

# ST. PATRICK'S GETS WITH THE TIMES

CATHEDRAL UNDERGOES LARGEST RENOVATION IN MORE THAN A CENTURY

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CATHEDRAL UNDERGOES LARGEST RENOVATION IN MORE THAN A CENTURY



Large hi-def LCD screens give worshippers in the rear and side aisles an upfront view.

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BY SHONAN NORONHA, EdD

The recent restoration of St. Patrick's Cathedral, a beloved New York City landmark, is the largest undertaken in the cathedral's 135-year history. The massive renovation project utilized modern methods and technologies to reinforce the stone structure, and refurbish the marble façade and stained glass windows. The entire length of the cathedral, from Madison Avenue to Fifth Avenue, as well as the Rectory and Cardinal's Residence have been outfitted with fiberoptic cabling to support digital audio, video, WiFi, security and other systems on the IT network.

The cathedral's iconic stature and 2400-seat capacity make it the preferred location for many events of national and worldwide interest. In addition to its parishioners, the cathedral also welcomes more than 5.5 million visitors each year. Envisioning the needs of present and future communities, the cathedral now features digital signage, digital guest books, souvenir vending kiosks, HD flatpanel displays, digital audio/video capture and distribution systems, as well as live streaming and broadcast technologies.

### Onward & Upward

Previously, the cathedral used analog audio and SD video. "We needed to upgrade and expand the audio and video systems at the cathedral," said Fr. Gary Mead, Administrative Director of Instructional Television (ITV) for the archdiocese of New York. The ITV studio is the diocesan broadcast headend, located on the campus of St. Joseph's Seminary in Yonkers NY, some 16 miles north of the cathedral. "The old system operated on a copper wire infrastructure with only three drops for cameras. The idea was to bring it up to date with state-of-the-art technology, so we had to put in fiberoptics. With the new infrastructure in place, we have 19 camera drops in and around the cathedral, with top-of-the-line connections that were put to a real-time test when Pope Francis visited last year," he explained.

Although four robotic production cameras are installed at the cathedral at this time, additional ones will be added as the need dictates and budget becomes available. "Hopefully, cameras

Though the organist and choir are not visible from the pews, they can be seen clearly via robotic cameras on the LCD flatscreens.







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and other equipment will offer even better quality and functionality in the future, and we will be able to put them in when we are ready to expand coverage," Fr. Mead said.

### New Systems

The new audio system features 58 K-array loudspeakers, 32 K-array amplifiers, eight receive channels, Shure Axient and a Yamaha CL3 digital console. For video, four Panasonic production-quality PTZ cameras currently capture video of the services. The cameras are located strategically, with one installed near the pulpit, two on columns on either side of the main aisle, and one in the choir loft at the rear of the Nave. Broadcast-grade components from Telemetrics, Haivision and Blackmagic Design complete the video system. Eighteen Samsung 65-inch commercial-grade LCD displays mounted on the columns bring the services closer to worshippers seated in the side and back pews.

The digital signage system includes four Samsung 65-inch LCD flatpanel displays, two each in the two Vestibules (side entrances). They are mounted in portrait orientation on Chief micro-adjustable wall mounts. Seneca Data media players are mounted on the back of each screen, and Scala cloud-based content management software completes this subsystem, which serves up dynamic content to keep parishioners and visitors informed about upcoming activities.

For the first time, a WiFi system will provide the congregation access to scriptures, hymns and virtual tours on their smart devices in the near future.

The security system was also upgraded and expanded with Avigilon cameras and other new gear. In addition to audio, video, data and security, the IT network also supports an HVAC building monitoring system.

Preplanning for various aspects of the restoration started in 2007. Over the next couple of years, architects, preservationists and conservators, as well as professionals in fire protection systems, marble and stained glass cleaning, security systems, audio, video, data networking, and other disciplines provided expert advice. The project was led by Murphy Burnham & Buttrick Architects, Construction Man-



Digital signage informs visitors of upcoming events.

ager Structure Tone ([www.structuretone.com](http://www.structuretone.com)) and Zubatkin, LLC, the owner's representative.

