Radio Guide

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July-August 2011 – Vol. 19, No. 4

The New Nautel Story

Inside Radio Guide:

This issue on-line at: www.radio-guide.com

6 - Cover Story: The New Nautel Story
10 - Xtreme Engineering: No Man Is An Island
12 - Transmitter Site: Nitrogen vs Air
14 - Studio Site: Music to Your Listener's Ears
16 - Disaster Preparedness: Disaster Prevention and Recovery
18 - FCC Focus: The Future of Media
22 - Safety and Security: Who Let the Perp In – No One
38 - Practical Engineering: Steal These Ideas

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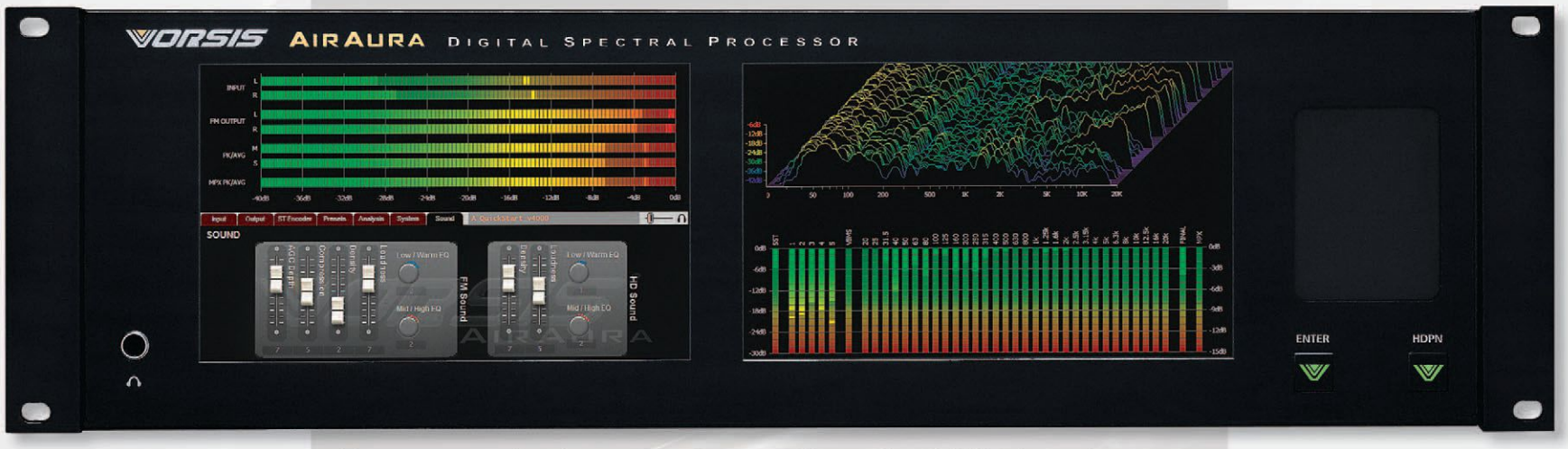

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Radio Guide

Contents

July-August 2011

Cover Story 6
The New Nautel Story

Xtreme Engineering 10
No Man Is An Island – How About a Radio Station?

Transmitter Site 12
Nitrogen vs Air

Studio Site 14
Music to Your Listener's Ears

Disaster Preparedness 16
Disaster Prevention and Recovery

FCC Focus 18
The Future of Media

Safety and Security 22
Who Let the Perp In – No One

Operations Guide 26
Stream On

Chief Engineer 30
Sizing Transmitter Cooling

Gear Guide - *Enco, Gorman Redlich, TFT* . . . 34
New Equipment, Product Updates and Releases

LPFM Guide 36
FCC to Study LPFM's Impact on Full Power Radio

Practical Engineering 38
Steal These Ideas

Small Market Guide 42
Finding An Engineer in a Small Market

Service Guide . . . . . 44 & 45
Radio Equipment, Products, and Services

Radio Pipeline - *BW Broadcast* 46
Equipment Distributors, Suppliers, and Engineering Services

Final Stage 47
Convention, and Event Register – Advertiser Information

Radio Guide

Volume 19 – Issue 4

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Radio Waves

by Ernie Belanger – Editor

Summer is Almost Gone

Summer is coming to a close already, and what a summer it has been. As we go to press, most of the Eastern U.S. is finishing up with the worst heatwave in recent memory, which makes this the perfect time for Scott Schmeling to advise us on cooling our transmitter plant in *Chief Engineer*.

Gary A. Minker gives us some background, and food for thought, on the proper method of pressurizing transmission line in *Transmitter Site*. I discuss station access issues in *Safety and Security*, and Jeff Johnson talks about recovery from natural and unnatural disasters in *Disaster Preparedness*.

In the "battle" of the two engineers with (almost) the same last name – West Coast: Mike Callahghan gets down to some *Practical Engineering* when he takes the lid off his treasure chest of good tips and tricks, while – East Coast: Steve Callahan discusses an *Xtreme Engineering* challenge with an AM stick on an eroding river island transmitter site.

In *Small Market Guide,* Roger Paskvan gives us a few pointers on selecting an engineer in a small market, and Chris Tarr advises us on the best ways to "Stream On" in *Operations Guide.* The future of media is discussed by Peter Gutmann in our *FCC Focus,* and in *Studio Site,* George Zahn describes how to set up a space to allow a live broadcast of musicians' performance on your station. Finally Leo Ashcraft discusses the FCC's study on LPFM's impact on full power radio in *LPFM Guide.*

We're always looking for writers, so if you want to join in on the fun, drop me an email: editorial@radio-guide.com

– Ernie Belanger, Editor

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Cover Story

by Ernie Belanger

The New Nautel Story

Dreaming of Things That Never Were, and Creating Them

The late Bobby Kennedy is quoted as having said, "I dream things that never were and say why not." This quote is the perfect corporate mantra for Nautel.

Deep Roots

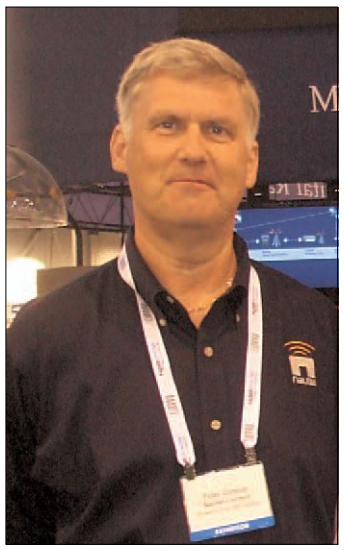
Over its 42-year history, Nautel has created cutting edge technology, carving out a place for itself in an industry dominated by Jurassic Giants. In doing so, this nimble company, rooted in the tranquil village of Hackett's Cove, Nova Scotia, has evolved to become one of the world's largest radio broadcast transmitter manufacturers, leaving the dinosaurs of our industry far behind. While moving into that coveted position, Nautel still remains a company that holds true to the small town community values instilled in its fabric by its founder Dennis Covill.

It is a telling fact that the three founders of a 42 year old company are still actively involved in it. It's no surprise that Nautel continues to support every product it's ever built. The founders would never abandon the very customers that allowed them to build the company.

Nautel's success today, while truly a full company effort, can really be pinned on one man – CEO Peter Conlon and his unassuming management style. Truthfully, Peter is the most humble CEO I've ever met.

The Conlon Factor

He sees himself as a facilitator, a leader who possesses the keen ability to hire the right people, give them vision, and then step back and let them do the job he hired them to do. He allows them the free reign to dream, unfettered by "corporate" philosophy or a weighty corporate bureaucracy.



Nautel's Peter Conlon

He sets the stage that allows his team to think beyond the convention of the moment, to envision possibilities (those "things that never were"), to ask why not and then try new things. He also gives them permission to fail. According to Conlon, in failure there is learning, and from failure comes new innovations.

His style has earned him selection as one of Atlantic Canada's Top 50 CEOs in 2007, 2010 and 2011. In addition, under his leadership, Nautel was selected as Nova Scotia's Exporter of the Year in 2009. To appreciate his unique way of thinking, see Conlon's "laws" of broadcast transmitters in the highlighted side bar.

Creative Atmosphere

There is an amazing atmosphere at Nautel, unlike any I've experienced in my career.

If I were to describe it, I would say that it is an environment designed for innovation. I can only imagine this was the same environment that once could be found at Edison's lab or at CBS labs many years ago.

The creative juices are in the air and permeate throughout the entire company; not just with its engineers, but from top to bottom. And innovation is exactly what we have experienced time and time again from Nautel's engineering team.

The last time I visited Nautel was while writing my first cover story for ***Radio Guide***, in 2009. Back then, the NV series of transmitters was brand new and innovations included its Advanced User Interface (AUI) allowing instant access to transmitter controls from anywhere.

Nautel customer Craig Timmermans powers up his transmitter for the first time. He described the scene to listeners as a Nautel factory tech ensured all systems were operational. The tech was at his office in Nova Scotia monitoring the transmitter over the Internet using the AUI.

Changing the Way Station Engineers Work

This AUI feature has totally changed the way broadcast engineers conduct business. It helps free them from the time consuming task of on-site inspection of their transmitters. The specific problem a transmitter has can be pinpointed before the engineer heads up the hill to initiate repairs. Necessary tools and parts can be brought up during the initial trip, saving hours of drive time caused by the need for repeated visits.

When given permission by the station engineer, this feature even allows a Nautel technician located at the factory to turn the transmitter on for its "maiden cruise" ensuring complete functionality that meets factory specs – and fine tweaking the transmitter for maximum efficiency. The AUI has become a platform for continuous improvement and innovation, and each new software release adds features that have been suggested by users.

More Innovation to Market

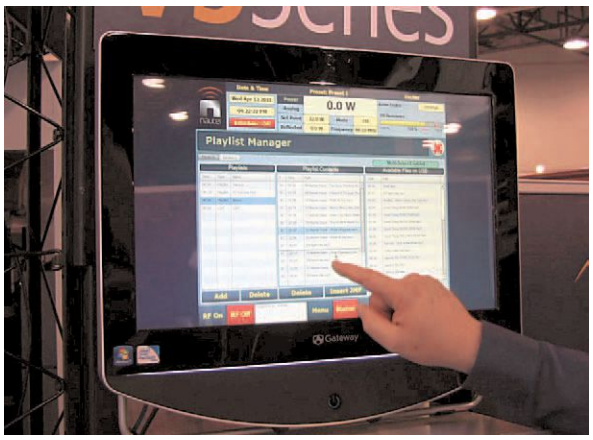
While at the factory in July 2009, Chuck Kelly, John Whyte and I discussed other innovations that were in the pipeline at that time, including the new VS series of low power transmitters that were in the prototype stage.

We discussed in depth the innovation of including a USB drive port that would give the station an advantage of having back-up audio on a thumb drive – right at the transmitter!

That was introduced as a standard feature when the VS series was brought to market. But I have to admit, that as forward thinking as I can be, what Nautel's "brain trust" came up with next (and introduced at the NAB this year), caught even me by surprise. This innovation really showed the industry how Conlon's leadership of the company truly allows free thinking. In whose universe of thought was the latest Nautel innovation – a complete convergence of technology at the transmitter site, adding studio automation to a transmitter?

Push Radio

Push Radio duplicates the audio storage at the transmitter site, and includes a simple automation to allow program playout from the transmitter itself. This changes everything for networks, that might today use satellite distribution, allowing them to "push" content changes and playlist changes to the transmitter via the Internet, and eliminates the cost of satellite. Most importantly, it facilitates localism in large networks. Nautel is working with a large automation company to create head-end software to manage the playlists at the remote transmitters, and even bring back and reconcile the as-played logs. Wow!



Push Radio's Playlist Manager Screen

Proactive Support

Nautel's innovation doesn't stop with hardware and software design either. The logical progression of an intelligent transmitter is to allow the transmitter to take care of itself, as well. Enter remote data logging. Nautel is developing a service that allows the factory to monitor transmitters in the field, making tweaks and changes as necessary to keep the units functioning optimally while on the air. Not really a big deal you think? Well, Nautel plans to take it a step further.

It's called Proactive Support and it is part of a broader vision Nautel has for the future of transmitters. In this model, the transmitter calls in the potential need for a new part. Let's say that the data logging detects a module running warmer than usual. This triggers a red flag. The tech on duty can then drill down further into the transmitter perhaps to find that a fan is beginning to slow down, indicating it might soon fail.

