Radio Guide

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July-August 2010 – Vol. 18, No. 4

Omnia – From Frank Foti to Team Omnia in 27 Years

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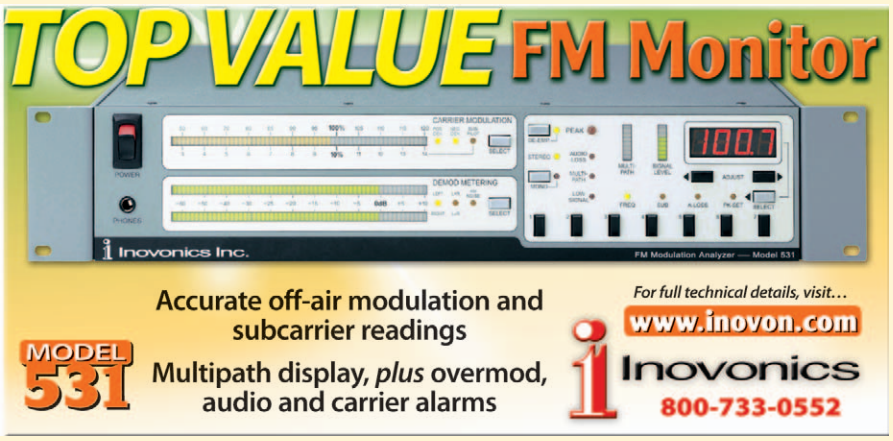

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Cornelius "Corny" Gould and Frank Foti with their new Omnia.11. Corny led the design of the front-end AGC/Compressor design and Frank engineered the back-end limiting/filtering/clipping.

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Radio Waves

by Ernie Belanger – Editor

Building a Better Radio Guide

It's been over a year now, since Ray gave me the opportunity to edit ***Radio Guide***. From the start, the one thing that personally impressed me was our writers. These dedicated writers have provided you with top quality, useful information to make your daily lives a bit easier. And we will continue to do so.

These are the folks that really make ***Radio Guide*** possible from an editorial perspective. They do excellent work for you in each issue – I'm proud of them.

We thank the manufacturers for supporting your publication with their advertising. We understand that money is tight, which is why we go the extra mile in ***Radio Guide*** to bring them as much value as possible.

Since I joined ***Radio Guide***, we've added a new feature *"Xtreme Engineering,"* which in this issue begins turning green with a story of a station that has reduced its carbon footprint by using wind power.

I hope more of you will come forward with stories of greening up your stations. Please email me story ideas or just call to talk; let's discuss them, and see how we can create a workable column.

In closing my first *Radio Waves* comments, I want to also thank *you*, our readers, for accepting me as the new editor. Lastly, Ray, thank you for the trust that I could help build a better ***Radio Guide*** on the solid foundation that has been laid.

– Ernie

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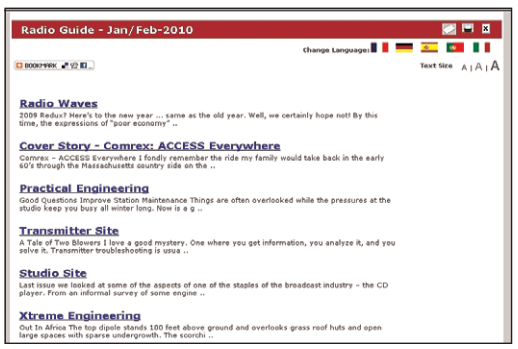
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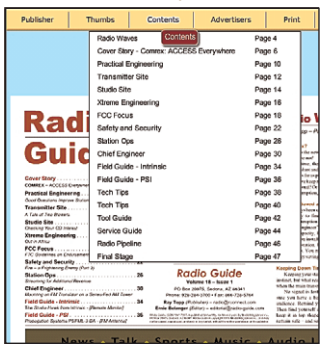

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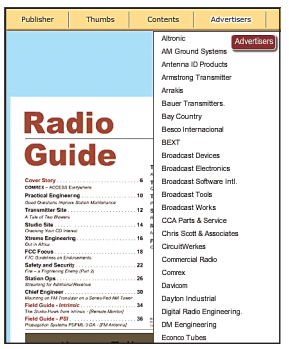

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Cover Story

by Howard Mullinack

Omnia – From Frank Foti to Team Omnia in 27 Years

In the beginning there was Frank Foti, a rookie engineer at an AM daytimer in the mid 1970s. Now, Omnia the company is a full team of dedicated engineering and design professionals, and Omnia the product is the audio processor of choice for most of the top-rated stations in all market sizes, all around the world.

Frank Foti's Start

Frank always had an interest in audio processing since his early days in radio. "I barely knew anything about equipment, but I was the guy that would re-tube the Audimax/Volumax and then fiddle with it." He then went on to WMMS Cleveland, where with his mentor, the late Jim Somich, he would sit for hours playing with processing schemes and ideas.

Z100 New York

In 1983, Frank was Chief Engineer at Malrite's KNEW/KSAN San Francisco. When told of their plans to put a "flame thrower" on top of the Empire State Building, he said, "I knew they wanted it not only just in signal but in sound as well." Frank moved to New York to light the flame.

"I scanned the dial – it was packed-up audio like I never heard before. Z100 had to compete with those guys.

"We took over WVNJ and changed the calls to WHTZ. They had only a barefoot 8100A Optimod-FM®, and I knew that wasn't going to fly. Our first air chain was a combination of the Optimod and Texar Audio Prisms.

"Overnight Z100 really did become the 'flame thrower' on the dial. For five years it was my job to keep it that way."

Raising the Bar

Eventually, others in town figured out the secret – EXR Exciter ,Texar Audio Prisms, Optimod-FM 8100A, Modulation Sciences CP-803 Composite Clipper – the legendary Z100 processing chain.

"I had to push myself to raise the bar yet again. We were playing around with the first model of the Aphex Dominator. I remember thinking, it's OK, but ... what could I do to make it better?"

And that was the beginning of Cutting Edge Technologies, which evolved into the Omnia of today.

The Vigilante

Frank recalls, "In 1988, I was in my early 30s, my brain needed a new challenge, and in a fit of insanity I made the decision to set foot out on my own. I did the New York City radio thing; that was successful, I'm proud of that. I figured, if I can do that for these guys, let's see if I could do it for myself.

"Being a fan of *The Godfather*, with the warped sense of humor that I have, there was Vito, Sonny, Michael, and so maybe there's a place for Frank in there as well? I've had these godfather-like names for the early products."

The first Cutting Edge product was the Vigilante Multiband FM-100, Frank's heavily-modified Aphex 700 Dominator.

The Dividend

The success of the Vigilante led to the next product. Frank designed and patented a composite FM low pass filter and branded it "The Dividend." The Dividend provided baseband protection; this allowed a station to continue to use their composite clipper with 57 kHz SCA services. "The best of both worlds, make an investment and the dividend comes back to you as a clean composite signal."

Unity 2000

The Vigilante was only a back-end processor. It was clear to Frank, "If I wanted to succeed, I had to go after the big guy, Orban, with a complete system of our own."

Frank set to work, designing a new multiband AGC, an update of the Vigilante's limiter, and a stereo generator. This became the Cutting Edge Unity 2000. It wasn't all analog or all digital; Frank called it "digitally sampled analog," using CMOS switches in the feedback path of an op amp.

This was 1991. The Unity 2000 was being prepped for its release at NAB. Then Frank learned that Orban was going to release their first digital audio processor.

"I remember thinking: 'I'm done, we're out of the market.' I was depressed.

"I called my friend Steve Church at Telos, who said 'Now Frank, don't fret, just because they have it doesn't mean it's going to be a home run. Don't give up the ship so quick.' On the merit of those words, I didn't!"

Cutting Edge and Telos Merge

On December 16 1992, Steve Church and Frank Foti merged their businesses.

Frank recalls that, "Telos had some projects coming up, one of which became the Zephyr. Steve felt there were engineering chops I could bring with regard to analog design. And Steve said that he would contribute to assisting me in developing a DSP-based audio processor."

Steve heard the 8200 and concluded that it didn't sound as good as their analog processors, "I think it's generating aliasing distortion internally; I have some ideas."

Steve and Frank agreed that they needed to develop a DSP-based final limiter and clipper that didn't alias. Frank took Steve's ideas, and after two years of research and development, it worked!

Omnia-FM®

In 1997, the Omnia-FM was born. Cutting Edge became Omnia Audio, a division of Telos.

Frank had one prototype. "I took it to those that didn't like the Unity." When shown the Unity they had said 'You know Frank, if you come up with something that really rocks, you call me.' And so I did."

To a man, every one of them said, 'Wow! Now this thing rocks.'"

A Success Story Waiting to Happen

Frank took one of the first production units to Dan Kieley, PD at Clear Channel's KDWB Minneapolis. Dan got on the Clear Channel program director's conference call and announced to all, "You guys, I heard the next best audio processing weapon ever – it's called Omnia, we're testing one at KDWB, this thing is amazing." And then he said, "I resigned yesterday."

Three weeks later, Dan was on the phone to Frank. "Frankie, I'm in Los Angeles; you gotta get me one of those wonder boxes. I'm program director at KISS-FM!" "The" KISS-FM, The LA version of Z-100!, Rick Dees and all. The next morning, Frank was on a flight to LA.

Jaws dropped!, KISS was louder and cleaner than anything else on the air. At the push of a button, Omnia-FM took Los Angeles by storm.

A week later, Randy Michaels called Frank, "You gotta get me more boxes, man!" he said. Word of mouth took over – Telos couldn't make them fast enough.

Omnia-FM Raises a Family

Under the guidance of "Godfather" Frank Foti, the range of products grew.

A slimmer version was created: Omnia-FM Junior. Omnia-FM VERIS was a joint development effort with Swedish Radio, a processor with no clipping at all, utilizing a multiband look-ahead limiter. Omnia-AM was released.

Not long after Omnia-FM took root in the market, Frank went back to explore what it would take to further reduce processing-induced distortion. After more years of research, Omnia-FM was replaced by Omnia.6, which evolved into the 6ex, with an early version of vocal detection, for determining when to back down the clipping and other parameters, as well as enhancements for reducing intermod distortion. Omnia.6exi is that concept even more refined, plus the addition of diversity delay. To this day, Omnia.6 and its descendants are the processors of choice for the vast majority of top-rated stations.

More followed: Omnia.3, Omnia.4.5, Omnia5, Omnia.AX, Omnia.5-AM, and Omnia.6-CD for mastering.

Frank, Corney and Kirk Harnack having a little fun in the Telos/Omnia booth at NAB 2010.

Omnia at an Aggressive Price Point

Omnia 3 was developed from Omnia-FM as a less expensive processor. Then salespeople came back saying "but we need something even cheaper!" *(Continued on Page 8)*

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Cover Story

From Frank Foti to Team Omnia in 27 Years

– Continued From Page 6 –

Omnia's engineers examined their current platform technologies and realized they could not be used to achieve the target price point. A new hardware platform was developed, with a smaller chassis, lower manufacturing cost, and a much more flexible DSP architecture that allowed for the DSP to be reconfigured in many different ways, serially, in parallel, or combination of both, and information can be shared between all chips.

Omnia One launched, first as an FM processor, then in AM, Multicast/DAB and Studio versions, with the ability for the same hardware platform to reconfigure itself for a different requirement. Omnia One will reach the 5,000 shipped mark this summer, an incredible achievement for a product shipping only two and a half years.

Team Omnia and the New Omnia 11

By the new decade, Omnia was no longer just Frank, and broadcasters continued to expect more. Every Omnia product had been an enhancement of the earlier product – evolution.

Now it was time for revolution. The motto: Spinal Tap's "Turn It Up to 11." The goal: Restore the quality and cleanliness to a station's sound that's often lost with heavy processing, without any sacrifice in loudness.

Develop new ideas and new technologies in every stage of processing and in the hardware platform itself. While retaining that winning signature Omnia sound.

Frank started the process of research into processor-induced intermod, especially in the clipping: "What would it take to make an audio processor that's going to deliver the competitive loudness that broadcasters demand?" Frank asked. " I know that everyone's talking about quality. But, broadcasters are broadcasters, and they will try to be as loud as they can be." Frank's research and a glimpse into his new clipping technologies was presented in technical papers to broadcast and audio groups.

