

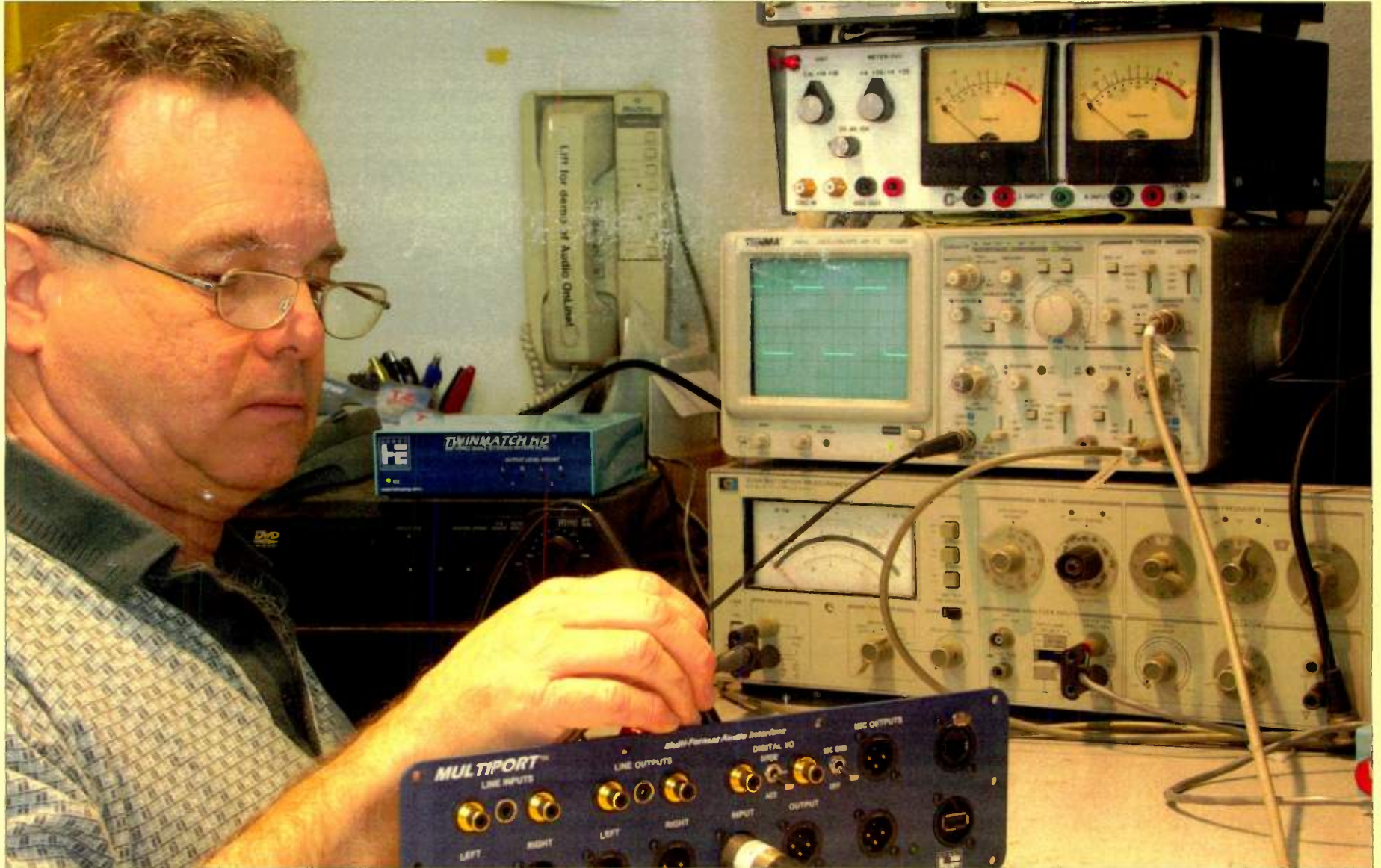
Radio Guide

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Digital Issue Now On-Line

March-April 2010 – Vol. 18, No. 2

Henry Engineering – The Little Company That Could



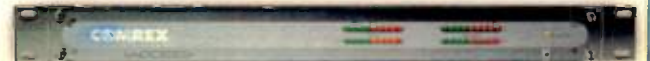
Inside Radio Guide:

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

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ACCESS
SUCCESS STORIES
FROM THE FIELD.
SEE PAGE 5

COMREX



Welcome to "Surge Suppression-101".

You're reading Radio Guide because you're responsible for maintaining a radio station and keeping it reliably on the air, right? Then keep reading to learn how to protect your station and prevent off-air downtime and damage to your transmitter.

Power line surges and spikes are a fact of life in the radio biz. Transmitter sites are especially vulnerable because long runs of utility wiring pick up lightning and other atmospheric disturbances. These cause the nasty voltages spikes that will trip circuit breakers and cause serious damage to your transmitter. **PowerClamp™** surge suppressors can help eliminate this threat and keep you on the air.

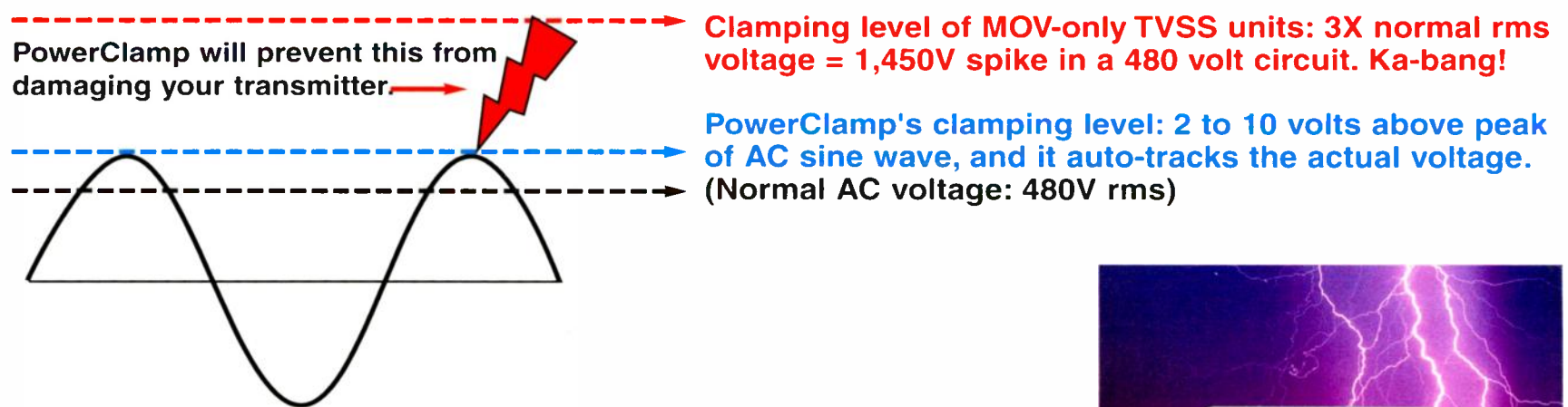
PowerClamp is the performance leader for one simple reason: it's ultra-low Clamping Level.

What's *clamping level*? It's the level to which voltage spikes are attenuated. The lower the clamping level, the better the surge and spike reduction. It's a simple concept, but it's easier said than done.

PowerClamp has an extraordinarily low clamping level of 2 to 10 volts above the sine wave.

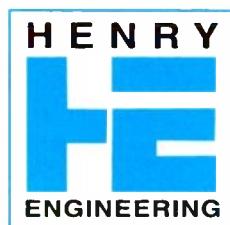
It uses *multiple attenuation circuits* (not just MOVs) to achieve this superb level of performance.

The diagram below shows how PowerClamp is different from many other surge suppression (TVSS) units. Suppressors that rely mostly on MOVs will typically have a clamping level that's *three times* the normal AC voltage. On a 480 volt circuit, a spike of *1,450 volts* will still get through! That's enough to trip a breaker or damage the power supply in a transmitter. This doesn't happen with PowerClamp: it effectively "clamps" spikes and surges to within just a few volts of the AC sine wave.



PowerClamp is your best defense against damaging AC spikes and surges. Don't wait until your transmitter goes up in smoke (and the boss goes ballistic)!

Get protected and *stay on the air* with PowerClamp.



For detailed information, user reports, and specs, please visit www.henryeng.com or contact any Henry Engineering dealer.

HENRY ENGINEERING

(626) 355-3656





...and wait until you see the 11 behind the screen.

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Radio Guide

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March-April 2010

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by Ray Topp – Publisher



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Cover Photo:

Hank Landsberg does final tests on Henry Engineering's newest product "Multiport."

Radio Guide

Volume 18 – Issue 2

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Radio Guide, ISSN 1061-7027, is published bi-monthly, six times a year, by Media Magazines Inc., PO Box 20975, Sedona, AZ 86341. Radio Guide is copyright 2010, Media Magazines Inc., and may not be copied, reproduced, or stored in any format, without the written permission of the publisher.

It's That Time Again

I'll admit I haven't unpacked some of our exhibit booth material from last year's NAB show. Now here we are again – time for another show.

This year, the radio suppliers' and manufacturers' location has been moved from the "intimacy" of the Las Vegas Convention Center's North Hall to the Central Hall.

Because of this change, *Radio Guide* will be located in **Booth C558**, in the Central Hall. We've decided to modify our booth this year, to include some chairs and sofas, so you'll be able to relax a bit (or a lot) after those long hours on the exhibit floor.

If you're attending the show this year, please stop by when you can. We'll have some special giveaways, and if you mention this *Radio Waves* column, you receive a digital multimeter – while our supply lasts.

Change and Growth

We've made a few substantial changes at *Radio Guide* this year. Ernie Belanger is our new editor, and Judith Gross has returned to the radio publishing business, joining our team to cover small market radio and other focused topics.

In February we launched a new publication, *Christian Radio Guide* (CRG) – a magazine focused on the management, programming and technical needs of the Christian Radio community. Ernie is also the editor of CRG and Judith will also play an important roll in the CRG content.

Thanks to your substantial, continuing support and response, you have helped us move *Radio Guide* to the #1 position in the Radio industry. – Ray T.

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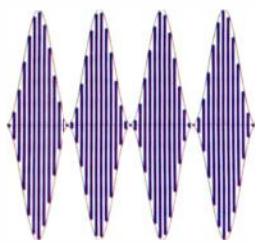
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Henry Engineering – The Little Company That Could

What is blue and black and solves a consumer-to-professional impedance matching problem?

Give up? A Matchbox.

The Start of Something Great

Ah, the Matchbox, my first introduction to the many time savers created by Hank Landsberg at Henry Engineering. I remember it fondly, or should I say, them. You see I was building a 100 kW FM station out in Colorado when I saw my first Matchbox, in the mid 80's.

This great little invention saved me a bucket load of hours. Back then CD's were a relatively new medium and small market stations couldn't afford the professional CD decks so we had to convert consumer players for use with broadcast consoles.

Barrett Mayer of Barrett Associates, an equipment distributor of new and reconditioned gear, recommended that I try Matchboxes to save myself a bunch of headaches. It was one of the best pieces of advice I've ever received.

Hank certainly had himself one great industry-wide product in the Matchbox, but that was just the start of a great success story.



The Original Matchbox

Humble Beginnings

Henry Engineering was founded 28 years ago by Hank Landsberg as a part time business while he was still Director of Engineering for Drake-Chenault, a programming syndicator in Canoga Park, California. He started Henry Engineering when he developed a series of upgrade plug-in modules for Autogram "IC"-Series broadcast consoles.

About a year later in 1983, Hank really put Henry Engineering on the map with introduction of the first version of the Matchbox.

That single product put Hank and the Henry Engineering name at the top of the list when it came to common sense, innovative products for use in broadcasting.

Over the next few years, the sales of Matchboxes took off like a rocket, especially after Allied Broadcast Equipment (which later became Harris Allied) started promoting them.

More Useful "Boxes"

The success of the Matchbox spurred the development of other "gadgets" that were needed in stations around the world.

Within a year, Hank designed the "Universal Turntable Controller," a logic/control interface for Technics SP-10 and SP-15 turntables. It made the turntable interface just

like a cart machine, with separate buttons for Start, Stop, and remote indicator lights for status.

Hank had proven to all of us that he had a knack to look at a studio and envision common sense products that made our lives as engineers, and those of the on-air talent, a lot easier. Easier for us because we didn't have to tinker around having to kluge stuff together to solve problems. Needless to say the UTC sold well too.

