Radio Guide

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May-June 2010 – Vol. 18, No. 3

CircuitWerkes – The Accidental Company

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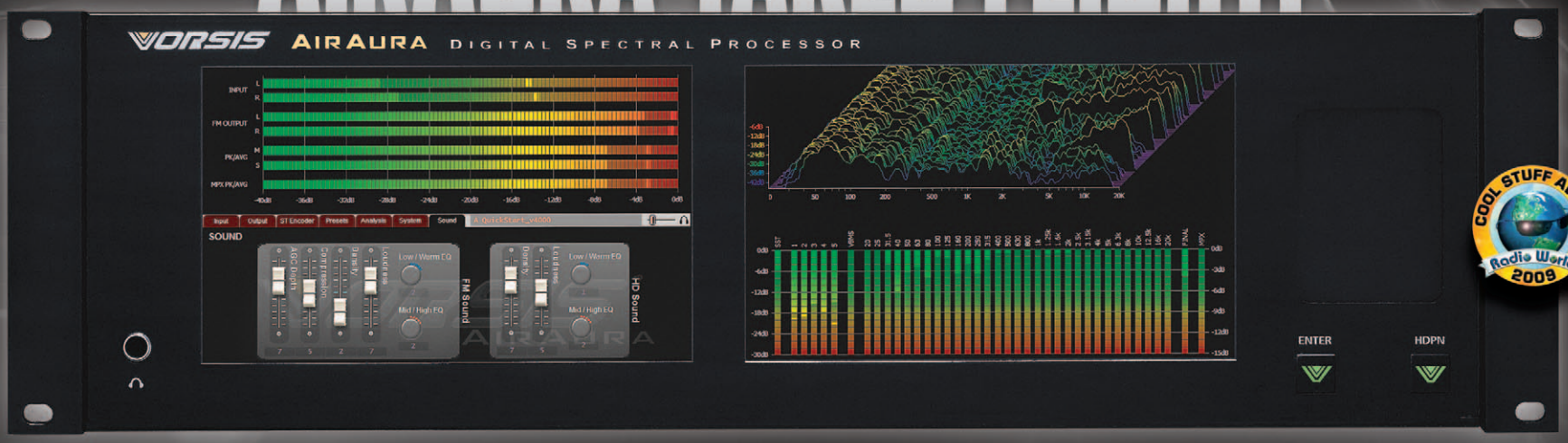

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Cover Photo:

The CircuitWerkes team: from left to right: Kyle Magrill, Shelley Selznick, Barry Magrill, Alex Lizardo, and Dmitri Kisten.

Radio Guide

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Radio Waves

by Ray Topp – Publisher

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For more times than I can remember, and a lot longer than I care to admit, we had been asked to place a digital version of ***Radio Guide*** on-line.

We finally tried one version, but found that the issues were too slow to load, too expensive to create, and really didn't have the features or user interface that you had been asking for.

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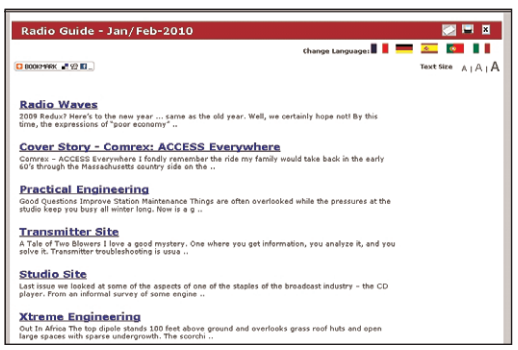

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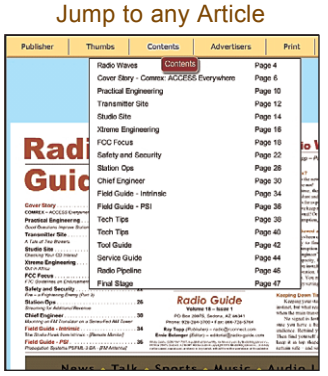

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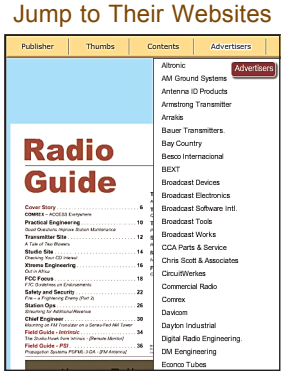

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Cover Story

by Ernie Belanger

CircuitWerkes – The Accidental Company

I imagine that most manufacturing companies are started when someone has an idea that they want to produce and sell. CircuitWerkes was founded by a lucky request.

Before CircuitWerkes

In the late 1980s, Kyle Magrill was the Vice President of Engineering for a modestly sized radio broadcasting company called First City Broadcasting. First City Broadcasting was supposed to be buying underperforming stations, in or around top 50 markets, and turning them around.

Kyle spent several years flying from city to city, building out studios and transmitter sites, tackling local ordinances, negotiating with the Bureau of Land Management, and racking up a lot of frequent flyer miles.

Like all new companies, First City had a 5-year plan for profitability. In 1989, however, the principal money behind the group was in financial distress, due to other failed investments in the big recession of 1987.

Not Good News

Word spread that the group might be sold off, either individually or as a whole. This was bad news since the oldest of the stations was only four years, and had just managed to start making money.

The rest of the chain was still struggling. It looked like Kyle was going to be out of a job pretty soon and might have to move from Florida to Connecticut, to become the Chief Engineer of one of the group's former stations. Being a tropical soul, this wasn't the most desirable option for him.

The Accidental Company is Born

In the midst of the First City Broadcasting breakup, a local Entercom Chief Engineer approached Kyle with a project that Entercom wanted to build. The idea was for a telephone dial-up, remote-controlled listen line.

Like many listen lines of the day, the device was to answer a phone call and play a radio down the line to the caller. The twist was that the radio needed to be controlled by touch-tones. Not having a clue about telephone circuits or DTMF decoding, Kyle turned to a rising star in the First City Broadcasting group, Mike Hagans.

Mike had quickly moved from smaller markets, up to Phoenix, and had left an impression everywhere. He was personable, easy-going and very knowledgeable. Although he had recently left First City Broadcasting and gone to work as the Chief for Pulitzer's Phoenix FM station, he had remained in touch.

The Brain Trust

When the project was proposed, Mike felt that he had the knowledge needed to complete the job. So, the project was divided up, with Mike handling the telephone interface and DTMF decoder, and with Kyle tackling the telephone hybrid and radio.

Now remember this was several years before the Internet became common – designs were faxed back and forth and a lot of time was spent at the library researching design ideas. After bread-boarding dozens of ideas, a rough design emerged and was supplied to Entercom.

They had some suggestions, but liked it well enough to order four more of them. They decided to call the product a TeleRadio, a contraction of "telephone-radio."

Product Spin Off

As those four units were built, Mike and Kyle began to discuss the individual circuit designs that had gone into the TeleRadio. There was a telephone auto coupler, a full DTMF decoder, a telephone hybrid and a radio tuner. They realized that the telephone coupler and DTMF decoders could each be their own product.

In addition, the telephone coupler and DTMF decoder could be combined to form a simple dial-up remote control. So, out of the TeleRadio, a total of four products could be made.

In early 1990, CircuitWerkes was officially formed with $2,000 of seed money from the two partners. Mike worked out of his garage in Arizona and Kyle worked out of a spare bedroom in Florida.

Industry Introduction

That first year, Mike and Kyle went to the NAB show, with the products in hand, and showed them to all of the major broadcast dealers who were at the show that year. Broadcaster's General Store and Crouse-Kimzey Company were the first two dealers to agree to sell the new products.

At NAB 1991, the duo showed the product to Scott Beelor, then of Harris-Allied, and he enthusiastically agreed to start selling the products.

In addition, Bradley Broadcast, SCMS and several other companies began selling CircuitWerkes products within that same year.

Transition and Growth

Eventually, Mike moved to Florida to become the engineering manager for Jacor's Jacksonville stations. A lot of new products were designed over the next few years, but in 1999, Mike left CircuitWerkes to become the Vice President of Engineering for Premiere Radio Networks in California.

By 2000, CircuitWerkes had grown large enough that it just couldn't be run from a garage anymore and it was moved to its current location in 2001. In 2004, new engineers were hired for the first time since the company's inception.

Although its staff has grown over the years, CircuitWerkes has intentionally remained a small company that values its customer relations. "We have a 'customer is always right' policy," explains Kyle. "If there's a problem, we fix it first and ask questions later. It most often turns out that the problem wasn't really on our end at all, but our goal is always to just fix the problem so that the customer is happy." says Kyle.

Customer Motivated Products

In addition to keeping the customers happy, most of the new product designs are started by customer requests. The MicTel is one example of a customer-requested product.

Customers wanted to replace the old Microtel that was designed in the early 1980s, but was no longer available since Gentner went out of business.

The Microtel was an inexpensive way to get audio in or out of a telephone set. For its day, it was a nifty little bit of engineering, but it did have some serious shortcomings.

Improved Design

When CircuitWerkes looked at the original designs for the Microtel, they saw a lot of room for improvement. In the 20 plus years since the Microtel had debuted, technology had advanced quite a bit.

Limiters were added to both input and output channels, and all of the inputs and outputs were made switchable between balanced and unbalanced operation – plus a cellphone jack was added.

The final MicTel design had better frequency response, higher output levels and, thanks to its new limiters, nearly zero distortion compared to the Microtel.

Battery life was impressive, having gone up from about 3 hours in the Microtel, to over 30 in the MicTel.

The Design Process

Each new design starts with an engineering meeting, where the idea is developed to see what features will be included. This becomes the blueprint for the eventual design.

During the meeting, the product idea is also evaluated to verify manufacturability, and if the final product will satisfy a needed niche in the market.

Kyle explained that CircuitWerkes does not like to design products that compete directly with those that are already doing a good job for broadcasters. CircuitWerkes focuses on developing innovative new products.

Ideas that survive the initial meetings are developed into prototypes, and eventually production units. In most cases, this involves creating a schematic, designing a PCB, laying out front and/or rear panels, and writing new firmware. Software may also be written to accompany the new product.

The Sicon-8

The Sicon-8

The most complex and powerful product that CircuitWerkes has produced so far, is their Sicon-8 remote control. Originally conceived as a simple, 8-channel, talking dial up remote control, the Sicon-8 took on a life of its own, in response to customer feedback.

The final product ended up being an 8 channel dial-up controller, but it is also expandable to 32 channels, and has an integrated Web server for control over the Internet. The Silcon-8 also comes bundled with free multi-site capable software that can be used for setup and control of one, or many units.

Sicon's Firmware

The Sicon's firmware is a proprietary, cooperative multi-tasking, real-time-operating-system that uses subprocessors for various tasks. The firmware is designed to be crash resistant. This means that a failure of one part of the system normally won't disable the entire Sicon-8. There are over 35,000 lines of code in the software and over 12,000 lines in the main firmware.

(Continued on Page 8)

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Cover Story

The Accidental Company

Continued From Page 6

The Sicon-8 was five years in development. The final result was a remarkable product that has very impressive capabilities for a modest price of under $1,300.

New Products Soon to Hit the Market

Several smaller remote controls are also in the final development stages at CircuitWerkes.

The SiteSentry6 is a six channel, Web-only junior sibling to the Sicon-8. Sharing much of the Sicon-8's firmware. The SiteSentry6 includes a real-time, battery-backed clock with event scheduler, adn critical and non-critical alarm handlers.

An on-board USB port is available for programming and local control. There are four status inputs, a stereo audio sensor and an on-board temperature sensor. The front panel includes an LCD display for local operation. Conveniently, the same Sicontroller, multi-site software that comes with the Sicon-8, can be used to program or operate all of the SiteSentry6 and Sicon-8s.

A New Web Only Remote

The SiteSentry2, an even smaller Web-only remote control, was introduced at the recent NAB. With only two channels of metering, you might think at first that it's a little under-powered, but the SiteSentry2 has enough power to handle the basics and maybe even a little bit more.

The SiteSentry2 was designed to make remote control affordable for facilities that might otherwise not be able to own a remote control.

Besides the two channels of 10-bit analog readings, there are two optically-isolated status inputs, six relay outputs that can be latching or momentary, a true-stereo silence sensor, and an on-board temperature sensor. Two of the relays are DPDT, and can be used for remote switching of balanced audio.

The $329 sticker price makes the SiteSentry2 a sweet deal for small stations – those that want a handy way to Web-control six relays, or even for those that want to have an inexpensive, Web-enabled backup controller for their main remote control. It can even be used as a stand-alone, four-channel audio/silence monitor.

The Web Gain 4

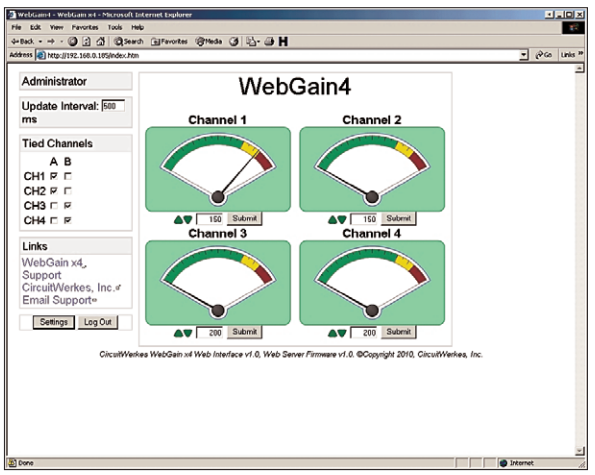
Something novel in CircuitWerkes' Web lineup of products is a four-channel, remote audio controller/mixer called the WebGain4.

The WebGain4 has four balanced, mono inputs and outputs. The integrated Web server lets users adjust the gain of each channel while viewing the output audio level on its own meter. A front panel LCD with controls allows for local control of the WebGain4, too.