Cornelius Gould got involved; a veteran broadcast engineer who has played with audio processing since he was in high school. Corny grabbed hold of the front-end dynamics design.

If you ever doubted that Frank is an Engineer, here's the proof!

Rob Dye, Omnia's DSP coding guru for more than ten years and a graduate of Case Western University as a trained acoustician, turned the concepts into singing and dancing algorithms with some tricks of his own.

Hardware engineers Bill Mohat and Ed Zmuginsky designed the new platform utilizing an industrial-grade PC running a quad core chip to give the Omnia.11 almost unlimited processing power. Some functions that would normally tax the quad core processor are done in DSP using a topology similar to that used on Omnia One.

Mark Manolio, Omnia's support engineer, is a valued contributor to the project as well. Mark was chief engineer of a radio station, loves audio processing, and knows how to adjust them.

Pride in His Omnia Team

Frank is proud of Team Omnia's new offspring. "We went into this year's NAB with something major! It's testimony to the hard work and dedication of the entire team of Omnia engineers.

Howard Mullinack is the Director of Marketing for Omnia. – Radio Guide –

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Xtreme Engineering

By Ernie Belanger

The Answer is Blowing in the Wind

It's an idyllic setting: crystal clear azure water, incredible natural beauty, fresh clean air, diverse wildlife, and endless, pristine shoreline all on the largest freshwater island in the world.

Beautiful Manitoulin Island, an all-season retreat for tourists located in northern Ontario, is also the site of the first and only green radio station in Canada.

At 100.7 "The Island," the staff is proud of both their island and their state-of-the-art technology including: automatic switching system from our main transmitter to the backup transmitter in the event of a failure; live on remotes that include full control of the studio from the remote location; extensive monitoring of transmitters, environmental and servers in a self-healing environment through redundancy.

A Common Thread

The island has three things in common with most radio stations both here in the U.S. and in Canada – a tower site on a hill where there is a lot of wind, the tower site is located outside of town, and like most transmitter sites, it uses vast amounts of electricity.

Go Green With Wind Power

After a year of research, The Islands CEO Craig Timmerman decided that was exactly the way to go. His goal was not to be one hundred percent off the grid, but rather to reduce the station's carbon footprint by cutting the station's power bill.

Craig is no stranger to reducing power consumption by going partially green and in doing so benefit the station's bottom line by lowering operational costs.

Experience Going Green

He had seen a power consumption reduction at the studios when he switched out standard florescent bulbs with LED lighting. He noted that each florescent ballast ate up about 80 Watts and the LED lights consumed only a few Watts. Grant money helped pay for the move to be more green. An additional side benefit was no more flickering fluorescents and staffers complaining of headaches from the florescent lights.

Craig also uses the heat from the computer rack room to partially augment the studio's heating system, reducing the station's heating cost significantly.

Doing Homework

Craig began with research to see what, if any, private sector or government funding was available to help defray the initial cost of installation. He knew money was available – it was a matter of finding it.

Having found a partial grant was available, he then moved to the next phase of research, checking with the local municipality to see if any special permits, licenses or other red tape would be involved. He wanted to make sure the project wouldn't hit any snags once the final decision was made to install a wind turbine.

His research found that if he used a "household" turbine, no special licensing was required. If he stayed under the maximum height allowed by zoning, no special permits or waivers would be needed either. He also checked with the power company to find out what the purchase rate was for surplus power that would feed back into the grid.

Turbine Selection

After much research into the turbines that are available, Craig decided to purchase the SkyStream 3.7 from Southwest Wind Power in Arizona. With the cost in hand, he audited the station's power bills to estimate the time it would take to pay back our investment.

Satisfied with everything, he ordered the turbine and monopole. Southwest's engineers sent a foundation drawing so a local crew could do the prep work for the pole.

When everything arrived, the prep was done and the installation proceeded without a snag. "Since the pole was was just 50 feet high it went up very much like a heavy duty light pole." Craig reports.

Grid Connected

The unit is grid-connect, which makes it even more green. The turbine's inverter, housed within the shroud of the turbine, up on the pole, immediately converts the energy generated to AC current. That in turn connects directly to the breaker box and provides real time AC, verses charging batteries for later use. Batteries are not only expensive, but lead acid batteries pose an additional set of problems that Craig didn't want to have.

The Monopole base partially completed.

Not Thrilled

Once the unit was up and running Craig wasn't pleased with the way it would "brake" when they were getting higher winds that would generate more power.

"I saw this braking action as a waste of energy." he told ***Radio Guide.***

What was happening was that the inverter was doing it's job, slowing the turbine to prevent it from producing more than the rated 2,500 Watts and overheating.

Remembering that it was built for the Arizona desert heat he decided to take a series of heat readings. Riding up in a bucket truck, Craig used a heat sensing gun to see just how hot the turbine and inverter were getting.

What he found confirmed his suspicions. The inverter, mounted on a huge heat sink, remained cool in this environment – heat wasn't a problem.

Green Power – "The Island's" Wind Turbine

Craig's Solution Equals More Power Out

Craig quickly formulated a plan that potentially would double the power output of the turbine. He called the factory and inquired about removing the brake control located on the inverter.

He was told that it was not advised and that it would void the warranty, but he was confident that the significantly cooler temperatures on the island would allow this uncontrolled operation without causing heat damage to either the turbine or the inverter.

He decided to go for it. He was right – the unit is and has been functioning flawlessly and it now puts out 5,000 Watts of power.

No Signal Problems

With the generator at 50 feet, and the FM antenna at 300 feet, there is no pattern degradation. It is also helpful that the blades on the turbine are carbon fiber vs the blades on the big industrial turbines that are built with an aluminum mesh skeleton.

So The Island's wind turbine is generating part of the power needed to run their Nautel NV10 FM transmitter and the transmitter is running fine on it's hybrid power hookup.

But That Isn't the End of the Story

Craig told us that because it was an especially windy period when the generator first went into service, the station already has an energy credit in excess of $5,000 and that the unit will pay for itself in less than half of the time he expected.

His successful wind turbine experience has also spawned a more aggressive idea. Craig is planning a small wind generator farm at his transmitter site. He plans to add four or five additional turbines and then feed all of them directly to the grid.

The local power company is paying around 21 cents a kW for green power it purchases. He will then buy back power from the grid at around six cents a kW.

We'll keep you posted on how his wind farm works out and the benefits The Island reaps from the project.

If you want more details on his wind generator success you can contact Craig at craig@manitoulin.net. Photos courtesy of Crain Timmerman.

In doing research for this story I found that the US Government is giving a tax credit that will pay for 30% of the installation of a single or multiple wind turbine generators. Most states have programs to subsidize Green Power production as well. These may help cover the initial purchase and construction costs. Some power companies have programs to also assist in developing Green Power generation. If you have a "Green Story" please email me at: editorial@radio-guide.com

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Transmitter Site

The Dark Side of IBOC FM

by Steve Callahan

As a Chief Engineer of an NPR station, and the owner of a small market AM station, I had high hopes that IBOC would be a positive step in the evolution of terrestrial radio.

It certainly was initially touted as a way to bring AM and FM radio to the next level for the future. Unfortunately, I have learned that IBOC comes at a very high price to first adjacent stations that are your neighbors on the radio dial.

White Noise Hash

Rhode Island Public Radio operates WRNI-FM, a 2 kW kilowatt Class A FM on 102.7, licensed to Narragansett Pier, RI. It serves southern Rhode Island and WRNI-AM serves northern Rhode Island.

WRNI-FM is a grandfathered, short spaced allocation to WKLB-FM 102.5 in Waltham, Massachusetts. On December 4, 2008, the licensee of WKLB-FM received an Experimental Permit from the FCC to conduct tests at higher IBOC levels.

When those tests started, the coverage area of WRNI-FM was dramatically reduced by white noise on 102.7.

In Come the Complaints

I immediately started to get listener complaints, one from a listener approximately 4,000 feet from our FM tower in Narragansett Pier.

Affected WRNI-FM listeners were confused because the IBOC white noise could not be attributed by them to traditional, audible interference from another station. They told me they thought the problem on 102.7 was due to deficiencies with WRNI-FM so they merely tuned to another station.

NPR Testing

During the summer of 2009, Rhode Island Public Radio partnered with NPR Labs to perform extensive field measurements, documenting specific locations of interference within the protected 60 dBu contour of WRNI-FM, from the increased-level IBOC carriers of WKLB-FM.

Those results were submitted to the FCC as part of a larger study by NPR Labs seeking to moderate the proposed across-the-board increase of IBOC levels from -20 dB to -10dB.

That study convinced the FCC that a -14dB IBOC level was prudent and also imposed a procedure of remediation if a station caused interference to an adjacent station by operating with the increased IBOC level.

Meanwhile on the Left Coast

On May 19, 2010, All Pro Broadcasting, Inc., licensee of KATY-FM, Idyllwild, California, operating on 101.3 MHz, filed a Petition with the FCC for Relief from Interference and for Modification of STA.

All Pro Broadcasting commissioned extensive field studies showing that the digital IBOC subcarrier for Radio Station KRTH, operating on 101.1 from Mouth Wilson near Los Angeles, was severely damaging their analog signal within the KATY-FM protected 60 dBu contour in Riverside County, California.

Similar Methodology Used

As NPR did in Rhode Island, All Pro Broadcasting conducted thorough listening tests and field strength measurements from a variety of locations focusing on areas of heavy mobile listening and traffic patterns.

The NPR study in Rhode Island noted that a ratio analysis of WRNI-FM to WKLB-FM while the test receiver was in motion yielded the most obvious effects of the interference. The KATY-FM coverage area subjected to KRTH's IBOC interference is, according to All Pro's FCC Counsel, Attorney John McVeigh, "1,871 square kilometers which is about 44.7% of the entire area contained within KATY-FM's predicted 60 dBu contour."

KRTH Took Measurements

Eliot Klein, principal of Klein Broadcast Engineering, technical consultants for All Pro Broadcasting, reached out to the licensee of KRTH, but was told that measurements had been done on KRTH showing no interference to KATY-FM. However, requests by Mr. Klein for copies of those measurements went unanswered and unfulfilled by KRTH.

Mr. Klein even went as far as to suggest to KRTH's corporate engineering department that a directional antenna for KRTH's IBOC signal, with a -15 dBu null toward KATY-FM might alleviate the interference. That suggestion was rejected by KRTH.

CBS Replies

On July 2, CBS Radio East, Inc. responded to All Pro's filing by refuting all of their claims of interference and the methodology of All Pro's field testing.

Glynn Walden, Senior Vice President of Engineering for CBS radio, and an early supporter of the present IBOC system when he was employed by iBiquity Digital Corporation, prepared the technical portion of the CBS exhibit.

Walden states "As part of the FCC IBOC proceeding and the NRSC evaluations, iBiquity Digital Corporation submitted reports and test results to the broadcasting industry and the FCC indicating that during the transitional hybrid IBOC operation that there would be some degree of interference generated to the analog operations of stations operating on first adjacent channels to IBOC stations".

Walden goes on to explain that CBS performed a series of tests from June 14 to June 16, of this year, to ascertain KRTH's adherence to the IBOC emissions mask even though he stated earlier in 2008 to All Pro's technical consultant that those tests and measurements had already been performed.

Mr. Walden notes that All Pro did not provide any evidence of specific listener complains of interference to KATY-FM.

Listeners Don't Understand IBOC Interference

At WRNI-FM I learned from contact with our affected listeners, IBOC interference is often misinterpreted by the listening public. They comprehend it as a deficiency with the signal of the station they are listening to which is being interfered with.

The rate of complaints received drops off because listeners just simply tune to another station. with no interference.

Proper Steps to Receive Remediation

According to Attorney John Wells King of the law firm of Garvey, Schubert and Barer, the procedure that affected stations must follow to receive remediation from IBOC interference is as follows:

The complaining station must first contact the offending station "to work cooperatively to confirm the instances of interference and to attempt to eliminate the interference using voluntary tiered FM Digital ERP reductions."

If the voluntary reduction works, the offending station must stay at that level and notify the FCC of the reduction in power.

If the stations fail to reach an agreement, the complaining station may file a complaint with the FCC.

FCC Required Documentation

Should the need for a complaint arrise, it must contain the following information to be considered by the commission.