Change in the Wind

It's funny how the course of life prepares us for changes that we don't even know are on the horizon. That was the case with Hank. You see in 1987, Drake-Chenault was sold and moved to Albuquerque, New Mexico. Hank was all settled in California and didn't want to move with the company; by then, Henry Engineering, Hank's "little" side business was making enough money for him to live on, so he decided to stay put. And those "problem-solving gadgets?" Well, they just kept on coming.

A Little Help From a Friend

Hank credits his good friend Tom Koza, who at the time was Assistant Chief Engineer of KIQQ in Los Angeles, with inspiring his next creation. It seems that Tom needed a "thing" to control the On-The-Air lights and a bunch of other "stuff." It wasn't too long before the Superelay was born.

A series of products quickly followed: Hanks Mix-Minus Plus, a godsend to those of us who needed a quick and inexpensive way to put phone calls on the air, long before the mix minus busses were common in consoles. Henry's LogiConverter, a universal interface that eliminates incompatibility in audio and video equipment remote switching. The MicroMixer, StereoMixer, TeleCart, and SynchroStart were all added to the product mix.

Now, if you take a moment to think of the stations where you have engineered or where you are engineering now, you probably can think of at least one or more Henry Engineering "gadgets" that are in use as you read this. I know that I can.

A Deeper Look

But let's look deeper into Henry Engineering as a company, and more importantly Hank himself. Many of you may have met Hank at a trade show. There you found a very sincere, honest guy who is very low key and always greets you with a smile. That's not a put on – that's really Hank. He's one of those amazing guys who has the keen sense to know what products are needed, but isn't flamboyant or puffed up about his skills or abilities. He's just like you and me, one of the guys.

And he's hands-on, directly with every product. But of course first and foremost, Hank is an engineer.

He has designed every Henry Engineering product, or better said, every part of every Henry Engineering product. He designs the metal work, the front panels, and the silkscreen artwork. Back before the days of CAD programs, he'd lay out his PC boards with Mylar and black tape.

I revealed the key to Hank's success early on in this story. That keen sense to look at a studio and station and

just see the common sense time savers that were needed. Plus Hank always listened to our needs as broadcast engineers and tried to develop products to fill those needs.



Hank Confirms a Board Layout

A Look Behind the Curtain

We are lucky enough to have convinced Hank to let us go where few get the opportunity to go. He's allowed us to go behind the "magic curtain," that impenetrable veil that manufacturers put up to prevent the world, and competitors, from getting a glimpse of their "mystical" process of product design and development. All are usually heavily guarded secrets.

In the case of Henry Engineering, Hank begins where most manufacturers end their process, with the writing of the manual – before anything is built.

The first step in the process is to identify the need. What problem needs a solution? How will the product make someone's life easier? What should the product do? And who will use it?

From the Outside, In

He then moves on to design the outside-functionality of the product. Again, a move that swims against conventional design methodology. Hank calls this designing "from the outside in." Based on what the product should do, he creates a design of the outside surfaces, e.g., the front and back panel. He answers the question: What controls, buttons, switches, adjustments, and ins/outs are needed?

It is at this point in the process that Hank's design process takes a unique and positive turn – he sits down and writes the product manual "Even though nothing has been built, I write the manual because that "locks-in" the concepts of what the product will do and how it will be used," Hank told us.

Now the Design Work Begins

Then, with the concept locked down, he begins the task of designing the circuitry to make the product meet the targeted need and function. This step of the process is the most involved. Circuit design, breadboarding, testing and de-bugging, and re-design if necessary.

Once the circuit is proven out, he then finalizes the schematic. Then it's time for the mechanical design.

(Continued on Page 8)



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

Cover Story

Henry Engineering – The Little Company That Could

– Continued From Page 6 –

CAD Conversion

Exact CAD drawings must be made from Hank's hand drawn sketches. All panel holes are rechecked.

PC boards need to be converted to CAD from hand drawn circuit diagrams. Part layout is determined to ensure that certain components aren't physically close to each other, like a power transformer to close to a hi-gain input stage.

Everything is checked and rechecked for accuracy, then the design goes out for prototypes to be made.

With prototypes in hand, Hank checks all functionality, ensuring the product meets the design standards and works like it should, doing the job that it was intended to perform.

The First Production Run

When approved, the design is released to production for a first run. Before the first run arrives, Hank writes test procedures. Hank then takes painstaking care to test every single unit in the first production run to make sure all is well, and the product is then on the shelf ready for purchase.

"I never announce a new product until it's actually in stock," Hank said. "I don't like to promote 'vaporware'!"

Hank went on to tell us that once the process is finished and the product is on the shelf, "You sit back and hope that your idea for this cool new product is well received by your customers. Hopefully it solves a problem in a way that's logical, practical and affordable," he concluded. For Hank it's been, so far so good.

An American Success Story

Hank stepped into a perfect void – the need for interfaces – a void that was too small for the big manufacturer's to worry about filling.

Hank filled it with his "Little Blue Boxes" that made our jobs easier, saved us tons of time and made the jocks and management happy. And filling that void suited Hank just fine over the years. Hey, what more could you ask for.



Assembling USDA Units

How Successful?

From its start in 1982 to the present, there are over 85,000 Henry units in the field around the world. About 40% of those are – you guessed it – Matchboxes.

Now we all know that time and technology march forward, but that didn't stop Hank. As the years went by and our analog stuff was replaced with digital gear, he's continued to try to fill the needs of broadcasters. In addition to Henry's humble analog DA (USDA 2X4), there's now also a digital DA which is also a format converter: the DigiMatch 2X6; and the trusty analog Matchbox HD now has a digital cousin, the USB-Matchbox II.

Hank points out, "It's not easy being in the "digital problem solver" business; simple solutions that could be accomplished in the analog world with a few opamps, pots, and switches now require a microprocessor, lots of SMT components, and \$20,000 worth of custom software!"

Diversifying

Henry Engineering diversified its product line back in 2004, into a slightly different area of broadcast station problem solving with the addition of the PowerClamp line of "transient voltage surge suppressor" (TVSS) products.

Hank's friend Tom Koza, had been using them for many years, in his new position as Engineering Manager at Univision in Los Angeles and thought they should be offered to the broadcast industry. Last year Henry Engineering purchased the company, after having an exclusive distribution agreement for six years. It's now called Sine Control Technology, Inc., and continues to produce PowerClamp TVSS units.

I don't know about you, but one thing I always look forward to every NAB is wandering over to the Henry Engineering booth, saying hello to Hank, and checking out what new "magic box" he's pulled out of his hat.

For more information about Henry Engineering and Sine Control Technology products visit www.henryeng.com



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Way Off The Grid

Around 9:00 p.m., one evening in September of 2007, I received a call from Jason, one of my men assisting with the construction of FM radio station KFTT, near Bagdad, Arizona. His call was breaking up, but I understood that he and three other men were cut off deep in the desert by the rising waters of Burrow Creek, which normally runs about 18 inches deep and twenty feet across.

Apparently the creek was swelling due to rains high in the mountains, and was now over 200 feet across and rising. The way home was cut off, they were nearly twenty miles deep in the desert from the nearest paved road, and they wanted to know what they should do ... but I need to start at the beginning of this story.



The Solar Panel Array in the Rough Terrain

The Beginning

My passion is ministry; specifically, Christian Broadcasting. In my "spare" time, I maintain and build FM radio facilities in the Southwest through my engineering business, Arizona Broadcast Engineering Services. A few years ago one of my clients asked me if I was interested in building a new FM station near Bagdad, Arizona. I said "sure," although I do not know if my answer would be the same today.

I appreciate a challenge, believing life should not be dull and boring. The proposed site, over 120 driving miles away, was 45 miles across desert back roads to Arizona highway 93, followed by another twenty miles over rough terrain, and a final six miles up a dry creek bed to the site.

The last six miles of the road was non-existent. If that were not enough of a challenge, the station would also need to operate "off the grid."

Can You Say Desert Dog?

On my first attempt to visit the site, I rode with an old miner by the name of Bill, who was the only person (or so I was told) who knew the back country well enough to find the right location.

We drove until we reached the last six miles to the site, and then began carefully navigating over extremely rough terrain. His driving was a little disconcerting, as we seemed to plunge ahead as if we had nothing to lose.

It was not long before his vehicle was hung up. After freeing the vehicle with a jack and couple of shovels, we hiked two of the last three miles to the site, which was close enough for Bill to point out the peak where the Arizona State Land lease was located.

You Want It Built Where?!

On my next visit, I backpacked the equipment needed to receive a couple of test signals from a communication site called Crossman Peak, which was to be to my STL link.

Now, when I left Lake Havasu City, the temperature was 118° F. Water is not an optional item in the desert. I also quickly learned, after a couple of close encounters of the third kind, that rattlesnakes are not typically happy fellows. I finally located the coordinates with my GPS, and found myself on the side of a mountain, 40 feet from the ridge, on about a 30 degree slope. I did not have the signal needed, which meant I would need an intermediate STL site, which would also require solar power. This project was going to require some work; but first, we needed to complete the road.

"Road!" – Oh That's What You Call It?

With the "road" completed – and I use the term loosely – we began hauling concrete for the tower base and anchor points. Delivery by concrete truck was impossible, so all the concrete needed for the small 50-foot, Rohn 55 guyed tower would need to be mixed onsite with a portable mixer. Approximately 400, 50-pound bags of concrete would need to be transported up the mountain.

On a couple of occasions, two four-wheel-drive vehicles were chained together to pull the trailer over the steepest section of the "road." The logistics of getting men and material to and from the site was the most difficult aspect of this project.

What would be a fairly straight forward, relatively small build at almost any other location, was complicated by the complexities of a four hour drive each way across steep, rugged desert country that was nearly impassable.

The Solar Option

KFTT is located miles from the nearest utility pole. Originally, the plan was to power the site with a diesel generator. After some consideration, I began to believe that it just may be feasible to operate the site with solar power, and use a lighter duty propane generator for backup.



Panels Angled for Maximum Sun Exposure

I determined the power consumption of all the equipment located on site and "did the math," discovering that about forty, 180 Watt Mitsubishi solar panels and 72 deep cycle batteries would be needed to supply the energy.

Once a decision is made to pursue solar, it is essential to design the station with efficiency as a high priority. In light of this, we used a Jampro horizontally polarized JLHP series antenna. Radiating horizontal only, reduced the transmitter power output by about 3 dB over circular polarization.

We opted for a 60-inch weatherproof enclosure to house the equipment.



The Self Contained KFTT Transmitter Site

The Array

To support the solar panels, a lattice of specially treated 4x4s was mounted above 18-inch concrete piers, with the angle of inclination optimized for the shortest days of the year.

Four Outback MX-60 charge controllers were installed to regulate battery charging, and a Trace inverter was used to provide conversion of the 48 volt battery bank to 110 volts AC.

Since the project's completion, well over two years ago, the Trace Inverter has not been off line and the back up generator has only needed to run for occasional testing.

The Stranded Crew

Back to my stranded crew. As I drove through the night, I did not expect to be able to reach them. How was I to cross 200 feet of fast flowing water?

I thought about telling them I would start out the next morning, but remembered my previous experience with this creek indicated it could be several days before we could get back across.

Dark Journey Through the Desert

I recalled another engineer telling me that there may be an alternate route, although it was believed to be impassable. Could I find this alternate path, navigate through 15 miles along a desert trail I had never seen, at night, believed to be impassable, to reach this crew?

I began to pray as I started out on my journey, realizing that I had little chance of success on my own. To make an already long story short, it is amazing how God is so faithful, as I was able to somehow navigate an alternate route through the desert, crossing trails, not knowing which way to turn, but somehow, against all odds, arriving just behind the location of my crew.

This article is written in memory of my best climbing vehicle, a 2001 Range Rover that encountered a bull late one night bringing my crew back across the desert. The bull walked away, but the Range Rover was laid to rest.

Faron Eckelbarger is the owner of Arizona Broadcast Engineering Services. He also manages Christian Radio Station KNLB-FM Both are in Lake Havasu, Arizona. He can be reached by email faron@knlb.com or call him at 928-855-9110



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BlueKeeper

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World Radio History

Transmitter Site

The Simple Project That Wasn't

by Steve Callahan

Several years ago, I took on what I thought was going to be a simple installation. Little did I know that what appeared to be a simple project was not going to be as simple as it first appeared. Read on for how a twisty path lead to an eventual solution that you could be confronted with someday.

The Project

A new LPFM at 104.3 FM needed a transmitter and antenna installed. They had permission to locate in the equipment room on the top floor of a high school which had an existing tower on top of the equipment room.

