



Government Case Study:

Command center scenario

The Q-SYS™ Platform enables faster, smarter police work for Chicago's new command center.

It sounds simple. Studies have shown that if police have better information when they arrive on the scene of a crime, they are more likely to make an arrest that will lead to a lawful conviction. What's not so simple, however, is assembling and communicating the relevant data quickly enough that officers on the street have it when they need it.

That's the task of the Chicago Police Department's Crime Prevention and Information Center (CPIC). "Its mission is to provide real-time information to support officers in the field as they investigate a crime or intercede with a situation in progress," according to Jon Chuchla of Chicago-based Audio Visual Systems (AVS), who designed its system.

CHICAGO POLICE DEPARTMENT

Crime Prevention and Information Center, Chicago Illinois



We decided to use Q-SYS to obtain the most comprehensive processing, matrixing, custom scripting, third party integration and redundancy capabilities.

John Chuchla, Audio Visual Systems



1 Information Assembly

While the dispatchers are sending officers to the scene, CPIC personnel are already retrieving information relative to the incident from a variety of sources, which may include video and audio from various cameras and data on the crime. The rate at which information can be assembled from different audio and video sources, and then communicated to the officers makes all the difference.

2 Physical Separation of Systems

For legal and policy reasons, the CPIC needed to keep the various information sources physically separated in one of three separate equipment rooms in different parts of the block-long police headquarters.

3 Integration & Control

At the time of the CPIC's last upgrade in 2003, the control technology available was relatively limited. In addition, other audio and video systems have been added to CPIC since its last upgrade and were never fully integrated into the system.

4 Simplicity

In the heat of an emergency, the last thing anyone wants is confusion over how to access a piece of information or how to open a communications channel.

5 Support

The CPIC provides mission-critical important information to the Chicago Police department. The system had to be fail-safe, monitored remotely, and receive full support when issues arise.

System Input Requirements



50 PCs



6 Cable TV Sources
with Audio & Video



4 Ceiling
Microphones



16 Telephone
Lines



16 Headset Mics
with Earpieces



2 A/V Inputs from a Video
Conferencing Codec

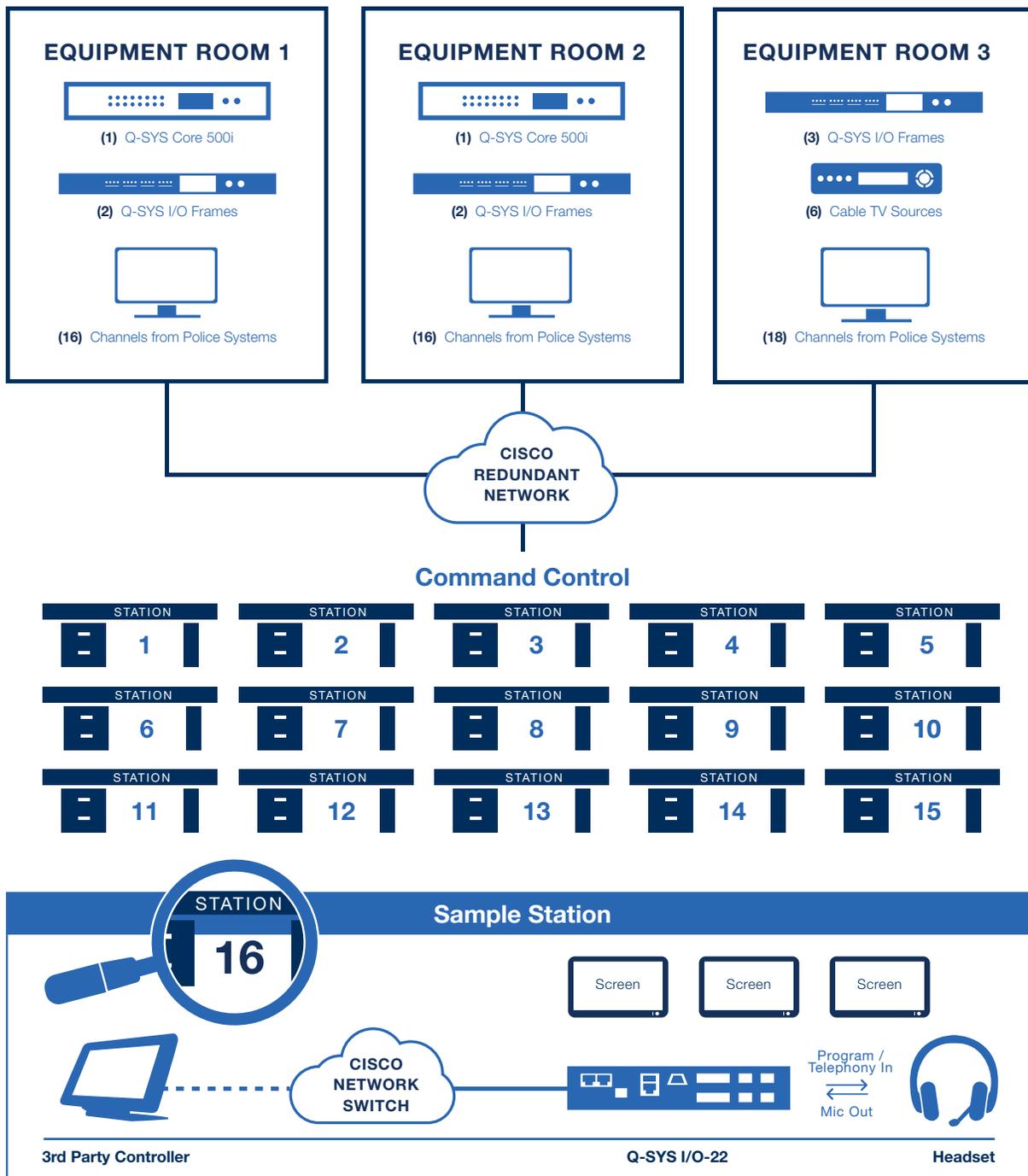


4 Ceiling
Loudspeakers



Full Audio Integration

Q-SYS allowed for digital transport and switching of all of these various audio sources. The routing system consisted of two Q-SYS Core 500i's, five Q-SYS I/O Frames and sixteen Q-SYS I/O-22 devices. Cores and I/O Frames were remotely located within the same racks that house the audio sources. There is one I/O-22 at each workstation to connect to the telephone equipment and the headset for each operator.