Complaints from at least six listeners, of ongoing (not transitory) interference. You are required to plot the location of the complaints on a map. You must also provide a "detailed description of the nature and extent of the interference being experienced at that location."

Finally, you must include a "description of the tests and equipment used to identify the alleged interference and the scope of the unsuccessful efforts to resolve the interference."

Mandatory IBOC Power Decrease

If the FCC fails to act on the complaint within 90 days, the offending station must reduce power, either to -14 dBC, -17 dBC, or -20 dBC, depending on the power level at which the station was operating.

A Lesson for You to Learn

The lesson to be learned from both of these experiences is that if you know your first adjacent neighbor is operating with -14dB IBOC sidebands, listen carefully to your listeners when they call and say that your previously good signal has diminished in the direction of the IBOC station.

Ask them if they now hear a "white noise" instead of your station. Be prepared to explain what white noise sounds like and why it is there. Remember you will be speaking with someone that probably doesn't have an understanding of audio or digital interference.

Once you have confirmed it is a case of IBCO interference, immediately contact that IBOC station and ask for their help.

Use Diplomacy

Be diplomatic about the situation. Talk it over with the Chief Engineer or the station's contract engineer and try to work together with them to find a solution.

Your ultimate goal here is to gain the offending station's cooperation in resolving the problem, so you won't have to go through the process and expense of gathering all the documentation which eventually will needed to be presented to the FCC should a complaint need to be filed.

Of course it goes without saying that you need to keep your FCC attorney in the loop. He can be an excellent asset in assuring that you handle the situation properly which would make it easier should you have to file a formal complaint with the Commission to get the situation resolved.

Steve Callahan is the Director of Engineering for Rhode Island Public Radio. He can be reached via email scallahan@wrni.org

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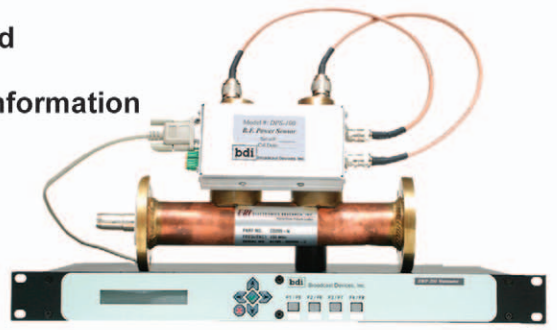

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Studio Site

Studio Improvements on a Shoestring

(Without the Knotty Problems)

by George Zahn

Well, here we are in the "dog days" of summer – hopefully the "dog" has nothing to do with our ratings or the new Arbitron wireless devices.

As some sectors of the economy and areas of the country are indeed rebounding, many broadcasters still find themselves behind the financial eight ball.

In the next few issues, I will share some money-saving ideas, along with input from an informal survey of engineers and operations personnel, to keep us on the technical beam while navigating the budget tightrope many are experiencing. So, if you're looking for economical ways to improve or replace equipment, this and the next issues of ***Radio Guide*** could come in very handy.

Technology Investments That Save

"Just think of all the money we're saving on Q-tips and alcohol now," mused engineer and ***Radio Guide*** writer Jeff Johnson, pointing to the advancement of digital recorders, "but the most economical things to do are to maintain equipment in a cool and clean environment, and have a first-rate engineer on call who knows how to do repairs and maintenance economically."

Sync or Swim

Since we're in the summer season, let's check that old rule of not swimming until an hour after eating. Pure and simple, the reason is that your body has a hierarchy of where your blood is needed most. The brain is always first. When you eat, the stomach comes in second place, pushing the muscles to a distant third, so you avoid potentially fatal muscle cramps by waiting to take that swim.

So, when it comes to the studio, where does your money, your financial life blood, need to go first – second or third? I'll share some thoughts from operations, programming, and management perspectives, and offer some insights on good maintenance and purchasing practices from my guest panel.

I'll start with my designations: Brain – most important area to spend a little more money; Stomach – the second most important resource, and Muscle – the area we may have to wait to improve in a non-emergency. I posed these to the panel which consists of some ***Radio Guide*** and non-***Radio Guide*** contributors.

Brain Power

In the list of Brain items, the one that came to the top in early returns was the issue of computers we use in our studios. Most specifically, I asked for input on combining computer resources in our air or production facilities.

If you're using computers in your air studio, multiple monitor screens and multiple computers can create space and fan noise issues.

One of the first inclinations might be to assume that all functions can be done by one computer, saving space, money, and reducing noise – but let's check the pros and cons. It may be worth spending more money to keep the system "clean."

Every respondent to my survey urged that the automation computer be uncompromised by multi-tasking. Not that the computer couldn't handle Internet or editing capabilities, but it's really the fear of contamination. "Imagine losing your audio delivery system and having to rebuild it," was a common response.

Among the recommendations were to disable all USB inputs for your audio delivery computer, using only CD and DVD for inputting audio resources into the system, keeping the audio delivery computer almost totally isolated.

Noise and Clutter

If computer fan noise is an issue with multiple computers in one studio, you can locate the computers in any other cool place in your station and run cables from there to the studio itself.

Operations specialist Dave Schram is a major proponent of using KVM switches, which allow multiple computers to access one monitor, keyboard, and mouse, minimizing the clutter of any studio. He has one studio in which one monitor handles all computers charged with the tasks of recording and editing, e-mail, Internet access, and traffic reports.

For the record, his audio delivery computer is totally separate from the others, and all audio computers for each studio are housed in one closet-sized cold room with its own dedicated air conditioner.

Traveling on Your Stomach

There are a few areas in our Stomach category. These are important, but may take a back seat to making sure your computer delivery system is running properly.

Let's check the areas of recording media and microphones. Recording media is one budget item that comes under scrutiny at many stations. How can we record cleanly, dependably, and inexpensively? From the classic days of carts and reels, to Mini Discs, then recordable CDs, and now flash recording media and thumb drives, the temptation is to use recyclable media to save money.

No Thumb Drives

This area ties back to the USB question on the computers in our Brain section. Here's the temptation: thumbdrives are extremely convenient, portable, and recyclable. That's great, but the problem is that thumbdrives can also be a collecting ground for computer viruses and malware.

Jeff Johnson adds to his warning emphatically stating "*No thumbdrives* should feed your automation system!" The problem is that people use their thumbdrives often for not only audio, but also other file sharing, including photos and documents.

Only if you can guarantee that thumbdrives and flash memory are not being used in compromised computers and areas, they may be an option, but it is something to consider. Mirrored drives can be a great backup, but in any case, backing up a system is a critical point.

The CD Option

"As cheap as CD recordable media is, if a station cannot afford a few 25-cent CD blanks a day, why be in business," said Johnson who likes the slightly more expensive Taiyo–Yuden as more reliable, "if a program will not air due to a badly burned CD, is that economy?"

He also advises burning audio CD's at 8X for better and less error-prone burns. At my station, WMKV, we utilize a large number of recordable CDs every week, and we know two or three brands that work for us. We generally watch for these to go on sale at office supply or audio stores, and then stock up.

Of Mics and Men

If you've read my articles before, you know that I believe that consistent microphone performance can play a major part in the station sound. While I was tempted to move microphones into the Brain designation, I decided to drop it down to Stomach status because of the feedback I've received so far. While you want your microphones to be as consistent as possible, most mics are long-term purchases that, if properly handled, can last far longer than even the most dependable and long-term staffer at your station.

To offer another opinion on the consistent microphone issue, I have to say that at least a few engineers brought me down to earth by responding, saying as much as "the 'general public' won't know the difference. Consider that many are now content to listen to lousy MP3s via earbuds."

Muscling Up

The tertiary areas in studio improvement and maintenance fall into monitoring and headphones. I'll add a quick note here to say that if your station is doing a significant amount of live music production, monitoring will quickly rise to higher priority as you must have critical monitoring to maintain original music mixing.

For many stations that are simply monitoring pre-produced segments, talk or pre-made music content, a decent set of speakers can and should last for years. It might be good to ensure that the studio amp cannot easily blow the speakers (we all have at least one "cranker" at every station!).

For non-critical mixing on headphones, there are several different approaches. Many stations treat headphones as disposable devices, and buy multi-packs at bargain rates.

HIPA, HIPA, Hooray

I worked at one station that practiced what I called HIPA, the Headphone Indemnity Portability Act. The idea was very simple: management supplied one set of very good Sony MDR-7506 headphones (about $100 each) to each full-time on-air staffer.

The headphones belonged to that person as a perk of the job, but each announcer was also always responsible for his or her headphones at all times. They were responsible for any abuse, repair, and maintenance of the cans. If you lost them, you had to replace them with whatever style you wanted. As a backup, there were always a few other pairs of headphones on the talk tables at the station but most of us took pride in caring for our personal headphones.

Next time, we'll discuss a studio restoration job for a small AM that had to save money, and we'll discuss maintenance issues and problem prevention.

Do you have any ideas for upgrading, maintaining, or solving a tech studio problem on a shoestring? I'm also looking for ideas on studio lighting. Do you prefer fluorescent, incandescent, natural (where available) or other? What's the funkiest light setup you've been around, or are there light-affected announcers at your station? Share your stories with others by sending ideas and feedback to gzahn@mkcommunities.org

George Zahn is the Station Director/General Manager for WMKV Radio in Cincinnati.

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Disaster Preparedness

Alert FM Reviving a Dormant RDS

by Judith Gross

You remember RDS, don't you? Also called RBDS, it stood for Radio Data System (or Radio Broadcast Data System) and it was going to do all sorts of great things for FM radio.

The technology uses FM subcarriers to broadcast a data stream that can be decoded by RDS receivers, many of which are now standard equipment in car radios. Stations generally use RDS today to identify a particular song as it plays.

But a lot of other great ideas about how RDS would be used got lost in the clamor of emerging digital technologies – mostly iPods, cell phones and an increasingly mobile cyber-world. A technology based on FM radio seems to be so old-school these days.

An Alert FM Receiver

New Use for RDS

Enter Alert FM, an application of RDS for emergency notification that can custom-tailor widely-based messages for local use. Add radio broadcasters' desire to put FM chips into cell phones, and you end up with a new use for a technology that previously had nowhere to go.

Alert FM is the creation of Tennessee-based Global Security Systems (GSS). It lets national, state and local emergency managers send messages to any FM receiver, including wireless or mobile devices.

"We're on 200 stations in 13 states around the country," notes GSS General Manager Jim Lowery. Mississippi was the first to begin using Alert FM.

Broadcasters Warming to the Idea

Some of the areas that have adopted the system are Tennessee, Arizona, Michigan, Florida, New Jersey and South Carolina. It has won the support of state broadcast associations in Tennessee, Alabama, Missouri and New Jersey, among others.

Early Flood Warning

Alert FM was recently put to the test, with severe flooding in Henderson County, Tennessee, which is roughly halfway between Memphis and Nashville.

At the beginning of May, heavy rains caused waterways to overflow and wash out bridges, dams and culverts, pouring water onto roadways and leaving motorists stranded, even up on I-40, according to Henderson County Emergency Management Director Jim McKee. "Alert FM acted as our early warning system," said McKee.

Some of the Flooding in Henderson County.

Excellent Coverage

"We had receivers in nursing homes, hospitals, schools, day care centers and police agencies and we were able to get flash flood information out to a wide area quickly and early." McKee noted that the Alert FM system even reached the hard to reach places.

"There are dead spots in weather radio reception that Alert FM was able to get to because FM coverage reaches the whole county," said McKee.

The county got a grant from the NOAA to buy the Alert FM receivers, which are conveniently small and sold in the local Radio Shack, according to McKee, for about $40 for the small mobile receiver.

Some emergency offices have received similar grants from NOAA of the office of Homeland Security to supply the receivers to critical first responders and public places.

Note the water level in this home.

Station Participation

Alert FM is set up at four radio stations in the Henderson area: WTBG-FM, WKNP-FM, WWGM-FM and WAUV-FM.

"This seemed like one more way for people to be alerted, one more way we could help the community," said Carlton Veirs, GM of WTBG-FM in Brownsville, Tennessee.

"We've had some tragedies with flooding in the past, including some fatalities," he said.

Minimum Equipment, Easy Setup

Equipment at the station level is simple: a V-SAT dish and an RDS encoder. The stations can use the RDS data stream for their own purposes, such as identifying song titles or scrolling headlines, in non-emergency times.

