Radio
THE RADIO TECHNOLOGY LEADER

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FACILITY**SHOWCASE**

# Revitalizing a Station, Reviving a School

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A little over three years ago, I walked into KBEM for an interview to become the new engineer. Having worked for another station within the same statewide affiliate network, I was familiar with some of the challenges that the station was facing.

The station is owned by the Minneapolis Public Schools and is housed in the struggling North Community High School. Hardly a year before my hire, the school district staved off an effort to shut down the building (putting KBEM down a path of uncertainty) and began to invest in a new future for the school and the neighboring community.

In doing so, MPS opened the door to make KBEM a stronger asset for education and outreach.

## ASSESSING THE FACILITY

My first week at KBEM basically consisted of a "this is over here, that is over there" walk-through with the outgoing engineer. Although I have quite a bit of respect for his planning and design, he and I fundamentally disagreed on what technology should be in the facility. Two engineers, three opinions, right?

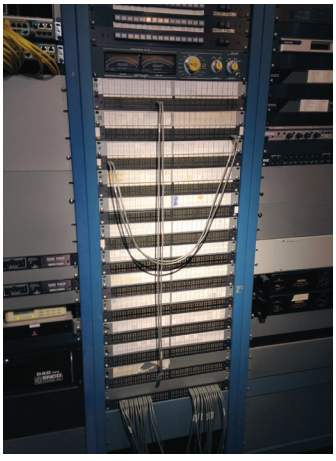
At the time, I felt that the technology that was available to the station and the staff was greatly underutilized. Each studio had an iMac with Amadeus editing software, but dubbing into a CD recorder was the preferred method for nearly all of the production work. Loading files into our ENCO automation system was done via manual internet downloads and ripping in all of our locally produced content off of the recorded CDs. Additionally, the protocol for scheduling daily ENCO playlists was carrying a USB drive between offices.

Audio routing between studios was done through multiple switches and a patch panel. Initially, I saw the value in this design, but the recent history was that the engineer was the only one who ever really understood how that all worked. It took all but 5 seconds for the station manager and me to agree that we needed to develop a plan that better maximized staff efficiency and streamlined station operations.

Finally, and most important, we needed to devise ways to make KBEM appealing to students. The school district takes their goal of "Every child college and career ready" very seriously. So, in addition to making the facility work better for me and other staff members, we assessed what we can do to help serve our student population.

It does not take much imagination to figure out that a member of the Class of 2014 would not be impressed with technology from 2004.


Housed in a north side neighborhood of Minneapolis, a station and its host high school both see opportunities to grow and improve.


Patch bays


Punch block wall

Ubiquiti Airgrid antenna and Comrex Access

KBEM Equipment racks with Wheatnet blades and Comrex Access

However, the considerations of the staff members and volunteers who have been with the station for decades also have merit. So, the ultimate challenge boils down to this: How can I design a facility that is useful and relevant to a 14-year-old as well as a 74-year-old?

## LAYING THE GROUNDWORK

The two major undertakings on my agenda before I started rebuilding the facility were to make sure the station was technologically stable and to begin easing the staff into a new way of thinking. The first six weeks of my time at KBEM were mostly cleaning up wires — XLR plugs out of phase, re-terminating Cat-5 with industry-standard methods, fixing headphone jacks in the studios and so on. As daunting as the task was, it gave me a solid idea of what I had to work with at KBEM. It forced me to understand how the facility was built and where exactly each wire goes in short order.

Before I was hired, the station had purchased new ENCO workstations and server, and I was tasked with completing their installation. This was another situation where I learned the new system quickly, having never worked with this program before. However, as I learned ENCO and read up on some of the functions, I began to envision possibilities for the future of the station. Understanding my automation system painted pictures on how it would integrate with new consoles, how it could save staff time, and how to apply it to other upgrades I had planned.

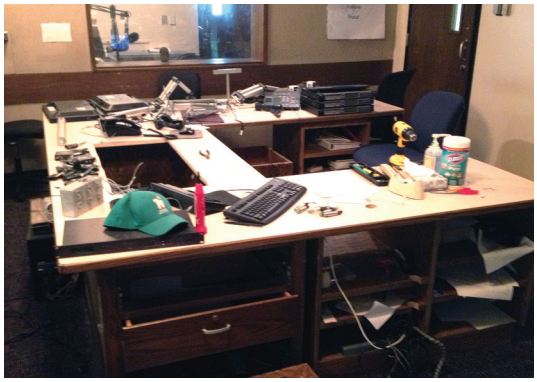
Getting my coworkers on board was hit-or-miss in the beginning. There was a lot of skepticism about using AoIP and whether or not there is any security risk in putting anything at all on the network. In an effort to show that "yes, we can rely on the Internet for what we do here," I purchased a Comrex Access for remote broadcasts in late 2011, specifically, a rack unit for the studio and the portable USB model for in the field. Our first broadcast was a modest morning show remote from a coffee shop. Upon realizing the ease, convenience and flexibility of the units, my fellow staff members became excited with the possibilities, so much so that we just completed our third year of broadcasting the Twin Cities Jazz Festival live from Mears Park in St. Paul using Ubiquiti AirGrids to deliver our IP link from the roof of a downtown bar.