On the back panel are two mixer outputs that allow the WebGain4 to be used as either a 4-channel mono mixer or as a two-channel stereo mixer.

Base Product Lines

Of course, CircuitWerkes continues to build a lot of the same products that many engineers have come to know and use over the years – from their line of telephone couplers, to DTMF and Subaudible tone equipment.



The Web Gain 4 Control computer control screen.

Some products have been in continuous production since the early 1990s and a lot of those products are still working at stations nearly 20 years later.

Private Branding

In addition to their own product line, CircuitWerkes designs and builds privately labeled products for clients. Privately labeled products account for about 25% of their business and that has steadily increased over the years.

Some custom products have been produced in quantities as low as 25 units, so if you need a few gizmos made for you, give the CircuitWerkes guys a call. They're always happy to talk.

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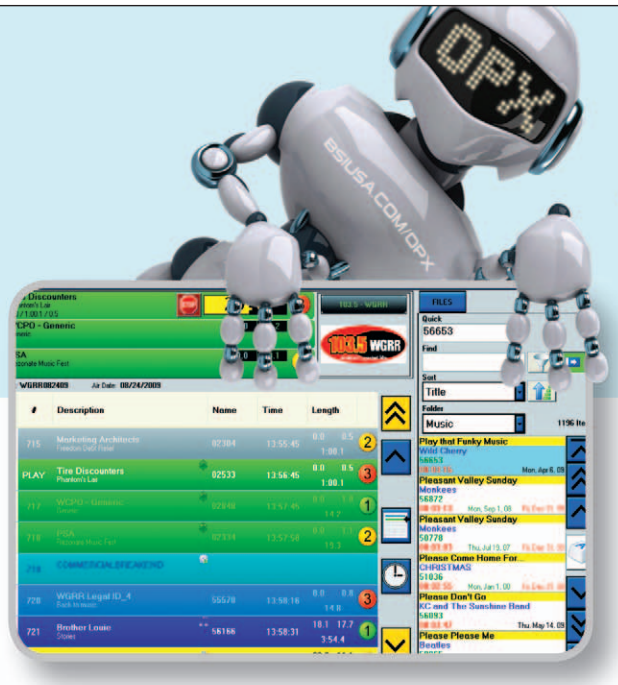

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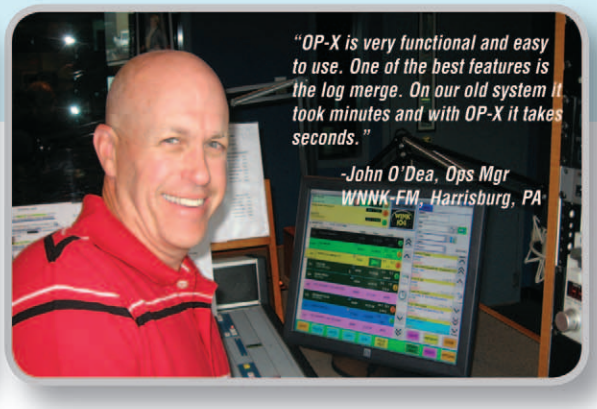

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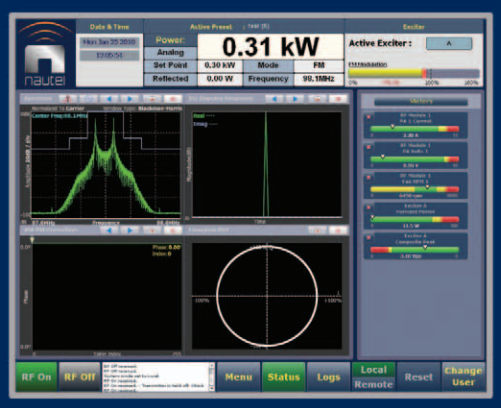

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Xtreme Engineering

By Steve Callahan

Murphy Defeated

Xtreme Engineering isn't always a new build with major issues. On occasion it is Herculean effort to get a station back on the air after a disaster.

Memories of a Previous Flood

This year's historic floods in Rhode Island brought back memories of another flood back in the spring of 1996, at WLOB-AM in Portland, Maine. This was my first look at the destructive power that water can wield on a radio station. Read on for how a station slowly came back from a muddy fate.

1996 Flood Water
Presumpscot River, Westbrook, ME

The four-tower WLOB array is located in Westbrook, Maine and the Presumpscot River practically circles the property. The studio and transmitter are located in a concrete block building on the property. It was a very popular rock and roll station in the 1970's, but at the time of the flood it was a respected religious station.

The Call

The owner got a call one night from the local manager that the water from the river was approaching the back door of the building. There was nothing to panic about yet, because this had happened in the past during some heavy rainfall. The next morning the local manager called back and said the water was coming in the back door so he pulled the main circuit breaker and evacuated the building.

What a Mess

Several days later, when the roads – including the Maine Turnpike – were reopened, the owner and I went to WLOB. The Portland Press Herald had a front-page picture of the four towers with muddy water twenty feet up the tower, way over the roof of the transmitter and studio building. As we entered the property, the first thing I saw was only three doghouses, where once there had been four.

There were pine branches stuck in the towers at the high water level. The building was full of mud and all of the equipment was full of fine silt. The old Gates BC5P was full of mud and the even older General Electric 250 Watt auxiliary transmitter was also full of water and silt.

There was a tube UHF TV transmitter on the site for a co-owned LPTV, and it was also full of mud and silt. But this was just the beginning of what we found.

Forget about all the studio equipment, it was thoroughly waterlogged and full of mud.

A Little Glimmer of Light

Fortunately, I had planned to retire the General Electric transmitter and move the aged BC5P to backup status. I had recently purchased a used CSI 5kW transmitter from a station that had received a power increase – it was just one channel away from WLOB. The CSI transmitter was safe and dry in a warehouse in New Hampshire.

However, there was a lot of work to do before that transmitter would arrive. The job at hand was to get WLOB back on the air somehow, someway.

Clean Up Begins

The studio building was knee deep in mud and the mud smelled – just plain bad. It was dark because the power company disconnected the electrical service at the service entrance.

What was once a fine radio station was now a mud filled cave. We weren't the only business affected by the flood, so the building trades in the Portland area were very busy. We had to wait our turn to start the demolition process.

We managed to get the mud out of the building with hoses and shovels. All of the wood paneling and sheetrock had to be stripped off the walls, along with all the inside electrical wiring. We had to dispose of all the office furniture as well.

RF Plant Cleanup

I took a look in the transmitters and the phasor, and the silt had dried to the consistency of fine face powder – it was in every crack and crevice. There was already a lot of rusting and corrosion starting on bare metal surfaces. We tried rinsing the LPTV transmitter amplifier trays with clean water, but it just moved the fine power around and even deeper into the equipment.

We focused on cleaning the phasor and restoring its operation. Flushing the contactors with clean water and lubricating them, got them working again. The tapped inductors and caps came through with no damage and they just needed flushing and cleaning. We finally got a building permit and permission from the local inspectors to put in a temporary electrical service similar to the type used by new houses under construction.

Not a Lot to Work With

I had four towers, three ATUs, one phasor and nothing else to get WLOB back on the air.

I contacted Broadcast Electronics and they shipped out one of their small 500 Watt AM transmitters. Then I called Phasetek and asked them to send out an ATU. The closest tower to the building was Tower #4, and that was the one without its doghouse.

It took a week to get the ATU box and the transmitter, so I removed the RF feed to Tower #4 from the phasor and got an AC feed from the temporary service panel. When the new ATU arrived, I tuned up the Tower #4 impedance and just left the inputs to the other three towers open.

Back on the Air

Fortunately, the owner had an FM station about 60 miles away, and a good FM antenna on the roof of the building brought in his FM signal clear enough to rebroadcast.

I got WLOB back on the air with a Special Temporary Authority from the FCC at 500 Watts non-directional, to maintain service to its listeners in the Portland area. Even though the local building inspector said that every inch of old wiring in the building had to go, I fortunately got to keep the old coax, sample lines and control cables to the towers, since most of that was outside the building.

During the reconstruction, I got a call from our regional FCC inspector who had been visiting FM stations in the Portland area. At the last minute, he decided to stop by WLOB on his way out of town. He was amazed that the station was even on the air under these conditions and laughingly asked me where the Public File was. I told him it was probably in the Atlantic Ocean by now, but we were doing our best to recreate the contents.

KLOB's studio was completely submerged. Tower #4 is in the background.

The Lengthy Process of Recovery

Over the months, an army of carpenters, electricians, and plumbers all did their thing, and WLOB got brand new studio and offices. One Friday afternoon, I headed to Portland with some new studio equipment to meet the new studio furniture that was on its way.

The studio furniture was there when I got to Portland, but unknown to me, there was also a huge convention in town that weekend and every hotel or motel room for 50 miles was booked. I spend the weekend wiring the new studio and sleeping on the new studio floor.

New Transmitter Installed

Finally, it was time for the stored CSI transmitter to be delivered. When it got there, it was thoroughly cleaned, small parts that were broken were replaced, and a new crystal installed.

It took several weeks to get the day and night patterns back in tolerance, and to get the data needed for the required non-directional, day and night proofs.

When we finally fired up the CSI at full power into the day array, it was the end of a very challenging project that seemed like it would never end. That day the local manager asked me "Do you know what day it is?" He then reminded me that it had been exactly one year to the day that the flood waters that had taken WLOB off the air.

Recently, as the floodwaters rose in Rhode Island, I couldn't help but remember that year in Portland Maine, and what it took to bring WLOB back to life.

Steve Callahan is the Director of Engineering for Rhode Island Public Radio. Studio photo courtesy of www.necrat.us

Note: Steve's only regret is that he was so focused on getting the station back on the air he didn't take pictures of the process.

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Transmitter Site

Of Brush Hogs and Weed Whackers

By Tweaker

It seems like yesterday that I wrote my first transmitter column for ***Radio Guide***. It's hard to believe that it is a year already.

Battle of the Weeds

Like many of you may be doing right now, I not so fondly remember battling the weeds, volunteer "trees" and other nasty vegetation at my transmitter site.

Weeds Are the Enemy

And as I get ready to do battle once again, both within the tower fence next to the building, and at those anchor points, this year I've got a plan.

As I sit here, I vividly remember the endless hours of sweat, keeping the bush from overtaking the building year after year. The light finally went on.

An Epiphany

It dawned on me this past weekend, as I readied my yard for my daughter's upcoming graduation. The realization was, that years ago I should have taken the advice of the landscapers on TV and invested a few hours and a few dollars working some of their ideas into my transmitter site.

Remember Rule #1: Work smarter, not harder – and don't repeat the same tasks, if at all humanly possible.

The Plan

So here's my plan, and perhaps it could become your plan this year.

First, I plan to go out and hog, whack and cut down all the same stuff I did last year and the year before that – and the year *before* that. All that is, which has started growing back again this year.

Then I plan to use a big mower to cut the grass (weeds) down as close to the ground as I can. Man, I want to kick up some dirt, and cut them to the ground if I can. (OK, so perhaps this is sounding too bizarre, and one shouldn't seek revenge for years of weed torture.)

Anyway, I plan to do this both inside the tower fence and for at least three feet from my transmitter shack and my anchor points. I may get aggressive and do the same for a couple of feet outside the fence too.

The Material List

I plan a quick trip to a home center for some herbicide – actually *lots and lots* of herbicide, weed blocking cloth, and some kind of edging. I think you probably have figured out where I'm going with this.

With all this in hand, I'm going to apply the herbicide liberally, to kill off everything where I've cut. In about a week, I should have nothing but dried out weeds. I then plan to rake up (with help of course) whatever will pull easy.

Now for the Weed Cloth and Borders

My plan is to lay weed cloth, covering everything that I've killed off. Following directions on the cloth roll, I'll be sure to overlap the cloths runs as suggested and stake down the cloth. This should provide a barrier to prevent re-growth and new growth.

Next step is to place my borders. I think Ill get the ones that give me about four inches both above and below the ground. This should prevent future encroachments from either direction.

Time for Rocks

With measurements in hand, it's off to my favorite quarry, to price out some pea stone, granite chips or other rock that will fill the bill. My plan is to get the least expensive stuff that will work.

I looked at possibly just using mulch as a cover, but that tends to break down with time and I don't want to have to budget for that every couple of years.

Likewise, I thought about buying my rock from a home center, but this much rock would be too expensive purchased a bag at a time. Due to the size of the project, bulk buying is the only way to go. Maybe your station can trade out for the materials and someone with a dump truck to haul it in, versus hauling it in your pick-up truck.

Final Steps

My plan is to lay in a second round of weed killer (yes, I want to make sure those babies will *never* grow again), and then I'll put about 3 inches of rock to cover the weed barrier.

Heck, I'm so excited about not having to be an annual weed terminator, that I may even take the time to paint the transmitter building before I lay in the rock. This way I won't have to worry about the ugly of dripping paint on the rocks. But I digress ...

One thing I made a special note of, is to be sure that the weed blocking cloth is not just butted against the foundation of the tower, building and anchor points, but to make sure to use a few inches up the structures to ensure weeds don't find a glimmer of light and start germinating.

I also plan on manually spreading the rock, so I don't rip the cloth in the process.

It's Kick Back Time

When I'm done, I plan to never have to hog, cut or whack weeds, underbrush or vegetation at the site again. In future years what little bit of weed dares to rear it's ugly head with be summarily destroyed with herbicide.

Now, I suspect that this project will take about 25 hours of work – even if it takes a bit longer that's OK. It will save at least that much work in the first two years, not to mention the hours of frustration dealing with the problem.

We all have more productive things to do than kill weeds every year.

Tick Check

This is of the utmost importance. Whether you tackle this exterior overhaul or not, it is important that you check yourself for ticks whenever you work at your site.