The equipment was installed by Alert FM at no cost to the station under a partnership agreement.

Veirs said he knew of RDS technology before being approached by Alert FM but hadn't considered it a particular priority. When there is no need for the emergency alerting, WTBG scrolls its call letters and frequency over the data stream.

Program-Specific Regions

What Alert FM brings to the RDS stream is the ability to select regions for the receivers to monitor and a means to transmit messages from NOAA, FEMA and other national emergency notifiers as well as from state agencies and local emergency managers.

"The messages from NOAA or FEMA are on an automated stream," GSS' Lowery said. "Then user-generated local info can be added as well. But the beauty of Alert FM is that, unlike EAS, there is no audio interruption."

GSS is working all sides of the equation, getting cooperation from emergency managers; putting the technology into FM stations and getting outlets for receiver sales as well.

"FM signals are nearly ubiquitous and it makes sense to send out emergency warnings via RDS," according to Lowery. "If cell phone manufacturers start putting FM receivers into cell phones, that's one more way to get important warnings out."

More of the disaster.

Cell Phones Could Be An Answer

That's a big "IF" broadcasters are pushing for. Some 60 members of Congress support putting FM chips into cell phones. FCC Chairman Julius Genachowski has told cell phone providers to come up with a Commercial Mobile Alert System by 2012. Alert FM might be one way they could comply.

If large broadcasters such as Emmis are successful in their efforts to get the cellular companies to include FM receivers, it could be a big boost for Alert FM.

"If that happens, we'll make an app for it," Lowery said. In such a case, RDS, a sleeping technology in search of a critical function, could go from mere entertainment to possibly saving lives.

Judith Gross is a former radio talent who spent a few years in the Colorado Springs market. Judith runs her own freelance writing and marketing business in Binghamton, NY. Visit her website at www.jgcreativemedia.com

Flood Photos courtesy of David Anderson, Lexington Progress News Paper.

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FCC Focus

LPFM vs Translators ... and More

by Peter Gutmann

The FCC may be on the verge of finally resolving the long-pending problem of how to treat conflicts between the Low Power FM and translator services, but not in a way that is apt to please some broadcasters.

On July 8, the Educational Media Foundation (EMF) and Prometheus Radio Project filed a "Memorandum of Agreement" with the FCC, which proposes to move new LPFM stations into a preferred position with respect to new and pending translator applications.

Translators vs LPFM

By way of background, translators have always been a secondary service.

They must protect all full-power stations and may be bumped to another frequency, or shut down altogether, in the event of complaints of interference to authorized FM reception.

When the Commission authorized the LPFM service in 2000, it imposed transmitter distance separation requirements, limited to protecting a full power FM station's 70 dBu principal community contour. It also required LPFMs to protect all existing translators. However, all future applications were to receive co-equal status so that any new translator or LPFM applicant would have to protect previously-filed translator or LPFM applications.

Over the last decade there has been considerable friction between the two services.

Both Sides of the Argument

LPFM partisans contend that their community-based programming is entitled to preference over mere rebroadcasts by translators, while translator operators point to their valuable extension of needed service to rural and other poorly-served regions beyond FM stations' practical reception areas (including "fill-in" service within predicted coverage contours).

Timing Caused Part of the Problem

When the FCC opened its last window for new FM translators and other major changes, way back in 2003, it was overwhelmed by over 13,000 applications. Over half of them remain pending. Nor has the FCC accepted any LPFM applications since 2002.

All of those were for 100 Watt stations; a separate class of 10 Watt LPFMs was authorized but has yet to be implemented.

In an interim effort to resolve the logjam – and recognizing that 15 parties had been responsible for filing half of the pending applications – in late 2007, the Commission required that translator applicants dismiss all but ten of their pending applications.

Shortly thereafter, the Commission stayed that requirement and deferred consideration of the issue of prioritizing LPFM and translator applications. And there the matter remains.

The Proponents

The new Memorandum of Agreement was submitted by EMF, licensee of hundreds of noncommercial FM stations and translators, and Prometheus, a primary advocate of the LPFM service. It does not purport to represent an industry-wide consensus, and clearly omits the views of commercial broadcasters and especially the NAB, which has fought LPFM at every stage so far.

Yet, the FCC is bound to be attracted to a suggestion that might relieve it of the obligation to navigate its way among at least two sets of interested parties to a contentious issue.

Perhaps anticipating a need for further protracted FCC procedures, the Memorandum of Understanding was accompanied by a Memorandum of Law that justified its proposal as a logical outgrowth of all the prior proceedings that already had explored the various options, including the dismissing of all pending applications and starting all over again, once new rules were in place.

Thus, the legal argument concludes that the presently proposed outcome falls well within the range that interested parties already could have anticipated and it need not be subject to further lengthy proceedings and delay.

The Proposed Agreement

The Agreement requests that processing of all pending FM translator applications from the 2003 window be deferred until a new LPFM window can been opened.

All LPFM applications filed during that new window would receive preference over pending translator applications. All translator applications in conflict with a new LPFM would be dismissed. Only then would translator applications not precluded by the new LPFM grants be afforded an opportunity to resolve mutual exclusivity.

(Continued on Page 20)

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FCC Focus

by Peter Gutman

– Continued from Page 18 –

The Memorandum further proposes that LPFMs be given priority over translators in all future application procedures and that only translators, but not LPFMs, be required to remediate interference to full-power stations.

In lieu of the national cap of ten that the Commission had tried to impose, the Memorandum would limit the number of translator applications an entity could file during future windows to a few per metro area or a few that would rebroadcast the same primary station. It would extend LPFM operation below the reserved band to 87.5, 87.7 and 87.9 MHz.

A final element would permit the sale or donation of translators to qualified local groups and the conversion of such facilities to LPFM operation.

Although operation of existing translators would not be impaired, the impact of the proposed procedures would be to effectively preclude new translators except in the least desirable areas, where not even the prospect of an LPFM operation would generate any interest.

Not surprisingly, the Agreement would advance the interests of the two proponents – Prometheus's advocacy for LPFM would be vindicated and EMF, which presumably already has most of the translators it wants, would be largely protected from future competition.

The Upside

On the plus side, the current stagnant state of affairs serves no one's interest – other than those opposed to any expansion of opportunities for new facilities.

As of press time, the FCC has not yet requested comment, but it will be tempted to look favorably on proposals that provide a path out of the present seven-year quagmire in which translator applications have been stuck and no further LPFM authorizations have been issued.

Indecency – an Update

On another, completely unrelated note, you undoubtedly have read (probably more than you wanted) about the Second Circuit U.S. Court of Appeals' decision invalidating the FCC's indecency policies on constitutional grounds.

Hopefully, your interest in the matter is strictly vicarious. Even so, regardless of the nature of your own programming, the decision heralds relief from a burden of concern to all broadcasters.

The Court's Concern

The court was troubled that broadcasters have declined to cover live events, including breaking news, for fear that some "background indecency" might slip in for which they could be held liable.

Let's face it – life is full of unpredictable events. There is no way that a broadcaster can control all the circumstances surrounding live news or event coverage to absolutely guarantee that an indecent word couldn't possibly slip in from the environment.

The only total protection is to abandon live coverage altogether and to rely entirely on carefully screened, prerecorded material.

No Practical Solution Available

But as competition heats up, many broadcasters find that approach unappealing, resulting in audience losses to stations that generate more immediate and appealing live or spontaneous programming.

The decision also carries implications far beyond the immediate question of how much smut broadcasters should be able to air.

Among the judges's observations were a recognition that a precise definition of objectionable content is nearly impossible, that abstract guidelines provide broadcasters with little useful guidance, that broadcasters face increasing competition from other less-regulated media, that kids have plenty of other sources for all types of content, and that technology has increasingly empowered parents to decide which programs their children may watch.

That last rationale, especially, applies more to TV than radio, which lacks any equivalent to a V-Chip for parental content control – good luck trying to screen your kids' radio listening!

Yet, the thrust of the court's general outlook is to place trust in parental supervision and communication of values – and in broadcasters' desire to avoid offending the listeners and advertisers upon whom they depend.

Less Content Regulation

The general trend away from content regulation should encourage all broadcasters, who are subject to FCC-imposed programming restrictions, while their increasingly prevalent and potent competitors remain unregulated.

Of course, the Second Circuit's decision is unlikely to be the final word on this matter, which has vexed the FCC and the industry for decades.

Further appeals, including to the Supreme Court, seem likely. For now, broadcasters and their First Amendment rights appear to be on the verge of greater protection.

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

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Safety and Security

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

Radiation! – *Part 2*

by Jeff Johnson

Scary? No, in radio, radiation is our business! That radiation is EMF, Electro Magnetic Fields, conveyed by photons.

Ionizing Radiation

As we discovered in our previous discussion, the most dangerous form of EMF is ionizing radiation. High energy tears electrons off of atoms, forming ions. The relative energy of the photons, determined by the frequency of the radiation, forms the dividing line between non-ionizing and ionizing radiation.

That line is in the range of short wavelength – higher frequency – ultraviolet, approximately 250 to 10 nm (nanometers). Photon energy becomes greater as frequency rises and wavelengths shorten. It is short wavelength ultraviolet that causes the tissue damage we know as sunburn.

Radio Waves

Radio waves are of much longer wavelengths than ultraviolet, and therefore of correspondingly lower photon energy – they are not ionizing. As we found, however, they can still be dangerous. At RF frequencies, heating of tissue is the primary destructive mechanism. SAR (Specific Absorption Rate) is power absorbed per mass of tissue in units of Watts per kilogram (W/kg), and is the determining measurement.

We Are Antennae

The human body acts as an antenna. "Thermal mechanisms are mainly associated with the absorption of the RF energy resulting from the electrical conductivity of most biological tissue.

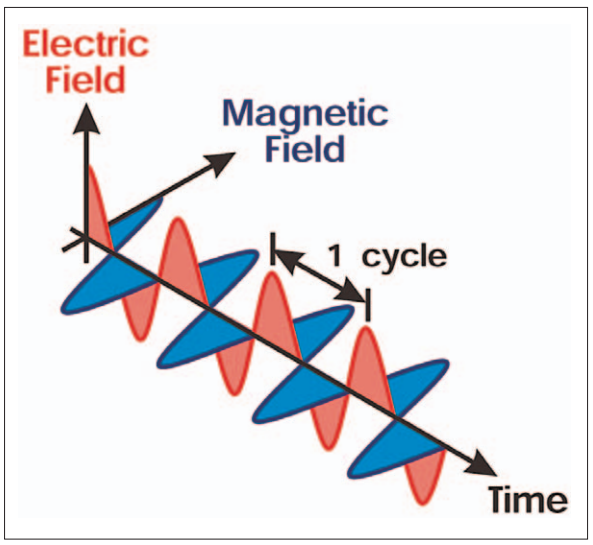
The RF electric field generates an oscillating current, and the rapid transfer of the energy of this current into the molecular motion responsible for most of the heat capacity results in an increase in the local temperature." *(L. J. Challis, University of Nottingham)* We heat up.

How We Are in Danger

In radio, danger may lie in getting too close to a transmitting antenna. A goal of this article is to explain why warnings and restrictions are necessary near radio antennas. Let's explore just what that antenna is radiating, and why getting closer is more dangerous.

Electromagnetic radiation (or energy) consists of both electrical and magnetic fields. The electrical field is called the "E" field and the magnetic field is called the "H" field. They are both radiating from an antenna at a right angle to each other. (The "H" field may also be referenced as a "B" field. In free space they are indistinguishable.)

Electromagnetic energy is composed of co-joined oscillating electrical and magnetic fields. These waves are produced when an electric current oscillates back and forth in a conductive body, producing a subsidiary magnetic field. Electromagnetic waves are then generated that propagate outward from the source, with the electrical portion of the waveform moving perpendicular to the magnetic. *(University of Denver)*



Radiating electric field and magnetic field.

Field Definition

Close to a radiating source, the antenna, is the "near-field" where the E and H fields are separate and their ratio varies. Further out is the "far-field" where the fields are co-joined. There, the ratio of the electric and magnetic fields is constant. Here are definitions found at www.microwaves101.com

Near Field is when you are close enough to an antenna so that its radiated field must be considered mathematically spherical rather than planar. Also called the Fresnel Region.

