The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

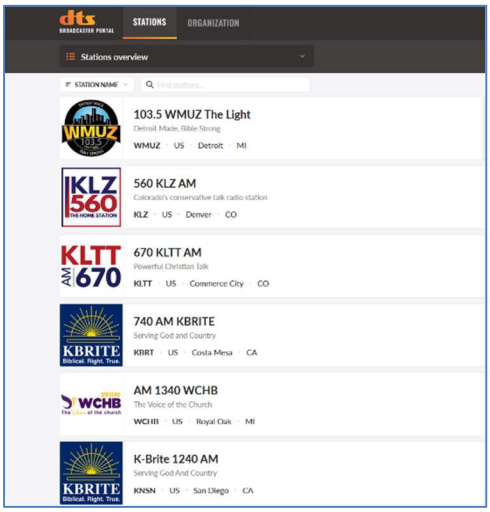
MARCH 2024 • VOLUME 34 • ISSUE 3 • W.C. ALEXANDER, CPBE, AMD, DRB EDITOR

Metadata

Back in October, David Layer of the NAB did a presentation to the Denver SBE chapter (#48), and I had the opportunity to interact with him in some detail on the topic du jour, which was metadata. David introduced the concept of the "Radio Dashboard Audit" to us and he described the process, showing us the results of several audits he had done in recent months.

To do an audit, David would fly into a city or market, rent a car with a connected dashboard and then drive to a parking lot somewhere that he could sit and play with the car's entertainment system for a while. He would observe what he saw on the screen.

Some stations would show up only as a frequency on the entertainment system's display. Others would show up with callsign or station name. And still others would have their station logo prominently displayed. Obviously, the stations with logo displayed would be the most attractive to a listener tapping his or her way through the channels, with the others relegated to also-ran status. All that is just the first phase of the dashboard audit.



A portion of our DTS Autostage dashboard where we provide station information and logos.

The next phase looks at the metadata. Is the station sending its slogan? Is it providing title/artist information (and is it correct/timely)? How about album art or Artist Experience?

All those factors go into a spreadsheet, and depending on the outcome, a color code is assigned. Green is for full functionality of the system audited (RDS or HD Radio). Yellow is for under-utilization, indicating it is using some but not all the available features. Orange is for wrong/bad execution, meaning that the station is using functions improperly. And finally, red indicates no functionality – the station isn't using any functions.

The idea of the audit is to provide an idea of how well a station is represented on the dashboard of a vehicle with a connected entertainment system.

After that presentation and dialog with David, I spent some time thinking through how our stations would likely do in such an audit, and other than the two analog-only AMs that we have, I was pleased to note that none would have scored red or orange. We transmit title/artist metadata and station slogan on all our HD and RDS stations, and we do Artist Experience on a couple of stations (and we're looking at adding to that number).

I got to thinking about those stations displaying their logos on car radio screens. How did those get there? They are not, to my knowledge, transmitted with station metadata. David cleared that up for me: they are transmitted over the internet using DTS Autostage or another connected car platform.

Shortly after that presentation, I signed us up for DTS Autostage and linked all our station logos, so those with Autostage-equipped vehicles should be seeing our logos. We may also join up with RadioDNS at some point, which would provide an improved dashboard presence on still more vehicles.

For most of my life, there was no such thing as metadata on radio. The title and artist were provided by the DJ in the intro or back-sell, and if you missed it, you'd have to wait for the next time that song came up and listen for it again. But over the past couple of decades, RDS has become a common thing, almost ubiquitous, and it's no big chore for a broadcaster to export song title and artist or even advertiser information over the RDS.

The problem with RDS is that there appears to be no industry standard for the way that automobile radio displays use the data. There are basically two fields available to broadcasters for metadata: Radio Text (RT) and Dynamic Program Service (DPS). Radio Text is apparently the field designed to display title/artist information, but some radios display the DPS field instead of or in addition to the RT field. My Ford Explorer displays RT in one place and DPS in another. In talking with David, I concluded that the only safe thing to do is to stuff both fields with metadata, and that's what we are doing company wide.

In my unconnected car's entertainment system display, RT is displayed in the center. DPS info is displayed at the top right above the frequency and it scrolls, and it is also displayed on an aux screen in the instrument cluster.

So, is metadata important? I don't think so… I *know* so. Listeners, myself included, have become accustomed to seeing metadata displayed on their radio screens, and when it is not there, frozen or wrong, it is an irritation at best and a tune-out factor at worst.

By way of example, there are two classic rock format stations, both owned by big groups whose names you would recognize, in the Denver market, and Amanda and I often listen to one or the other when in the car together. For a good while, one of the stations' metadata was not working. The default, which amounted to the station slogan, was continually scrolling, and we both found that to be a tune-out factor. The other classic rock station's metadata was working. If that was our reaction to bad/missing metadata, my assumption is that others would react the same way.

The point of all this is that we have got to make sure our metadata is being transmitted and that it is correct. This applies to FM/RDS and both AM and FM PSD for our digital stations. How do we know it's being transmitted and that it's right? That's our engineers' job. Sure, we would expect program directors, hosts, managers, AEs and other staffers to speak up if they see something wrong, but it's primarily our engineers' job to at least spot check the metadata daily if not more often.

Going forward, we may well develop some commercial uses for our metadata, and when that happens there will be revenue tied to metadata, so it will be even more important to monitor it closely.

Computers

Love 'em or hate 'em, they're part of our lives and constitute a huge part of the modern broadcast infrastructure.

To some degree, a computer is a computer, with the differences being form factor, processor, RAM, storage, video and ports. And once you reach a certain threshold, in the radio broadcast environment, there is little perceptible performance improvement to be had by upgrading CPU and RAM.

That said, there are certainly *quality* differences between computers. An off-the-shelf small-form-factor desktop PC that you get off Amazon or at office supply does not have the same quality as a purpose-built industrial-grade PC, even if all other factors are equal.

That, folks, is why we have for years used Dell Precision rack-mount workstations for our audio servers and DRRs. They are made to have the kind of reliability that we need in those mission-critical applications. Just open the lid and the difference is apparent (including the warning that you'll get when you remove the top cover – that cover is part of the cooling airflow path).

Last month, I went onto the Dell Premier site to order a Precision Rack 3000-series machine for a DRR application in one of our markets, but I couldn't complete the order because the 3000-series and 5000-series machines were not there. Our rep subsequently told me those had been discontinued, and only the 7000-series remained in production – starting at just $5,000! Forget that!

I started looking around for other options and found a few, but they were mostly "brand-x"

offerings that I was not comfortable using in such important applications. So I circled back to Dell.

In the last decade, before Dell came out with the 3000- and 5000-series of Precision Rack workstations, we bought single-processor file servers from them with no OS, installed Windows ourselves and used that hardware for audio servers. At one point, we tried that but were unsuccessful – Dell had configured its IDRAC system to limit the OS choices to only server operating systems. Thankfully, that was right when the aforementioned Precision Rack workstation line came out, so we had a place to go, arguably a better place with a lot more options.