I purchased an FMX 150 transmitter from Armstrong along with two bays of their FMA 707 series antenna. I also got seventy feet of half-inch foam coax and contracted with my favorite tower guy to install the coax and antenna on the existing tower.

He didn't even have to drill a hole in the concrete block for coax access into the equipment room because there was already a hole right behind where the transmitter rack was going to be placed. I thought to myself "How easy is this installation going to be!"— or so I thought.

Completion

My tower guy installed the two new antenna bays with the interbay harness and "T" splitter per Armstrong's specifications.

He also installed the coax with two correct type "N" connectors and carefully weather proofed them.

I took the transmitter end of the coax and connected it to my portable Bird Wattmeter and then a three foot jumper from the Bird to the rear of the transmitter.



Armstrong's FMX-150B

I turned the transmitter on and made the initial adjustments per the manufacturer's specifications. I then ran the transmitter up to the proper output of 113 Watts and the front panel power meter on the transmitter agreed with my Bird. All of the transmitter's readings were well within the numbers on the factory test sheet. We ran it for an hour while I finished the remote control wiring.

We turned the transmitter off because the station's official debut was a couple of days away, but I had enough to start the license application for the new facility.

So far, so good – or so I thought.

Wait a Minute!

A couple of days later when they officially turned on the transmitter, it immediately showed a foldback to exactly 50% of the 113 Watts. First, I hooked up my Bird watt meter and a dummy load to the transmitter output and the transmitter worked fine at 113 Watts into the load with zero Watts reflected.

Obviously the problem was somewhere up above. I reconnected the vertical coax back directly to the transmitter and looked skyward.

Time for a Second Climb

My trusty tower guy came back out and took off his excellent job of weatherproofing and installed new connectors. He said the original connectors had looked fine and he hadn't seen any water intrusion.

We double checked his installation of the coax for any recent kinking or other physical damage, but it looked just fine.

If at First You Don't Succeed

With the new connectors in place, I turned the transmitter back on and it folded back to exactly 50%.

Thinking that the repeated 50% foldback was more than just a coincidence with a two bay antenna, maybe I had a bad antenna bay?

So I asked my tower guy to connect the vertical coax directly into the top bay without the interbay harness. He did it and the transmitter came right up to 113 Watts. Progress, I thought.

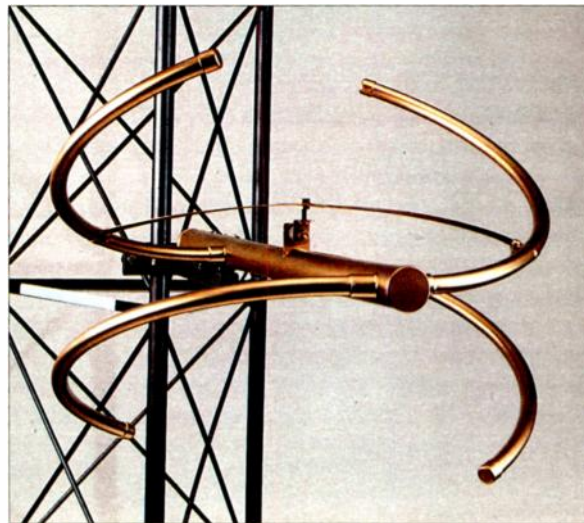
Just to confirm that the problem was a bad bottom bay, I asked him to connect the vertical coax to the bottom bay. When I turned the transmitter on, into just the bottom bay, the power came right up to 113 Watts with no foldback.

Well, it looks like I had a bad interbay harness – or so I thought.

Time for a New Harness

I contacted the manufacturer and they immediately sent out a new interbay harness and my tower guy reluctantly came back out and once again cut into his weatherproofing to swap out the harnesses.

With the new harness in place, I confidently turned on the transmitter and (you guessed it) it went immediately into foldback at exactly 50% output.



Armstrong's FM-707 Low Power Antenna

Down came the interbay harness again and I replaced the "T" splitter. Up went the harness again and once again the transmitter folded back to 50% power.

Time to Call the Factory

I called Armstrong's technical service number and Kevin Smith answered the phone.

I explained the problem and what I had done to get to this point of utter frustration. I speculated that perhaps the foldback setting in the transmitter might be set too low even though my Bird watt meter had shown little or no reflected power when it was in-line.

Kevin then suggested that I add a couple of feet of transmission line to the vertical run. He had experienced the same problem in another installation and that solved the problem.

I had a brand new three foot Superflex jumper handy, so with a Type N barrel connector, I added the jumper to the end of the vertical coax and then connected the Superflex to the output of the transmitter.

I turned on the transmitter expecting to see the all too familiar foldback but it went right up to the desired 113 Watt output and stayed rock solid. It's been running that way for several years now.

Lesson Learned

I now believe that there was some degree of standing wave on that particular length of transmission line at that particular frequency and the transmitter just didn't like it.

As you will remember, there was no problem when I inserted my Bird watt meter with a three foot jumper, thereby slightly lengthening the line. There was also no problem when I shortened the line by removing the interbay and we fed each bay individually, one at a time.

After I discovered the solution to my problem at the LPFM, I recalled a higher power FM facility that I had visited many years ago. The hard line there made an unusual jog on the output of the harmonic filter.

The old time engineer had called it a "trombone" section and it was done because that RCA transmitter was unstable with the original line length and the jog added a little more line and made the transmitter stable.

A Second Lesson Learned

This episode also taught me that there is a wealth of knowledge and experience available to you when you call the service department of your favorite broadcast equipment manufacturer.

When you have a problem in the field, get them involved early on because chances pretty are good they have seen the problem before.

Many of the tech support personnel started out in the field just like you and me. It just might save you a lot of time and frustration.

Thanks to Kevin Smith at Armstrong for his assistance.

Steve Callahan is the Director of Engineering for Rhode Island Public Radio. He is an SBE member with CBRE and AMD certifications

Correction: In the last issue (Jan/Feb-10) Steve inadvertently cited the wrong FCC form number for FM Translator Licensing. The correct form is FCC Form 350, not Form 302.

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We Appreciate Your (email) Feedback

by George Zahn

One of the greatest benefits of writing for *Radio Guide* is the reaction the written word here draws from engineers and managers, along with anyone else so addicted to this thing we call "radio." In this issue, I wanted to share two poignant stories which I received in reaction to past articles, and I want to take this opportunity to invite your "war" stories or creative ideas from the field dealing with technology for the studio – including "out of the box" solutions and epic tales of audio heroism!

Digital Flash Recorders

Ron Wood is a retired engineer from Waseca, Minnesota, who responded to the article on the Zoom and other portable digital flash recorders. He had originally ordered another digital recorder which arrived DOA from the supplier. Rather than a straight exchange, he added a few bucks to upgrade to a Zoom H2. Ron reports a few of the same issues I found, but was, overall, very happy with its performance.

Wood explained that his first goal was to use the recorder as an intermediate step to transferring LP records to CD. The plan was to pull audio after the turntable preamp (for the recording curve correction), then send it from a low level output into the line input on the H2.

Since his audio setup and his computer were not in proximity, the portability of taking the encoded SD card from the H2 and simply plopping it into a card reader on his computer worked well, and it saved him several hundred dollars on the purchase of a CD recorder – but he found yet another bonus.

Two Mics or Not Two Mics?

"My main reason for buying it was to transfer music from LPs to CDs. But I found it so easy to operate and carry around, that I decided to use it for our music group recording where I had been using a portable cassette unit." Wood's only critique on the digital remote recording was the relatively low audio levels, even when using the "Two-Mic" mode. This mode allows the user to record using the built-in microphone elements on the H2.

Low Mic Levels

In my article, I noted that external microphone levels were quite low going into the H2. The result was a somewhat noisier recording with an external mic than might be desired for broadcast purposes. If this is a problem on your digital flash recorder when attaching an outboard microphone, one of our regular contributors, engineer Jay Crawford, has a solution.

"If you're trying to avoid low levels on a recorder and if you're using a dynamic microphone, you may need to switch to a condenser," says Crawford. For those using these units as news gathering recorders, it may be a good investment.

In my experience, I have found interviews using a standard dynamic microphone were low, and "hissy" when amplified to a usable level. The good news is that there are fairly durable and useful condenser microphones, both mono and stereo, that can be interfaced with portable digital recorders. This family of microphones benefits from a small built-in amplifier which gives the microphone output a bit more "umph!" in signal strength.

Phantom or Battery?

Here's the one thing you'll definitely need to check, depending on which digital recorder you own. As most of our engineer readers well know, the condenser microphone needs some form of power to make the microphone element and the aforementioned amplifier work. That power can come from the recorder unit, a console (phantom power), or may be supplied by a battery inserted into the microphone. You should know if your recorder will supply phantom power before purchasing a condenser microphone.

A portable recorder which produces phantom power for a condenser microphone will generally cost more. Keep in mind that some condenser microphones are more finicky than others as to the voltage needed from a phantom power source, and it helps to get the values as closely matched as possible.

Lower price point recorders such as the H2 generally do not supply phantom power. In that case, you're likely going to need a battery operated condenser microphone to get hotter level.

Jay's Suggestion Works

I have tried Jay's suggestion, utilizing a very basic Nady SPC-25 battery-powered condenser as an experiment, and found that I had more than enough level. So yes, it does work, but you need to closely monitor record levels, and your Automatic Level Control or compression settings, as well as your input level.

Signal level went from famine to feast – actually more like gluttony – but it created a good, solid level and eliminated the need to crank up levels and any preamp hiss with them. This is a great work-around for news gathering and interviews done with a single microphone on the fly.



The Electro-Voice 635A

With Microphone in Tow ...

Speaking of news gathering and microphones, no check of the mailbag is complete without another ElectroVoice 635A microphone war story. This one came in a while back, but it bears telling only because most nonprofessionals wouldn't believe it if they didn't hear it.

Those of us in the field know what the 635A can withstand, as it seems to remain as the Heavyweight Champion (actually it weighs only about 6 ounces) of Microphone Durability. As you'll learn from the fol-

lowing incident, these microphones have been around longer than tacky pink flamingo yard decorations and maybe even taxes.

OK Here Goes

Bill Newbrough, President of RF Specialties of Washington Inc., recalls the greatest test of a 635A that he ever witnessed. "I was supervisor of technical operations at NBC's WMAQ in Chicago, back in 1976. We had a bunch of 635's assigned to our field reporters. One day, one of these reporters came into my office and said that he had a problem.

It seems he was in a big hurry to get back to the studio after covering a story in a western suburb. He threw his recorder, headphones, mic and cables into the trunk of his car and sped down the Eisenhower Expressway, back to the Merchandise Mart."

So far, so good, but here's where it gets really juicy ... According to Newbrough, "When he parked, he discovered that his microphone was hanging at the end of the cable, out of the trunk, and onto the street. To say that it was beaten to a pulp, after 15 miles of dragging along at 60 mph, is a mild understatement. He was embarrassed and wanted a new microphone."

The Rest of the Story

Before we get hate mail from People For The Ethical Treatment of Microphones, there was a mostly happy ending according to Newbrough: "Knowing the reputation of the 635 and its ability to withstand the hammer test, I was curious to see if it still worked. We plugged it in, and listened to it and it sounded just fine," he continued.

"He took it back and continued to use it for several months. Alas, he dropped it one day and that killed it. EV had an unbeatable warranty on this mic, which said that they would repair or replace it if it failed to work for any reason."

Bill concluded, "So, I wrote a truthful letter of explanation to EV and sent the mic back to them, and within a week or so, they sent a brand new 635A at no charge. Ya can't beat a deal like that."

A "Warrantee-ed" Response

I have to say I've used this model of microphone at several different stations in my 30+ years and haven't heard of a test that tough. By the way, given today's economy, don't count on "lifetime guarantees."

I recently spoke briefly with a friendly person named Brad in customer service at EV, which is now a subsidiary of Bosch Communications. They do stand behind the newer 635A models.

That said, the standard microphone warranty for most EV microphones appears to be three years.

Now just in case you'd want to use these sturdy omnidirectional entries in a video setting, the 635A and its cousin the 635N/D which has an updated neodymium magnet for slightly hotter output, are also available in a matte "camera-black" finish instead of the old silver-gray coating.

Thanks to Ron Wood and Bill Newbrough for their feedback. As always, we at *Radio Guide* welcome your equipment, broadcast, recording, and studio comments and stories. It's a great chance to learn from the collective experience of professionals in our field. Thanks for sharing your ideas and accounts!