(Continued on Page 24)

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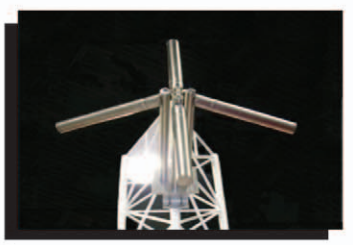

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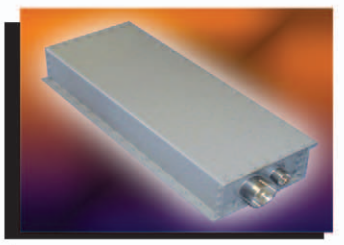

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Safety and Security

– Continued from Page 22 –

Far-Field is when you get far enough from an antenna so that its radiated field wave can be considered planar. Also called the Fraunhoffer Region.

A Rule of Thumb

When the distance to the radiation source is less than three wavelengths, the distance is near-field. If the distance is greater than 3 wavelengths, the distance is far-field. It is important to make note of this near-field / far-field distinction when making measurements. In the near-field the E and H fields must be measured separately.

Biological Effects

Biological effects of electromagnetic fields depend on the following:

• **Frequency** – The average human body is a half-wavelength at FM frequencies. Glands and eyeballs resonate at higher frequencies.

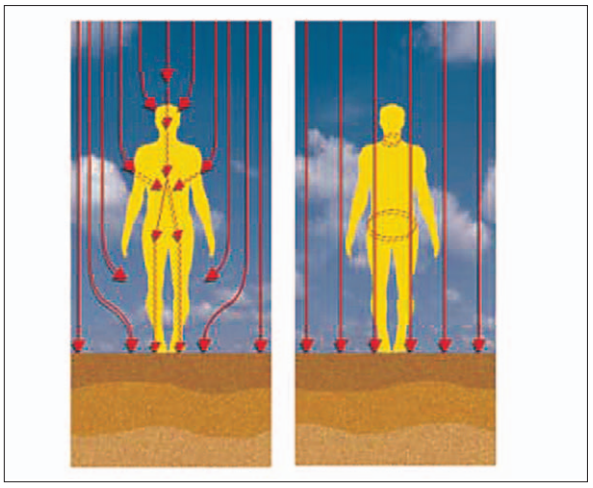
• **Field strength** – Watts per kilogram is the determining metric. The more wattage, the greater the danger.

• **Field type** – H field is capable of greater penetration and generating induced currents. E fields can cause arcing.

• **Duration of exposure** – Think of timing your hamburger in a microwave – rare or well–done?

• **Extent of exposure** – Body parts with greater circulation can dissipate more heat. Parts with little circulation, such as eyeballs, are at greater risk.

• **Signal shape** – At equal transmitter power, a focused signal from a dish is stronger than the same from an omni radiator. In the near–field, E and H fields will differ.



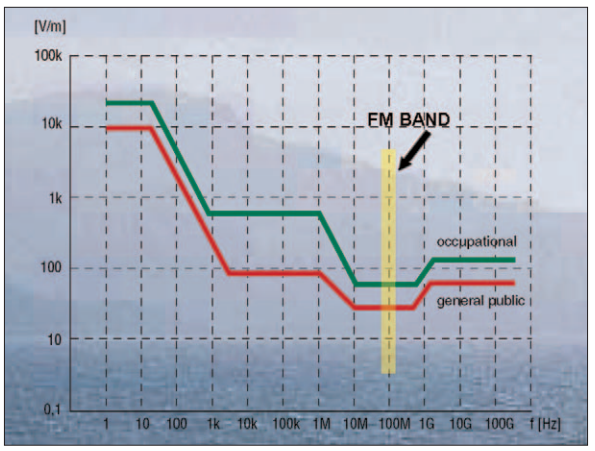
E field on left. H field on right.
Source: Narda

This illustration graphically displays the differing effect of the body on the E field and the H field. As shown, the electrical field can be easily affected, skewing measurement results. This difference is important to keep in mind when measuring field strength, particularly in the near-field.

Standards and Guidelines

The International Commission on Non-Ionizing Radiation Protection, the ICNIRP, working with the World Health Organization, the WHO, has authored international guidelines and standards. These guidelines and standards are not arbitrary, but are based on research into biological effects and the recommendations of scientific committees. It is acknowledged, however, that short-term effects are more thoroughly understood than long-term.

An interesting graph of E field limits (Volts/meter) shows that, for human exposure, the most critical frequencies are centered about the broadcast FM frequency band. It can be seen that the human body is quite efficient as a half-wave antenna for broadcast FM frequencies centered at 100 MHz.



Note the critical dip centered on 100 MHz.
Source: Narda

As has been stated, in addition to frequency, field strength is also a critical safety parameter. According to Narda, field decay is equal to 1/r (where r = distance to the field source) for E and H in the far-field for all wireless communications including radio and TV. Note that this is not the square of the distance, but the reciprocal. Twice as far is only half the field strength.

Useful website references:

www.healthandsafetyatwork.com – www.microwaves101.com
www.who.int – www.Narda.com

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

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Operations Guide

Integration of Smartphones Into Your Network

by Chris Tarr

People are using Smartphones in record numbers, and that number is only going to increase in the future.

What is a Smartphone?

A Smartphone is a phone that has some sort of "QWERTY" keyboard (either physical or "virtual" on a touch screen) and has applications such as email and Internet browsing using a data connection.

Station Engineers and IT folks are getting more and more requests for employees to connect them to the company network to receive company email.

Making a Policy

What's a reasonable policy regarding integration of these devices into your network?

First, you need to consider the inherent danger of having these devices connected to your company network. The biggest danger is the threat to network security. If a user loses a device, sensitive information may be exposed. That's a risk that many of us don't want to take.

Secondly, there's the matter of support. With all of the different platforms out there, it can be more and more difficult to know how each and every one works. Allowing multiple platforms to integrate into your network is opening a huge can of worms.

Network Security is Top Priority

Well, lets start with security. The reality is that if you're allowing standard POP or IMAP email access outside of your network, there is no security. All Smartphones now have the ability to easily check POP and IMAP mail.

You have no control over the device, and if someone loses their phone, your only option is to change the account password to prevent the device from sending and receiving email.

In this case, your only way to enforce any policy is to clearly articulate your expectations and use the honor system to be sure that people are honoring it.

Enterprise Servers and ActiveSync

Fortunately many companies are using Microsoft Exchange for email. Microsoft Exchange has a great built-in feature called "ActiveSync." Many mobile devices, such as the iPhone and Android devices, use ActiveSync for connecting to Enterprise servers.

ActiveSync allows for real-time wireless synchronization of email, contacts, and calendars. This clones all of the data on the parent system and the mobile device to ensure the same information is stored on both.

Additionally you can send a command to the device to wipe all of its data if the phone is lost. Most importantly you can also force the user to apply security measures such as a password.

Blackberry Technology

Another system is the Blackberry Enterprise Server, or BES. BES is an add-on server that acts as an intermediary between your email server and Blackberry Smartphones.

(Continued on Page 28)

Meet the indestructible console engine from Axia.

Unpack it, install it... forget it.

Just add console •

Meet PowerStation™, the new, **self-contained console engine** that's over-engineered to ensure years of reliable, trouble-free service. Setup couldn't be easier: PowerStation needs just one cable to connect to an Element™ mixer. With over 1,000 already installed, Element is rapidly becoming radio's most popular mixing desk.

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Built-in audio connections make setup simple.

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Simple networking •

Use PowerStation to build a stand-alone studio, or network as many as 4 studios without external switches. There are **16 built-in Ethernet ports**, including 2 Gigabit with SFP ports for networking with fibre. Axia is easily scalable — for larger networks, just add a core switch; Axia networks can handle as many as 10,000 stereo channels.

Fanless operation •

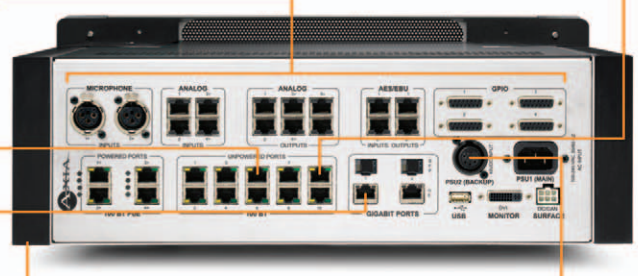
PowerStation is silent and fan-free. These large, extruded heat-sinks ensure cool operation.

Built like a tank •

This is Element. It's **built for heavy use**, with avionics-grade switches, heavy-duty optical encoders, silky-smooth, dirt-resistant conductive-plastic faders, high-impact Lexan module overlays and specially-designed switch guards that prevent accidental operation. All this is housed in a frame made from thick aluminium extrusions designed for rigidity and RF immunity. To read more, visit **AxiaAudio.com/Element/** .

Simply scalable •

Add a **PowerStation Aux** to double your Mic, Analog, AES and GPIO I/O. If that isn't enough, simply plug in Axia Audio Nodes for even more I/O.



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Do your plans demand a **backup power supply**? No problem. Along with audio I/O, PowerStation Aux adds redundant power with automatic switchover.

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Integrated phones •

Operators don't have to take their eyes off the console — Telos multi-line phone systems are **controlled right from the surface.**

More options •

Element mixers are **built to your specifications**, from 2 to 40 faders in single- or split-frame configurations. Over a dozen different module types, with standard or motorized faders, let you create a board tailored to your exact needs.

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Operations Guide

by Chris Tarr

– Continued from Page 26–

BES gives you unprecedented control over the devices connected to your email. You can lock and wipe lost devices, prevent the installation of third-party apps, and even remotely backup data.

With either Exchange Server or BES systems in place, you can then be assured that your data is safe and your network is secure. How much security you require is up to you. As always, you need to balance your goals with the needs of the end-users. Lock the devices down too much, and they become difficult and frustrating to use, due to all of the restrictions.

Device Security

A good rule of thumb is to at least require the device to auto-lock and use a password.

What this does is force the phone's screen to automatically lock after a certain amount of inactivity. The phone then can't be accessed without entering a password.

This will prevent the phone from being accessed if it's lost or stolen. It will also insure that the data on the phone is safe until it's erased. Any security above and beyond this will be determined by your company needs.

Lock Possible Back Doors

There is no question that these devices can do amazing things, with all of the "apps" and services available.

In fact, many devices, such as iPhones and Androids have VPN clients built in so that your mobile workforce can connect directly to your network and access resources. The Blackberrys, when using BES are always connected to your network.

All of which is an even better reason to make sure that you have even basic security turned on. While these devices are convenient, they're also a back door into your network.

Device Support

You really can't be expected to know and support every platform out there. Make a decision, which devices you want to support, and advise station personnel that those are the only devices you will support.

This puts the ball in their court when it comes to the decision to be compliant. Then too, you might decide that you don't want the potential headache of supporting any mobile devices.

Personally, I support three platforms: Blackberry, Android, and iPhone. I support the Blackberry since we have a BES server (and IT support staff to run it) and the Android and iPhone because we use Exchange and have ActiveSync.

I know those systems very well, and can solve many of the problems that come up with them. Plus, those devices support the security policies that we have in place, so we're assured that if someone is using one of these devices, our data is secure.

Who Should Connect?

Some companies may just simply open up their system for every employee, while others may choose to allow access to only key employees.

Remember, all of this connectivity obviously increases your bandwidth usage, and in the case of Blackberry, there is a per-device licensing fee. Then there is the "soft-cost" of support, like the man-hours it takes to maintain server up-time and connectivity. These devices are connected 24/7 and your users will come to expect significant uptime and time spent helping employees get set up on the network.

Smartphones are now a way of life. Employees are going to want to start being more connected. Planning ahead will allow them to gain that connectivity while keeping your data and network safe.

A written policy will be a big help and you want to have it in place before you get flooded with requests to connect!

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

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

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We just made it less expensive.

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Nx12

Need to control more phone lines? Check out Nx6's big brother, Nx12. Handles twice the number of phone lines, and can serve two independent studios simultaneously. An Nx12 package with a Desktop Director and Assistant Producer software is only $4,995 MSRP.

ONE-x-Six

A tight budget doesn't mean you should have to compromise. Get a ONE-x-Six package with switching for up to 6 POTS lines, a built-in Telos ONE hybrid for clear, clean calls, a Telos Switch Console, plus Assistant Producer software for only $2,995 MSRP.