Wood ticks are bad enough, but easy to see. Deer ticks on the other hand are the size of a poppy seed, and carry Lyme Disease. Lyme is physically debilitating to humans.

If you happen to take your dog to the site be sure to check him for ticks as well. If a dog is bit by a deer tick and develops Lyme, you have an 80% chance the dog will go into kidney failure and have to be put down if it's not caught and treated in time.

On to Other Maintenance

While we're on the subject of site maintenance, remember this is the time to make sure all of your annual spring/summer checks are made. Old bees nests need to be knocked down, and check the building to see if mice or other critters have found their way in over the colder winter months.

Don't forget to change filters, or at least clean the filters on the transmitter and other equipment. For most of us this is the start of the dirtiest time of the year, so we need to make sure our equipment is protected.

You may want to do a light bulb check as well. Even though the days are longer, those midnight calls may still come, so you may find yourself in the dark if the bulb or motion detector isn't working properly.

Clean out old bees nest tucked under an exposed roof soffet.

Roof Check?!

There is one other important item that you should check at least every year: the transmitter-building roof. If you have a wood and shingled roof, check for discoloration that may indicate a leak. You should also climb onto the roof to check the condition of the roof shingles. With high winds, and in areas where there is freezing and snow, it is possible that some shingles have become damaged and may need to be replaced.

Yes this is a pain to do, but remember the roof is protecting your transmitter and related equipment, that not only has several thousands of dollars of value, but is also your station's lifeline. An ounce of prevention in this case could save thousands of dollars of damage to equipment and in lost revenues.

Electronics Checks

If you have a smoke detector, heat detector, or perimeter detector that wires to the remote control to alert you or others of a problem at the transmitter site, you may want to take time now to check their operation.

Likewise, check to see if there has been any winter damage to exterior ground connections.

Even if my plan for weed control didn't motivate you to do the same, and you don't have other big projects, there is still plenty of routine spring/summer maintenance to do.

Ah, summer, a great time of the year – then again, maybe not.

If you have a transmitter site story idea that you would like to see covered or you want to contribute a column let us know,email: editorial@radio-guide.com

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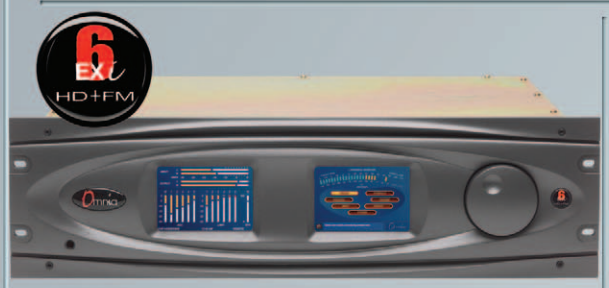

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Studio Site

All Mics Are Not Created Equal

by George Zahn

In the annals of radio advertising, there's a spot that features two motorists talking about their car care preferences. One gentleman – the "smart" consumer – revels in the performance of his engine and the fact that a certain brand of oil made his high performance possible. The other guy simply drones on that "motor oil is motor oil," but you can tell by his demeanor that his car isn't quite so zippy, leaving us to infer that there is indeed a difference in brands.

Trying to "refine" the point here; if you have an engineer or a manager who simply says "microphones are microphones," then it's possible that your station may sound as sluggish as the "droner" in our first example.

Let's take a look at some of the things that make microphones the same, yet dramatically different. At the core, all microphones are transducers, meaning that they change acoustic energy to electrical audio.

The Sound Starts Here

Lest ye think that which microphone you're using is not important, stop and think about how much of your on-air content emanates from the microphones in your studios. The microphone is at the very front of the conduit through which your announcers pass before continuing through processing, the transmitter, and eventually the change back to acoustic energy by the speakers in the receiver or headphones of your listener.

Yes, any part of this chain can indeed detract from the equation, but as we consider the radio studio in this column, let's give your audio the best possible start.

I've seen, worked in, or heard of radio studios that have used everything from the most crude omnidirectional dynamic microphones (which can result in an dull, echo chamber effect, reminiscent of some of the CB echo boxes out there - no amount of processing in the chain can fix that). Then, there was the overkill of the finest vintage ribbon microphone which I observed in action in the small FM studio of a local drive-in theater, where, by the way, the clientele was listening on beat up boom boxes.

A Good Mic Doesn't Need to Be Expensive

Do you need an expensive ribbon microphone to make good radio?

Absolutely not. But consider the middle denominator in the entire chain. You've likely spent good money on the board, STL, transmitter and possibly studio processing, plus a decent transmitter. You likely couldn't afford to go top grade throughout, but all else being average or above average, if you put a lousy microphone at the head of the chain, your audio is lousy throughout, when that microphone is open.

The "Condensed" Version

If you've heard that condenser mics tend to be more crisp and bright, that is true as a microphone family, and a decent condenser might be the right choice for an FM station or Internet streaming at high fidelity bit rates. Condensers, especially the really good ones, will cost more, as a rule, than a simple dynamic microphone. There are some issues that can happen with certain condenser microphones, especially in interfacing them with some analogue consoles, for those who are still using them.

Which Power Source is Best

The condenser microphone family usually needs power to operate the microphone's internal amplifier, and in some cases, to help the microphone change the sound into audio by providing an electrical charge to the microphone's element.

In a studio situation with constant use, you don't want to necessarily depend on a battery for this power, although it is an option on some condensers. In some cases, a mixing console may supply power to the mic through the microphone cable (phantom power) but that is not an option on many older consoles.

In-line Power May Not be Reliable

Many professional condensers have power supplies that plug in-line on the mic cable between the console and the microphone. Don't always assume that will work well.

When I was working at WVXU, we moved to new studios in 1986, bringing our on-air microphone, a Neumann U-87, with us. The mic was one of the last things connected before we threw the switch to the new studios, as it had just been used at the old studios a few blocks away.

In-line power was connected and we threw the switch, then opened the mic, and only about six words made it on the air before the power supply, the mic, and the new console decided they had irreconcilable differences. Despite attempts to fix the issue, we eventually moved to a Sennheiser 421 dynamic and scrapped the condenser dilemma in that studio.

"Reigning" Cats and Dogs

If condensers are the finicky felines of the studio microphone world, the dynamic mic family represents the loving dependable dogs – but not dogs in performance, necessarily.

The dynamic, though, doesn't need any extra power. It's not as fragile as a ribbon, either. Because of those considerations, most of us have dynamic microphones in our studios. And it comes down to what kind we're using, no matter what family.

How do we know what we're buying? As I've said in this column before, the most expensive is not always the best in every situation. Here are two major considerations that can help trim down some options if you're looking to upgrade microphones.

Transient Response

Transient Response is the hardest to notate on a spec sheet, but it is the microphone element's ability to react to sudden and dramatic changes in sound. You probably have a transient response tester on you right now – a set of keys.

Here's how to gauge a microphone's transient response quickly. Pot up the microphone while listening on a set of good quality headphones, then jiggle the keys in front of the microphone.

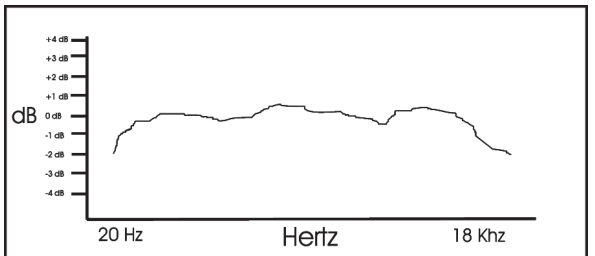
How crisp is the clanking of the keys? Does the microphone approximate the brightness and sudden changes your ear would discern? If so, the mic has good transient response and should come off as crisper, helping to bring out the diction of your announcers.

Bad transient response microphones, can make even the most precise announcers sound "mushy."

A Matter of Frequency

Another, even more important factor is frequency response, the fidelity with which the microphone reproduces the frequency range from bass to treble. This is generally indicated by a chart showing a decibel scale on the vertical plane and the frequency range on the horizontal.

A straight line at 0 dB would be the perfect microphone – the mic would show no coloration of incoming sound. Any variation above or below 0 dB shows you the predisposition of the mic to over or underperform at certain frequencies.



Ye Olde Frequency Response Graph

No microphone that I've seen or heard can boast a flat line at 0 dB. For microphones not supplying a frequency response graph, the notation in the spec section or literature might look something like this: Frequency Response 30 Hz - 16 kHz +/– 2 dB

This is actually not a bad mic frequency response at all. It tells you that at no point between bass (30 Hz) and upper treble (16,000 Hz), will the mic vary more than 4 decibels in response – note the variation is plus *or* minus 2 dB

Take Caution When Reading Specs

When we see Frequency Response 20 Hz - 20 kHz on an inexpensive microphone we should be cautious.

That notation really tells us nothing without the decibel variation range. The mic might reproduce frequencies from bass to treble, but the variation could be dozens of decibels, which for critical and professional use is a real risk. If the frequency is missing, or so far down in volume, no reasonable amount of processing can put it back.

Finding the Right Mic Within Your Budget

So how do we match budget with needs? There are a couple of good practices that managers and engineers can implement. Realizing that each station processes its signal differently, you can still listen to competitors, not just for content, but for sound.

Decide which stations in your market, or in markets where you travel, have the best sound. Contact the station's engineer and inquire about the microphone they use.

Testing One, Two, Three

One way to execute that part of the plan is to borrow the microphone, or a variety of the microphones, in question to try them with your processing. Record off-air, trying different mics, and possibly processing settings, to see what works for your station.

If you have a good relationship with a vendor, a loaner could be arranged, especially if there is the possibility of them eventually selling multiple microphones

The bottom line? If your station is a candidate to clean up your microphone sound, don't equip all the studios until you have a very, very good idea as to what will work for you.

George Zahn is the Station Director/General Manager for WMKV Radio In Cincinnati, Ohio and a Peabody Award-winning producer. He has countless hours of recording experience most notably as recording engineer for Riders Radio Theatre heard on NPR stations. Share your "feedback" with George contact him at gzahn@mkcommunities.org

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Disaster Preparedness

Three Rhode Island Stations Dealing With Spring Floods

by Judith Gross

Disaster preparedness for stations starts with anticipating devastating events that could take a transmitter or studio out of commission, and having a plan to make sure the broadcast still goes on.

But what about disasters no one could have anticipated?

The 500 Year Flood

The flooding that deluged Rhode Island after heavy March rains was called a "once in 500 years" event. Some stations got lucky and weren't hit too hard; others used the latest technology to fill in service, while others had to just deal with what nature threw at them.

Seeing how each type of station handled the situation provides a measure of preparing for an occurrence that, thankfully, most stations won't ever have to face.

WRAV Under Flood Waters

WRNI-AM

Public station WRNI-AM in Providence turned out to be one of the fortunate ones. Even though the station's four towers are located on a piece of T-shaped land in the middle of a pond, the flooding did not knock the station off the air, according to Director of Engineering Steve Callahan

"When we rebuilt the site we really took into consideration what a storm could do, but this one exceeded everyone's projections," said Callahan. The unusual tower site dates back to 1958 and actually uses the water surrounding it to help propagate the signal, Callahan said.

He noted that the water did break through part of the T-shaped land mass and eroded it, but did not harm the station's tower. "The transmission lines were hanging in mid-air until a tower crew could put up temporary lines," said Callahan, "but the station never went off the air."

News-Talk WBLQ

Not quite as fortunate was news-talk WBLQ-AM in Westerly, RI. GM Christopher DiPaola said that the flooding did cause the station to go off the air, but not for any equipment problems; the area had a power outage which cut off electricity to its studio.

Fortunately, today's technology came to their rescue. WBLQ has an on-air personality who broadcasts remotely, in Warwick, RI, 35 miles away. A studio in place at that location became the back-up and a simple PC feed to the transmitter saved the day.

WRAV, Warwick

One of the hardest hit stations of all was also in Warwick: WARV, a Christian-formatted AM owned by Blount Communications Group. The station's three-tower array is located next to the Pawtuxet River.

David Young, the station GM and VP of Blount, said that when the towers were erected in the 1980s, the builders made sure the antennas and tuning units were above the 100-year flood plain. But with the rains that came this March, it wasn't high enough.

"Our transmitter site was at 'ground zero' for this flood," Young said. "The tuning units were submerged by the first flooding and tuning units and transmitters submerged in the second flooding. Both times the station was forced off the air."

Just How High?

A record 16.2 inches of rain fell over the region, pushing the Pawtuxet River to a record height in excess of 20-feet by March 30th. Young noted that the high water forced WARV to sign off the morning of March 15th.

The transmitter site remained submerged for several days, he said, but by the afternoon of March 16th, he was able to get access to the ATUs – traveling by canoe!

"The water had subsided enough that I was able to access the ATUs, remove debris and mud and open the doors to allow drying to begin," said Young. Still, the station stayed off the air.

After the tuning units had some time to dry, engineer Dick Jolls was able to restart the transmitter – a Nautel XR12 – gradually increasing power levels to the normal 5,000 kW. Some relays and micro-switches were damaged by mud; still, the station was able to broadcast.

Not Out of the Woods Yet

But the worst of the flooding was yet to come. As the Pawtuxet began to reach its record high levels towards the end of March, the waters engulfed the actual transmitter building, washing over two transmitters and a phasing unit.

WARV's #3 ATU

At that point, water damage took WARV off the air again. Young noted that the water was so high that the site was completely inaccessible for several days. Finally, two other staff members were able to navigate the canoe to the site and start the cleaning and drying out process all over again.

Another engineer, Blair Harden, was able to install a rented, 1 kW Nautel J1000 transmitter, and WARV went back on the air on April 3rd. The station broadcast for several days at the lower power while the XR12 was being restored.

The transmitter building had to be partially deconstructed and sanitized to be safe. "Because of the proximity of the non-functioning Warwick sewer pumping station, everything that had been immersed in mud and water was assumed to be contaminated," said Young.