(Continued on Page 8)

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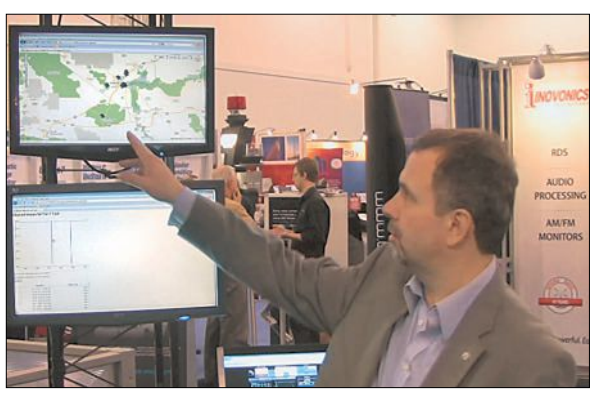
Cover Story

The New Nautel Story

– Continued From Page 6 –

Auto Shipping

If the station is set up on auto-ship, an order is placed to have the replacement fan automatically sent to the station. Then the station engineer is alerted to the problem and the expected arrival time of the part. If they aren't on auto-ship, the chief engineer receives a phone call alerting him of the problem, and a request to authorize part shipment – one less thing for busy engineers, who are multitasking at several stations, to worry about. This is a program designed to give your station maximum up time.



Kevin Rodgers Demonstrates Proactive Service

The Innovators

Nautel maintains about 40 engineers on staff. These are the innovators whose vision has been brought to market, and made Nautel a four decade "overnight" success. Tim Hardy leads the engineering team, and "green broadcasting" is one his personal passions.

Hardy explained, "Green, like reliability, is just part of our design philosophy. Given the choice between a lower priced, less efficient component versus a more expensive but more efficient part we'll go for efficiency ... same for reliability."

Tim is very proud of the world-leading, 90% efficiency of Nautel's NX Series AM transmitters, and he notes that Nautel was the first domestic manufacturer to ship efficient LD-MOS technology in a Radio Broadcast transmitter.

Tim is also the champion for something called Dynamic Carrier Control, where AM transmitters can easily achieve power savings of 30% or more. His paper on the topic, at the 2009 NAB, has been the catalyst for successful trials and regulatory approvals in Alaska, and Tim says that we should watch more news on this space.

More Goodies in the Future

Besides green initiatives, there appears to be plenty more secrets locked away in the Nautel "think tank" vault. These, I'm sure, will include further ways to integrate your transmitter and your audio chain, blending the technologies to help your operation run more efficiently – and more cost effectively. Yes, I have the distinct feeling that we'll be seeing other goodies from Nautel soon.

And if the innovation we've seen so far is any indication of what we can anticipate in the future from Nautel, they will continue to be the leaders in rewriting the rule book for broadcast transmitters. *– Radio Guide –*

– Conlon's Transmitter Laws –

- *Products don't need to be obsoleted.*
- *Exciters don't have to be expensive. In fact, transmitters with built-in digital exciters don't have to be expensive.*
- *Transmitters can be intelligent.*
- *High power FM can be solid state.*
- *Low power transmitters don't have to be cheaply made, to be low cost.*
- *Audio processing can live inside the transmitter.*
- *Some audio content can be stored at the transmitter as well as the studio.*
- *Software can be used to make transmitters more powerful and more efficient.*
- *A transmitter should be able to tell you what you'll need before you head to the transmitter's site.*
- *Since IP audio is everywhere else why not put it in the transmitter too?*
- *Transmitter efficiency saves money, reduces A/C and is good for the environment.*
- *A transmitter manufacturer's service team should be proactive, not reactive.*

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Xtreme Engineering

By Steve Callahan

No Man Is An Island How About a Radio Station?

If you are a broadcast engineer who has been around awhile, you will have your favorite radio stations. One of my favorites is a 1 kW AM on 1220 kHz in Providence, RI, now with the call letters WSTL. Under the previous ownership, it had the calls WRIB and it had an interesting history.

I was the Director of Engineering for the previous owner and one of my duties was to keep an eye on WRIB. The studio and transmitter were located in a concrete block building at the end of a road in East Providence, RI. A run of 7/8-inch coax, strung along and supported over the water, connected the transmitter with the tower on the island. The station was actually successful by airing a religious format during the morning and a Spanish language format in the afternoon. The former general manager of WRIB knew his audience and his programmers because he had been at the station for 38 years.

The island as it looked in 2006.

Island in the Stream

When WRIB went on the air, it used a self-supported tower on a tiny island in the middle of the Seekonk River between Providence an East Providence. The salt water in the river really helped the coverage of the station. If you check the FCC's M-3 ground conductivity map, most of rocky New England is considered a 3, and with some analysis of non-directional proofs you can easily see that the ground conductivity is more realistically a 0.5.

However, factor in salt water, and you get 5,000 conductivity that gives you a huge boost in coverage. The builders of WRIB located the tower close to where WICE, another classic Rhode Island AM station, got its start. Both stations wisely wanted to take advantage of the salt water conductivity and close proximity to the downtown Providence area. Even with the benefits of salt water conductivity, having a tower on an island can be a problem – a really big problem.

Row the Boat and Bail

WRIB used to have the official station row boat that you needed to use to get out to the island and take base current readings. Unfortunately, the row boat leaked so much that your round-trip time was limited by the amount of water you could tolerate in the boat as you rowed as fast as you could. One day, the WRIB general manager called me and said there were flames coming out of the box at the base of the tower on the island. By the time I got to the station, the fire was out, but the transmitter was still on.

I got in the leaky boat and made it to the island in record time. The former wooden ATU building was in tough shape. There was an old static drain choke that had been entirely consumed by flames after it had filled up with water. However, the wooden ATU building needed to be replaced and it was a perfect time to upgrade the ATU and its components.

New ATU

Luckily, the local engineer had all the parts available for a new ATU, so I assembled it and got it out to the island. I had a tower crew remove the charred remains of the old ATU and mount the new ATU on pipes set in the concrete tower base. It seemed like a good time to also replace the rusty guy wires of the 115 foot tower, that went out to three guy points which were wooden pilings driven into the river bottom.

I was not at the station when, decades before, a hurricane knocked down the original self-supported tower, but the longtime general manager said the winds that day were ferocious and the sound of the tower falling into the river was terrifying. The old tower still sits in the mud on the bottom of the Seekonk River and a part of it is visible when there is an exceptionally low tide.

Erosion Taking its Tole

The tower crew made me an offer I couldn't refuse, so we also painted the tower because it was due, and since they were on site doing the guy wires, the price was right. Over the years, the tiny island had been suffering erosion from the tidal action of the Seekonk River. There was more of the big concrete base from the old self-supported tower remaining than the actual island itself.

The ground system could be affected because the copper ground system wires were often visible and tempting to copper thieves – this was going to be a problem in the not-so-distant future.

Dave Doherty, of Skywaves Consulting, took over the technical duties at the station when it was sold in 2006. One of the first things Dave started thinking about was the island erosion and how to best deal with it. Diplexing with other nearby AM stations was considered, but the natural conductivity "bump" from the salt water was too tempting to leave behind. His plan is to build a cofferdam around the existing tower base, and use a "sheet piling" to pour quickset concrete to fill an area slightly larger than the present base and in the area under the tower base.

As you can see from the photo below it is now exposed by erosion. Dave says it looks like there are four large pilings sunk into the island and river bed, and they were "capped" by the huge block of concrete which worked so well many years ago as the base for the original self-supported tower.

New Ground System and Unipole

The ground system will be changed from the present ground radials in the river, which are vulnerable to seasonal ice damage. The new ground system will be six heavy copper radials, which will be run vertically through conduits mounted in the new concrete base, down and out into the river bed to avoid ice damage. Dave also wants to install the Base Max system to further enhance the ground plane, and try to minimize the effect of the 7-foot daily tidal swing.

Finally, he has also planned to convert the present series-fed tower into a folded unipole to accommodate the installation of an existing FM translator now used by the station. As part of the project, the work has to be considered as maintenance and not new construction. The station has to remove any old pilings and make the island esthetically pleasing to the eye, and they must remove the remains of the old self-supporter tower too.

The effect of four years of erosion is obvious.

An Xtreme Project

This is a big and Xtreme project for a station that will have to remain on the air during all of the work.

Unfortunately, the many variables in this project, such as a constantly changing base impedance due to tidal flow, has made this project impossible to model.

Good engineering practice dictates that this fix must be done right the first time, and has to address all of the issues which are now affecting the station. Dave hopes to start work on the island in a couple of months and get the project completed before the winter weather sets in.

We've all been at stations that have been confronted with major projects which would have made some station owners wonder whether it was prudent to fund them or just turn the station off and send in the License. Fortunately, there are owners like WSTL's, who want to preserve the heritage of a classic AM station and to allow it to continue to serve its listeners.

Steve Callahan, CBRE,AMD is the Director of Engineering for Rhode Island Pubic Radio. His email is: scallahan@wrni.org

Dave Doherty of Skywaves Consulting can be reached at 401-354-2400 or by email dave@skywaves.com

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Nitrogen vs Air

by Gary A. Minker

There has always been a disagreement in the engineering field as to which pressurization system is the best for transmission line Nitrogen or Air, it's similar to the disagreement we find between Ford and Chevy fans.

The introduction of inert dry gasses is nothing new to our industry and food preparation as well. Noble gases and other flammable gasses have long been pumped in to bags and cans of crispy and chewy snack foods to keep Oxidation at bay and to keep the snacks crispy and free from the effects of moisture.

Notice the word "Oxidation" No, your snacks don't rust or corrode but they do age, rot and discolor in the presence of Oxygen, and the idea of moisture in your pretzel bag is just unthinkable. Argon, Nitrogen, Propane, and other combinants of Butanes, and a host of other smells have been used to preserve everything from Twinkies to Tostito's for ages.

The Same Principals Apply

The same principals apply to our little environment of dissimilar metals the disparity and elementally high Voltage cries out for a super dry environment. In broadcasting we have a simple list of elements including Silver, Stainless steel, Copper, Brass, and Bronze. To those we add you add finger dirt, silicon grease, and other forms of dirt and other containments that enter the system during the building process. We then excite it with RF energy. You can see the receipt we end up with is complex and continues to unfold.

Cable Purging

The debate as to which method of pressurization is best is a long running one and dates back pretty much to the beginning of electrical technologies.

One of the first recorded uses for purging cables with inert gas was telephone cable. These lead, oil, and paper, buried and aerial cables had valves installed on them so that Nitrogen could be pumped through the cables to keep moisture at bay. It is true that the purveyors of the round conductor equally vacillated on the use of Nitrogen and Dehydrated Air.

But when it got down to it, tarnish, oxidation, corrosion and just plain rot can not happen in a Nitrogen environment while it can happen in an air environment. This notion was the first thought with regard to the paper, oil and lead cables. Fungus, tarnish, rot, water intrusion, and corrosion were factors here.

Unfortunately the conundrum does not stop with green fuzzy rot. During a burn out, other than the molten metals dripping down from the sustained arc inside the line, the Teflon insulators are the main culprits. Like any useful petrochemical, PTFE and all of the derivatives used in transmission line is full of nasty chemical compounds that are released during the early stages of severe heating all the way through the point of self sustaining combustion. (OK, the arcing helps out a lot)

There is even a Patent for a Line Safety Monitoring Device that includes the purity of a Nitrogen atmosphere inside the transmission line system as one of the criteria for detecting a fire in the making.

Fuel For The Fire

I have spent days looking for the article published by a chemist that proves beyond a doubt that under certain and ideal conditions, burning Teflon can create soot while in a pure Nitrogen atmosphere. I admit that I am not a chemist and while I followed the article with great interest, the chemist admits that precise conditions must exist in order for this chemical breakdown to happen. While these precise conditions are a bit scarce, I give Kudos to the author whoever he was.

The practical side of the matter, after nearly 30 years of working with Transmission Line fires, is that the ones that have Nitrogen pressurization are greatly limited in collateral damage from smoke, soot, and other gaseous damages. Line with Dry Air pressurization just flames away and soot up the system with dramatic consequences. I don't know if it was the 50th or the 100th burn out that I worked that convinced me of this but I just state my case and have photos.

Fire is inspirational and should not be taken lightly. Soot can destroy a line and render it a total loss if not a candidate for a total strip out and component replacement there is the potential of future fires from the missed carbon that remains from a poor cleaning job.

Dehydrator on a stand.

Toxic Mix

As if this is not enough, there are other consequences. Severely heated PTFE products also release root base gasses. I submit the following two web sites for your reading pleasure. You have heard that cooking at too high a temperature in Teflon pans can be harmful to humans and in fact is extremely toxic to birds that may live in your home.

Here are the links to two files that deal with potential toxic pollutants when teflon is overheated or burns.

http://www2.dupont.com/Teflon_Industrial/en_US/assets/downloads/h75334.pdf

http://www.fluoridealert.org/pesticides/teflon.decomposition.prod.htm

The first document is from DuPont it caution users to avoid multiple forms of human contamination from everything ranging from simple ingestion to combustive breakdown. The second site is also a primer on the chemicals that are released when these materials are superheated. The one major player is Fluorine.

Fluorine Gas

This is a highly corrosive and toxic gas that has been seen to corrode the metals inside of the transmission line systems when it remains present because the line wasn't purged from a super heat incident that may not have resulted in a line fire. This includes a high VSWR condition that was caught and supposedly cured. This confirms the fact that purging is a good thing and popper valves can be your friends.

