

Radio Guide

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Digital Issue Now On-Line

November-December 2010 – Vol. 18, No. 6

Wheatstone – A True American Success Story



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LEFT RIGHT -20 -10 -7 -3 0 +3

1 2 3A 3B 4A 4B 5A 5B 6A = COMPUTER 6B

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IMAGINE THERE'S NO IP HASSLE. IT'S EASY IF YOU TRY.

Preface... Clear your mind. All that anxiety that you've come to associate with the typical AoIP network install is going to leave you now... Think of cool clear water flowing into the coffee maker and the sound of sprinkles hitting fresh, hot donuts... OK. Ready?

1. OPEN

Confront your boxes. You know they're there. They know they're there. But only YOU have the power to change that. Go ahead... open them.



10:03am

2. LOOK

Take a good look at what's in the boxes. You've got a control surface mixer item and rack mount BLADE something or other. They sure look pretty. And they are. Using this stuff you are gonna be a chick magnet. Or a guy magnet. Whatever, you are going to be IN CONTROL. Cool part is, THAT is only moments away!

10:09am



Every BLADE has all the information about your entire network stored in it. Should any part of the network go down, the rest continues to function perfectly. Simply plug in a new BLADE and you'll be where you started in moments!



3. RACK EM UP

Rack mount the rack stuff. OK, we're going to be brutally honest here. THIS SINGLE ONE STEP takes the longest of the entire setup process (unless you have a REALLY dull knife in step 1). Of course you'll need your own rack and screws, but hey, if it's a deal breaker, we'll work it out.

10:20am



4. PLUG IN

Time to hook them up. You knew it was coming. Your little tummy is wrapped around your throat. I mean, it's gotta be a real hassle, right? Interfacing these things? Setting them up? Getting them to talk to each other? Somebody get me an antacid.

Wait... is that a CAT-6 cable? You know what that is. And that's all it takes? Mmm Hmm. Yep. You bet.

11:02am



It's literally this easy. WheatNet-IP has all your bases covered. CAT-6 cables hook up the BLADES and surfaces. Regular audio cables for the rest.

5. PUSH THE BUTTON

OK. Everything all hooked up (meaning, is the CAT-6 cable plugged in)? Great. Now we're gonna configure the system. We start by turning it on. Then?

Um... that's it. It configures itself. Every piece talks to every other piece and does what it's supposed to do. What? Doesn't EVERY IP Audio system do it that way?



WheatNet-IP does ALL the work of configuring your system EVERY BIT OF IT! It knows when you are adding on or when you are taking something out. You concentrate on content. We concentrate on getting it where it needs to be.

11:05am

6. IT'S WORKING!

You've got a system! From here on out, it's just like the analog stuff you're used to. Except ultimately more flexible. And much more reliable. And better sounding. And completely expandable. And such a joy to use. Yes - you heard it - I said A JOY TO USE! (Bet you never thought you'd hear an IP system described that way. Certainly not one from the other guys)



11:06am

7. CELEBRATE

Time for that cup of coffee and donut we talked about in the preface. Let's face it...the whole process was painless. AMAZINGLY PAINLESS. So painless, you are already up on Facebook and Twitter talking about what a stud muffin you are with your technical prowess. Don't get cocky, kid. But DO enjoy a delicious coffee and donut. And remember, next time you even think about installing new gear, you've gotta call your Uncle Wheaty...



11:07am

AoIP ADVANCED...

It's great to be able to say you invented something (whether you did or not). Turning that invention into a viable, workable solution for modern applications is what's needed if we are going to take this technology to the next level. The status quo was a pretty good starting point - but taking it out of the vacuum and into the workplace requires a fresh, objective yet passionate approach to advance it. WheatNet-IP certainly advances it, making your workflow everything it should be. We cost the same or less. We can handle 10 times the bandwidth. We are far more reliable. And we're poised for THIS decade as well as the NEXT one. We're Wheatstone! This is what we do! What else would you expect?



8. SLEEP EASY

With a WheatNet-IP system, rather than having to be on the phone to who-knows-where in the middle of the night, you can take your emergency engineers off the clock and let them get a good night's sleep. We ARE here, 24/7, in beautiful New Bern, North Carolina, and if you need us, we'll talk to you all night long. But with Wheatstone's reliability record, chances are much greater that those visions of sugar plums will just keep dancing in your head.

3:40am

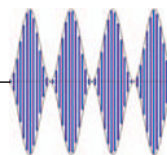
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by Ernie Belanger – Editor



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Cover Photo:

Gary Snow ponders a module design in the Gray Barn studio – June 1979.

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Many Thanks

Here it is, already time to put another year into the history books. With this – the final issue of the year – it's time for me to extend a sincere "thank you" to our readers for responding positively to our content, and also to our advertisers, who make it possible for us to continue to provide you with the relevant information you need.

Thank you also for your emails to our writers and **Radio Guide**, letting us know that we remain right on target – and for offering suggestions for future columns. Our writers have been wonderful again this year, and I can't thank them enough for their support and a job well done.

Special Thanks

There is one special group of folks that I want to thank this Holiday Season – our advertisers. While the support from our readers and authors is vital, our publication wouldn't be possible without our advertisers' belief in what we are doing.

We've just completed our renewal cycle for the coming year and we want to extend a hearty "thank you" to all our advertisers who extended their support of **Radio Guide**.

And, for those who mentioned it, my sincere appreciation for the positive comments about my stewardship of our editorial content. I also extend my appreciation to our publisher for letting me be part of the best publication in radio.

Happy Holidays to everyone, and I hope you spend them in the warmth of love with family and friends.

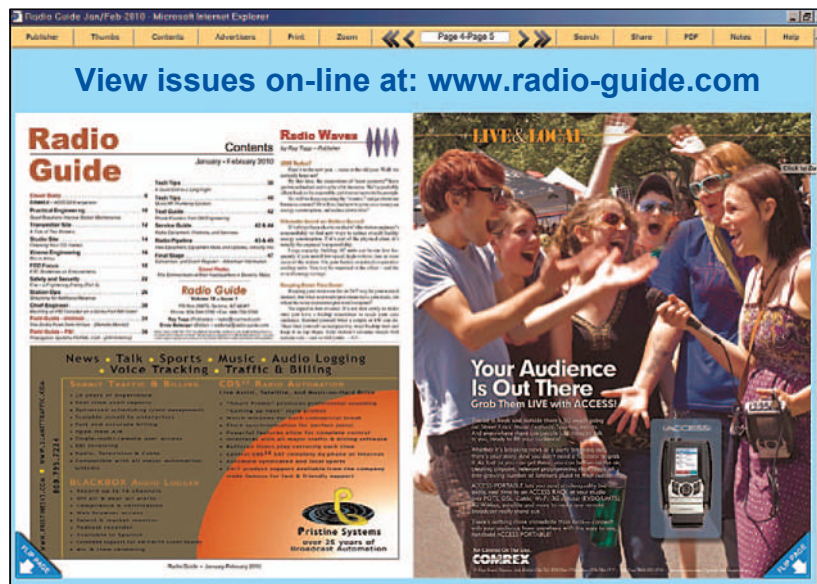
– Ernie Belanger, Editor



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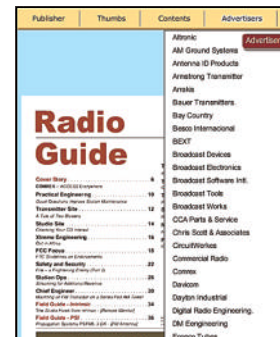
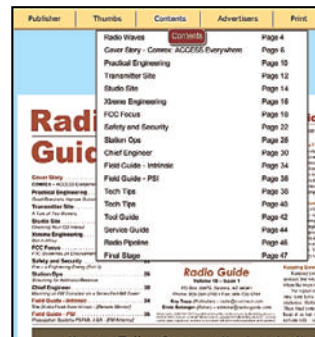
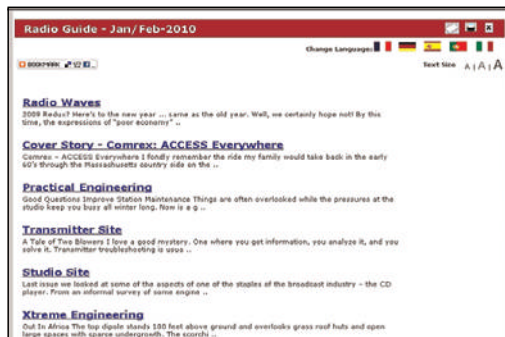
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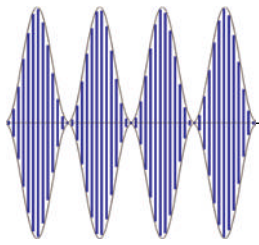
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Wheatstone – A True American Success Story

As you travel through the countryside of Connecticut, over narrow winding roads, through rolling hills and “quaint” New England villages, it’s hard to believe that this area was the birthplace of a company that has developed into one of the world’s top broadcast audio equipment manufacturers.

But it’s true – for three decades now, Wheatstone Corporation has designed and manufactured professional broadcast audio equipment that has become world renowned. And it all started back in the 1970s in a little town outside of New Haven, Connecticut.

Early Beginnings

The Wheatstone we know today was originally founded 35 years ago as Audioarts Engineering by Gary Snow and his wife Kathy. A classic garage start-up, Audioarts began with \$400 cash in hand, in the attic of the Snow’s small, one bedroom home in rural Bethany, Connecticut.

At that time, they designed and hand built small mixing boards for live bands, as well as a club mixer – remember disco? A year later in 1976, a parametric equalizer, a feedback suppressor, and an electronic cross-over for high-end sound reinforcement systems were added to the product mix.

Gary Snow – A Life Rooted In Audio

Gary Snow’s interest in audio came early: “By age 12, I was running a neighborhood radio and TV repair shop. I built my first stereo system at 15 and then moved on to guitar amps and loud-speaker enclosures,” Snow said. After high school, Gary took a job repairing amplifiers and special effects devices while attending Onondaga Community College in Syracuse, New York, where he majored in electrical engineering.



Gary Snow

Snow’s career then progressed to larger companies, where he engaged in more sophisticated high fidelity repair and installations. Gary explained, “I was sent to KLH, McIntosh Laboratories, and the Allen Organ Company for further technical training. In 1971, I was offered employment at Theatre Sound Inc. in New Haven, Connecticut, where I expanded into electronic circuit design, and large system design and installation.”

An AES Debut

Audioarts Engineering exhibited its equipment for the first time at the 58th AES show in New York City in 1977. Word of mouth about the new Audioarts products rapidly spread between club owners, and demand for the low-noise, low-distortion equipment began to ratchet up.

In 1978, again at AES, the company showed its first larger, multi-channel sound reinforcement console.

The response was through the roof – the small attic space was soon bursting at the seams. A move was immediately in order.

The Gray Barn

Just down the road from the Snow’s house was an old, rebuilt turn-of-the-century carriage house and horse stable that had just become vacant – the “Gray Barn.”

Audioarts moved into the building, which now afforded enough space to hire some half a dozen assembly workers. It also allowed the design and assembly of larger mixing consoles. Though Gary’s original intent was always to streamline product and make it easier to build, his love of design led to things otherwise.

As Michael Shane, the first employee hired by Audioarts all those years ago, reminisces: “Every time Gary set his sights on a new board, he took it further and further; it was so easy for him to add features as he worked out the circuits. As a result, every succeeding console design got bigger and bigger. Before we knew it, we were building boards that took two or more people to move from one room to the next.”

It was in the Gray Barn that things started to take off commercially, as word got out about the amazing sound quality of Audioarts gear. Dealer inquiries grew, and soon regular shipments were leaving Bethany to all parts of the country.

The rack mount signal processing line evolved and expanded, and larger multi-channel mixing consoles became part of regular product sales. Naturally, space became a problem once again. And that prompted move number two, to a new 5100 square foot building.



The LM-80 “Wheatstone Project”

Wheatstone Appears

In 1981, Audioarts Engineering officially became Wheatstone Corporation – named after its largest Audioarts mixing console to date, the LM-80 “Wheatstone Project.”

