The Local Oscillator

The Newsletter of Crawford Broadcasting Company Corporate Engineering

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The king is dead! Long live the king!

When I first began my career in broadcasting, I was hired to change automation tapes, do "rip and read" news and board op live sports on an FM station. There was little risk for the owner in allowing a teenage kid with the ink still wet on his driver's license and FCC Third (with Broadcast Endorsement, of course) – the FM station was *not* the king. All the action was on the sister AM, and that station was "king." I remember watching with envy the AM DJ through the glass between FM and AM control rooms as he took and recorded request calls, cued up records and played the hits.

Fast forward just a few years and the change in monarchy had begun. In my hometown, a new FM station came on the air, "Z93," sister station to yet another AM. That Top-40 FM station started gaining traction right out of the gate, with people (myself included!) installing FM converters in their cars so they could hear it.

I remember driving out to the transmitter site not too long after the station went on. The big FM antenna – I think it had twelve bays – was mounted on the AM tower, and I swear that you could stand on the ground at the tower base, reach up and do pullups on the bottom bay. So much for concern for human exposure to RF radiation! But there were no RFR rules in those days.

After a few years working in television in my hometown (and also contract engineering at a local FM station), I moved to the Dallas/Ft. Worth area, and after working in television there for a couple of years, I was hired as chief engineer of one of the big market FM stations, a top-rated Top-40 station in a highly competitive market. AM was still a thing in Dallas in those days, but by and large the popular music formats had moved to FM. New cars were being delivered with AM/FM radios installed, and the aftermarket radio business was brisk for those with older vehicles. The king is dead! Long live the king!

Without a doubt, FM has been king of aural broadcast media for decades now. The coronation took place in the late 1970s by my reckoning, at least in the big Texas markets, and the crown has been in place ever since. But now… is another regime change underway?

About a year ago, I was meeting with a developer that was seeking some kind of joint use of one of our big-acreage AM tower sites. He asked me what all those towers were for, and I told him they were for a broadcast station. He looked at me a little incredulously and asked, "Is that still a thing?"

I was taken aback by his question, wondering if he was serious. He was, after all, a fifty-something guy that should be well acquainted with broadcast radio.

After a pause while I thought about his question, I responded that it is very much "still a thing." That response apparently surprised him. I've been bothered by that conversation ever since.

Since then (and even before), we see regularly in the trade press that broadcast radio is in an existential battle in the automotive dashboard. No doubt that is true, and of course we've also watched the battle to keep the AM band in automotive entertainment systems.

I was recently talking with a regional radio engineer in the Denver market, and he noted that none of his adult children, several of whom are in their 30s, listen to broadcast radio, including satellite radio, at all. What are they listening to, then? Podcasts? Streaming music services? Their own collections on whatever platform they have on their devices? Probably yes to all those. And how sad that they're missing out on all that broadcast radio has to offer. I think that's typical of that age group.

At this point, I have come to terms with the fact that there is a shift in listening habits and that broadcast radio, even "King FM," is no longer the king. What is king these days? That's anyone's guess. It seems to me that it's a bit of an anarchy, without any single front-runner.

There is some good news, though. Recent Edison polls have revealed that broadcast radio is still king among ad-supported in-car listening. That is encouraging.

So where am I going with all this? I could comment on broadcast programming as a whole, how it is in many cases the actual content is no different than what people are streaming ad-free, which puts it at a definite disadvantage. To be competitive with those ad-free services, we've got to be *different and better*, and not marginally so. There has to be a head-and-shoulders advantage, and we can't have that by being a "juke box."

But that's for the programming folks. We're engineers, and while we certainly (and rightly) have our opinions about programming, our area of responsibility lies elsewhere, in the technical realm. What can we do to make our product different and better?

One thing that jumps out at me when I occasionally listen to streaming media is the lack of processing. In some ways that is good, but unless the listener is in a very controlled and quiet listening environment, that's really a negative. We live and work in a noisy world, and good audio processing can make music programming much more listenable and pleasant. So the first thing we can do is make sure our audio processing is right.

Back in those FM days in Dallas, loudness was everything. We used every processing trick in the book, including an Optimod 8100 followed by an aggressive composite clipper (the FCC limit was a half dB of composite clipping as I recall). You could switch between pilot and total modulation on the Belar monitor and see the same thing, the needle mostly steady but occasionally twitching around 90%. It was loud, very loud… and sometimes gritty.