In 2008, the architect started conversations with Jaffe Holden ([www.jaffeholden.com](http://www.jaffeholden.com)), a Norwalk CT-based AV and IT system design firm. Jaffe Holden provided an initial system design for acoustics and AV systems. During the following years, preliminary exploratory work and method testing were conducted on structural, mechanical and other systems. In March 2012, His Eminence Timothy Cardinal Dolan announced the restoration project, and onsite work started in May.

The electrical work was awarded to B&G Electrical Contractors of New York, and included installation of the fiber backbone and final terminations. As the project evolved, IT subsystems were added, and Jaffe Holden's IT department was brought in to design the IT infrastructure.

### Refreshed Equipment List

Jaffe Holden also refreshed the original AV equipment list to include newer models that were better suited for the cathedral's newly envisioned applications. The initial RFP from Structure Tone for AV systems installation and integration was issued in the summer of 2012. Because AV cable pulls were to be performed by IBEW Local 3 labor, AV subcontractor Masque Sound ([www.masquesound.com](http://www.masquesound.com)) worked closely with B&G Electrical to assure that



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audio systems and flatpanel LCD displays were properly deployed.

Broadcast systems integrator AbelCine ([www.abelcine.com](http://www.abelcine.com)) was contracted directly by the archdiocese to design and engineer the video system, including PTZ cameras and video switching, with remote connection to the diocese's broadcast head-end in Yonkers NY.

Tele-Dynamics Voice & Data ([www.tdny.com](http://www.tdny.com)) designed and implemented the IT systems that support security, digital signage and HVAC. The security system designed by DVS Security ([www.dvssecurity.com](http://www.dvssecurity.com)) was installed and integrated by Diebold ([www.diebold.com](http://www.diebold.com)). The HVAC system with wireless control over IP was designed and specified by LFG. Mechanical contractor Lane Associates engineered the HVAC control system in conjunction with USG.

### Inevitable Challenges

In addition to the usual adventures inherent in coordinating a major landmark project with so many contractors, perhaps

the biggest challenge was the requirement that the cathedral continue to function as usual during renovation, without disruption of Masses and other services. Sometimes this required substantial additional planning and workarounds. For example, a temporary audio system was installed for use during the 18 months or so that it took to install and integrate the new audio, video and networking systems. To keep the cathedral up and running during renovation, areas were cordoned off and each team worked in turn to complete the specific geographical zone before moving to another zone. Systems integrators often had to plan for long durations of time between work sessions in subsequent zones.

There were numerous other challenges presented by structural limitations. Installing 21<sup>st</sup> century technologies in a 19<sup>th</sup> century building demanded ingenious thinking and creative collaboration among many teams.

### One Mission

It is estimated that more than 200 people

worked on the cathedral renovation on any given day, in addition to the support from cathedral staff, consultants and vendors' management. Structure Tone had oversight of all aspects of the restoration and renovation. The company had earned the client's trust in its abilities to manage workers from multiple companies, based on an earlier job of renovating the Rectory. A major aspect of the job for Ron Pennella, Structure Tone's onsite Project Manager, was what he calls "people engineering." Reflecting on the project, Pennella noted that there were about eight major teams, each one with a slightly different agenda.

"Getting all the teams and every person working on the site to align with the single goal of making everything work, and getting their buy-in while enabling them to have a personal sense of ownership and pride was essential for success," Pennella said. "It took a little bit of passionate persuasion, a little bit of intimidation, a little bit of salesmanship and horse trading, but at the end of the day, everybody bought into the entire concept with the goal of

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Data and AV racks were hoisted through the narrow arches of the triforiums.

delivering a world-class work product,” he explained.

### **Creative Solutions**

Various teams had to work together to problem-solve as realities of structural and preservation work presented the need to change some original designs or engineer new solutions. For instance, the cables for power, audio, video and data had to be routed down some of the columns. With project team concurrence, Structure Tone suggested that the multicolored Cat6 and fiber cables be concealed with Wiremold and custom painted to match the color of the marble columns.

It was also impossible to move the AV and data racks up the narrow spiral staircase to the triforium level (one level below the attic). The solution was to crane lift the Middle Atlantic AV racks from the main floor of the cathedral through the narrow marble arches of the triforiums. “Yet another ingenious solution was leveraging the planned and budgeted fire protection water mist suppression trolley structure for cable mounting trays, and running fiberoptic and other cables,” noted Pennella.

