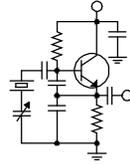


The Local Oscillator



The Newsletter of Crawford Broadcasting Company Corporate Engineering

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Another Translator Update

The shift in focus in recent months has taken some adjustment. For my first 31 years at this company, translators were the farthest thing from my mind, unless of course someone else fired up a translator that was causing interference to one of our full-power FMs. Right now, translators are at the forefront as we scramble to put our first batch on the air and continue to look for other possibilities company-wide.

A number of things have taken place on the Crawford translator front since the last issue. First, the FCC has granted the transfers of control of three of our four initial acquisitions: Denver, Corona and Birmingham. We closed on Denver on March 23, and we plan to close on the other two very early this month. There was a very minor paperwork issue with our Detroit acquisition that has been corrected, and we expect an FCC grant any day now.

Another development is that we have entered into an agreement to purchase another translator in Denver, this one a 99-watt signal on Lookout Mountain that will not have to be moved. We will pair this 100.7 MHz signal with KLZ when we close, and between now and then we have provided the seller with a retransmission authorization so the translator can begin carrying that station immediately.

The 100.7 MHz signal would provide full-market coverage were it not for a co-channel signal on Cheyenne Mountain in Colorado Springs. The

translator has a broad null to the south-southeast to protect the class C station's 60 dBu contour. That, in combination with the interfering signal from that station coming into some parts of the south part of

metro Denver, limits the effective coverage of the translator somewhat. Still, more than a million people are served by the signal. It will be a great value added for KLZ.

We made a move in the San Diego market, contracting to purchase a translator in El Centro, California for a move into San Diego for KNSN. We filed the FCC paperwork for the transfer and move in early March in a bit of a hurry-up action.

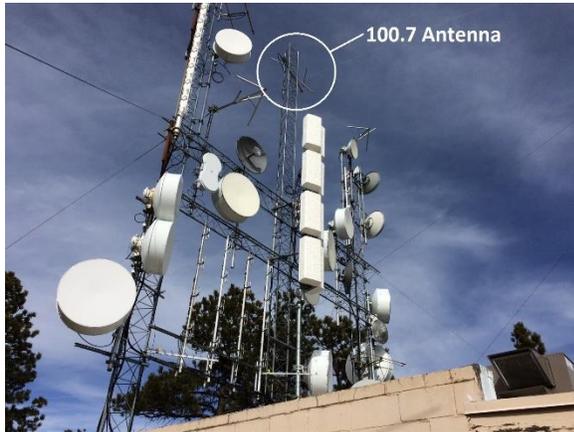
Subsequently, I found out that a co-channel Los Angeles station sited on Mt. Wilson, even though it is fully spaced and contour protected by the proposed translator relocation, puts a strong signal into San Diego and even shows up in that market's ratings. Rather than fight that battle down the road, I opted to hunt for a different frequency, and I found one. In late March I filed an amendment specifying a different channel, one without any big out-of-market signals on it.

The new channel has a contested LPFM application on it that the translator must protect. It is our hope that this application will be dismissed and we can let the pattern out and power up to cover much more of the market.

In Denver, the 95.3 MHz translator installation is done and awaiting the installation of internet service at the Lookout Mountain site.



The "KLDC-FM" antenna on Lookout Mountain



The soon-to-be KLZ-FM antenna

Amanda and I noticed that the transmitter was showing a VSWR alarm even with the transmitter off, and when we inserted a Bird wattmeter in the antenna line we noticed several watts of RF coming back down the line. I suppose we shouldn't be surprised. We have a four-cavity bandpass filter that will take care of that. Once we have the filter and internet service installed, at we can fire up 95.3 (and begin providing programming to the 100.7 MHz translator).

The 95.3 antenna, a Scala HDCA-10H, was installed along with its transmission line on March 22. The 100.7 antenna, a Nicom BKG77, is already up and operating. We put all the equipment for both translators into a single rack and secured it with security star-post rack screws. Unless someone has the special tool for those screws, they will have to steal the whole rack.

In Birmingham, Detroit and Corona we are gathering up equipment and preparing for the installation of antennas and transmission lines. All we lack in Birmingham and Detroit is the antennas, which have shipped. At KBRT we are waiting on the weatherproof, temperature-controlled cabinet, the antenna and isocoupler, all of which should be there shortly. We have contracted with tower crews in all three markets to do the antenna/line installations. Our own people will do the rest. We hope to have those three translators on the air sometime in May, but it could come sooner in some locations.

I have ordered the FCC-required signage for all our translator sites and those should also be arriving shortly. These signs must be placed on the antenna supporting structures so that they can be read from the ground. We may have to compromise a bit on that in some locations, but we'll get it done.



