are viewing through dual desktop monitors connected directly to the shoutcaster PC via HDMI. The shoutcaster PC also feeds HDMI into the AV over IP network via a NAV E 121, allowing audiovisual content produced on the PC by the shoutcaster crew to be distributed to the arena screens and to the Internet. The production crew monitors the outgoing feed and other selectable feeds on a 75" interactive flat panel display connected to the AV over IP network.

AV System Control

The TouchLink Pro touchpanels that are used by production personnel in the sound booth and the shoutcaster booth to control the AV system operate through an IPCP Pro xi control processor working with the NAVigator System Manager. The control system configuration that runs on the control processor was created using Global Configurator® Plus and the touchpanel graphical user interface was created with GUI Designer.

RESULTS

According to recent statistics, esports businesses contribute more than \$750 million annually to Georgia's economy. Georgia students benefit from this growth, as school systems throughout the state prepare a new generation with technical skills that can lead to well-paying careers in game content

“Esports is giving students a competitive outlook that a lot of these kids haven’t had before. Not everyone plays sports, and they need that extracurricular activity and the sense of being on a team. Esports fills that need. They’re so excited! It’s so much fun! Seeing the kids when they win a match and jump for joy is so inspiring.....

They celebrate each other!”

Troy Hester
Social Studies Teacher and Esports Coach
Adairsville High School

Madison Hilton
Mathematics Teacher and Esports Coach
Adairsville High School

creation, software development, and allied fields like graphic design, marketing, public relations, event production, and broadcast media.

Esports is an exhilarating way to get young learners who may not show interest in science, technology, engineering, arts, or mathematics to sit up and take notice of STEM subjects. Having students produce the live-streams, do the on-air commentary, operate and maintain the computers, networks, and AV production apparatus are great skill development and workforce development tools that showcase how scholastic esports is more than just playing the game.

For students who don’t gravitate to traditional physical team sports, esports is recognized by the State of Georgia as an official varsity activity which engages K-12 and higher education students in extracurricular activities that reinforce teambuilding, critical thinking, and other social skills important to graduating well-rounded individuals who will make positive contributions to society and fuel Georgia’s economic growth.

BARTOW COUNTY ESPORTS ARENA VIDEO LINKS

[Click Here](#) to view a YouTube video that describes how the Georgia Department of Economic Development sees esports as a powerful engine driving economic growth in the state.

[Click Here](#) to view a video produced by PowerUpEDU during the 2024 Fall Esports State Championships at the Bartow County Esports Arena, featuring footage of the event, interviews with attendees, and interviews with School District leaders.

[Click Here](#) to view student-produced coverage of the 2024 Fall Esports State Championships streamed live to YouTube from the Bartow County Esports Arena.

Photos and videos courtesy of Bartow County School System and PowerUpEDU.

FEATURED EXTRON PRODUCTS

Model	Description
NAV E 121	1G Pro AV over IP Compact Encoder - HDMI
NAV SD 101	1G Pro AV over IP Scaling Decoder - HDMI
NAVigator	Pro AV over IP System Manager
NAVigator LinkLicense	NAVigator 48 Endpoints Upgrade
MGP 641 xi	4K/60 HDMI Multi-Window Processor with DTP3 Extension
SMP 351	H.264 Streaming Media Processor
DMP 128 Plus C AT	12x8 ProDSP Audio DSP Processor with AEC and Dante
IPCP Pro 255Q xi	IPCP Pro xi Quad Core Control Processor
TLP Pro 1025T	10" Tabletop TouchLink Pro Touchpanel
Global Configurator Plus and Global Configurator Professional	Powerful Configuration Software for AV Control Systems
GUI Designer	Free Design Software for User Interfaces