### **Evolving Needs**

When Jaffe Holden’s AV team started work on the project, their scope of work was acoustics and AV system design. “The acoustics scope was pretty limited because the finishes within the building were not going to change,” noted Ben Bausher, Senior Consultant, Audio/Video, Jaffe Holden. “Initially, we were to design the PA system, specify replacements for the loudspeakers that were in use for more than two decades, specify replacements for the video displays and design the backend infrastructure. We were not going to touch anything in the house mix position, but as the project scope expanded, we were to move all of the power and cabling for speaker lines, amplifiers and video up into the triforiums,” he said.

Jaffe Holden’s team did a thorough site survey and analyzed all the routes that could be taken. They could not go below the ground floor level because the basement was temporarily sealed off for asbestos abatement.

The cathedral has stair towers that provide access to the triforiums. “The width of the stairs is very narrow, but the towers have hollow centers that a couple of older



buildings use to make the long cable runs, and we planned to do likewise,” Bausher explained.

The plan was to deploy power panels and signal distribution racks in each of the four triforiums. “They were all going to be fed via fiber because there was no opportunity for signal isolation between the house mix position and the lower attic. Additionally, the cable runs were very long, so we decided to use fiber for signal integrity,” noted Bausher.

### Redesigning For Digital

Plans for upgrading the broadcast systems at St. Joseph’s seminary led to the decision to upgrade to hi-def video at St. Patrick’s. “At that point, we took a fresh look at the audio systems in the house mix position. We decided to replace all the analog consoles with a Yamaha CL3. All the wireless mics now are frequency-agile and receive channels of Shure Axient that use two handheld transmitters and six body packs,” noted Bausher.

Discussing the selection of components, Bausher explained, “The Yamaha console was selected because the size is good, it has a wider degree of flexibility, and its network architecture lends itself very well to the rest of the system; everything is IP-based and distributed over fiber. All speaker output signals are derived from Symetrix Edge DSPs that use the Dante stream transmitted throughout the church, so having a console that integrated with Dante made perfect sense. We presented John Knetge, the House Engineer, with a few different console options and he preferred the Yamaha over the others.”

### Clear Sound In A Big, Live Room

Fifty-six Karray speakers are mounted to columns throughout the Nave and near the altar. The amplifiers are located on four AV racks up in the triforiums. “The KK102 speaker allows for greater control of the coverage at each location,” said Matthew Peskie, install department manager at Masque Sound. Discussing the selection of the wireless mics, Peskie noted the flexibility and RF management tools with the Shure Axient system. “The AXT600 Spectrum Manager constantly scans the RF environment, updates the list of usable and non-usable frequencies, and communicates these frequencies to the AXT400 dual

channel receivers and to the bodypack and handheld frequency transmitters,” Peskie explained.

The choir loft features a new speaker system consisting of two 12-box Alcons LR7/90 line arrays driven by three Alcons Sentinel amplifiers located in the adjacent music room rack. The arrays are mounted on custom cantilever steel tube stock poles to allow positioning along the north and south ends of the choir loft.

Masque Sound shop-built the audio system at the company’s HQ in New Jersey.

“We tested every component and all the outputs, as well as the software,” Peskie said. “So, once the system was installed at the cathedral, bringing the racks online was pretty much plug and play,” he noted.

The initial plan submitted by the AV systems design consultant merely called for replacing the old SD pan/tilt video cameras, but with new directives at the archdioceses and after discussions with AbelCine, the vision for video evolved and expanded rapidly to include an upgrade to hi-def capture, multipoint control and



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streaming capabilities.

“The plan was to expand the broadcast capabilities at the cathedral, as well as at the studio in Yonkers,” said Jonathan Epner, Director of Market Development at AbelCine. “The idea was to simplify the workflow of the production team and eliminate the need for travel between Yonkers and Manhattan on a daily basis,” he noted.

AbelCine conducted a site survey and needs analysis to upgrade the video systems. “They wanted a solution that involved permanently installed robotic cameras that

could be controlled from the cathedral, as well as the studio in Yonkers, and used for streaming daily Masses at the cathedral to the ITV studio,” said JC Sciacca, Integration Design Engineer at AbelCine. “These cameras also double up as broadcast cameras for larger services and special events,” he explained.