One rack, two complete "AM-on-FM" translators

AM Revitalization

In an email exchange with a friend recently, I commented that the FCC was really messing things up by moving too fast on some things these days. With the translator window crunch, I've not had a lot of time to read and digest the comments filed in the AM Revitalization Further Notice of Proposed Rulemaking proceeding. I've read the online trade journal accounts but only a few sets of actual comments in their entirety.

It wasn't too surprising that iHeartMedia and the AM Radio Preservation Alliance came out with a strong opposition to any scaling back of skywave service protection rules. Their anchor tenant argument is what one would expect, that class A stations are the glue that holds the AM band together and attracting the rest of the listeners to the AM band, so don't mess with the anchor tenant. They argue that reducing protections to class A stations will destroy reception and drive listeners away from the AM band.

I can't say as I blame them for coming out swinging. They have, after all, had franchise player status for decades and they want to keep their incumbent protections at all costs. The problem is, all costs includes the impaired or non-existent

reception of scores of other AM stations, most of which would otherwise provide local service to their markets during critical hours and at night if they did not have to protect the skywave contours of distant class A stations that provide exactly zero local programming for distant markets.

So while I get the class A licensees' defense of their incumbent protections, I don't see that they have a leg to stand on with regard to the need for those protections and skywave service in 2016 and after.

The class A licensees also argued against an increase in the protected contour value of class B and D AM stations to 2 mV, citing increased interference across the board. They did not address the underlying reason for such an increase, namely an increase in the noise floor that makes the present protected contour, 0.5 mV/m, unlistenable in many if not most locations. Of course that's not an issue for class A stations in their local markets — they have plenty of horsepower and signal to overcome the noise. The rest of us — well — maybe not so much.

In a series of exhibits showing the population that would be negatively impacted by elimination of critical hours protection of class A stations, the population numbers they provided apparently mostly came from cities within the impact area, cities in which a 100 uV/m signal level would be completely obliterated by manmade noise.

The reply comment round is going to be interesting, and it wouldn't surprise me if someone doesn't petition the FCC for an extension in the reply comment deadline to give us sufficient time to study and rebut the class A licensees' arguments.

Hopefully I will find time to put together and file some meaningful reply comments in the reply comment round. I will, if I can ever get caught up from the translator crunch.

If you have interest in reading the comments filed in this proceeding, go to:

http://apps.fcc.gov/ecfs/comment_search_solr/search

In the Proceeding Number box at the top of the screen, enter 13-249. You'll find 501 separate filings to read through, some of them with 100+ pages. That should keep you busy for a while.

A New Paradigm

Over the last year and a half, we have installed AOIP infrastructures at many of our stations. This opened a whole new world for us in terms of audio routing and mixing, one that we have taken advantage of in many ways in the markets so equipped.

As we began making changes in the Denver operation to make maximum use of the translator's FM signal, Amanda and I wrestled with the thought of what to do with EAS required weekly tests. Specifically, when an RWT airs on a station being simulcast, the other station will have dead air during the EAS header and EOM. That would be confusing to listeners. We needed a way to cause the other station's EAS encoder to fire at the same time the simulcast station's did, and we would need this to follow to whatever station was at the moment being simulcast.

I'd like to say that there was a beam of light from heaven and the sound of angel voices as I had an epiphany right here at my desk, but it wasn't quite that dramatic. Still, it occurred to me that the WheatNet-IP system should be able to do this for us. With a little help and advice from Jay Tyler, we got it figured out.

When we go into a simulcast mode, a Nexgen macro fires that routes the audio. It also routes logic from the simulcast station's (either KLZ's or KLTT's) EAS unit relay 4 out to the KLDC EAS encoder DIN-1 input. When the tones fire on the KLZ or KLTT EAS encoder, the tones will simultaneously fire on the KLDC encoder, following whichever station is simulcast at the moment. When not in a simulcast, all remote EAS connections are broken.

This was very easy to set up and was mostly done in software. It is certainly a new paradigm for our engineers, who would otherwise have to construct some logic circuitry with relays or solid-state switching to route the EAS (or other) signaling around a radio station.

As Amanda and I were having lunch the day we were implementing this EAS logic, another thought occurred to me. It is an easy thing to set up software logic inputs/outputs (SLIOs) in WNIP that Nexgen can talk and listen to.

For example, suppose you want to fire a macro on ASERV 1 from ASERV3. Normally you can't do that in Nexgen unless those two audio servers are set up as a master-slave pair (as we do at KBRT/KNSN). What you can do is set up an output on ASERV1 that talks to a WNIP SLIO, then set up an input on ASERV3 that listens to an SLIO. Cross connect the two SLIOs in Navigator and you're good to go!

