



Quantum Elite Facilitates Cardiovascular Training in Innovative Operating Environment

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Robert Murray
Director of System Engineering
National Communications Corporation

Within the Detroit, Michigan suburb of Royal Oak is William Beaumont Hospital, the 20th largest hospital in the United States. In 2013, Beaumont Hospital opened its 9,000 square foot Suzanne and Herbert Tyner Center for Cardiovascular Interventions, home to the hospital's nationally ranked Cardiovascular and Heart Surgery program. Within this center is the 1,600 square foot Instructional Hybrid Operating Center for Cardiology, where minimally invasive and catheter-based surgeries are performed in the same environment.

Shining brightly in this innovative medical facility is the Extron Quantum Elite videowall processor, which serves as the backbone of a system that expands the world class Hybrid Operating Center into a technologically advanced training facility.

Collaborative Planning

When planning the Tyner Center, Beaumont's surgeons and cardiologists set out to create a facility that not only provides its patients with the latest advances in surgical techniques and technologies, but also provided an educational environment for medical professionals from around the world.

To create the learning environment, a spacious elevated observation suite and classroom was built adjacent to the Hybrid Operating Center. This space required numerous live surgical camera and data feeds be presented in real-time and with high quality to medical professionals.



Extron Electronics
INTERFACING, SWITCHING AND CONTROL

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The responsibility of designing and installing the viewing system was given to National Communications Corporation, based in Troy, Michigan, which had already successfully integrated numerous AV systems elsewhere in the facility. Robert Murray, Director of System Engineering, was tasked with developing the solution.

XTP Systems for Today's Needs, and Tomorrow's

At the time of the initial design, the precise number and types of sources were not yet known. To allow for sufficient flexibility, the AV system components would have to support a wide variety of signal formats, provide high resolution signal transmission over CATx twisted pair cable, and allow for expansion as the system evolved.

For signal distribution, Robert selected an Extron XTP CrossPoint 3200 frame with a variety of input boards to receive camera and computer-video signals from the operating room, two auxiliary inputs located in the observation suite, and the hospital's closed-circuit television signal. The XTP CrossPoint output boards supplied eleven HDMI signals to the Quantum Elite processor and a standalone display in the adjoining classroom. One analog stereo signal was supplied to an Extron DMP 64 for audio signal processing and distribution. The Quantum

frame has space for three additional input cards and four output cards to accommodate future expansion of sources and displays.

A Virtual Window to Surgery with Quantum Elite

The biggest challenge Robert faced was determining the best way to present surgical camera feeds and data to trainees without impeding the view of live surgery from the observation suite. The solution was to install a 3x2 videowall above the observation window using 1366x768 LCD panels.

Robert chose an Extron Quantum Elite 615 videowall processor configured with ten HDMI inputs and six HDMI outputs to drive the displays. He selected the Quantum Elite for its patented image scaling and real-time performance, which ensured clear, accurate presentation of data and camera feeds from surgery.

"To make this medical learning environment effective, the hospital needed a videowall processor that could display high-definition surgical cameras and data in any configuration, while maintaining the integrity of the original sources. Any introduction of scaling artifacts or reduction in



An Quantum Elite videowall processor provides real-time performance and preserves critical image detail on the observation room's six-screen videowall



An XTP Crosspoint 3200 Digital Matrix Switcher allows for future system expansion



Audio signal processing is performed by an Extron DMP 64 Digital Matrix Processor



Observation Room seating

frame rate would have a negative impact on a viewer's ability to analyze and interpret the surgery," Robert Murray explained. "The best-in-class scaling and real-time performance of Quantum Elite made it the best product for this quality-critical environment."

One important factor was reliability, as the observation room must be available at a moment's notice and is operational 24 hours a day, 7 days a week. Quantum Elite's flash-based storage has no moving parts, providing a highly reliable platform for system operation, and has redundant, hot-swappable power supplies and fans to ensure continuous system operation. Another important factor was Quantum Elite's bezel compensation, which provides perfect image alignment from one screen to the next, ensuring that content maintains a natural appearance when spanning multiple screens.

The powerful Quantum Elite processor presents any of the 13 sources supplied from the XTP Crosspoint switcher in a variety of window combinations. Several unused slots in the Quantum Elite frame provide room for future expansion. When the observation room is not in use, the system makes use of Quantum's ability to store and display image files, presenting a Beaumont Health System logo on the videowall.

Dynamic Viewing Control

System control is made easy thanks to Quantum's simple yet flexible remote control protocol. A touchpanel located in the observation room allows an operator to select from a variety of preset window layouts, and then specify which source appears in each window, providing simple, yet dynamic presentation of many signals.

State-of-the-Art Facility, State-of-the-Art AV

Medical environments continue to make use of AV systems to present surgical images and data in the operating room and beyond. For Beaumont Hospital, a state-of-the-art operating room and observation suite, combined with Extron processing and signal distribution, created an environment where their acclaimed techniques can be shared with medical professionals in the United States and around the globe.

"Beaumont uses the system to train medical professionals from all over the world in advanced heart and vascular care," Robert Murray concluded. "Extron played an instrumental role in the planning phases and was available all the way through the installation process. The ease of integration and reliability of the equipment is why we choose to work with Extron on all of our projects."

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