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## KUNV Comes Home With New Facilities

Jackpot for Vegas Broadcaster Includes New Equipment, Studios and HD Radio Signal



Author Frank Mueller records KUNV General Manager David Reese in KUNV's Recording Control and Performance studios. Recording is done with Adobe Audition using a Yamaha 02R board. Reese is on a Rode NT2000 mic on a Yellowtec m!ka mic arm.

**BY FRANK MUELLER**  
Operations Manager  
KUNV(FM)

LAS VEGAS — Having two major projects scheduled to finish within a year of each other can be overwhelming, but

### **FACILITYPROFILE**

KUNV(FM)'s staff, volunteers and contractors have shown that they were up to the task.

September of 2009 found us moving into new studios on the University of Nevada, Las Vegas campus after 10 years of being a couple of miles from our sponsoring university. September of 2010 saw the launch of our HD Radio signal.

Innovative solutions have been key in completing both projects while working around technical and environmental diffi-

culties, budget shortfalls and anticipation of future demands.

#### **NEW STUDIOS**

KUNV's new studios shine with furniture and equipment that provide staff, volunteers and students with an environment to rival some of the top commercial radio stations. Rooms designed by the Russ Berger Design Group ensure superior sound performance. All studios use a combination of angled walls and windows; baffling on the walls and in the air ducting; varying ceiling shapes and heights; air gaps in the walls; and isolated floors to ensure a high level of "deadness."

Furniture in the studios was custom created by Omnix Broadcast Furniture to match the space and technical requirements of each area. Herman Miller chairs complement the modern furniture.

Spring noise from previous mic booms

was a constant annoyance, so in selecting the arms for this studio we were impressed by the Yellowtec m!ka solution arm system. In use we've found them to be a superior solution with all but some of the heaviest microphones.

As our on-air staff is large (more than 30 volunteers), our microphones see a lot of work for several types of voices and handlers. We wanted to make sure we had mics in our two on-air studios that wouldn't color the voices and would also be near bulletproof. We selected the Shure SM7B and have found them to be durable with a clean sound.

One of the challenges associated with the move was to

take our massive CD library (approximately 10,000 CDs) and move into the 21st century by digitizing it.

As we had not yet settled on an automation system at the time we began the conversion, we wanted to use software that would implement a naming convention that could be imported by any system into a database to affiliate with the audio files.

#### **CD LIBRARY**

We settled on Exact Audio Copy, which allowed us to write file names containing all necessary data using a common delimiter between fields. We found it to be a superior program not only for the naming convention but that it was able to autocomplete information for the vast majority of our CDs by retrieving data from the FreeDB online database.

Of course, we needed a place to store all of those audio tracks. In combination with



**KUNV Host Greg Magnusson sits at the HD1 air studio's Axia control surface. ENCO Systems automation can be seen in the background. The mic is a Shure SM7B, its arm is a m!ka with a tally light.**



**A UNLV student practices audio production in one of the edit booths using Adobe Audition. M!ka arms, Axia board and EV RE20 mics visible.**

UNLV's TV broadcast facility, which also joined us in the new facility, we went with a Rorke Data Galaxy network-attached storage systems (NAS). The system has been nice both for the ease of configuration through the browser-based interface, as well as for the RAID configuration that allows for hot-swapping the drives easily without risk of data loss. The NAS, along with other equipment not required to be in-studio, are stored in a technical operations center where their heat and noise have no impact on our studios.

When it came time to select an automation system, we wanted one that was both flexible and easy to use. Many of our volunteers are from an analog background and we wanted an interface that would be fairly trouble-free to adopt. A presentation from Brady Sharp, a sales representative with ENCO Systems, changed our mind from our original choice; and we have found that the folks at ENCO work constantly to improve their software. Additionally, their technical support and online community are great assets.

From the beginning of the project we knew we wanted an audio-over-IP solution that would match our goals for HD Radio broadcast. We chose Axia's Livewire system due to its compatibility with so many other vendors as well as its well-thought-out design. It is a decision we have never regretted. The Axia software and hardware are top-notch. The hardware still looks like new after a year of heavy use and the audio delivery has been flawless. Additionally, we



**KUNV's rack space in the TOC includes Omnia 6EXi and Omnia One processors, Axia engines and audio nodes, Comrex Access, Arbitron PPM encoders, Public Radio Satellite System hardware, streaming server/encoders and iMediatouch skimmer. Also at work is gear from Sage, Broadcast Tools, DaySequerra, QEI, Orban, Moseley and Belar, among others.**

found the combination of their audio delivery with a new Omnia 6 EXi processor so improved our audio quality that we had listeners calling us and telling us that we sounded noticeably better.