Keep that in mind going forward. It really is a whole new way of operating.

The Motown Update

by

Joseph M. Huk, Jr.

P.E., CPBE, CBNT

Chief Engineer, CBC – Detroit

Hello Everyone! It's an honor and pleasure to be back working for the best radio group in the industry, Crawford Broadcasting. I have been working in the automotive industry with infotainment (information and entertainment) products which are predominantly related to the automobile radio. My area of focus was tuners and reception. While it was interesting work, I really missed the radio broadcast industry. When Cris indicated that an opportunity existed for me to come back as chief engineer in Detroit, I put my hat in the ring for the position right away. The rest is history.

Since I have been back, we have been preparing to implement an FM translator (W244DL) to enhance our reach and provide an FM presence to our WEXL(AM) facility. Many of my other Crawford colleagues in other markets are indeed busy getting their new signals on the air. We are using BW Broadcast transmitters, Omnia ONE-FM processing and a very nice Inovonics Model 730 RDS/RBDS encoder.

During the setup of the overall translator chain you have various configurations of the transmitter, RDS encoder and audio processor/stereo generator to set up. We chose for simplicity to use the loop-through rather than side-chain mode for RDS insertion. It eliminated one coaxial jumper. This takes the stereo generator composite output and feeds it through the RDS encoder, to the exciter. In order to put it in this mode, you must change a jumper setting in the Inovonics 730 RDS encoder.

Right now we have taken delivery of the transmission line, antenna system, and other necessary accoutrements necessary for installation. By the way, the Kathrein/Scala log periodic antenna that we are using for this installation is very robust. I was most impressed with its construction.

At present we are waiting for a schedule opening with Great Lakes Tower (GLT) to get the antenna system and transmission line installed on the WMUZ tower and launch our new station. It looks like we are about a week out before we can get an appointment. Right now, the new system is in a

dummy load playing good tunes. Stay tuned for more!

Last month, Jay Tyler from Wheatstone (õAll Hail Jay!õ) was in town and paid me a kind visit to provide an overview of the WMIP system that is now a vital part of our installation. He gave me an overview of the system's Navigator crosspoint software and showed me the similarities and differences between it and the older bridge router system and X-Point.

The one main take away feature is the ability to make the accidental application of a crosspoint by accident. There is a feature that can be turned on that would require you to push the control key and use the mouse to apply a crosspoint (ctrl-click). This can prevent you from taking your audio source off the air (smile). Jay also showed me how õassociationsõ can take a connection or audio route and associate a secondary audio route with it.

Jay indicated that Wheatstone used the feedback it received from many of its customers to make this next generation audio routing system better. It certainly is impressive, and I have just scratched the surface (no pun intended).

Brian Kerkan, a.k.a. õMr. Audio Processor,õ also paid us a visit to demonstrate the new software in the Omnia 7. This processor, if one of your main desires or objectives is loudness, can certainly go up against some of the higher priced processors like the Omnia 11. It is not an Omnia 11 with its level of sophistication, but can really provide major market performance for medium and small market stations at a lower price. The software is improved and can provide much smoother audio with less sibilant distortion. My understanding is that there is a new level of software in development that will soon be available for the Omnia 11. This will give the Omnia 11 some of the new features incorporated into the Omnia 7. I can't wait to evaluate that software and report out.

Until next time, be safe, and if all goes well, we will be reporting to you from the pages of *The Local Oscillator* next month. Best regards.



The New York Minutes
by
Brian Cunningham, CBRE
Chief Engineer, CBC – Western New York

Hello to all from Western New York! I am not a very political person. My loyalties do not lean either Democratic or Republican, and I never offer up my opinions unless asked. However, watching this year's presidential election coverage on TV and reading newspaper accounts of what the candidates are doing and what they stand for, I see that we as a country are in serious trouble. The rest of the world I am sure is taking a step backwards and watching us slowly devour ourselves in the U.S. We have turned this election into a political circus, and the candidates are the clowns in control. Everyone should pray for this nation, that we can make the right decisions on the election of the new leader of this country and do whatever we can to support the decisions that affect us all, not just a select few. A godly man (or woman) is definitely needed in the nation's top office. Which candidate has the nerve to stand on their beliefs and to run this country as a God fearing leader? From what I see, it's none of the above, and we shouldn't have to settle for the best of the worst. Pray for this nation. Pray hard and pray often! We are a nation on its knees.