Parts of the building and gear were either decontaminated or simply removed.

WARV's transmitter building is on the left.

Back On The Air

Finally, on April 12th, nearly four weeks after first going off the air, WARV had refurbished the XR12 and was back broadcasting at 5 kW Young added that new relays were ordered for the ATUs – for the second time – and replaced.

Some Gentner and Burk Technology remote control units also suffered water damage and had to be replaced, along with some components in the tuning units, according to Young. "We also saw that our old RCA back-up transmitter was damaged beyond any repair that would be cost effective," he said.

He added that the main transmitter doesn't seem to have suffered permanent damage. "We were thankful that Nautel provided us helpful advice along the way and got the rental 1 kW transmitter to us in a hurry," said Young.

Now that the ordeal is over, Young and his engineers, along with other stations, are sure to be reviewing equipment and emergency procedures and trying to assess what, if anything, could have been done to prevent going off the air.

Planning for the Future

"We're discussing alternative ways to resume broadcasting should the entire transmission site ever be inaccessible again, " Young said, "But this wasn't something we had foreseen."

Of course, if all gear were situated in a place above where water could reach, the flooding never would have caused such problems for WARV. But Young said that doing so would have involved extraordinary measures and that moving the tower and transmitter would be a very expensive undertaking, and may not even be technically possible.

"All the historical evidence said the transmission gear should have been high enough where it was," Young noted. "Will it happen again, or is it going to be another 500 years? So much for learning from history!"

Judith Gross is a former radio talent who runs her own freelance writing and marketing business in Binghamton, NY. Visit her website at www.jgcreativemedia.com

Photos of WARV's building and equipment were provided by David Young and his staff.

If you have story ideas email me, editorial@radioguide.com

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-For the fact that **both the transmitter and receiver can measure the modulation percentage and pilot signal level** (19 KHz stereo without disconnecting the audio from the transmitter).

-For its **remote control**.

-For its **analog telemetry**.

-For being made for **mono or stereo (MPX) signal**.

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FCC Focus

Ownership Reports – Deadline and Changes

by Peter Gutmann

After much delay, and a false start, the FCC has set a deadline of July 8 for all broadcasters to file its new biennial ownership report for all attributable entities. This time, presumably, they really mean it.

Don't Miss This One

Please do not ignore or put this off! The new form requires substantially more preparation than the prior version.

Moreover, the new forms must be completed from scratch, and do not permit you to copy or incorporate information from prior versions of the ownership report, even if all the information remains unchanged.

A final caution: the Commission's website, through which the new form must be filed, has a tendency to bog down when a heavily-used deadline approaches, as many last-minute applicants discovered to their detriment during the last translator window.

Who Must File?

All licensees must file a separate report. For the first time, this includes individual owners and partnerships composed solely of natural persons, which previously were exempt.

In addition, all attributable entities that own or vote 5% or more of a licensee must file their own report. This includes parent corporations, partnerships and limited liability companies – unless they meet the Commission's insulation criteria, which are specific and detailed.

Separate Parent Company Reports

Beyond that, each parent entity further up the chain of ownership or control must also file a separate report – unless they, too, meet the insulation criteria.

For example, if Licensee 1 and Licensee 2 are each owned 55% by Corporation A and 45% by Limited Partnership B, then four reports are required.

But if Corporation A is owned by Limited Liability Company X, whose manager is another Corporation Y, and whose member is yet another Corporation Z, then X, Y and Z also need to file reports.

And if they, in turn, are owned or controlled by yet other entities, each of them probably needs to file reports as well. Tax consequences aside, there's something to be said for straight-forward ownership structures!

Some Good News

Fortunately, individual owners of licensees or parent entities do not have to file reports of their own. Rather, they must be listed in the report of the entities that they own or control.

For a corporation, this includes all officers, directors and voters or owners of at least 5% of the stock. For a partnership, it means all general partners and all limited partners who do not meet the FCC's insulation criteria. For a limited liability company, it means all managers and non-insulated members. For a trust, it means all trustees.

FCC Registration Numbers Required

For the first time, every entity or individual that either files a report or is required to be disclosed in a report must obtain and provide its, his or her own FCC Registration Number (FRN).

This means that every officer and director of a corporation must have his or her own FRN, which is to be used consistently for this round and all future reports. An FRN is obtained from the FCC but requires disclosure of the entity's address and Taxpayer Identification Number or the individual's Social Security Number.

What if you don't want to disclose your Social Security Number? That's still being debated.

The FCC has two interim solutions. First, it invites individuals to go on-line and register directly for their FRNs, to avoid disclosing their Social Security Number to others. If that won't work, then the FCC will permit filing of this round of biennial reports with an interim "Special Use FRN" that the form will generate – but only if "after using diligent and good-faith efforts" the person completing the form is unable to obtain an FRN for any individual (not for an entity) who must be reported. It is unclear what will happen in the future.

Currency of Information

The purpose of the biennial reporting requirement is to obtain a "snapshot" of broadcast ownership every two years, in place of the rolling updates of the prior system (in which stations were to have filed on the even-numbered anniversaries of their license renewal due dates). The new reports are to be due November 1 of each odd-numbered year.

(Continued on Page 20)

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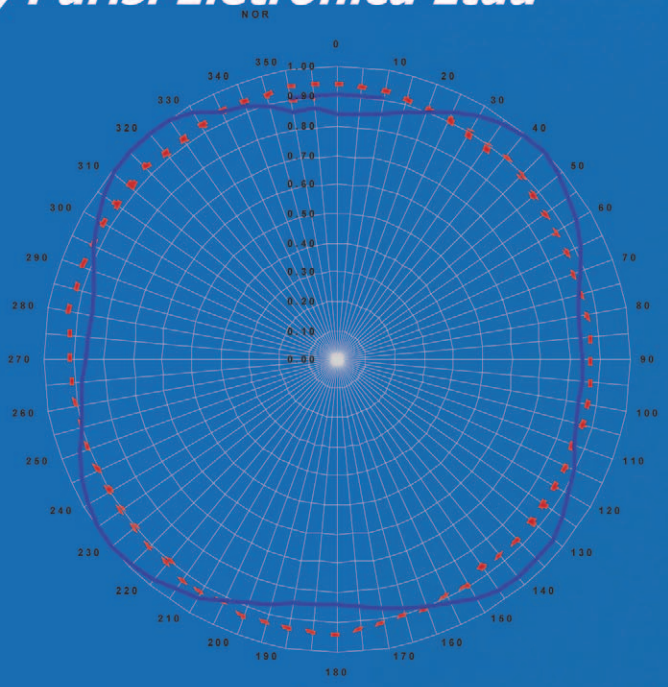

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FCC Focus

Ownership Reports

– Continued from Page 18 –

Unfortunately, we're already well beyond that. Even so, all information in this initial round is to be reported as it was on November 1, 2009, so the "snapshot" provided by the initial set of reports will be quite faded.

For stations that have already changed hands, the prior owner remains responsible for the upcoming report.

Mechanics

Most of the information is essentially similar to the content of the prior report forms. However, unlike the old forms, the FCC has built in validation checks that must be satisfied before a form can be successfully submitted. As a result, required information cannot be omitted or offered in an incompatible format.

For example, each document that must be listed (such as a corporation's articles of incorporation) requires either specification of its expiration date or checking a box for "no expiration date" – you can't simply leave it blank as the prior form allowed. As another example: a subform that lists principals' family relationships requires that the names listed there must exactly match the corresponding entries in the table of principals. Omitted middle initials or even a period after a suffix will trigger rejection.

Duplication of Information

Completion of the forms requires entry of a substantial amount of repetitive information which seemingly should not be required for data that is entered and accessible electronically.

For example, since each entity and attributable owner has its, his or her own FRN, one would assume that the Commission's computerized database could associate them with all facilities and entities in which they report an interest.

Yet, every report requires a separate listing for each interest holder and every station in which it, he or she has an attributable interest. For parent entities controlling multiple licensees, each with separate officers or directors, this can prove daunting.

The Department of Redundancy Department

As a further example of redundancy that should have been obviated by the FRN requirement: all licensee reports must include a scan of a flowchart showing the licensee's vertical ownership structure. The only exception is for licensees owned and controlled entirely by individuals.

(If the whole point is to collect and sort data electronically, and each entity already has to list its parents in its report and each of them, in turn, has to list its parents in its own report, then why require an art project and especially one that contains no data in a format that can be added to the Commission's ownership database?)

When we asked the FCC staff about this redundancy, they replied that it is to be used as an "error-checking backstop." That is, it is intended to serve as a check to ensure that information contained in one report was not omitted in reports for related entities.

The staff also plans to use the result of this checking procedure to evaluate the need for future revisions. The staff also noted that they appreciate the time and expense required to construct this first comprehensive searchable database of broadcast ownership.

I hope that this doesn't come across as a crass advertisement for the services of your communications law firm, although undoubtedly it reflects the frustration we have all encountered so far in wrestling with the requirements of the new form. By all means, go on-line to do the forms yourself. But start soon and gird yourself with lots of patience!

Good News

In lighter news, this year promises a more pleasant change. For the very first time, the FCC has proposed a reduction in the annual regulatory fees that will be due this August!

Actually, the credit goes to Congress. Despite all the harsh things being said about that body recently, it was the Congressional annual appropriations act that specified that the regulatory fees to be collected by the FCC for 2010 are to be 1.8% less than last year. It's not much, but every little bit helps nowadays, right?

As in past years, the FCC intends to send pre-billing notices to each station (using the mailing address on file in its database). However, also as in the past, the notice will only address the primary station and will omit auxiliary facilities for which additional fees must be paid. The Commission proposes to eliminate this type of notification in future years; as a result, broadcasters will have to rely on the FCC website, where the fee information is to be posted.

This year, fees are to be imposed only on radio stations' primary AM or FM analog channels, based on class of station and estimated population served.

No fee is to be collected for HD channels, although that could change in the future.

Peter Gutman is a member in the Washington, DC office of the law firm of Womble Carlyle Sandridge & Rice PLLC, where he specializes in broadcast regulation and transactions. He can be reached at pgutmann@wcsr.com

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Safety and Security

by Jeff Johnson

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

Radiation!

Radiation! Scary! Run for your life ... or should you?

No word disturbs our sense of safety and security more than radiation. There are radiation burns and poisoning!

This series of articles is meant to illuminate sources of threats to our, and our radio stations', safety and security. Both common sense and legal obligations play a role.

What Is Radiation?

Looking for a definition of radiation you will find, "Radiation describes any process in which energy travels through a medium or through space, ultimately to be absorbed by another body."

The most basic understanding of radiation is to understand the difference between two types of radiation – ionizing and non-ionizing.

Ionizing Radiation

"Ionizing" refers to the ability of energy to "knock" an electron out of its orbit in an atom. The result is a free negative electron and a positively charged ion. It takes a certain level of energy to incur ionization. Ionizing radiation consists of both particles and photons. The science of our profession, radio, is involved with electromagnetic radiation conveyed by photons.

Photons with sufficient energy to produce ions, break chemical bonds and alter biological function, are short wavelength x-rays and gamma rays.

Health Risks

Exposure to such radiation can cause cellular and molecular changes such as mutations, chromosome aberrations and the death of cells. At high doses, ionizing radiation is capable of inducing cancer.

Radio waves are not of sufficient energy to induce such damage. That cell tower in the neighborhood will not cause cancer. Its radiation is non-ionizing.

Why then are there regulations controlling radio frequency wave exposure? The waves that we all work so hard to produce are quite capable of causing damage to our health.

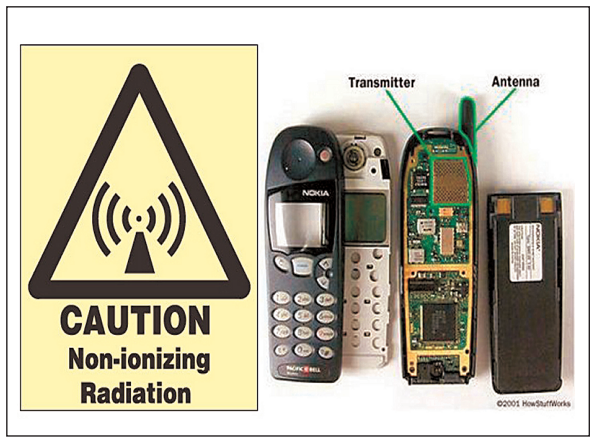
It is via a different mechanism than ionization – heating. A microwave oven is a familiar example.

Microwave Radiation

A tower service professional known to the author was asked, "How do you know you are getting too close to an active antenna?" His response, "You start feeling warm!"

Microwave radiation exposure is often expressed in terms of incident power density, in mW/cm^2. Here are the effects of exposure to certain power levels, without time limit. Frequency is unspecified.

1 mW/cm^2 = nothing. 10 mW/cm^2 = nothing. These are accepted standard for maximum continuous exposure to radiated emissions – cell phones, etc. When the radiation level reaches 30 mW/cm^2, you can feel heat. At 5,000 mW/cm^2, cooking commences!



A cell phone does not emit ionizing radiation.

Let's Get Serious

As radio engineers, we are responsible for safety requirements. Exposure to radio frequency energy, while non-ionizing, can have legal and health consequences.

There are basic access requirements – failure can result in injury or fines:

• Failure to keep an AM tower base fence and/or ATU cabinet door closed and locked. Failure to keep an AM tower base fence in a sufficient state of repair so that it remains an effective barrier.

• For all RF facilities: Failure to have posted adequate warning signs: either wrong type or format, insufficient number of signs, or improper placement. This last requirement has two levels – restricted professional access and general public exposure.

"Occupational/Controlled" and "General Population/Uncontrolled" are the terms in use to describe the two categories of exposure levels.