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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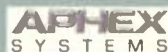


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Disaster Preparedness

Emergency Portable Studio

by Judith Gross

The large majority of pre-planning for disasters and emergencies has imagined the worst catastrophes hitting a station's transmitter site. But while the location of such sites make them obvious targets for a first strike, power outages, gas explosions, hurricanes, floods and fires are just as likely to render the main studio and control room inoperable or inaccessible.

Preparing an alternate way to send programming – be it news, talk or music – to the transmitter is just as important. Borrowing some technology from radio's past and blending it with today's newest technology, makes ways to accomplish this easier than ever.

From radio's past comes the idea of remote broadcasts. Sure, today, many stations just send the talent out with a cell phone and interface such as a JK Audio, Wireless Phone Audio Tap (CellTap) to handle a car dealer remote on the weekend, while computers at the studio handle the programming and commercials. Unfortunately, this approach robs a lot of the "theatre" and sense of importance that use to accompany such events.

Radio Remotes Like the Old Days

But some stations still create remotes designed to exhibit all the excitement and immediacy of radio with a flourish. They use codecs and phone lines, a portable mixer, microphones and, these days, most likely a laptop with a music library, adding speakers for the full dramatic effect on location.

And it's this type of remote set-up that could double as an emergency remote studio in the event of a disaster. It's portable and cost effective; it may even make use of remote equipment the station already owns.



A portable "DJ Pod" remote may be used as an emergency studio set up.

Portable Performance Pod

A portable DJ set-up or "pod" like the type used for station events or entertainment is a good place to start. Ideally, it would have a portable rack, small mixing console, microphone or two (maybe one wireless mic) and a dual-well CD player – with all equipment self-contained in a durable, portable carrying case, like those sold by Calzone or SKB.

To this on-the-go set up, add a laptop with the station's music library, the commercial database and on-air software. The CD player also makes it possible to play music directly from the source, or to play special emergency CDs that many stations keep around in case of studio computer

malfunction or for live events in areas where the over-the-air signal may be spotty.

There are a number of ways to get the programming from this portable set-up to the transmitter, depending on where the transmitter site is and what kind of communications are available. And this is the part of the process where pre-planning takes center stage.

Some Likely Set-Ups

One way to complete the emergency remote studio would be to add a portable multi-platform codec, ideally one with IP capability such as the Comrex ACCESS, installed in the rack of the DJ pod. A rack-mount codec unit at the transmitter would interface with the portable unit. A switch on the phone line would let it be input into the rack-mount codec. The codec's output would go into a low-cost processor, such as the Inovonics David III, while another switch would feed the processor's composite output to the transmitter in place of the STL's output.



The Comrex ACCESS

Configuration at the Transmitter Site

Steve Callahan, Director of Engineering for Rhode Island Public Broadcasting said that the two-phone line approach is the way to go. "You'd use two (POTS) phone lines: one to control the transmitter and switch the audio – via a Henry relay box, for instance – and the composite via a composite switcher; and the second phone line for the audio and codec from the remote site," Callahan said.

He added that the set up might work with just a single phone line and DTMF generator and decoder. "But then you're betting the farm on just that one POTS line."

Rick Fulkerson, owner of Mountain Goat Broadcast a Las Vegas, Nevada-based broadcast engineering firm, echoed the idea that such a set up would work in a pinch. "You could do it with just one phone line and the DTMF tones to switch the audio and the composite at the same time."

No POTS, Now What?

Some transmitter sites, however have no POTS phone lines and are only accessible with cell phones. Thus the beauty of the remote studio set-up, which could even be situated in a van at the transmitter. Alternatively, if space and equipment allowed, an emergency studio could be pre-installed at the transmitter shack.

Taking It to the Sky

Chris Crump, Director of Sales for Comrex, said that remote broadcasting in the face of disasters has become fairly common place. "News stations do this all the time in

disaster areas already; we saw that recently during the earthquake in Haiti and its aftermath."

While a codec such as the Comrex ACCESS can play a major role in emergency remote set-ups, Crump noted that a disaster kit recently put together by FEMA adds another dimension to the possible scenarios: satellites.

The FEMA Survival Kit

"FEMA has anticipated this need; they have their own broadcast survival kit and have been giving them to stations like those owned by Curtis Media in places such as Winston-Salem, North Carolina," Crump noted.

The FEMA kits are meant to be located at the transmitter site and include such necessities as drinking water and food. They also use the INMARSAT Broadband Global Area Network, or BGAN, a global satellite Internet network with telephony.



The INMARSAT Portable BGAN Transmitter

More on BGAN

The BGAN is accessed with portable terminals that can connect a laptop to broadband Internet in remote locations. High-end BGAN terminals have download speeds of 492 kbps and upload speeds of about 300-400 kbps. They do require line-of-sight to the satellites.

But one of the advantages is that there are no bulky satellite dishes. BGAN terminals are about as big as a laptop and are usually carried around in a backpack.

"It's basically a satellite phone with IP," Crump said. "Set up the device, hit a satellite and you're good to go."

Remote Studio Using a Blackberry

One station, WKSL, made use of this technology by combining a Hughes 9201 with the Comrex ACCESS, plus the station's library loaded onto a Blackberry, fed directly to the transmitter.

Yes, a Blackberry! Crump noted that with today's digital technology, remote studio set-ups might not even need that laptop with the station's software, and he added that the possibilities are becoming even more versatile.

"You can use broadband, DSL, satellite phone, or VSAT. Add a microphone and an iPod or Blackberry with the station's entire music library, and you have everything you need to broadcast away from the studio," said Crump. "It's a lot easier than anyone ever imagined."

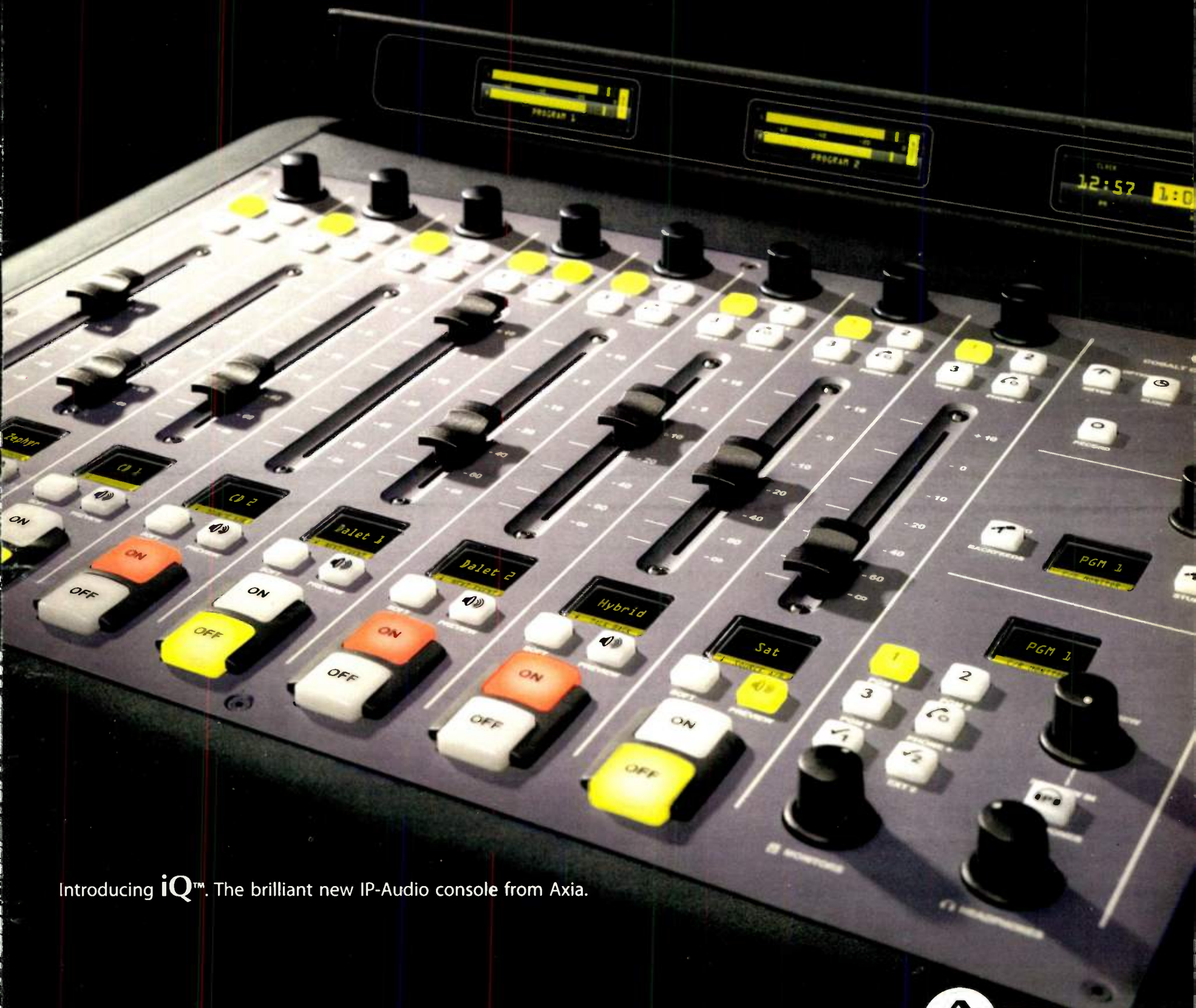
While there are several options of how to configure an emergency portable studio, the importance lies in planning now and getting equipped now – before a disaster strikes. Disasters usually don't give us fair warning before they arrive.

Judith Gross has spent more than three decades in radio, as a news director, prominent broadcast trade journalist and DJ. She operates her own marketing and freelance writing business, JG Creative Media, in Binghamton, NY.

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FCC Focus

Two Aspects of the Crucial Topic of the Future of Radio

by Peter Gutmann

The FCC National Broadband Report

Most of the recent attention on communications matters has been focused on the FCC's massive Broadband Report – and rightly so, since potentially it represents the most radical change in the structure and regulation of the communications industry since its advent.

By now you've probably read the basics – plus a lot of opinion from a wide range of industry leaders, pundits and advocacy groups. So, let's just focus briefly on its implications for radio.

More Impact on Television

The immediate effect on radio should be rather minimal, at least compared with TV. An underlying concern of the Report is to ensure that spectrum is used efficiently and if not, then to recover the value of spectrum from its primary users.

Much mention is made of the fact that only about 10% of television viewing nowadays is over-the-air – an amount that promises to continue to fall as new technologies enable viewers to feed their video diet through broadband and cable.

Of course, any claim that TV stations should be forced to give up broadcasting in favor of more efficient distribution of their programming would ignore the social cost of disenfranchising the most vulnerable segments of society who depend upon TV reception.

Indeed, after the painful transition last year from digital to analog TV, it's clear that no one is seriously advocating the elimination of broadcast TV altogether.

Yet, there is talk of restacking the TV spectrum to free up some of the band for other uses; channels 44 through 51 already are being considered for reclamation. And among the proposals being considered is a procedure by which TV stations could "sell" their spectrum or have to face steeply increased user fees to continue to occupy their channels.

Minimum Effect on Radio

Radio does not face such issues, at least not yet. Most radio listenership still comes from direct reception of broadcast signals and that is not likely to change in the near future. Indeed, the 20 MHz devoted to FM broadcasting and the less than one MHz devoted to AM hardly seem worth the trouble.

However, the philosophical thrust of the Report remains troubling for the future. If nothing else, it compels discussion and consideration of the place of broadcasting for a rising generation that increasingly obtains all of its entertainment through streaming

Compensation for Spectrum Users

A related issue is the appropriate model for compensation from spectrum users. While the only immediate technical impact would seem to be a possible realignment of

auxiliary microwave facilities, the fact that more universal matters are being openly questioned and discussed suggests that a reappraisal of radio broadcasting as currently utilized may lie in the future.

New Report Will Delay Other Actions

It is also possible that the huge commitment of staff resources required to produce the Broadband Report (and to staff the 40 or so FCC rulemakings, plus enabling legislation, that will be needed to implement all of its recommendations) will further delay action on long-pending broadcast matters such as indecency, localism and modification of the new biennial ownership reporting form.

Focus on Crucial Roles

Both individually and through trade groups and state associations, broadcasters have done a fine job of focusing attention on the crucial roles they play in their communities and in fostering the ideals of our democracy.

Legislators surely appreciate broadcasters' devotion of their resources to a wide range of public benefits, from disseminating emergency information to fostering debate over important public issues. But a cash-strapped government is looking for ways to monetize its resources, and the broadcast spectrum is an increasingly attractive target.

