

### Pro64 Audio Network at Cuyahoga Community College



The Center for Creative Arts at Cuyahoga Community College

#### APPLICATION

Audio Network and Monitor Mixing

#### MARKET SEGMENTS

Education  
Studio

#### LOCATION

Cleveland, Ohio

#### PRODUCT LINES

Pro16®  
Pro64®

#### TESTIMONIAL

“The flexibility of the Aviom system is paramount to the success of this new facility. Aviom has delivered and exceeded our expectations in performance and sonic quality.”

**Mark Baker**

Studio Technical Support Manager  
Cuyahoga Community College

#### FEATURES AND BENEFITS

Easy for both instructors and students to use  
Flexible design allows the system to be reconfigured as needed  
Studio/broadcast quality audio

#### PRODUCTS

- 8 6416m Mic Input Modules
- 12 RCI Remote Control Interfaces
- 12 MCS Mic Control Surfaces
- 13 6416i Input Modules
- 12 6416o v.2 Output Modules
- 10 6416dio Digital I/O Modules
- 19 MH10 Merger Hubs
- 2 MH10f Merger Hubs
- 5 ASI A-Net Systems Interfaces
- 16 A-16D Pro A-Net Distributors
- 19 AV-P2 Output Modules
- 6 AN-16/i Input Modules
- 20 A-16II Personal Mixers

#### TECHNOLOGY FOR EDUCATION AND THE STUDIO

Cuyahoga Community College’s Center for Creative Arts houses the school’s film and digital media arts and recording arts programs and shares space with the archives division of the Rock and Roll Hall of Fame and Museum. An Aviom digital audio network functions as the backbone for the school’s recording arts facilities, tying together the building’s five production suites, two control suites, three audio classrooms, and various other common areas.

The school also serves as a recording studio for local artists, and students in the recording arts program produce a regular live music television show called *Crooked River Groove*.

When program manager Tommy Wiggins and studio technical support manager Mark Baker began thinking about the new center, they knew that they wanted state-of-the-art equipment that would “teach students the new methods and technology in the industry and that would better prepare them and make them more competitive in the job market,” says Wiggins. “That is critical for our success as a training institution. We have to ride the wave.”

## Case Study

### DESIGNING FOR SIMPLICITY AND FLEXIBILITY

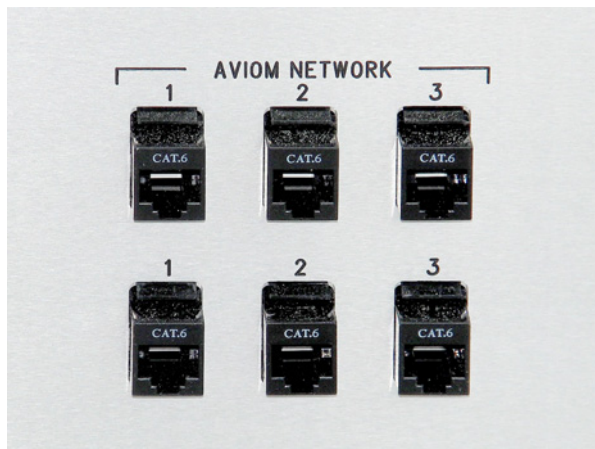
The consultant hired by the college to design the technology systems for the new building, Ray Kent from Westlake Reed Leskosky, was faced with the challenge of designing a system for distributing audio that was easy to understand and use in an educational environment and that offered the flexibility required for the program's needs.

Not only did Kent need to design a network to distribute audio throughout the 75,000 sq. ft. space, but he needed to do so with a system that was rugged and easy to use and that would support a wide range of configurations. The Aviom audio network that Kent designed meets these requirements and also distributes Word Clock and SMPTE throughout the entire building, both of which would have been expensive systems if they had been done separately. Kent explains, "I ended up with a system that was a lot more flexible with ultra-low latency and that allowed for a topology that could be any way that I wanted."

In addition, the Aviom network seamlessly integrates Aviom Personal Mixers for cue mixes in the school's studios.