Now established in the new building, the company began serious forays into larger mixing console markets – multi-track recording consoles and serious “front of the house boards,” as well as some of the first dedicated, professional side stage monitor mixing consoles.

It was in 1983 that Wheatstone introduced the A-500 Radio On-Air board at the 64th AES show.

The console attracted the attention of the CBS Radio Network, whose Chief Engineer wanted to replace the mixing boards in all of their stations with one standard audio console. CBS chose the A-500 to be that console.

This was the Wheatstone’s first real venture into the broadcast market. With the completion of the CBS contract, Wheatstone had successfully entered the professional broadcast industry. The company never looked back.

Leaving behind AES shows and the recording and sound reinforcement market, in 1984 Wheatstone began exhibiting regularly at the National Association of Broadcasters annual spring show, where they soon gained a reputation for excellence in engineering and manufacturing standards, at a market price that put them head-to-head with established broadcast brands. Soon Wheatstone was a buzzword in the industry for quality installations both large and small.

Quick Product Roll Out

As a relatively small, nimble company, Wheatstone was able to bring out new product in unheard of turnaround times – with multiple new console and equipment designs every year. Relying on a small core group of dedicated people, manufacturing was kept in house as much as possible. If a problem developed with a supplier, the preferred route was to bring the offending part directly under company control, cutting out middlemen and their inherent delays.

A telling example of this was a supply problem for top quality linear faders. Gary Snow’s solution? “We’ll make our own.” And they did, with quality indistinguishable from the originals – even to company reps doing hands-on touch and feel in the Wheatstone show booth.



So You Want To Buy An Equalizer? A 1980’s ad that never made print. It was “shot down” as too edgy. The 45 is real – one of Audioarts employees was the town constable, and it’s his “equalizer” in the photo.

Wheatstone Takes Off

With the high-end console market firmly targeted, more and more broadcasters began turning to Wheatstone for equipment needs. The company relocated again, this time to Syracuse, New York – Snow’s hometown.

In this first Syracuse building, serious production space led to a plethora of new products – stereo production consoles, studio furniture systems, combo production/on-air broadcast consoles, a larger family of signal processing gear, and an ever-expanding line of mid-market mixing boards, brought out under the original Audioarts Engineering brand name. All of these products were conceived and designed by Gary Snow.

(Continued on Page 8)



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 and components

“If it’s AM Radio, it is Kintronic Labs.”

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With more than 200 years of combined engineering and technical experience, Kintronic is a global leader of world-class radio broadcast antenna systems. Kintronic engineers can custom-craft your radio broadcast antenna system or component need for any location, at any fixed site, or to meet any mobile requirement.

Cover Story

Wheatstone – A True American Success Story

– Continued From Page 6 –

Wheatstone Enters The TV Market

In 1991, Wheatstone's first television console, the TV-600, was shown at NAB. It won an industry excellence in engineering award – the first of many future awards to come.

The following year, a flagship radio console, the A-6000, made its appearance, boasting all-electronic switching. By 1994, building number three was full with no room left to expand. Wheatstone then built a new Syracuse plant from the ground up at double the size, and moved again.

Wheatstone On The Cutting Edge

1995 saw Wheatstone unveil its first digital product, the D-500 radio console – again winning multiple awards.

The following year brought the SP-8 stereo production console, and in 1997 their computer controlled TV-1000 television master control audio console.

In 1998, the TV-80 console appeared – also computer controlled – and yet again Wheatstone found itself with another full building and the need to expand.

New Bern, North Carolina

This time the move was a major one, to a 51,000 square foot shell building at an industrial park in New Bern, North Carolina. After construction was complete, Wheatstone was poised with a production plant that remains unique in the industry.

End to End Manufacturing

Manufacturing capabilities included: a complete metal shop with a computer controlled laser – cutter, bending break, Bridgeport and multi-tooled punch press. There is also an automated, surface mount line, with real time individual component testing.



The New Bern, North Carolina hand assembly area. A long way from Gary and Kathy's attic.

Also found, are a fully autonomous silk screen department, in-house graphics, in-house powder coating, and computer controlled testing for all product lines. In-house, automated furniture and counter top mills with complete in-house laminating add to their capabilities.

Their front end computer design, R&D and prototyping, software coding, and the ability to program and burn in-house software chips makes for "everything under one roof."

With production capabilities like this, virtually any design direction became possible, and new products once again began to roll off the line in droves.

The automated production facilities gave the Audioarts line an incredible boost in manufacturing efficiency, greatly diversifying Wheatstone's product base and giving the company an even stronger foothold in the small and mid-market arena.

The Digital Revolution

New forays into audio networking changed the face of traditional products. Digital not only arrived – it took over. The Vorsis line of cutting-edge signal processing was launched to great fanfare. Wheatstone's Generation, Evolution and D-Series digital networked control surfaces became de facto standards in the industry.

As the Internet took over everyday life, audio-over-Internet protocol was embraced as well, and the WheatNet intelligent blade network was developed to interface seamlessly with the company's digital audio control surfaces.

Wheatstone Today

Wheatstone today is well known, a major global player in the audio broadcast equipment industry, with product placement throughout the country and all over the world. From tiny radio stations to huge institutional 30-40 studio installations, Wheatstone, Audioarts and Vorsis are there.

It's a far cry from those days of the seventies, when each unit was hand-built by Gary and Kathy Snow in the attic of their home in the New England countryside. But it goes to show what hard work and a dream can accomplish.

Wheatstone is truly an American success story.

For more information on all of the Wheatstone product lines visit their web site www.wheatstone-corp.com

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*—Leslie Whittle, Program Director
KRBE, Houston, TX*

Not since Axia audio-over-IP was introduced to the broadcast industry have we at BGS been so excited! It is with great enthusiasm we'd like to invite you to take a look at the new Op-X Radio Automation delivery system for any single or multi-station cluster. Op-X's versatility allows it to operate seamlessly with either Axia IP-Audio networks or legacy audio consoles.

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The Tail of a Transmitter Site

Having been in the radio engineering business almost 40 years, I have seen some good and some bad transmitter sites. Some transmitter sites were built with all good intentions to maintain them, but a steady stream of new owners, with no commitment to maintaining their sites, was all too common in recent years.

One transmitter site, that proves a site can be built correctly, is the five tower, WAMG/WQOM diplex site in Ashland, Massachusetts.

The Boston area is home to some tough areas in which to try to build a new AM tower, so it's become the home of two AM triplex facilities. The Ashland site is an extension of one of those.

Site History

But first, some interesting history. Back in the 1970's, WGTR 1060 kHz was a new one kilowatt daytimer in Natick, Massachusetts that did a great job of serving its community. I listened to it when I was in college and it was a great station, even though it was just a kilowatt.

The owner of WGTR wanted a power increase, so he purchased some land out in the country in Ashland, and put up five in-line towers for 1060 kHz, to get more power into Boston, while adding night power.

Being close to WBZ at 1030 kHz, de-layed the process of increasing the power but eventually WGTR operated from the Ashland site with 43 kilowatts.

Later, WGTR was sold, and eventually that buyer had to sell the Ashland site. It was sold to one owner and the 1060 kHz license was sold to a different owner.

890 kHz Moves to Ashland

Around this time, a new CP was granted in the Boston area for 890 kHz and the Ashland site was a perfect place to locate it. The 1060 kHz array was retuned to 890 kHz and that station operated from Ashland for many years, and 1060 kHz went dark.

Fast Forward to the 1980's

The now silent 1060 kHz was in need of a transmitter site. Enter radio entrepreneur Alexander Langer, who knew how to bring 1060 kHz back. Alex is not only a fellow broadcaster, but he's a friend who believed in AM radio and still does.

He engineered 1060 kHz daytime to operate from a site in Framingham, Massachusetts along with 1200 kHz and 650 kHz, thereby building and operating the first AM triplexer in Massachusetts.

However, 1060 kHz still had a small night time signal. To improve this, Alex decided that he had to build the 1060 kHz night array at the place where 1060 kHz started out – the Ashland site.

Site in Bad Shape

However, the years hadn't been kind to the Ashland site. It was in disarray because of several absentee owners. It was so bad in fact, that the site became notorious for just not working right. One engineer who worked at the site told me that he got RF burns from touching the ground strapping.

When I first saw the site in the late 1980's, the antenna tuning units were located in concrete septic tank enclosures, fortunately they hadn't seen any service in the sewage industry! It was a tough site that needed a lot of work.

A Huge Undertaking

The capable engineers from Carl E. Smith Engineers in Bath, Ohio, were brought in to totally rebuild the site with an eye toward bringing the 1060 kHz night facilities to Ashland first, and then eventually the 1060 kHz day facilities, along with improving the 890 kHz signal already at Ashland.

The first step in the process was to get rid of the septic tanks. A total of ten metal shipping containers were brought in, and installed to replace them.

This of course required a new ground system, all new transmission lines, and a thorough inspection and repair of the five in-line towers.

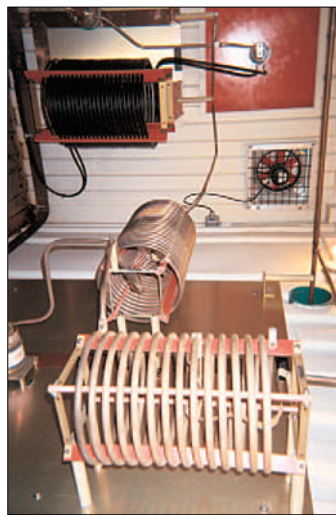
New Samples and Filters

New sampling loops were put in place. Due to the height of the towers and the two frequencies involved, each loop was located at the optimum current point on the tower for that tower and frequency.

As part of a well designed diplexer, each tower required a filter for both 1060 kHz and 890 kHz



Two Mini-Flectors were used to create an "isocoupler."



The frequency shaping network for 890 kHz and 1600 kHz.

Five new, higher power antenna tuning units had to be installed, and new phasors were installed in two of the shipping containers. After a summer of construction and running radials, 1060 kHz night joined 890 kHz day and night at Ashland.

1060 kHz Daytime Moves to Ashland

Recently, a new owner of 1060 kHz wanted to locate the day facilities for 1060 kHz at Ashland to eliminate the need for two costly sites and to improve the station's night power.

This required the installation of a new phasor and a new Nautel NV50 transmitter at the site. Previously, there had been a lot of work done on a "high tension" power line that ran North to South at the eastern end of the array, to detune the individual high-line towers.

There was also a question of whether the power line coming into the site was going to have adequate capacity for both stations.

Better Signals After The Move

Because the site was originally engineered for 1060 kHz and was well redesigned when the 1060 kHz night facilities came over, it was relatively easy to bring over the 1060 kHz day facilities.

This move will save the new 1060 kHz owner the cost of running and maintaining two transmission sites and provides for a better day and night signal for 1060 kHz, where it all started back in the 1970's in Ashland.

Cost Effective Options

Diplexing and triplexing for AM stations is a viable and cost effective way of keeping an AM station on the air when its transmitter site is no longer available.

Too many heritage AM tower sites are sitting on valuable real estate in areas that are no longer away from the population centers of an area.

In some cases, the land is worth more than the actual station, so owners may be compelled to sell the transmitter site and take the AM dark. A station can realize some valuable income from sharing its array with another station.

The first step is to retain a consulting engineering firm who has had experience with diplexing AM stations. Different firms have different ideas about just how close two frequencies can be, considering the filtering needed to keep each frequency isolated from the other. Then work closely with a manufacturer to actually build the filters and the new combining network.

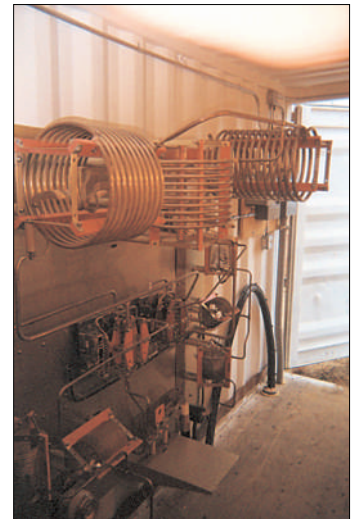
Diplexing and triplexing are becoming more common in AM dominant markets, and more consultants have experience building and adjusting them. It truly is a way to keep an AM station on the air and serving its audience.