A Pop Valve

This gas is sometimes known as Oxygen difluoride or Fluorine monoxide, and according to the one document, shares a top spot with another unrelated chemical for the king of respirator selection criteria. Then there are various oils and other semi solids that ooze about and can irate the technicians if contacted or once again ingested.

Which is the Best

In this debate the question then becomes, what is practical for your use? Many years ago, Litton Medical introduced a Nitrogen Generator called the InstaGas. This was a fantastic creation because it extracted and stored pure Nitrogen gas from ambient atmosphere at 35 psi and vended it to you at any pressure below that level. Unfortunately it came with a cheap compressor that did not live very long and the sieve device required periodic trips back to the factory for care and adjustment.

The unit was only on the market for a decade or so and then left many of us with them to sit in the corner sad and neglected. Bottled high pressure gas is always a good choice, for those without active leaks or a desire to purge their lines often.

High and Low pressure Liquid tanks are cheap and plentiful. Caution, liquid tanks do not have a shelf life of much longer than 3 weeks. You have to use the gas or it boils off and vents to the room which can cause an inhalation or suffocation hazard. Dehydrator manufacturers have been having some issues lately with deciding who will stay in the market place and who will abandon it after years of dominating the market.

The decision to use air or gas is a personal one and should be made with many factor brought in to consideration. Tight systems, remote locations, transportation problems, line size and type, all play in to the decision process. What should NOT influence your decision is what the neighbors do or how your predecessor has done "it" for years. Make this decision wisely and for those in doubt, chat about it at an SBE meeting. The facts that I've outlined here and the experiences of fellow engineers will help you in the decision making process to ensure you implement a system that will not only do the job for you but one with which you will be happy.

Gary A. Minker is the owner of Radio Works R.F. in Lake Wood, Florida he can be reached at (561) 969-9245 or via email at Gary@Radioworksrfconsulting.com

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Studio Site

Music to Your Listener's Ears

What to do When Musicians Show Up at Your Door!

by George Zahn

As radio stations and formats become increasingly more "cookie cutter," managers and programmers are looking for inexpensive ways to differentiate themselves from their competitors.

The old adage is that, there are no new ideas in broadcasting – just concepts stolen or "imported" from other markets. At one point many years ago, the ideas in this issue's article might have been cost prohibitive, but here is a programming/technical seed that might just blossom for some stations looking to be "different."

Non-Commercial radio has been doing live music mix, in-studio broadcasts for decades, and the sound of a live band (be it a touring band in town or a local band that merits the exposure and fits format) can add a special touch that makes a station stand out. Whether "standing out" is for the better or for the worse, might depend on the expertise of your personnel and some fairly low cost technical expenditures.

The group Brasil performing on WMKV–FM from the station's conference room. The space is so tight that you can see the author's head in the lower left corner of the picture as he mixes the performance live on the air.

Stu-Stu-Studio

In my career, I've been on both sides of the radio fence. Since Non-Coms can often procure grants, and do not have to pay financial dividends to their shareholders, it's easier, in my opinion, for public broadcasters to make a commitment to doing more live music on air.

It's odd, though, that many Non-Coms do such a great job of capturing the live sound of artists that may be out of the music mainstream, while right up the dial, the commercial rocker is relegated to the last minute placement of screeching mic booms and barely passable voice mics, trying to capture the guitar of a superstar who pops into the studio to play a few hits.

To the commercial stations out there, is it really that much of a stretch to swipe a page from the Non-Com playbook and experiment with more live music broadcasts?

I argue that the cost of the technology to try this addition to your station's sound is minimal, compared to a possible advantage in the market that will set your station ahead of your competitors.

Start Small or Large – But Start!

I've seen the gamut of "performance" spaces at stations. I worked at a public station where I mixed a live 45 minute, mini-acoustic set and interview with Squeeze, Over The Rhine, and then with the Cowboy Junkies the same week, with fairly detailed musical mic placement.

Meanwhile, in that same period, an engineer friend of mine at a commercial giant had to swing a second studio vocal mic around to get close enough to John Cougar Mellencamp's guitar to eek out a rough mix on the market's second highest rated station.

What's wrong with this audio picture? Why can't the commercial station have a few special mics and some minimal gear, to make the big name artist broadcast sound even better?

I've had the luxury of working at a station with a full audience studio. We had a stage area, dedicated mixing booth, and up to 60 seats for an audience, although many of the visiting groups would simply visit on an afternoon and do a laid back acoustic set with only the radio host in the room.

Finding Room

At another station, there were adjacent television production studios that were used as sound stages for artists. At my current station, I've helped clear out a conference room to accommodate groups ranging from steel drums to a Brazilian band. In recent years, our engineering staff has run stereo cabling between an auditorium in our building and the air studio, which now gives us a chance to bring music live to air.

No matter the situation, the studio space can be customized to make the artists' experience fun and comfortable. At the station with the dedicated audience studio, we became legendary among record labels, which would send many of their bands and artists to the station when they were in the region.

The reputation of the station can grow quickly by the artists' interaction with your host(s) and technical people – but paramount is a welcoming place to play. This makes the difference between a performer simply showing up at the behest of the label and an artist that really wants to be at your place to hang out and make an unforgettable radio moment.

Channeling Your Energy

At WMKV, we have far leaner resources. We've daisy chained my personal Yamaha and Behringer consoles to handle large numbers of inputs. Stations not yet equipped with such devices can start in a very basic way, with a small multi-channel console or even a basic mic mixer.

A recent audio catalogue showed mixing consoles ranging from $300–$900 retail. In the old days, these smaller mixing consoles were virtually non-existent, Now there is a tremendous array of decent, affordable, and compact consoles made for everyone from garage bands to radio stations.

Cause and Effects

Some stations will choose to simply do a dry mix of the visiting talent. This could be done with even a basic mic mixer.

If you are using a multi-channel console or have access to a studio patch bay, you may be able to inexpensively add some basic effects such as reverb or compression. Affordable reverb units run from $150-$300. You can also add compression for just over $500, retail.

Bacchanal in performance on WMKV–FM.

Having an arsenal of at least a few alternative microphones is a great idea. For guitars and other string instruments, a very good multi-use condenser microphone is the Shure SM81. AKG has been legendary for its switchable pickup pattern C-414, but they have the newer C-214 (cardioid only) that sells for less than half of the 414. Audio Technica and a few other manufacturers make a range of even less expensive mics. It's important to consider the need for an outboard power supply or a console with phantom power when adding condenser mics.

A really good dynamic, multi-purpose mic for instruments (horns, drums, etc.) is Sennheiser's MD 421. For vocals, the old standby Shure SM58 – which also works great on a snare drum – is a good, cheap add-on. For kick drums, the AKG D112 is a music industry standard. Not all air studio voice mics will work well on instruments, so having some diversity for capturing musical instruments can really help

Monitoring the Situation

For radio broadcasts, studios don't usually haul in monitor wedges to place in front of the performers. Many of the artists for a radio broadcast will be very happy with a headphone mix. It does help to have someone on your staff or at least "on call" that has knowledge of the band's sound, or basic mixing skills. In many cases, a national band's road manager or tech person will travel with the group and either assist your mixer, or can sometimes do the mix for you.

Off the Record?

Two of the best compliments I've ever received in broadcasting involved live music broadcasts. One came from a member of a national touring band who said he actually looked forward to coming into our studios. The other comment came from a listener who wanted to know if we were playing a new CD because, as they knew everything by the group, "... this is great! I've never heard this version before!" That live mix gave that listener something new and different. On that day, at that moment, nobody else on the dial could replicate what we were doing!

If you've been doing live music mixing, share your experiences with us. If you're thinking about starting a live mix segment on-air, I have more than 25 years experience in doing live to radio music mixes and may be able to help.

George Zahn is the Station Director/General Manager for WMKV Radio in Cincinnati he can be reached via email gzahn@mkcommunities.org

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Disaster Prevention and Recovery

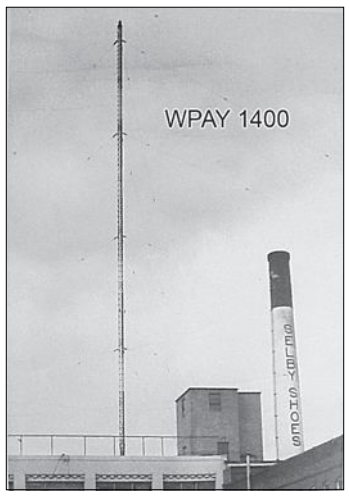
Natural and Unnatural Disasters

by Jeff Johnson

Natural disasters and accidents cannot be avoided – just minimized by smart planning and mitigation. Unnatural disasters may spill from greed and stupidity, but most often from unforeseen failures and stumbles. "Why didn't I think of that earlier?"

Loss of Tower Site

Broadcast is now more a data service, in essence, than the outmoded "Empire of the Air" that it used to be. We are involved with servers and IP issues as much as towers and RF. Still, over-the-air broadcast remains important to our industry.



WPAY tower on factory roof.

WPAY-FM in Portsmouth, Ohio, lost its towers to an ice storm in 2003. Around the same time, WPAY (AM) lost its tower location on the roof of a large, abandoned shoe factory in downtown Portsmouth. due to the demolition of that building.

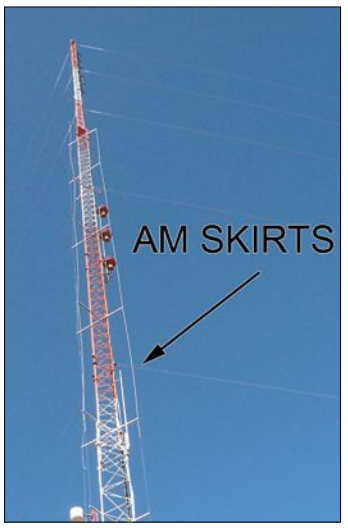
The AM antenna system involved a counterpoise ground plane a few feet above the flat roof. The author remembers brushing against the counterpoise wires a few too many times while checking the system. The mild shock was a tactile reminder of the significant electrical involvement of an AM ground system.

Tower Collapse

This tower collapse (shown above) was possibly due to ice accretions sliding down guys and pushing preforms loose. Here is a "natural" disaster that may have been avoided by planning for just such an event.

Dead-end sleeves (Ice Clips) or Ice Krakers, installed down the guy wires, may have protected these towers from this disaster by breaking up the ice.

These twin disasters were solved in one stroke – the station decided to erect an new tower. While shorter than the original tower, the new stick was designed to accept both the FM antenna and Unipole skirting for the AM antenna.



WPAY's combo AM/FM tower.

Fire on the Tower

For higher power stations, that very power may strike back in the form of VSWR and hot spots in the transmission line. The plastic outer shell of coax is flammable, and has been known to bring down towers if ignited.

Even seemingly innocuous weeds at the base of a tower may burn and send flames up transmission lines. The cure for the weed problem is self evident – clean out the weeds and make sure they don't grow back. But what about VSWR or other arcing-caused damage?

Preventing VSWR Disasters

The old WPFB-FM (now WNKN) has a pair of fine old RCA BTF-10 transmitters. Not trusting that old technology to protect itself, engineer Jim Wagner installed "Bird Wattcher" transmission line monitors on their outputs (column 3 photo on right).

If a VSWR event occurs, due to a line fault or lightning, the Bird Wattchers immediately shut down the transmitter preventing line damage. If the fault was transitory, resetting the Wattcher restores operation.

A Different Sort of Cloud

Cloud computing is radically different from cloud-scraping broadcast towers, yet it may satisfy another, more contemporary broadcasting problem – what to do about all of our data. Many stations and networks rely on play-out from servers rather than the services and companionship of jocks – especially all-night jocks.

No longer does Wolfman Jack or Ralph Emery speak to us in the wee, small hours from afar – yet right next to our ear. Radio is now mostly just satellite feeds and server farms with nary a human involved. All that data that now drives us has be stored and retrieved reliably.

According to *Infoworld,* cloud computing is: "a way to increase capacity or add capabilities on the fly, without investing in new infrastructure, training new personnel, or licensing new software.

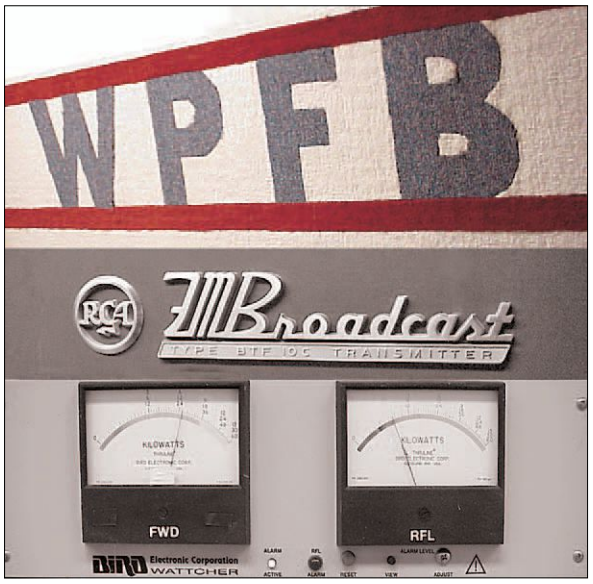
Cloud computing encompasses any subscription-based or pay-per-use service that, in real time over the Internet, extends IT's existing capabilities.