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Chief Engineer

The Story of Two Rebuilds – *Part 2*

by Scott Schmeling

Recap of Past Column

In the last edition, I related the story of a dual studio build project from 15 years ago.

In 1994 we installed a centralized computer system complete with the beginnings of a standardized cabling system, and we re-designed and re-built the KTOE studio. Over the years, we added one station, then another; both new stations had live morning shows and were satellite fed the rest of the day.

We converted a sales office into a new studio for one of the stations and used one of the production studios for the other. After the morning shows, those rooms were both available for production.

The audio computers for the new stations were mounted near the other two computers, maintaining the centralized distribution. We ran this way for a number of years.

Overnight Growth Equals New Build

But 2008 would bring big changes. That's when, literally overnight, our building would grow from four to seven stations! More offices would be converted to studios and more space would be needed for the additional computer systems. In fact, everything would have to be enlarged or expanded. Planning, standardization, and documentation would now be more important than ever.

Documentation Side Note

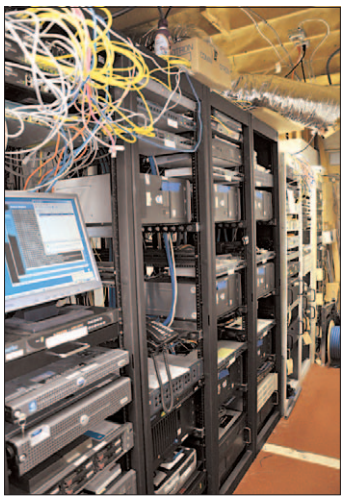
On the subject of documentation, I love Microsoft Excel! In my mind, it's the perfect tool for studio and wiring documentation. Actually, I'm sure any spreadsheet program would work as well, but I like Excel because I can vary column widths and get the sheet to look exactly the way I want it to. I have blank sheets for cable pair, punch blocks, console and automation inputs and outputs, just about every wiring job has an Excel spreadsheet.

The Plan

OK – back to the expansion project. Starting in the middle of the building, two sales offices would become studios. Across the hall in my rack room, the double rack with the audio computers and switchers would be expanded. In addition to the computers, the satellite receivers would also be moving in. Two racks would be growing to six. One major problem was that the room wasn't big enough.

The plan called for knocking out a wall which would more than double the size of the room. That also meant we needed to move an existing studio to a new location – more work, just what we needed.

My double rack would grow into a full-fledged TOC (Technical Operations Center).



Scott's Tech Ops Center

The TOC

The TOC would include all of the on-air computers and audio switchers, the servers and "support computers" as well as our satellite receivers and "off-air monitors."

On one wall, I planned punch blocks for cables to all the studios and punch blocks for cables to the computers and satellite receivers.

I also planned to use punch blocks for the audio cables feeding the STLs located at the end of the building.

Not a Solo Project

Given the time frame for, and magnitude of, this project, I brought in an assistant. Marv Olson, who was a contract engineer on a number of projects.

We're the same age (within a few months – I won't say who's older) and we work in such a similar fashion that it's often hard to tell which one of us worked on a specific area.

You could say we both work with the same degree of anality.

I brought Marv in, once plans were in place, equipment was ordered and the building construction commenced.

(Continued on Page 32)

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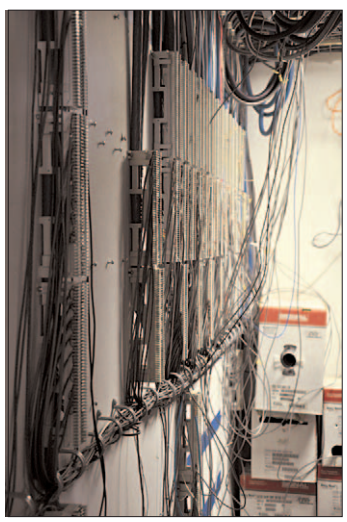
by Scott Schmeling

– Continued from Page 30 –



The Punch Block Wall

Forward Thinking Wiring Needs

Now the fun began! My "standard" studio wiring called for two runs of 20-pair shielded cable for audio, one run of 25-pair un-shielded for control functions, and five runs of Cat5. The 20 and 25 pair cables were terminated in S66 punch blocks.

All console inputs and outputs were also wired to S66's. In fact not every console had all input modules installed, but I still wired them to punch blocks.

This way, if we add or move a module – or make any kind of change – the wiring is already in place.

It is just common sense to pull all the cables at the same time when you're installing the console, rather than just doing what you need now and then pulling more cable later, to accommodate changes that need to be made.

A bit of forward thinking will certainly pay off by making life a lot easier down the road and it will make a fast hook up, done in an emergency, a cinch.

Things Went Smoothly

The three studios, the two new and one we moved to make room for the TOC, were pretty straightforward and went smoothly.

The TOC itself was a bit more of a challenge. Partly because the stations being added already had their own computer audio systems.

We had planned to run with two different audio systems and two different traffic systems for a while – we would literally pick up their computer system's racks and move them to our building – intact.

Wiring at the current location had to be documented and marked in advance, so when moving day came we could disconnect only what was necessary and the move could happen as quickly as possible.

Using Moving Professionals

To make things run as quickly and smoothly as possible, we hired a local moving company to move the big stuff – namely the computer racks.

It was decided early in the planning process that a professional mover would have the skills, the experience, and the proper tools to do the job right.

What was spent for their services more than paid for itself in both time saved, and the move completed with no casualties! And Marv and I didn't have to kill ourselves moving the equipment.

I've often seen engineers who turn into movers to save a few dollars. The risk of personal injury is just too great, not to mention the time taken away from the engineering part of a build.

It just isn't worth doing it yourself. Remember, if you get hurt your project is dead in its tracks, not to mention the hours you will spend recovering from a potentially serious injury to your back or a broken bone.

One of the New Studios

Plan and Then Hold Your Breath

Although we had been preparing and building for months in advance, nearly living at the station as we wired studios and ran cables between them and the TOC, up to that point the actual moving process was still theoretical. We were pretty confident things would go as planned, but until Marv and I had actually started disconnecting and moving things we really didn't know.

A Sigh of Relief

All that advanced planning paid off in spades. Moving day could not have gone any smoother. At the prescribed time, we started disconnecting and moving and re-connecting.

As with all moves, things were happening too fast to document in detail, but suffice it to say, I could not have been happier with the way the move went.

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

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Field Guide — FM Receivers

Fanfare Adds DTMF Remote Control

by Gary Peterson

Our local radio cluster operates four fill-in translators. One is in a location which could be either difficult or impossible to reach during a spring blizzard.

The Rules

Part 74 of the FCC Regulations make it quite clear that there must be a means to turn "on or off the transmitting apparatus at will," and that the on and off point be "readily accessible at all hours in all seasons." The Rules also specify that the transmitter mute the RF upon loss of signal, and that it be secure.

It is, obviously, impractical to have an operator present at a translator site whenever it is in operation. Unattended operation places some requirements on the licensee. Our Fanfare FM translator receivers will output 12 Volts DC, from a rear BNC connector, upon loss of signal, which will mute the transmitter's RF output.

Home Brewed Remote On/Off

I had cobbled a pair of DTMF tone decoders and a latching relay to make a functioning remote on-and-off switch. This configuration allowed me to send a shortly spaced pair of DTMF tones over the air, which would remove or apply AC power to the translator's transmitter.

Because the tones originated from the parent station's main studio, the security condition of Part 74 of the FCC Rules were met. The on and off control were protected from being tampered with by unauthorized personnel and the transmitter apparatus was also secure.

Receiver Option Suggested

I felt that this feature would be a useful option for the Fanfare Broadcast Reference Receiver, which seems to be so commonly found at FM translator installations. Marv Southcott, at Fanfare, seemed very interested in my suggestion. He set the wheels in motion to produce a prototype receiver with the DTMF feature.

The DTMF Decoder Features

What resulted was a receiver that would decode two, sequential DTMF tones. One two-tone pair would effectively place the receiver on standby and provide 12 Volts DC to the rear panel BNC connector. This feature functions similarly to the carrier sense option already built into Their FT1AP receiver.

Another tone pair would re-activate the receiver and remove the voltage. This would enable muting or unmuting translator transmitters, via a tone pair sent out over the parent station's program channel.

I gladly agreed to beta test the Fanfare prototype.

Getting Ready for Beta Testing

Prior to the arrival of the prototype, I recorded and edited the two appropriate DTMF tone pairs and dubbed them into our hard disk audio storage system.

These were available on "hot keys," on the touch screen of our Scott Studios control room SS-32 – XLATOR ON for the tones to turn on the receiver, and XLATOR OFF to shut it down when needed.

Minor Tweaks Were Needed

When the prototype arrived, testing began.

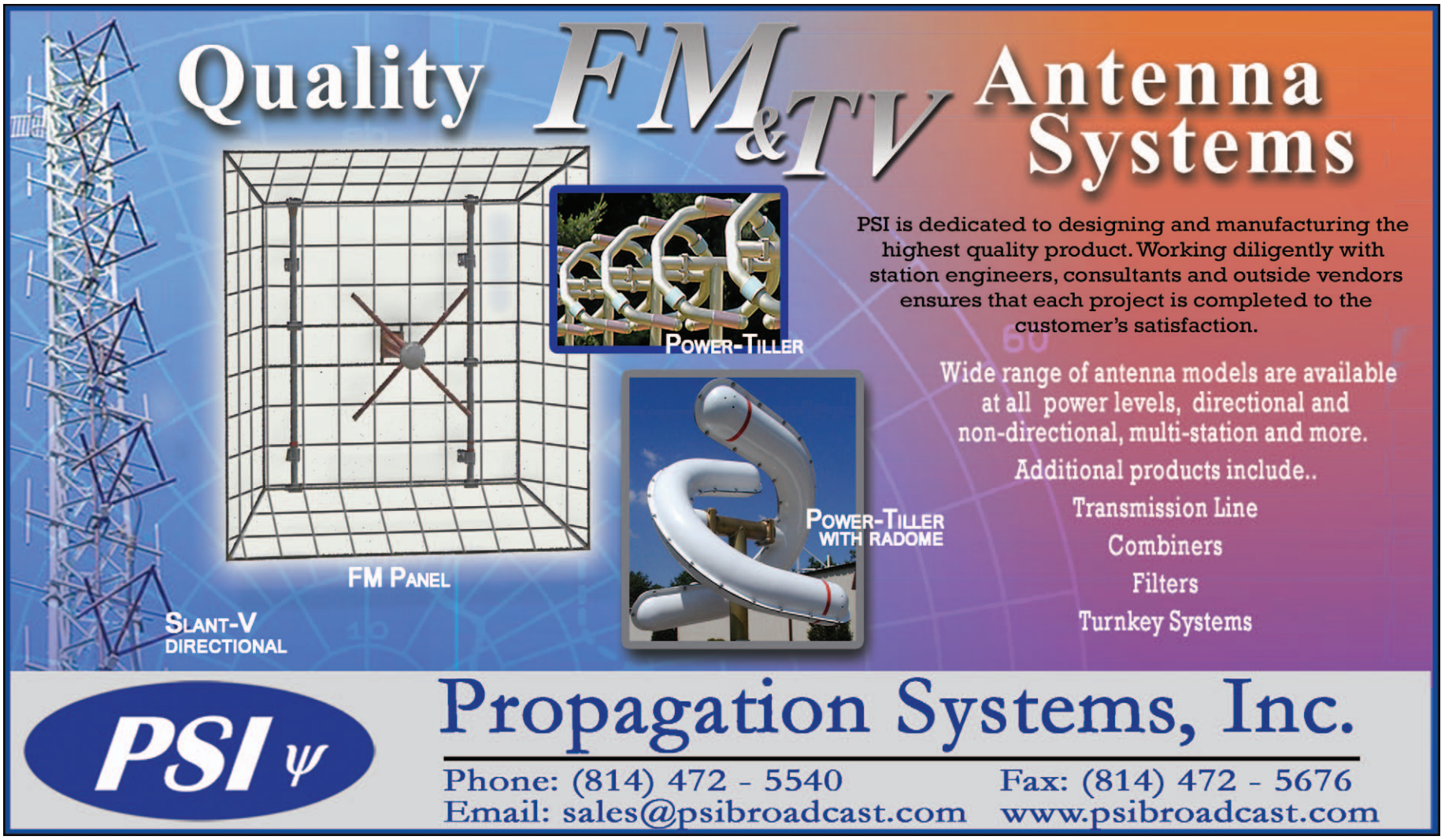
After some minor software (timing) adjustments, the decoders in the receiver performed flawlessly, whether the tones came from the Scott hot keys or the keypad on the control room telephone. No false decoding was observed from heavily processed program audio. The BNC "carrier sense output" connector will produce 12 Volts DC for muting, if either the "XLATOR OFF" tone is sent in program audio or if the receiver loses signal from the radio station. No additional wiring was necessary.