Each project is unique with its own set of problems, and each is a great example of Xtreme Engineering in action.

Steve Callahan is the Director of Engineering for Rhode Island Public Radio. You can contact Steve by email scallahan@wrni.org



High tension wires on site. The power tower had to be detuned.



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Is Your Winter Survival Kit Ready?

by Tweaker

It is the most wonderful time of the year, or so the story goes. But more than ever, this is the time to be prepared for the worst possible weather – regardless of what the part of the country you call home.

This final *Transmitter Site* of the year is going to be devoted to ensuring that you are totally prepared to take care of – *You* – should the need arise.

It's been a long year of traveling a lot of miles between transmitter sites for some of us. For those who are more lucky, it may be only one site or two fairly close by. Now is the time when the days are shorter, the nights seem darker (usually because the roads are wet), and being prepared for getting stranded overnight at a remote transmitter site is most important.

Stranded is Stranded

Trust me – if you are one of the few engineering brethren who hasn't experienced it – nothing is worse than to get a call in the middle of the night and head up the mountain – only to find yourself stranded there.

You may find the road to site has become blocked by a fallen tree, or what was a marginally passable road up the hill becomes impassable because of blowing snow – or it has become too icy to traverse safely even with the 4WD “tank” you drive. Whatever the situation, stranded is stranded.

Winter Survival Kit

If you haven't taken the time to put together a survival kit, perhaps the list of what I carry will help you to get focused. Should you only be responsible for one site, some of the items in my “road warrior” kit can be stored at the site. For the rest of us, however, this is a mobile pack.

A fold up cot – Nobody likes to sleep on a hard, cold floor, even if the building is heated. So visit a local sporting goods store and pick up a folding cot. This will give you a “comfortable” place to sleep that is above the cold floor and won't kill your back. One engineering friend of mine packs an air mattress and pump rather than a cot because of the limited space in his truck.

A comfortable, warm sleeping bag – Even if your building is heated, this will give you some padding to sleep on and it will give you covers for the night. Also, if you get stranded while on the road, you can depend on this to keep warm without the risk of keeping your vehicle running for heat until help arrives.

Get a nice warm sack that is good to 40 degrees below zero – if you have to use it, you'll thank me later. Oh, and don't forget a small pillow.

Boots – A spare pair of waterproof, insulated boots. If for whatever reason, the shoes or boots you are wearing get wet, you'll want a dry pair to change into.

A folding field shovel – This not only can be used to shovel yourself out, if you're stuck on the roadside and get plowed in to the point that your truck can't get out, but it has another handy use or two as you'll read later.

A good backpack – This can be either a nap sack or a hikers pack with a rack – it will depend on you.

I like to keep my sleeping bag rolled and tied to the rack, so I don't have to juggle too much – especially if I have to hike to get back up the hill for some reason. One quick grab and I've got everything I need to get out of the cold.

Suggested Backpack Contents

In your backpack you'll want your spare boots to keep them handy and dry.

A pair of socks or two – If the shoes or boots you have on get wet, chances are your socks will be wet too. So you'll want both spare boots and socks to keep your feet dry.

Gloves – A spare pair for the same reason as the boots and socks. Wet gloves mean cold fingers and hands.



A Side Note

I remember from Arctic Survival Training, back in my military days, that as we become colder the blood circulation to our extremities slows so the heat of the blood keep vital organs warm. That is why it is so important that you make sure your feet and hands are properly protected in cold climates. Frostbite isn't something to mess around with, and in warmer climates wet socks and feet are just darn uncomfortable.

Back to The Pack

Our list of stuff to keep in your pack continues ...

A pair of earplugs – Transmitter blowers are loud, so save your ears and use the plugs if you have to stay overnight.

Chemical heat packs – Pick up four or five; if the power goes out, you won't have heat in the building. Using these will help keep you warm while in the sleeping bag.

A spare flashlight – You'll want to see, to get to your “bed” once you turn off the light in the building, and if the need comes for a potty call in the middle of the night, you'll need to see where you are walking. You may want to take your field shovel for the walk too, just in case you need to cover things up.

“The necessities” – Oh, and don't forget to pack a role of “TP” and some hand sanitizer. I don't think this needs explaining.

Food and Drink

For sustenance, make sure to pack a couple of bottles of water and maybe some fruit juice. If you're a coffee drinker, a bottle of iced coffee might be nice. Hey, cold caffeine is better than no caffeine – get over it. Put these in a waterproof zip lock type bag in case of spillage.

Be sure you have a half dozen food bars so you'll have something to eat – my wife suggests that you pack chocolate too, I guess that's a girl thing. Come to think about it, it is nutritious – nothing wrong with a little comfort food.

Remember too, if you have medication that you need to take on a regular schedule, you might want to include some of this in your pack as well. In a worse case situation, it might be a day or two before you get back down the mountain depending on conditions.

Keeping Entertained

For entertainment pack a book to read or pack your favorite copies of *Radio Guide* to catch up on your important reading. If you have your laptop with you, and you have Internet access, you can watch TV or catch up on your email. In fact, depending on your device, you could even do that on your cell phone – or so they say.

Of course – and here's a novel idea – you could just take advantage of the solitude, put in your earplugs and catch up on some ZZZs.

Options

Your survival kit can get as exotic as you want it to be. For example, depending upon how Spartan your buildings are, you might want to pick up a small “milk house” heater in case the transmitter doesn't keep things warm.

You could also carry a chain saw so you're prepared to cut your way down the hill if a tree or two is blocking your path. Then too, depending upon the situation, you may have to cut your way into your transmitter site.

Some engineers in snow country pack snow shoes, which have a dual purpose – hiking into a site if needed or back down the mountain if your vehicle is stranded.

I know of a couple of contract engineers who carry a small contractor-site electric generator with them so they can get a station on the air with an exciter if there is no power at a site that has no back up power. This could also be used to run a small heater if you are stranded and provide power for a light source.

The contents of what you have in your “survival” kit and your backpack, and the options you choose, really depends upon your location, how equipped your transmitter buildings are, and your personal needs and desires.

The Key is Preparation

While the chances of getting stranded at a transmitter site are slim, when “slim” happens it is better to be prepared with the right stuff in advance than to be stuck without anything you could use to be a little comfortable. Not to mention staying dry, warm and not hungry while you weather out a storm or wait for a road to be cleared enough to get the truck back down the hill.

Those of us in snow country know that remote mountain roads aren't a priority in a blizzard or ice storm – routes in main population centers are – so if you get snowed in to the point where your truck can't get down the hill, or the road becomes blocked and you're stuck until morning, you need to be prepared.

Running without some type of Winter Survival Kit is like playing a game of Russian Roulette. So, make your list (or use mine) and go to visit a sporting goods store or your favorite discount store that has camping gear – today.

Remember too, with the days much shorter, there may be a time when you might want to lay down for a short “power nap” because you are just too road-weary to head home or to another distant site.

So don't try to be a hero and put yourself or other drivers in danger. It's better to take the rest at the site rather than to fight sleep and fatigue while driving.

Your Winter Survival Kit can actually be the perfect solution for this as well. – *Radio Guide* –

Have a winter survival story? Email editorial@radio-guide.com

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Quantum Leaps in Shoe String Theory

by George Zahn

“Long, long ago in an economy far, far away,” managers and engineers didn’t have to scrimp, repair, and recycle quite to the extent they are doing today.

As we are in the holiday season, we’re reminded of the Scrooge that this economy has become when it comes to upgrades and repairs. If your station is like mine, we’re scrutinizing every new item and sometimes making due with partially functioning, non-critical items.

Increase Your Value – Be Frugal

As jobs are slashed and corners cut, one way we can all increase our value to our company is to utilize our resources as efficiently as possible. The money we save may be the difference in the salary of one of our staff – or ourselves.

In the last two issues, we’ve provided tips and guidance on some ways to improve our studios on a shoe-string budget. We “tie up” some more ideas this time and try to apply some key points as a blueprint for moving forward. Even though this is the last scheduled shoe-string article, I’d love to feature creative ideas in future articles, so please share them. We all learn through common experience!

At Your Disposal?

At what cost does a “disposable” alternative come into consideration? For example, there are some stations which treat consumer-grade CD players as “disposable” items, especially in lesser used studios.

If a nice pro deck costs \$2,000, the feeling of some managers and engineers is that you could buy twenty \$100 CD decks over the same span of the life of that single expensive deck.

If you look at the cheap DVD consumer decks, which will also allow for playing MP3s, you might be able to get the deck for under \$50.

Lest you follow the apparent yellow brick road that the consumer-quality path appears to be, please remember that there are some speed bumps along the way.

Not Always The Bargain You Think

Note to managers: Our engineers will remind us that the consumer grade machines are lacking in more than just durability. If you’re looking for balanced inputs and outputs, you’ll not find them on a \$100 CD player.

Granted, a Henry Engineering Matchbox or an engineer-built interface will add to the first time cost, but that’s a one-time expense.

What may, or may not, be a one time expense, is the remote-start capability for each unit.

Using an infra-red remote is a boondoggle with multiple decks. If you have to open each player to rig a remote start apparatus, you’re talking extra time and money which should be applied against using a “disposable.”

You’re production and air staff may also be used to other nicer high end features such as “recall” and “auto cueing” which may not be on the corner discount store shelves.

Plus, given durability issues, you know that Murphy’s Law will dictate one of those disposable decks will die in the middle of the over night shift – when your engineer is on vacation.

Dis and DAT

A final note on disposables, with an example that is a bit dated. But the lesson remains: When I worked at WMKV Radio and the XStar Network, we used Digital Audio Tape (DAT) extensively in the 1980’s and 90’s. So much so, that our manager at the time was sick of paying for professional TASCAM decks.

A cost analysis showed we could buy some nice consumer grade Sony decks for the growing number of studios, and the increasing number of studios would likely extend the life of the consumer decks by spreading the use of them around.

That worked well, until the first generation of DAT decks started to fail. When we went to buy the next round, we couldn’t buy the same, dependable models we had come to rely on. We were faced with upgrading to pro decks, or to save money again and buy the “new and improved” consumer-grade DAT decks. We winced and bought the consumer grade decks, and then we winced some more ...

It seems that the tape path in those “new and improved” consumer DAT decks was not as precise as on the pro decks. The feeling, according to the DAT recorder company rep back when this happened, was that people wouldn’t be using the decks for anyone but themselves. So the only tape path for playback that was important, was the same one that the tape was recorded on. Surely no one was shipping DAT tapes to other people.

Lesson Learned

The company that made the consumer-grade deck had discovered a way to cut corners. When we complained, our company rep raised a “Spock-like” eyebrow, and in unmitigated logic inquired, “And why exactly were you using a consumer grade unit in a professional setting?”

Even considering that CD’s won’t be as finicky as a DAT which had helical scan tracks the width of human hair, we can still learn a lesson here.

If you treat decks as disposable, don’t plan on consistency of design, features, or even performance from one unit to its successor – and if you’re popping boxes open to add remote start gear, you’ve basically shot any warranty on the consumer unit.

For those who have a feeling one way or the other on the disposable issue, please share your success stories or “crash and burn” moments with us.

Invest In Quality

Engineer Jeff Johnson feels that there’s more to be gained by investing in quality, “Never buy cheap equipment, it is not cost-effective in the long run. Quality equipment will be supported with a longer warranty.”



A DAT Tape Cartridge

“It will be sold by a quality company you can count on many years later. That superior company will still have parts and advice years on, and that will save you the cost of purchasing new equipment.”

Johnson stresses that more modern gear is more energy efficient, especially citing transmitters, notable on the AM side.

He does suggest that many professional studio products may even outlast their usefulness: “Quality gear will become obsolete before it wears out. Buy spares and be sure a staff member is competent to service the gear. Why send out to a shop at hundreds of dollars a pop, when a sharp in-house staff member could do the work with \$50.00 of parts?”

Cheap Vs. Economical

It may be among the oldest of semantic arguments, but cheap versus economical can help determine a station’s future. Sometimes the cheapest choice makes sense in the short term, but you have far more down time and repair, or replacement, costs.