In last month's report, I talked about the issues we were having with our Verizon Internet Services. This DSL hosted both of our Internet streams along with the Zephyr IP communications between Rochester and Buffalo and our VNC ports into several key computers in our network. For some time, the service would be on, then continuously drop the connections. Needless to say, our streaming listeners were beginning to become quite upset, and the quality of our on-air product suffered also. Cris ordered another IP service from Time Warner with a 25/5 download/upload speed. So far we have noted no additional problems with our streaming, and the audio quality between Buffalo and Rochester has improved greatly. By the beginning of next year we will be cutting all ties with Verizon, transferring our entire phone services to a SIP trunk, drastically reducing our phone and Internet monthly costs.

One issue I would like to get nailed down this year is the modulation problem at 970 WDCZ in Buffalo. Since the previous owners installed the



Harris DAX-5 transmitter and set everything up to broadcast in HD, the modulation level cannot be set (positive) any higher than 112% and negative peaks at 92%. This only happens when the transmitter is into the 5 tower array; when switched to the dummy load I can achieve +125 and -99 peaks with no VSWR faults showing on the transmitter's fault log.

The previous engineer told me that he had put numerous hours into this issue, and finally gave up, not finding a solution. I am sure the problem resides in the tower array, and it could be as simple as the ball gap too close on one or more towers. I will continue to report on this issue as things progress.

One item to note, the HD-R is not running on this station, so the addition of HD into the equation would have no bearing. Having this station broadcast in HD-R is on my to-do list. The previous owner could not get the HD signal to lock, and there is no documentation there to determine what could be the cause. I guess the first step would be to sweep the antenna system and see just where the cusp lies on the Smith chart and see just how much bandwidth I have to work with. It could be as simple as shifting the phase a few degrees one way or the other, or I may find that this five-tower diplexed array cannot handle the bandwidth necessary to broadcast HD-R. Once all the data is collected, Cris and I can determine if this is doable. More to come.

There are no issues to report on from our FM station in Buffalo and AM facility in Rochester. Things are operating smoothly at this time. I am waiting on the weather to warm up so we can get our fencing replaced at the WDCX(AM) tower site in Rochester. The old wooden fences are rotting away, so we plan to replace them with new chain-link fencing. This will be a huge improvement to this transmitter site, and is the last major project I had on my replacement list.

That about wraps up another month here in the great northeast, and until we meet again here in the pages of The Local Oscillator, be well, and happy engineering!

News from the South
by
Stephen Poole, CBRE, AMD
Chief Engineer, CBC–Alabama

Given that Alabama itself is essentially an April Fool's joke the covers about 52,419 sq. mi. area (give or take a few, depending on whether Aunt Petunia is out visiting relatives), I often ponder the pretentiousness of some folks.

Look: I grew up in a small town and I loved it. Super nice people, several fabulous churches, and some of the best barbecued pork on the planet. But I was also amused at the way some of my folks could put on airs.

When one of my friends had the rehearsal dinner for his wedding, all of the Biddies were clucking about the menu. There was some fancy French thing on the buffet that had them all worked up. I couldn't pronounce the name (and can't recall it now), but essentially, it was boiled chicken with a grilled egg on top. This was apparently very high tone.

Like most small towns, there was a friendly competition between our Presbyterian and the other 'main street' churches, the Baptist and the Methodist. When one church would hire a pastor with a doctorate, nothing would do but that the others should hire a 'Reverend Doctor' as well. One church started a handbell choir; eventually, the others had one. You know how it goes.

But when our church purchased a new Casavant Freres pipe organ, we scored something of a coup. We hired a guy with a PhD in music, too, winning a whole bunch of strutting and bragging rights. Couldn't tell us *nuthin'* because we weren't listening.

That organ not only sounded fabulous, it was gorgeous, with giant, gleaming pipes behind the pulpit and over the choir loft. One entire wall to the side contained the 'swell box' of pipes located behind shutters that could be opened or closed to adjust the volume. The truth is, it was probably too large for our sanctuary; whenever it would go Full Organ (whence cometh the old phrase, 'pulling out all the stops'), it was deafeningly loud. The pews would shake.

Glorious! We were sure they could hear us in heaven!

Now: for those who might not know, tuning a pipe organ can't be done in a hurry. Each stop (i.e. each different 'sound') has its own set of pipes, one for each note and each pipe must be tweaked. For a larger instrument, this can take a very long time. These pipes are temperamental, too. Just touching a pipe could warm it slightly and cause the tuning to drift. We had to run the air conditioner all the time, day in and day out, to ensure that it would be on pitch for the Sunday morning service.

Right after the organ was installed, the church hired a friend of mine to do the initial tune-up. He was in the middle of this incredibly long and drawn-out process when one of the Official Church Biddies strolled in. She gazed at the shiny pipes overhead. Then she examined my friend's Strobotuner. Finally, she turned to him and said, 'You know, we have the only Casavant in the area.'