### THE NETWORK DESIGN

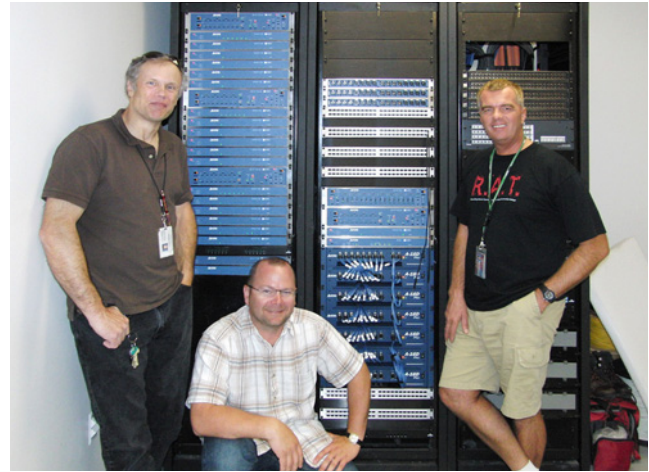
There are 17 rooms in the new Center for Creative Arts that are directly connected to the Aviom audio network, and other rooms in the facility can be patched in as needed. Each of the 17 rooms has a panel like the one below for connecting selected input and output racks to one of the three Aviom



Wall plate with Aviom connections

audio sub-networks. Each sub-network can be accessed in the various studios, control rooms, classrooms, and other areas tied in to the main network.

These three audio sub-networks—along with a fourth used for SMPTE time code—are housed mainly in the building's machine room. The three audio sub-networks, each comprised of 64



Tommy Wiggins, Aviom's Jeff Lange, and Mark Baker in the Tri-C machine room with the Aviom sub-networks and SMPTE network

channels, distribute a total of up to 192 channels throughout the building, with latency between the sub-networks of no more than three microseconds. This tight synchronization is critical in ensuring consistent quality and accuracy for recording purposes. The RJ45s in the wall panels are labeled for the three sub-networks. The heart of each sub-network consists of an Aviom 6416dio Digital I/O Module for clocking and six MH10 Merger Hubs for tying in to the various wall plate connection points.

Each of the network connections throughout the building is patched directly to a port on one of the MH10s that make up the sub-networks. The 6416dio in each audio sub-network is the Control and Clock Master for that sub-network. Clock for each sub-network is taken from the SMPTE network's 6416dio.

This setup makes it possible for students to sync audio and video, regardless of the location of their sources, and ensures that the entire audio infrastructure is clocked together. Channels from multiple sub-networks can be selected, and the clocks remain aligned, ensuring pristine recording.

In addition to the 6416dio used for the system's master clock, the SMPTE network also includes a 6416i Input Module that connects to SMPTE wall jacks located throughout the facility. To distribute the SMPTE signals, an ASI A-Net Systems Interface is used to convert the Pro64® signal to a Pro16® one. Pro16 A-16D Pro A-Net® Distributors connect to AV-P2 Output Modules installed at various student work stations throughout the facility. Each of these source select systems allows students to select and sync to one of 16 independent SMPTE streams for editing.

Two additional Aviom merger hubs are installed in the machine room so that the network can be expanded to include other

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locations on campus. These MH10f Merger Hubs seamlessly integrate fiber into the network and allow for long distance connections between buildings. Wiggins says, “The longevity of the system is certainly a benefit. The Aviom system future proofs the building. We have pristine audio quality from a system that we can continue to build on and use in a variety of ways.”

### MOBILE I/O RACKS FOR FLEXIBILITY

In addition to the equipment in the machine room, the school has 10 mobile racks of gear—four input racks and six output racks—and six Aviom personal mixing systems that are installed and used as cue mixing systems in the recording studios.

Each of the four mobile input racks includes two 6416m Mic Input Modules, an ASI, and an A-16D Pro and can be connected at any one of the 17 rooms’ connection panels. The 6416m modules each send up to 16 mic-level signals into the network. The ASI converts the Pro64 A-Net signal to Pro16 for outputs to the Aviom Personal Mixers in the studios. All Personal Mixers are powered and connected in parallel through the A-16D Pros. These cue systems can also be used independently of the Pro64 network because there is additional Pro16 gear installed for this purpose in each of the control rooms.