The replacement option may be the most painful, once you’ve tossed money in on a cheap alternative that fails prematurely. You can simply tack that cost onto the price tag of the next piece of gear you bring in to replace it. Even with resourceful engineers, cheap is not always best, and it’s important to take into account what the engineers are hearing from colleagues about what is working and not working in the field.

One way to be more economical – not cheap – is to shop intelligently for the gear you need. I know one engineer and lighting guru who specializes in live sound reinforcement. He stocked most of his gear at a fraction of the retail price by shopping smart through eBay. He stressed to me that it’s important to buy from reputable sellers and that the deals are indeed out there.

A Resource In Hand

One of *Radio Guide’s* own, engineer Jeff Johnson suggests eBay, used equipment brokers, and other sellers, listed in this publication, as ways to stretch dollars and upgrade on a limited budget.

As with any new vendor or auction site, especially if the price seems too good to be true, it may be best to try a “test purchase” in which you buy something smaller first – a known quantity component. If the shipping charges and delivery time are acceptable, and the item is indeed “as described” or better, then you might have a solid vendor for future large purchases.

Most websites have seller ratings and comments supplied by buyers. Keep in mind that no company’s perfect, but you can see patterns in some complaints against companies with poor reputations.

When in doubt, ask colleagues about the quality, and follow through on a site you might be interested in as a vendor. If the item price is incredibly low, be sure to check shipping or handling fees before impulsively buying the item. Some vendors in the past have tacked on exorbitant shipping to more than cover the price break they’ve given on the item.

How are you saving money and still getting the job done? What are future topics you’d like to see addressed in Radio Guide?

I’m also looking for more ideas on studio lighting. Do you prefer fluorescent, incandescent, natural (where available) or other? Maybe a combination? What’s the funkiest light setup you’ve been around or are there light-affected announcers at your station? Share your stories with others by sending ideas and feedback to gzahn@mkcommunities.org George Zahn is the Station Director/General Manager for WMKV Radio in Cincinnati.



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Are You Disaster Ready?

by Ernie Belanger

One thing that many stations overlook is the need for a station disaster plan for their staff. This is your station's disaster playbook, and like any playbook station staff should both have input into it and they should know the plan. While some disasters, like Tornado's, come without a lot of advanced warning, others give us time to make needed preparations to mitigate the situation the best that we can in advance.

But without a Disaster Plan that has been well thought out in advance, your staff's energy at the critical time of a disaster may not be focused and haphazard ideas throw into motion may prove counterproductive or just won't work.

Create a Plan

Take the time now to create a contingency for your station so everyone is on the same page of the playbook in the event of a disaster. (If you have one, take time to review it to make sure it is still viable.)

You will need to create an organizational chart as part of your disaster plan. Designate in advance who is "in charge," and develop an organizational chart. This doesn't have to follow the normal station organizational chart, as most staffers will be put into service doing tasks they may not normally perform.

When you use this structure and everyone knows the chain of command, it will go a long way in preventing duplication of effort or lengthy discussions when someone questions how they are being utilized or thinks they have a "better idea."

Remember, if everything in your plan is well thought out in advance, and everyone knows what they and everyone else is doing, your plan "should" work like a well-oiled machine.

Design a Call Tree

Regardless of the disaster type, a call tree should be established and used to alert your staff that your disaster plan is in action.

This is where it all starts, if a disaster plan needs to be initiated after normal business hours or on a weekend or holiday. It will also be used to alert staffers that are not at the building during normal business hours, at the time of plan activation.

Designate who will be calling whom. Be sure whoever imitates the call tree provides short concise information. Include the type of disaster, when the plan is being initiated, and if there is any deviation from the plan. The designated callers will relay this information to each staff member on the tree.

Call Tree Rules

There are some rules that your staff will need to follow when they make their call or calls. First they want to make sure that they talk with the person and not just leave a message.

If, for whatever reason, they don't talk with a live person, they should call the next person down the line to ensure the information is passed and the call tree remains intact – this is an important step to be sure the communication chain isn't broken.

If someone leaves a message, they need to call that person back repeatedly until they reach them personally.

Once the caller makes their contacts, they should report back to a designated person at the station that they have made their calls.

As a contingency for those that can't be reached by phone, you might want to establish a code that would alert your staff that you have initiated your disaster plan but not alert your listeners. An example of this type of announcement: "WXYZ taking a minute to say hello to all our staff and thanking them for being part of the WXYZ family." Staffers hearing the message should then call the station to see what's going on.

What Personnel Are Key?

As part of your planning process, you need to decide who is considered key to your operation and in the event of a disaster would be expected to stay behind to run the station, passing vital information on to your listeners versus those that can leave for a safe area, depending of course, on the type of disaster.

It is important to sit down and think through each potential disaster situation. Take the planning step by step.

First, decide which tasks need to be covered in a disaster and plan who is going to perform each specific task. It is important that you plan a primary and back-up person for each of the tasks. If your primary is stranded somewhere, or is out of town when disaster strikes, you will still have a viable disaster plan you can rely on.

While the list of tasks and personnel can be the same for all types of disasters, the difference will be the timing of their action and the length of time they will be pressed into service.

Response Time

Obviously, it will be "all hands on deck" immediately before a disaster – a blizzard strikes and immediately thereafter – but requirements will begin to dissipate as things get back to normal.

With this type of disaster you usually will have a day or so warning of the event, so everyone can know in advance when they will be needed.

For no warning, or minimum warning disasters like flash floods, tornados, earthquakes, chemical spills, nuclear disasters, or other events, your staff will have to immediately respond to the plan – thus the call tree.

What to Include

At a minimum, the following should be included in your disaster plan. Determine what members of the staff will go to the station. Task them to either go on the air or back up the talent already on the air. Decide who will go to the county or city command post to relay vital information to the on air staff or directly to listeners, and who will be doing reports from the field to keep listeners updated.

Determine who will be taking designated equipment to a safe location just in case your studio site loses power or is otherwise effected.

This gear would be set up and ready to serve as an emergency studio to keep the station on the air. Designate which staffers will cover phone calls from the public.

Determine who will verify information received for accuracy etc. There is a good chance, depending upon the type of disaster and the effect on communications, that the station may become a clearing house of personal messages, so loved ones can find out that their family is OK.

In this way, everyone will know what they are responsible for, and you will avoid a situation where something isn't covered because everyone thought someone else was covering it.

Food and Cooking

You can't depend upon local restaurants for food or beverages. They may be closed and you may be snowed in or isolated by flooding. It is important that as part of your disaster plan you have a food contingency.

Personnel may be given a list of things to bring to the station when called in, such as hot plates and pots and pans to cook in if the station doesn't have a kitchen. You will also need to make sure there is canned food and beverages on hand for the staff. In a worst case, you can get some MREs (Meals Ready to Eat), on-line or from a military surplus store.

An Evacuation Plan

In your planning, remember human nature. Key personnel who remain to man the station in a time of disaster don't need to be distracted worrying about their family's safety.

Consider eliminating this distraction by making an evacuation plan for their families. Granted, it's not necessarily the station's responsibility; however, to keep your staff focused, it is in a station's best interest to do so.

Some Suggestions

If staffers have extended family or friends visiting, who live in an area that won't be effected by the disaster – and there is enough advanced warning (such as we get for a hurricane) – they should leave to get there as safely, and as soon as possible.

For non-essential staffers and families of staff members who don't have a place they can stay, establish a protocol that has everyone's family meet at the station, or a designated location, so they can caravan together to a location that is safe.

Your station could make advance arrangements at a hotel where everyone stays together. With a call, the standing "emergency room block" can be set so everyone knows where their family and your non-essential staffers will be staying.

What – No Internet or Cell Phones

In your planning, you have to assume that there may be a good chance the Internet, cell phones, and possibly wired phones and electrical service will be interrupted – or, depending upon the disaster, spotty at best.

Listeners probably won't be able to email, tweet, or go to your website for more information, and your staffers may not be able to phone in field reports. Ask yourself this question: "If this happens, how will your station be their lifeline?"

Seek Expert Help

Visit with your county or city disaster preparedness office early in your planning process. They are the experts that can help you with your disaster plan.

Remember, you'll want to interface with them when a disaster strikes, so it's best to start that relationship now.

In this way, you can be an asset that they can use to communicate with the public and you'll be an asset to your community as well. – *Radio Guide* –

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- HC-3 telephone autocoupler and AC-12 rack of autocouplers
- DTMF-16 and DS-8 DTMF tone decoders.

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Social Networking – Problems Brewing

by Peter Gutmann

As we all have come to recognize, the so-called “social media” are playing an increasingly important role in radio’s future. To broadcasters’ relief (and attorneys’ distress), social media tend to be relatively free of FCC regulation – at least so far. Yet, there are some areas of concern. One, which has attracted little notice, is a potential conflict with the FCC’s local Public File rule.

Media Integration

Radio’s broadcast signal, of course, remains its primary platform. But with growing success, stations are interleaving tools from the Internet into their overall service and branding.

That evolution began with websites and streaming, but now is venturing into texting and interactive media like Facebook and Twitter.

These newer platforms already are producing significant volumes of communication between listeners and traditional broadcast stations. That’s certainly a good development for a station’s profile, but it does raise implications for indirect FCC regulation.

Here’s the Problem

The Commission requires that all written comments and suggestions received from the public regarding operation of a station be placed in a station’s local Public File and retained for a period of three years.

That Rule specifically includes electronic mail messages, defined as “messages transmitted via the Internet to station management.” But does that include “tweets” and other informal social media communications?

If so, how do stations handle the potentially thousands of brief social messages they hope to receive daily from an engaged audience?

The Public File Rule

While the scope of the Public File rule initially was limited to letters, over a decade ago it was amended to include email sent either to station management or to an email address publicized by the station. The Rule permits only three exceptions: First – where the writer has requested that the communication not be made public; Second – when the licensee believes that an item should be excluded from public inspection because of the nature of its content (such as defamation or obscenity); or Third – where a personal email is sent to station employees.

Huge Volume Is An Issue

By their very nature, Facebook and Twitter encourage a huge volume of communication to a station, nearly all of which is bound to relate in some way to some aspect of its operation.

Indeed, the very purpose of social media is to generate lots of brief, cheap and convenient, opinionated feedback.

Must They Be Included?

So, are “Tweets” or Facebook messages sent to a station “electronic mail messages” within the meaning and intent of the Public File rule? If so, they would have to be retained and made available to the public for three years.

The answer, unfortunately, is unknown. The issue has never been addressed by the FCC, whether in the context of rulemaking, a complaint or adjudication.

On informal inquiry, FCC staff has suggested that an answer might be obtained by requesting a declaratory ruling.

But as we lawyers like to say, “If you don’t want to hear the answer, then don’t ask the question.”

It is encouraging that the FCC has generally disavowed regulation of the Internet on both legal and practical grounds.

Email In Your Public File

Years ago, when the FCC had proposed requiring that stations not only place email in their Public Files but post it on their web sites, the Office of Management and Budget declined to approve.

Even so, the risk in seeking a declaratory ruling is that the result might be to confirm that all electronic messages must be included in the Public File. That, in turn, would generate a logistical nightmare.

Just consider the sheer quantity of “Tweets” and similar communications, which already can be overwhelming and only promises to increase exponentially.

Without an indexing system, which the Public File rule doesn’t require, it seems doubtful that anyone reviewing a massive chronological file would be able to locate anything of particular interest.

(Continued on Page 20)



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by Peter Gutmann

– Continued from Page 18 –

Archiving Messages

To compound the problem, most social messages already received over the past three years undoubtedly already have been deleted.

Calls to Facebook's Washington office suggested that it would be risky to rely on Facebook, Twitter, et. al. to store their own traffic (and make it available) for the required three-year FCC retention period.

A corollary concern is the vexing privacy issues with which the social media are grappling nowadays—exposing the messages they convey to the public at large could violate the terms of their user agreements.

A further snag could be to discourage listeners from sending casual Tweets to a station if they knew that their impulsive thoughts would be memorialized and made public for all to see, thus largely defeating the purpose of a social media campaign.