So the bottom line here may well be that we may dodge the proverbial bullet this time, but the hunt has just begun.

HD Radio

Getting back to more mundane matters, the struggle to establish HD radio continues. Many broadcasters continue to question its value, given the substantial expenses of acquiring the hardware, paying the associated license fees, and, of course, creating appealing content.

(Continued on Page 20)

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– Continued from Page 18 –

It's Not Just the Cost

To those challenges can be added the industry leaders' ill-conceived initial marketing strategy of highlighting HD's digital sound quality (as if anyone in a car or office or listening through cheap earbuds could tell the difference), and making available to consumers only outrageously priced receivers.

Fortunately, and just in the nick of time, emphasis now has shifted to something of genuine value to listeners – extra channels of interesting programming.

The Power Increase

To give HD a needed boost, the FCC recently amended its Rules to permit FM stations to increase their digital effective radiated power.

This is intended to enable digital stations to more closely replicate their analog coverage and to overcome reception problems in the mobile and indoor locations where most radio listening occurs. The existing limitation to 1% of analog power often hindered these goals.

RF Interference

At the same time, the Commission's plan also strives to minimize interference to the protected contours of analog FM stations. To achieve that balance, the power increase Rules reflect the results of experimental operation and are modeled upon an agreement between iBiquity (the licensor of HD technology) and National Public Radio, which had performed extensive field testing to evaluate its concerns over potential interference.

Here is a summary of the new provisions. Note that they apply only to digital FM stations – AM stations and Low Power FM stations are not eligible for the power increase:

- All but super-powered FM stations will be able to increase digital ERP by 6 dB beginning on the effective date of the Rule changes, which will be the later of 30 days after publication in the Federal Register or approval by the Office of Management and Budget. Following the effective date, HD power may be increased, but within ten days of commencement affected licensees must notify the FCC through its electronic filing system.

- The few super-powered FM stations will have their maximum digital ERPs calculated through a program that is to be available on the FCC Media Bureau's web page.

- FM stations may commence increased power digital operation before the effective date of the new Rules, but only by obtaining special relief from the Commission.

- The NPR/iBiquity agreement contains a formula to determine if power may be increased beyond 6 dB up to a maximum of 10 dB, based upon protection to first adjacent channel 60 dBu analog signals. Other methodologies may be used and evaluated on a case-by-case basis in situations where the simplified formula method is claimed to be inapplicable due to terrain, environmental or technical factors.

- In the event that any power increase causes interference to the protected service contour of a full-service analog FM station, the affected analog station must contact the digital licensee. That notice will obligate the digital station to remediate the interference. If an agreement cannot be reached for power reduction or other remediation measures, then a complaint may be filed with the Media Bureau. A complaint must present at least six reports of on-going objectionable interference within the analog station's protected contour. The complaint also must include maps and detailed descriptions of tests to identify the interfer-

ence and unsuccessful efforts to resolve it. If the Bureau has not acted within 90 days, then digital ERP must be reduced in 3 dB increments down to 1% of analog power.

- The Commission reserves the right to revisit the new standards should implementation of these power increases result in wide-spread instances of non-resolvable cases of objectionable interference.

Broad Support

The National Association of Broadcasters supported the power increase as a key to improving digital coverage, ensuring reliable reception of new multicast signals and increasing consumer enthusiasm for HD radio. But other broadcasters already have expressed reservations. For example, in a filing shortly before release of the FCC decision, the New Jersey Broadcasters Association predicted "devastating effects" including the disruption of established listening patterns that often fall outside protected contours and a resultant diminution in local public service, especially for Class A and short-spaced stations. Time will tell.

While the FCC's power increase supports industry efforts to boost digital FM broadcasting, the ultimate success of the medium depends far more upon the integration of HD into smart phones and other new mobile communication devices, as well as campaigns to promote consumer acceptance.

Crucial levels of listenership, in turn, will depend largely upon the extent to which broadcasters are willing to create a product of sufficient value to induce consumers to buy new equipment and listen. The fate of HD radio lies far less in any power increase than in the hands of broadcasters themselves.

Peter Gutmann 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

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

Arc Flash and Arc Fault – Poorly Understood Dangers

by Jeff Johnson

Most simply stated, an arc flash (also known as an arc blast) is an electrical short circuit in the air. If it takes place in front of your face, in your electrical panels or in your transmitter, you are in trouble.

How Can Electricity Travel Through the Air?

If enough energy (voltage in this case) is applied across a gap, some of the gas molecules in that gap will be stripped of their electrons – ionized into charged particles. It is via those charged particles that the electrical flow is possible.

An electric arc has an inverse, non-linear relationship between current and voltage – a negative resistance. Once the arc is formed, more and more ions are created, lowering the resistance and more current flows. This goes on until your equipment's conductors melt, the arc is blown out like a candle, or the power source is disconnected.

ARC Flash Danger

How can protection from such an occurrence be established? Protection of equipment and protection of personnel are two separate considerations. If an arc flash occurs, any personnel nearby (you) should be wearing protective clothing.

If a fire is occurring due to the arc, type "C" fire extinguishing equipment, as discussed in previous articles,

should be used. Do not dump water on an arc! Power to the arc must be disconnected, of course.



What the well protected engineer wears.

Be Sure You Are Protected

An arc flash is an explosion that releases a broad spectrum of electromagnetic energy, plasma, fragments, and spray of molten materials. Special Flame Resistant (FR) clothing and face shields must be worn.

The National Fire Protection Agency's (NFPA) 70E is the Standard for Electrical Safety Requirements for Employee Work places. NFPA 70E requires employees to wear flame resistant protective clothing wherever there is a possible expo-

sure to electric arc flash. Perform an Internet search for "Arc flash clothing" and you will find extensive information.



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While protection against high energy arcing – arc flash – is generally a matter of safe practices and personnel protection, low energy arcs, arc faults, can also prove dangerous.

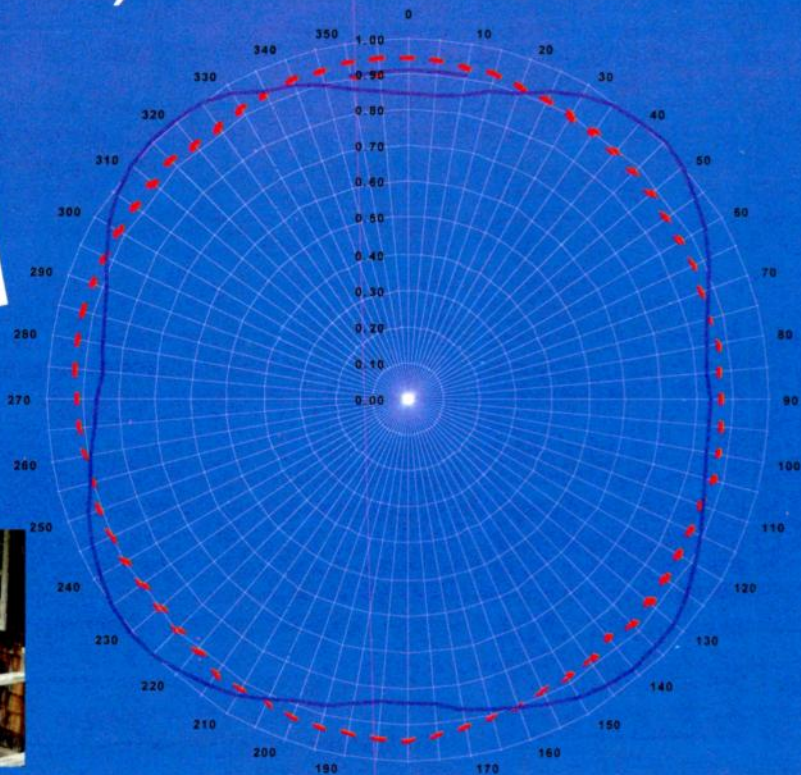
(Continued on Page 24)

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Safety and Security

Arc Flash and Arc Fault – Poorly Understood Dangers

by Jeff Johnson

– Continued From Page 22 –

ARC Fault Danger

While it has been pointed out that arc flash – sustained conduction of electricity through ionized gas – will commonly not occur in air below a potential difference of 480 VAC RMS, protection against all-too-familiar slips of a screwdriver or wrench while working on “hot” circuits must be guarded against. Lower voltage arcs – arc faults – can be extremely hazardous, as they may be hidden from view in walls or junction boxes.

A tragic example of this was the Beverly Hills Supper Club fire in the '70s, which was determined to have been caused by faulty aluminum wire termination.

Office and Home Fault Protection

In low energy instances, such as a home or office, an AFCI (Arc Fault Circuit Interrupter) is generally used to protect against fire, while a GFCI (Ground Fault Circuit Breaker) is used to protect personnel from shock. The AFCI is designed to prevent fire from series arcs, bad connections, arcs to ground or to common.

The AFCI works at a higher threshold (30 mA) than GFCI devices protecting against electric shock, which operate at 6 mA. However, advanced electronics inside an arc fault circuit

breaker detect sudden bursts of electrical current in milliseconds. It is a “smart” device. A new AFCI will commonly be a “combined” device incorporating the GFCI function which trips at the lower, 6 mA threshold.

Smart Circuit Breakers

These “smart” circuit breakers, the AFCI types, protect against what is termed “nonfunctional” or “nonworking” electrical arcs. They are able to distinguish between working arcs such as occur in brush-type motors and nonworking arcs, as in a lamp cord that has a broken conductor.

Although specifics of the “brains” in these devices is hard to find and seemingly proprietary to their manufacturers, the author concluded that differences between intermittent and regular patterns of voltage and current fluctuations must be the key.

Other Electrical Dangers

AFCIs are designed to protect against fires caused by electrical arc faults. They provide no specific protection against “glowing” connections, excess current, high line voltages, or low line voltages. Other types of circuit breakers, mounted in receptacles, including PFCI and OFCI, will be encountered for protection against other types of faults.

From a receptacle, a PFCI (Power Fault Circuit Interrupter) can detect glowing connections where there is no arc, but the fault consists of a voltage drop of high current existing in a high resistance junction.

PFCIs are also designed to prevent fires caused by excess voltage across loads. A damaging source of high line voltage occurs when a neutral path opens within a two-leg 120V electrical system.

When a neutral wire breaks or opens, voltage can almost double to over 200V with large leg-to-leg load imbalances. This extreme situation can result in almost four times the power and heat in resistive loads. Some loads can reach self-ignition temperature in a few minutes.

A Real Life Experience

This over voltage situation occurred to the author when DOE of a large market cluster. The neutral conductor of one of the emergency circuits opened. Suddenly MOVs in plug strips under desks were popping, and smoke was filling the rack room. Flames were shooting from the power supplies of one of the automation servers and other computers. All four stations were off the air simultaneously.

It was a sweaty palms situation with an unknown cause. After circuits were de-energized, the root cause of the trouble was discovered – the open neutral. PFCI breakers would have eliminated a good deal of the damage. A PFCI acts like a “firewall” for unacceptable line voltages. A product called SafePlug is a PFCI device.



SafePlug on Left – AFCI on Right

An OFCI (Overload Fault Circuit Interrupters) is designed to protect against excess current drawn by equipment connected to a particular receptacle. It is logical that OFCIs must be located within receptacles. Low voltage can cause inductive loads, such as motors relying on reverse EMF, to draw dangerously high current. Both thermal circuit breakers and OFCIs are required to prevent fire from excess current.

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



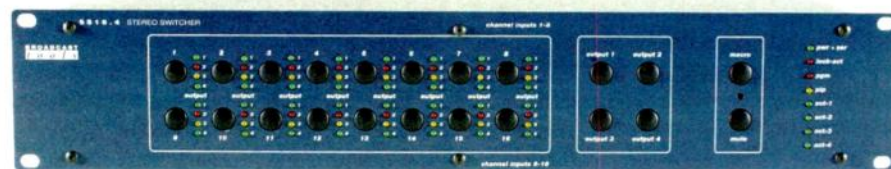
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Interoffice Secure IM Server

by Chris Tarr

In this issue Chris Tarr gives us step by step instructions to set up a secure IM server using free software.

Sometimes the rapid pace of creativity in a radio station gets slowed while waiting for meetings, email, or telephone calls.

Such was the case at my Madison, Wisconsin stations. The General Manager asked me about allowing the staff to communicate via instant messaging.