RESULTS

Separate design files ran on each Core, and Chuchla used these to create two large matrix switchers within the Cores. “For security reasons, each of the Cores handle half of the inputs and outputs, plus about half of the auxiliary audio sources, such as the audio from the TV tuners and video conferencing system.” The ability to utilize Q-SYS’s **Core-to-Core Streaming** functionality, which sends specific audio streams between Cores, was crucial.

To enhance reliability, a redundant audio network was employed two standard Cisco SG-200 switches in each location.

✓ Keeping things simple

Each station allowed the operator to choose between three AV sources and send each to one of three computer monitors installed at that workstation, and Q-SYS routed the incoming and outgoing audio signals automatically.

However, the CPIC needed more than just simple audio switching. Each operator needed the ability to listen to the primary channel while peripherally monitoring secondary audio channels. “If an operator is on the telephone but he or she has a radio channel open as well, they hear if someone is trying to come in over the radio,” Chuchla explained. Similarly, operators can listen for related announcements being played over the room’s four **QSC AC-C42T** ceiling loudspeakers while still focusing on their primary open channel.

“This scenario is quite difficult and cumbersome on other DSP platforms” Chuchla said. “Standard routers generally default to muting a previously selected source when you switch to a new source”. Working with QSC’s Application Engineering Team, Chuchla created a custom **Lua scripting block** within Q-SYS that managed a complex channel attenuation scheme.

In addition, the system used **automatic gain control** and **noise cancellation** to ensure that each source had the same volume level. They also took advantage of Q-SYS software-based acoustic echo cancellation for video conferencing.

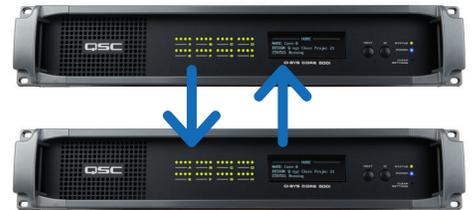


Third Party Control

To further simplify operations, CPIC utilized Q-SYS’s ability to interface with **third party devices**. For example, when a gunshot is identified by the CPD’s city-wide gunshot detection system, a custom script in Q-SYS triggers an audio tone on the operator’s headset while ducking whatever he or she may be listening to. The system also employed **audio-based logic** – for example, if no one is actively monitoring the gunshot system and an alert comes through, Q-SYS will alert other personnel via their touch screen controller.”

The system also used the Q-SYS **GPIO blocks** to control the hook switch status of the telephone hybrids. Operators control their audio switching via a Crestron video control system, which communicates to the Cores via **Q-SYS external control protocol**.

Core-to-Core Streaming



Watch a tutorial on how to stream audio between Cores.

To learn more visit:
www.qsctraining.com/core-to-core/

External Control Protocol



Watch a demonstration of the Q-SYS external control protocol.

To learn more visit:
www.qsctraining.com/external-control



Systems Support

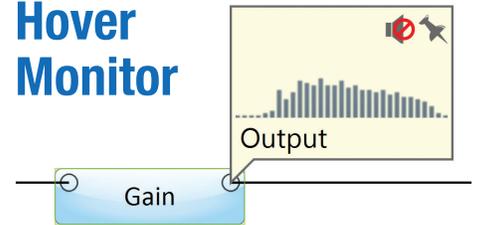
Chuchla said “AVS has developed a great working relationship with QSC over the past several years. We have never had a hardware failure. Q-SYS has proven 100% reliable for AVS. Q-SYS is also extremely flexible and allows us to easily program functions that would be difficult or impossible with other systems.”

“As a company that offers 24/7 service, we placed a very high value on the ability to monitor and service Q-SYS systems remotely. It allows us see the monitor our client’s systems, using tools like the **Hover Monitor**, which allowed us to remotely listen to any workstation’s input channels. Quite often this single feature allows us to fix a problem before our service engineer can find his boots.”

Still, Chuchla said the biggest reason he prefers Q-SYS is the quality of the service and support from QSC and its local representative. “Our local reps (Audio Biz) also have a programming specialist on staff, who came out to help me as I thought through this complex system. QSC should be commended in putting local feet on the street.”

Chuchla added, “The quality of this support, as well as the reliability and flexibility of QSC products, have made a huge difference in our ability to help the Chicago Police, through CPIC, support their officers on the street.”

Hover Monitor



Hover Monitor allows for remote monitoring and troubleshooting of every input channel in the system.





About QSC

QSC is a globally recognized manufacturer of audio systems for huddle rooms to large outdoor venues —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. This is AV built for IT, and it means more than workaround-free network connections. It means compatibility with IT systems that use LDAP and SNMP protocols. It means easily scaling to meet changing customer needs and supporting centralized management and monitoring. And it means producing meeting experiences users did not know were possible.



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