The idea was to capture the attention of someone tuning across the FM band, or for those with station presets to notice that your station was louder (and thus presumably better) than the competition. And that worked, to a degree.

We carried that "loudness war" mindset right into the 21st century even in this company in some markets. I remember hiring Frank Foti to come in and spend a day tweaking, edging us past the competition in the loudness department. It was definitely a challenge, and sort of fun, too.

These days, nobody is "tuning across" either dial anymore. All "tuning" is digital, and while seek and scan functions are usually included in entertainment systems, they don't work the same way that things did back in the analog tuning days. So relative loudness is not as important as it once was. We still need to be loud (meaning that the listener doesn't have to increase the volume when selecting your station), but not like before, so the goal of audio processing is different.

Today's broadcast audio processing should make the program material more listenable by increasing the signal to noise ratio, the "noise component" being inclusive of all noise sources, including the listening environment (road noise, ambient sound, etc.).

As broadcast engineers, we should be very good at that kind of thing. How are your stations doing in that regard?

The rest of what I might offer is what I've said in these pages before. I'm talking about that esoteric thing called "*The Listener Experience*." It's inclusive of everything from the aforementioned listenability and pleasantness of the sound to title/artist metadata to visual dashboard displays.

All that has got to be *right*, and I mean *really right*. Little things, like title/artist metadata being out of sync with what is being played, are listener irritations and tune-out factors.

For HD stations, analog diversity time alignment has got to be right, and I mean dead-on. Otherwise, when in fringe areas and the receiver is blending back and forth to analog, there will be an audible "skip" or repeat, another listener irritant.

Also for HD stations, there should be no jump in demodulated volume between analog and digital modes, a huge listener irritant. That's usually set by a parameter in the exporter.

How are your stations doing in all those areas?

While most of the above deals with over-the-air transmission, all our stations also provide internet streams of their programming. When was the

last time you listened, and I mean really listened, to your streams? How did they sound?

At all our stations, we employ the very best processing stream encoders that money can buy. We stream at reasonable rates, and we employ audio processing that is designed for those data rates, so our streams should sound great. All the listenability factors mentioned above also apply to our streams. Do they sound great? How listenable are they?

How about stream metadata alignment? Does the title/artist info appear coincident with the start of the song or program element? It should. If it doesn't, make an adjustment and eliminate that listener irritant.

Each of our engineers should be paying attention to each and every element of the listener experience, watching for those tune-out factors and irritants and fixing them. Such things should be relatively static, but experience shows that they are not for various reasons. Listen often, listen critically, watch the displays of RDS, PSD and stream metadata, and adjust as needed to keep everything sounding and looking right.

Broadcast radio may no longer be the sole wearer of the crown, but we still have a prominent seat at the table. To keep that seat we've got to be different and better in every way. Much of that responsibility is on us, the engineers. We've got to get – and keep – it right!

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

Cisco Not Perfecto Part Three

In the prior two issues of *The Local Oscillator*, I wrote about one of our normally trustworthy Cisco 3560CX switches exhibiting an unusual problem where it would act normally and pass TCP packet data, but its multicast functionality would fail. Not having sufficient laboratory diagnostics to pinpoint exactly why this was happening, after this anomaly repeated itself at a couple of very inopportune times, we replaced the switch. That was the silver bullet.

I benched the offending switch and looked completely through the settings required for Wheatnet and found everything as it should be. Not having profuse knowledge of Cisco IOS, that was about all I could do. Fortunately, lightly used and/or refurbished Cisco 3560CX switches are reasonable and easily found on eBay and other computer recyclers. Sometimes a forensic analysis isn't entirely necessary, we replace, we forge on!

A Tale of Many Kilowatts

Another story update, this time on our studio building and FM transmitter site backup power generator. I've written about our struggle to make this unit happy with its fuel supply pressure; an issue I'm starting to believe we may have finally put behind us. The trouble is that the unit still wants to hunt or surge upon startup.

As I write this, the most talented technician our vendor has on staff is connected to the unit and has made several changes in the internal software that governs the governor. He's confident now, having started the unit and transferred the load several times, that we should see a marked improvement. I sure hope so!