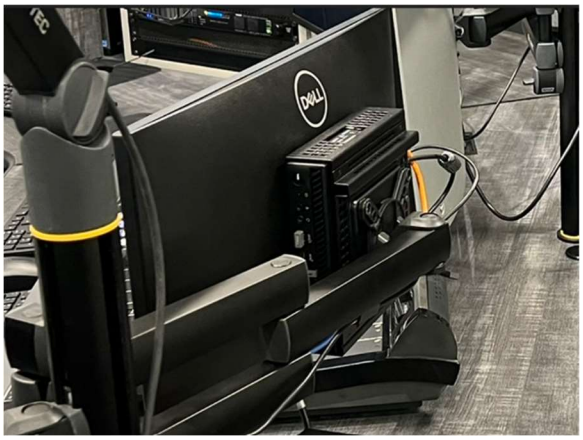
It was with that in mind that I circled back with our Dell rep and his server guy. They were unable to confirm for me that there was a workaround that would allow installation of W11 on an R250 server, but they set up a "try-before-you-buy" so we could give it a shot on the bench here. The workaround worked, and we were able to install Nexgen as well as WNIP drivers, just as we did years ago. That trial machine is now in Detroit as their DRR.

The limitation with server packages is that they have a single VGA output with no options for anything more and no way to add a video card. That means that they can't be used as on-air or production workstations, but that's okay – we didn't use the Precision Rack workstations in those applications, anyway.

So we're back in business with industrial-grade rack-mount (1RU) computers for audio servers and DRRs.

But what will we do going forward for production and on-air workstations? For the past several months, in one of our markets we have been using Dell Precision Compact 3000-series workstations. These are really small, almost not recognizable as a computer, but they have a lot of power and offer the video and RAM options we need in on-air and production applications. They are ultra-quiet and can be mounted on a monitor arm or almost anywhere.

The only negative I have observed is that they do put out a significant amount of heat. It seems like more than a typical PC, but it's really not – it's just confined to a very small form factor.



There's one! A Dell Precision Micro 3260 mounted on a monitor arm in the WMUZ-FM control room.

We'll continue to watch and evaluate these tiny PCs for on-air and production use, but my guess is that this will become our company standard, at least until Dell discontinues them.

In addition to those Nexgen-related uses, we're looking at our options for non-Nexgen applications, such as music scheduling, security DRR monitoring and the like. We have been using discrete computers for these applications, but that is a real waste of computing power, space and energy. We're exploring using containers to run these multiple apps simultaneously (used by different users) on a single server, which will be much more efficient. Stay tuned for progress on that front.

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

Hello to all from Western New York! I am beginning to wonder if this nation's economic platform will ever get back to pre-pandemic conditions. It seems that everything you order these days is placed on back-order until product is available.

Case in point, last October I ordered tower light bulbs for our 5-tower array in Hamburg, NY. It took almost five months for product to arrive! I ended up requesting a 3-month NOTAM with the FAA instead of renewing the NOTAM every 30 days. Every supplier I called reported no stock on beacon bulbs, even the tower companies that service towers had little to no stock available for purchase.

We budgeted for and ordered a Bard 6-ton A/C unit for our FM transmitter site in Boston, NY and it took a few weeks short of a year for us to get the A/C unit installed. In fact, we ended up getting a unit that was ordered for another company, but their order was cancelled due to the lengthy wait, which pushed us further up the waiting list. Had this not happened, in all probability, we would still be waiting!

The same goes for our new Gillette 100 kW generator that was ordered last year. We received the generator back in December, but the transfer switch was back-ordered for an additional three months.

I'm not certain if manpower is really the issue, or is it the ability to get the components needed to manufacture / assemble the end product? According to the US Department of Labor, the current unemployment rate is at 3.7%, the lowest unemployment rate since 2004. If the manpower is there, why is manufacturing the products taking so long?

Truth is, the US only provides 10.7% of the total manufacturing output in the country, the remainder of the manufacturing process and labor comes from outside the country. I think that is where the bottleneck occurs.

The real issue comes down to utilization of raw materials. When raw materials aren't utilized fast enough, they can become obsolete. This may be due to the inventory reaching the end of its life cycle, or because the product has lost its market value and demand. If this occurs, even if the raw materials are turned into finished goods, they will no longer be sellable.

This type of scenario is particularly common with fashion and apparel, furniture, and electronics, as these verticals experience extremely quick shifts in trends and technology updates that replace existing products.

Whatever the reason, we have become a hurry-up-and-wait consumer.

The month of February was strange to say the least. Weatherwise, we have not seen the extreme snow/cold that we normally experience in the Northeast, which is a welcome change. Statistically, February, March and April tend to be our worst winter weather months, and weather prognosticators are leaning towards an early/dry spring and summer. You-Ha !!

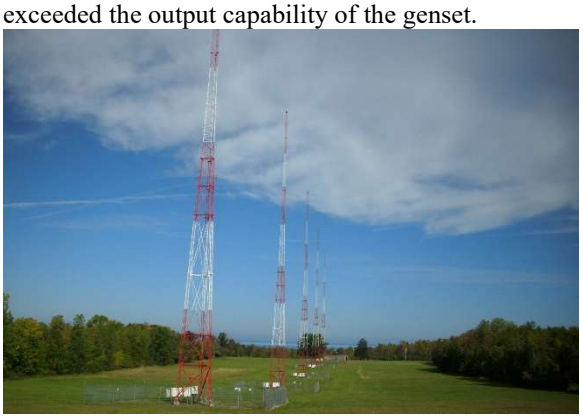
As I mentioned earlier, we finally completed the new Gillette 100 kW generator installation last month. Ferguson Electric began the electrical tear-out of the old wiring and transfer switch on Monday the 5th, and finished up the installation on Wednesday the 7th.

The initial plan was to have four guys on the installation, two working outside and two inside, but another project was needing completion so they opted to pull the additional two workers off our project, which extended the completion date by a couple of days.

The guys did a whiz-bang job, I was very pleased with all aspects of the installation, and no

issues were noted during the testing and programming of the controller. In fact, we lost commercial power the very next morning at the transmitter site, and the new generator performed wonderfully!

The most important factor in upgrading the size of the generator is in the fact that we will not have to shut off the A/C while operating the transmitter plant from generator power. In the past, during the summer months, I had to shut down the air conditioning while we were on the old 50 kW generator, as the building's electrical demand far exceeded the output capability of the genset.



WDCZ's five tower array near Hamburg, NY.

On Wednesday the 14th, Mike Cortese of Northeast Site & Tower performed the beacon installation on towers 1 and 4 at the WDCZ tower site in Hamburg. All went well except for tower 4's bottom beacon lamp. At some point, it had apparently taken a lightning hit and fused the lamp base to the socket. Mike was unable to remove the old lamp from the socket, and he had to replace the bottom socket with a used one he had in his truck.