After getting buy-in from my staff and supervisors, I purchased our new STL. KBEM has been using a T1 circuit to connect to our tower on the University of Minnesota campus, so I selected the Moseley Rincon. Previously, we had been using an Intraplex, which still serves as our backup. The Rincon was my choice because I needed a solution for digital audio delivery that could use T1 and/or IP links. The STL was simply fed with an analog to digital converter until I could build the new studio and station infrastructure.

## UPGRADE-A-THON

In the summer of 2012, I planted the seed that our master control room was going to be rebuilt the next year. Throughout the following 12 months, many a staff meeting involved some aspects of what the new space would look like. Ergonomics were a big issue in the old studio setup. Previously, the host would have to turn 100 degrees to the right of the console to talk to guests, and there was a lot of wasted and unusable space in the old furniture. Additionally, one of our interns that year used a wheelchair and we quickly realized that the old studio was, although

Old studio furniture and console



Disassembling old studio

LX24 Control Surface and LCD monitors

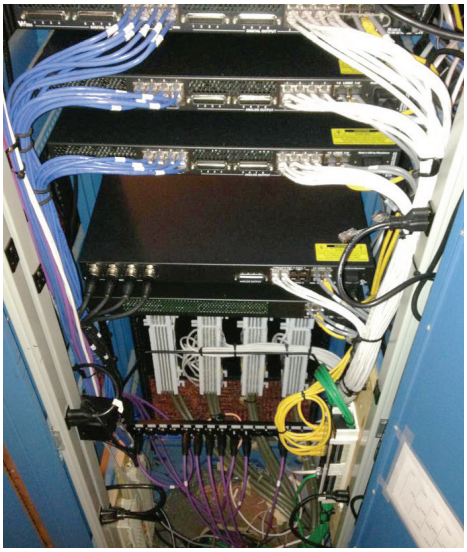
technically legal, not very accessible. Our old console, a Wheatstone A-300, was starting to fail and I was buying spare parts from a guy in Alaska I found on eBay. It became apparent that the whole room was to be gutted and rebuilt.

That same summer, I was fortunate enough to meet Bill Lund, the man who initially built my facility in its current location. It was a random meeting where he noticed the station T-shirt I was wearing at a craft shop in northern Minnesota. We came to find out that not only do we both have ties to KBEM, but our cabins are on the same lake. It was "beshert." Bill visited the station a couple of times before I started construction and gave me some solid insight into how he envisioned the station when he built it. At that point, I was convinced to keep the some of his original design while I implemented our new IP system.

## EQUIPMENT LIST

**New Equipment**
- Wheatstone LX-24
- IP88A, IP88D, IP88AD, M4-IP, IP88E blades
- Moseley Rincon
- Audemat Relio
- Comrex Access
- Enco DAD
- Enconveyor
- Telos Hx6
- Radio Station HUDs
- Inovonics 730
- Electrovoice RE-20
- Ubiquiti AirGrid M5
- Yellowtec Mika Arms

**Existing Equipment**
- Tascam CD1-RU
- Shure SM5B
- Sage ENDEC 3644
- Comrex Nexus
- Telos Zephyr Classic
- Inovonics 531



Equipment rack rewiring

By the dawn of 2013, I had decided that KBEM would purchase another Wheatstone control surface. I felt it was the right fit for my staff and their abilities as well as ease of maintenance for me. Our students also thought it looked the coolest, so there was that. I devised a plan that all of our analog inputs and outputs would still flow through the patch panels that Bill had installed 31 years prior while feeding into the Blades I was about to install. This way, I would have a backup manual audio routing system if ever needed.

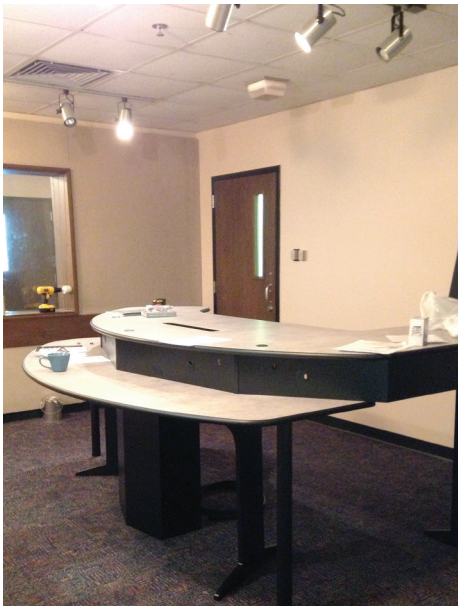
Of course, no major project is free. Half of the money came from existing funds and grants, but the other half was raised in a 24-hour "Upgrade-a-Thon." For 24 hours straight, our morning show host stayed on the air asking for donations to the project. The whole "a-thon" had a superhero theme as we tried to vanquish the "evil" technology that was causing so many headaches. The event drew attention from local political figures and featured local jazz musicians giving live performances every hour. It came down to the wire, but at 23 hours and 35 minutes, we reached our $20,000 fundraising goal for that day.