(Continued on Page 24)

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Safety and Security

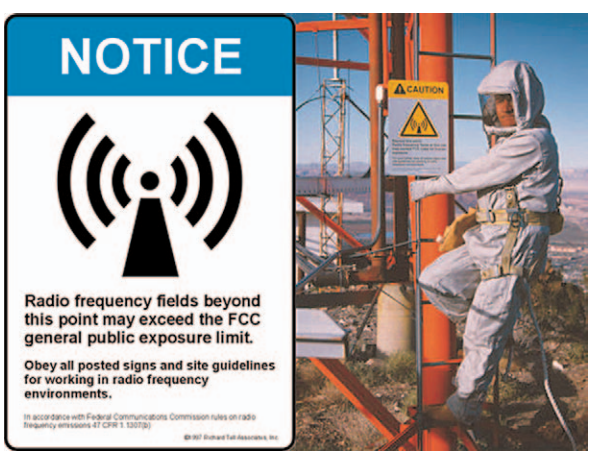
by Jeff Johnson

Radiation!

– Continued from Page 22 –

What is Considered a Controlled Environment

Exposure in a controlled environment is measured in Maximum Permissible Exposure (MPE) limits and averaged over the body and averaged over time. The FCC carefully defines a "controlled environment" as follows:



Protected worker in a high RF environment.

"The FCC provides definitions for the two types of exposure. A simplified view, endorsed by the Occupational Safety and Health Administration (OSHA), is that the more restrictive General population/Uncontrolled limits apply unless the organization is operating under a written RF safety program, and the individuals who may be exposed to levels above the General Population/Uncontrolled limits have received RF safety training.

FCC Regulations

The terms "fully aware" and "able to exercise control" are referred to in the current FCC Regulations when defining the requirements for determining whether an exposure situation qualifies to use the higher MPE limits for Occupational/Controlled exposure. The Notice further defines these two important terms.

The phrase "fully aware" refers to workers who have received both written and verbal information regarding RF radiation, and have received training that includes how to control or mitigate RF radiation exposure.

The phrase "able to exercise control" refers to workers who understand how to use administrative controls to reduce their exposure level. Administrative controls include time averaging.

Engineering Controls

Workers also understand how to use engineering controls to reduce their exposure level. Engineering controls include Personal Protective Equipment (PPE), specifically RF personal monitors and RF protective clothing.

Simply stated, a "controlled environment" is to be occupied only by trained personnel and delineated by appropriate signage, surveillance, security, locks and fencing. An example would be a locked level, such as a roof, accessible only by a key available only to certain people.

An "uncontrolled environment" has no such restrictions. It is available freely to all, at least in terms of RF exposure danger.

The following tables delineate the exposure limits for the occupational and general populations.

Frequency (MHz)	Power Density (mW/cm^2)
0.03–1.34	100
1.34-30	$900/f^2$
30–300	1.0
300–1,500	f/300
1,500–100,000	5.0

Electric Field MPE Limits for Occupational/Controlled Exposure

The averaging period for Occupational/Controlled exposure is six minutes for exposure to frequencies below 15 GHz.

Frequency (MHz)	Power Density (mW/cm^2)
0.03–1.34	100
1.34–30	$180/f^2$
30–300	0.2
300–1,500	f/1500
1,500–100,000	1.0

Electric Field MPE Limits for General Population/Uncontrolled Exposure

The averaging time decreases as the frequency increases from 15 GHz to 300 GHz. It is important to note that the FCC does not allow time averaging for General Population/Uncontrolled exposure.

We'll explore how levels are determined in the field, and how personnel are trained and protected – in our next issue.

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

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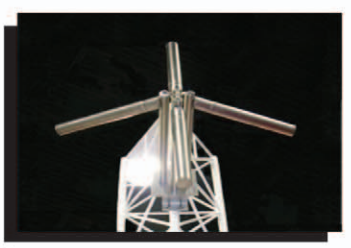

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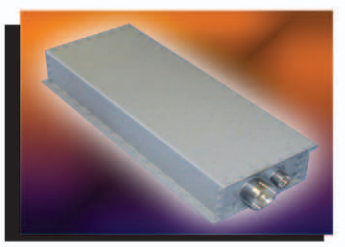

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Operations Guide

Computer Rule #1 – Backup, Backup, Backup!

by Chris Tarr

You're getting ready to print out that big presentation you've been working on for days. The meeting is just a few minutes from now. You hit the power button on your computer and, nothing happens!

Your computer is dead – It won't start!

Well, thank goodness you had a backup of that presentation somewhere, right? Right??

The Cold Hard Drive Facts

Computers crash, and hard drives die. Fortunately, it's now easier than ever to back up your "life" on a regular basis to protect yourself from emergencies.

There are generally two ways to back up your data. Locally, using an external hard drive, or on-line, using one of many different "cloud" based services.

Local Hard Drive Backup

For many years local, hard-drive based backups ruled. Hard drive space keeps getting cheaper and cheaper, and the speeds keep getting faster.

Additionally, there are plenty of choices when it comes to software. Not only do Windows and Apple computers come with free backup software, but many external drives come bundled with backup software.

It all works really well. But, with this time-proven method there is one downside: What happens when your drive crashes, and you don't have the backup drive with you?

Backup On Line

That's where on-line backup services can help. On-line services such as Mozy (www.mozy.com) and Carbonite (www.carbonite.com) charge a fee per-month for space on a remote server.

You install their applications on your computer and it keeps an up-to-date backup available to you when needed. All you need to do is either run the software to restore, or go to their website to download the files that you need.

Which Backup is Best for You?

There are four major types of backups. A full backup is a job that backs up all of the files you select every time you run the backup job. This takes a long time, especially if you're doing an on-line backup. Whether or not the file has been backed up before, it will get backed up again.

Incremental Backup

The second is an incremental backup. With an incremental backup, you create a full backup the first time you run the backup job. Then every job after that is just a backup of what has changed.

The subsequent backups are fairly fast, since you're only backing up files that have been created or changed since the last backup. This is good for "versioning" files as well, since you can go back two of three backups to get older copies of files. The one caveat with this type of backup is that it constantly grows, and you'll eventually run out of space.

The way to manage this is to delete older incremental backups. Most software will automatically delete the oldest backup files as needed.

Synchronous Backup

The third is a "synchronous" backup. This type of backup is the fastest and most space efficient type.

You start with your initial "full" backup. On subsequent backups, the source and destination are scanned. Any file that is changed on the source gets copied to the destination, replacing what was there.

If anything has been added or deleted on the source drive, those changes are made on the destination.

This is similar in theory to RAID-style "mirroring" of a drive. Many online backup services recommend this type of backup.

That way, all you need to do is purchase the amount of space that you need once. The space is equal to the size of your hard drive and your backups run without intervention.

(Continued on Page 28)

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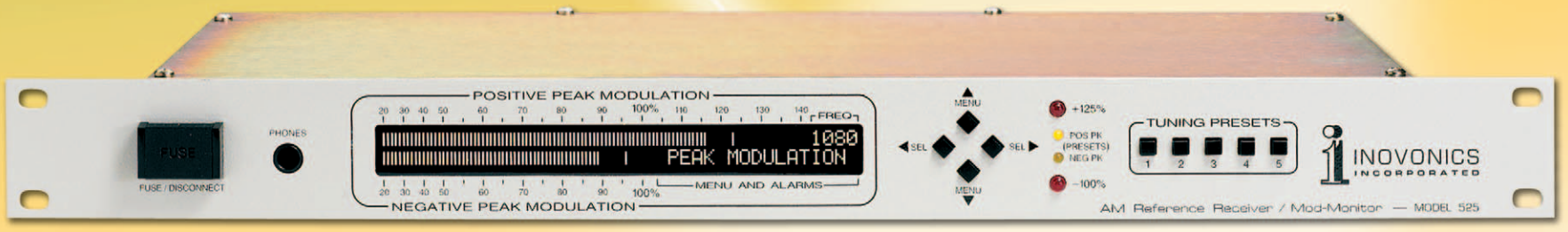
Two sets of peak flashers indicate both absolute and user-programmed modulation limits, and programmable front-panel alarms (with tallies) give overmodulation, carrier-loss and program audio-loss warnings. The 525 is supplied with a weatherproof loop antenna.



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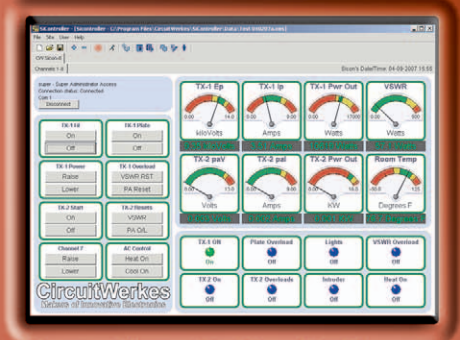

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- External trigger inputs activate user-defined actions.
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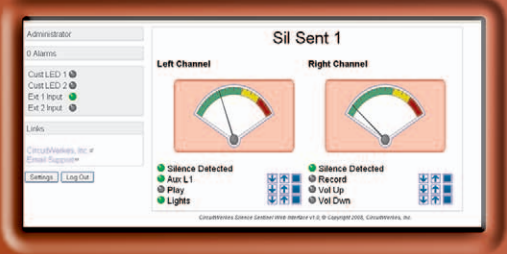

Remote Broadcasting Solutions

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- External power input with silent, auto-switching battery backup.
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- Our Silencer™ option removes control tones from the audio path.
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- Can be used as a phone tap or a passive manual telephone coupler.
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- Transcon-16 - Move up to 16 contact closures from room to room over an audio cable
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- SUB-03 Subaudible tone decoder and SEN-6 Subaudible encoder.
- HC-3 telephone autocoupler and AC-12 rack of autocouplers
- DTMF-16 and DS-8 DTMF tone decoders.

Find Full product info & downloadable manuals online at www.circuitwerkes.com. 352-335-6555

Operations

Computer Rule #1
Backup, Backup, Backup!

– Continued from Page 26 –

Back-up on the World Wide Web

Backup with Imaging Software

The final way is to use imaging software and a local external drive. Software such as Acronis's True Image software (www.acronis.com) allows you to backup your entire drive and provides you with a boot CD that will allow you to boot your computer and restore your entire drive back to the pre-backup state.

Doing a restore using this method is great if you have programs installed that you can no longer find the disks for. It essentially "clones" your computer.

This is especially handy if you want to install a new hard drive. Make an image of your entire drive, replace the hardware, and restore! If you're in the Mac world, Apple's built-in Time Machine software creates restorable images, as does Bombich's free Carbon Copy Cloner (www.bombich.com).

So, What Do You Back Up?

That can be a hotly debated question, but really the best thing to do is simply back up your music, videos, documents, pictures, and anything you can't do without.

Unless you make a lot of custom changes to your operating system, it doesn't make much sense to back up your entire drive.

In most cases you'll have to have your computer's operating system installed in order to restore your files, so you won't be able to re-use the backed up copies of system files in many cases, especially if you're using a new computer.

Programs that have been installed on your computer generally can't be restored unless you've imaged your entire drive with the operating system, because they often leave files in several places, including the registry in Windows computers. You can, however, back up the "installation" file of a program, such as a program downloaded from the Internet. That can be restored and re-installed.

Additionally, if you're using an on-line backup, uploading the entire contents of your hard drive to a backup service could literally take days!

So, What's the Best Way?

Well, it really depends on who you are and what you do; 99% of the time a synchronous backup works just fine.

After the initial backup, subsequent backups are fast and take up very little space. They're well suited for use with on-line services and should cover you very well. However, if you're the type that constantly updates documents and adds or removes files frequently, then an incremental backup with it's inherent versioning ability would be ideal.

Finally if you really like to customize your OS, and don't want to spend lots of time tweaking a fresh operating system install, then an full, image-type backup is for you.

At the End of the Day

In the end, what really matters is, that no matter which route you choose, remember to do it!

Computer failures are never a matter of "if", it's always "when" and as we all know, our friend Murphy seems to apply his law at the worst possible time.

It's become very easy and inexpensive to back up your computer, so there's no reason not to do it!

Chrisistopher "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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Chief Engineer

The Story of Two Rebuilds – *Part 1*

by Scott Schmeling

I remember when I started in radio so many years ago I thought about how it would be really fun and cool to build a studio. I was in high school at the time, working part time at KSDR in Watertown, South Dakota.

We had a Gates Dualux console, one microphone, two turntables, two cart machines, one reel-to-reel, telephone, and a Marti. The room was very functional; equipment placement was pretty standard, and there was really nothing wrong with the way it was. I just thought it would be a cool thing to do.

Jump Ahead to 1987

When I started here with Minnesota Valley Broadcasting in Mankato, Minnesota, we had two radio stations, KTOE AM, and KDOG FM. We had two production studios – one mono and one stereo – and a newsroom studio.

The stereo production studio also had a mono cart machine so commercials could be dubbed for the AM.

The AM and FM control rooms and their associated production studios were at opposite ends of the building. In fact, the FM was in a second addition to the original structure.

Audio distribution was done with a 15 pair shielded cable terminated by barrier strips. The cables all met near the AM transmitter. The barrier strips were all mounted on a thick sheet of aluminum and all cables were tied together so whatever was on pair #1 in AM Control was also on pair #1 in FM Control, etc. And there was no documentation. Oh, I found a few partial pieces of paper indicating what had been on each pair once upon a time, but it was very outdated.

Technical Advances

In 1994 we installed our first "Audio Storage and Retrieval" system (computer automation) – we chose Audisk. Back then, the system used very expensive SCSI hard drives. Considering that expense, we opted for a shared SCSI system. That way we could save money by buying fewer drives, and both stations would have access to all audio on all drives. That also meant everything – both computers and the shared drives – had to be mounted together.