'That's true,' said my friend. The lady continued smugly, 'It cost over \$100,000 dollars! And I understand that it has a chuff.' We paid extra for that.

'Also true,' my friend agreed. He turned back to the organ. On a hunch, he chose a particular stop and pressed a few keys. There was a 'choof' choof noise just before each note sounded. (If you've ever heard a traditional pipe organ, I'm sure you've noticed this on some of the stops.)

The lady turned her head one way. Then she turned her head the other way. Finally, she asked, 'What is that funny sound?'

'That's the chuff that you paid for,' my friend replied, doing his best not to laugh. The Official Church Bidy turned red and made what we small-town southerners call a 'mumblin' exit,' never to be seen again by my friend.

Translators

Cris has been as busy as a bumblebee in



springtime, doing frequency searches and filing applications for FM translators. Even with computer software to some of the work, it's a very painstaking job and I'm deeply impressed by how many apps he has filed so far. We're getting one on 95.3 here in Birmingham, to be married with 1260 AM, WYDE. We've received all of the equipment and are ready to go.



Figure 1 - 1260's 95.3 MHz translator, soon to go live at Red Mountain.

In Figure 1, the item at the top is the APT codec, which we'll use as an STL. Immediately below it is our Vorsis FM55, for my money one of the best processors on the market. It blows away everything else in its price class. It has a unique feature that allows you to enhance the stereo separation while still limiting *total* separation to help with multipath. We use this on our *öbigö* Vorsis AirAura3 with WDJC, and the difference is astonishing. I'm looking forward to hearing it on this little translator.

Below the APT and the Vorsis are the RDS generator ó a standard Inovonics 730, and the BW transmitter. I'm giving away my age (I am an Old Timer! , after all), but honestly, it amazes me how much power can be crammed into such a small space nowadays. This is a 300-watt transmitter and as you can see, it takes up only two rack spaces!

I've been in the business for 40 years, but this is my first experience with low-powered FM stuff. While I knew intellectually that many of these require directional antennas, that still didn't prepare me for the sight of that big Yagi. We have a crew scheduled to come later this month to hang this and to repair the data link for 850 AM. I hope to have a report on that next time.

New Transmitter

April is going to be a busy month for us. We're expecting a new Nautel GV40 for WYDE-FM



Figure 2 - The Scala Yagi cross-polarized antenna being assembled.

in Cullman. We learned a lot with last year's GV40 installation at WDJC-FM on Red Mountain, and that will serve us well here. For one thing, Cris ordered the shorting stub along with the transmitter. I'm making up the final order on hard line components as I write this.

This will be a good bit of work, so we'll hire Danny Dalton, who has helped us many times in the past, to do the forklift and cartage stuff. At present, WDJC's old FM30T is sitting in Cullman as an auxiliary. WDJC still has its ancient Continental 816R-4. The plan is to retire that Continental and to return WDJC's FM30 to Red Mountain. The Continental will be carefully stored and preserved inside the old building at Red Mountain for now.

I feel like Scrooge McDuck sometimes. Back in NC, not only was I scraping for a living, most of the stations there were using equipment that was so old, some of the meters no longer worked. Now I've got a complete, ready-to-run transmitter sitting in storage. Amazing. Aside from the fact that it's heavier than a zoo's worth of elephants, if we have a natural disaster that completely eats one of our sites, we'll have a ready-to-go transmitter for the recovery.

We plan to go ahead and do these transmitter moves before the GV40 arrives. That way, we'll have a nice, cleared floor space ready and waiting.

A New Hood

Speaking of GV40s, Cris asked Rick Sewell to send me some photos of the nice job that Mack Friday had done in Chicago on their vent system. We were so space-constrained, though, we had to come up with a more traditional-looking solution (see Figure 3).

We hired K&S Services, not only a loyal advertiser but a top-notch mechanical contractor, to do the work. They measured and pondered and



Figure 3 - New vent hood and fan being installed over WDJC's GV40.

discussed it with us, and finally settled on a high-volume, high-temp inline fan with traditional

ductwork. At first, we were concerned that it wouldn't help that much, but as soon as that fan was switched on, the temperature in the building started dropping.

We'll see if our power bill goes down as well. We still have a little bit of hot air bleeding into the room, but I think we'll weather the summertime heat with fewer AC problems.

That's about it for this time. I hope to have more pictures next month, once we get everything completed. Until then, keep praying for this nation!