The Fanfare FT1AP receiver

A Fanfare receiver with the remote control option is a very simple and reliable FCC compliance feature. Though the possibility is remote, it could keep me from having to snowshoe up a mountain trail to shut down a malfunctioning translator. The option I'm told will retail for around $395.

Gary Peterson is the Chief Engineer of New Rushmore Radio, Inc., a division of Schurz Communications, Inc. He can be reached via email at engineer@newrushmoreradio.com

For more information about the Fanfare Receiver with the remote control option contact Marv Southcott at 800-268-8637 or email orders@fanfarefm.com



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Field Guide — RF Test Load

Altronic Research Inc. 6710 Air Cooled RF Load

by Warren Shultz

Citadel-owned WLS-FM calls itself "Chicago's True Oldies." The station has been on the air since the 1950's and has become the radio home for such Hall of Fame on-air talent as John Landecker, Scott Shannon and Dick Biondi.

The station's main transmitter/tower site is on the Windy City's tallest building – the Wills/Sears tower which can create its own set of unique challenges.

Need for a Load

I had an immediate need for a 10 kW FM test load for an auxiliary FM transmitter site about 18 miles southwest of the main antenna site.

The first image that comes to mind, when you think of a test load, might be an electric furnace with a unique purpose. I contacted Altronic for their test load model 6710E. It's an interesting-looking unit. In fact it has what appears a squirrel cage blower you might find in a home furnace.

The Load Arrives

The 6710 arrived well packed for severe handling. When I unpacked it, the first thing I did was to record the DC load resistance for future reference and verification. To the limits of my DMM it was exactly 50 Ohms. I recorded the date and marked it on top of the unit as a point of reference.

The test load unit has leveling legs to balance and square it off and a top, EIA 3-inch flange feed – this all worked well for the installation.

Installation

We connected the interlock and noted it was enabled with the blower off. We found that the 6710 blower would turn itself on with heat rise, upon application of RF. So, if you forgot to turn the blower on, it would do so as the heat continued to rise.

Therefore, the interlock was good, as long as AC power was on, even if you didn't manually turn on the blower.

I have not yet tried this feature, but I am sure that someday, being the absent-minded type, I will see this feature work.

The Altronic 6710 Load

Ready to it Up

Then the question is: when the transmitter is on, do you turn the fan on by hand or let it come on by itself? That's one option I'll need to test.

I have run the 6710, 10 kW test load up to more than 10 kW for short bursts, as I fiddled with a recycled 20 kW transmitter. The transmitter was being setup for a 9 kW TPO application, however its control circuit design would not allow the transmitter to work at less than 10 kW.

It took some time to figure things out and change a part value. Once that was done, the power control was put into a solid-state feedback loop to regulate power. It took a while to figure it all out, while I researched it, but I got the transmitter power control to work.

Back to the Load

Remote operation of the load is critical, as testing an auxiliary site on the antenna creates interference to the main site. This would especially be noticable since the main site is running HD Radio with a delay and the auxillary site doesn't have a delay.

I'm very happy that the Altronic has the automatic fan-on control when the load reaches temperature. I'll know that the load will protect itself from excessive heat even if the blower isn't turned to the "on" position.

This will serve as a failsafe should someone fail to activate the blower via remote control.

Good Stability and Great Features

The RF stability of the load under power and the lpw VSWR along with the other of the Altronic 6710 Air Cooled RF Test Load met my immediate test needs at an important time and helped me get the job done.

Warren Shulz is the Chief Engineer of Citadel Communications Chicago Stations.

For more information on the Altronic 6710 Air Cooled RF Load visit www.altronic.com or call 870-449-4093.

"the performance of the 6017 is simply stunning"
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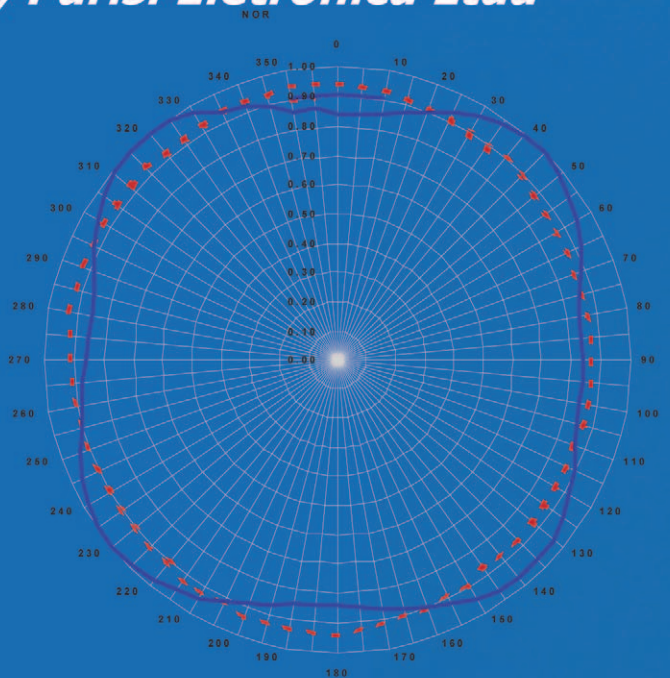

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Practical Engineering

Using a Small Computer to Save Major Resources

by Mike Callaghan

What was that old saying? You can never be too thin or have too much rack space!

Well, maybe you can be too thin, but too much rack space? Not likely.

Rack Space is Always a Premium

As facilities grow and evolve, we seem to add twice as much gear as we ever take out. One addition that takes up a lot of space are computers and the peripherals they need

Think of a full-size rack-mounted PC, with a monitor, keyboard and mouse. You've probably filled at least 1/3 of an equipment rack.

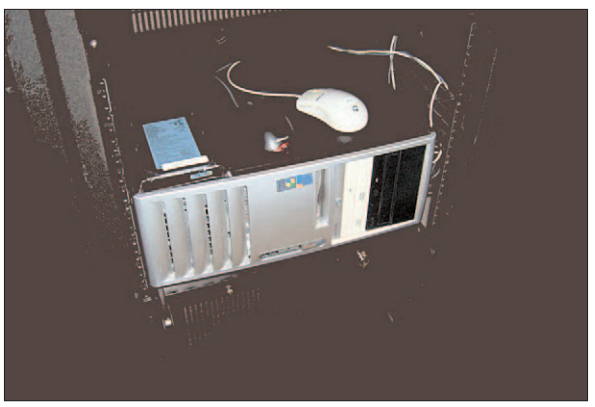
The computer probably has at least a 400 Watt power supply, a full size motherboard, and a CD drive. Add up the parts and it probably ends up costing a few hundred dollars.

Why It's There

It sits there getting hot, with at least two fans spinning to keep it cool. And for what?

Transferring data between a remote control system and the Local Area Network? Logging information from an EAS system? Changing an antenna pattern twice a day? What's wrong with this picture?

Using a full sized computer for this is a waste of money, power, heat, and space. In these days of improved technology, there are more space and energy efficient systems that can be used.



The Rack Space Waste – a Full Size PC

Enter the Netbook

A much more compact way of getting these jobs done is to use a small netbook system in a pull-out drawer. This configuration offers a number of advantages:

- **The space needed is tiny:** just a single rack space for a fully functioning computer.
- **No peripherals are needed:** no monitor, keyboard, or mouse – they are built in.
- **It's fully loaded:** small as it is, the netbook has full networking, audio, and USB I/O's.
- **WiFi ready:** if you need wireless networking, it's already built in.

Even More Advantages

- **Power consumption is minuscule:** there are no fans spinning away 24/7.
- **Built in power back-up:** the power supply charges the battery, and the battery will continue running the computer during a power outage. Batteries are available for under $50 that will keep the system operating for over six hours.
- **No moving parts:** the netbooks will easily accept a solid state drive. This creates a computer system with absolutely *no* moving parts. It's difficult to imagine something more reliable.

Netbook with Rack Drawer Closed

Tucked Away Until Needed

When it's not being accessed, it takes up a single rack space. When it does get used, it's easy to pull out the drawer, lift open the display, and type in whatever's needed. A touch-pad surface fills in for a mouse, and when the work's done, the display folds down and the drawer slides in again. It's hard to imagine making better use of such a small space.

(Continued on Page 40)

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MR-PRO

The MR-PRO is a versatile reference grade analog audio source generating both standard and user-stored signals at extremely low distortion. It also includes some remarkable additional features including readout of the impedance and phantom voltage of connected devices, as well as a cable test/signal balance function.

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- User stored signals and signals for polarity and delay testing
- +18 dBu output at -96 dB distortion

MR-PRO XL2 (with M4260 microphone)

XL2

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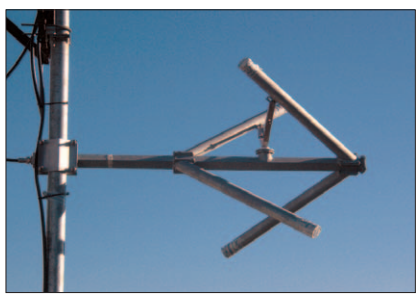

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Practical Engineering

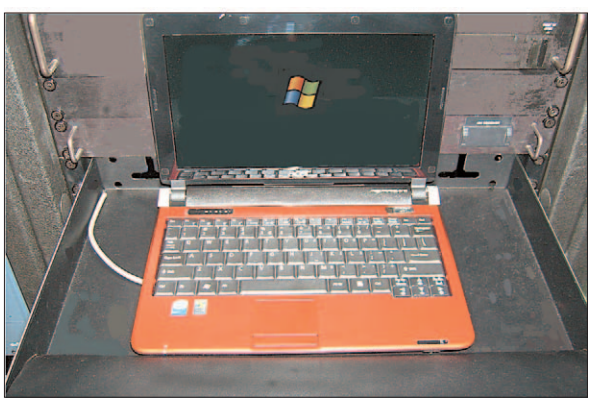
by Mike Callaghan

Using a Small Computer

– Continued from Page 38 –

Different Strokes for Different Folks

These small netbooks come in a variety of sizes and Operating Systems.



Drawer Open, Netbook Ready for Input

One of the most common is with 1 GB of RAM, either a 120 or 160 GB hard drive, loaded with Windows XP Home or the starter version of Windows 7. They come with three USB ports for driving printers and a Ethernet port for networking.

Audio if Needed

Stereo ins and outs are on the side if you want to use the machine for program logging or listening to the logs. Sound quality is excellent even with the built-in audio card. If more storage is required, there's no limit to the number of external drives that can connect to the USB ports.

This is close to ideal for a monitoring use. Power used is but a fraction of the larger system.

A Smart Option

One enhancement to consider is taking out the mechanical hard drive, and swapping in a solid-state drive.

To run Windows, you'll need at least an 8 GB SSD. These are very economical – a 32 GB SSD can easily be had for about $100. Cards are available up to 64 GB if you need that much memory, but the price is more than double the street price of the 32 GB cards, in most cases.

The beauty of this is that once the SSD is loaded in, formatted, and has Windows installed, the system has *no moving parts*. No fans, no spinning hard drives, virtually no heat, and extremely low power consumption.

Mechanical Rack Configuration

The power supply can be secured in the rack behind the sliding drawer. If you need a USB hub or network switch, it can go there as well.

If you can, leave a blank space above the rack drawer so the cables going in and out don't get pinched on the bottom of another piece of gear. If you can't free the space, you may have to notch the rear of the drawer to clear the cabling.

Suggested Computer Operational Configuration

Set the power options to turn off the screen when the lid's closed, but leave everything else running all the time.

No sleep mode, no power down and no screen saver – there isn't the need for one.

