Radio Station 2.0

Radio — THE RADIO TECHNOLOGY LEADER

By Jake Robinson

In the summer of 2008 I was asked by Cumulus Media Cincinnati, which owns and operates WRRM (Warm 98), WGRR (Cincinnati's Greatest Hits), WFTK (96 Rock), WNNF (Frequency 94.1) and WOFX (92.5 the Fox) to help plan, design and manage a complete studio and office facility move. With the purchase of WNNF and WOFX, the cluster had outgrown its downtown facilities and expanding in the existing building was not an option. The area had also been on a steady decline: It was time to make a move.

Karrie Sudbrack, local market manager, Gary Kline, Cumulus V.P. of engineering and IT, and I visited numerous buildings and locations. Would the building be easily accessed from all locations in the city? Would there be adequate parking? Did the facility have the proper security and safety for the employees? Were there clear STL paths to all the transmitter sites from the rooftop or could a small tower be erected on the premises that would accommodate these needs? Would there be enough space to expand or add studios in the future? Within a few short months and after many discussions, a perfect location was chosen.

The studios would be housed in a new and very modern building called Linden Pointe in the Norwood, OH, area. Norwood is a centrally located, up-and-coming neighborhood in the greater Cincinnati metro. It is surrounded by trendy retail shops, restaurants, businesses and night life. The floor chosen for the radio stations had never been occupied: It was a perfect blank canvas.

Getting started

The architectural firm selected for the project was SHP Leading Design. The SHP team worked with us to create an open office. Many radio station operators put their studios in a corner of the building to hide them from the public; our design would put the studios at the forefront of the facility. Two air studios would be placed on either side of the reception area with windows looking in. The rest of the studios and the technical operations center were laid out in the main hallway so clients and visitors would walk through

In a down economy, stations must be resourceful to reduce, reuse and recycle, even when building new facilities.

The Warm 98 air studio has one of two Axia Powerstation systems.

and see them. Floor-to-ceiling windows bordered the entire space allowing a great deal of natural light. Walkways around the entire perimeter ensured the open feel. A giant common area and comfortable lounge areas were put in place to encourage collaboration. Only a few closed-door offices were proposed, but each would have glass doors and be visible from the outside.

Reduce, reuse, recycle

Building a facility of this size can be an expensive venture. Broadcasters in general have certainly felt the pain of the current economy and we simply could not look at the project with great big budget eyes. We would have to reuse much of the equipment we already had in place and purchase only necessary infrastructure items such as furniture, racks, wire, cable and connectors.

We moved a used 100kW natural gas generator from a former Houston studio facility. We reused our Best Power/Eaton UPS system from the old studio location. We even removed and reused the IAC soundproof doors from the old studios to save thousands of dollars.

For the studios we chose Omnirax's new Innova series line of furniture. David Holland of Omnirax took the time to help us configure and design a perfect fit customized for each room, console and operators' needs. We needed furniture that would be budget-friendly, but also very functional. It had to be sturdy and long lasting and we had custom size and usage requirements. Due to existing tenants on the floors below and above we could not run conduit to our studios and furniture. Instead, all the wire,

The studio for 96 Rock is almost identical to the Warm 98 studio. WGRR's studio is a mirror image.

cabling and electrical would have to enter the room and furniture through wall junction boxes. Omnirax's custom CAD design matched exactly to the plans and layout. Wire and cable were easily distributed throughout the furniture and the punch blocks were easy to access and terminate. We were absolutely amazed with the quality, craftsmanship and extremely easy setup of this furniture line. On the day of delivery, we had a small crew of six engineers. Less than eight hours from the time the truck pulled up we had unpacked, moved and assembled all eight studios. It was definitely an experience to remember.

We decided to purchase two new consoles for the WRRM and WGRR air studios. These studios would be built first and would provide us a way to transition the stations one-by-one into the new facility. Our plan was to move the gently used Wheatstone G6 consoles and Bridge router system for WKTF, WNNF and WOFX. We needed to replace the aging analog and digital consoles in the production rooms and chose to install used Harris Impulse Digital and Airwave Digital mixers from our surplus equipment. We would also need to replace the aging automation system.

For the two new air studio consoles we chose Axia Element surfaces along with Powerstation. This would be the first Powerstation installation in North America, and we were extremely excited to get our hands on the equipment. 16-fader Element console frames were picked to accommodate all the sources needed in the studios. Axia was chosen for its versatility and Livewire IP audio technology. Additional AES/EBU and Analog Nodes were placed in the TOC for interfacing with any other source or destination requiring traditional audio wiring. We needed a system

The main production room is the largest production studio.

A wire tray exits the TOC feeding individual studios through square cable chase conduits.

ourselves. We chose overhead data center wire management ladders and kept them below any plenum ceiling spaces for additional cost savings.

To house our TOC equipment we purchased Middle Atlantic WMRK series 48" deep server racks with split rear doors. An ever-increasing amount of broadcast equipment systems are server and computer-based. The racks housed square-hole rails with removable 10-32 cage nuts for mounting traditional equipment. With the square holes we were able to mount all the servers and computers with their proper sliding rail systems. In the past, I have run into so many situations where you unpack the latest, greatest server, go to mount it in a traditional broadcast equipment rack and find that the rails don't work or stick out the back. With the 48" deep racks and adjustable rails we were able to mount each piece of equipment exactly as it was intended.