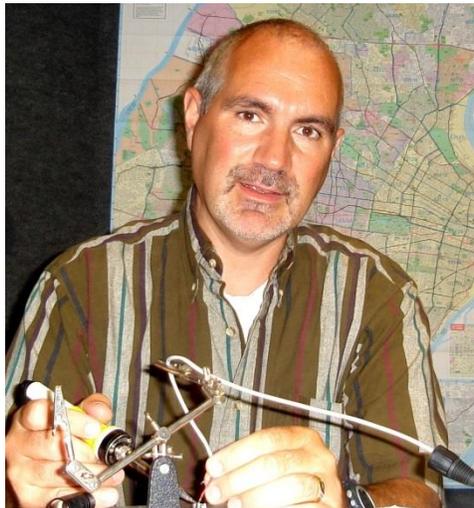
The Chicago Chronicles
by
Rick Sewell, CSRE, CBNT, AMD
Engineering Manager, CBC-Chicago

The first quarter of 2016 is complete and it turned out to be a far busier quarter than I had originally expected. We had several projects that stretched out longer than planned and of course ended up taking a good deal more time for each, than I anticipated.

One of the projects was to move the offices and studio in Rockford to a new location. This is considered the main control point for WYRB, our Rockford station. Years ago, the station was a synchronous simulcast for the most part of one our Chicago stations, but it eventually split to where now there is no simulcasting and it is truly its own entity.

The studio was used primarily for sending files back to our Hammond facilities to be used on air or in production. The needs for a highly productive facility weren't that great until the format change with the split from the simulcast approach. It really started becoming a

problem when the program director/afternoon host moved to the Rockford area and began using the studio on a regular basis.



The aging, eight-channel mixer that needed constant intervention to keep it sounding somewhat decent really needed to be replaced. The plan to replace this mixer had already been in place before it was decided to actually move the studio and office. So when the move date started to coincide with the timing of purchasing the new equipment, it became logical that we would combine the installation with the move.

Besides replacing the mixer, we also wanted to upgrade the studio broadcast cabinets as well. The previous cabinets were a just barely fit for what was in place at the old studio. It had to be that way because the studio equipment occupied the same room as the kitchen/conference room. With the move, the studio equipment would be housed in its

own room and would truly be a studio.

We had some older but serviceable broadcast cabinets stored away in pieces in a storage building at one of our transmitter sites, so the hope was we could get something restored instead of making a new purchase. Our building maintenance guy, Larry Kaminski, did some great work in this particular case and had stuff that looked like it was junk coming out of the shed looking almost new.

For the mixer, we had originally thought about purchasing a self-contained mixer with no routing capabilities. However, after installing five WheatNet-IP control surfaces in our Hammond production rooms last year, I really felt this was the way to go. It turned out the price difference actually worked in favor of the WheatNet-IP installation, so for me, it was a no-brainer.

We purchased the Wheatstone IP-12 surface with a Blade 3 console blade, which includes four AES inputs and outputs as well as the four analog inputs and outputs. The WNIP system has routing capability but is only done locally. Who knows? With Internet Provision speed and technology always improving, we may be able to one day incorporate it into the Hammond WNIP system where the routing software sees it as a local device. It could happen. For now, it is a significant jump from where this studio was just months ago. For our program director, it was Christmas in March!



The new Rockford studio and IP-12.

The installation was originally supposed to take place in January, but as with most projects depending on construction (or in this case, reconstruction), we were really not able to work in the new office until February. Our official move-in date was February 15th, but I had to halt my installation of studio equipment because they had to make last minute changes in all of the heating and cooling ductwork in the ceiling right above the control surface. I was not very comfortable with leaving the brand new surface just sitting there, vulnerable to whatever might happen during a

complete restructuring of everything just five feet above.

We eventually had everything in place and the Wheatstone IP-12 was perfect for this installation. I could see this as not only a good production mixer but it would be a perfect on-air board for radio stations that just play music without a lot of other remote sources. Wheatstone also makes a 16-channel version and with the routing capabilities, it would probably be perfect for most stations' needs.

The other big project early in 2016 was the installation of the new Avaya phone system for the downtown Chicago offices. An Avaya VoIP phone system was already installed at the Hammond offices in 2013, so bringing it to the Chicago office as well just made a lot of sense. The idea was to not only replace the aging system located there, but to also connect it and make it an extension of the already existing system in Hammond. This would hopefully save us significant long distance charges between the two sites with the plan to do extension-to-extension dialing rather than making long-distance calls between the downtown office and suburban offices and studios.

Since we had a VPN connection between the two sites for sales and traffic to interact and share resources, it seemed we were already set to do this. Once we started the installation, however, we realized that we were very limited in bandwidth due to the fact that the VPN connection on the Chicago downtown office was only using a DSL Internet service. The extension-to-extension calls sounded worse than those free long distance websites in early days of dial-up Internet.