The six mobile output racks include two 6416o v.2 Output Modules, two 6416i modules, two RCI Remote Control Interfaces, and two MCS Mic Control Surfaces. Like the mobile input racks, they can be placed wherever they are required for a particular project. A 6416dio is racked separately and kept with each one of these output racks for connecting to digital consoles and work stations, while the two 6416o v.2 modules provide line-level outputs to the school’s SSL console or any of the other analog mixers in the control suites. Because the 6416dio is racked separately, it can also easily be separated from the rest of the rack and used independently wherever digital I/O or Word Clock is needed. The two input modules provide the returns to the input room, and using the MCSs, students can remotely control the Aviom mic pres for optimizing gain structure through the network interface provided by the RCIs.

### ULTIMATE CONFIGURABILITY, SUPERIOR FIDELITY

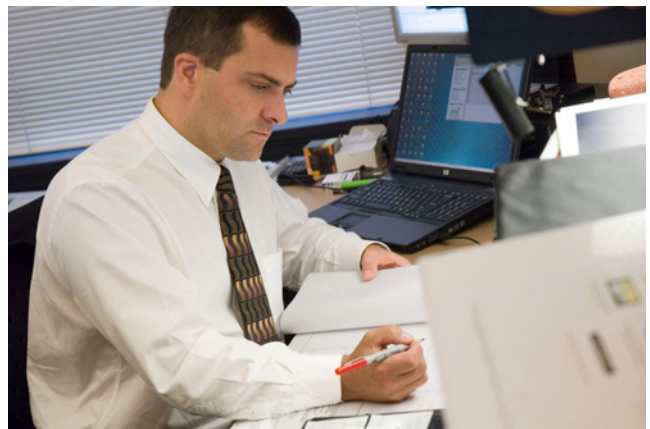
These mobile I/O racks can be connected to any of the Aviom sub-network connections that are located throughout the facility so that audio can be routed to and from any location as needs change. All routing of the audio can be done from the output racks, so it is not necessary to go to the machine room to physically reconfigure the system.

The school also uses these mobile I/O racks for remote recording sessions or to set up an independent digital snake for live sound production.

Wiggins explains that the use of mobile racks of gear, like the use of Cat-5 cable to interconnect the entire facility, saved the school money but also gave them “configurability that is really cool. We can make it what we want to make it. It’s like a very cool Lego set.” And much like a Lego set, the school can continue to build on its existing Aviom system, so it can adapt to the changing needs of the program.

Wiggins adds, “The Aviom system is elegant in how it provides plug-and-play connections into the network. And we are very satisfied with the sonic quality.”

In fact, Wiggins says, “When I heard that we were considering a network-based audio system, I was skeptical because I know good microphone preamps, and I only use good microphone preamps. But then I heard the Aviom mic preamps, and I played grand piano through them. They are marvelous—very clear, very open. The top end is very nice. It’s not brittle. It doesn’t break up.”