I sure do miss Don Boye of Western Antenna & Tower, a company we used forever. Don decided last year that it was time to retire, and he packed up and moved to the Atlanta area. We still keep in touch, and Don mentioned how glad he was to not have to participate in last year's base insulator replacement at tower #5 at the WDCZ tower site! I sent him a ton of pictures so he could see all the fun he missed!

Once a month during my weekly maintenance visit at the CBC transmitter sites, I operate the auxiliary transmitters into the dummy load to insure proper operation in the event of a failure of the main transmitter. Monday the 19th was the day to test the WDCX-FM Continental 816R-4C transmitter. When I applied plate voltage, the transmitter came up then immediately shut down.

I noticed that there was a large amount of reflected power on the IPA, so I lowered the transmitter's total power output and applied plate voltage again. The transmitter stayed on, but the output power was bouncing, and the reflected power on the IPA was again noticeably higher. I shut everything down and decided to come back later with some test equipment to troubleshoot the problem.

On Wednesday the 21st, I came back with my Bird wattmeter, dummy load and frequency counter to check the performance of the Continental 802-B exciter and the IPA amplifier. Bypassing the IPA and running the exciter directly into the PA showed no difference in performance, the transmitter would not stay on with power settings above 55-60 percent.

Tests of the IPA showed everything good there, and the exciter exhibited no issues and was on frequency.

A thorough examination of the tube socket showed no abnormalities, burn-outs or signs of extreme heat, which led me to suspect a tube problem. I had a used tube on hand and installed it to see if the problem went away. It tuned up beautifully, although total power output was maxed at 85%.

After calling around, you guessed it, there were no rebuilt tubes available, and pricing was all over the place. I received quotes from several different companies that ranged from $2,180 to $2,450 with dud exchange. Of course, new tubes were readily available, but the cost, wow! A new Eimac tube was $4,950, and National (Chinese manufactured) was $2,127.50 (including a $277.50 US tariff) Econco did not have any shelf stock on the 4CX15000A tube, which means that I would have to send a dud tube to them for rebuilding, which would take approximately 3 to 4 weeks turnaround.

At this point, I am leaning towards purchasing a new National tube from Richardson Electronics, but I am waiting on one final estimate from another supplier.

That about wraps up another month here in the great Northeast, and until we meet again here in the pages of *The Local Oscillator*, stay safe, and happy engineering!

The Motown Update
by
Mike Kernen, CSRE
Chief Engineer, CBC–Detroit

New FM Control Studio in Service

The WMUZ-FM control room remodeling project has crossed the finish line. In the past few issues of *The Local Oscillator*, I've reported on our "down to the studs" remodel of the FM control room studio. I'm thrilled to report that the transition back from the temporary studio went smoothly.

Naturally, there's a ton of work that goes into any studio build, and without a doubt, this was no exception. Details abound, stuff no non-engineer would ever think about has to be thought through and executed prior to anyone ever opening a microphone.

Issues were limited to things like the mic arm needing a bit more spring tension, we added a fader module to the console so that an additional source could always be present, and we had a minor issue where the headphones on the new guest turret muted in sync with the monitor speakers. Everyone loves their new space.

Location, Location, Location

In the past, I have adhered to my own best practice rule of never putting anything with a fan in a studio environment. I especially avoided single rack space computers with their tiny, notoriously noisy, high-speed fans. Every studio PC was in the TOC with a KVM extender, allowing its use from the studio.

I've set that rule aside these days because KVM systems bring their own set of challenges to the fore. For one thing, they're expensive. At my former employer, I spent over $250,000 on a KVM system that had many advantages beyond just remote control of a server class computer. It allowed the remote nodes to select from any computer that was on the system provided the user had been allowed to view it. It also had an IP component which we used for entrance from beyond the confines of the building.

While I found that system very reliable and incredibly flexible, and the staff used it well, it became overmatched by the video resolutions we began to require, and it lacked native USB connectivity which forced me to use USB to PS/2 convertors, which sometimes malfunctioned or refused to work at all.

In our new control room, I decided to break my own rule and move the NexGen control room PC into the control room. This allowed me to select the excellent Dell 32" curved ultra-widescreen monitor and to ditch the USB-C to VGA converter that was required to stuff the NexGen's video into our existing KVM extender. Occasionally, the computer would "forget" to output video on its DisplayPort enabled USB-C port, requiring a full power-off restart to correct. Fortunately, these newer Dell 1RU computers ramp their fan's speed down to inaudible levels and with some hacksaw modifications to their rack rails, fit into the studio cabinets.

Along with the relocation of our NexGen control room computer, I elected to move to Dell's OptiPlex Micro Form Factor computers for several other studio duties. These neatly mount via an optional bracket between the monitor arms and the monitors themselves. This configuration saves finding space in a furniture leg (where heat and dust are an issue) or on the countertop. I ordered some super short DisplayPort cables to neaten the installation even more.

From the Wall to WallTime

A dependable Enberg BA-6 alert monitor hung from the studio wall and displayed silence alerts for all four of our stations for decades, dutifully flashing its lights whenever someone rang the doorbell or pressed the gate intercom call button. Unfortunately, when the old studio was demolished, the contractors tossed out its cover panel, and with the studio's new layout, its location wound up being out of the operators' field of view – time to upgrade!

Paravel's WallTime unit is a tiny Raspberry Pi based device that by using a standard PC monitor combines several clock options, a studio timer, GPIO status notifications, and can even display some HTML. I've joined it to our networks via its one wired and one Wi-Fi Ethernet connection. I use both because we keep Wheatnet on a closed network and

connectivity to the public internet is necessary for its NTP clock and for me to access the built-in GUI.

The newly-remodeled WMUZ-FM control room.

Normally I endeavor to keep the bulk of our stations' technical status alerts away from our operators but in addition to the doorbells there are still several things they need to know about. There's also tremendous value in having your studio clock locked onto an atomic standard that's accurate to +/-1 second over 100 million years. Ok, well maybe it doesn't need to be that accurate.

Along with displaying its synchronized time of day clock, I have also created statuses for several things that an operator should know about. WallTime can monitor and display the status of up to 36 items from a mix of Axia Livewire, Wheatstone Wheatnet, and/or Modbus logical I/O sources, but I've also interconnected our Burk remote control system so I could display statuses that it was already monitoring. By doing that, I harnessed the power of the Burk system's macros to sustain and flash the doorbell alert on WallTime and grab its already configured silence alarms.

WallTime has tons of potential, and I've spoken at length with its developer, downloading my many thoughts and observations that he could potentially use for future improvements to the system.

Wall Door

The WMUZ-FM transmitter room is tiny, and clearances around the transmitters are minimal to say the least. Our NV40, for example, cannot even open its front doors completely. This is not to say that it's not serviceable, but to remove certain modules a door must be removed first.