We then tried to move the VPN over to the new, higher-capacity Internet service that was hosting the SIP connection for the new VoIP phone system. This seemed to work fine for the phone connection between the two sites, and the file servers seemed to be happy connecting to each other. But we couldn't get any computer behind this VPN to connect to the Internet. There were many off hours put into trying to get it to work, but we ultimately had to put everything back to the original DSL VPN so that we could maintain and conduct normal business from this very important sales office.

On the agenda for this month is creating a brand new separate VPN on the higher capacity connection. Then we will first move the new phone system over to this VPN so we can begin the extension-to-extension dialing between locations. After that we can work on getting the rest of the servers and computers moved over in an orderly fashion without interfering with the operations on the existing VPN.

Once that is done we can eliminate the outdated DSL service at the downtown location. My hope is that we

can give a positive report on the new VPN connection next month.

The Portland Report
by
John White, CBRE
Chief Engineer, CBC-Portland

At the end of last month came good news: finally, the last nearby tower would be detuned. After something like 16 years, the possibility that KKPZ could end its ongoing Special Temporary Authority (STA) became real. The operative word in the phrase STA is supposed to be *temporary*, which apparently includes a duration of at least 16 years, if not more.

Another phrase comes to mind: be careful what you wish for. Now the real work begins with the detuning adjustments for all the towers as a group. As they say (whoever *they* are), the last 10 percent of the job is 90 percent of the work.

In the case of the water company facility, that prediction (curse) is operating in full force with two difficult problems. Even before the adjustment of the detuning begins, the first problem becomes, how does one measure the reradiated signal from towers at the water company facility?

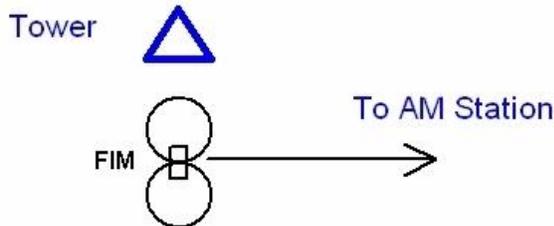


Figure 1 - Typical reradiation measurement.

The classic solution is to place a Field Intensity Meter (FIM) near the tower to be adjusted. As shown in Figure 1, the FIM is oriented to place the null of the meter in the direction of the station while the sensitive portion of the FIM antenna pattern includes the detuned tower. In this configuration, the FIM samples the reradiated signal allowing the meter to track the reradiating signal as the detuning is adjusted.

Now take a look at Figure 2, the layout at the water company facility. By placing the FIM to sample tower 3 at a location away from the other towers, the detuning can be adjusted using the normal procedure. At tower 1, however, placing the FIM away from the other towers isn't possible because of the sheer drop off adjacent to the tower. Tower 2, which is between two other towers, is even worse to adjust. With these towers, RF current to ground is the only proxy available for adjustment.

Even assuming that a valid detuning adjustment proxy is found, that is only a good beginning to the solution. At this facility we have five large structures that are detuned. Each has significant mutual coupling to all the other towers. As a result, adjusting any tower's detuning tends to interact with the adjustments of all other towers.

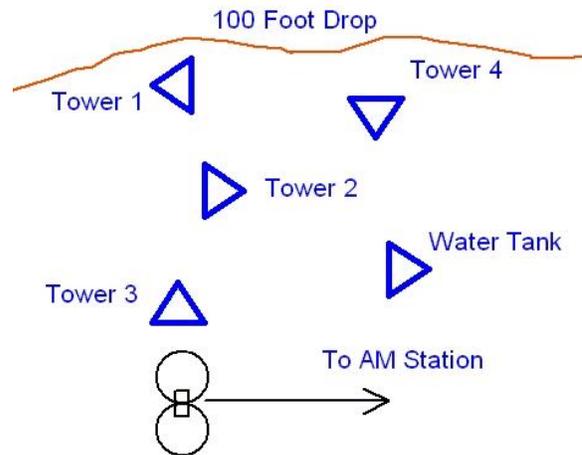


Figure 2 - Water plant tower layout.

The resulting adjustment process involves adjusting a tower and then tweaking all other towers in turn. Each adjustment brings the group of towers

closer to the final solution. Termed "successive approximation," the process is a bit like stumbling in the dark with the hope of discovering the proper adjustments.

Ben Dawson, whose firm handled the latest tower detuning, in describing the work to complete the group detuning, said: "All I can say is that is the worst, most complex detuning project I've ever seen."

From another perspective, KKPZ may be a

chance to experiment with a new application of the method of moments process. The center tower of the KKPZ array is a self-supporting, grounded tower with a skirt feed. The added complexity of a skirt feed makes MOM modeling complicated. As we move forward with this project, we may well be on the forefront of new AM applications. Stand by for updates as we work our way through that last part of the task.