Make Sure You're Secure

The first thing that popped into my head, being an Engineer and IT Guy, was security. We'd be talking about proprietary things, and possibly sharing files. The last thing I wanted was for this information to pass through AOL or MSN's servers. I needed something that would keep everyone on our network.

I had been familiar with the Jabber IM protocol, and wondered if that would be a possible solution. The Jabber IM protocol is an open-source protocol designed to be a cross-platform system – able to use any chat program that supported it.

Google Talk is an example of a system built on Jabber. Knowing that it is open-source, I figured that would be a good place to start in my search for a solution.



The main Openfire administration screen.

Choosing the Right Software

Almost immediately, I stumbled upon Ignite Software's Openfire Server. Openfire is open-source server software that runs on a variety of different platforms. A little more research revealed that this was going to be the perfect solution.

Like many open-source projects, the documentation is a little on the lean side. Your best bet is to read the on-line documentation thoroughly before diving in, since you have a few choices to make based on how you want to install it.

This shouldn't be a difficult task for someone who is computer savvy, but it will be a challenge for someone with little familiarity with Jabber.

I strongly recommend having a dedicated computer to run it, though you don't need high-end server hardware or a server OS to run it. In fact, you can easily use an old office workstation running Windows XP.

A Minor Glitch

Openfire stores all of its information in a database. You can choose to use Openfire's embedded database, or use an external database such as Microsoft's SQL or the free MySQL. On my first run on installing it, I used the built-in database. I got everything up and running, and some users loaded. Then for some reason, it lost its mind! The database crashed, leaving me unable to login and administer the system.



Openfire's Add On Screen

Take Two

The second time around I went with MySQL. It took a little more time and a little more research, but the performance was much better and I've had no problems at all with the installation.

Once you've decided which type of database you want to run, then you need to begin the setup. Again, you want to be prepared, since some of what you'll be inputting as part of the setup will be difficult to change later.

Setting Up the System

As part of the setup, you'll be asked to choose a database type, as I mentioned above. Another thing you'll be asked for is the server name. This is important for many reasons.

(Continued on Page 28)

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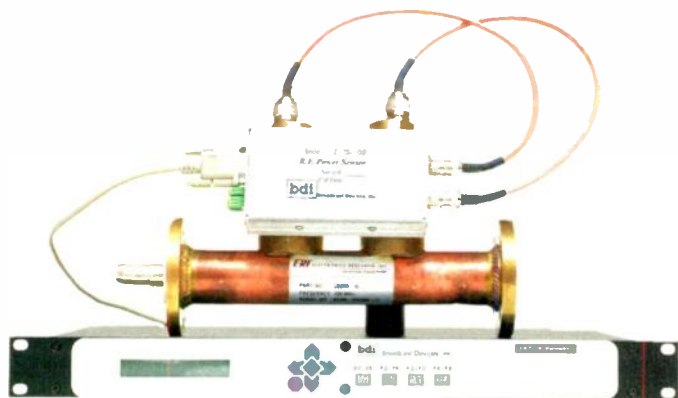
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by Chris Tarr

Interoffice Secure IM Server

– Continued from Page 26 –

First, if you choose to make your server available outside your building for people working at home or at remotes you'll need to have a server that can be "resolved" from the outside. Generally you'd do this as "name.domain.com" so if my server's name is "chat" and my Internet domain name is "xyz.com" my server name will be "chat.xyz.com".



Psi's Main Account Screen

DNS Records

You will need to set up some DNS records to support that, but it's a bit beyond the scope of the article to delve into that. The other thing to note about the server name is that it will be

part of your user's login name. Using my example above, John Smith's chat login would be jsmith@chat.xyz.com.



Psi's Connection Screen

Configuring the System

Once you've completed the installation, it's time to start configuring. I've found the Openfire server to be extremely feature-rich and can be customized. The IM users can have the ability to voice chat, share files, and even create group chats.

Another convenient feature is the ability to create groups of people. For example, I have a group created for users in my Madison stations, and a group for those in Milwaukee. Members can "see" the people in their own market's "buddy lists." The few people who work in both markets can be assigned to both groups and see everyone. It keeps the "buddy lists" from getting too long while still being able to support many users.

There are also plenty of add-ins for the system such as a "Message of the Day" that users will see when they log in as well as things like content filters, and the ability to "broadcast" messages to everyone.

Once you get the server up and running, you then have to get people connected. Create your users and user groups, then get them logged in.

Selecting the IM Software

Because Jabber is an open protocol, there are many instant messaging clients that will connect to it. We've settled on Psi. Psi is another piece of open-source software. It's an IM program that runs on Windows, Mac, and Linux. It has many features, like the ability to manage the chat server through the client.

Installing Psi is very easy. Once you've installed it, it's just a matter of entering in your server details and login information and you're ready to go. You'll have the entire office chatting in no time!

The Benefits

Setting something like this up surely isn't for the faint of heart, but the reward is that you will have a highly functional, secure platform upon which your employees can share ideas.

Within hours of turning on the server, our employees were discovering little features and having fun sending messages!

Links to the software:

<http://www.igniterealtime.org/projects/openfire>
<http://www.mysql.com>
<http://psi-im.com>

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

Do You Have a Tech Tip?

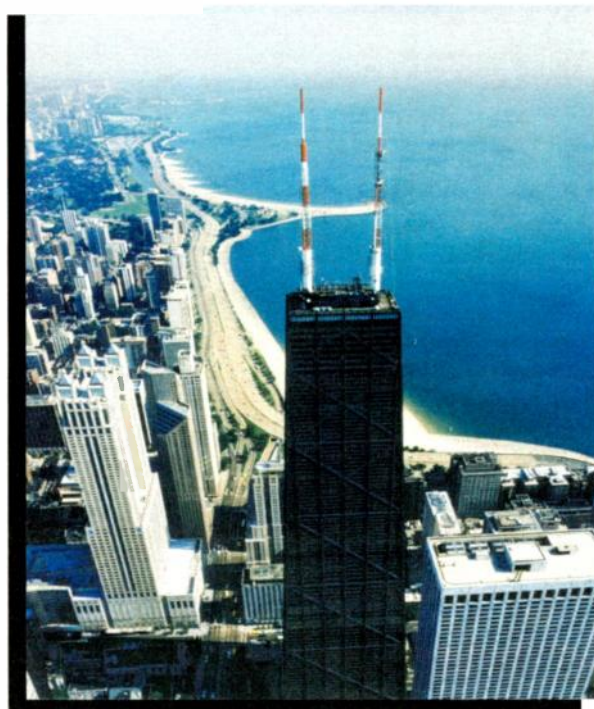
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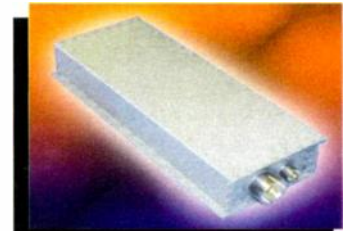
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Chief Engineer

The IPs Have It

by Scott Schmeling

In the September-October 2008 issue of *Radio Guide* I wrote an article about the many ways we use codecs. In one particular instance we were putting a new station on the air. Since we were not able to shoot an STL from the studios to the transmitter site, and we didn't have a tower close enough to double-hop it, we opted to use a codec and the Internet.

Good Bandwidth in Town

Bandwidth was not a problem at the studio end. However, as is often the case, the transmitter site was out in the country. The only wired Internet available out there was on dial-up. I knew that would not work. However, a cell phone company operating in the area offered wireless broadband Internet service.

This is not to be confused with Internet access offered on your cell phone. This involved putting a directional receive antenna on the tower. The receiver is connected to the router, which, in turn, is connected to the other devices.

Excellent Quality Most of the Time

We paid approximately \$300 per month for extra bandwidth and a static IP address. It worked great – most of the time – and the audio quality was excellent. However, even though we were paying for the additional bandwidth, when Internet usage through this wireless site got heavy we got squeezed and the audio got jittery.

Working great most of the time simply wasn't good enough. We needed a rock solid audio path.

IP Radios

I had heard about IP radios some time ago and remembered thinking this was something I should look into sometime. If I could extend my network out to the transmitter site I could continue using a codec and not be affected by increased Internet usage. I decided to do some research sooner rather than later.

The number of IP Radio manufacturers I found surprised me. I chose Motorola – a very reputable company well known for their two-way radios. I'll admit it: their reputation is part of what sold me.

Free Path Analysis

The next step was to run their path analysis software. With the help of the radio distributor, we entered the coordinates and available tower height of each end. After this was entered, the software linked with Google Maps to plot the path. Then we plugged in the various antenna and radio options to see what would work best for us.

Our path is just over 35 miles. I had room up at the top of my STL tower at the studio and could go up 320 feet at the transmitter site. I knew I did not have enough Fresnel clearance for a conventional STL, but these radios, though "point to point," are not line of sight!



The mounted system. The white box between the antennae is the radio's ODU.

Configuring the System

The radios come in two configurations, standard and one with Type "N" connectors. The standard radio has a self-contained antenna – I've heard them referred to as "pizza box antennas." It's a square box that mounts directly on the tower. The version made for this application had type "N" connectors for external antennae.

The path analysis determined we needed two four-foot parabolic antennae – one horizontal and one vertical – configured as a spacial diversity antenna at each end. That meant we also needed the connectorized version of the radio.

With that configuration the software indicated 99.999 percent reliability! I doesn't get much better than that.

(Continued on Page 32)

Model 730 Inovonics' Flagship RDS/RBDS Encoder

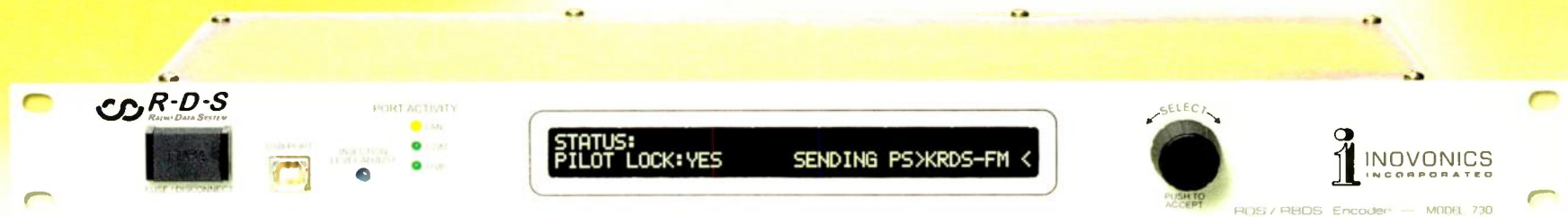
Supports RT+
Song Tagging

Featuring a front-panel LCD screen and jog wheel for instant on-site setup, the 730 may also be programmed easily through any of its data ports using the included Windows® software. USB, TCP(x2), UDP and serial ports can accept both ASCII and UECF command sets.

The 730 connects directly or can be networked with virtually any playout system and offers full support for RT+ 'tagging'

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- DTMF-16 and DS-8 DTMF tone decoders.

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Chief Engineer

by Scott Schmeling

– Continued from Page 30 –

Tower Mounted Radio

Unlike a standard STL system, with the receiver mounted in the rack and Helix running up to the antenna, this system puts the radio called the “ODU”, which stands for “out door unit” – I’m not kidding – up on the tower between the two antennae.

The system power supply, called the “IDU” – I’m sure you can figure what that stands for – inside the building. These IP radios also do not use coax for interconnect. Shielded Cat-5 cable is used to connect the ODU to the IDU.

In addition, the IDU has a second RJ-45 connector which is used to connect the IDU to your network. No license is required for the IP Radio system because it operates in the 5.8 GHz region.

Physical Installation

Mounting the antennae was pretty straightforward. The tower crew mounted the dishes and radios. They then strung and secured the shielded Cat-5 up the tower. They marked the antenna bearing using a compass and roughed it in.

This was done first the studio end, then the transmitter end. The installation went without a hitch. So far, so good.

The Fun Really Begins

Now in a perfect world, we would power the units up and see signal right away. We should be so lucky. We got nothing! I held my breath, figuratively of course, as we started searching for the signal.

We moved along step by step. First, we disconnected the vertical antenna on each end so we could work on the horizontal alignment. We moved the studio antenna a little, then swept the transmitter antenna left and right.

No luck. So we then moved the studio antenna a little more and moved the transmitter antenna again, and again and yet again! It was like trying to find a needle in a haystack.



The Motorola “In Door Unit”

Built in Features to Help Antenna Alignment

These radios have a couple of great features to aid in dish alignment. They have a web interface, so I could look at the radio’s receive signal strength while the tower guy was aiming the dish. They also have a feature that allows you to set them to emit an audible tone as a signal level indicator to aid in aiming the dish.