Definition of Email

At the heart of the problem is the broad scope of the FCC's definition of electronic mail.

It could be argued that social messages are indistinguishable from "email messages transmitted via the Internet to station management" and thus are covered by the plain language of the Public File rule as it now exists.

Let's face it – nearly all non-verbal communication nowadays is through email, texting or social media.

When is the last time you mailed an actual letter in a stamped envelope? And how many emails, texts and Tweets have you sent since then? So, it stands to reason that the vast majority of comments concerning station operation are bound to be in an electronic form, and that excluding them would compromise the essential purpose of the Public File rule—to ensure that the public has ready access to communications concerning the station.

Email Equals Snail Mail

Indeed, when the Public File rule was amended to include email, the Commission stated: "there is no fundamental distinction between email and printed letters that would justify treating those forms of communication differently for purposes of this rule."

Both means of communication can be used to convey important comments or suggestions regarding programming, and should be treated in a similar fashion." And lest we need to be reminded of how much times have changed, the rule allows email to be made available "on computer diskette."

In that light, the safest course, although tantamount to a worst-case interpretation of the rule, would be to periodically print all social media communications and place them in the public file (or dedicate a computer at the public file location to storing and displaying them), despite all the problems that would entail.

Yet, while the Commission's rationale once might have been persuasive, the nature of electronic communication has changed drastically over the last decade. In that time, email has evolved far from its origin as being tantamount to (and merely a delivery option for) a traditional letter.

Thus, it could be argued that nowadays the vast bulk of email, and virtually all Tweets, are far more casual in content, having little meaningful bearing upon station operation.

Thus, few Tweets are apt to "convey important comments or suggestions regarding programming," as the Public File rule contemplates. Rather, they have come to comprise a far different category of communication than formal expressions of opinion, and so perhaps their treatment should reflect their special nature.

A Possible Option

A compromise might be to require station staff to review and sort all social media messages and to include in the Public File only those that actually contain genuine input or opinion regarding station operation.

But that task, in itself, could be hugely burdensome in light of the vast quantity of electronic messages a station would hope to receive.

Conversely, any effort to limit solicitation of social media messages would be self-defeating, as it would discourage development of this unique tool for bonding with listeners.

Perhaps the lesson here is that many of the innovative developments that herald the continued evolution of a healthy radio industry are bound to trigger legal complications with traditional FCC concerns.

Hopefully, the FCC will find a way to satisfy its core public interest obligations without unduly impairing broadcasters' ability to change with the times and enhance their public service activities

Peter Gutmann is a member in the Washington, DC office of the law firm of Womble Carlyle Sandridge & Rice PLLC, he specializes in broadcast regulations and transactions. His email is pgutmann@wcsr.com

If you have a comment about Peter's column or if there is a legal question you would like Peter to explore in a future column, please let us know. Email us at: editorial@radio-guide.com



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Safety and Security

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

Radiation – Part 3

by Jeff Johnson

Guarding against danger we can see is much easier than shielding ourselves against danger we cannot see. We need “eyes” to spot danger to which our senses are blind.

This radiation safety series has been concerned with radio frequency – RF – energy, our lifeblood as broadcasters.

Short Review

There are two components of RF energy, the ‘E’ field (electrical), and the ‘H’ field (magnetic). Together, they comprise the electromagnetic field. At radio frequencies the electromagnetic field, in the form of photons, carries our signals out from our antennas.

The closer we get to our transmitting antennas, the greater is the danger from RF radiation.

We discussed previously that areas around our antennas must be defined with warning and danger signs.

Of course, it is necessary for engineers to initially define those areas, and to enter those “occupational” (non-public) areas subsequently.

Area measurements are made with survey sets while personal monitors guard and warn individuals.

RF Monitoring Equipment

There are many survey sets or area monitors available for specific purposes. One is the Narda SRM-3000 – the yellow one pictured in the next column.

The Narda SRM-3000 can be used by broadcasters, radio network operators, measurement service providers, and public authorities, to selectively measure the field exposure produced by individual telecom services, and “assess the results in accordance with the applicable standards,” according to Narda.

Two functions of this set are to give results indicated in V/m, A/m, power density or percentage of permissible limit, and the Automatic computation of contribution of individual services to overall field exposure – the unit’s Safety Evaluation mode.

Various probes provide electric or magnetic, and flat or shaped response coverage.

Detection is performed by diode, thermocouple or compensated diode, with thermocouple for the highest accuracy.



Two Survey Sets, Radiation Meters or Area Monitors

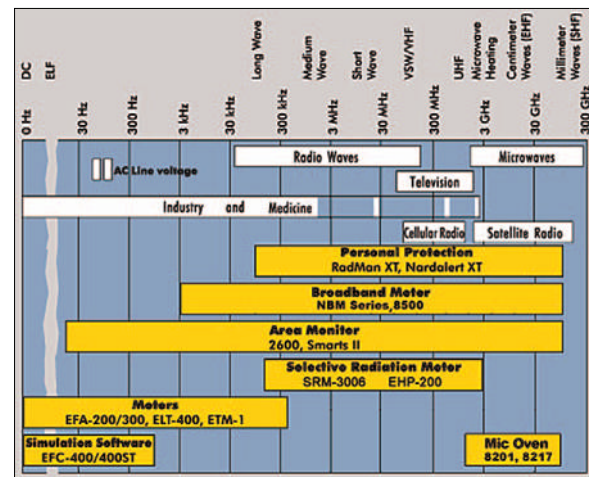


Chart of RF Frequencies and Appropriate Monitoring Devices – Source Narda

Shaped RF Response

Shaped RF response is useful for satisfaction of specific regulatory parameters. For example, a certain field strength at FM frequencies might be dangerous, while at AM frequencies the same field strength will not be dangerous.

Quoting Narda, “Most people are aware that the FCC’s Maximum Permissible Exposure (MPE) limits vary with frequency. For example, the MPE limit for Occupational/Controlled exposure is 1 mW/cm² - from 30 MHz to 300 MHz. The exposure limit is 100 mW/cm² - below 3 MHz and 5 mW/cm² - above 1,500 MHz.”

Why Shaped Response? Problems occur when antenna systems operate at frequencies with different exposure limits. An extreme, but very real, example is a site with an FM antenna mounted on an AM antenna tower.

(Continued on Page 24)



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Safety and Security

by Jeff Johnson

– Continued from Page 22 –

If you were to use a conventional probe that measured all frequencies equally and found that a particular area has an equivalent power density of 5 mW/cm, what would that tell you in terms of compliance and safety? Not much!



SafeOne (left) – Nardalert XT (right)

Specialized Probes and Monitors

The four major exposure standards and regulations – FCC, IEEE, Safety Code 6, and ICNIRP (International Commission on Non-Ionizing Radiation Protection) – all have similar frequency-dependent exposure limits.

Shaped-frequency response probes and RF personal monitors are available for all of these standards.

Warning Signs Mean Monitors Needed

When signage warns of radiation caution or danger, and work must be performed within these areas, personal monitors are required.

In areas of the highest RF radiation strength, protective clothing must also be worn. Protective clothing has a minimum of 10 dB attenuation.

It is important that all closures are secure and tight. In every instance, personal monitors must be worn OUTSIDE of any garment.

Whereas area monitors are omni directional (isotropic) personal monitors have limited response on the side nearest the body. This minimizes spurious reflections from the body of the wearer.

Personal Monitors

Perhaps the most affordable personal monitor available is the SafeOne™ from LBA Technology. SafeOne personal RF safety monitors give you audio and visual warning when the IEEE and ICNIRP limit is exceeded.

It immediately alerts you to high frequency radiation fields that could be a health hazard. SafeOne gives an approximate value of RF strength to help you determine how long you can stay in the radiation field,” according to LBA. The monitor can be set to two alarm levels – general public and occupational.

Narda markets two personal monitors – the Nardalert XT and the RadMan XT.

According to Narda, the shape of the RadMan allows use in three ways: as a warning unit, it is worn on the body by attaching it to clothing using the clip, or to a belt using the belt pouch supplied.

If used as a monitor unit, RadMan is used to check in advance that limit values are not exceeded in areas where humans are present.

To reduce the effects due to the body as far as possible, RadMan is held at arm’s length or the extension rod is used.

RadMan can also be used as a locating unit to locate leaks on waveguides and coaxial connectors.

A vendor of Narda monitors states: “The RadMan monitor is effective, but not as accurate as the Nardalert XT.”

The Nardalert detects only the ‘E,’ electrical field, however it incorporates all three sensor types, the highest frequency range via thermocouple, the low frequency range with a diode-based surface area sensor, and – like the RadMan – the mid-frequency range with a diode-based dipole sensor.

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



The Radman XT Monitor

Please refer to these URLs for further information:

www.lbagroup.com/technology/safeone-personal-rf-monitor.php

www.narda-sts.us


www.rfsafetysolutions.com/Products%20Pages/Personal_Monitor_Technology.html

www.ets-lindgren.com

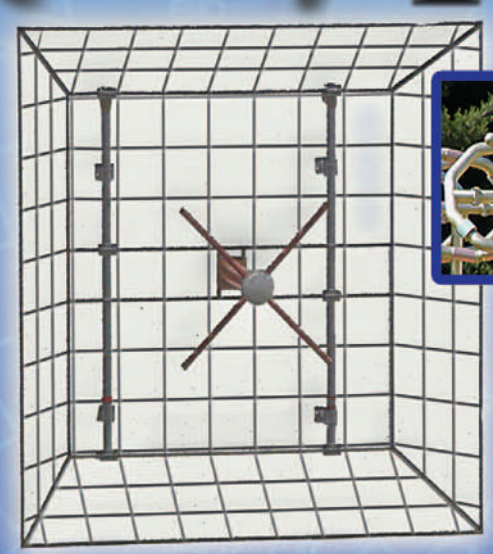
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Operations Guide

How To Speed Up Your Computer

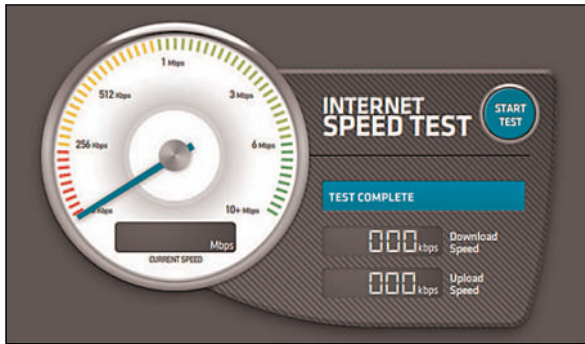
by Chris Tarr

We've all been there before – your once blazing fast computer grinds to a standstill on a daily basis. The honeymoon is over. You want to just kick it to the curb for that younger, sleeker model.

Wait! Help is Out There

There are many ways to get your PC's speed back, many of which are had for the low, low price of *free*. Usually there are a handful of things that make a computer slow down, and 99% of the time it's fairly easy to fix.

Where many people get caught up, is when they assume they need a new machine or – gasp – believe the commercials on TV that there is a magical program you can buy that will fix everything.



Where The Trouble Begins

Let's take a look at where computer speed bottlenecks occur. The two major spots are the CPU, and the hard drive.

The CPU is the brain of the operation. Think of it as an engine. When you're driving slow and the engine isn't doing much, it's pretty easy to step on the gas and get thrown into the back seat. Why? It's because there's plenty of power to spare.

Now take that engine and run it wide open. What happens now when you hit the gas? I can tell you that you won't go any faster!

That's because – to quote our famous Patron Saint of Engineering, Scotty – "I'm giving her all we've got Captain!" You've used all the available resources of the car.

A CPU is the same way. If you aren't running a lot of programs, then the CPU isn't very busy.

So, when it comes time to open your web browser it pops right up. Give it a lot of background tasks to do however, and it will take a long time for anything to happen.

Hard Drive Issues

You can take similar performance hits because of your hard drive. A speedy hard drive is critical to PC performance.

Aside from serving up your files, Windows uses your hard drive as a sort of memory extender.

Memory Hogs

Computer operating systems (OS) require a lot of memory, but sometimes the things they need in memory don't need to be immediately accessible.