This spring we will be taking delivery of a new Nautel GV40 transmitter, which is going to replace our old Continental which sits in standby service at the back of the room.

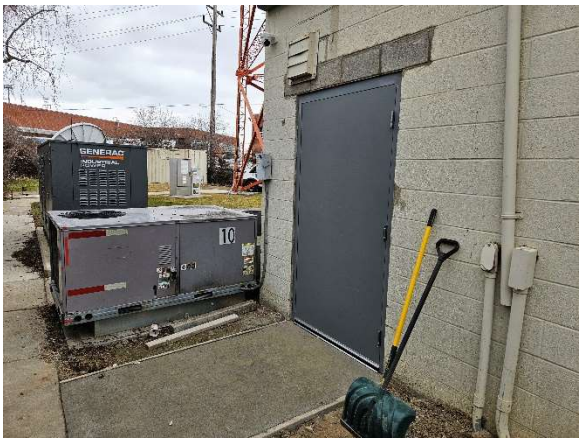
Because the transmitter room is a long rectangle, to R&R the furthest from the door transmitter means that everything between it and the door would need to first be removed. The trouble is that includes the main transmitter and the equipment rack which would mean we'd have to spend a significant amount of time on our tertiary backup transmitter which is only about 250 watts – not an option!

The solution to this issue was seemingly simple – cut a hole in the outside wall of the transmitter room and install a door. In addition to the door, I had concrete poured up to our existing sidewalk so that we have a paved pathway for our transmitters to traverse. The contractors did a fantastic job, and we now have a 48" doorway for our project and the new transmitter's movement will not interfere with our broadcast.

Operators have an array of monitors, including a 32-inch curved monitor for Nexgen. WallTime is at the top right.

NexGen DRR Change-up

The transition in our TOC from having multiple desktop computers on shelves to truly professional rack mounted equipment is nearly complete. One of the last to be upgraded was our DRR which is NexGen speak for Digital Reel-to-Reel – essentially a DVR for audio. The DRR serves an important function in our system, gathering programming from our satellite receivers and placing it in a NexGen cut so it can be aired later automatically. It also provides a place for NexGen to synchronize its clock. While this doesn't sound like much, it's used by all our stations several times daily.

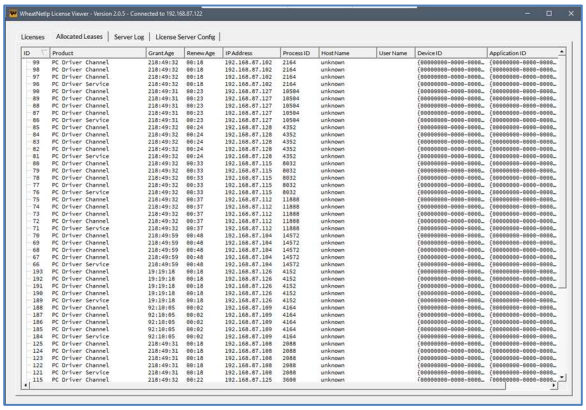


The new oversized door and concrete pad will make swapping out transmitters much easier.

Over the years, Dell has provided ample obstacles to navigate when trying to employ their rack mounted computer hardware in radio applications. Dell's focus for these devices is on data centers and server rooms, where they'll run Linux or an MS server operating system. Radio applications typically need to run desktop versions of Windows, and for a while Dell graced us with a rackmount "workstation" class Precision 3930 that happily ran Windows 10 or 11 Professional, but as Dell is wont to do, they've pulled that product from their lineup and the proverbial rug from beneath us wee broadcasters.

Fortunately, Dell has given us excellent sales support and was able to provide their DellEMC PowerEdge R250 sans OS. We took delivery in Denver where Amanda Hopp set about installing Windows 11 Professional and running down all the drivers needed to support this OS on the PowerEdge hardware.

I remember doing this very thing many times over the years trying to use server class hardware in other applications. At one point I purchased 34 1RU Gateway servers and made them run Windows 2000. What's tricky is when the hardware devices were never intended to be used on a non-server OS, and drivers for things like RAID controllers, video GPUs, and even processors must be sourced individually.



Wheatstone License Server Screen

The most challenging of these always proved to be the Dell R210 and R230 computers. Thanks to Amanda for taking this on – the PowerEdge R250 is running perfectly and if it weren't for Windows enumerating Wheatnet drivers incorrectly, its installation would have been near zero effort.

License to Thrill!

Wheatstone offers users the ability to consolidate their licenses to a central server. Eventually, all their software will support this method whereby licenses are maintained and distributed in one place and the software connects to this and verifies the validity of the license.

Advantages are that the software licenses can be administered much more efficiently, allowing their audio drivers to draw from a pool of licensed audio channels. An example would be that if you have several computers running four-channel drivers and you need only three audio channels on each machine, the remaining audio channel on each becomes available for use elsewhere.

I set up a license server here and simply pointed each computer's Wheatnet driver at the license server. Easy. The server software comes with a viewer and a config program, and Wheatstone creates a master license for it. Should the license server become unavailable, it's very easy to relocate this process to another machine on the network well before any sound would ever be interrupted.

News from the South
by
Todd Dixon, CBRE
Chief Engineer, CBC–Alabama

FTP Automation, Part Deux

I know that everybody has been waiting with baited breath for the second installment that I promised about automating FTP audio. This second part is truly the easier part of the automation. For Crawfordarians™ (in the event that I write a radio-centric Sci-Fi thriller), it is entirely based on RCS Nexgen and their audio format converter utility. I am certain there are other software products that do audio conversion and radio automation systems that feature match automatic loading of audio into their systems like RCS has had in their product for some time.

Nexgen Autoload

The bulk of this second part is work that needs to be done in the RCS Audio Format Converter (AFC). Before we start in that utility, we need to set up a feature in Nexgen called "Autoload." There is really no need for a grand introduction here. The feature does as the name implies, it auto loads audio into Nexgen.

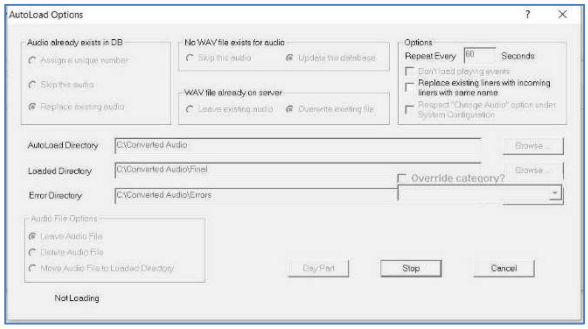


Figure 1 - The RCS Nexgen Autoload window.