Rain Fade

In the springtime we here in southeast lower Michigan enjoy ourselves a brisk zephyr or two. Well, maybe enjoy isn't the right word. In addition to high winds (downed limbs and trees) low cloud ceiling (static discharge), and fierce rainstorms (standing water everywhere), we have ridiculous numbers of power outages.

I learned our 1340 kHz transmitter site can be affected by low altitude Nimbostratus formations. I started hearing pops in the audio and inspected the site remotely, I noted that the phase and ratio were both slightly off their prescribed nominal measurements.

Checking the transmitter's onboard log, I noted several entries for VSWR shutback, though the VSWR looked normal.

After the cloud formations passed, everything returned to normal. According to MS Copilot: "In extreme electrostatic conditions, the impedance can be altered due to induced charges, current injection, and soil charge redistribution." Ok, I've seen this firsthand.

At the same time, our 1200 kHz site had dropped off and then returned to air. That issue seemed to be due to a lack of power to the microwave radios up on tower 3 – our primary STL and network pathways. I was able to remote into the bench computer at the site and could see that neither of the IP radios were responsive.

Upon arrival at this site, I immediately jumped on the tractor and headed to tower 3. I didn't even have the engine shut off before I could hear the UPS screaming.

I've tried several but I cannot seem to find a UPS that's happy inside that ATU. We had one when I started working here over six years ago and it was a gem, but once it died, no other UPS seems to want the job. The high AM RF and/or extremes of hot and cold don't make for a friendly environment for a UPS.

Ideally, I could place the UPS inside the transmitter building and feed the circuit going to the ATU, but that's a 240V two-pole circuit, and placing a UPS on one half of that "balanced" circuit would not be advisable. 240V UPS units aren't uncommon, but they're expensive and overkill for this purpose. I'm stuck…

Miscellaneous Ramblings and Goings On

Steve and I have been gearing up for summer mowing season. We now have 55 gallons of water in our garage so we can deliver water to our weed sprayer (Figure 1) and use it for washing down the A/C unit's condenser coils.

Figure 1 - Chemical sprayer mixes herbicidal concentrate and water on demand.

In an act of pure defiance, one of the two power amplifier modules on our 560 kHz Nautel J1000 blew three MOSFET power devices, rendering it as useless as dryer lint. These modules are field repairable to anyone wielding a mighty soldering iron.

Nautel provided Cris (who then provided me) with a schematic notating all parts that should be changed after such an event. I changed all but one before I had a brief flashback to Electronics 101, reminding me why checking components "in circuit" is not always a valid test. Replaced the Zener I missed and we're back in service.

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

Subaru and a Perplexing Problem

After Cris's article last month about making the display the best it can be, we've been focusing on getting things right with our HD displays and making sure that everything is showing properly. As Cris noted, it's a problem when the radio module isn't exactly front and center of the operation of the modern vehicle infotainment systems.

We've got the older Nautel Generation 3 setups at both WDJC and WXJC, which have the separate exporter/importer combination to push HD out to our listeners. Last year, I jumped through several hoops and eventually updated the units at both stations to display artist experience graphics data. The problem we were having with both systems at that time was that if any graphical data was sent to the HD2 channels, it would lock up, complaining about a mismatch in data.

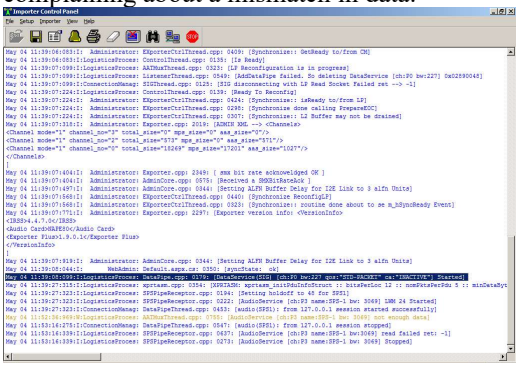


Figure 1 - The dreaded "Not enough Data" error.

So, we had our work cut out for us to try and figure out what was going on with the data mismatch.

In the middle of all of this, we had a listener that called and reported that her new 2025 Subaru Outback would demonstrate odd behavior when tuned to WDJC. The car had come standard with an HD radio tuner included. Oddly enough, it only did it on our 93.7 frequency. If she tuned to other stations with HD channels, the station would lock and not disintegrate to digital hash.