So what the OS will do to increase memory and performance, is create some storage space on your hard drive in the form of a large file, referred to as virtual memory.

The OS will then hand off things to that file that it may not need now, but would like to have handy. It does this "swapping" frequently. If there is not enough space on the drive for this file, or the drive access is slow, this process takes more time than it should to complete the swap.



Speeding Things Up

So, how do we speed things up? Here are some tips: Uninstall any unnecessary programs. This should go without saying, but if there is a program you haven't used for a while, get rid of it!

All it's doing is wasting space. Consider buying an external USB hard drive and off-loading your files onto it.

(Continued on Page 28)

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Operations Guide

by Chris Tarr

– Continued from Page 26 –

Comb through your documents folder and delete anything you don't need.

This especially applies to downloaded program files. If you've downloaded and installed a program, there's really no need to keep the installer file. Trash it!

Turn Stuff Off

Turn off any unnecessary "add-ons." You know what I mean – all those little icons to the left of your computers clock that pop-up messages and control little things.



Your Anti Virus Software at Work

Every one of those is like a little program, using up precious CPU resources.

Unless you really need them, disable them or better yet, uninstall them.

Be Virus Free

Make sure your system is free of viruses and spyware. Microsoft has released an excellent anti-virus and anti-spyware program called "Microsoft Security Essentials" – http://www.microsoft.com/security_essentials

This program will not only rid your system of nasties, it will prevent them from getting on to your machine in the first place.

Add RAM

Consider additional RAM or a larger drive. Increasing memory and hard drive space will give your machine a nice boost in speed and capability.

These things are generally low-cost, but have the highest "bang for your buck" factor.

How to Stay Speedy

Now that you've cleaned up your drive, removed those resource-sucking add-ons, and got yourself a memory upgrade. What can you do to keep things speeding along? Here are some tips for you to remember.

Avoid downloading unnecessary programs. Many times, even after you've uninstalled a program, it leaves little bits of code here and there. These bits of code muck up the works.

Watch out for hidden stuff in freebies. The best way to avoid that is to avoid installing the stuff at all. If a free program seems too good to be true, it probably is. There is generally a price we pay for "free."

Scrutinize those downloads carefully, and make sure there's no hidden ad-ware that you'll be installing. Not only is that a security risk, but those programs generally run in the background, using resources.

Remember, the more stuff running in the background the slower the performance of your PC.

Don't Multi-Task

Try not to run several things at once. While, computers are good multi-taskers, even *they* have their limits.

Every browser window or tab that's open, every program you're running, every email you've left open – all take up CPU cycles and memory. If you're done with it, close it up.

Reboot every once in while! Poorly written programs often suffer from memory leaks. These programs ask for resources, but don't let them go when they're no longer needed.

If one of these programs is running in the background, it can bring your computer to it's knees in a few days or worse, a matter of a few hours.

An occasional reboot will unload that program and start everything fresh. That's likely to make a big difference.

A Reboot Batch File

If you're really into automation, try this: create a batch file with this command: "shutdown /l /t /t:00 /y /c" (without the quotes).

Then using the Task Scheduler, schedule the batch file to run every couple of days in the middle of the night.

That will cause your computer to stop whatever it's doing and restart.

If you leave your computer on all of the time, that's a handy way to give it a little refresh.

Christopher "Doc" Tarr is the Director of Engineering for IT at Entercom's in Madison and Milwaukee, Wisconsin.

If you have a Station Ops story you would like Chris to explore in a future column email editor@radio-guide.com

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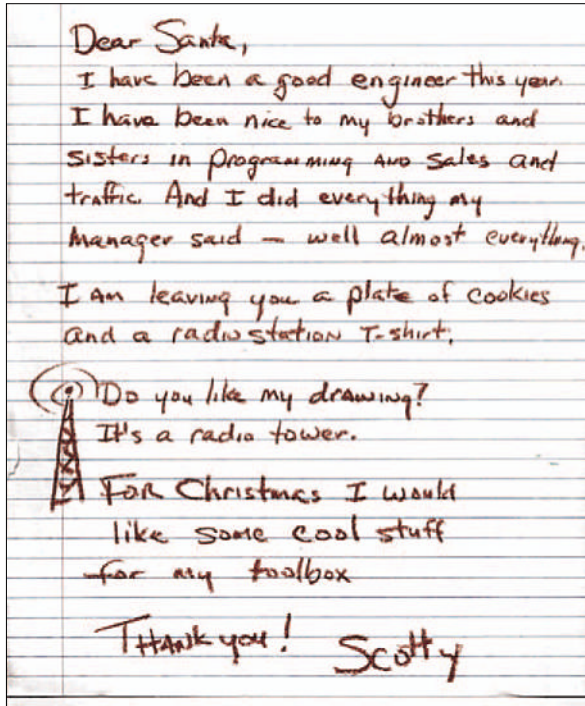
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Chief Engineer

Dear Santa

by Scott Schmeling



Christmas is just a few weeks away. I've been told that I'm a hard person for whom to buy gifts. But, I disagree. Tools are always a very good gift!

Over the years, I've managed to collect some "neat stuff" for my tool box. I'm sure you have, too.

Having the right tool for the job can mean the difference between getting the job done right or struggling with it for a long time and possibly not finishing properly.

So, today I'm going to open my tool box and show you what's inside – it may give you some ideas for your Santa list.



That orange and black device is a cable tie tool. It pulls the tie nice and tight around your cable bundle, then with a twist of the wrist it trims the tab off nice and clean.

You also see two varieties of right-angle screwdrivers. One ratchets and the other is solid. These are incredibly handy in situations where there isn't enough room for a "standard" screwdriver.

These are quite literally two of the handiest, most indispensable tools in my tool box.

The next one is a long Phillips bit for my power screwdriver. It's really handy when the standard length bit doesn't quite reach.

Power Screwdrivers

Speaking of power screwdrivers, when they were introduced my first thought was, "How lazy can somebody be? How much effort does it take to turn a screwdriver?"

I changed my tune the very first time I used one! Our youngest daughter gave me one the next Christmas.

Several years later she told me that it was more expensive than she wanted to spend, but she sees me using it all the time. She felt much better about spending the money. I've gone through several battery packs and replaced the switch once.

Other Great Tools

Sometimes I need to see behind or around something. That's when the "dentist mirror" comes in handy.

It's a small mirror on a long handle and it's perfect for seeing in spaces you otherwise couldn't. Speaking of dental tools, a set of picks is great for picking at stuff – go figure!

The last two items in the first picture are small versions of very familiar tools. There really are times when smaller is better.

(Continued on Page 32)



ACS 8.2 Plus Audio Control Switcher



ADMS 44.22 Analog / AES Digital Matrix Switcher



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Chief Engineer

by Scott Schmeling

– Continued from Page 30 –



Getting a Grip

Here are some “grippy” tools that make great gifts to add to your Santa List. The top item is a three-foot flexible gripper. When you’ve dropped that 8-32 nut inside the transmitter and you can see it, but you can’t get to it, this is just the thing!

Just maneuver the grip end to the nut and press the spring-loaded plunger, four little metal tongs appear at the other end like four very small fingers. Slowly release the plunger and the little fingers grip the nut.

I’ve also got a surgical clamp and a small needle-nose vice grip. I also have a couple “standard” vice grips, one large and one very small. Also, sort of in the gripping category, is a pivoting magnet on a long handle.

Two more of my mini-tools are also shown in this picture. I have a full-size “Wonder Bar” in my heavy-duty tool box, but I have this mini-version in my regular everyday tool box. I don’t use it a lot, but there are times it’s exactly what I need!

And last is a small tubing cutter. It works great for making a nice square cut in the outer jacket of half-inch Heliac.

Great Electronic Stuff

The top two items in the last photo are not actually in my tool box, but I have them with me all the time.

The first is a laser temperature sensor. When you need to check the temperature of something, just point at the spot and pull the trigger, put the dot on the spot and release the trigger. The temperature is displayed on the device. This is great if you suspect a bad connection heating up. You can check the temperature without putting yourself in danger.

One of my most recent additions is a point-and-shoot digital camera. I can’t believe how much I use it.

It’s great for documenting equipment conditions, for showing “before and after” scenarios. You can also take pictures and insert them in instruction sheets to help the “technically impaired” understand exactly what meter or switch you’re talking about.

Electrical “Toys”

My first electrical gadget is an outlet tester. Plug it in an outlet and the lights will tell you if the outlet is wired correctly or not working.

The second goodie is a handy voltage tester. You can put the end into either side of an outlet. The tip of the tester will light up if voltage is present. It’s also great for checking whether a wire is “hot” or not. I also carry a few rolls of colored tape for color coding.



Under the camera is a wrench for type “F” connectors. There’s a slot in it that allows you to slide the wrench onto the F-connector. It makes tightening them a breeze.

Next are three varieties of Sharpie markers. There’s the regular one, an ultra-fine point, and a GREY one for marking on black surfaces. The ultra-fine point is perfect for writing on cables as long as they’re not black.

Warning

By the way, I mentioned at the beginning that tools are always a great gift idea for me. With that in mind, let me say that, conversely, a vacuum cleaner for your wife may NOT be a good gift – the voice of experience!

As we draw near the end of 2010, I’d like to take this time to wish you all a very Merry Christmas, have a safe holiday season, and best wishes for 2011

Scott 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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XL2 (with M4260 microphone)

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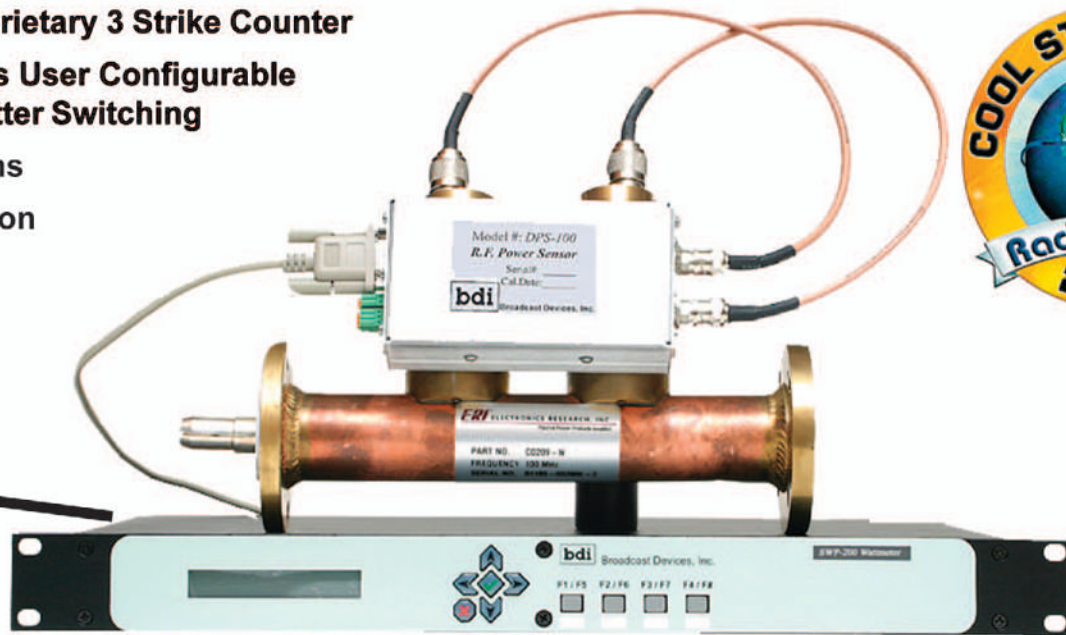
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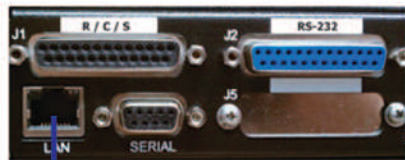
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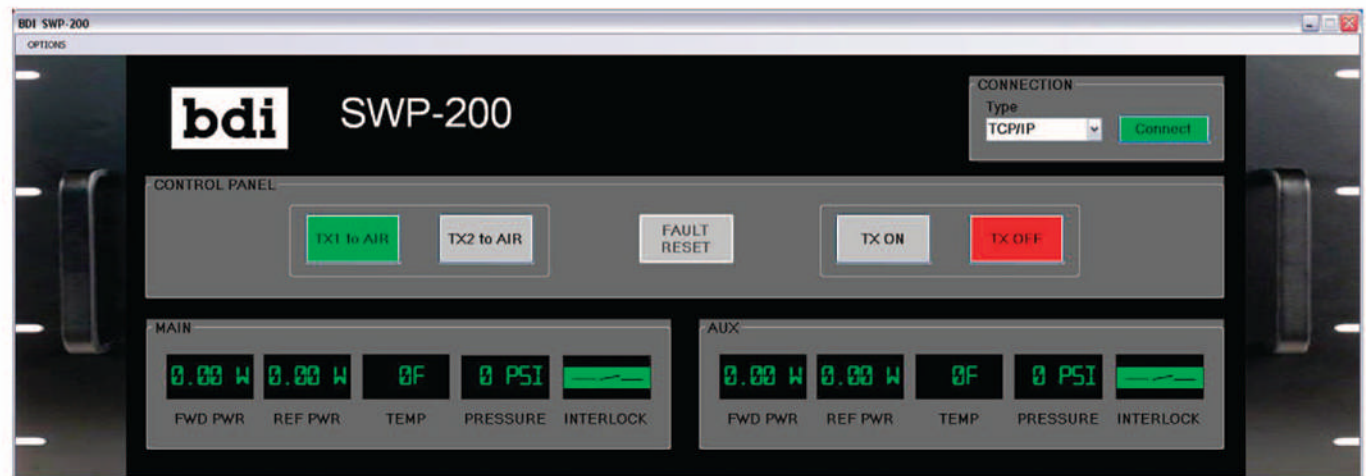
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Screen Shot Of the SWP-200 User Interface