The "Cloud" can be thought of as a utility, a source of information "power" – your particular data and the processing of that data – available anywhere. By putting all the information from your music files, to your playlists and spots, up in the "cloud" – even the functions of your automation software – a broadcaster can operate from virtually anywhere.

Fire or flood at the studios? Insurrection? Forgot your keys? Just pull from the "cloud" somewhere else – perhaps Starbucks or McDonalds – and redirect the resultant program stream to the IP of your transmitter and the IP of your stream server or service.

Cloud Technology can easily help you mitigate the effects of a station tragedy. This is something that we have never been able to do in the past, without a lot of time and major effort spent setting up a temporary physical plant from which to stay on the air.

But remember, even with this instant capability, your station still needs a disaster plan to ensure your staff knows how it will function during a disaster and in a post disaster situation, until they can get back to using your regular facility.



The WNKN Bird Wattcher

Push Technology

Transmitter manufacturers have now incorporated digital inputs in addition to traditional analog, composite and AES3. Nautel's "Push Radio" is such a technology. In Push Radio we send new content as audio files and send updated playlists to the transmitter, which then plays the content locally. The system will be expanded to send the "as-played" logs back to the station," according to Nautel.

Not all digital technologies are panaceas. AoE (Audio over Ethernet) equipment is essentially local LAN only. AoIP (Audio over Internet Protocol) encapsulates audio data within IP packets with attendant Internet uncertainty and latency. Check with the equipment manufacturer to be sure you get the right equipment for an emergency application.

These technologies can free radio from conventional studios, consoles, and complex infrastructure. Should that infrastructure be damaged or unavailable, cloud computing and Ethernet based connectivity may be harnessed.

Jeff Johnson, CSRE, can be reached at: jeff@rfproof.com

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FCC Focus

The Future of Media

by Peter Gutmann

The only potentially big FCC news for radio recently has been the release and discussion of its "Future of Media" report.

Although FCC Chairman Genachowski reportedly had major input, at this point it is unclear whether the report should be read as an outline of Commission initiatives in coming years.

Out of Touch?

The Commission often is accused of lagging far behind technology, and out of synch with the needs both industry and the public, and so the report may merely serve as a "safety valve" to assure Congress and critics that the FCC indeed is aware of recent developments and is prepared to take them into account in shaping its regulations and policies.

The key to the report is its formal title: *"The Information Needs of Communities."* Its overall finding is that while there has been a huge increase in the sheer quantity of available information, its quality is deficient and generally ignores local needs. Tracing the history of broadcasting as a local medium, the report contends that the quest for profits, fueled by consolidation, has led to a near absence, outside the top markets, of labor-intensive local and investigative reporting on civically-important matters.

The report recognizes that the government is precluded by the First Amendment from playing a dominant role in influencing broadcast content. Rather it proposes various means for the government to increase public access to information concerning local media performance, foster media attention to local matters, and fertilize the conditions for local media to find innovative solutions to improve public service.

Radio is Healthy

The chapter devoted to the evolving place of radio in the media landscape views radio as fundamentally healthy (citing its 90+% weekly cume) but increasingly hollow. The report adheres to the essential principle that in exchange for their exclusive use of spectrum, broadcasters are obligated to serve their communities with programming about significant local issues.

The report faults the current regulatory scheme as discouraging public participation, noting that during the last three decades since elimination of specific guidelines, the Commission has never granted a citizen objection to a license renewal.

The report further contends that all credible, independent studies and surveys dispute industry assurances of meaningful service in the public interest.

So What Does This Mean for Radio?

Notably, the core recommendations of the report do not focus on providing ammunition for renewal protests. Rather, they are designed to enable leaders and others to assess which stations are covering their communities effectively, and to incent more significant coverage.

To achieve that, the primary recommendation is to replace current paperwork with on-line disclosure, and to shift emphasis away from the current license renewal process (and FCC regulation in general) toward consumer empowerment to ensure that broadcasters meet their needs. However, that does not necessarily translate into less work. Among other matters, the report urges resumption of annual employment reports – not the current type restricted to recruitment efforts, but revival of the former charts that had broken out the racial, ethnic and gender composition of broadcast station workforces.

The *"Future of Media"* observes that most of the currently-required paper Public File materials are uninformative, rarely read and thus useless. It urges elimination of the quarterly issues/programs lists, rejection of the proposed "enhanced disclosure" standardized form, and termination of the ongoing "localism" proceeding as pursuing unworkable and burdensome ideas. Instead, it urges on-line disclosures, which place a greater emphasis upon continual input, rather than only quarterly or annual updating.

To implement that, the report proposes web-based disclosure of content information drawn from a single "composite" week of programming each calendar quarter. (Time for a memory/age test: Does this sound familiar? Remember the laborious composite week analyses of promise v. performance required for three-year renewals, prior to deregulation in 1981?)

(Continued on Page 20)

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FCC Focus

by Peter Gutmann

The Future of Media

– Continued from Page 18 –

The Composite Week

For the composite week, disclosure would be required of how much programming concerns the local community, including a breakout of certain types (such as reporting about local government), the utilization of extra multicast channels, news-sharing arrangements, staffing levels, collaboration with other local news entities, accessibility of websites to the hearing and visually impaired, and sponsorship identification of "pay-for-play" material appearing in news and informational programming. Links to clips of programming claimed to be responsive to the local community are also suggested.

The report encourages the government to target more of its own advertising toward local media, and especially local news and journalism operations, rather than relying upon broad-based national buys.

This is intended to support local businesses financially, create new jobs and save money through cost-effectiveness. That's the good news – the bad news is that when enumerating the targeted local media, the report speaks of "local placement on TV, in print and on-line," and thus calls into question how much of the spending would be directed to radio.

Indeed, most of the broadcast portion of the report is oriented toward TV, and so many of its specific proposals may not necessarily apply to radio.

No Advertising Tax

Amid the mixed news, one recommendation is clearly beneficial – the report strongly urges against raising money for public media by taxing advertising, as this would only impair the creation of sustainable business models.

An additional set of recommendations encourages the formation of state public affairs networks (SPANs) that would air government proceedings and thus enable citizens to monitor the workings of elected officials directly – and hails those already in operation. Although the emphasis is upon cable and on-line distribution or SPANs, their impact could reduce pressure upon individual radio stations to perform similar functions.

Serving the Underserved

A further aspect of the report with possible ramifications for radio is an attempt to ensure that media serve historically underserved people. Here, the reference is not only to minorities, but small businesses and people with disabilities. Among the suggestions are reinstatement of the tax certificate program, with an emphasis upon sales of stations to small businesses and new entrants to stimulate job creation and enhance diversity.

Rather than reinstate racial or gender preferences in awarding facilities, the report focuses upon disseminating information about opportunities for media ownership and initiatives to educate would-be entrepreneurs on financial and other issues needed for success.

Not unexpectedly, the report's first impassioned critic was Commissioner Copps, who knocked the report as far too timid and chastised the Commission as having abdicated its responsibility to play a vital role in ensuring "that all Americans have access to diverse and competing news and information that provide the grist for democracy's churning mill."

He characterized the fact, that one-third of commercial broadcasters air no news whatsoever, as a crisis and "tens of thousands of reporters ... walking the street in search of a job instead of working the beat in search of a story" as evidence of failed policies. He asserted that the overall dearth of covering cultural diversity is dreadful, and that enhanced disclosure would be useless in the absence of remedial action.

Time Again for Localization

Overall, the report tends to reflect much of the very same criticism that industry observers have leveled against radio for decades – and which industry leaders have largely ignored in practice. At first "all-music" and "less talk" formats had great audience appeal and competitive advantages – but no longer. Now that portable personal media, satellite, and most recently Pandora and similar Internet-based streaming, enable former listeners to customize playlists and obtain their favorite music on demand.

Indeed, these developments have shaken the basis of a radio industry still rooted in homogenized, mass-appeal formats. It seems ironic that the answer to revitalizing radio may very well lie in embracing just what the report criticizes the industry for having forsaken – localization and intensified focus on local listeners' needs and interests.

Whether or not the report is a roadmap to our future, it is extremely well-written, thoroughly documented (with over 100 pages of detailed footnotes) and well worth reading. It can be downloaded from the Commission's website at: **http://transition.fcc.gov/osp/inc-report/The_Information_Needs_of_Communities.pdf**

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Safety and Security

A regular column on protecting property and persons – with a technical slant.

Who Let the Perp In – No One

by Ernie Belanger

I recently had the opportunity to visit the local studios of a three-station cluster. Even though these stations are owned by one of the bigger groups, what I found was amazing to me. First let me set the scene.

The stations are located in a rural area, with a low incidence of violent crime. The studio building is located on a major state highway, and sits less than one hundred feet off the road, only a few miles from the largest city in the county.

I'm sure the pastoral setting and the low crime in the area have lulled the owners and employees into a sense of "security." Other than a huge sign, and three towers in a field next to the building, there is no indication this is a radio station, as the building itself is unassuming in appearance.

Easy Access

Visitors can freely enter the building, and once they are inside they have immediate access to every vital piece of equipment that keeps all three stations on the air. When they walk in the door, they are about ten feet from the main studio through which all three signals are routed to the STLs. To the left, through an open doorway is the equipment room complete with STLs, satellite receivers, the station's servers, and other related equipment.

It's about 25 feet from the main entrance to the racks. On this day the door was open, as were the doors to every studio and office.

A Potential Disaster

During my 20 minutes at the studios, no less than three visitors came in unannounced to drop off information for the station's community calendar and to pick up free tickets they had won. All three walked right in, unimpeded by a security system of any kind. Had they not been friendly listeners, the situation could have quickly become one that might have required intervention by the County Sheriff or State Police.

Factually, however, even if there were time to call authorities, because of its rural location, they most likely would not have arrived in time to prevent a real tragedy – unless they were already in the station lot.

There are several things wrong with the picture I just painted for you. First and foremost, is the sense of false security the stations have been lulled into. Security, be it physical or personnel security, starts with a state of mind. Station personnel need to clearly understand that the station is a potential target of acts such as those I'm about to outline.

These are real, and have happened in business and broadcast outlets already. Keeping your facility secure, and your staff safe from harm, is one of the most important things you need to accomplish, and it should be at the top of your "To Do List."

Yesterday is Gone

Were this the 1950's, this lack of physical security wouldn't raise an eyebrow. But in 2011, we live in a world that is significantly more complex and the threat level is exponentially higher. Everyday we read about a spouse who discovers their other half is cheating and they become violent and seek to harm their spouse or the third person involved. This often happens in a workplace confrontation, and is usually an irrational act of rage, driven by passion. As any police agency will tell you, that is a potentially lethal mix.

We have all read about people who, for whatever their reasons, are seeking their fifteen minutes of fame, and would do anything to get it. This can include taking over your station, regardless of how rural the community is within which it is located.

In fact, because your station might be rural, it may be a higher priority target for this. Mainly because it has a higher profile than in an urban market with several media outlets.

Develop Security Instincts

Develop a set of security instincts and use them to assess your station's vulnerability. Just look around your station from the perspective of someone wanting to take over your main signal or harm a member of your staff. Seriously look at the ease with which they could gain access. You might want to contact your local police department, sheriff or State Police, and ask them to send someone to help you with this.

(Continued on Page 24)

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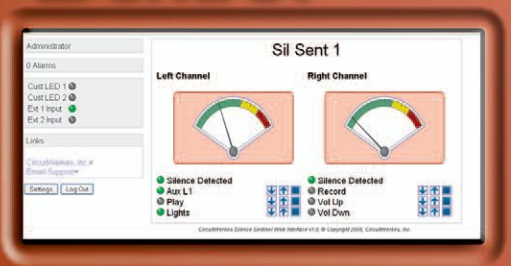

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Safety and Security

by Ernie Belanger

– Continued from Page 22 –

Should you choose to include law enforcement in your assessment, it would be a good time to give them a plan of the station layout so they can have it on record should they ever need it in a worst-case situation. Remember, if something should happen, these are the first responders who will come your station's aid. The more familiar they are with your studio layout, the more effective they will be in an emergency.

A Short Checklist

Here are some things to look for when you do you security assessment. Do you have a video entry system that allows your staffers to see who is at the door and wants to gain entry? Is the camera positioned such that they can see the whole person and not just a head shot? This is important because your staffers could spot a weapon being held where the "visitor" thinks you can't see it. Does the system include strike locks – those electronic striker plates that can be remotely unlocked to allow access by visitors?

Once inside, can a visitor have immediate access to your staff, the main studio, or your equipment? Does your station have a "panic button," located for easy access, to immediately trigger a call to authorities and a sound alarm to alert those in the building of a dangerous situation? This would allow staff to leave by the "back door" and the alarm could possibly scare the intruder out of the building, defusing the situation. Are doors to offices, studios and equipment rooms kept shut?