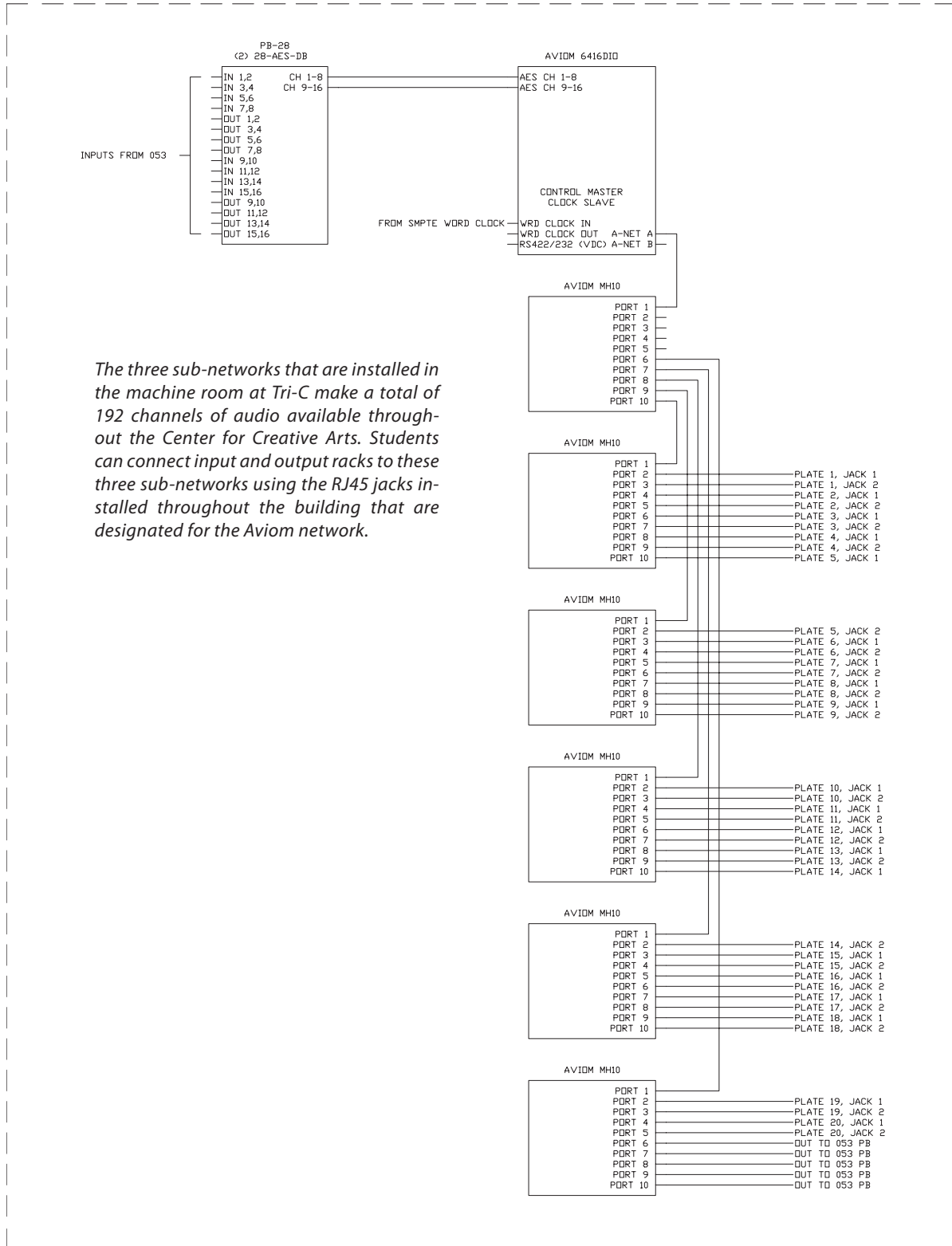


*Raymond Kent, CTS LEED AP EAVA  
Westlake Reed Leskosky*

Thus, the system that Kent designed is uniquely configurable, and the flexibility that is built into the system made it an affordable option for the school. Kent explains, “The goal was to make the system as simple as possible. It was a happy accident that the SMPTE network and Master Clock for the facility were able to be done with the Aviom system as well. The result was a unified system that required less gear, so it was more affordable.”