## THE BUILD

During the Upgrade-a-Thon, while everyone else was otherwise occupied, I prepared one of our production rooms for the task of being our main on-air studio. At the time, the bulk of our station's switching and routing was done by a Broadcast Tools 16x16 switcher. I set up a 16x4 to run parallel while I started disassembling the master control room.

On July 18, 2013, immediately upon completion of the fundraiser, I officially began tearing down the existing studio. After removing the old console and all other equipment, I borrowed a sledge hammer from the janitors and gave each one of the summer interns and staff members a good whack at the old furniture before I finished it off. It was a very satisfying feeling, I must say. Upon emptying the studio space, patches of carpet and paint from the original 1981 construction were visible. The school district paid for the updates for that as well as the installation of electrical outlets under the floating floor to power the new equipment.

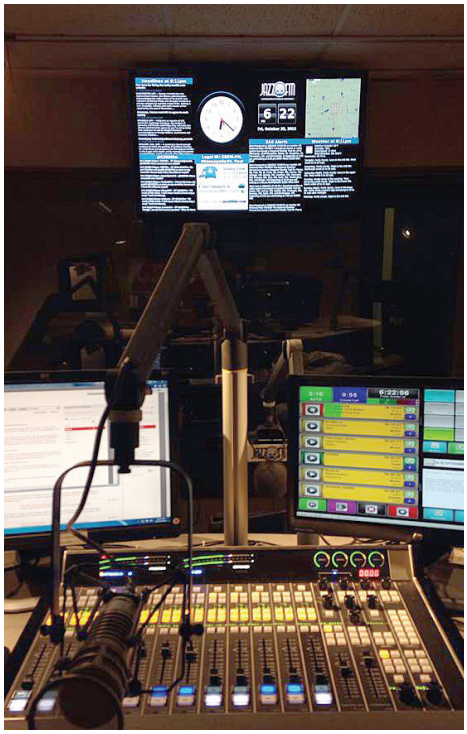
I ran into a bit of a snafu when the new furniture arrived from Forecast Consoles. I had found Forecast at NAB while spending a whole afternoon furniture shopping. They sold me on their product's durability, something that was important to me when you consider high school students and their gum, pens, paper clips and whatever



New furniture installed in studio

else could damage the furniture. Although Forecast had constructed the piece perfectly, I had misunderstood their drawings. The wiring cubby is apparently at the foot of the host, under the control surface. I had planned for it to be under the rack turret and that's where the outlets were installed. Oops. I decided to run audio and network wires through their cubby and still feed the power as originally planned. Forecast offered to make custom panels to hide the mess I had created for myself, but the cost of custom work concerned me. After some brainstorming, we decided to put a shelf in that space to hide the wires and provide some extra surface area that wasn't the table top. Luckily, the Room Essentials bookshelves at Target fit in that space perfectly, leaving about half an inch of clearance around the top and sides. The best part was that it was on sale for $18.

We went live from the newly constructed studio on Oct. 9, 2013 — a few days early of my 90-day goal. I sat in with each of our hosts the first two days to answer any questions or address any concerns they may have. The new studio was a hit with the students, one of them saying it "looks like something from Star Trek." I decided to add a heads up display from Radio Station HUDs (a custom data display system based on the Raspberry Pi) for the convenience of the air staff, a feature that is second in popularity only to new control surface. The



Radio Station HUD (above) displays key information at a glance

LX-24 console has been user-friendly and the Wheatnet routing invaluable to me and the way I designed the station's future.

## LOOKING AHEAD

Since the completion of the new studio and the installation of the WheatNet infrastructure, I've continued to implement new cost saving measures and other technical upgrades. Our station archive once was a shelf full of burned CDs, now is housed on a Synology DS1513+. I've added our ENCO machines to our local network to eliminate the USB sneakernet we had before. We've even been able to cut our telco bill into less than half by replacing some of our services with IP solutions.

KBEM continues to march forward from the aging operations we had only three short years ago. Our plan is to replace and update the remaining studios by 2017, starting with our recording and performance studios this fall. The school district is also looking to invest further into the station as a part of their commitment to grow North High. The investments so far have paid off, with projected enrollment on the rise. The television studios in the building were also redone in the last year, further strengthening the communications program we're building at North. KBEM is proud to be building a modern facility that our students can learn and grow in while simplifying operations for all generations of user.

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