Autoload is found in the "utilities" portion of Nexgen. In order to properly use Autoload, we need to create a folder somewhere on a drive, either a local one or one that is networked, on the computer. The naming of your folder is left to your discretion, as an example, the Birmingham market calls ours "Converted Audio" and it is located on the root of the "C:\" drive (C:\Converted Audio\). It will make sense shortly, but inside that folder are two other folders that we called "Final" and "Errors" that the utility requires in order to work correctly.

Going from top left, the Autoload will see if audio already exist in the system. If it does, we ask it to replace the audio with the new audio. It will then update the database and also overwrite the existing file. It will search the "Converted Audio" folder every 60 seconds and if there is any audio that has been added to the folder, it will process it and add it to the system.

The three folders we created and named above are necessary to fulfill the obligations for the directories in question and they all need to be physically different locations. We simply leave the audio in the Converted Audio directory as it will be replaced the next time the batch file runs.

Lastly, you'll hit the "Start" button and the feature will begin the process of consistently searching for new audio in the Converted Audio folder until you hit the "Stop" button (once the start button is clicked, it changes to stop).

This Autoload feature persists through restarts of Nexgen and reboots of the entire machine. If you find that your audio loading has halted, this would be the first place to look. My experience is that this feature is rock solid and hardly ever needs attention. It can also be set up on multiple machines and paired with AFC in order to do this process on different workstations within your studio, assuming you have the correct licensing in place.

AFC to Cross the Finish Line

The Audio Format Converter utility is the last step in this FTP automation process. We have gone out and gotten the audio and placed it into separate folders. We have set up the Autoload feature in Nexgen to look in one particular folder so that it can ingest audio into the system. The missing piece is the software needed to convert audio, attach the necessary metadata to the audio, and move it to the "Converted Audio" folder above to be brought into the system.

The Audio Format Converter (from now on

AFC) in simple terms is divided into singular groups for each piece of audio with settings about where audio can be found in specific folders. The inbox is the folder where you have placed the FTP audio. The conversion folder is the outbox, the value of which should always the "Converted Audio" folder we created in the previous step.

AFC will convert audio into a number of different formats, but for our purposes, MPEG 1 Layer 2, which is the Nexgen default, is used along with the choice of a compression value). A "DAT template" can also be chosen to add metadata to the given audio. Other choices, including normalization, creating VID files, deleting original audio files and running in "auto" mode are all left to the user's discretion.

The first thing you'll note is that the default number of individual groups (files) in the initial install of AFC is only eight. This low number would hardly be useful since our goal at the end of this process is to handle many more files than that number. So we go into the configuration section of the initial screen and choose for the number of groups to be higher.

When choosing the number of groups, be careful to not overshoot your actual needs. This number can always be adjusted to a higher number, and restarting the program will change the number of groups to the new setting. The issue with putting a higher number of groups than necessary in AFC is that it starts at the first group and cycles all the way through to the last, so you'll be adding unnecessary time before AFC returns back to the first group. It is important to keep the number of groups relatively tight since it is so easy to add more when you are ready for additional converted audio.

Once the appropriate number of groups has been established, the next step is to create "DAT Templates" from the tab in the Config window. These templates have the information that AFC needs in order to give each piece of converted audio the correct information, from its cart number, cut number, audio name, end dates, archive dates, deletion dates and even the production audio category that the audio needs to be placed in.

After you have your templates built out, one of the final steps is to go back into the individual groups on the main page of AFC and begin putting in the settings that you need for each piece of audio (group) you want to use. Typically, I'll rename the group to something useful while keeping the group number somewhere in the title (normally at the beginning). Its good for me to know when a particular group is coming up for conversion / processing and what group is associated with what piece of audio at a glance.

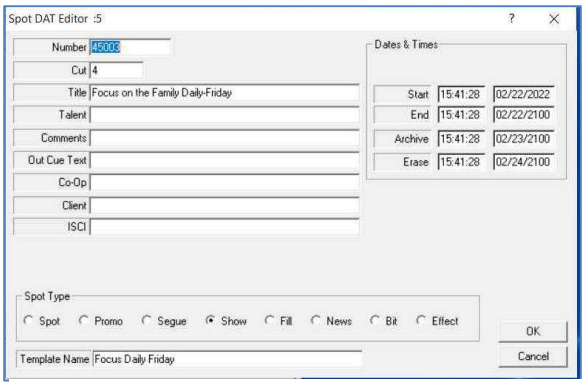


Figure 2 - The individual DAT template screen allows you to pair data to a particular piece of audio.

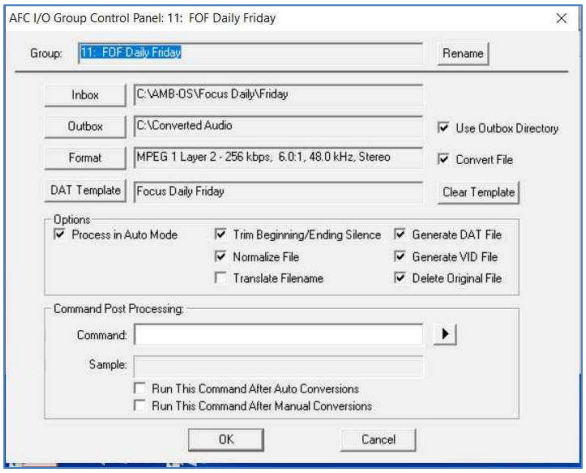


Figure 3 - The AFC settings page for each audio group.

The next thing to do is to click the inbox and browse to which folder the audio was placed into. The outbox will ALWAYS BE the "Converted Audio" folder mentioned above as we want to move audio to that folder so it can be placed in the system.

Unless you have a reason to convert to a different audio format, the format for Nexgen use should be MPEG 1 Layer 2 with compression to your system's taste.

The DAT template that you painstakingly created can now be chosen for the audio group. We choose the options as above for our groups, but you may prefer more or less. Critically, "process in auto mode" must be chosen as AFC runs in auto mode as it moves from group to group checking to see if any

audio has been added to each of the folders. "Trim for silence" and "Normalization" settings can be tweaked to your liking in the "Audio Processing" tab found in the configuration section window shown earlier in this section.

Once you are fine with all the settings you have chosen, you can hit the "OK" button and then configure another group. If you have added all the groups that you intend to add for the time being, you can simply hit the "Auto" button in the upper left of the main program window and the software will begin checking the inbox folders of each of the groups and processing the data. This is really the completion of the automation process.

When AFC finds audio in a group's folder, you'll see a light blue bar move across the screen as it completes the conversion and adds DAT settings. It will move onto the next group while it silently passes the audio to the Autoload utility. With the Autoload utility set at a 60 second check of the Converted Audio folder, it takes a minute or two for the processed audio to show up in the production category to which it was assigned, depending on where in the 60 second window the audio was placed in the folder.

Lastly, the final batch files that you may want to create is ones that kill AFC once a day and then restart it a minute later. This can be done overnight so it does not interfere with any automatically processed audio.