This is just a preliminary list, and not meant to be all-inclusive. Check with your local authorities or a security company – they can give you a more complete checklist of security measures.

An all-in-one video intercom/door release system.

Back to the Local Station Cluster

Now back to my visit to the local station. I observed the problems there without even doing a formal inspection. I found them literally, by just being observant as I walked in the door to cut a commercial.

While a full-blown commercial grade steel security door system, complete with video and allowing only secured access, will run in excess $1,500, the issues I stumbled upon could easily be fixed for a few hundred dollars.

Seriously, less than $500 could secure the building, depending upon the equipment used. Here's two perfect examples of how the situation could be remedied quickly, and without spending thousands of dollars on equipment.

My Best Suggestion

First, install a lock with a remote open capability. If you don't have the budget for a commercial system, you will find that most companies that make residential locks now have locking systems available that have remotes to unlock them. One of these is far better than the unlocked door I found. A very basic unit at a local home center was priced at just $120.

Install a small security camera and monitor with a recording capability. I found one on-line for around $299. This allows you to see who is at the door of your station, and also records them, so if something does go wrong the local police can get a digital photo capture of a suspect.

You will need a small inexpensive intercom as well – about $40 – and a doorbell to alert the staff that someone is at the door. Again, from a home center a wireless doorbell is about $40. Grand total to secure the building and staff, $499.

A Less Expensive Option

The other option would be to go with an all-in-one system that has a video intercom with a built in door bell, and a door open button that triggers an electronic door strike wired up to unlock the door via remote control.

That system, on-line, would cost between $100 and $200, depending upon which one you purchase. Add in the cost of the electronic door strike mechanism, priced on-line at $80, you get at top end price of under $300.

The only drawback here is that you won't get a long-shot look of the person, so they could be hiding a weapon from camera view – and it doesn't record. But it is a deterrent, and it will secure your station and protect your staff.

Whatever method you choose, you can rest a little easier knowing that, at least, you have placed a deterrent in the path of a potentially violent person, and this may someday save the life of a staff member. *– Radio Guide –*

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Operations Guide

Stream On

by Chris Tarr

So you've decided that it's time to get your station into today's technology and start streaming. Congratulations! Now, what next?

There are a lot of decisions to be made, plus a lot of technology options available. In this column I'll break it down to its components.

Streaming Software

First, what will you use to stream? In the past, you could load something like Quicktime or Windows Media Encoder on a server, hook it up to your network and away you go! Of course, with streaming as popular as it is today, you'd fill up your bandwidth pretty quickly! So for most of us, we'll be outsourcing the job of streaming. By doing that, we just need to encode one or two streams to the distribution point, saving on bandwidth.

Great! So now we just plug in audio from our console and go, right? Well, not so fast!

Legal Issues to Consider

There are two legal issues we need to address. Many years ago, national voice-over artists successfully asserted that they should be compensated for their performance if it was done over the Internet to a worldwide audience. This could add a layer of complexity to your stream.

If you play any national spots, you'll need to devise a way to "overlay" them with local content. If you only play one or two national spots, you can pretty easily do a one-for-one replacement.

Otherwise, you can use the overlay as an opportunity to create a new revenue stream by replacing all of your commercial content with new audio – "web only" spots, or sponsored vignettes. The technology exists to speed up or delay on-line audio so that the overlays fit perfectly over breaks that may not be perfectly timed.

The second issue deals with performance payments. You will need to pay royalties for any song that you stream on the Internet. As of 2011, the cost is $0.0017 per listener, per song. Essentially, if nobody is listening to your stream, you pay nothing.

If 1,000 people are listening, you pay $1.70 per song – over an hour (assuming 10 songs) that's $17.00 you'd be paying to stream.

So, how do you figure all of that out? Well, you need some sort of back-end system that can measure the amount of streaming listeners you have, and match that with the current song you are playing. Then you need to be able to pull that out in a report form to submit to SoundExchange, which is the group that handles the collection and distribution of royalty payments.

Delivery Method

Once you've figured that out, there's the delivery method. In the past, it was easy enough to just have a simple web player that you could access from your website. Sure, you could still do that, but with the explosion of portable devices and smart phones – Nielson research predicts that Smartphone penetration will hit 49% in this quarter – you'll be missing out if you do.

Those devices generally pull data from the cell network, so they'll generally need a lower bit-rate stream than a desktop player. Many stations today use a split-rate system – sending a high quality stream for desktop applications and a low quality stream for portable devices.

Of course, there's the player itself. Will it be embedded in the site itself? Will it use Flash or Silverlight? Will it be protected or available to any streaming app? So many choices! It seems like a huge undertaking to pull it all off! Fortunately, you're not on your own when it comes to streaming implementation.

Streaming Providers

There are many streaming providers to choose from, and all of them can do all the things necessary to make the things we discussed earlier happen. Still, there are many choices to be made, and those choices will affect how much your monthly streaming bill will be, and how the listener experience will be.

Since you really have no control over things like royalty payments, let's take a look at the things we can control, like overlays, stream quality, and players.

Even if you don't play any national spots, having the ability to overlay commercials can be a new source of revenue. It's pretty easy to do if you have a digital playback system, since all modern systems can be configured to help you with the effort. *(Continued on Page 28)*

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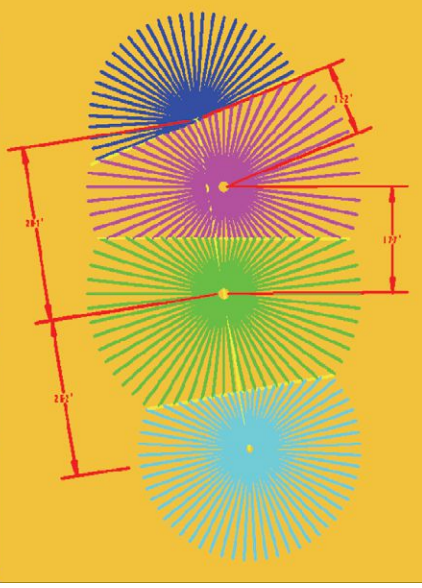

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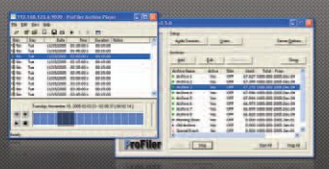

PC Software for archiving and logging all of your stations audio.

Operations Guide

by Chris Tarr

– Continued from Page 26–

As long as you can tell the streaming software that you're playing a commercial, you can trigger an overlay. You can use metadata such as cut ID or category to accomplish this. Most streaming companies allow you to schedule the replacement audio to play much like you'd schedule local spots. They can also provide performance information to help with billing and affidavits.

It's important to note here, if you are a non-commercial station: Streaming paid commercial content will not jeopardize your Non-Commercial standing with the FCC. What you stream has nothing to do with what you put on your licensed station in this regard.

Stream Quality

Stream quality is becoming more and more important as streaming becomes more popular. Many people (myself included!) have devices such as Roku media players that connect to home theater systems, which allow you to listen to streams through high quality speakers. Of course, that same equipment can highlight the shortcomings of those streams as well.

The flip side is that those high quality streams use more bandwidth, which then makes listening to a stream more difficult on a portable device. Fortunately, the cost of bandwidth has dropped to the point where running multiple streams is very affordable. Many services now allow you to send two streams, such as a 64 kB per second stream for portable devices and a 128 kB/s stream for computers and other playback devices.

The dual feed system gives your listeners the ability to control their listening rather than have us do it for them. Ultimately, they can tailor their bite rate so they get the best possible streaming experience. That brings us to the subject of players.

Streaming Players

This is one of the most important decisions you can make. The player is the connection your listeners have to your stream – get it wrong and you may loose them.

How quickly and easily does it launch? Do you need to download software to get it to run? Is it easily controlled? Can the listener minimize the player while doing other work on the computer? These are all very important questions, and ones you will absolutely want answered as you shop for a provider. Remember, the people using your stream aren't likely to be technically savvy, so the easier it is for them to listen, the better.

Now we're ready to discuss a very important, and somewhat heated topic: The ability for your stream to be intercepted and played through third-party players. There is no wrong or right answer to this – after all it is your product.

The Third Party Players

There is a small cottage industry of developers that create stream aggregating players, such as WunderRadio and TuneIn Radio that function like "Internet Radios" giving you the ability to select stations by format, location, and more. These programs work by finding the server that your on-line player uses, and essentially pretends to be your player and grabs the screen.

The debate is this: Many operators place advertising on the players, or require you to go through their website to access their stream – seeing their ads and raising their hit count in the process.

These programs bypass all of that, and bring the stream to the listener directly. Some people believe that this is cheating the system. On the other hand, it opens up your station to be discovered by people that may not know you exist, or people that may not visit your website. Therefore your audio ads will hit more ears.

There is no wrong or right answer, just different ways to do things. It does pay to research these third party developers though – many are more than willing to work with broadcasters to make the experience benefit both the station's listeners and the developers customers.

Do Your Homework

Once you've decided how you want to the end-user experience to work, and what you want to accomplish by streaming, it's time to get to work.

Go on-line and visit as many station websites as you can. Listen to their audio. Try the player. Is it easy to use? Is the quality acceptable? Do the overlays sound natural? Listen as a consumer. Most players will contain "small print" information on who provides the streaming. That link will take you to the provider where you can get more information.

I've worked with two or three different providers, and they've all been very helpful and involved in setup and maintenance of the streams. There's a good chance that no matter what automation you use, they have experience interfacing with it.

Streaming has quickly moved from a novelty to a necessity. How you do it, and how the experience is for the user, has become more important that ever.

Chris Tarr CBRE, CBNT, DRB is the Director of Engineering and IT for Entercom's radio stations in Milwaukee and Madison, WI.

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Chief Engineer

Sizing Transmitter Cooling

by Scott Schmeling

Coincidentally, as I write this, Minnesota is one of 32 states facing Extreme Heat Warnings. Today, temps in the mid 90's, with a record dew point of 84 degrees, gave us a heat index of 116 degrees. I'm not complaining – we waited all winter for this. But enough about the weather.

Clean Air

One of the things your transmitter needs is plenty of clean air for cooling the tubes or solid state devices. But how do you know how much air your rig needs?

Check the technical specifications sheet in your transmitter's manual. Two things you'll want to be aware of are the operating temperature range and cooling air requirements.

The manuals I've looked at, while researching for this article, list an operating temperature range of 0 to 50 degrees Celsius. For those of us in the Fahrenheit world, that translates as 32 to 122 degrees. My in-depth research – three manuals – all listed the same temperature range, so let's assume that is fairly constant.

What will vary is the air requirement. For example, my new Nautel NV20, solid state 20 kW transmitter wants 1500 CFM (cubic feet per minute) of air flow, while my older Harris, HT-10 tube-type 10 kW transmitter needs 400 CFM.

By the way, remember these two transmitters, we will revisit them later in the article. Depending on the climate where you live, you may or may not need to consider air conditioning for your plant.

System Planning

So let's start planning your air flow system. For the air intake, think quality *and* quantity. You want to filter the air you are bringing into the building so it's as clean as possible. Clean air means a clean transmitter – and a clean transmitter is a happy transmitter. (Or, as Stan Freeberg once said, "Cleanliness is next to high fidelity!") Gary Minker wrote a great article about various air filter types in the May/June, 2011 edition of ***Radio Guide***. If you missed it, go back and read through it.

As far as quantity, this is a case where more truly is better. You should provide more air flow than your transmitter requires – this will pressurize the room. A negatively pressurized room is essentially a partial vacuum. Air and bugs will enter through every hole and crack in your building and your transmitter's blower will have to work harder to suck in the air it needs.

Blowers vs Fans

To pressurize a space, you must use a squirrel cage type blower. A fan is designed to move air *within* or *out* of a pressurized space – a fan cannot compress air nearly as well. A squirrel cage blower will not only move air but also pressurize your space. There's an easy way to tell whether your transmitter room is positively or negatively pressurized, without any fancy measuring devices. If your door opens into the area, it should offer some resistance when you open it. Likewise, if your door opens out, will feel a resistance when you try to close it.

Scott's home brewed intake blower.

Intake Location

When possible, I prefer to mount my air intake on the north side of my buildings. During the heat of summer, the north side of the building will generally be in the shade. By locating it thare, you'll be drawing in cooler air than if you placed the intake directly in the sun on one of the other sides. I'm sure there are commercially available air intake blower units, but I prefer to "roll my own!"

(Continued on Page 32)

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bdi

Chief Engineer

by Scott Schmeling

– Continued from Page 30 –

I can usually buy a used blower from a local heating-air conditioning contractor – including the motor and squirrel cage. As part of the package, the contractor also builds a housing for the blower with a slot for a washable metal-mess air filter. They also construct an intake hood to be mounted outside – with screening to prevent any critters from getting in.

The air intake is pretty straight forward. You pump in more filtered air than your transmitter requires. But intake is only half the air flow system.