The unit is WiFi ready, as mentioned earlier. This can be both good and bad.

If you plan on using the computer to connect to your network via WiFi you are ready to go. If you aren't connecting that way, shut it off – both to conserve power and for system security.

Adding Software

Loading programs into the netbook is simple. Almost any current USB drive stores more than a CD, so all that's needed is to copy the CD to a flash drive, put the drive into the netbook, and let the program install.

If you want to run a program that requires an old-fashioned serial port, there are a number of serial to USB adaptors available.

These are configured through a Windows application to set the baud rate, handshaking, and hardware parameters. Following that, the serial device plugs into the adapter and the adapter goes into one of the netbook's three USB ports.

If you need multiple serial ports, adapters are available that provide them through a single USB cable.

Good to Go

Once the program's set up and running, you can close the display, slide the drawer closed, and not worry about it for a very long time.

It's hard to imagine a task these small computers can't handle. From controlling an AM pattern switcher to sending an email – even when the power fails.

They can take the place of a system many times their tiny size.

Mike Callaghan is the Chief Engineer at KIIS FM, in Los Angeles,CA.

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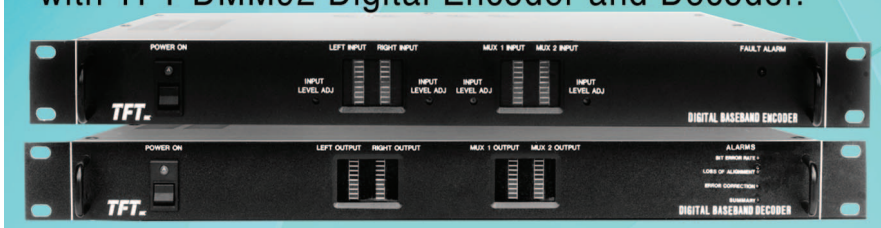

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Small Market News

Localism 101: What the FCC Could Learn From Small Market Stations

by Judith Gross

It had to put a smile on the faces of many small market station managers when the FCC decided to tackle the concept of how stations could be more local, several months back. Do they really need a federal agency to tell them how to do what they've been doing all along merely to survive?

If localism was a good idea in a thriving economy, it became a necessity for small radio markets when the recession hit full force and stations saw their sales figures plummet.

So to help out the Commission, here's a roundup of some of the best ideas small stations use to promote localism – and a caveat to avoid some of their mistakes.

First, the "Do's"

• **News, Sports, Weather:** It sounds obvious, but as many stations cut back, they've turned to syndicated or national services for their news and information. This is ignoring one of their strongest assets.

The big corporate-owned stations save their expenses by making all their stations sound the same. Small stations, especially those independently-owned, would do well to cover the local school teams, interview the town council and tell listeners to take an umbrella that day.

• **Local Business Features:** A weekly profile of a business, with a brief on-site appearance by the on-air talent, can not only help fill the advertising coffers but cement future business and loyalty in times of economic struggle.

• **Promotions:** Many stations have adopted the "buy local" philosophy and have used it on-air to co-promote other independent businesses. But exciting station events, especially those tied to local charities, are something that stations in small markets can do really well – and they can be tied to advertising packages.

• **Use Local Talent:** Do you have a local music buff who has a following, and would be passionate about doing a specialty show, maybe on weekends? Use that person for a two-hour show – whether or not they sound "polished."

• **Bring Back Personality Radio:** This is one thing I've heard over and over from listeners. The "Jack" format failed because people couldn't connect. Make your jocks into celebrities and encourage their uniqueness in many public appearances – not just car dealer remotes.

• **Just Show Up:** Be visible in your community, at Chamber meetings and big events. And not just to fill your sales lead sheets. This includes local charity fundraisers. The good will gained will pay you back over and over again in listeners, loyalty and the bottom line.

• **Guide to Attractions:** Start a "Proud of Our Area" campaign and don't neglect the local arts organizations.

Now for the "Don'ts"

• **Not Everything Has to be Sponsored:** If you insist on turning everything you do into a revenue stream, there's a lot that you won't do. Giving, pays off in the long run.

• **Consider the Boredom Factor:** Yes, make use of local talent gems that are in your market. But don't let the guy from that stuffy organization drone on and on with jokes only he thinks are funny.

• **Cooperation Beats Bullying:** Don't do what one small market station owner I know did. He tried to "bully" the local business association into endorsing only his station and stormed angrily out of the room when they wouldn't agree.

• **Maintain High Quality:** One of the biggest things branding small market stations as amateurs is the poor production values. Hire talented professionals and pay them a little more if you need to –keep your on-air standards high.

• **Don't Go Too Small:** You can't do every lost cat or friends and family fundraiser.

• **Encourage Feedback-But Don't Give It Too Much Weight:** Use your website and social sites like Facebook and Twitter to hear from listeners. But don't direct them to go on-line instead of listening to your station.

• **Don't Fret the Ratings:** Many small market stations don't subscribe to ratings services and those who do often get caught up in worrying too much about them.

National ratings services are notorious for extremely tiny samples in small markets. If you're truly serving your market, you know how well your station is doing.

All these suggestions come down to simply paying attention and focusing on the area you are licensed to serve. What small market stations do every single day.- Maybe someone should alert the FCC.

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

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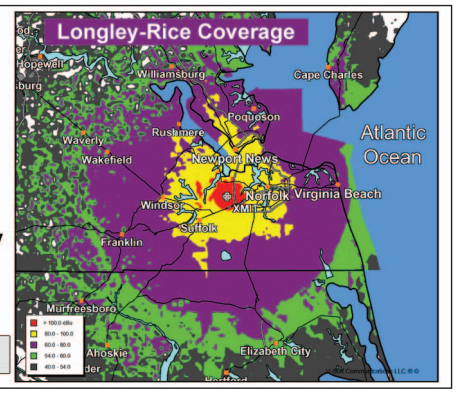

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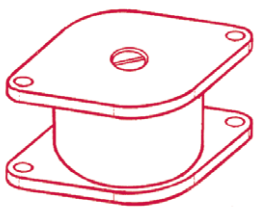

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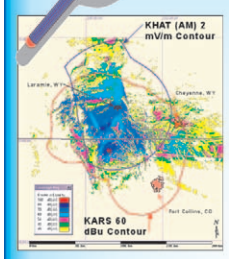

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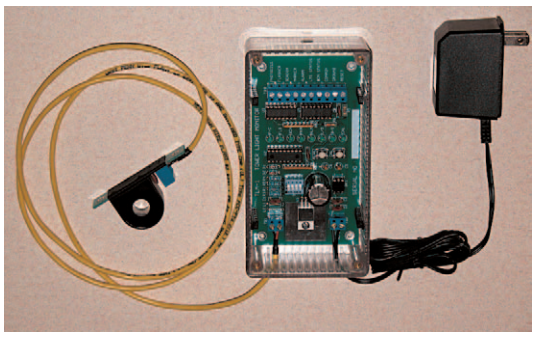

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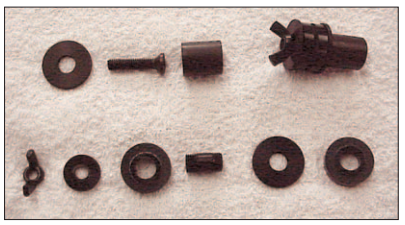

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The repair side of the business includes rebuilding of a ground system after a study to determine if it makes economic sense for the station. The company also installs lightning grounding, does tower tuning and offers turnkey site solutions.

Owner Kevin Kidd notes that the technology is one that "dates back to about 1928." He says a lot of the knowledge about AM ground systems lapsed among engineering firms in the 1970s and 80s because so few AM stations were built then. That uniquely positions AM Ground Systems as one of the few companies with the necessary expertise to tackle ground system complexities.

More recently, says Kidd, work on ground systems is necessitated by AM stations moving locations, sometimes because populations centers have shifted; sometimes because the land they are on has become more valuable and been sold for profit.

Kidd adds that rebuilding a deteriorating ground system can boost ERP, uncover hidden problems with the signal and improve coverage for a station. And though AM ground system technology is old, Kidd says AMGS uses today's technology to do the work, including state-of-the-art test equipment, computer-aided design and modeling, and even computer-driven plows.

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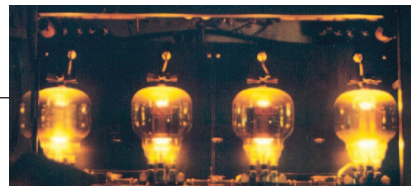

RADIO ROUNDUP

The Radio Guide Event Register

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

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

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

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

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

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

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

Radio Guide Advertiser Info – July/August 2010

Advertiser - Page	Website
Altronic - 20	www.altronic.com
AM Ground Systems - 42	www.amgroundsystems.com
Armstrong Transmitters - 40	www.armstrongtx.com
Arrakis - 21	www.arrakis-systems.com
Axia - 27	www.axiaaudio.com
Bay Country - 41	www.baycountry.com
BEXT - 41	www.bext.com
Broadcast Connection - 32	www.broadcastconnection.com
Broadcast Devices - 13	www.broadcast-devices.com
Broadcast Software Intl. - 8	www.bsiusa.com
Broadcast Tools - 37	www.broadcasttools.com
CircuitWerkes - 25	www.circuitwerkes.com
Commercial Radio - 39	www.commercialradiocompany.us
Comrex - 5	www.comrex.com
Davicom - 39	www.davicom.com
DM Engineering - 47	www.dmengineering.com
Econco Tubes - 40	www.econco.com
Fanfare - 41	www.fanfare.com
Gorman Redlich - 42	www.gorman-redlich.com
Harbach (Peter Dahl) - 47	www.pwdahl.com
Henry Engineering - 2	www.henryeng.com
Inovonics - 1, 24	www.inovon.com
Intrinsicnet (MySine) - 36	www.plussine.com
Jampro - 22	www.jampro.com
JK Audio - 11	www.jkaudio.com
Kintronic Labs - 7	www.kintronic.com
LBA Technology - 30	www.lbagroup.com
Lightner Electronics - 35	www.lightnerelectronics.com
Michael Patton - 47	www.michaelpatton.com
Micro Communications - 39	www.mcibroadcast.com
Moseley - 19	www.moseleysb.com
Myat - 18	www.myat.com
NAB Radio Show - 43	www.nabradioshow.com
Nautel - 9	www.nautel.com
NTI - 38	www.ntiam.com
OMB America - 15	www.omb.com
Omnia - 33	www.omniaaudio.com
ProAudio.com - 35	www.proaudio.com
Progressive Concepts - 26	www.progressive-concepts.com
PSI (Propagation Systems) - 34	www.psibroadcast.com
RAM Systems - 28	www.ramsyscom.com
RF Specialties - 23	www.rfspecialties.com
SAS - 17	www.sasaudio.com
SCMS - 31	www.scmsinc.com
Shively - 37	www.shively.com
Systems Store - 47	www.systemsstore.com
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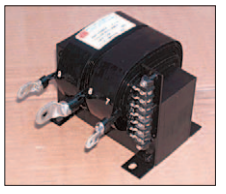

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Entravision currently has Wheatstone TDM systems in 5 of their markets –including Los Angeles where 27 surfaces provide programming for their eight Los Angeles area transmitter sites and seven satellite uplink networks.

Rick Hunt, Vice President and Director of Radio Engineering at Entravision Communications Corporation knows that taking chances with unproven or ad-hoc technology simply isn't feasible – that the ultimate cost of using less than the best can be detrimental not only to day-to-day operations but to their overall success.

"Entravision prides itself on delivering the highest quality content and programming to our loyal base of radio and television audiences, and we rely on the Wheatstone system as an important piece of our broadcast equipment. The system is versatile, easy to manage and one of the most advanced pieces of technology on the market. It also delivers an unmatched level of consistancy, ensuring that our systems operate the same way regardless of size or location."

You do your best to create and maintain a successful business. Wheatstone designs and builds its networking systems, whether TDM or IP based, right here in the USA. Wheatstone knows that your programming, network and content are mission-critical, and that failure is not an option. Don't leave it to chance - choosing Wheatstone can only ensure your efforts are rewarded...continuously.

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Rick Hunt, Vice President and Director of Radio Engineering at Entravision Communications Corporation, with one of their Wheatstone G5 consoles.

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