The spinning drives were loud enough that we couldn't put the system in a studio. We decided to locate it in my small engineering room, roughly in the middle of the building between the two stations. We figured it was a good central location. Since the computers were not in any studio, we had to get the audio back and forth between each computer and its respective station. This would be the start of a centralized audio distribution system. And this time it would be documented!

Anticipating Future Audio Needs

Earlier, I mentioned that the audio was distributed through a 15 pair cable, but this time I chose a 20 pair shielded audio cable, where each pair is individually shielded and jacketed. The 20 pairs are then covered with a foil shield with drain wire, then an outer jacket. If 15 pair had been enough before, 20 pair would be better, and two runs, 40 pair total, should last forever! Yes, believe it or not, we actually thought 40 pair would last forever. It gave us room for expansion, and it was enough for nearly 15 years. The screw-type barrier strips were going, too, replaced by S66 type punch blocks.

The Newsroom

The Finite Details

All the materials were ordered and the more detailed planning began. Over the years, I had worked up various forms for wiring, punch blocks, and wiring numbers. I used to put an adhesive number strip on every pair and cover it with clear heat shrink tubing. The forms have evolved and grown in number.

My constant companion whenever I am doing a project like this is a yellow legal pad and a mechanical pencil. I like to make a list of all the sources and destinations, then arrange them in logical groupings. With the legal pad, I can make notes and drawings – and even move things, circle things, and draw an arrow to where it should go. *(Continued on Page 32)*

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Chief Engineer

The Story of Two Rebuilds

– Continued from Page 30 –

Yes, I know I can do the same thing with my laptop, but it's easier to carry a notepad around. Doing the lists really helps plan what will be where on which cable. I know – wire is wire – but when you lay things out logically it gives you a more organized feeling.

Materials Arrive – Now the Fun Begins!

We pulled two runs of the 20-pair shielded audio cable from the computer area in engineering to each control room. The run to the AM control room was pretty easy; we followed a conduit and just had to make a hole in the wall a little bigger.

The run to the FM control room was another story. That studio was in an addition to the building. To get to our destination we had to punch through a cement block wall that had formerly been an outside wall.

That wouldn't have been hard, except the holes in the center of the blocks had been filled with cement! After all the cables were finally in place, they were terminated in S66 punch blocks.

Adding Automation

Of course, while all this was going on we were also getting the Audisk computers loaded and ready to go. Once that was completed, everything was put in place, cross-connects punched, and bridging clips installed. We were ready to join the computer age!

AM Master Reworked

Did I mention, we were also going to "re-do" the AM control room, too? It was difficult to conduct an interview the way the room was set up. Programming had changed somewhat and it just wasn't working as well as it could. We designed a new counter top to better fit current programming. This allowed the announcer to be facing the door to the studio.

KTOE Studio after 1994 board relocation.

In addition, the counter extended to the left for two interview guests. This counter was designed to fit in the opposite corner of the room. We planned to use all the same equipment with a little plus and minus. The "plus," the new computer system was being added, and the "minus," the turntables were being removed. The turntables were being used very little at that point anyway. The music would be on the computer or on CD's.

The console was an eight channel Autogram. Talk about a workhorse, this thing was built like a Sherman Tank. The only two problems I ever had with it were crackling audio when the Jones connectors to the amplifier deck developed a little "crud" on the blades, and some low frequency drop off when capacitors in the line amps dried out.

I eventually built a mix-minus bus to make the phones work better. But I digress.

Preset

We were just moving across the room. The room was large enough that we could set up the new counter area without disrupting the one currently in use. I ran more of that 20-pair cable from the rack to the new console area.

Since we were going to make this move in a single over-night, I needed to do as much as possible ahead of time, so I also built a new wiring harness to go from the console to the punch blocks. The console end of the harness was dressed and terminated in spade lugs. The punch block end was numbered – to be dressed and punched when the console was in place.

Smooth Sailing

When moving night came, all the advance planning really paid off. As I recall, from 15 years ago, early that evening we connected the computer switcher output to the transmitter input, so the station could stay on the air, and we started dismantling.

The console was moved over, wiring connected, trimmed, dressed, and punched. Everything else was moved over and the finishing touches were just being completed when Don Rivet, the morning man, arrived.

This project is from 16 years ago. In the next issue I'll share with you how we grew from four to seven stations literally overnight. And how we fully rebuilt this same studio again to meet today's needs.

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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Field Guide — RF Switch Monitor/Control

Broadcast Devices Inc. SWR-200

by Jim Stagnitto

Broadcast Devices is one of those companies that comes to mind when I've had an audio or composite switching or distribution problem to solve. One of their new RF-based products turned out to be just what we needed for an RF switching/monitoring solution during a recent fast-tracked transmitter construction project.

My station, WNYC in New York City, purchased the former WQXR and I was tasked to move and install the transmitters into existing transmitter space in the Empire State Building.

Tight Spaces

Space for this addition to the facility was physically limited to the equivalent of about three and a half racks, including the main and secondary transmitters, so every piece of gear had to have a good reason for being there. This was no problem for most of the audio equipment.

When it came time to spec the automatic transmitter and RF switch control and the RF monitoring, things got a little larger.

Three Functions – One Rack Space

I discovered the BDI SWP-200. It combines three separate functions in a single rack space. It is a highly accurate RF power meter, suitable for both digital and analog forward and reflected power measurements. It can provide complete control of one to four RF switches, and BDI can provide the interface cables to mate the box to your flavor of four-port switch.

It can also intelligently manage critical interlock closures and transmitter on/off control functions.

Options

You can outfit the SWP-200 (as we did) with the optional RF failure and RF safety sensing features. That will protect our RF switch from damage if the system detects the presence of RF and a switch command is erroneously issued.

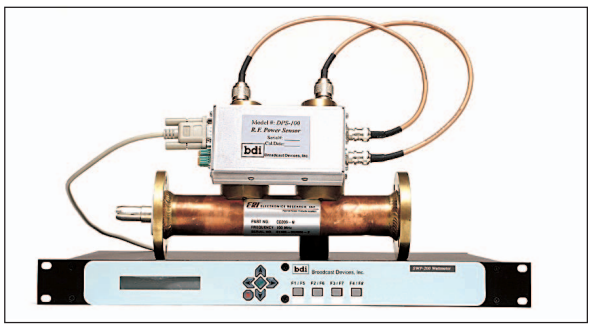
A "three strikes" VSWR protection system is included, which will open the transmitter interlocks if a user-adjustable reflected power limit is exceeded. The RF failure feature will automatically switch transmitters if RF goes below a user-defined level. Another option is the LAN interface, which will allow computer access to the device.

Simple to Install

One of the things that simplified installation is the way that the box allowed me to wire up my interlocks. Normally, you would have a long serial string of closures: from your antenna switch or dummy load, looped through a VSWR protection device, and for us the Master Antenna system interlocks. Then, the correct interlock string had to be routed to the proper transmitter in the right conditions.

With the SWP-200, I simply wired the interlock connections for the two transmitters to their associated ports in the box, and connected the interlock switches themselves to proper inputs. The device recognizes what position all of your antenna switches are in and will route the correct interlock closures to the correct transmitter.

If RF is detected by the Power Monitor, the system will lock out any antenna switch commands that are given.



BDI's SWP-200 shown with line section.

Accuracy Verified in a Unique Way

The accuracy of the power meter is spot on. When I was in the testing phase, I noted that the BDI power meter was reading about 200 watts lower than what the transmitter output meter was showing. Since my TPO for this particular station is only in the area of 800 watts, any power deviation was critical.

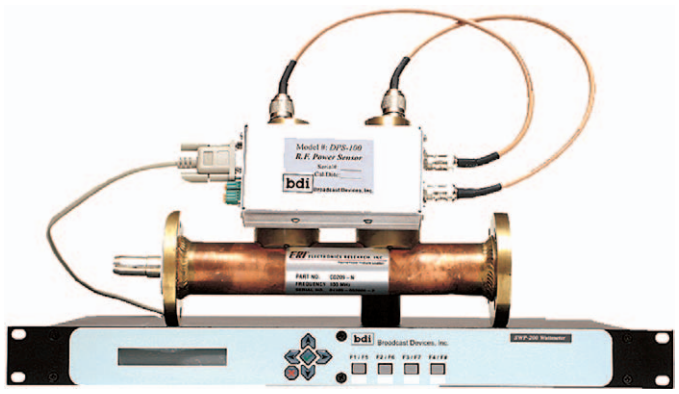
After several phone calls, the transmitter manufacturer loaned me their calibrated power meter. As it turned out, because the transmitter was being operated at such a low power (780 watts on a 2 kW rig) the transmitters meter was proven to be off, and the SWP-200 was correct.

The Broadcast Devices SWP-200 turned out to be a great solution for us.

Jim Stagnitto is Director of Engineering for WNYC, the New York City-owned public station. For more information on BDI products visit www.broadcast-devices.com – call 914-737-5032 or email:sales@broadcast-devices.com

Digital R.F. And Audio Management Solutions

New! The SWP-200 Calibrated RF Power Meter & RF Switch Controller is suitable for digital & analog forward and reflected power measurements . Provides complete control of one to up to four RF switches. The SWP-200 can be interfaced to your existing four port switches, can (*optionally)* be supplied with interface cables for most four port switches made.



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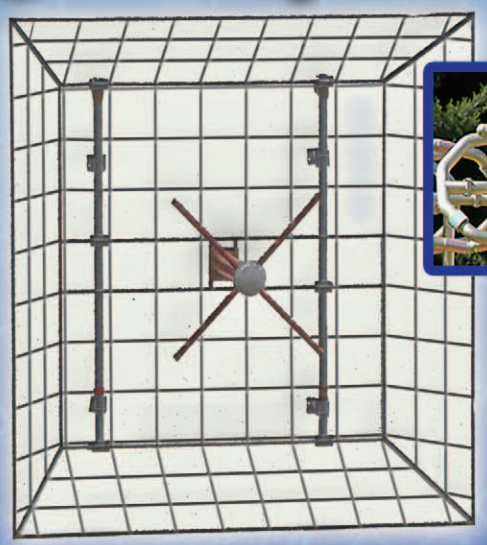

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Field Guide — FM Antennas

Shively Labs 6810 FM Antenna

by George Evans and Ralph Jennings

WFUV is a class B FM station at 90.7 MHz, with an antenna height above average terrain of 155 meters and an ERP of 46 kW (full class B facilities); it is licensed to New York City (NYC).

The main transmitter is located in a building on the roof of a 28-story apartment building, on about the highest spot in the Bronx, on the campus of Montefiore Hospital which places strict limits on the downward radiation from the antenna.

Last December, the station began broadcasting with a new Shively antenna, Model 6810-6D The Shively unit replaced a defective antenna first licensed in March, 2006.

Weak Signal Toward NYC

WFUV, licensed to Fordham University, went on the air in 1946. It currently has a CUME well above 300,000, which is expected to grow with the improved signal.

Even with an upgrade in 2006, the station had a consistently weak signal – especially to the southwest in the direction of New York's major population centers. The antenna at 405 feet consistently under-performed when compared to a previous, temporary single-bay antenna at 240 feet on the university campus.

FCC constraints limit WFUV's signal to 5.25 kW at 200 degrees, and 2.27 kW at 260 degrees. These two bearings almost exactly outline the direction to Manhattan, and there are listeners in Manhattan that WFUV would like to serve.

With the help of our consulting engineer, Clarence Beverage of Communications Technologies, we determined that Shively had the capacity to meet our special needs.

New Mounting Configuration

Bob Surette, at Shively Labs, proposed a 6810-6D-(0.78)SS-BT-DA antenna. However, he wanted it to be leg mounted on a two-foot face-section tower. The old main antenna had been 10 bays, attached to the 4 foot face tower.

WFUV's Shively 6810

Investigation of the original 10 bay, 0.5 wave spaced antenna design led to the identification of possible trouble areas. Shively conducted test range studies and determined that the required directional pattern was difficult to achieve on the original face tower.

They then determined the face width and mounting configuration most compatible with WFUV's authorized pattern.

Keeping Radiation to a Minimum

One unique requirement for the antenna system at the medical center is a highly attenuated elevation pattern to minimize RF radiation on the roof and into sensitive medical equipment at Montefiore.

Shively developed the same controlled-elevation pattern as before, with only six bays, by using 0.78 wave spacing and loading the rigid interbay feed line to achieve the desired element phase and amplitude.

Measurable Results

WFUV engineers have conducted multiple drive studies for the main site and associated FM boosters in the last few years. In coordination with NPR's and CPB's planned HD radio tests, special vertically and horizontal polarized antennas have been constructed to quantify signal strength in the city and suburbs.

Measurements were undertaken on the original antenna system just before the Shively install and again after the install. They showed signal strength improvements in almost all areas.

While a station survey of listeners after the new antenna was installed showed mixed results among listeners in Manhattan, overall nearly half (48%) of WFUV listeners responding said the overall quality of the signal is better today than it was before the replacement. Listeners in the vicinity around New York City reported the most improvements, as did listeners in the Bronx, Queens and Brooklyn.

George Evans is Director of Technical Operations and Ralph J. Jennings, Ph.D. is General Manager at Fordham University's WFUV-FM. For information on Shively products call 888-SHIVELY or visit the website at www.shively.com

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Practical Engineering

Preparing for the Heat

by Bill Croghan

Most of you think you know about hot weather from the beach, but you may not know how to work in conditions that are easily fatal if not taken seriously.

Love the Desert, Wary of the Heat

I was raised in New York but I much prefer the desert southwest. After 18 years in southern Arizona and eight years here in Las Vegas I have learned what hot weather is all about. Summer temperatures here routinely run near 120 degrees.

These years of experience have taught me a few things. I am an active ground Search and Rescue person with Civil Air Patrol and have found too many illegal aliens dead of dehydration in the Arizona border country to ever take the hot weather lightly.