Exhaust Methods

There are several options when it comes to exhausting the heated air. If possible, avoid exhausting through the roof. If your exhaust duct goes through the roof, you can almost count on eventually tracking down leaks.

One method is to simply allow the transmitter's hot exhaust to dump into the room; then move that heated air outside using a thermostatically-controlled fan mounted high on the wall, preferably opposite the intake blower.

You'll also need a gravity damper on the opening, so unfiltered air doesn't blow in when the fan isn't running. This option will work fairly well with smaller transmitters and also provides heat for your room during the winter.

If your box generates a lot of heat, you will probably want to exercise more control. You can duct the hot air directly into the space above the ceiling. By the way, you can still use the transmitter to heat the building by putting a register grill on the duct with a cap on it.

During winter months, you can get a reasonable amount of heat simply by pulling off the cap. When you don't need heat, putting the cap in place directs all the hot air up and out. Your building's roofing system will determine what you can or should do next.

Roof System Experience

If your building does not have a ridge vent and soffits, you should install a ventilation fan to evacuate that heated air. If you do have a ridge vent and soffits, the roofing system may take care of that for you – depending on how much heat you're trying to get rid of. By design, the ridge vent/soffit system works by natural convection. Hot air rises out through the ridge vent, which draws air in through the soffits to ventilate the roof.

An acorn exhaust fan

I discovered the hard way, though, that exhaust fans do not work effectively if you *do* have a ridge vent and soffit system. If you dump a bunch of hot air up there and throw in an exhaust fan, rather than evacuate the hot air, the fan draws air in through the ridge vent – a path of least resistance – and sends that air outside.

Remember my Nautel NV20 and Harris HT-10? They live together in a modest country home with a ridge vent and soffit system originally occupied by a single Harris FM20K. Knowing that the attic exhaust fan and the ridge vent were not working well together, I had ducting added in the attic to contain the transmitters' heated air. The duct fit completely over the exhaust fan, so the fan no longer drew air from the ridge vent. This system worked very well – until we hit this current heat wave. Granted, it's exceptionally hot right now, but things don't work well when it's 122 degrees inside!

Bring in a Pro

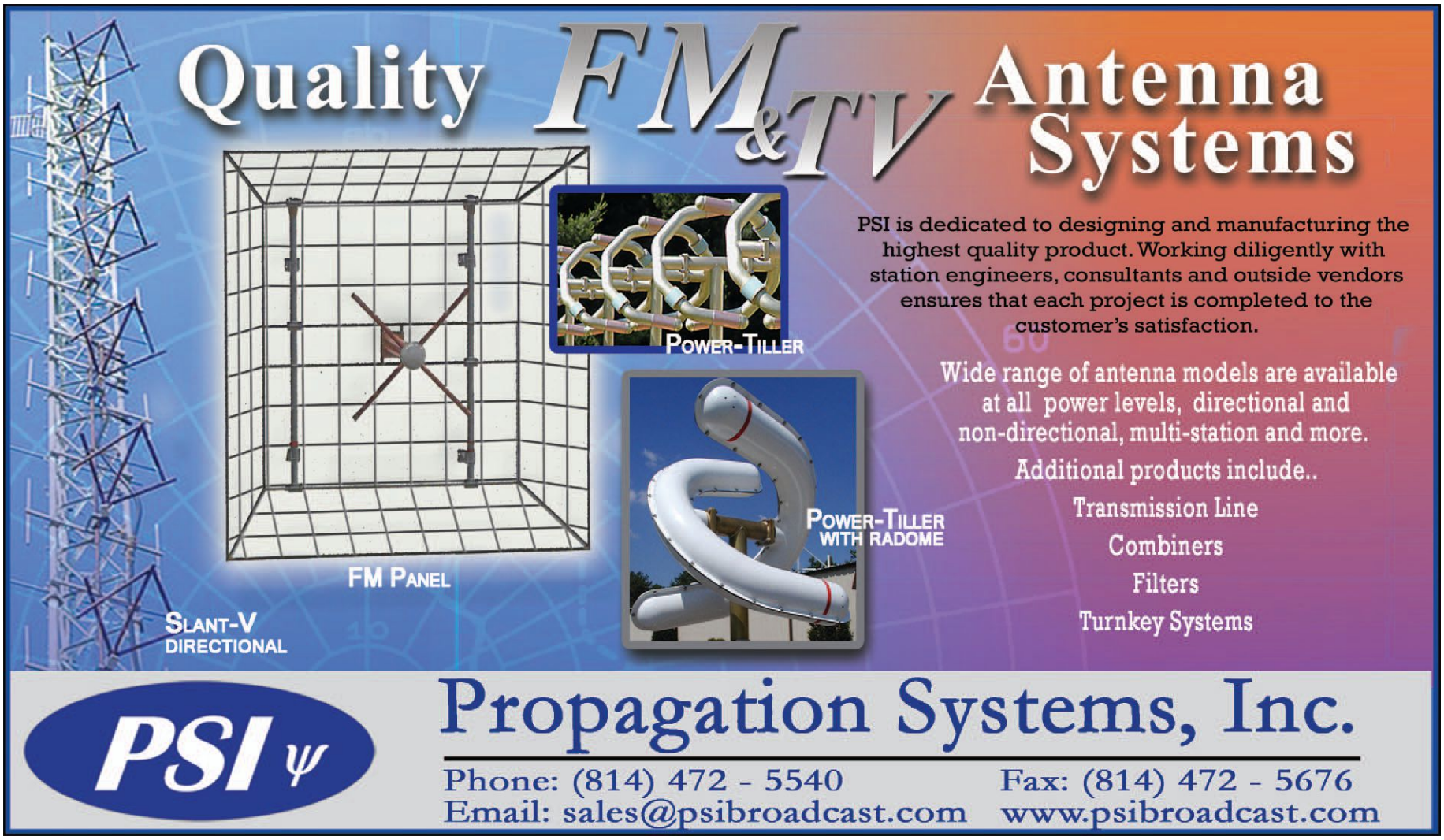
A heating/AC contractor and I went to the site to check the in's and out's of my air flow. Remember from earlier in the article that the Nautel wanted 1500 CFM, and the Harris 400 CFM, for a total of 1900 CFM. Air flow in from my furnace blower checked at 2000 CFM – slightly more than the combined requirements of the two transmitters, so we were creating positive pressure.

But – my exhaust fan with it's new duct shroud only indicated about 980 CFM output. No wonder things were getting hot. The fan literally could not exhaust the hot air fast enough to keep up with the needed volume. A larger fan and damper are being installed as we go to press.

What I Have Learned

Check the transmitter requirements to see what it needs. Check your intake blower and exhaust fan to be sure they meet the requirements. Know what kind of roofing/ventilation system you have. Most importantly, talk about this with a heating and air conditioning contractor in your area. As broadcast engineers, we put on our HVAC caps once in a while. Good contractors know HVAC forward and backward, because they works with it all the time, and should be able to help you find the best route to a happy transmitter. So stay cool – and enjoy the rest of your summer!

Schmeling is the Chief Engineer for Minnesota Valley Broadcasting, a 16 station group in Southern Minnesota. He can be reached via email at scottschmeling@radiomankato.com



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Gear Guide — Enco Systems - Gorman Redlich - TFT

Enco – enCaption 2

Automation has entered the realm of captioning and signing for the hearing impaired, with enCaption 2 from ENCO Systems.

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Already in use at broadcast facilities, from local stations to networks, enCaption 2.0 provides improved accuracy and response, as well as supporting a number of languages including four variants of English (American, Canadian, British and Australian) and several of both Spanish and Portuguese. enCaption is shipping now and is delivered as a service, billed on a monthly basis.

www.enco.com – 248-827-4440

Gorman-Redlich – CAP-DEC1

Gorman-Redlich Manufacturing Company has received notification that their latest product, the CAP-DEC1 CAP-to-EAS converter unit, has passed the Integrated Public Alert and Warning System Conformity Assessment (IPAWS-CA).

This series of tests is meant to: "verify that alert and warning software and hardware products conform to the Organization for the Advancement of Structured Information Standards (OASIS) Common Alerting Protocol (CAP) v1.2 USA IPAWS Profile v1.0 and other IPAWS requirements as identified in the IPAWS CA Program Guide."

All broadcast stations are required to be able to receive Common Alerting Protocol (CAP) formatted messages via Internet by September 30, 2011. The Gorman-Redlich CAP-DEC1 unit (list price $1350) helps broadcasters achieve that goal by retrieving alerts from Internet CAP alert servers and converting them into EAS headers and audio that may be used with existing EAS equipment.

The use of such a converter does not require stations to retire properly functioning equipment in favor of new equipment which replicates the functionality of existing EAS equipment but with the addition of CAP functionality.

At this time, only three other CAP-conforming devices are listed in the FEMA Responder Knowledge Base as having passed this IPAWS Conformity Assessment – none of these are of the converter type. Gorman-Redlich is developing an integrated CAP/EAS unit for those who wish to replace their current EAS equipment and also meet CAP requirements.

www.gormanredlich.com – 740-593-3150

TFT – Model 3320

The TFT Model 3320 CAP-to-EAS Converter receives CAP encoded messages, filters, decodes them, and generates an EAS protocol audio output in accordance with IPAWS 1.2 and the ECIG Implementation Guide 1.0. The unit allows present EAS Participants to comply with new FCC regulations easily without the expense of replacing their present EAS equipment.

The Model 3320 has two RJ-45 jacks for Internet/Ethernet connection to poll two different CAP servers and two USB ports. With connection to a keyboard, mouse and monitor, the Model 3320 can be configured in minutes.

Updates to software can be downloaded directly to the unit transparently, without user interface or system interruption.

Options include a test-to-speech conversion software package, a relay card output for triggering program interrupt devices, and an optional accessory featuring a USB-connected LCD setup panel for easy programming.

TFT has also arranged a demo/test CAP server site to transmit messages via the Internet to a specific unit for testing.

Logs of all CAP messages received are stored in memory for easy retrieval. When used with a TFT Model EAS911 EAS Encoder/Decoder, data from the EAS911 can be looped back to the Model 3320 for reporting and logging.

The Model 3320 is available directly from the factory or from any TFT authorized domestic dealer.

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FCC to Study LPFM's Impact on Full Power Radio

by Leo Ashcraft

The FCC is currently seeking public comment on the scope of the proceeding around how data from existing LPFM stations can be applied to future LPFM stations, and whether there are some limitations or issues with current data, to make judgments on the future LPFM service.

In February, the FCC provided an overview of the Local Community Radio Act of 2010 (LCRA), and the rule changes that the law requires the FCC to make in response. Items discussed included the level of protection which LPFM stations must provide to full-power FM stations and FM translators – with the possibility of priority of LPFM stations in relation to pending FM translator applications through a rule making.

Section 8 of the LCRA requires the FCC to conduct an economic study on the impact that LPFM stations will have on full power commercial FM stations. A similar study was ordered in the original Radio Broadcast Protection Act of 2001. The FCC released a NPRM seeking input from the public. While the LCRA didn't exactly state what was to be studied, the FCC suggests the study needed to be based on previous experiences related to the LPFM service. The FCC has suggested several issues that should be studied as it seeks more information through the NPRM.

The study would determine whether LPFM stations will economically impact full-power FM stations. Many say this is a non-issue, since LPFM stations are non-commercial. While LPFM stations are noncommercial, the FCC suggests that, through underwriting and sponsorship of programs, revenue that may have previously went to full-power FM stations in a market, might instead be redirected to LPFM stations.

The Commission asks whether the LPFM service has had this impact since 2000, and whether there is any accurate reporting system to determine the impact of more LPFM stations in radio markets.

The FCC is also looking for data about the impact of LPFM stations on audience ratings and advertising revenues to commercial stations. While the coverage area of an LPFM station is small in relation to full-power FM stations, the Commission questions whether LPFM stations take audiences away from full-power FM stations.

The Commission is seeking "before and after" audience shares from those that would believe that there has been an impact from the LPFM service. Since more than half of the LPFM stations are outside of rated markets, the Commission would like input on determining other methods to measure the audience in unrated markets.

This will require the Commission to define relevant markets before analyzing the economic impact. To do this, the Commission may look only at the areas where LPFM and full-power FM stations have overlapping contours. The Commission believes this is where the most direct impact will occur. Finally, the Commission will look at the overall impact of LPFM stations in the respective rated markets, regardless of whether there are overlapping service areas.

Interestingly, this inquiry will not address interference issues, as that was done in the previous MITRE Report. The Commission also believes that other portions of LCRA created remediation procedures that should eliminate the economic impact of interference on full-power FM stations.

Those that have information on the economic impact of LPFM stations should consider filing comments. This study will help establish the rules for any modifications to the service in the future, including the upcoming filing windows next year. Comments on MB Docket 11-83 were due on June 24, 2011. Reply comments due July 25, 2011. Comments may be filed through the FCC's ECFS Express system. Interestingly, at the time of this writing, only four comments were listed in the Commissions ECFS system regarding this rule-making. This leads us to believe that Commercial stations have taken little interest in LPFM this time around. Maybe LPFM is more of a non-issue to them than they were originally led to believe.