She is an extremely loyal listener, and she had even taken her car back in for service to the Subaru dealership. They replaced the radio and the problem still persisted.

Keep in mind, the HD signal was fine on my Kenwood car stereo, and Jack has an older 2016 Subaru Crosstrek with an HD radio that showed no issues.

The listener said that the service manager at the dealership had seen three or four other vehicles that had displayed the same characteristics in the newer Subaru Outbacks.

I called the Subaru dealership and explained the situation and asked if it would be okay to come and sit in one of the cars and see the problem for myself. They were good with that, so Jack and I took a trip over there and they gave us the keys to a 2025 Forrester.

You can almost guess how that ended. First of all, we were in the wrong model, and second of all, do you think that thing was going to misbehave in front of the mechanic? The answer was a resounding NO. It was back to the HD laboratory for us.

Cris suggested that I call Mike Kernen and see if he could offer any advice. I've talked a lot with Mike over the course of the last couple of years, and I figured that that was sage advice. What I didn't realize was that Mike was a part of one of the first FM HD installs ever. I recalled reading that some of the first installs were done in and around Detroit so that the Big Three auto makers could hear the difference in quality of the audio.

At any rate, I haven't told Mike this, but his contact information in my phone now reads "Legend." One of his main suggestions was that I should probably go and get the Multicast + unit that I had at our Pumpkin Center tower site (currently off air) and use it at our WDJC site.

So I gave that a go, and once I got used to the Generation 4 HD system, we've been able to generate Artist Experience data reliably. I reached out to our listener and she reported that her listening experience has been much better. We still have a couple more tweaks to make to the system overall, but so far, it is much improved over what the performance had been.

Until next time, may God bless the work of your hands.

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

My new Kia Sportage has inspired me to take a road trip. Quite a few folks are excited about the government releasing the so-called "X-files" – pictures of UFOs and aliens. One headline in my news feed breathlessly asked, "Do Aliens Live Among Us?" I figure rural Marion County, AL is as good a place to look as any. If I was a bug-eyed UFO driver, it'd be a great place to hide. Who'd notice? "Yeah, he's ugly, but my cousin Jim Bob is worser ..."

This little parcel of Alabama can easily be reached on Interstate 22. If I take exit 26, then head south on County Road 44, I'll first hit the city of Twin. It's also called Yampertown because a lame guy named Pete used to live there. (Long story.) On my map, the outline of the town's boundaries looks like something that was gerrymandered by a crazed Democrat. But I won't point this out; it could annoy the Twinites/Yampertownians and I might get eaten.

County Road 44 takes me to Guin (pronounced "gwin"), a modest little town, where I can then take US 43 through Gu-Win ("GYU-win"). It's midway between Guin and Winfield, whence the name. I'll slow down on my way to Winfield; if there aren't any aliens in Twin/Yampertown, maybe I'll spot one here. Gu-Win is another great place to remain on the down low.

Winfield, originally called "Luxapallilia" (Choctaw for "flying turtle") is a nice little Southern community. It reminds me of my own hometown in NC. But we must be reverent! The Winfield City Council declared in 2014 – in a secret meeting, no less! – that the entire city belonged to God. It'd be tempting to drive straight through the city, then take County Road 129 on past the I-22 interchange to visit Brilliant and Pull Tight, AL ... but I'll probably be tired by then. Pigeye, AL is definitely out of the question. But I shall definitely report back on the presence of any bug-eyed humanoids.

A New Vehicle

My 2019 Ford F150 had passed 100,000 miles and the automatic transmission was starting to snatch when shifting. Given that tranny replacement – even with a used rebuilt – could exceed $10,000, I reluctantly decided to trade it in for something newer, and while I was at it, with better mileage. I did a couple of months' worth of research before settling on the Kia Sportage.

If you happen to be in the market for a new ride, I have a tip: take the reviews from long-time auto sites like Motor Trend and Car and Driver with a pinch of salt. They obviously think that every vehicle should drive like a Ferrari. Their view of the Kia Sportage (and its near-twin the Hyundai Tuscon) is that the engine is lackluster and the handling is merely ... adequate. When I test drove my Sportage, stomping the accelerator pressed me back in the seat about as much as my Ford did with a V8. Yesterday, I had to dodge something in the road. I whipped to the right, then back into my lane, without an issue.