Rear Panel Data Ports



Access and Remote Control is made easy with included Windows software which provides a clear view of vital information. Mobile device users can access this information using readily available terminal emulation software. Further details on this and all our products can be found on our web site.

Field Guide — FM Transmitters

Nautel HD PowerBoost

by John Holt

American University's WAMU in Washington DC is a progressive user of HD Radio™ technology and was one of the first HD Radio multicast stations in the USA.

Last year, we installed a Nautel NV40 transmitter with plans to increase our IBOC power as soon as we had FCC authorization to do so. We found the NV40 very easy to install; Nautel also gave us presets for all sorts of variations of IBOC power settings that could be used.

Desire to Increase HD Output

We began operation at the -14 dBc injection levels in the Spring but were interested in trying Nautel's PowerBoost technology, which uses an enhanced peak reduction algorithm that permits up to 30% more power while improving transmitter efficiency.

This technology also enables the use of asymmetrical sideband ratios, which could let us increase IBOC levels to -10 dBc on one sideband while keeping the other at -14 to protect adjacent channel broadcasters.

Asymmetrical sideband operation has not yet been approved by the FCC so WAMU applied for an "experimental authority" to test the technology.

The FCC gave us a six month authorization; as part of the authorization we have to write up a report on the results of our testing at the end of the six months.

Our next step was to get a new exciter from Nautel that supports HD PowerBoost. We received the exciter on a Thursday – it took me about a half hour to install it in our spare exciter position.

We decided to put it on the air two days later. We found a nice feature of Nautel transmitters is their remote access.



WAMU Running Asymmetrical Sidebands

Getting On the Air

Philipp Schmid, the Nautel engineer who was one of the brains behind HD PowerBoost, was given a login so he could access our system from his office in Nova Scotia.

That Saturday, Philipp logged in, checked out our new settings, switched back and forth between the exciters several times, and then put us on-air with the new system. Once we figured out a few new parameters for our operation, everything slipped into place nicely.

Coverage Increase Reported

We were pleased to see the increase in transmitter efficiency once Philipp completed the adjustments, and the asymmetrical sideband operation worked like a charm.

Listeners reported that there is a noticeable increase in the HD signal.



John Holt (right) with Rich Cassidy (left)

The engineers at iBiquity Digital Corporation, 40 miles away from us, have also noticed an increase in our signal. It appears that we achieved a 2 mile increase per dB.

PowerBoost effectively increased our coverage area an average of 8 miles.

Our initial HD PowerBoost operation includes the asymmetrical sideband operation, but because the adjacent channel stations that need protection aren't on-air yet, we will probably conduct a test in the next few weeks at the full -10 dBc on both sidebands to see what the coverage is.

Painless Process

Overall, this was a painless process. Our Director of Content and Operations, Dick Cassidy, says: "The rewards are incalculable in terms of our expanded coverage, and having Nautel available essentially on request, without having to fly in to our site, is fantastic."

The bottom line: Nautel HD PowerBoost is everything it was proposed to be. It just works.

John Holt is the Director of Engineering and Operations at WAMU. For more information about Power Boost go to www.nautel.com, or email sales@nautel.com



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Field Guide

FM Processors

Inovonics David III

by Kelly Carlson

Buying equipment for a radio station is always a delicate balance of cost versus performance. If you spend too much, there's not enough left to finish the job, and if you go the "cheap and dirty" route, performance and reliability may suffer.

Sometimes you get lucky, and get great performance without breaking the budget. Such was the case when we recently built out nine construction permits for new FM stations. As a non-profit broadcaster operating on donations from our listeners, making every nickel count takes on new meaning.

Selecting The David III

When the time came to make a decision on audio processors for these new builds, I decided to try the Inovonics "David III." The decision was based in part on the good luck we have had with the Inovonics modulation analyzers that we use throughout our stations.

When the David III arrived, we decided to test fly it at our home station, where we could keep our eyes and ears on it in the event of any unexpected problems.

Easy Installation

Installation could not have been any easier. The audio inputs are two XLR connectors on the back panel, and the composite output is located on a BNC connector. All that was left was to apply AC and set up the generator.

The David III accommodates a wide range of input levels, from -15 to +10 dB.

A set of jumpers on the mother board sets the operating level for -15 to 0, or 0 to +10. Everything else is done from the front panel.



CSNI's Daniel Davidson, adjusting the David III.

Set Up Is A Breeze

A single screw-driver-adjust, multi-turn pot sets the input level. Just tweak it until the AGC lights are in the center range with normal program audio. With just one control, there's no hassle trying to adjust left and right separately for balance.

The Master Drive control sets the drive level to the tri-band processor. The more you crank it, the more aggressive the processing.

Bass and Brilliance

The David III includes controls marked "bass" and "brilliance." These are not true "EQ" controls, but rather control the relative amount of energy at each end of the spectrum, and are dynamic in nature, dependent upon program material. The Polarity Independent Peak Processing allows full negative and positive deviation of the carrier with all types of program material.

The David III's composite clipper has a 3 dB range to squeeze the last bit of loudness out of the signal. Once you've tweaked your David III for the "sound," all that's left is to set the composite output level and pilot injection level. Both adjustments are done with screwdriver adjust multi-turn trim pots from the front panel.

Hats Off to Inovonics

I have to take my hat off to Inovonics for the superior job they did on the operating and service manual for the David III. There's a set-up section that takes you by the hand through the adjustment of each section of the David III. It gives clear and concise descriptions of the circuits and how they operate, as well as the theory and justification for each.

Another plus is complete schematics for those of us from the "old school," who repair to the component level. Inovonics also uses garden variety parts, available from dozens of suppliers.

We now have a couple of years experience under our belts with the David III's and have yet to have a failure. Our stations sound great, they sound loud, and they do it for a fraction of the price of other processor/stereo generators. I could not be happier.

Kelly Carlson is the Director of Engineering at CSN Radio International. For more information on Inovonics products go to their web site www.inovon.com or call 800-733-0552

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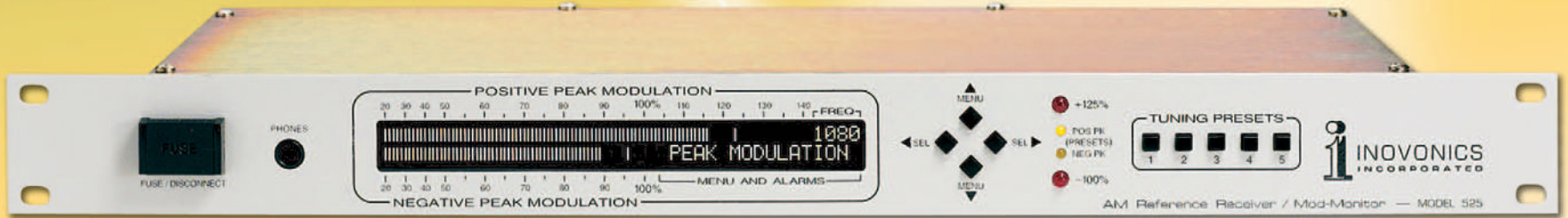
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has five station memories that can be preset to your own station and to market companions. The high-resolution, peak-holding LCD readout shows positive and negative modulation simultaneously, and also switches to display the incoming RF level and asynchronous noise to qualify modulation readings.

Two sets of peak flashers indicate both absolute and user-programmed modulation limits, and programmable front-panel alarms (with tallies) give overmodulation, carrier-loss and program audio-loss warnings. The 525 is supplied with a weatherproof loop antenna.



For full technical details, visit...

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Practical Engineering

Who Builds the Best Promo P.A. Ever? You Do!

by Mike Callaghan

Ah, the promotion people. Overworked, understaffed, and always running late. Make their life better, and you'll never have to buy a T-shirt or key chain again!

And, just how do you make their life better? Easy! Build them a PA system that doesn't break down and is painless to use. Anyone that can use a car radio can use this PA system. Matter of fact, that's what it is. A car radio – with benefits!



Mike's Promo P.A.

P.A. Overview

Built around a normal radio head with a tuner and CD player, the PA uses a Vicor Flat-Pac 150 Watt switching power supply, a Crunch Powerzone P500.2 Class D amplifier, and a Shure SCM262 stereo mixer.

All together it puts out over 120 Watts and weighs under 35 pounds.

The power cord is permanently secured, and there's even space to add a wireless mic.

An unbreakable rubber ducky whip antenna fits in the case. The speaker connectors use patch bay jacks that are virtually indestructible.

High Reliability

As for reliability, I built five of these for KIIS six years ago, and so far we've had just one failure. A large part of the durability is that the parts are built to get bounced around – they're meant to be in a car!

The construction makes a difference, too. Nylon lock-nuts are used to secure everything together.

Getting Started

It all starts with a two-unit-high rack shelf, an SKB 3 RU road case and a Shure SM-262 mixer that's half a rack wide.

This specific mixer has two mike inputs, three high level inputs, and bass, treble, and master gain controls.

The rack shelf is on the bottom, and secures the radio head, the amp, and the power supply. Shelves are usually steel, but if weight is important, spend the extra and get aluminum.

Above the rack shelf, the remaining space is filled with the mixer and the wireless mic receiver.

On the filler panel provided with the mixer are two XLR mike jacks and three large LEDs mounted in rubber grommets.

LED Indicators

The end two are green, and the center is red. The red lights up as soon as the P.A. is plugged in to a live outlet – too many times we've been victims of sockets that are turned off or dead for some other reason. That big red indicator also lets you know if the power dies during an event.

The green LEDs have series resistors and go across the amp outputs. This verifies the speakers are being driven. From inside a promo tent, you can't hear if a channel dies and a speaker goes dead.

It's embarrassing to find this out from a listener. So, the flashing green LEDs are cheap assurance that both speakers are alive and well.



Rear Panel

The rear panel holds the speaker jacks mounted in an insulated block, the standoffs to wind up the power cord, the chrome ball the rubber ducky threads onto.

(Continued on Page 40)

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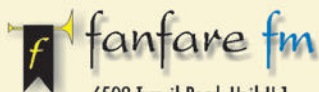
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Practical Engineering

by Mike Callaghan

– Continued from Page 38 –

Two clips to slide the ducky into for transport, are on the back cover as well as XLR female that feeds the mixer with IFB from the studio for remotes. The connections between this panel and the parts inside all plug into each other.

The mixer has a IEC power connector on the rear, and this feeds from a short cable connected to the AC power block. This same block feeds the power supply.