### Video Capture & Control

Four new Panasonic HD pan/tilt/zoom robotic cameras are now in use in the cathedral. “We had installed Panasonic cam-

eras in a couple of music venues, as well as in schools and radio stations where our clients were very happy with the quality of the image, ease of use and flexible control of these cameras,” Sciacca said. Of the four, two AW-HE120 cameras are installed at columns to the right and left of the center aisle closer to the altar, and one next to the pulpit. A Panasonic AW-HE130 is installed in the choir loft. “When we tested the AW-HE120 up there, the image was shaky due to vibrations from the organ. We chose the HE130 for the choir loft because it has an optical image stabilizer,” explained Sciacca.

To enable PTZ control from multiple locations, AbelCine installed a Telemetrics RCCP-1 camera-control unit at the house mix position at the cathedral, and another in the ITV studio in Yonkers. Combined with Haivision’s Makito X encoder and decoder, this allows for a multi-view signal of all the cameras to be sent to Yonkers for control from there. AbelCine had installed Haivision’s KulaByte encoder for streaming with great success at other locations and was confident in the quality and reliability of the Haivision brand.

### Signal Routing

Fiberoptic connection points for cameras are installed throughout the cathedral: at conventional camera locations, at the columns, under some of the pews in the back and a few outside the cathedral. Some are used for the robotic cameras and others are used for additional cameras when a broadcast crew comes in for a larger event.

Telecast/Grass Valley T-POV-301 throw-down units are installed at each camera location in the cathedral. These units convert the HD-SDI video and control data signals out of the cameras into single-mode fiberoptic-compatible signals that then travel up to the AV racks, where fiber patch points route the signals throughout the building and back to the mix position.

“The T-POV-301s are the original units we installed, but the base station for these can handle only three cameras,” said Sciacca, noting, “When we added the fourth camera, we also had to add a corresponding throwdown unit in the choir loft, and its base station at the mix position.” The base station units convert the fiber-compatible signals back into HD-SDI and control signals that are then fed to the Blackmagic Design ATEM video switcher and Telemet-



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rics control system. An Evertz 6501 HD/SD sync generator also provides timing signals to cameras over the same Telecast/Grass Valley system to minimize latency and ensure system stability. The ATEM switcher also embeds house audio in the HD-SDI output that is fed directly into the Haivision streaming encoder.

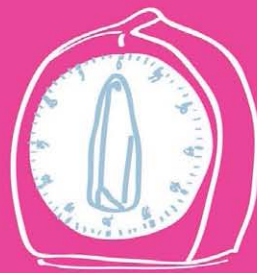
### Video Trials & Triumphs

A major, multifaceted, long-term project such as the renovation of St. Patrick's Cathedral is bound to have many interesting and challenging twists and turns. "One of challenges, right from the very beginning, was adding scope to the initial plans for video while the process was already moving along pretty quickly," noted Epner. "Additionally, dollar-wise, video was a tiny portion of the overall budget. And then, video and AV integration were at the mercy of the overall restoration project. So, if scaffolding was in the way, video and AV had to wait," he said. Construction-related dust was also a factor to reckon with, especially when renovation work was going on at the upper levels at the same time that the AV and video teams were working down below.

"One of the biggest challenges was the time constraint that arose when it became known that Pope Francis was coming to town," said Sciacca. "The cathedral had used some of the cameras to stream the morning Mass online, so we knew that the infrastructure of the system worked. The key to success during the pope's visit was ensuring that outside broadcast equipment worked together with the cathedral's installed system," Sciacca explained.



Cabling for cameras and speakers is concealed with wire molding and painted to match the columns.



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The PTZ camera above the pulpit provides views of the altar and Sanctuary.



House engineer John Knetge (left) with Masque Sound's Matthew Peskie at the digital audio console.

A media pool, where one production company was given access to the inside of the cathedral and their feed was available to TV networks, was organized for the pope's visit. The production crew's cameras used the fiber drop points inside and outside the cathedral. AbelCine's team stepped up to ensure seamless signal routing between the outside production cameras and the assigned destinations.

For the first time, St. Patrick's has a robust IT network within the cathedral. The segmented, distributed network includes one MDF and eight IDFs. Separate managed VLANs support the house mix posi-

tion, cathedral AV, gift shop, three organs, VoIP, WiFi, security, building-management and cathedral-management systems.