Finally we started getting some signal! Once we peaked everything, the signal was within a couple hundredths of the predicted level – so now I could stop holding my breath.

It’s Part of the IP Network

The radio operates as an extension of my network at the studio. I have a small five port switch connected to the IDU at the transmitter site. My other equipment, the codec for example, is connected to the switch.

The radios are a two-way system. I can look at either end from either end. I can also “look” at other equipment at the transmitter site while at the studio. This feature showed its real value earlier this month.

We put the system on-line in mid November of ’09. It’s been rock-solid until a couple weeks ago. Twice in three days we had no audio. The first time I suspected it was because I had left some papers on top of the IDU and it got pretty warm. But two days later it was down again.

Great Troubleshooting Tools

From my office I first checked the radio at the studio end. It indicated both send and receive signals were good, then I checked the transmitter site. That screen indicated the copper network was down.

It had to be either the network switch or the jumper to the IDU. A thunderstorm had gone through earlier in the morning, which certainly could have taken something out. So, I grabbed a five port switch and Cat-5 jumper and headed to the out to the site. After a quick check I found that the switch was the problem. I theorize that it was the victim of the storm.

One Happy Chief Engineer

I couldn’t be happier with the system so far. With the exception of the previously mentioned two instances, the system has been up and running non-stop.

No more jittery audio when the Internet gets busy since we got rid of the wireless broadband service. And one side benefit – I can check my email when I’m at the transmitter site. Though I’m not sure if that’s good or bad!

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 — Audio Processor

Inovonics 261 Utility Processor

by Brant Herrett

A few months ago, I reconfigured the audio chain at KAZU in Monterey Bay, California to take care of some issues with their first generation HD radio system. As part of this change, I moved the station's Orban processor from the studio to the transmitter site.

The Need for a Special Processor

This created some problems at the studios. I now had to protect the digital input to the STL from being overloaded. I also had to find a way to feed processed audio back to the air room headphones so the announcers could hear something closer to an off-air feed for proper mixing. The 8 second HD diversity delay didn't allow a regular off-air feed to be used.

There also had been an on going problem with the varying audio levels coming from the different content sources provided to Public Radio Satellite System. This level variation was particularly noticeable during the stations automated periods.

I knew I needed to get a processor that could provide some light audio leveling and perhaps some fast peak limiting in order to feed the digital STL and station monitoring systems.

Keeping It Close to Home

There are a number of products that would work in this situation, but since the station is near Santa Cruz, California, it occurred to me to contact my friends over at Inovonics to see if they had anything new to offer.

I've worked with Jim Wood and Ben Barber on a few projects over the years, and since they sell a variety of processor products like this, it seemed like a natural thing to do. And the GM and I wanted to support a local company if possible.

Looking through equipment catalogs, I noticed that Inovonics now had a small processor that might fit the bill nicely. The 261 Utility Processor is a DSP based audio processor that offers independent AGC and peak limiting. I liked the idea that it was built with AES inputs and outputs in mind, rather than having D/A's and A/D's tacked on to an older analog design (analog input and output are also provided if that's what you are looking for).



Inovonics 261 Utility Processor

Easy to Install and Set Up

Installation was straight forward and setup was simple. I opted initially for some easy AGC to take care of the level issues we were having and it took care of things nicely. I was hoping that this would be sufficient to protect the STL front end, but there were occasional peaks that were fast enough to overload it.

At this point, I added in the peak limiter function of the 261. This is a "look ahead" peak limiter This requires DSP processing time, so there was a 4.5 ms delay introduced when using the peak limiter.

Delay Causes Problems

Unfortunately, this delay was not acceptable to our announcers. Descriptions of what they were hearing ranged from "sounds like I'm in a hollow room" to "that robot sound."

I called Ben to discuss this with him. A day or two later, he called to tell me that they had made a change in the firmware and we would now be able to adjust the look ahead time period for the limiter.

He came down and installed it—I really appreciated the fast response time.

With the firmware change, I was able to adjust the delay to a value that worked for our announcers and that didn't impact the protection we needed for the STL.

Feature Rich

The 261 has a number of features that I didn't need, such as the combined compressor/limiter. But one feature in particular I did use—the "Panel Lockout" switch on the back of the unit allows you to keep unauthorized people from changing your settings.

Small Company Advantage

One of the advantages of working with Inovonics is that they are small enough that they can pay attention to your technical needs with their products, and respond to them in a timely manner. Of course, in my case, it's a bonus that they are "just down the street."

Brant Herrett is a Broadcast Engineer working for a variety of stations around the Central Coast of California.

For information on Inovonics processors and other products in their line visit their web site, www.inovon.com or call 800-733-0552 or email sales@inovon.com or info@inovon.com



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Field Guide — Web-Based Utility Switch

Broadcast Tools Site Sentinel IV

by Michael Bradford

Tucked into a corner of the transmitter room at WILS in Lansing, Michigan, are two Mid Atlantic equipment racks full of equipment that constitute the up-link for the Michigan Farm Radio Network.

This satellite delivery provider began almost 30 years ago in the corner of a parking lot in Milan, Michigan and served affiliates with farm market news that impacted a tri-state area.

Added Program Channels

When Saga Communications purchased the system and moved it to the present Lansing location, the expansion of services soon included up-linking the Detroit Tigers, Lions, Pistons and Red Wings.

Then followed the Illinois Radio Network with studios in Chicago, and most recently, the Minnesota News Network, with its main studios in Minneapolis/St. Paul.

For many years we have depended on various Broadcast Tools equipment to permit dial-up audio monitoring, remote switching and, most recently, Internet-based control of re-boot functions for two Nexus ISDN codecs using the Broadcast Tools "Web Switch."

But, with all the added up-links, it soon became obvious that we needed more capability than existed with our previous dial-up units.

The recent installation of a hi-speed Internet connection, into the up-link site to accommodate our Web Switch, opened up a whole new venue for remote control and monitoring.

Enter the Site Sentinel-4

The Site Sentinel-4 is a cost-effective, one-third-rack size device for web-based remote control, monitoring, status alerts and relay interface with other equipment from virtually anywhere you have access to the Internet. This includes the newest web-capable hand-held devices.



Site Sentinel-4

Reviewing the Site Sentinel's capabilities gave me the immediate impression that the designer had been sitting in on our brain-storming sessions all along.

Here was a "tool" that includes analog metering for 4 separate channels, status monitoring for 4 channels, 4 logic relay interfaces for direct interface with other equipment, a stereo silence sensor, a built-in power loss detector, a separate set of contacts for remote power control via a third-party device, and an optional temperature probe.

All of these features are programmable in numerous manners to accommodate a host of user requirements and every feature can be accessed over any IP network. It even features a logging system for alarms, status, metering and

temperature sensing that will email anyone of four recipients with routine metering and/or alarm situations. It's equipped with four buffered, high-resolution 10 volt metering (analog) channels, four optically isolated status/logic channels configured for 5 to 24 VDC "wet" or "dry" inputs (user selectable with jumpers), four channels of SPST 1-amp relays that may be latched on or off, or pulsed with user defined timing.

Interface Capability

The Site Sentinel-4 also features a separate, isolated relay with user selectable contact assignment to interface with an external device, such as Mid Atlantic's RLM-15-1C, 20-1C or RLM30-L530-1 AC controller devices to turn higher current external equipment "on," "off," or "reboot" as required. SNMP and SMTP username and passwords are also supported.

Password Protected Control

Because each channel of control can be password protected, it is possible to assign security clearance for each of the four separate affiliates at the MFRN up-link its own password.

This permits everyone to monitor what's going on at any time, *but* limits control functions to those with specific password authority.

Plus, the Site Sentinel-4 has the regular features we've all come to expect from Broadcast Tools: euroblock screw terminal connections for metering, status/logic, control relays and the stereo silence sensor

Michael Bradford is an engineer with Broadcast/Audio Service.

For more information about the Site Sentinel-4 contact Broadcast Tools. You can call them at 360.854.9559 Their web site is www.broadcasttools.com



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Welcome Ken Perkins

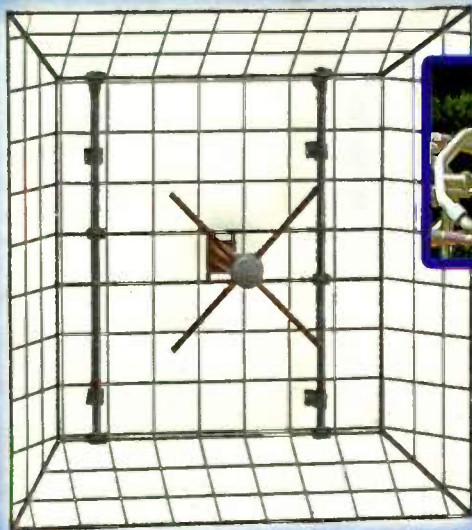
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Practical Engineering

Line Sweeping: a Cost-Effective Maintenance Item

by Gary Minker

There is a nagging question Mr. Three Piece Suit is going to ask you, because your engineering budget is an expense to him and not a tool as valuable as the sales staff.

It might even be that this is partly your fault.

The Memo

TIME: 16:52:47

TO: Chief Fix-It-When-It-Breaks

SUBJECT: Is this Line Sweeping thing you asked for an effective tool as a maintenance item? If so, why wasn't it a regular, planned for expense as part of your last budget? What are we going to get in return for this expense? Let me know by 16:59:59 today or we'll just forget the whole thing, and maybe your department too.

Do you smell the smoke yet? Is it coming from your ears or the front office? You might surmise that there are a couple of problems brewing here.

Failure to Communicate

In previous articles, we touched on the possibility that you need to be a bit more proactive in your communication with the Suit up front.

In his mind, Engineering usually is not a valuable tool because: "you geeks sit back there cleaning your pocket protectors, show up when stuff breaks, speak to no one in understandable sentences, and then skulk back to your inner sanctum where all those weird meters and rosin smoke plumes

live." This segregates you from the rest of the tribe – and most importantly Mr. Suit.

When you last talked with the guy you should have assured him things such as Line Sweeping *will* be included as a regular expensed maintenance line item starting next year. Unfortunately, even if you did, he may have conveniently forgotten that thought.

Communication Necessary

It is critical to consistently – and as kindly as possible – remind the Suit and the rest of the staff that while you and your staff (if it exists) may be different, you are people too, and your department is a part of the solution and not the problem.

However, you still are on the block for the memo. OK, here is the help you need. The question is pretty direct. Is Line Sweeping a cost effective tool as a maintenance item? This is best answered through consideration of the following documentable questions:

1. Did you receive a booklet of proof of performance on your antenna system when it was installed?
2. Why should you save your line sweeping reports?
3. What are the pros and cons of testing; why test?
4. Do you really like to be off the air?

Developing the Right Resonse

Did you receive a booklet of "proof of performance" data on your antenna system when it was installed?

When your system was built, a data booklet with the system drawings and the factory test data on the antenna at the test range was supplied. (You did have that new antler range-tested, right?) Also attached is the test data from when you installed the system, when the factory, or your other favorite Line Sweeper, came out and tested the system for you. (You did have it swept when it was installed, right?)

This booklet of data is your system Bible, and it must be updated like a clean bill of health every year or your job could expire. Mr. Suit needs to know about this very impressive compilation of letters charts and graphs – the EKG of the system – and that without a current report, all bets are off because that nice shiny Watt meter is always the last thing to know that you are having a system problem and the on-air jock is the first.

You should try to get Mr. Suit to see that you understand what the report says – in five minutes or less – and you are really on the ball.

System Documentation

Why should you save your Line Sweeping Reports?

This is the CYA (cover your "posterior") portion of the drill with Mr. Suit. You were the happy and lucky recipient of a great Line Sweeping adventure when your system was put in 17 years ago, yet you have not had the system tested since then. Mr. Suit wants to know why not – and *why now*?

You could tell him that this was an oversight. Of course, you may well be looking for a job in about five minutes. Or, you can tell him that it is now the industry recommendation that such things be conducted annually.

Alternatively, you could note that from your intensive involvement in the new standards, and as part of your self-avowed continuing education, the practice and art of Line Sweeping has come to your attention. Having saved the initial report in the station files, it is high time to have a new one this Sunday night during the maintenance window in order to avoid catastrophic damage from a sudden creeping failure.

(Continued on Page 40)

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Practical Engineering

– Continued From Page 38 –

Benefitting From Documentation

What are the pros and cons of performing these tests?