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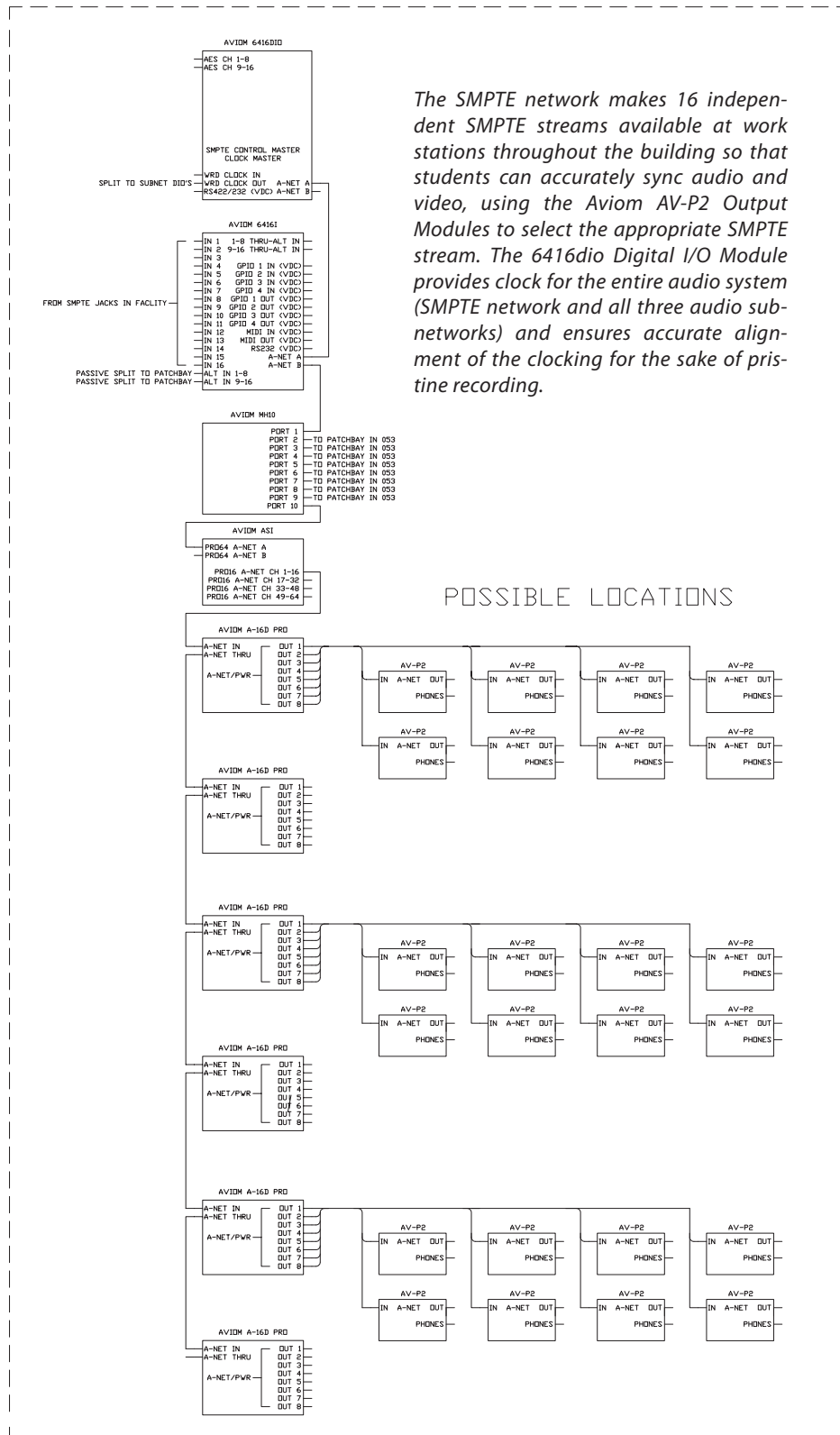
## SUB-NET 1 (TYPICAL OF 3)



The three sub-networks that are installed in the machine room at Tri-C make a total of 192 channels of audio available throughout the Center for Creative Arts. Students can connect input and output racks to these three sub-networks using the RJ45 jacks installed throughout the building that are designated for the Aviom network.