For those patiently waiting for the next opportunity to file for an LPFM station, this is a big step closer to making that a reality and word from FCC staffers indicates this may happen in the first or second quarter of 2012.

Leo Ashcraft is CEO of Nexus Broadcast. He is a broadcast consultant with over 20 years engineering experience and an avid LPFM advocate. More information at NexusBroadcast.com

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Practical Engineering

Steal These Ideas

by Mike Callaghan

In this issue Mike has opened his secret vault of practical tips and tricks he uses to make his life easier at KIIS in Los Angles. You're invited to "Steal" any of them that will help you do the same.

1. When installing studio headphone jacks, mount and wire two in parallel. This gives the jock a spare if one fails during a show. Putting a 20 ohm resistor in series with the hot leads protects the volume control if someone inserts a mono plug.

2. When you install beepers or horns in the hallways, to let you know about a transmitter or audio drop, use different sounders for different stations. That way when an alarm goes off, you'll know which direction to start running.

3. When you move from old studios to new ones, avoid any embarrassment when the switch happens, like buzzes, hums – or worse, connection problems. Order a pair of stereo lines from the old to the new studio, and a few days before the launch, put the new studios on the air, feeding the old studio like a remote. This gives you time to fix any glitches between the new location and the transmitter. Then when the champagne's flowing at the launch party, and the new studios go on the air, just fade down the old plant and start using the new. It's so much easier than switching STL's or phone lines while crossing your fingers that it will all work right.

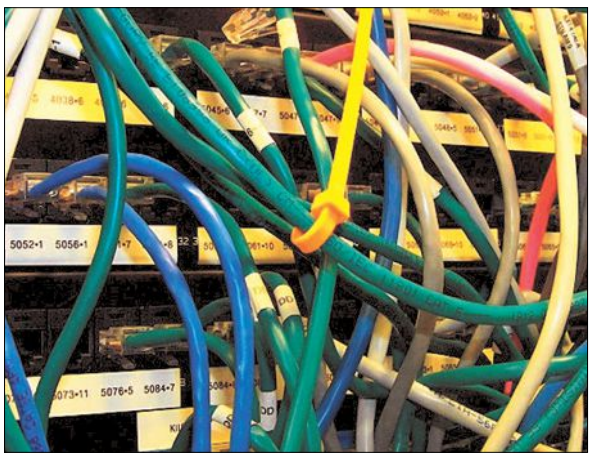
4. Don't overlook the value of the studio web cam. When a weekend board operator is confused about getting a remote working, have them point the web cam at the console. You can watch it from home and guide the operator through getting the console set up right. This also works with Zephyrs or any other gear that's complicated.

5. Get a cordless phone and wire it to a copper POTS line. You'll be able to walk out of the shop into the rack room, and carry on conversations without transferring the call to other extensions. Put a real desk set on the same line and have reliable communications during power failures and cell outages.

6. Avoid log confusion by keeping all logs – EAS and otherwise – in "LOCAL" time. Note this in the log heading. This way, concern about daylight saving and standard time becomes a non-issue.

7. Want a lot of light when you're working in an equipment rack? Forget the trouble light. On the wall behind the rack, mount fluorescent fixtures flat against the wall. Put them up high enough so you won't bang into them when you're working.

You will not believe how easy this makes it to work on transmitters and inside racks. If you can, cover the bulbs with those prismatic lenses that diffuses the light. A major advantage to lighting the equipment this way is that with the lamps spread out on the wall behind you, you won't be casting shadows inside the gear, and this makes it easy to see what you're doing.



8. Anyone that calls radio wireless has never looked under the hood at a radio station. We have bundles of wires running everywhere. When you need to trace one wire in a bundle, and they're all the same color, it's easy to lose track of the one you want.

Try taking a bright-colored tie wrap, and putting it around the wire you want to trace. Zip the tie wrap down to where it's secure, put still has plenty of slack to slide along.

Then just slide it as you follow the wire. Leave the tail intact, so you can leave it sticking up out of the bundle if you have to leave it and come back later. When the tie wrap has moved to the other end of the bundle, you will know for sure it's the wire you started with.

(Continued on Page 40)

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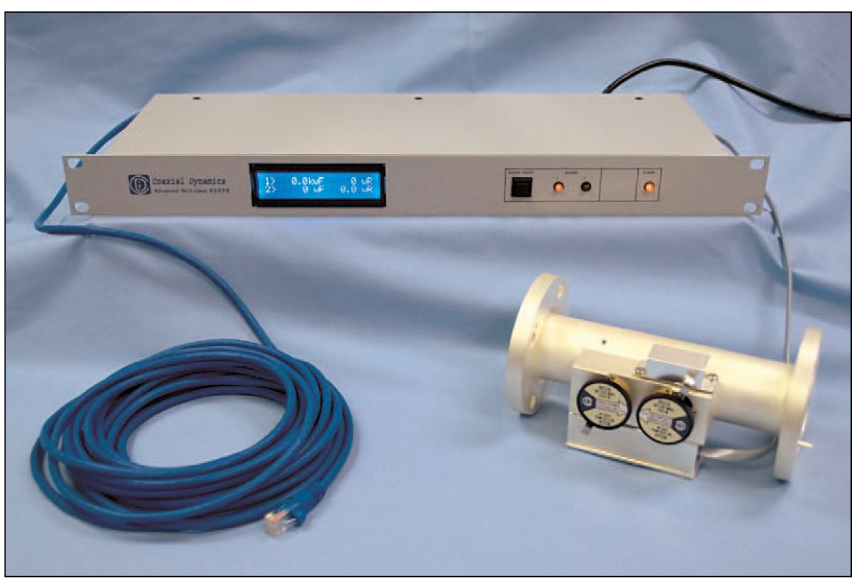

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Practical Engineering

by Mike Callahagn

Steal These Ideas

– Continued from Page 38 –

9. When you order coax for studio wiring, avoid getting it all the same color. A variety of colors let you differentiate the FM, TV, and cable TV feeds after the wiring's done.

10. Cabling a new studio facility is less costly if you suspend cable trays below the ceiling – wiring up into the ceiling and down into the rooms with EMT conduit. Because the cables never pass through a plenum, you can use regular wiring and save the cost of plenum-rated cables.

11. Make it easy on yourself when you have to do monitor points. Instead of dealing with the Field Strength Meter, the clipboard, and a bunch of maps, get a GPS that lets you set a series of locations ahead of time. Program the day points and the night points as separate itineraries.

When you do the points, just sit behind the wheel and do what you're told. The GPS will guide you to each point, wait while you take the reading, and then guide you to the next one.

12. Keep extra mike muffs. Give each jock a different color, and keep contagious diseases at bay.

Avoid the can of disinfectant spray in the studio unless you have a water-proof microphone.

13. "Disposable" headphones are nice when guests need them. These are the under-$20 ones they sell at the big discount store in your town.

14. Make a "leech" cable for each studio – nothing more than a 1/4" stereo phone plug with the tip and ring feeding a male XLR plug, through a 50 dB pad. It allows you to plug into any 1/4" headphone jack and get a mike-level feed for shooting video or recording interviews for your web page. You trim the gain to match the camera with the headphone volume pot.

15. If a hard drive crashes, the size of the disaster depends on what it takes with it. You don't want to be around when a Vox-Pro lets go with dozens (or hundreds) of irreplaceable interviews. Be a hero instead, and get an external USB drive to back up the Vox-Pros at least every couple of weeks. It just takes a few minutes, and you'll deserve a ticker-tape parade when you bring all the jock's interviews back from the dead.

16. Set up a channel on your remote control to read De-icer Current. You need to know if a heating element has failed *before* the ice storms arrive. Just turning the heaters on and off tells you nothing. Old-timey transmitters would try and feed a frozen antenna. The new ones just shut off to protect themselves and their warranty, thank you.

17. When you replace an FM antenna, budget to have the manufacturer send a tech with a network analyzer and get it field-tuned. This will be some of the best money you will ever spend. Benefits are, better stereo, less multipath, and a happier transmitter. A one time expense, it just keeps paying for itself, year after year. Remember to include the cost of the tower rigger that does the actual tuning.

18. Get a different color studio chair to go in each studio. It helps keep them where they belong.

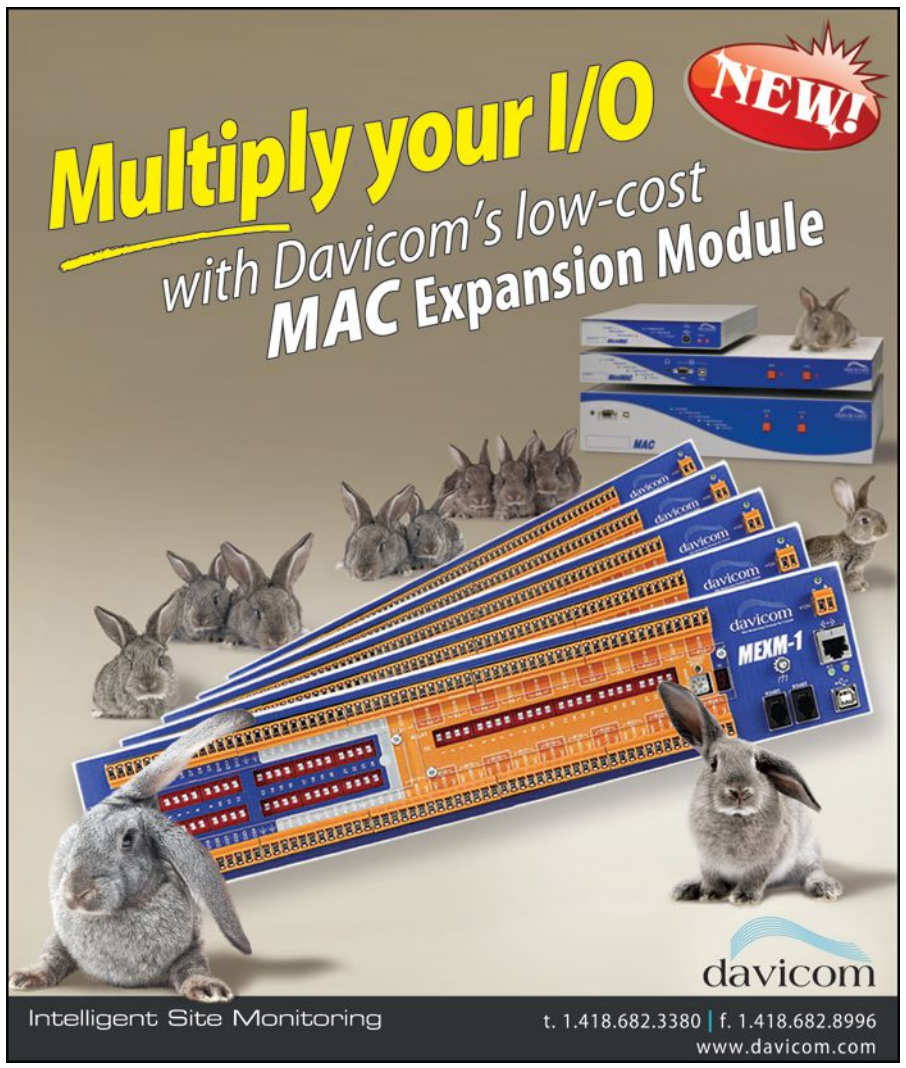
19. When you have to fill a new equipment rack yourself, it's easier if you lay the rack on the floor face up, and then lower the equipment in one piece at a time. Slide the pieces up and down on the rails to put them in place, and then drive in the rack screws. Finally, stand the rack back up. This is much easier than fighting gravity as you install each piece.

20. When you are laying out a new studio or office, and can't get a feel for whether the spacing, walls, and windows will work, try this. Take the plans, a tape measure and a roll of masking tape and lay it all out actual size in the parking lot. Then you can stand in the precise space allotted and see how it feels.

Now this final idea might sound preposterous, but it makes a lot of sense if you can do it.

21. Get a UPS for your transmitter! KIIS-FM, in Los Angeles, for all it's fame and notoriety, only produces 8,000 Watts. When we moved to new studios 10 years ago, we had a 20 KVA full-time UPS left over, and were able to move it to the transmitter. Mt. Wilson has its share of outages, but the station just keeps right on going. It's been over 8 years since it was off the air, even momentarily. A good second-hand UPS is not that expensive, and the benefit of having it is enormous.

If you have comments, a suggestion for a Practical Engineering Column or if you have some tips or tricks you want to share, email us at: editorial@radio-guide.com. Mike Callaghan is the Chief Engineer at KIIS-FM in Los Angeles, CA. His email is: mc@amandfm.com



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Small Market Guide

Finding An Engineer in a Small Market

by Roger Paskvan

Every station owner has crossed this bridge, and at sometime in their career. You need an engineer, you need them now, and you are located in a small town.

Contract Engineering in a Pinch

There are several ways out of this dilemma. Some of the solutions are not instant but need to be developed over time. If you need an instant engineer, because you're off the air, it's going to cost you – and plan on paying travel time. Many engineers contract out their services on a per hour basis but this will not come cheap.