The only reason I suggest this is that it happens occasionally that AFC will freeze up, and we've also had people shut the program down accidentally. Despite the confidence I have tried to engender in this process, we are dealing with computers that humans still have access to, so it doesn't hurt to have AFC automatically shut down and then restart itself a minute or so later.

The batch file in Notepad that needs to be created to terminate AFC simply has this single line in it:

taskkill /f /im PsiAfc.exe

Remember to save it as a batch (.BAT) file and to use the Windows Task scheduler for it to work sometime in the early morning – daily.

To restart AFC, you don't need a batch file. You simply need to go to the Windows Task Scheduler and Create a Basic task as shown earlier in the document. Name the task, then configure the trigger (schedule is daily, preferably one minute after it was terminated above), and the action is to run the PsiAFC.exe file (browse to it in the C:\Programs Files (x86)\RCS\AFC4\ folder) and then run through the same settings I mentioned previously about highest privileges and so forth.

I hope this process helps to take a load off of what people that are programming your stations are doing on a daily basis so that they can focus on other details of their job.

As I mentioned, I have zipped folder containing a number of ministries that already have batch files included and will just need to be tweaked to your individual market needs and rest of the process just takes some time to set up and do correctly. Good luck in that endeavor.

Until we visit again next month, may God bless the work of your hands.

Tales From Cousin IT
by
Stephen Poole, CBRE, AMD
CBC Corporate IT Specialist

When I was a freshman at Hoke County High School in Raeford, NC, I had a classmate named Danny. He was a big, cheerful fellow, all muscles, very few brains. Everyone liked him, but we were careful about allowing him to handle anything more advanced than a pencil or fork.

One day during PhysEd, we were playing softball. Danny was placed in the right outfield because that was least likely to have any serious activity. But as the game proceeded, someone on the opposing team hit a high, arching fly ball directly toward Dan-Dan. Everyone held their breath.

Now, we had told Danny to "keep your eye on the ball." Always keep your eye on the ball. And he did. As the ball slowly left orbit and headed toward him, he stared with great intensity. The ball dropped lower. Still staring, he adjusted his position a bit to the right, then a smidge to the left. But his eyes never left that ball.

The ball arrived with a loud, "smack!" as it struck Dan-Dan right above his left eye socket. It bobbled around a bit, but Danny continued to follow it with radar-like concentration. The ball fell into his hands and the crowd went wild. "Yer out," yelled the umpire.

Infrastructure: First, Boeing

Don't ask me why that memory drifted up when I saw the state of some power lines behind our studios and offices in Homewood, AL (Figure 1). But I did recall it, and the only thing I can figure is that maybe the people running our Infrastructure (capitalized out of reverence) are somewhat like Danny: they keep their eye on the ball and ignore everything else, including injury.

In their case, though, the ball is "money." Stock value. Market cap, net profit, dividend shares. Boring stuff like that. And that lets me ask this month's rhetorical question: What do Boeing, AT&T and Alabama Power have in common? Let's start with the airplane maker.

Because I've been interested in learning to fly (just waiting on MOSAIC to see what's available), I've been hanging around in a pilots' forum online. Mostly lurking, occasionally posting. Many of the regulars there are airline pilots, and more than a few have worked for Boeing, Airbus, Lycoming – you get the idea. With a wink and nod, we shall refer to them as "insiders." What follows is all hearsay and third-hand info, mind. But I found it interesting.

Most of these fellows trace Boeing's problems to their merger with McDonnell-Douglas. I remember when it happened, and I vaguely remember some industry folks wondering why, oh why, would Boeing agree to let the MD people manage the thing? MD had basically been in deep money trouble; Boeing, on the other hand, was not only profitable, but it also had the reputation as a "company run by engineers" who were concerned about quality and safety. After the merger, the top management became far more concerned with profits and the stock price.

Figure 1 - I hope these lines aren't energized!

Again, I have no idea how much truth there is to that, nor do I believe you can blame it all on the MD folks who arrived, carpet bags in hand, after the merger. But according to employees of the company, they have been under pressure to do more with fewer people ever since. Things get missed – such as the "plug" door that wasn't attached on Alaska Airlines Flight 1282 several weeks ago. Before that, Boeing were under so much pressure to get the 737 MAX

certified that they cut corners on a critical control system and two airliners were lost (Lion Air Flight 610 and Ethiopian Airlines Flight 302).

AT&T and Alabama Power

Not sure who gets the blame on this one. The poles are usually owned by the power company, but AT&T, our local legacy telco, certainly has some say over their own cables. You might not see it clearly in that little image, but the pole is rotten. The one in line just before the one pictured in Figure 1 is clearly decayed, with visible cracks in the graying wood. Figure 2 is a close-up of the second pole.

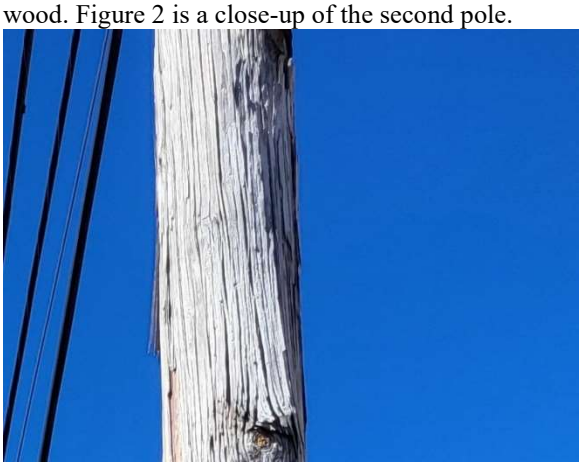


Figure 2 - A closer look at one of the poles.

I don't know if this line is still energized, but when I traced it out, it seemed to go to a pole about 100 feet to the south with a transformer that was feeding the building adjacent to ours. Maybe it's no longer active. I certainly hope not; the thought of one of those poles breaking and dropping a 7.5-kilovolt line on one of our satellite dishes, thereby feeding a hilarious amount of voltage into our satellite receivers, makes me itch.

The Point

Driving around Alabama, I see stuff like this all the time and in some cases, it's obvious that the lines are in use. I've seen utility poles that are warped and leaning, clearly overloaded with huge transformers that remind me of hogs clinging to a thin tree branch. I've seen junction boxes on AT&T's equipment with open doors, smashed cases (probably struck by a vehicle) and wiring that hangs and drops down into branches ... and in some cases, even touches the ground.

Another thing that spurred me to mention this is the announcement from AT&T that they'll soon abandon all of their old copper wiring. Maybe that's why they're ignoring what seems to be obvious problems. But I have a feeling that they (and Alabama Power, for that matter) may be looking at some "737-style" problems of their own in the near future.

What this means to us, unfortunately, is that we need backup plans. Not every station or office can justify a whole-facility generator, but we need to keep these things in mind. One reason why we work with Agility Recovery is because we expect problems and need to be ready to meet them head-on. As technical staff, we need to make sure that WE are ready to gitterdone, too.

