

UPGRADING LEGISLATIVE CHAMBER'S AUDIO EXPERIENCE

South Carolina House Of Representatives

Q-SYS Platform Provides Full Redundant Processing Solutions for Mix-Minus Reinforcement System

📍 Columbia, South Carolina

The [South Carolina House of Representatives](#) is vital to the state's legislative process. Comprised of 124 part-time citizen legislators, this chamber represents the interests and needs of the people of South Carolina. To better serve legislators, staff, and the citizens they represent, a massive restructuring of the Chamber's AV facilities was initiated to modernize and enhance communication capabilities and greater collaboration.



“**The Q-SYS Platform provides our Chamber with full centralized processing, remote I/O peripherals and loudspeaker remote control and status monitoring.**”

Michael Schwartz

Deliberative Designs Consulting, LLC

Solutions

A Sound Decision

The first step was to do a ‘brain transplant’ with a new DSP system. For this, Deliberative Designs Consulting, a consulting firm from Colorado Springs, Co, implemented the [Q-SYS Platform](#) with analog inputs and outputs to work with the existing equipment. With the new ‘brains’ in place, they transitioned to a completely new distributed and networked audio system to provide a significant improvement in overall quality and speech intelligibility.

Microphones Just About Everywhere

On the input side of the equation, microphones are seemingly everywhere. There are 123 member desk microphones located throughout the floor of the Chamber. These mics are switched on and off by the Q-SYS system, either from a large touch screen controller at the reading clerk’s desk, or from any computer or tablet connected to the system. For an authorized user, remote control is also available via the Internet or campus-wide intranet.

There are also 26 special event microphone inputs used for joint sessions between the House and the Senate, model student legislatures, and many other functions. These microphones can be selected via the [Q-SYS Control](#) for hands-off automixing or mixed by a house technician on an iPad or computer.

Inputs, Outputs & Control

There are a total of thirty-six 16-channel [Q-SYS I/O Frames](#) used in the system for inputs and outputs, in six discreet physical locations around the Statehouse and Chamber. Signals can be distributed to any of these physical locations via the [Q-LAN network](#). Each of these six locations use a pair of standard network switches, and are all connected with a pair of single mode fiber optic cable back to the switches. The output of each Q-SYS I/O Frame conforms with the new AES67 interoperability standard ensuring future compatibility.



Solutions

Fully Redundant

These switches route all signals to and from redundant Q-SYS Core 4000 processors (now available as the [Core 5200](#)) which process all signal routing, distribution, EQ, echo cancellation and control. An external control VLAN network port is also provided to a local Dell computer, which is used as a user control interface for Q-SYS.

“One of the key attributes of this system, other than standard Ethernet networked audio and AV connections, is the fact that, the with the exceptions of the microphones and reelers, the entire active electronic signal chain is fully redundant,” Michael Schwartz, Deliberative Designs Consulting principal consultant explained. “This means that for every device from input to speaker outputs, there are two devices available to perform the intended function. This extends even to amplifiers and loudspeakers. To the House and its members, the net impact is that the system never appears to go down, even if a component fails, it always works.”

The (Loud)speakers in the House

With loudspeakers virtually everywhere in the Chambers, Deliberative Designs Consulting used 18 individual Q-SYS power amplifiers located throughout the facility, including CX1100 two-channel, CX168 eight-channel, and CX254 four-channel models.

For low frequency support, they added four KW181 single-18 subwoofers — two per side — and custom finished to match the window alcove paint color.

Mix-Minus

Augmenting an impressive assortment of video display and projection capabilities, the space is now home to a sophisticated audio system that incorporates loudspeakers, over 150 microphones, and a redundant networked Q-SYS system for distribution, processing and control of the various audio assets.

“With this system, each desk and special input has an extensive series of controls for mix-minus including filtering, equalization, automatic gain control, compressor/limiters, and gain sharing automixer/matrix feeds,” Schwartz explained. “The previous system’s active feedback reduction system has been maintained, which allows increased system gain before feedback on each microphone. All outputs also have extensive drive processing, including multi-band dynamics, equalization and notch filtering, protection limiting, metering, etc.”

“The Q-SYS Platform provides our Chamber with full centralized processing, remote, I/O peripherals, and loudspeaker remote control and status monitoring, as well as the capability for an advanced signal localization technique,” Schwartz continued. “As members are located throughout the large Chamber floor area, if someone is seated behind and to the right of a member, the sound appears from the direction of where that particular representative is sitting, which gives an aural cue as to their location. From there, the signal is reinforced throughout the room for maximum intelligibility.”

Implementing Q-SYS in the South Carolina House of Representatives Chamber has transformed communication and collaboration. Now, legislators and staff can count on pristine audio and simplified control to efficiently address the interests and requirements of the people of South Carolina.



Q-SYS is a globally recognized manufacturer of audio, video and control (AV&C) solutions for huddle rooms to stadiums—and everything in between. Our systems make it easy for your team to design and integrate flexible, scalable solutions and deliver the native IT integration and standards-based technology your customers expect.

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