"The new data network is designed to fully support the current data communication, security and building monitoring needs of this landmark facility," said Michael Starobin, Vice President, Tele-Dynamics Voice & Data. "It provides a seamless path for future growth as the cathedral's needs change and evolve." The robust network includes redundant Avaya core switches in the MDF connected by redundant 10GG fiber uplinks to Avaya PoE edge switches in the triforiums. All switches have redun-

dant power supplies connected to redundant Tripp Lite SMART 3000RMX UPS and racks are equipped with Tripp Lite Environmental Monitoring Probes and door position sensors. The WiFi system consists of an Avaya 8100 series wireless LAN controller with 12 WAP8120 WAPS and 18 external dual-band antennas. The firewall, a Dell SonicWALL, consists of two versatile HA Dell NSA2600 Appliances.

### Cable Pathways

Because fiberoptic cable was being laid down for the first time in the 135-year-old structure, plotting the pathways was no simple task. "The design documents specified the cabling types and pathways for coverage of the full extent of the public areas," noted Dan Pellegrino, IT Infrastructure Consultant at Jaffe Holden.

"We addressed the physical aspects of signal distribution, given the scale of the space, and connection points for wireless devices that would use external antennas," he said, noting, "The sheer size and massive structure of the cathedral presented challenges for WiFi penetration and coverage to all seating and circulation areas."

Tele-Dynamics provided the IT system parameters to Jaffe Holden during the infrastructure design phase to ensure that all of the systems on the network would be fully supported. There are multiple strands of both single-mode (OS2) and multimode (OM4) fiber that land on fiber patch bays at each rack.

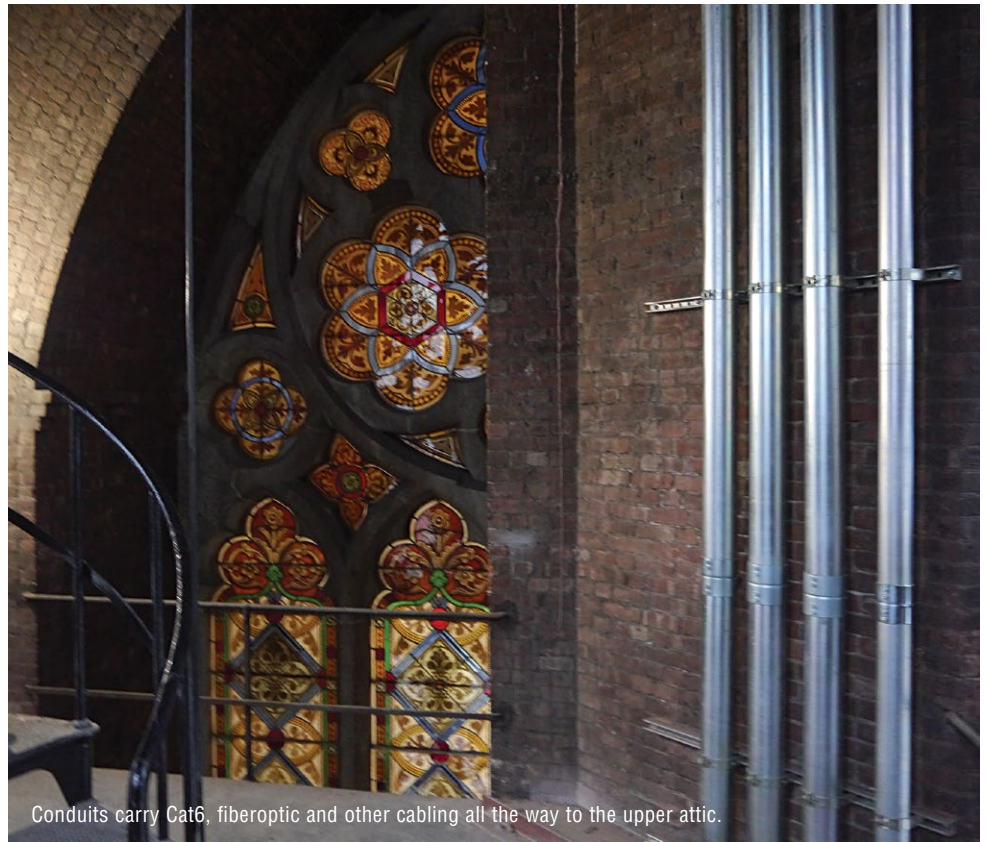
There were numerous cabling-related challenges, and at least one that impacted AV was the result of additional structural