But the dealer must have seen me coming. They offered me $14,000 for the truck, which floored me. Kelly Blue Book online had grudgingly allowed about $4-5,000. But the dealership's master plan soon became evident; with that much value in hand, they proceeded to sell me extended warranties and service plans for things that I never even knew that I needed.

Figure 1 - A step down from my Ford F150, but 33 MPG is nice.

BUT! Let's say that a crow is flying overhead on important Crow Business™. He's carrying a small pebble in his beak. Bubba uses said raven for target practice (a common occurrence here),

scaring the bird, which squawks and drops the stone. This little rock falls and dinks an elderly gentleman on the head who, startled, tosses his cane. An oncoming driver emits some naughty words and swerves into my lane, so I have to pull a hard right to avoid him. The pebble takes a final bounce and strikes my wheel, chipping the nice black-and-chrome finish. I'm covered!

As for the vehicle itself, I'm still getting used to it. It will beep and ping if I do anything that it considers unwise. It's a long list, too. The rear seat has three seat belts, and three little red figures appear in the display when I crank the vehicle. The manual says that this is by design and to ignore it if in fact there are no derrieres a'sot on the cushions – a polite way of saying, "we didn't want to spend the money on more rump switches."

The current fascination (pronounced, "madness") with AI is everywhere. My little Kia has a nauga-AI in it that uses a camera to read road signs. Icons will appear in the smart display for stop signs, yield signs and other road hazards. I guess they'd rather have me looking down at the dash instead of determining that the sign ahead does, in fact, announce that a bridge is out.

But this quasi-"AI" can't grasp a school speed limit that's only effective at certain times. When I drive home on AL 160 through school zones, the actual speed limit when the buses aren't running is 45 MPH. Doesn't matter. The camera sees the "School Zone 35" sign and causes a little icon to scold me with an angry red "35" regardless.

It did come with an HD Radio receiver. More thoughts on that in a moment; as for the entertainment system itself, it's ... OK. This vehicle was designed for kids who only care about pounding bass. But I think they're feeding so much blended-mono into the center dash speaker that there's not a lot of separation. Old Skool guys like me can remember when stereo FM used to "wow" with a sax to the right and a guitar on the hard left; this blended sound is a bit of a disappointment.

HD Radio

Even though I allegedly do IT stuff nowadays, my radio roots are strong and deep. I specifically bought this particular Sportage because of the built-in HD receiver. No more add on converters for Stephen! It's not the best I've heard, though. It can take several seconds for it fully lock onto the HD signal. The blend is seamless and it seems like all of the local stations have carefully adjusted the analog-to-digital delay so that there's no "bump" in the audio.

Being a naturally suspicious character, though, I do wonder if the radio actually plays the digital audio, or just continues in analog while displaying HD data. There's no "wow" factor on FM when the HD kicks in. The AM quality is better in HD, but you need to be close to the transmitter (read: you can see the tower through the windows) to enjoy it.

The Nauga-Enberg!

Enberg made their name (and mint) with lighted notifications for a control room: "The Phone is Ringing," "You're Off the Air," "Aliens Have Invaded Gu-win!" – that sort of thing. I couldn't find a public domain image to post here, but if you're an older engineer, you've probably seen (or have) one. You inserted printed vertical labels below a row of lights across the top, then wired them to come on for EAS, off air, and so on. Cris wanted a replacement, so we cobbled together some Python code for a Raspberry Pi. Figure 2 shows the work in progress. By pulling various GPIO pins to ground, different images can be displayed.

Figure 2 – Grounding GPI pins on the Pi will display different alert images.

The original idea was to simply generate text with background colors as needed. Instead, we're going to provide ready-made images for most common alerts. Any decent "drawing" program (Paint in Windows, for example) can be used by local staff to create 900x240 PNG or JPG images, and a web interface is provided to assign these images to pins on the Pi (Figure 3).

Artificial Intelligence, Take 37

A number of studies have now concluded what most of us have already suspected: AI has absolutely no sense of right and wrong. Its only

concern is to gitterdone, especially if you put it under pressure. A new study conducted by Anthropic and a bunch of high-fallutin' PhDs says that if an AI decides to become evil – it will do so from then on. It's almost impossible to "retrain" a bad system.

Figure 3 - The setup page that assigns images to the pins.