SMPT E NETWORK

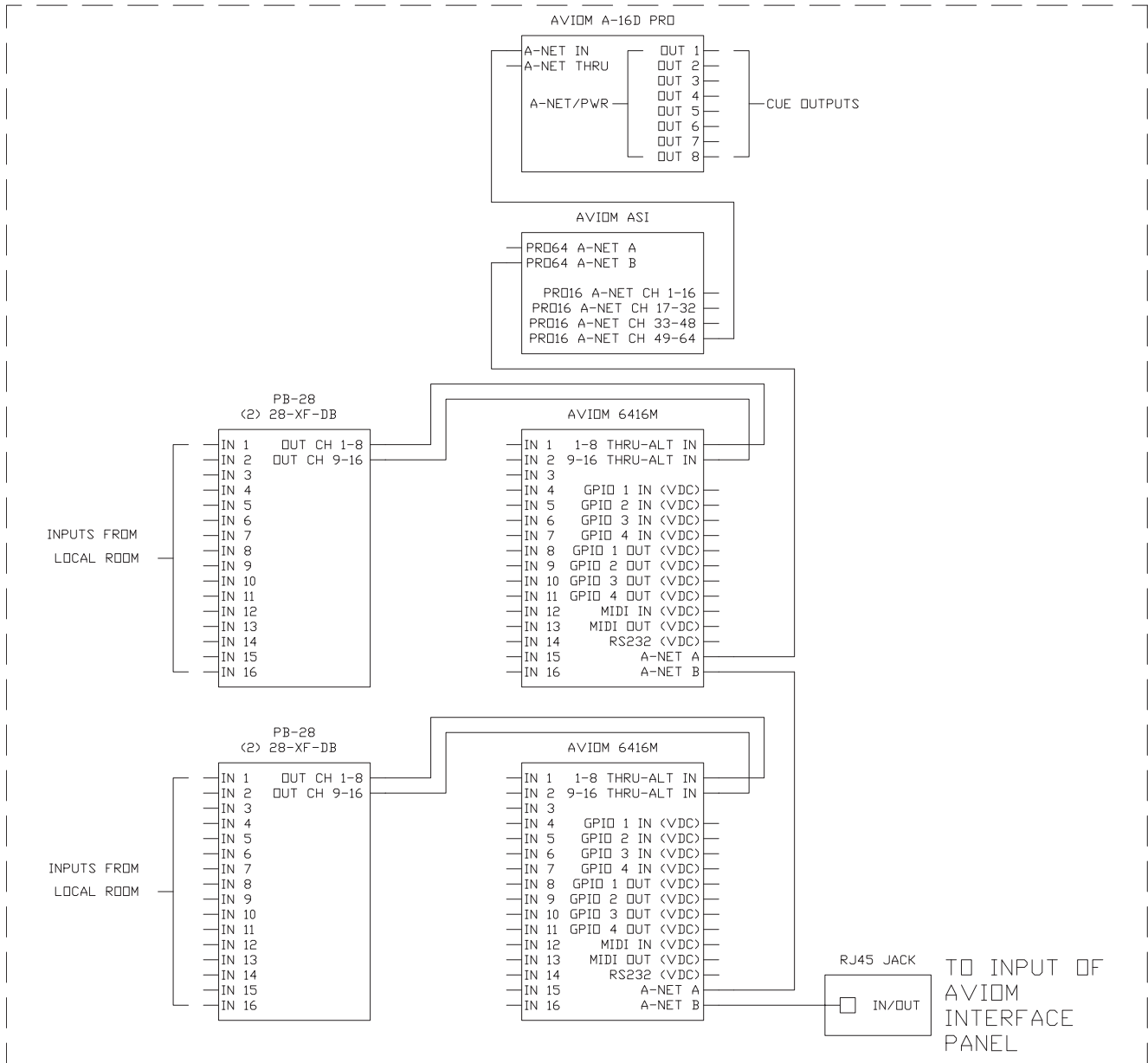
The SMPTE network makes 16 independent SMPTE streams available at work stations throughout the building so that students can accurately sync audio and video, using the Aviom AV-P2 Output Modules to select the appropriate SMPTE stream. The 6416dio Digital I/O Module provides clock for the entire audio system (SMPTE network and all three audio sub-networks) and ensures accurate alignment of the clocking for the sake of pristine recording.