and mechanical work done in the spiral stair tower leading up to the triforium. The hollow center of the stairway planned as a cable pathway was filled and left no room for running conduit. The solution was not readily apparent but, thanks to a B&G electrical foreman who located a decommissioned chimney, a complete, complex and challenging pathway was mapped out using a portion of the chimney, and the problem was solved.

### Reclaimed Pathway

The first 70 feet of chimney flue (which is about 30 inches in diameter) was reclaimed and provided pathway continuity from the mix position, through the undercroft, up to the attic and down to the AV racks, IT racks, as well as a path for conditioned power for the racks array. "B&G extended 11 conduits and cabling through the new pathway," Pennella said, noting, "and we were fortunate to have a very thin and creative electrician fit in the space to get the job done." The wire/cable path from the house mix was reconfigured to



Conduits carry Cat6, fiberoptic and other cabling all the way to the upper attic.

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go down to the undercroft and all the way up to the midpoint of the chimney, cross a triforium, pass through the mid roof and tuck behind a buttress on the building exterior, enter the attic and then route down to the rack locations to the Ethernet switches in the triforiums.

Another challenge was running RF antenna cables for the distributed antenna system. Church dignitaries sometimes enter in procession from the Fifth Avenue side, so wireless coverage of the full length of the cathedral was necessary. “We did have a second set of antennas in the choir loft that is on the Fifth Avenue side, but the

challenge was how to run about 300 feet of very heavy-gauge RF antenna wire all the way from the entrance to the house mix location. Fortunately, the Masque team found a recently introduced RF-to-fiber converter from RF Venue,” Bausher said, noting, “It worked fantastically well.”

As he reflected on the project, Fr. Mead said, “Now that we have a high-quality fiber infrastructure, we will be able to add the latest and improved technology in the cathedral during the next couple of decades or until the technology changes again, as it always does.”

The various teams worked tirelessly to

ensure that the systems would operate flawlessly. “Every project has stressful parts and, while working on it, one is concerned whether things will work as planned, but each job has its own merits,” Bausher said. “This project was fun and everyone pulled together really well. We all spent a lot of time at the site, had to improvise on the fly and made some design decisions in-construction, just because, if you’re working in a 150-year-old building, that’s the type of thing you have to do. It was definitely an honor to be a part of such a high-visibility project in New York City,” he said.

What was the high point of this project

## Equipment

### AUDIO

- 2 Alcons GRD7 choir array grids
- 22 Alcons LR7/90 choir speaker arrays
- 3 Alcons Sentinel-3 choir array amps
- 26 Artel Fiberlink 3355-B7L SDI fiber to HDMI converters
- 2 Artel Fiberlink 8202-BS77 SDI fiber DAs
- 8 Artel Fiberlink 8204-BS7777 SDI fiber DAs
- 4 Asus PA248Q mix position LCD displays
- 2 Audio Accessories WEP-EO-C-26-N-2-A audio patch bays
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- 1 Crestron DIN-AP3 processor
- 1 Crestron MPC-M5 remote
- 4 DPA 4060 lavalier mics
- 2 EAW UB12 choir loft speakers
- 1 Extron DXP 88 HDMI switcher
- 4 Genelec 8020C near field monitors
- 8 Jensen Transformers ISO-Max 2-channel universal isolators
- 56 K-array KK102 main speakers
- 32 K-array KA10 amps
- 56 K-array K-KWall2w white speaker mounts
- 4 Listen LA-140 ALS emitters
- 4 Listen LT-82 ALS modulators
- Listen receivers, charging stations (lot)
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- 8 Middle Atlantic various racks w/accessories
- 2 Middle Atlantic VC-4819-WS18 ViewPoint monitoring consoles
- 1 Netis WF2780 WAP wireless AC router
- Optospan fiber jumper cables (lot)
- 2 Professional Wireless high-power 2-way splitter RF splitter
- 1 QSC CX502 amp
- 1 Radial Engineering MC3 volume control
- 1 Rane DA216S audio DA
- 4 RF Venue RF Optix OPTX2-INS dual-channel RF to fiberoptic conversion systems
- 22 Samsung MD65C column/vestibule displays
- 3 Sennheiser e912 PZM mics
- 4 Sennheiser ME 34-nx mic elements
- 2 Sennheiser MXTX 31-nx mic desk stands