We also wanted to make sure we had a recording facility to match our broadcast facility. We had used an old broadcast audio board in our old facility and knew we wanted something more dynamic. We also wanted something that would incorporate a

DAW and would deliver audio-over-IP to the recording and post-production systems.

We ended up going with a Yamaha O2R board paired to an ADK Quad Core system with 4 GB of RAM and Adobe Audition 3 for recording and editing. The system has a Digigram LX6464ES interface card that works with the Yamaha via EtherSound. We have had trouble a couple times where the Digigram system lost its settings, but restoring from a backup is fairly quick

and the quality of recording is light years beyond what we had before.

It also helps that we paired the system to an array of quality microphones, the top-most of which are a set of Røde NT2000s. Additionally, we made sure we provided a high-quality recording environment using a boxed room structure for the main room, a floating floor for the ISO booth and air-gapped walls and sound-rated doors for all remaining studios.

We wanted to make sure recordings and live broadcasts sounded as good on the road as in the studio. For live remote broadcasts we opted for the Comrex Access codec system with optional mixer. The flexibility of connections is bar-none and the sound quality is exceptional. Since we are in Las

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Vegas, other stations periodically call on us to record conventions, events and interviews. Field recordings are handled either through an HP laptop with Adobe Audition and a Digigram UAX220 USB audio interface or, for lighter work, a Samson Zoom H4 solid-state digital recorder.

As we moved towards HD Radio, we wanted to make sure the quality didn't break down at the STL. Additionally, we wanted plenty of bandwidth for future expansion. We were wary of operating in the unlicensed space.

We decided to go on a DragonWave Horizon Compact microwave system based on a recommendation from Axia and have found it a solid solution. We get 300 Mbps throughput and operate in the 11 GHz licensed range.

### HD CONVERSION

Once we had the broadcast and record-



**The full-time staff. Front, from left: Music Director Kim Linzy and Development Director JoAnn Kittrell. Rear: Operations Manager Frank Mueller, Business Manager Gretchen Rexroad and General Manager David Reese.**

ing facilities in operation, we immediately turned our sights on an HD Radio conversion. Thanks to the generous support of the Corporation for Public Broadcasting, along with an allotment made by UNLV, the funds were available to move forward quickly.

In our initial proposal for HD conversion, we planned to combine at the antenna using an ERI dual-input system. However, in working with American Tower, who owns our transmitter site, we found there were no available towers that would support the antenna and signal protection prevented us from moving to another site without going directional, which was out of consideration. We therefore had to adopt a low-level combining solution.

The floor space in our current transmitter facility is limited and at first we were unable to find a transmitter that would fit in the space of the outgoing Broadcast Electronics 10S; but we found one through sales representative Ellis Terry at Nautel. We went with their NV20 transmitter to allow us up to -10 dB of HD power while running at 10 kW analog. Not only were we impressed at their efficiency in combining, but have been blown away by their remote Web interface for monitoring and configuration changes. We can change exciters, input sources and levels all from the convenience of a brows-

er. Nautel also provided our importer and exporter.

Listening to some other HD Radio stations in various parts of the country taught us some things we did and some things we didn't want to do.

First, we wanted to make sure our HD Radio signal was processed well. Omnia provided us with their Omnia One processor and we have been pleased with the sound.

Additionally, we didn't want to have constant problems with finding out from a listener that we were out of sync between our analog and HD signals or that our PAD was not displaying. We've been happy with Belar's FM HD monitor to keep us on track on both fronts.

We also took the opportunity during the upgrade to add an RDS generator in the form of a Broadcast Electronics RDi20.

Finally, we would be remiss if we failed to mention the great help we received from Joe Sands and Ray Ragle with Desert Sands Engineering, Dennis Todd with Todd Communications and the folks at Azcar. One major project is enough of a team effort. Two requires a crew of true professionals and we couldn't have asked for better.

*Radio World wants to hear about your new studio or RF facility. Share your story idea at [radioworld@nbmedia.com](mailto:radioworld@nbmedia.com).*