Let me share with you some of what I have learned, so that you do not become a statistic. As Dave pointed out in his article, planning ahead not only counts – it is essential. I have a canoe paddle over my desk to remind me never to be up the creek without one.

The Rule of Threes

In search and rescue, we teach the Rule of Threes. Three minutes without air, three hours without shelter, three days without water, and you are in pretty bad shape – or dead.

Shelter starts with clothing. I have seen a lot of folks who think the way to dress is shorts, flip-flops, tee shirts, and no hat. While I enjoy that in the lady tourists walking along on the Las Vegas strip, it is not the way to survive in the desert.

Think of the classic Arab dress. These guys live in the hottest climate in the world. They are covered head to toe and can survive for long periods. I recommend long sleeve, loose cotton shirts, long pants, and a hat that gives you at least eye shade.

Having lost some good friends to Melanomas over the years, I wear a broad brim hat at all times to keep the sun off my ears and neck. I personally prefer the crushable Indiana Jones-style felt hats for the absorption of sweat, but the cheap straw planters or cowboy type also work as well. Just make sure it has an absorbent inner hatband for cooling.

Keeping Your Cool

Anything that keeps the sun off your bare body, provides for evaporative cooling, and is comfortable enough to permit free air flow is good. However, nylon, polyester, or most artificial fabrics do not absorb water and are not much good for cooling. Cotton shirts and pants are good at absorbing sweat and then evaporating, providing an efficient cooling process.

Preventing overheating also means staying out of the sun. A cheap plastic tarp thrown over the ATU unit while working in it will give you shade, keep the metal from getting too hot, and protect you from the sun.

If you are working out of a car at a stationary point, put the tarp over the windshield to cut down on the green house effect. Silver would be best for sun reflection – camouflage tarps are suicide if you need to be spotted by rescuers.

Sufficient Water

You might survive for three days without taking in water, but you would be uncomfortable after a few hours, in trouble after twelve, and may have permanent brain damage after a day or two.

The rule I follow is: Carry at least two quarts of water at all times, four quarts during the summer and more if you might be away from a source of refill for any serious time. *Do not make the mistake of thinking there is a substitute for water.*

I have seen some folks show up with a couple of liters of Coca Cola, large thermos of coffee, or some other drink. Any drink that contains *caffeine is a diuretic*; that means it causes your body to use water *faster*. Some teach that it takes two measures of water for every single measure of a caffeinated drink – coffee, Coke, etc. – just to break even.

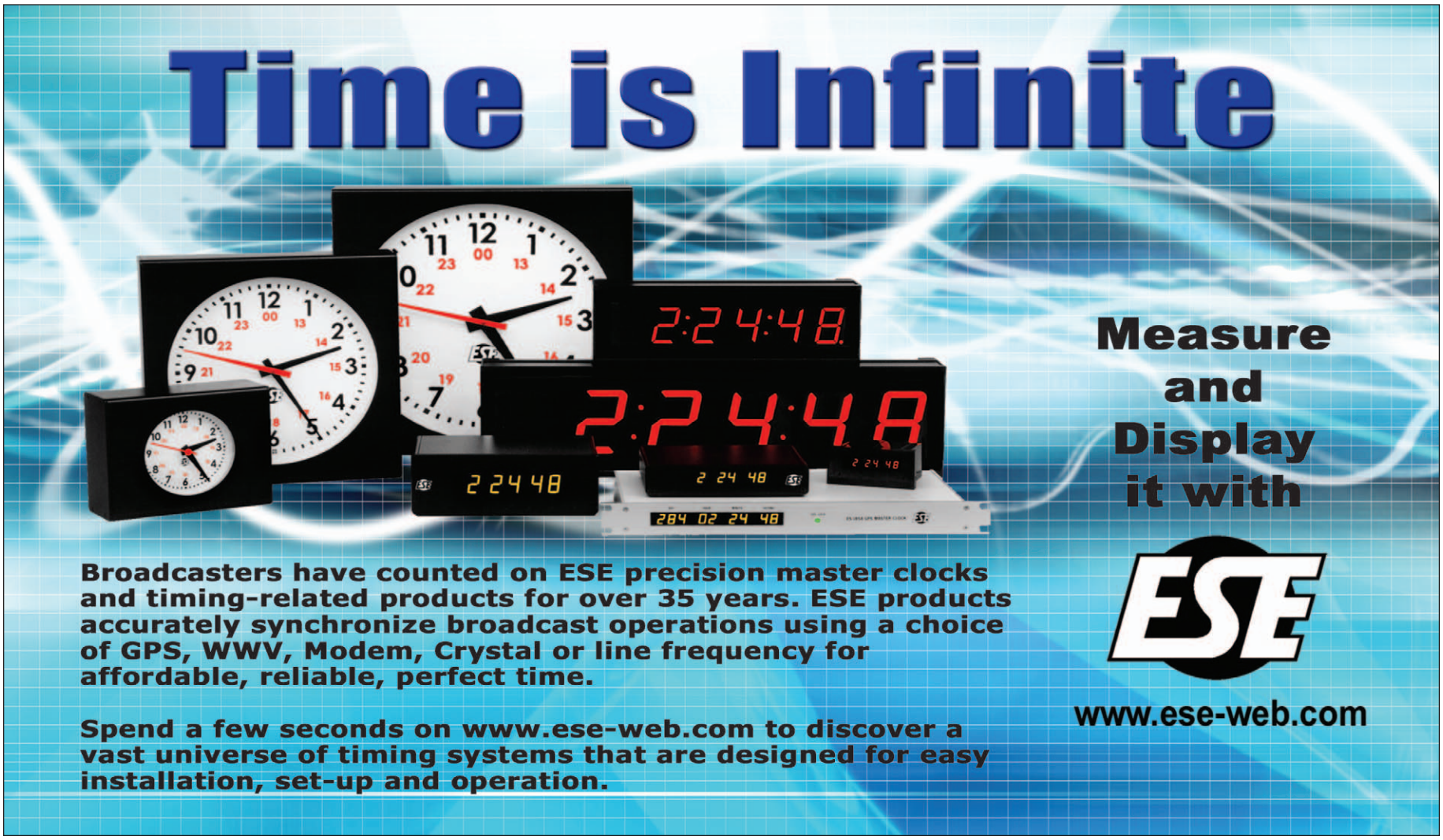
An old rule of thumb is that if you are not urinating once every two hours, you are not drinking enough water. Cold water is nice, but any water is good. I carry a couple GI quart canteens and a lot of 16 ounce bottled water bottles. That way if one of the small bottles breaks, I do not lose all my water. Sometimes I will freeze a couple of those 16 ounce bottles, refilled about halfway, and then have cool water while it lasts.

Unexpected Stuff Happens

So there I was, cruising along in my well-equipped SUV, headed for the transmitter site at 7:00 AM to get a jump on the hot day. The air conditioner was running already because here in the desert it does not take long to get over 90.

About ten miles past the last ranch house, down a dirt road rarely used by anyone, the SUV made a horrible sound and stopped running.

(Continued on Page 40)



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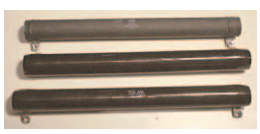

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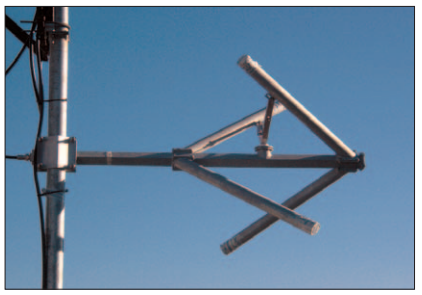

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Practical Engineering

Preparing for the Heat

– Continued From Page 38 –

It takes very little time for that SUV to turn into a green house without the air conditioner running and with no wind coming through the windows.

I grabbed the cell phone to call for help, no coverage. My ham VHF/UHF rig was of no more help since I was on the wrong side of the mountain for the repeaters. I very rarely have the HF in the SUV when I am going to be going up rough mountain roads. So there I sat.

Fortunately before I left I made sure that a couple of responsible people at the radio station knew where I was going, the route I was taking, and when I would return. If I waited long enough, they would send someone to find me.

PREPARED FOR THE UNEXPECTED

As the sun rose, the prediction was for another balmy Nevada desert day with temperatures in the low three digits.

In the back of the SUV was my emergency kit. I had, as usual, double-checked its contents within the last month. First, I rolled down the windows, opened all the doors, and put a blanket or tarp over the windshield. That helped keep the SUV cool.

Alternatively, I could have gotten out and sat on the shady side of the vehicle, using a tool box or back seat to sit upon, since it is five or ten degrees cooler if you are up off the hot ground.

I checked my water, found I had plenty, and drank a bit when I got thirsty. People have been found dead of dehydration with water still in their canteens; if I am thirsty, it is my body telling me that I need water. The best place to store water is in the body. Sip it – do *not* chug it. Use your water carefully.

It was a long walk back to the last ranch house. If necessary, I would have waited until dark and taken plenty of water during the walk out along with a two-cell flashlight I carry, stored with one of the cells turned around to prevent accidental battery drainage.

During a less stressful time, Bill Croghan and Jim Owen (r) check out some of the survival tools carried on the truck.

In the meantime, I exerted myself no more than absolutely necessary. It is always smarter to stay in place and await rescue.

STAY IN SIGHT

If I had been stuck there longer, one of the best ways to let searchers find me would be to make myself bigger. What this means is to make sure you can be seen easily from the air or from a distance.

One trick is to take a bunch of those CDs I keep in the truck and spread them around, shiny side up. They are great reflectors. One can be used to signal to any low flying aircraft or helicopters that pass. With a little practice, a CD makes a great signal mirror; when a searcher comes near you can flash the mirror at them.

Other options include throwing hands-full of sand into the air to make large dust clouds. Wearing bright clothing works as well. That Space Blanket from the winter kit is bright aluminum colored and easily seen. Or perhaps one could start a small fire with stuff that will smoke to get attention.

If the situation became really desperate, one could burn the spare tire. It will smoke like crazy and get attention – but only as a last resort, because it will not last long.

CARRY THE RIGHT FOOD

I also keep some food in the emergency kit; foods that keep well, require no preparation, do not use water, and can be eaten easily.

Years ago I used to carry little cans of cocktail sausages until I noticed the sodium content. Sodium = Salt = Need for more water. Now I carry power bars, military MREs, and hard candy – stuff I do not normally like so I will not be tempted to snack on it when it is not needed.

Since I am a diabetic, my kit is stocked with food to take account of my specific needs. I have checked with my diabetic dieticians and doctors about what is good for just this situation – your needs may be different.

RESCUE!

Sure enough, my assistance noticed that I had not checked in from the transmitter site. Around four hours later the welcome sight of his vehicle was raising dust along the road. Right behind him was the tow truck. The transmitter visit would wait for another day.

Time and experience prove that even with the best of plans, it is always possible to end up "out there" for extended periods of time. You can survive and work comfortably for a long time in the desert if you just use some common sense and listen to what your body is telling you. *– Radio Guide –*

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Small Market News

Can Small Market Stations Afford to Go HD?

by Judith Gross

Many small market stations are intrigued by the idea of going HD. Some of this is due in part to the chance to broadcast one or more of their HD channels over analog translators, recently allowed by the FCC.

They can do this either because of a regulatory "loop-hole" or thanks to a planned campaign by the Commission to foster more interest in HD – depending on whom you ask.

The Cost

But up to this point, the biggest obstacle facing small market stations in going HD has been the licensing cost. At the start, iBiquity was charging a fee of $25,000 per station to go digital. But recently, they've heeded the cry of small market stations and responded with a revamped, pricing structure.

Rick Greenhut, Director of U.S. Sales for iBiquity, said that as HD acceptance recently passed the 2,000 station mark, there's been an effort to reach stations even in markets that are unrated. As a result, he said, the fees to go HD are at their lowest levels, ever.

"We've pushed for lower fees to make HD more affordable and we have pricing options that could bring the cost of adopting the technology down to less than half of what it was," Greenhut said.

If stations send a check up front for iBiquity's licensing fee, the price tag is $10,500. A station can also do 30 day net billing for $11,000, or have the fee deducted electronically over 12 months, for a total cost of $12,500.

iBiquity also charges a yearly multi-tasking fee for each additional HD channel. It's $1,000 or 3% of the incremental revenue a station reaps for advertising on the additional channel-whichever is greater.

Why Not Scale Fees?

If iBiquity wants enthusiastic acceptance, why not just scale the fees to a station's revenues or market population?

According to Greenhut, that's a delicate legal matter. Because the FCC virtually handed iBiquity a de-facto monopoly when it made their HD system the only one approved by the commission, iBiquity's legal team felt that different pricing for different users could bring up legal issues, maybe even lawsuits.

Internationally, some HD equipment manufacturers have built the licensing fees into a package that includes the gear, amounting to a discount. Greenhut said such an option doesn't exist in the U.S. for the same legal considerations.

So How Well is the Market Accepting HD?

Currently, Greenhut put the breakdown of HD acceptance as 40-45% large market; 20-25% medium market and 30-40% for small markets. Still, he believes the new costs will encourage more smaller stations to go HD.