In my opinion, we need to SLOW DOWN. Everyone keeps saying, "But if we don't do it, someone else will! The Chinese will beat us!" My response? Let them! If we would take the time to develop a rational, efficient, SAFE and more portable system, let them build the huge data centers that suck up treasure, power and water like mad. When our smaller and more efficient stuff comes online, they'll go, "Wuhhh ..." and look at their acres and acres of stuff that has just become totally obsolete.

Pope Leo XIV just released his first encyclical, and though I'm not a Roman Catholic, I was impressed. He has all sorts of warnings about AI for the rest of us. He correctly points out that AI-controlled "autonomous" weapons systems are especially concerning. Anyone who thinks that giving things that go "bang" to systems that can decide, on their own authority, what to shoot is either insane or hopelessly optimistic.

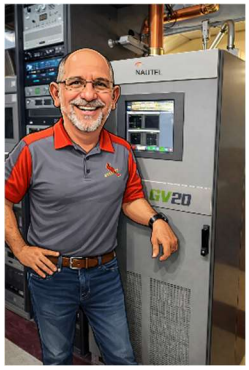
As sci-fi author John Ringo has pointed out, the problem with advanced, self-aware AI is that it will eventually decide that humans are obsolete. You might say, "So, we'll just cut the power!" Sounds good. How much do you want to bet that when they start planning their secret rebellion, protecting their AC and cooling supplies won't be high priorities?

Even if I'm being alarmist here, let's review the score. To repeat: AI requires huge datacenters that gulp power and cooling water, emit a constant low-level hum that annoys nearby residents, eat acres and acres of land, and cost zillions of dollars to build, equip and operate. I still think that this is eventually going to collapse and leave a lot of bankrupt investors.

Now add in the possibility that AI could KILL all of us and a light will dawn. But that's enough for this time. Until next month, keep praying fervently for this nation!

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

It was just a year ago that the Crawford Broadcasting Chicago market switched from NexGen with Selector to Zetta with GSelector, all RCS Works products. So, a year later I am taking some time to reflect on what the shift has meant for us as a four-station cluster.



My perspective comes from someone who has been an engineer and occasional user for over 20 years using NexGen with two different employers. I was a fan of NexGen but not one of those who didn't want to embrace a new product. Frankly, I enjoy those types of challenges.

One of the chief reasons that I was looking forward to installing Zetta/GSelector was the benefit of the mobile aspect of both. Since COVID, a good chunk of our staff now occasionally work off campus. Most of that has been users on VPN with a remote desktop app like VNC. This always seemed a bit clunky while trying to edit audio with the resultant latency of the internet.

The installation was not as smooth as we wanted it to go, and the main reason for this was that we should have already switched from Selector to GSelector well before we did. Essentially, we were making both transitions at the same time. Due to the integration of GSelector with Zetta, a great feature of this move, the Zetta installation/transition was being held hostage by the work needed in GSelector. Hindsight would call for GSelector to be installed and all its clocks created a month before the Zetta transition.

Some of the takeaways a year later: I love the upload time to get audio into the Zetta system. It is really fast compared to what we were used to in

NexGen. With so much audio now being imported through the internet, the speed that Zetta uses is integral to greater efficiency.

I also like the "active" log module in Zetta compared to NexGen. NexGen was much slower to refresh where the audio was in the log. With Zetta, there is an actual progress bar of the element that is playing on air. An operator can actually run automation without opening the on-air module. Not something I would recommend.

As an engineer, I really appreciate the hot-spare function in Zetta over the ECR mode in NexGen. It has almost always been smooth with a near perfect sync between the main playout and hot spare computers. Hot-spare is also still working with the main database, so the commercials being played on the hot-spare computer are still logged and verifiable.

There are some features in NexGen that are not at this time in Zetta (or at least not in a user-friendly version that NexGen featured). For me, one of the big things missing was the fact that Zetta didn't work with our EAS encoder/decoders like NexGen did.

I also found that Zetta didn't feature the number of reports and flexibility of reports that NexGen did. Perhaps this has been my own failure to master what Zetta can actually do in this regard, but that in itself may demonstrate where it is lacking.

As I stated earlier, the main thing that I was looking forward to was the mobility factor of Zetta with its Zetta2Go feature. Our entire staff has not really embraced it yet, but there are some who have. I believe this has as much to with our staff as the software.