The IT Circus

Ah, life continues in the Land of IT. I mentioned to Cris in one email that if Amazon Web Services (AWS) or some of the other companies that I've been forced to work with were employees of Microsoft or IBM, there would be bloodshed. Corpses in the hallways painted blue. Yelling, screaming, madness and burning of paper ... there is no way that Microsoft, just to name one, would allow someone to release an "update" that requires that the programmer – that's me – to immediately rewrite my software to fit their new specification.

(Yes, Microsoft has certainly done some things like that, but only after a transition period and with plenty of advance warning.)

Google Play has, like the Apple Store, been extremely successful; no one can deny that. As a result, it (and the Apple Store) has been targeted by hackers, crackers and bad guys. As a result, Google is serious about making sure that you follow their constantly-changing rules for putting an app in that store. For one, each updated app must have an internal, secret incremented version number. For another, if the app is written for an older version of Android, Google may simply delete it after a while. You've got to stay on top of things and keep them updated. One of our problems is that the app hadn't been updated for a very long time (years).

One of the biggest embarrassments of my career – I'm not exaggerating – is when I initially estimated a couple of months on getting the apps and website for My Hope Now updated. It never occurred to me that the Android "eco-system" could be such a weird and chaotic circus of software, modules and ever-changing specifications. That's just not how Apple, Microsoft or for that matter, Linux (in general, nowadays) does things.

The package that I was using to update the Android app, for example, kept screaming for upgrades while I was tinkering. I installed them and it

broke a bunch of stuff. I mean, broke, as in, "no longer works." Some Googling (taste the irony) found several forums and bug-report sites where others were complaining. The standard cure was, "Revert to an older version." Easier said than done, because each update brings in a bunch of different new modules.

Finally, we're going to base all of the new work on the website. That'll be the standard and the foundation. Most browsers will allow you to directly view the "page source" for any website; that's one of the first things I did with My Hope Now ... and received a shock. Look, I'm used to gibberish; half of programming IS gibberish. But this was… wow. I saved the page to my computer and opened it in the KWrite editor, which promptly complained:

"The file ... contained lines longer than the configured Line Length Limit (10,000 characters). The longest of those lines was 405,394 characters long ..."

That's enough for now. We're on it, we're gittenerdone, and God is still in control. Until next time, keep praying for this nation!

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

Profanity Delays

At the beginning of the year, we began installing our new Eventide BD600W+ profanity delays. These are Wheatnet enabled so that they integrate into our AoIP system. Our prior profanity delays were also made by Eventide and part of their 600 series. Since they were aging, they were up for rotation for replacement. So, this upgrade was to basically the same unit but with Wheatnet capability made too much sense.

Not only is the audio available in the Wheatnet Navigator crosspoint map, but all the logic is as well. Due to our formats being primarily music, we only use two logic functions, dump and safe. But if needs should change in the future, we can easily go into Navigator and add other functions that might be needed for a more talk-heavy format. No need to pull off a connector and add additional wires. All the logic functions of the profanity delays are available in a few minutes with just a few mouse clicks.

So far, we have two of the units installed and are in the midst of getting the last two installed. There have been little issues with the two units that are currently on air. Really, the only issue we had in installation is that we had a lapse in our documentation and had an IP conflict with another device on the AoIP network.

Low Voltage Power Supply

We recently lost one of the low voltage power supplies in the Nautel NV5 transmitter at our Kirkland site (WYRB). This transmitter has a backup for each of the LVPS supplies, so it stayed on the air. Nautel support asked us to exercise the ribbon cables on the PA modules to make sure that there were not any false readings due to oxidization. This made no difference in the voltage level of both power supplies.

Once we got the replacement supply on hand, I did the replacement and noted some really strange behavior. The voltages from the supply, both 15 and 5 volts DC, were varying up and down. This meant they were going into alarm condition. The backup supply was still functioning properly.

I am not sure of my logic, but I decided to take 120-volt AC cable off the backup supply and let the main supply run on its own. The result was surprising as the voltage levels stabilized and didn't have the up and down variations. As soon as I re-connected 120-volt cable to the backup supply, the variations on the main supply would start again. I did a swap of the 120-volt cables and still got the same issue.

I have a suspicion that there is something not quite right about the new supply, but without the secondary supply powered up, the transmitter is on the air and not having any issues or alarms.

I reported this weird issue to Nautel support.

They seemed to be scratching their heads a bit as well. They want us to swap the supplies in position to see if the problem follows the supply or stays with the position (main or backup). This makes sense and I will do so when I get out to this site again.

Valley News
By
Steve Minshall
Chief Engineer, KCBC -- Modesto

In my 44 years of broadcast engineering, I have been exceedingly lucky to have incurred lightning damage on only two occasions, that is up until just recently. On one occasion I had an FM exciter damaged, and on another I had a studio tower hit by lightning that caused several pieces of equipment to fail in the studio/office where I worked at the time. Late last month, I had my third experience with lightning damage.

It was a stormy afternoon when I got an alarm from the remote control at KCBC. The station was off the air at 4:05 in the afternoon. Neither transmitter would respond to an "ON" command, then I tried the night pattern and both transmitters were happy with that. At this point it was pretty obvious that there was a problem with the day antenna system.

Arriving at the site, I took a look at the transmitter and the antenna control system. Everything seemed to be normal, as it was running in the night mode. When I switched to the day pattern, I found that we had a tally light not lighting up for tower number two. It was pretty obvious that something was amiss with the contactor at tower two. The odd thing was that there was no reason for the contactor to get stuck in the night position at 4 o'clock in the afternoon.

Did I mention it was stormy? The worst of the weather had passed by, and it was just a matter of slogging through the mud with tools and an umbrella to get to the antenna tuning unit. I opened the door and sniffed for the expected burnt electrical smell, but I was not able to detect anything with my nose. Turning on the lights, I could see some soot around the contactor. At this point, my suspicions were high that we had taken a direct hit from a strong lightning bolt.

Using my phone, I switched between patterns and found that the small slave relays that activate the contactor were clicking just like they should be. Using my voltmeter, I found that there was no voltage going to the contactor during the switching periods. I found that there was normal voltage on the circuit board that holds the small slave relays used to activate the solenoids in the contactor. I pulled out the relays, checked the socket pins for voltage and there was none.

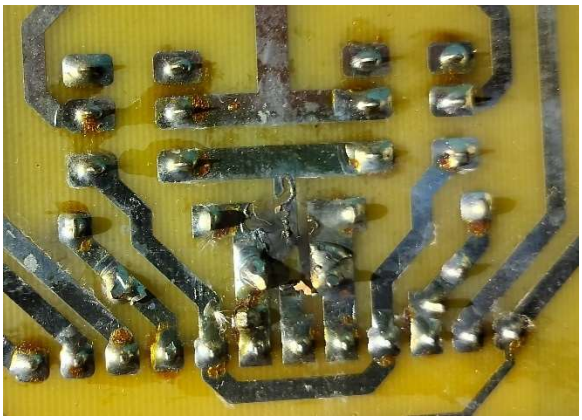


Figure 1 - A vaporized circuit trace, easily fixed, was the extent of the damage.