- 4 Sennheiser MZH 3062-nx mic goosenecks
- 2 Sescom SES-FA2 portable 2-channel mic/line level audio over fiber extender kits
- 6 Shure Axient AXT100 RF beltacks
- 2 Shure Axient AXT200/SM58 RF handheld mics
- 4 Shure Axient AXT400US-A dual RF receivers
- 1 Shure Axient AXT600US RF spectrum manager
- 2 Shure Axient AXT610US show link WAP
- 1 Shure Axient AXT630US RF antenna distributor
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- 4 Shure UA874 RF antennas
- 1 Super Logistics rackmount PC control PC
- 6 Symetrix Edge frames w/various cards, DSP
- 1 Tannoy Di-5A speaker
- 6 Tripp Lite SU2200RTXL2U UPS
- 1 Yamaha CL3 console
- 1 Yamaha Dugan-MY16 card slot card
- 1 Yamaha MBCL console meter bridge
- 1 Yamaha MY16/AE console AES card
- 1 Yamaha PW800W console PSU
- 2 Yamaha RIO-1608-D console I/Os
- 1 Yamaha RIO-3224-D console I/O
- 1 Yamaha RMio64D Dante to MADI interface
- 50 custom AV facility panels

List is edited from information supplied by Masque Sound.

### VIDEO

- 1 AJA Ki Pro rackmount digital file recorder
- 1 Blackmagic Design ATEM TV Studio production switcher
- 1 Blackmagic Design ATEM 1 M/E broadcast control panel
- 1 Evertz 6501 HD/SD sync generator, timecode, wordclock
- 1 Flexible Picture Systems OmniScale 200 scaler for videowalls, LED signs
- 1 Haivision Makito X decoder
- 1 Haivision Makito X encoder
- 1 Kramer VP-790 8-input broadcast scaler
- 2 Marshall V-LCD17H-3G-DT 17" 3GSDI monitors
- 1 Panasonic AW-HE130 PTZ camera
- 3 Panasonic AW-HE120 with FEC-120 WMK PTZ camera wall mounts
- 1 Telecast/Grass Valley T-POV-301 1RU base station
- 3 Telecast/Grass Valley T-POV-301 throwdowns
- 1 Telecast/Grass Valley T-POV-324 throwdown
- 1 Telecast/Grass Valley T-POV-324 1RU base station
- 1 Telemetrics DS-4 protocol translator
- 2 Telemetrics RCCP-1 camera control units

List is edited from information supplied by AbelCine.




for the AbelCine team? “I realized the magnitude of what we had accomplished at St. Patrick’s when Pope Francis arrived in the cathedral and I was watching the live feed,” said Sciacca, who was at the video mixer and control position at the time. “To see that they were using our cameras to capture live video of the pope was really something special. It was something more than we had originally imagined,” Sciacca said with emotion, confessing that, although it was a very long session, it was an exciting day.

Sciacca added, “We’re still in there to do minor adjustments and upgrades, and we’re usually on hand during large events, just to make sure that the crew coming in understands how the system works and that they bring the proper equipment to adapt to the system.”

### Work In Progress

Establishing a secure connection between the cathedral and the ITV studio in Yonkers, as well as provisioning for secure WiFi access within the cathedral, are still in progress. Currently, the daily morning Mass is recorded and broadcast on a cable channel in the afternoon, but live broadcasts are anticipated as soon as scheduling and other arrangements are in place.

As noted in the Mission Statement, “The heart of St. Patrick’s Cathedral is the faith, work and generosity of good people bringing God’s presence into the world, inspiring a conversation among the generations.” Although the new media and data systems enhance viewers’ experiences, this epic restoration should also prompt spirited discussions among AV professionals and others in related industries. 



The new choir loft system features speaker arrays on the balcony.



In the choir loft above the church floor, AbelCine’s JC Sciacca adjusts a robotic production camera.

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