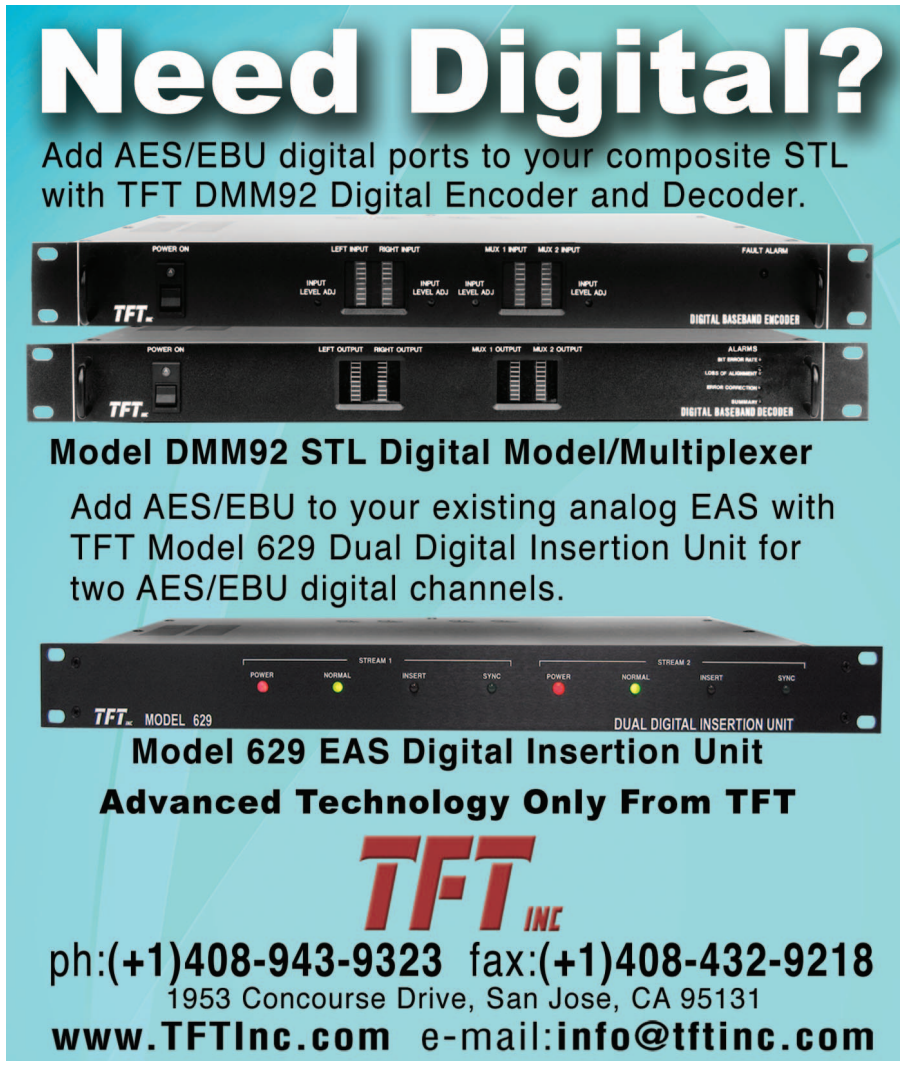
"I'm incredibly optimistic about small markets going HD," Greenhut explained. "Fifteen auto makers have announced that HD will be in 86 different models of autos, 36 of them as standard equipment."

Small Markets Have Been Creative

Greenhut added that many smaller market stations have been creative in using HD to boost ad revenues. "For the first time they can go to that tiny business who couldn't afford their ad rates and offer something affordable," he said.

Greenhut added that the ability to broadcast one of a station's HD signals on an analog translator has been another attraction for small stations. Some have even made deals with receiver manufacturers to sell HD radios on their web sites.

Judith Gross is a freelance writer who has been involved in radio for more than three decades. She runs her own marketing media company in Binghamton, NY with a website at www.jgcreativemedia.com



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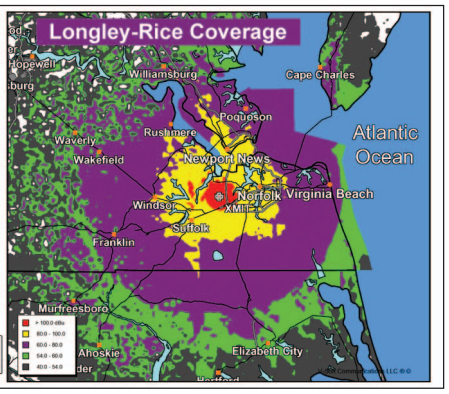

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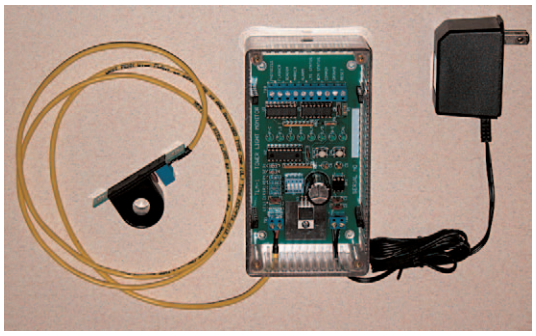

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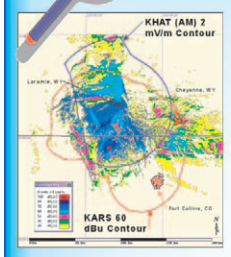

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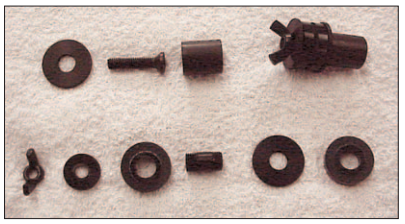

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Radio Pipeline

Bext Inc. – Davicom/Comlab – Gorman Redlich

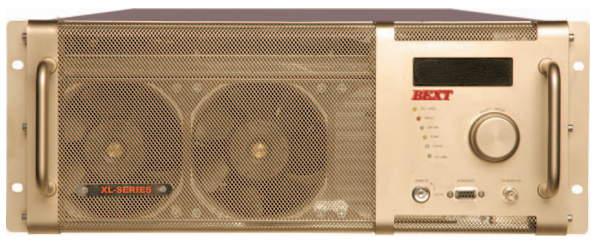
New Equipment

Updates and Modifications

Industry Information & News

Bext Inc.
Bext XL 3500 FM Transmitter

The Bext XL 3500 is a super-compact, 3.5 kW, self-contained FM transmitter in a four-rack space enclosure. Despite its diminutive size, it packs the power and features on which the Bext line of broadcast equipment has built a solid reputation.



Housed in a stainless steel enclosure, the transmitter can be field re-wired for either single phase or three-phase operation. It has a built-in low pass filter, is completely solid state and frequency-programmable from the front panel.

The unit is easy to service with modular construction through individual RF modules as well as multiple power supply modules. The XL 3500 comes with a built-in stereo generator and multiple audio inputs – including left and right channel inputs, composite input for use with external stereo generator, and AES-EBU input.

The overall efficiency from the AC line is high: typically close to 70% of entire transmitter efficiency (not just PA) and the unit produces very little heat. Other features include proportionate auto-foldback in case of alarms such as SWR, temperature or other overloads. The transmitter also features ease of settings through front panel display with a user-friendly menu.

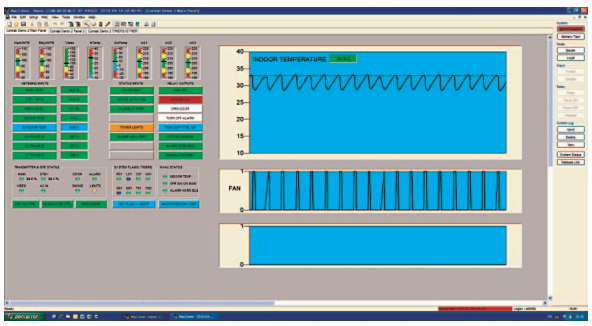
All events are stored for later viewing through the event history log, and the front panel offers secure access to all settings by a locking feature, allowing only authorized users to make any changes.

The unit is remote-control ready by standard contact closures and analog readings, or through PC connection with no need for proprietary software.

BEXT Inc.
888-239-8462 • www.bext.com

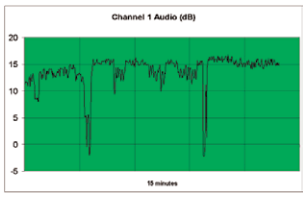
Davicom/Comlab
Davicom Version 5.40 for MAC2

The latest release from Davicom is the version 5.40 firmware for the family of Davicom MAC2 products. This update was designed to serve the MicroMAC, MiniMAC2 and MAC208/216. It includes full support for ModBus devices (both RTU and TCP); audible remote alarms on the MacComm software and external USB modems as well as USB dongles and USB memory devices.



The new release of firmware also provides support for communications via external two-way radio links; data logging at rates up to 1 Hz and trending graphs on MacComm main screens.

The data-logging allows for extensive troubleshooting of intermittent problems by allowing users to go back in time to the exact instant before a problem occurred and see what conditions were present. The data log can contain 94 million events, or nearly three years of samples on one channel at a 1 Hz rate-or one year with three channels at 1 Hz, or 60 years on three channels at a sampling rate of 1 minute.

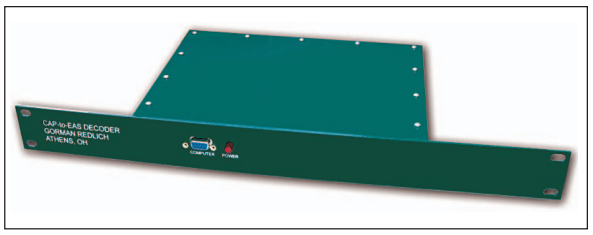


One other important feature is the ability of the Davicom units to record EAS logs from a serial port and e-mail them as attachments whenever desired for record keeping.

Comlab
877-282-3380 • www.comlab.com

Gorman Redlich
CAP to EAS Converter

Built by a company with 35 years of experience in the emergency alerting industry, this converter is a stand-alone unit that translates received CAP alerts into EAS headers, as well as converting digital audio to analog audio – which will then be transmitted into a station's current EAS equipment. It is intended to work not only with Gorman Redlich EAS but with all other brands as well.



The CAP to EAS converter is loaded with features, such as: compatibility with existing IPAWS CAP profile; built-in text-to-speech functionality; email alert reports via built-in SMTP server; print alert reports to USB or network printer and 500+ MB on-board storage for log files and message/audio archives.

The unit has a RS232 serial port for data transfer and up to eight USB ports for attaching printers, storage devices and network adapters. There is also a 10/100/1000 Gigabit LAN connection for fast network connectivity; codecs for decoding and playing MP3 or OGG Vorbis alert audio; 1/8-inch TRS jacks for audio in, audio out, and microphone in; and a powerful 1.6 GHz dual core Intel Atom 330 processor.

In addition, the convert reads and processes RSS feeds to monitor lists of CAP alerts. Software can be updated via LAN and the unit may be configured via an available VGA monitor, mouse and keyboard connections. The converter automatically updates and synchronizes the clock via pre-configured NTP servers. Also a plus-standalone CAP-to-EAS conversion does not require the purchase of new encoder-decoder.

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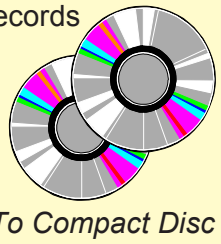

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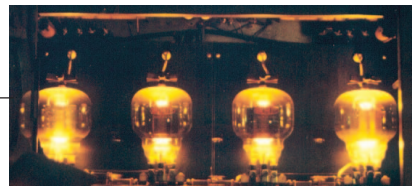
Final Stage



RADIO ROUNDUP

The Radio Guide Event Register

Email your dates and info to: ***radio@rconnect.com***

TAB Trade Show and SBE, 56th Annual Convention
August 12-12, 2010
Renaissance Austin hotel – Austin, Texas
www.tab.org/convention-and-trade-show

NAB Radio Show
September 29 - October 1, 2010
Washington, DC
www.nabradioshow.com

SBE 22 Broadcast and Technology Expo
October 6, 2010
Tuning Stone Resort and Casino, Verona, New York
www.sbe22expo.org

Broadcasters Clinic & National SBE Meeting
October 26-28, 2010
Madison, Wisconsin
www.wi-broadcasters.org

Fall 2010 National Student Media Convention
October 27-31, 2010
Louisville, Kentucky
www.askcbi.org/?page_id=843

129th AES Convention
November 4-7, 2010
San Francisco, California
www.aes.org/events/129/

Radio Guide Advertiser Info – May/June 2010

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AM Ground Systems - 39	www.amgroundsystems.com
Armstrong Transmitters - 40	www.armstrongtx.com
Arrakis - 23	www.arrakis-systems.com
Axia - 15	www.axiaaudio.com
Bay Country - 40	www.baycountry.com
BEXT - 42	www.bext.com
Broadcast Connection - 35	www.broadcastconnection.com
Broadcast Devices - 34	www.broadcast-devices.com
Broadcast Software Intl. - 8	www.bsiusa.com
Broadcast Tools - 20	www.broadcasttools.com
CircuitWerkes - 27	www.circuitwerkes.com
Commercial Radio - 39	www.commercialradiocompany.us
Comrex - 5	www.comrex.com
Davicom - 40	www.davicom.com
DM Engineering - 47	www.dmengineering.com
Econco Tubes - 40	www.econco.com
ESE - 38	www.ese-web.com
Fanfare - 40	www.fanfare.com
Gorman Redlich - 39	www.gorman-redlich.com
Harbach (Peter Dahl) - 47	www.pwdahl.com
Henry Engineering - 2	www.henryeng.com
Inovonics - 26	www.inovon.com
Intrinsicnet (MySine) - 37	www.plussine.com
Jampro - 1, 24	www.jampro.com
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Progressive Concepts - 28	www.progressive-concepts.com
PSI (Propagation Systems) - 35	www.psibroadcast.com
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SAS - 19	www.sasaudio.com
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Telos - 31, 33	www.telossystems.com
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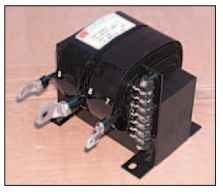

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- **Auto Switching between Off Line Mix and On Line Mix Minus per channel**
- **Control Room and Studio Monitor Outputs with selectable sources from Audio Network**
- **4 Main Mix Busses**
- **Per Channel Mix Minus Output with Selectable Reference Mix and Talkback Interrupt. Complex Mix Minus setups made simple.**
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