There's only about an inch of distance between the relays and the point where the power enters the circuit board, so there should not be much difficulty in locating the problem. I unmounted the circuit board and turned it over. I found the result that you can see in the photo. The trace from the

main power input to the relay sockets was vaporized. It was an easy fix; I used some copper braid to replace the missing foil on the circuit board. After the repair everything worked normally again.

Lightning can be a funny thing. Of all the things the strike could have damaged, it only took out a section of foil on the circuit board. In doing so, the arc must have caused a temporary connection of the power input to the night contactor solenoid, putting the contactor in the night position. The chances of that happening must be incredibly small, but weird things do happen, especially with lightning!

I mentioned the exciter failure I had due to lightning in the past. That was a real oddball also. The only damage to the equipment was a dead voltage regulator and a punctured mica insulator on that device. It's amazing that the exciter was not totally fried and that somehow the lightning found a path to ground by puncturing a mica insulator and only damaging one component.

I've been chief engineer at KCBC for nearly 34 years now, and this is the first lightning damage that I have had at the station. I am glad that it was minor and easy to repair. I am quite sure that these towers have been hit many times over the years without any issues whatsoever, but like I said, lightning is a funny thing, and you never know exactly what paths it will take.

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

Burk!!!

We replaced our last Burk ARC Plus in February. We had been migrating to the ARC Plus Touch units for a couple years now. The KLVZ day site was the last we needed to update, and to say that I am thrilled with the change is an understatement.

I think it was Joni Mitchell who sang, "You don't know what you've got 'til it's gone." While I didn't lose an ARC Plus Touch, going back and forth from the Touch to the regular unit was an irritation.

As with most things, you see how they get better with new revisions. The ARC Plus Touch is no exception. I was weary of having no touch screen at one transmitter site enjoyed that feature on three units I do have. Adding this one completes our sites and allows me to easily move around from site to site (on the unit) to check various things when needed. It's especially important at this site because when we have to do work, we put it on the night site, and having the touch screen makes it a lot easier. The SNMP functionality is another great plus.

Trailer

We've long been in need of a longer trailer to haul the Kubota tractor on, no pun intended. We had a 16-foot two-axle trailer that was a tad too short to haul the tractor with the brush hog attached. When hauling that combo we'd have to leave the ramp gate down and use some ratchet straps to secure it to the bottom of the brush hog. Not ideal, as it makes it difficult to see the brake lights from the rear, and we've had a ratchet strap break mid-drive, and that's never a pretty thing.

I was able to trade in the 16-foot trailer and get a nice 20-foot one. We loaded the tractor on it once we got back to the KLZ site with it, and it fit perfectly! I think this will make things easier this spring when growing season starts. Now we've got to install the chocks and tie-downs, a good project for the off season.

Progress at KLZ

You've read many times in these pages about a road-widening project near the KLZ transmitter site. It's made things a mess. There've been plenty of road closures and detours to deal with and even a time or two where gaining access to the site was nearly impossible.

When we went to buy the new trailer, we had trouble with deep ruts in the driveway as they had been bringing in truckloads of dirt. Thankfully

my car made it through, but it was tough. The truck had no trouble, but we could feel the trailer dragging on high center as we went through. We had to have a conversation with the two guys in charge of the project and we came to an understanding. Only time will tell if it did any good.

They have the basic infrastructure in place now, so we should be getting back our main entrance any day now, and they tell us they will be done with the majority of the work on our property by April 1. They are on a tight deadline because the canal that they had to move will be turned on April 1.

The new trailer is long enough to haul the tractor with the brush hog attached.

Coming Up

As March is now here, I am working on figuring out what to do to better manage the growth at the KLTT and KLZ sites. I am also praying that the spraying we did at KLVZ last year keeps things from growing up this year.

I think sometime in March, either I or my assistant Dylan will begin mowing at KLZ, finishing up what I didn't get last year. Then as soon as things start greening up, spray the heck out of the site. It's much bigger acreage wise, but at least we have running water.

A drone's eye view of the road widening project along the KLZ site frontage. An agricultural canal that runs along our frontage on an easement had to be moved, no small feat.

I will also do the same for KLTT, possibly taking the tractor out there early in the season to knock down the growth we didn't get to last year and again, spraying herbicide to keep the Canada thistle down. We will have to haul water to this site but, with the new trailer, I think we can haul it with the tractor so we can make it a one stop shop. Well, it also depends on if we can load the sprayer on to the trailer too, with the tractor.

I am praying my month can be spent outside with some good weather, getting caught up on the outside work. I pray you all stay safe and well!

KBRT • Costa Mesa - Los Angeles, CA
740 kHz/100.7 MHz, 50 kW-D/0.2 kW-N, DA-1
KNSN • San Diego, CA
1240 kHz/103.3 MHz, 550W-U
KCBC • Manteca - San Francisco, CA
770 kHz/94.7 MHz, 50 kW-D/4.3 kW-N, DA-2
KLZ • Denver, CO
560 kHz/100.7 MHz, 5 kW-U, DA-1
KLDC • Denver, CO
1220 kHz, 1 kW-D/11 W-N, ND
KLTT • Commerce City - Denver, CO
670 kHz/95.1 MHz, 50 kW-D/1.4 kW-N, DA-2
KLVZ • Brighton-Denver, CO
810 kHz/94.3 MHz/95.3 MHz, 2.2 kW-D/430 W-N, DA-2
WDCX • Rochester, NY
990 kHz/107.1 MHz, 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/94.1 MHz, 5 kW-U, DA-1
WDJC-FM • Birmingham, AL
93.7 MHz, 100 kW/307m AAT
WCHB • Royal Oak - Detroit, MI
1340 kHz/96.7 MHz, 1 kW-U, DA-D
WRDT • Monroe - Detroit, MI
560 kHz/107.1 MHz, 500 W-D/14 W-N, DA-D
WMUZ-FM • Detroit, MI
103.5 MHz, 50 kW/150m AAT
WMUZ • Taylor - Detroit, MI
1200 kHz, 50 kW-D/15 kW-N, DA-2
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/95.3 MHz, 5 kW-D/41W-N, ND
WYDE-FM • Cordova-Birmingham, AL
92.5 MHz, 2.2 kW/167m AAT
WXJC • Birmingham, AL
850 kHz/96.9 MHz, 50 kW-D/1 kW-N, DA-2
WXJC-FM • Cullman - Birmingham, AL
101.1 MHz, 100 kW/410m AAT

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