Rocky Mountain Ramblings
The Denver Report
by
Amanda Hopp, CBRE
Chief Engineer, CBC - Denver

I know I say this a lot, but I honestly cannot believe April is already here. While I have not been extremely busy, time has just flown by.

The changes that are coming in Denver are very exciting. We have two FMs to work with now. The fun has been trying to figure things out. One of them, 95.3-FM, will be for KLDC. We will be simulcasting a mixture of KLZ and KLTT on this station and its FM signal. We figured this would be fairly easy. It was, until we started thinking about all the details.

NexGen has one major flaw that makes this whole thing so difficult for us. Ideally, we'd create a macro on the KLZ and KLTT audio servers to allow those stations to control what happens on KLDC. This would allow it to sound a bit smoother than trying to make sure everything is dead-on timing-wise. But you cannot do that. Everything has to be done on the audio server of the station itself (i.e. you cannot run a KLDC macro from KLZ or KLTT). This means that KLZ and KLTT will need to be sure they are running on time when it is time to simulcast. Otherwise they risk the transition on KLDC sounding bad.

EAS is another thing we had to figure out. What happens if KLZ has a weekly test scheduled? We are having to create salvos within WheatNet Navigator to tell the system to also run one on KLDC at that time. This seemed difficult at first, but with a little time, a call to Jay Tyler at Wheatstone and some

thought, we were able to figure it out. All that's left to do is test it.

The biggest issue right now is Comcast, the

IP at the Lookout Mountain FM site. We cannot seem to get Comcast to get up to the new site and install service. I met with someone from Comcast at the end of February. He said what needed to be done and it was supposed to get done the next day. Apparently his notes did not make it to the guys that came out the next day, as they were completely unprepared. Had I not given them the first guy's

phone number, they never would have figured things out. They need to do a drop to the site, which means they need a boom of some sort so they can get the line up from the pole and over to the building. It took Comcast three weeks to get back out again. It wasn't done once again due to weather - you know, that 20-inch blizzard that hit March 23? So they rescheduled yet again. We now wait and hope they get it done so we can get the stations on air sooner rather than later.

This has honestly been my life for the last month. Just working on getting things ready to go with the new FM translators. I hope to be able to get some smaller projects done around the office soon. We are looking into possibly rebuilding the tabletop in the KLZ talk studio and making more room for the hosts and all their stuff.

Maybe next month I'll have more to write about. But since that about covers it for this edition, until next time, that's all folks!!!



The Local Oscillator
March 2016

KBRT • Costa Mesa - Los Angeles, CA
740 kHz, 50 kW-D/0.2 kW-N, DA-1
KNSN • San Diego, CA
1240 kHz, 550W-U
KCBC • Manteca - San Francisco, CA
770 kHz, 50 kW-D/4.3 kW-N, DA-2
KKPZ • Portland, OR
1330 kHz, 5 kW-U, DA-1
KLZ • Denver, CO
560 kHz/100.3 MHz, 5 kW-U, DA-1
KLDC • Brighton - Denver, CO
1220 kHz/95.3 MHz, 660 W-D/11 W-N, ND
KLTT • Commerce City - Denver, CO
670 kHz, 50 kW-D/1.4 kW-N, DA-2
KLVZ • Denver, CO
810 kHz, 2.2 kW-D/430 W-N, DA-2
WDCX • Rochester, NY
990 kHz, 5 kW-D/2.5 kW-N, DA-2
WDCX-FM • Buffalo, NY
99.5 MHz, 110 kW/195m AAT
WDCZ • Buffalo, NY
950 kHz, 5 kW-U, DA-1
WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT

WEXL • Royal Oak - Detroit, MI
1340 kHz, 1 kW-U, DA-D
WRDT • Monroe - Detroit, MI
560 kHz, 500 W-D/14 W-N, DA-D
WMUZ • Detroit, MI
103.5 MHz, 50 kW/150m AAT
WPWX • Hammond - Chicago, IL
92.3 MHz, 50 kW/150m AAT
WSRB • Lansing - Chicago, IL
106.3 MHz, 4.1 kW/120m AAT
WYRB • Genoa - Rockford, IL
106.3 MHz, 3.8 kW/126m AAT
WYCA • Crete - Chicago, IL
102.3 MHz, 1.05 kW/150m AAT
WYDE • Birmingham, AL
1260 kHz, 5 kW-D/41W-N, ND
WYDE-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT
WXJC • Birmingham, AL
850 kHz, 50 kW-D/1 kW-N, DA-2
WXJC-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT



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