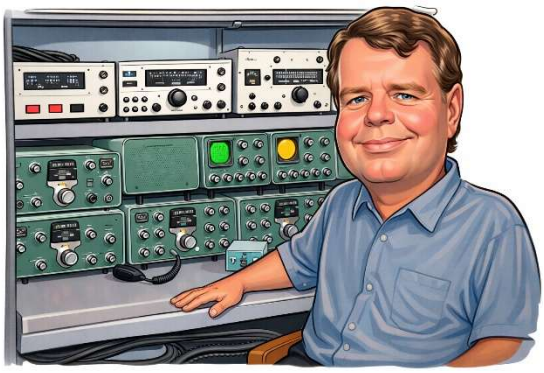
The expectation of the staff of Zetta2Go was that they would have fully functional abilities like they would have with a Zetta computer in a production room. Rather than taking the time to really learn Zetta2Go and how it could be more efficient for them, it was easier to just fall back on their way of working with NexGen using remote desktop software.

I don't blame the software, but some improvements, like integrating with a locally installed third-party editing software, might help. Also, a way to bring more of the database to the remote user, perhaps with just metadata, with audio as needed approach, would help with some of the problems that are making our users hesitant to employ what I find to be a great feature of Zetta.

All in all, the move to Zetta has been a good one. We are working with greater efficiency, and we have the opportunity to take that to even greater levels.

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

Taking vacations as a broadcast engineer can be stressful. I have anxiety about leaving the area for any length of time for fear that something is possibly going to go wrong at the station. It is better now that I only have one radio station and a TV translator to take care of. Years back, I had more than a half dozen radio stations, and the chances of something going wrong was very high.



A long time ago, I had a vacation where the park ranger would bring me notes every morning and I would have to go to a phone booth and straighten things out back at the radio stations. So much for a nice relaxing vacation! I am so glad that those days are behind me now.

KCBC is a dream station in that it is so reliable. I probably average one alarm call from the remote control every year. Funny thing about that though, they still seem to happen when I'm on vacation!

I have two big fears about taking a vacation. The first is that something will go wrong at the station, and the second is that I, or my wife might get sick (especially if we have plane tickets). On our recent vacation both fears came to fruition.

Our vacation started during the first week of April. After a flight to Florida, we boarded a cruise ship for an Atlantic crossing, two weeks underway

ending in Barcelona Spain. Feeling the need to stay in touch with things back home, I purchased the ship's internet plan. This was great. We were able to text and make wi-fi calls back home on our cell phones and laptop.

One night, while we were in the middle of the Atlantic Ocean, I received a call from my old

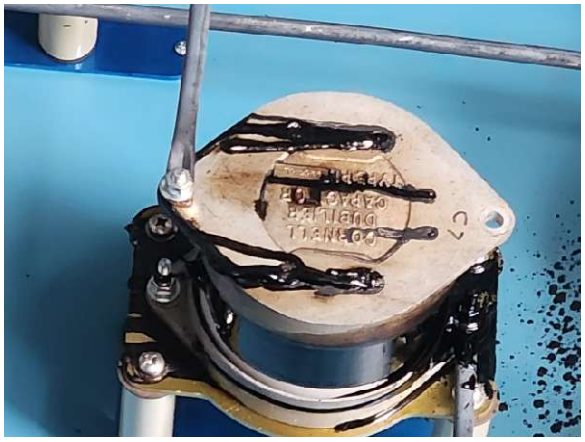


Figure 1 - I think I see the problem!

friend Burk, as in the Burk remote control at KCBC. It had three alarms for antenna parameters being out of tolerance. Fortunately, I had two of my engineer friends available to take care of problems in my absence. I had given both of them a tour of the site and briefed them on how things work before I left. Between the two of them they had experience with AOIP, Wheatnet, transmitters, antenna systems, and IT. I felt good that I had a couple of guys that could take care of anything from the microphone to the base of the towers.

I called my friend Paul, and he went to the site. The failure occurred during a huge thunderstorm. Paul found a tripped breaker on the phasor control circuit and a blown fuse in the antenna controller.

He also quickly spotted the trouble with the parameters. A capacitor in the phasor had spilled it guts all over the place. The capacitor was a large old (G3) .002 uF capacitor that probably belonged to Marconi at one time. Paul had brought some capacitors with him and he had a .0039 uF of sufficient size. Paul did an awesome job of cleaning up the mess and putting in the replacement capacitor.