Contract engineers know you're in trouble before they get there and that's how they make their living. In an emergency they are well worth what they charge.

Think of it from this perspective; a furnace repairman or plumber normally charges over $125 an hour for their emergency services and they don't help you maintain a revenue stream.

No License Needed

At one time the FCC required all broadcast engineers to have a FCC First Class license. This was a qualifying bench mark that set the level of par in the big game. Through time and the revamp of the Communication Act of 1996, that requirement went away. So now, anyone that can walk into the station could be an "engineer."

This is fine and good until something serious is wrong, and the wanna-be engineer is over his or her head. With the relaxing of regulations and automatic control of radio stations, most station managers got the idea that you could walk away and everything would run itself.

Computers worked their way into the automation and a lot of computer experts became pseudo-engineers. This was all fine until the actual transmitter went off the air and then the problem became more than a hard drive or USB problem. So where do we find good, qualified people to do technical work at a small market broadcast station?

Grooming an Engineer

Like I said earlier, the solution may take some time, and it is a good idea to begin solving your problem before a crisis occurs. If your market is large enough, a local ad could bring results and an experienced engineer, either on contract or on your payroll. When this avenue doesn't work, you must get creative. In a small market, comb your resources carefully – there is more to the solution than just a body that can fix computers.

Most transmitters require a trained person to repair, and those people are rare. I would suggest that you check the local tech schools; not for students, but an electronics instructor that wants some part-time income and is willing to learn about your specific equipment.

Worth Taking Time

They may start out rusty, but will develop the skills over time – be patient. One nice thing is that you will not be paying mileage and high hourly wages. Most of the tech school teachers have a college degree and some related work experience. If your small market has a college or university, checkout the possibilities.

Some professors look for industry experience and would treasure a responsibility like your broadcast property. Another avenue at a university is the technical lab people that may not teach classes but are responsible for setting up physics labs/AV materials and repair of electronic equipment on campus. Electronics, Physics, Mass communications, Industrial Technology and electronics maintenance are a few departments to investigate on any campus.

Check These Places Too

The next venue to look for engineering types is the local pool of Ham Radio operators. If you're not familiar with the hobby, all of the Amateur radio operators hold an FCC license and have passed a technical test on radio theory.

Many Hams are very well versed in high voltage, and own kilowatt linear amplifiers not much different than the transmitter in your broadcast station. Some would be very excited to have the opportunity to work in the real world of broadcasting. If you don't know of any Amateurs in your area, just drive around and stop at the first house with a big antenna tower in the back yard.

The rest is a sales job on your part, selling the great opportunity you have for this person. Look in the local paper for the area Ham club meeting. Show up and meet some of the local technical people. Like I said, you need to fit your need to solve your problem. – *Roger Paskvan is an Associate Professor of Mass Communications at Bemidji State University, Bemidji, MN. You may contact him at: rpaskvan@bemidjistate.edu*

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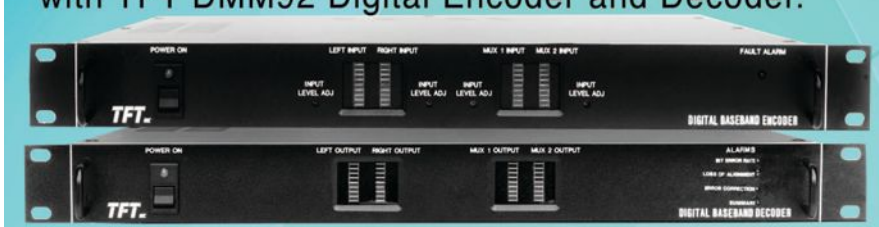

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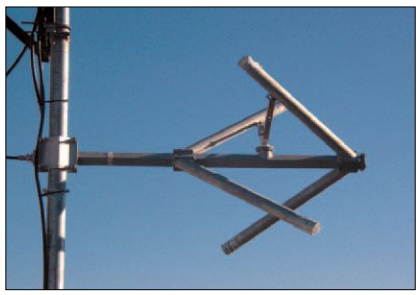

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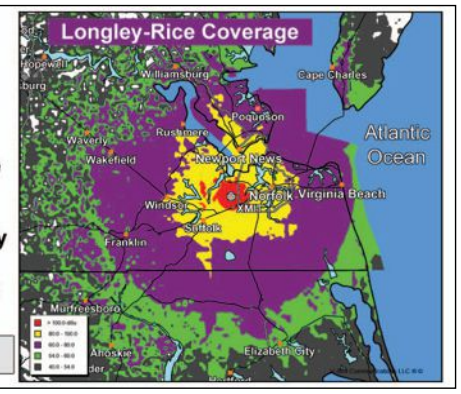

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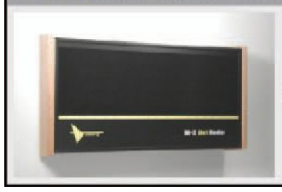
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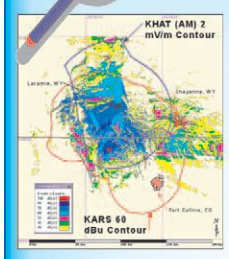

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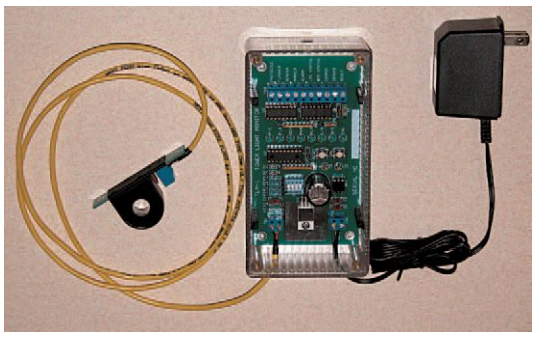

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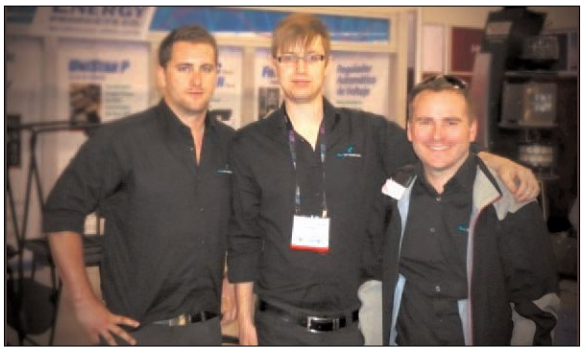
London by design, and London by nature, BW Broadcast offers high quality, innovative and industry-shaping equipment, including FM Transmitters, Audio Processors, FM Receivers, IP Codecs, FM Amplifiers and RDS Encoders. The brainchild of Scott Incz and Roger Howe, BW Broadcast is certainly a company on the rise.



Adam, Dave and Scott at NAB 2011

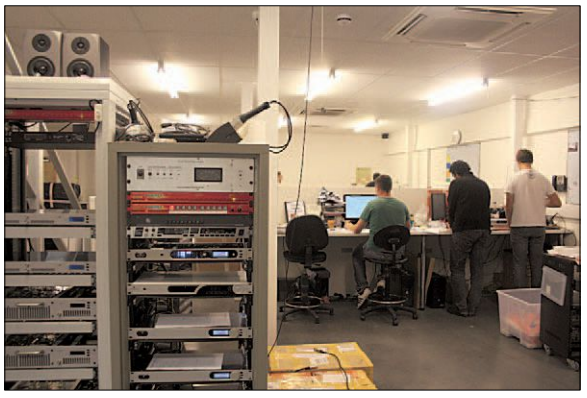
Roger and Scott are radio through and through, and that ethos runs through the very core of BW Broadcast. Both Roger and Scott, before the inception of BW Broadcast, had been involved in all walks of radio, from manufacturing all the way to the "talent." It is that experience, from across the board, that has created the undercurrent of everything that happens at BW Broadcast – if it doesn't work, and work well, then it is no better than a door stop.

Designed to run in the toughest locations, you can find BW Broadcast products running smoothly all around the world from remote locations to the best stations in some of the largest cities in the world.

Their commitment to service does not stop at making reliable equipment. Should the worst happen, every BW Broadcast product comes with a two year warranty as standard, and to ensure you can always contact an engineer, there is a toll free support number that will connect you directly to someone who can help, whenever you need it.

At BW Broadcast, the emphasis on reliability and service is run a very close second by innovation. In a industry that is truly global, there is always something new being worked on, and the R&D team at BW Broadcast (soon to receive two more members), works consistently to improve existing lines, produce ground-breaking new products, and meet consumer demands – some of which the consumer doesn't even know they have yet! If you have a BW broadcast product, and have an idea how it can do more, you can call the factory and be part of the development.

The guys at BW Broadcast have created a brand that is synonymous with quality, performance and affordability. This is not to be confused with cheap – far from it. Cheap insinuates something that will break, or is shy of features, and BW Broadcast products are certainly not that. Take, for example, the award winning RBRX1. Launched in 2010, it has quickly become the industry standard for re-broadcasting with more features and functions than a Swiss army knife. Follow that up with the Aptus range of FM transmitters coming soon that offer RDS, Audio back-up, IP Connectivity and much more, on top of the fully featured FM Transmitter. Both of these products will be on show at IBC2011 in September and NAB 2012 in April of next year. You can also request demos or information from one of their U.S. Distributors.

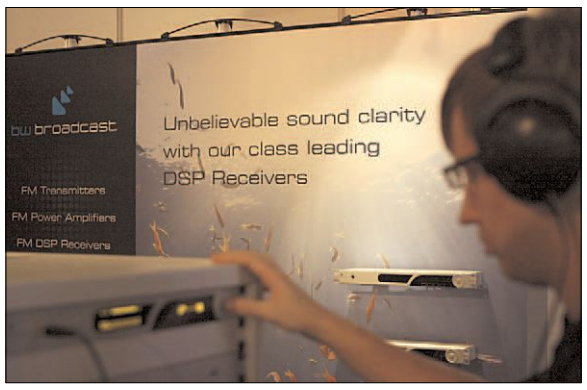


Some of the test racks and production desks at BW Broadcast.

In 2010, BW Broadcast moved into a custom-built facility, designed in-house, to suit the needs of their growing business. As BW Broadcast manufactures all of its gear in London, the new building had to provide space for manufacturing, for design, for R&D, for testing – and of course for sales and marketing. Split over three floors, each area has a dedicated focus to get the best out of each department. Scope was also incorporated for growth, and since the move in May 2010, eight new members of staff have come into the organization with more currently being recruited. If you are a forward thinking engineer or sales person and want to work in a progressive and energetic company, then go to www.bwbroadcast.com and check out their job section.

There is a real team spirit at BW Broadcast, which contributes in no small quantity to the creative side of the company. Innovation does not come from staring at a computer screen all day, so there are regular team outings, often with a competitive edge like paintballing or Go Karting.

Communication is paramount, and Scott is an advocate of idea sharing. Having a talented team counts for very little without the encouragement to express ideas and think outside the box. This environment is reflected in the number of projects currently underway at BW Broadcast. Very soon there will be some great new products coming out of BW Broadcast HQ, so keep your eyes peeled at the next tradeshow or on-line!



The innovative BW Broadcast booth design.

With this, the future is certainly bright at BW Broadcast. The Aptus range of FM transmitters coming in 4th quarter is a clear sign of intent from BW Broadcast. In the not too distant future, expect to see increased RF power levels from their transmitter range, developments in digital radio and audio processing, more innovative multi-solution boxes – and don't be surprised if you see a BW Broadcast product where previously you may have seen a competitor's product.

BW Broadcast is available in the U.S. through its stocking distributor SCMS, N.C., and Progressive Concepts, IL. To find out more please visit the soon to be updated www.bwbroadcast.com or email info@bwbroadcast.com

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☑ Exciters, STLs, audio processors, etc. repaired
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NETWORK...HEAL THYSELF

No matter how well you maintain your life, there are bound to be ups and downs. Of course, just by selecting WheatNet-IP, you're already practicing the best possible regimen of preventative medicine. Its robust architecture and hyper-intelligence ensure that it's out there keeping your network healthy every minute of every day. Each BLADE (what we call our super smart nodes) knows the full configuration of its network, ensuring there is no single point of failure. And while all networks have a backup system, we go way beyond that: WheatNet-IP offers as many points of recovery as you have BLADES in your system.

But, every now and then, something MAY happen that might call for the replacement of a BLADE. In the exceptionally unlikely event that a BLADE should fail, just plug an alternate in and you are up and running. Since each BLADE has the entire WheatNet-IP Intelligent Network's configuration embedded in its DNA, the new BLADE inherits its function immediately and you are back up and running. Pretty cool, eh?

Wheatstone

THE INTELLIGENT NETWORK™

WHEATNET IP

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IS YOUR AOIP NETWORK AN INTELLIGENT NETWORK?

Download the FREE white paper "The Technical Case for the Intelligent Network" at WheatIP.com