POSSIBLE LOCATIONS

## Case Study

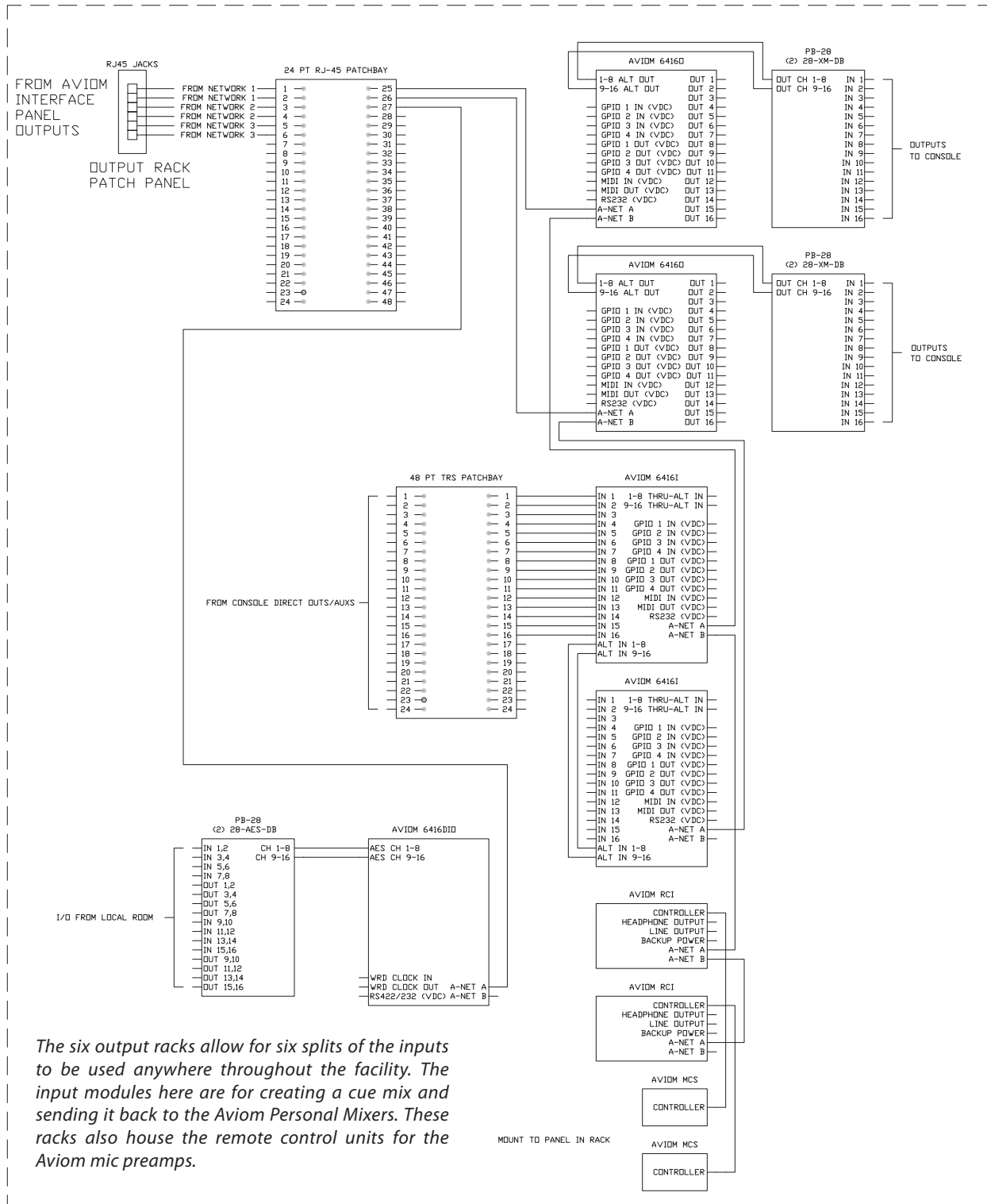
# INPUT RACK 1 (TYPICAL OF 4)



*The input racks are used to send up to 32 mic-level signals to recording consoles and work stations and to provide the return feeds for the Aviom Personal Mixers. These input racks can be connected to the Aviom audio network via any of the RJ45 wall plate connections that are located throughout the building.*

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## ANALOG OUTPUT RACKS (TYPICAL OF 6)



The six output racks allow for six splits of the inputs to be used anywhere throughout the facility. The input modules here are for creating a cue mix and sending it back to the Aviom Personal Mixers. These racks also house the remote control units for the Aviom mic preamps.