This gets easy. First the cons: Without continuing maintenance, things at the transmitter site get really really loud, and then they get really, really quiet.

Indeed, after the fire trucks leave from extinguishing the fire that started in the grassy field and woods next to your tower – from the flaming molten metal and plastic shroud parts dripping from your previously good old antenna – the GM will hold you are up for the “silence is golden”



This is not what you want to see, but often is the result of maintenance-free operation.

award and the ensuing tens of thousands of dollars that the repairs will cost, which will immediately precede your being

fired for losing your crystal ball (and your gross negligence and obvious incompetence).

The proactive stance in order to avoid these things is to make the case that the most frequent cause of antenna and line failure is not lightning, but actually the slow and methodical mechanical wear of the bullet joints.

These joints which include the actual fingers themselves and most importantly the watch band springs, wear down and make silver dust which is highly conductive; the now bare joints, which often consist of dissimilar metals of brass, stainless steel, and beryllium/copper, eventually fade to fatal.

The silver coatings wear off or pit from the thermal expansion and contraction every 24 hours for years at a time and – oops! – you have smoke. This smoke often comes from the high resistances that develop in these bare metal joints from the lack of silver and/or the arc path that develops from the silver and other metal dust that has landed on the next lower insulator in the system.

Line Sweeping can see these joint failures. In many cases you will see the corrupted insulator that the conductive metal dust has landed on, or the small carbon path that has started to burn the surface of the next lower insulator. The eventual generation of high heat, smoke and toxic Fluorine gas, which is also highly corrosive, spells the end of anything in the system with which it comes in contact, including your lungs.

Line Sweeping will also let you know if your antenna tuning has slipped due to any of a number of problems on the tower. A “favorite” is when some goof mounts another antenna in your aperture without telling you.

Other things that *do* happen: a giant buzzard bends your elements; slot covers rot off and wet minerals splash on the gas barrier face, porcelain insulator/centering pins, and the ensuing arcing in the antenna sets the gas barrier on fire; or the three wraps of magic tape dried out and your slug slipped a few inches.

By bringing in your favorite Line Sweeper you can usually catch these things before they turn in to a problem.



What is going on up there?

To Air or To Err

This one is the family favorite of all time: Do you really like to be off the air?

Even with off-the-air insurance and a back up facility, is the expense and grief really worth it if you are burnt to the ground? I have heard of only one instance where the station made out on the insurance claim, otherwise the off-the-air part is pretty bad.

This is where Mr. Suit gets to realistically question your competency and could actually have a point there. As I have said before: there should be no space, thing, place or procedure that you do not touch at least one time per year in your plant. If you blow this point you are up for the Engineering Darwin Award – and face it, rightly so.

Sharing the Credit

All in all, here is where you tactfully turn the tables. It should not be a stretch to get Mr. Suit to agree with you that the idea of Line Sweeping that he just came up with is really a great idea to secure his job, and that you will get right on it.

Even if the reverse psychology does not work with him, he will have to agree with you that in the interest of everyone keeping their jobs this is a necessary expenditure and the station and the owners are best served by the annualization of this activity. – *Radio Guide* –

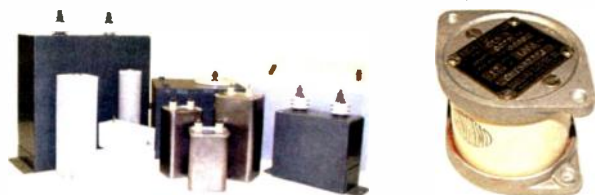
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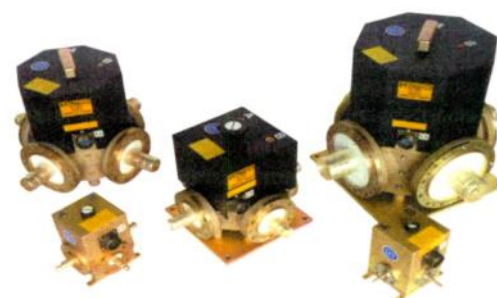
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Small Market Survival Guide

FM Translators for Better Coverage

by Judith Gross

When the FCC opened the window to new translators in the "Great Transmitter Wave" of 2003, something else flew in with the thousands of applications: new opportunity for small market FMs.

While the majority of the 2003 applications came from non-commercial and religious stations, shrewd FM owners also saw it as a chance to fill in portions of their contours, penetrate population pockets and expand a listener base to attract ad dollars.

East Catches Up With West

"It's not as unusual west of the Mississippi as it is in the eastern part of the U.S.," says Kevin Fitzgerald, Director of Engineering for Times-Shamrock stations in the Scranton, Pennsylvania region. "FMs with signals in mountainous areas have been using translators to fill in coverage for years."

Fitzgerald says the terrain in the Scranton Wilkes-Barre market offers such challenges: a steep ridge of hills around the city. He installed translators for WEZX-FM to counter multipath reflecting off nearby Montage mountain, and for better coverage on the University of Scranton campus.

Multiple Translators

Fitzgerald is also Director of Engineering for Equinox Broadcasting's WMTT-FM and WPHD-FM in Elmira, and technical consultant for Equinox's Binghamton New

York stations. Each has multiple translators. WMTT, which has translators since the '90s, has a total of seven.

Not That Uncommon

Another engineer in small markets in the Catskill region of New York uses translators on FM stations for the same reasons. Don Perkins is Manager of Operations and Engineering for a Radio Group with stations in Norwich, Delhi, Deposit, Oneonta and Walton.

Perkins also put translators on WKXZ-FM in Norwich to fill in shadows and get a better audience on the Colgate University Campus. He also installed a translator for WDHI-FM in Delhi to fill in its signal in Oneonta, 30 miles away.

Perkins is also Chief Engineer for a station in Binghamton - WLTB-FM, which also has a translator.

"We moved the city of license from Owego to Johnson City, 25 miles east, and at the same time we put a translator at the original site," Perkins says.

The Gear Isn't That Expensive

He notes that the translator gear itself is not expensive, but renting space on towers adds to the budget. "Renting tower space could cost a couple of hundred dollars a month. If the station has multiple translators, that adds up."

Both Perkins and Fitzgerald said stations need patience when it comes to obtaining translator frequencies.

A station first has to propose a translator and then make sure there is no conflict with another station's

proposed translator. If there is a conflict, the stations will try to engineer a solution. If no resolution is reached, there's an auction.

With the complexities of the process, plus the expense of tower rental, do the advantages of translators for FMs in smaller markets pay off?

Is It Worth The Cost?

"Is the better coverage going to pay for itself in ad revenues, and if so, how do you prove that?" asks Perkins. Fitzgerald points to the Elmira, New York market. "The top four FMs in the Elmira market each have one or more translators. WMTT, with its seven translators, has definitely benefited; I've seen the ratings go up," says Fitzgerald.

He observes that small groups and independent owners are more likely to add translators than large corporate owners, who already have a great deal of power and coverage in multiple stations per market. "Translators help us level the playing field," Fitzgerald says.

A Lot of Potential

But the true genius in adding translators to FM stations may lie in a much newer application: HD radio.

The FCC now allows stations who go digital to broadcast the programming from their HD channels on their translators, as an analog signal, if they choose.

This means digital programming can be heard in analog even by those who don't yet own an HD receiver and a station can broadcast multiple programming formats in a single market, with a Classic Rock station also programming jazz, or country to reach different audiences. It's like getting two or three stations for the price of one.

Judith Gross has spent over three decades in radio. She operates her own marketing and freelance writing business, JG Creative Media, in Binghamton, NY.

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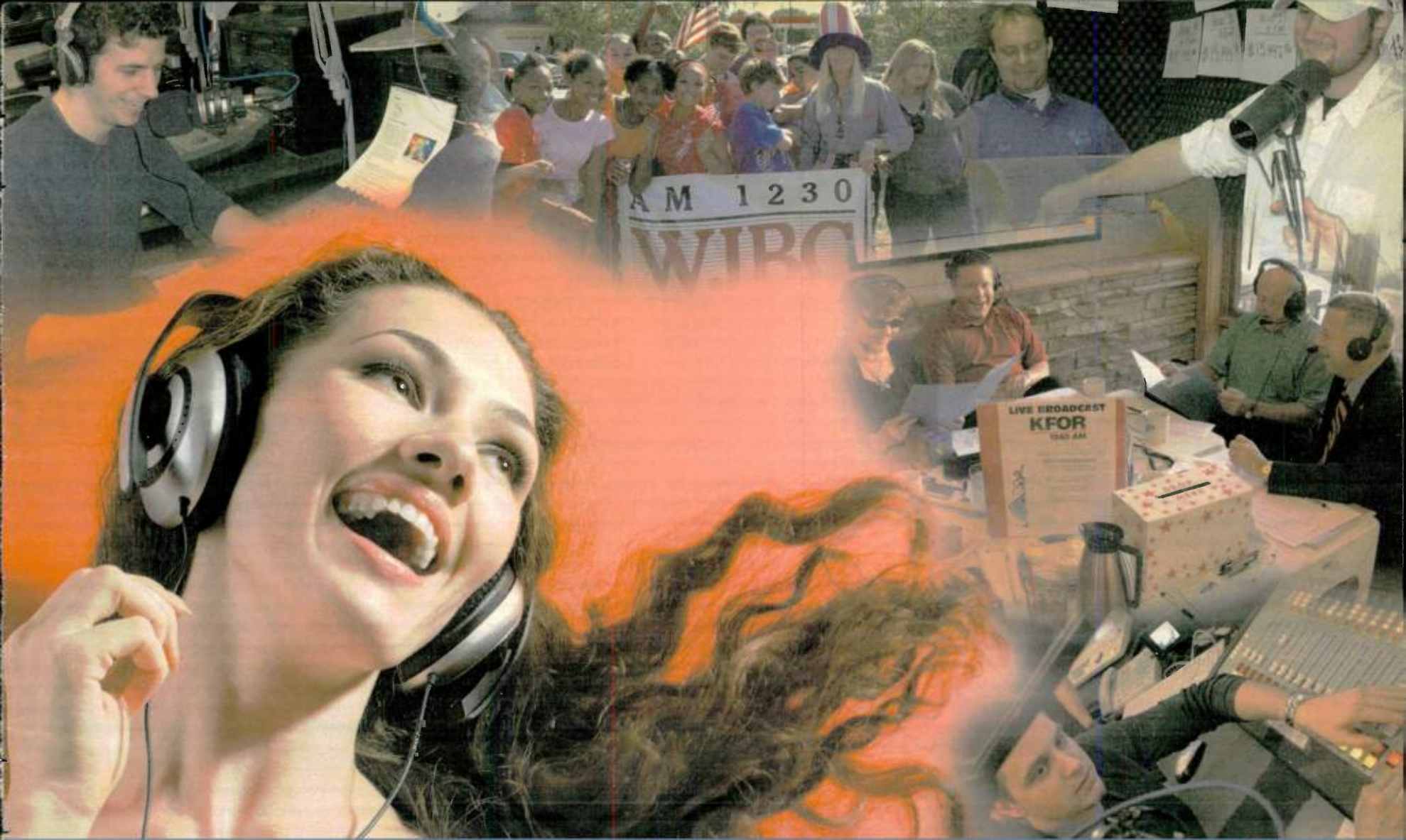
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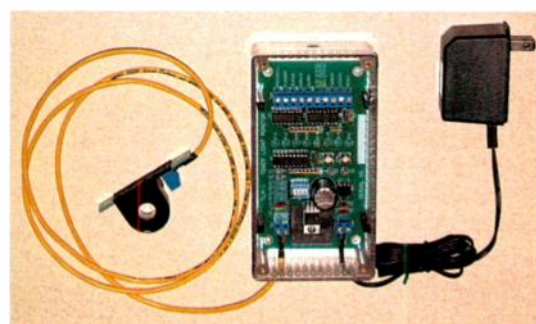
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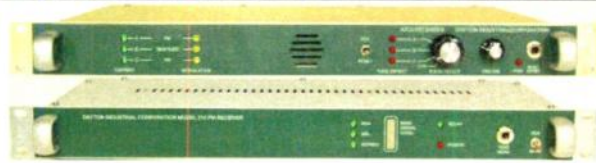
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RADIO ROUNDUP

The Radio Guide Event Register

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

NAB 2010 Spring Convention

April 10-15, 2010
Las Vegas, Nevada
www.nabshow.com

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/

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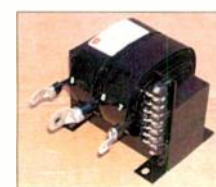
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