The speaker and power connections use pre-made plug and jack cables. These are supplied with matching plugs and sockets on each end. You cut and strip them in the center for circuits you'll need to unplug later. The last connection is the radio antenna, and this pushes into the back of the radio head. Note that the rear panel is recessed inward.

Front Cover

The front perforated cover is two units high and has a rectangular hole for the radio head. It fits on the lower left side. The right side is left intact, and allows you to look inside and see the emblem glowing on the power amp.

The connection between the LED panel and the power amp is also a pre-made cable. This allows removing the mixer panel easily.

Easy Work On

Rare as it may be, working on the system is simplicity itself. Unscrew the rear panel from the road case, unplug the cables, and set it aside. Then undo the front rack screws, and slide the rack shelf and mixer out the front.

There are a few caveats to address when you start gathering parts.

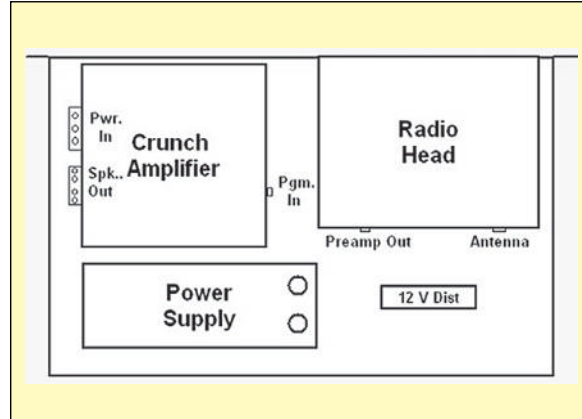
The radio head must have rear panel preamp outputs. These are what feed the mixer. A USB and/or SD card slot is useful as well.

If you stray away from the Crunch power amp, make sure it will fit before you buy it. The same applies to the Vicor power supply. These are expensive if you buy a new one. There are numerous switching supplies about the same size, and don't overlook the numerous surplus vendors on the Internet. Avoid a power supply that has a fan.

Rack Shelf Layout

Lay the parts out on the rack shelf and mark where the holes go. Use the photo for a reference.

Leave space alongside the amp to wire the power and speaker posts.



The Euro Barrier strip for the DC power goes behind the radio head. Measure how long the bolts need to be and make a list. Use the largest size hardware that will fit. Buy nylon locknuts for each bolt.

Radio Mounting

The radio can't use the standard mounting hardware. A heavy angle bracket secures the unit's rear mounting screw to the shelf. Make the rectangular hole in the front perforated cover.

Then slide in the DIN mounting sleeve before measuring for this. The lip around the sleeve is very small, so be careful the hole for it is straight and parallel to the edge. Make the hole slightly small and use a gentle flat file to just get the sleeve to slide in.

After mounting the sleeve, temporarily fasten the perforated cover to the rack shelf with #10 hardware. Put the shelf on a workbench and slide in the radio head.

Place the angle bracket behind the radio and place a small level on top facing fore and aft.

Then, while the radio is level, mark where to drill the vertical on the bracket so the radio stays level. Afterwards, mark and mount the bottom of the angle. Buff off the paint around the rear screw – this is where the ground ties to the power supply negative output.

Next time, we'll do the power and LED wiring cables and get the parts hooked up.

Your Homework

Your homework until then, is to find an old 1/4-inch patch bay and liberate two jacks from it. We'll use these for the speaker jacks. Use the parts list in the on-line Nov/Dec issue to gather the items needed. When you purchase your RCA plugs be sure to get the ones with a firm grip – a loose connector could ruin someone's whole day.

Mike Callaghan is the Chief Engineer at KIIS-FM, Los Angeles. Mike has provided excellent photo documentation on this Remote PA. We have provided the parts list for the project and all photos on line, as extra pages in the digital version of the Nov/Dec Radio Guide, found at www.radio-guide.com

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Small Market Guide

Incentive\$ to Go Green

One of the biggest issues facing small market stations is financial survival in very tough economic times. While some owners are playing it close to the cuff when it comes to equipment purchases, others very prudently are taking advantage of some nice tax incentives to begin going green. They are harvesting the benefits of increased profits by immediately reducing their operating expenses – now and in the future.

You Don't Have to Go Off the Grid

A big misconception that some radio station owners may have, is that they need to be 100% off the grid to make it worth their while or investment.

This simply isn't true. So here is a chance for you to become a hero to your station's owners by saving them money, both in the short term by getting grants or rebates, and in the long term by lowering operational costs.

Let's Start With Your Building

Many utility companies are offering energy efficient lighting to businesses – totally free or at greatly reduced prices.

Most will gladly come to the station and do a *free* energy audit to show you where even small changes will save money on your utility bill.

Why? Because utility companies are under Federal and state mandates to help customers reduce power consumption, and they receive incentives to do so. They benefit and you benefit.

So, bring in the power company's energy efficiency expert to help you be a hero, and then with their help develop a plan for the station to become more efficient.

So far, we've been able to help you get reduced cost or free energy efficient lighting – lowering your capital investment. We've helped lower the electric bill which lowers your operations budget, and we've helped with something else – which may be the crown jewel in the plan to lower your carbon footprint – additional tax deductions.

The Energy Efficient Building Deduction

There are additional incentives to reducing power consumption besides just the immediate savings on the station electric bill.

If you can bring your building into compliance, the station can receive a Federal tax credit of up to \$1.60 per square foot. The total energy consumption cost of the station must be reduced by 50%. The deduction is for energy-efficient commercial buildings.

Buildings that have certified systems installed, but don't make the 50% cut, are eligible to receive a \$0.60 per square foot deduction. There are specific qualifications laid out in Internal Revenue Code section 179(D).

You Don't Have to Own the Building

The best part of this incentive is that your station doesn't need to own the building to qualify. The tax credit goes to the entity that pays for the systems that allow the building to qualify.

This means that a renter can qualify for the incentives if they pay for the improvements.

Many states and the Federal Government are offering tax incentives to install more energy efficient appliances as well. These apply to businesses too. Perhaps now is the time to replace the station refrigerator or hot water heater.

A Lot More

But we've just scratched the surface. The ultimate goal is to help reduce your station's carbon footprint. These ideas will do that.

But what if there was a way that you could make money from the electric company every month. Not an energy credit, but cash payments. Would you be interested?

Renewable Energy Generation System

I'm talking about building a renewable energy system that would feed the grid and bring you back some green in the form of cash from your power provider. Best of all, you can get part – possibly most – of this system paid for by non-refundable grants and tax incentives.

There are government programs to do just that. For wind and solar power, you can get 30% of the cost of the project from the Federal Government as up-front money to reduce your capital investment.

Most states and local utility companies have similar programs. Drawing from these money pools should cut building cost considerably.

Double Check Before You Jump

One word of caution. After you do your initial research on any of these ideas, be sure to check with your CPA to be sure the station qualifies for the tax incentives. Even if you can't get the tax incentives, the ongoing operational savings alone may justify the investment. – *Radio Guide* –

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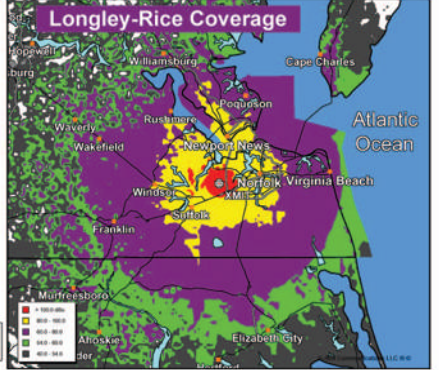
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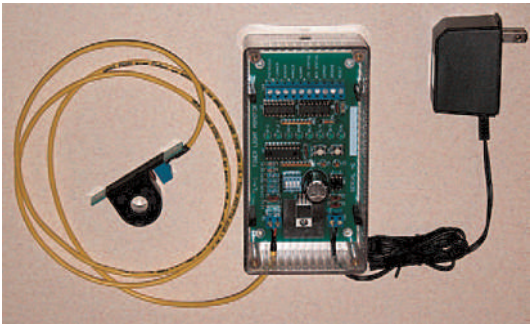
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RADIO GUIDE

 www.radio-guide.com

IMAGINE THERE'S NO IP HASSLE. IT'S EASY IF YOU TRY.

Preface... Clear your mind. All that anxiety that you've come to associate with the typical AoIP network install is going to leave you now... Think of cool clear water flowing into the coffee maker and the sound of sprinkles hitting fresh, hot donuts... OK. Ready?

1. OPEN

Confront your boxes. You know they're there. They know they're there. But only YOU have the power to change that. Go ahead... open them.



10:03am

2. LOOK

Take a good look at what's in the boxes. You've got a control surface mixer item and rack mount BLADE something or other. They sure look pretty. And they are. Using this stuff you are gonna be a chick magnet. Or a guy magnet. Whatever, you are going to be IN CONTROL. Cool part is, THAT is only moments away!

Every BLADE has all the information about your entire network stored in it. Should any part of the network go down, the rest continues to function perfectly. Simply plug in a new BLADE and you'll be where you started in moments!



10:09am



3. RACK EM UP

Rack mount the rack stuff. OK, we're going to be brutally honest here. THIS SINGLE ONE STEP takes the longest of the entire setup process (unless you have a REALLY dull knife in step 1). Of course you'll need your own rack and screws, but hey, if it's a deal breaker, we'll work it out.

10:20am

4. PLUG IN

Time to hook them up. You knew it was coming. Your little tummy is wrapped around your throat. I mean, it's gotta be a real hassle, right? Interfacing these things? Setting them up? Getting them to talk to each other? Somebody get me an antacid. Wait... is that a CAT-6 cable? You know what that is. And that's all it takes? Mmm Hmm. Yep. You bet.



11:02am

It's literally this easy. WheatNet-IP has all your bases covered. CAT-6 cables hook up the BLADES and surfaces. Regular audio cables for the rest.

5. PUSH THE BUTTON

OK. Everything all hooked up (meaning, is the CAT-6 cable plugged in)? Great. Now we're gonna configure the system. We start by turning it on. Then? Um... that's it. It configures itself. Every piece talks to every other piece and does what it's supposed to do. What? Doesn't EVERY IP Audio system do it that way?

11:05am

WheatNet-IP does ALL the work of configuring your system EVERY BIT OF IT! It knows when you are adding on or when you are taking something out. You concentrate on content. We concentrate on getting it where it needs to be.



6. IT'S WORKING!

You've got a system! From here on out, it's just like the analog stuff you're used to. Except ultimately more flexible. And much more reliable. And better sounding. And completely expandable. And such a joy to use. Yes - you heard it - I said A JOY TO USE! (Bet you never thought you'd hear an IP system described that way. Certainly not one from the other guys).

11:06am



7. CELEBRATE

Time for that cup of coffee and donut we talked about in the preface. Let's face it...the whole process was painless. AMAZINGLY PAINLESS. So painless, you are already up on Facebook and Twitter talking about what a stud muffin you are with your technical prowess. Don't get cocky, kid. But DO enjoy a delicious coffee and donut. And remember, next time you even think about installing new gear, you've gotta call your Uncle Wheaty...

11:07am



AoIP ADVANCED...

It's great to be able to say you invented something (whether you did or not). Turning that invention into a viable, workable solution for modern applications is what's needed if we are going to take this technology to the next level. The status quo was a pretty good starting point - but taking it out of the vacuum and into the workplace requires a fresh, objective yet passionate approach to advance it. WheatNet-IP certainly advances it, making your workflow everything it should be. We cost the same or less. We can handle 10 times the bandwidth. We are far more reliable. And we're poised for THIS decade as well as the NEXT one. We're Wheatstone! This is what we do! What else would you expect?



3:40am

8. SLEEP EASY

With a WheatNet-IP system, rather than having to be on the phone to who-knows-where in the middle of the night, you can take your emergency engineers off the clock and let them get a good night's sleep. We ARE here, 24/7, in beautiful New Bern, North Carolina, and if you need us, we'll talk to you all night long. But with Wheatstone's reliability record, chances are much greater that those visions of sugar plums will just keep dancing in your head.



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