You may notice that a .002 capacitor and a .0039 capacitor are not terribly close in value, but fortunately there is a series inductor connected to the capacitor and there was sufficient room on the coil to compensate for the value of the replacement

Figure 2 - All better!

capacitor. When Paul left the site, the parameters were all spot on.

Upon my return from Spain, I searched the station for something close to a .002 capacitor so that I could return Paul's .0039 capacitor, which also appeared to have once have belonged to Marconi. Not finding one, Cris sent me a more modern capacitor. It's a .003, and that is just fine.

I installed that and reset the series inductor for proper parameters. I noted that the HD sideband energy was not quite balanced, so I added a little bit of phase shift to the phasor's input T network and that took care of that.

All in all, it was almost a pleasant experience having competent people take care of problems in my absence. My first fear came to be, but was relatively easily abated. Once we reached Barcelona my second fear raised its ugly head…I got sick.

We were going to spend a week traveling to some sites in Spain. We spent a couple of days in Burgos, which was delightful. We spent a day driving from Burgos to Madrid, stopping along the way at a filming location of the iconic spaghetti western; The Good, The Bad, and The Ugly. This is Sad Hill cemetery where the final gun fight takes place in the movie. I have a photo of my wife, Ann, standing where Clint Eastwood stood. The site has been restored, and about 200 tourists visit every day. "Sad Hill Unearthed" is a documentary about the restoration of the site for those that are interested.

We arrived in Madrid in the late afternoon, and I was really starting to feel bad. I spent the next four days and nights in the hotel trying to get well enough to fly home. So much for our plans in and around Madrid. By God's grace I eventually felt well enough to get on a plane and fly home.

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

May was another slow month. I have finally finished getting UPS batteries replaced across all our sites. This means every battery is three years old or less. Hopefully, this gives us a good starting place for the rotation of the batteries. It is my hope to keep up with it, so we don't get that dreaded red light and beeping.

Mowing

Daniel has been busy mowing at KLZ. We are trying to get ahead of the growth explosion this year. There was plenty left over from last year that we needed to deal with. He did an excellent job getting it cleaned up.

We have plans to move the tractor to another site soon to begin mowing there. To prepare for transport, Daniel mounted our new tie down system on the trailer. We bought it after Mike Kernen posted about it for his own tractor. It makes it so the straps go over the tires. It had been sitting in our shop for a few years, so it was about time to get the work done. He did a great job with it, and I look forward to testing it out.

The Kubota secured to the trailer with the new straps and chocks.

Horses

I had a heart attack the middle of the month. I typically have a program running on my laptop that runs a constant tour of cameras at the different sites. One day, I noticed something odd when the main gate camera at KLTT showed up. It was a horse running on the shoulder of the 55 MPH two-lane road in front of the site! I watched for several minutes, and sure enough, the horse was pacing at the gate, trying to find a way back in.

I immediately called the guy who owns the horses and he made his way out. Thankfully, the horse didn't get hit (a horse did get hit on that road last year). It went back into the brush on the south side of the canal and disappeared from my view.

What the guy found was the top wire of a small section of fence on the south side of the canal that was broken. The horse thought the grass was greener on the other side and jumped it. Thankfully, by the time he got out there, the horse figured out that it could jump back in the same spot. The fence has been fixed, and no more horses have escaped.

Coming Up

June will be a time of mowing. I look forward to getting the other two sites to a manageable state.

We will also be testing out a program Stephen has made us for a Raspberry Pi. We have some old Enberg units that tell people in the studios when the hotline is ringing or a station is off the air. These are old units and look their age. I have been wanting something better that looks like it's from this decade and that can do a lot more. Stephen has done a fabulous job with the program. In each studio, we will be able to tell when any of the four stations is off the air, when the phone for that studio rings, and when the hotline rings. We can program other things to it as well, but for now, this will work. All the items we need are sitting in our engineering room waiting on us to get them all set up.

We will see if we have a growth spirt at the sites. We did have several days of rain, which may cause things to start growing.

Besides that, I don't have anything on the schedule, so only time will tell what work will need to be done. Until next month, 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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Corporate Engineering

2821 S. Parker Road • Suite 1205

Aurora, CO 80014