To make network connections easy, the rear of each rack was outfitted with a 12-port CAT-6 patch panel that terminated to a master patch panel in the network switch rack. Each piece of equipment requiring a network connection could be patched without ever having to home run the wire.

Both the Axia and Wheatstone systems use standard RJ-45 connectors for their analog and AES/EBU audio connections. Crimping hundreds of RJ-45 connectors can take a very long time so instead we purchased inexpensive 100' CAT-6 pre-made cables. With the pre-terminated cables we could cut each one in half, plug the connector end into the equipment and terminate the other end directly onto the punch blocks. The left over cable was used

that would require the least amount of trunk wiring and be extremely quick to set up and deploy. Axia also provided us an excellent path to grow and build future studios without traditional TDM-based digital routers or analog wiring systems.

For our automation system replacement, we chose Broadcast Software International's OpX. The scalable and redundant multi-tiered architecture of OpX with the integration of Axia's Livewire IP audio drivers were a perfect match. Using high-availability network switches we easily connected all the OpX and Axia systems without wiring a single audio card. Our OpX installation included a master file server, multiple and redundant audio record/playback servers, studio clients and numerous other utilities to quickly import and export audio, create rotator carts and playlists, and easily automate satellite programming. The back-end functions of OpX also let us export artist/title metadata and information to our RBDS systems, streaming encoders, now-playing website banners and future technologies.

For our wiring design we wanted the highest performance and lowest cost wire and cable that could be used for analog audio, AES/EBU digital audio, data, control and even video. We decided to stay away from traditional and expensive multi-pair trunk wiring and instead chose to use inexpensive 650MHz spec CAT-6 cable for all our connections to and from the TOC and studios. For termination we chose to use Krone K-110 punch blocks, Neutrik audio connectors and L-Com RJ-45, RJ-11 and D-sub connectors. To save money we did not use a wiring integrator and instead designed our own wire distribution and grounding system, ran all the wire, mounted all the blocks and terminated every connection

The second and third production studios are slightly smaller. Carl Cruse, morning show producer for the Fox, is at work.

for cross-connecting the blocks to their destinations. This wiring method saved us a considerable amount of time and money.

Beyond the studio

For our STLs we needed a way to operate out of each facility simultaneously for a seamless transition from the old location to the new studios. We chose to leave the RF STL systems in place at the old facility and to install a combination of reused Harris Intraplex T1 equipment and new Pulsecomm PCAU audio circuits. The PCAU cards had not been used in Cincinnati before and it took quite a bit of convincing with the local telephone company for it to understand and agree to the installation.

We installed a Valmont/Pirod 30' guyed tower on the rooftop of the new building to mount the 950MHz and 5.8GHz RF STL antennas. Once the stations began broadcasting at the new facility the systems were taken down and moved from the old facility. We also installed a new 3.8 meter Prodlein satellite dish on a non-penetrating rooftop mount for our satellite program delivery. Closely monitoring each one of these separate projects and shopping around for contractors helped achieve our budget goals while getting the highest performance out of each system.

Because of our current economy big budget moves are a thing of the past. We must find new and clever ways to build and improve our facilities. With the right attitude and ability to be creative we're able to make anything possible. The future of our radio broadcasting facilities and our capital projects depends on us as engineers to step up to the task, embrace new cost saving technologies and think outside the box.

Radio station 2.0: It's here.

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Editor's note: BSI is owned by Cumulus Broadcasting.

More photos and equipment list online at www.RadioMagOnline.com

FACILITY FOCUS

The technology behind Cumulus Cincinnati

Broadcast Software International (BSI) Op-X

Op-X is a feature-packed broadcast automation system from BSI. It was designed to work in a multi- or single-station environment. Talent will appreciate its intuitive on-air environment with full-touch screen, simple voice tracking, and easy to use interface. Engineers will enjoy easy installation and maintenance, automatic backup features, a built-in clock builder, and versatility of installation. Station managers will love its relentless up-time and very low cost to maintain. Op-X includes built-in file and audio servers, time bending functions, satellite interface and flexible serial device server allowing you to share audio routers and trigger devices across multiple stations. The intuitive Op-X Studio Client interface is incredibly easy and fast to use, either with Touch Screen, Keyboard & Mouse. From single stations to radio group clusters, Op-X will provide the scalability, reliability and professional sound you expect for your station.

www.bsiusa.com
888-BSI-USA1

Axia PowerStation and Element

PowerStation, Axia's new integrated console engine, combines audio I/O, console power supply, DSP mixing engine and network switch into one easy-to-deploy package. Setup couldn't be easier: connect your studio gear and an Element 2.0 console (as large as 40 faders) with standard CAT-5 cables, name sources with a browser, and you're ready for air. Put PowerStation at the heart of standalone studios or make it part of a larger Axia network; Simple Networking lets you daisy-chain up to four PowerStations for easy multi-studio installation without a separate core switch. And it's built to deliver rock-solid 24/7 reliability, hardened with industrial-grade components and redundant power capabilities. With over 1,500 studios on-air, Axia is the fastest-growing console brand in broadcasting. If you're thinking IP-Audio, think Axia. Because experience counts.

www.axiaaudio.com
216-241-7225