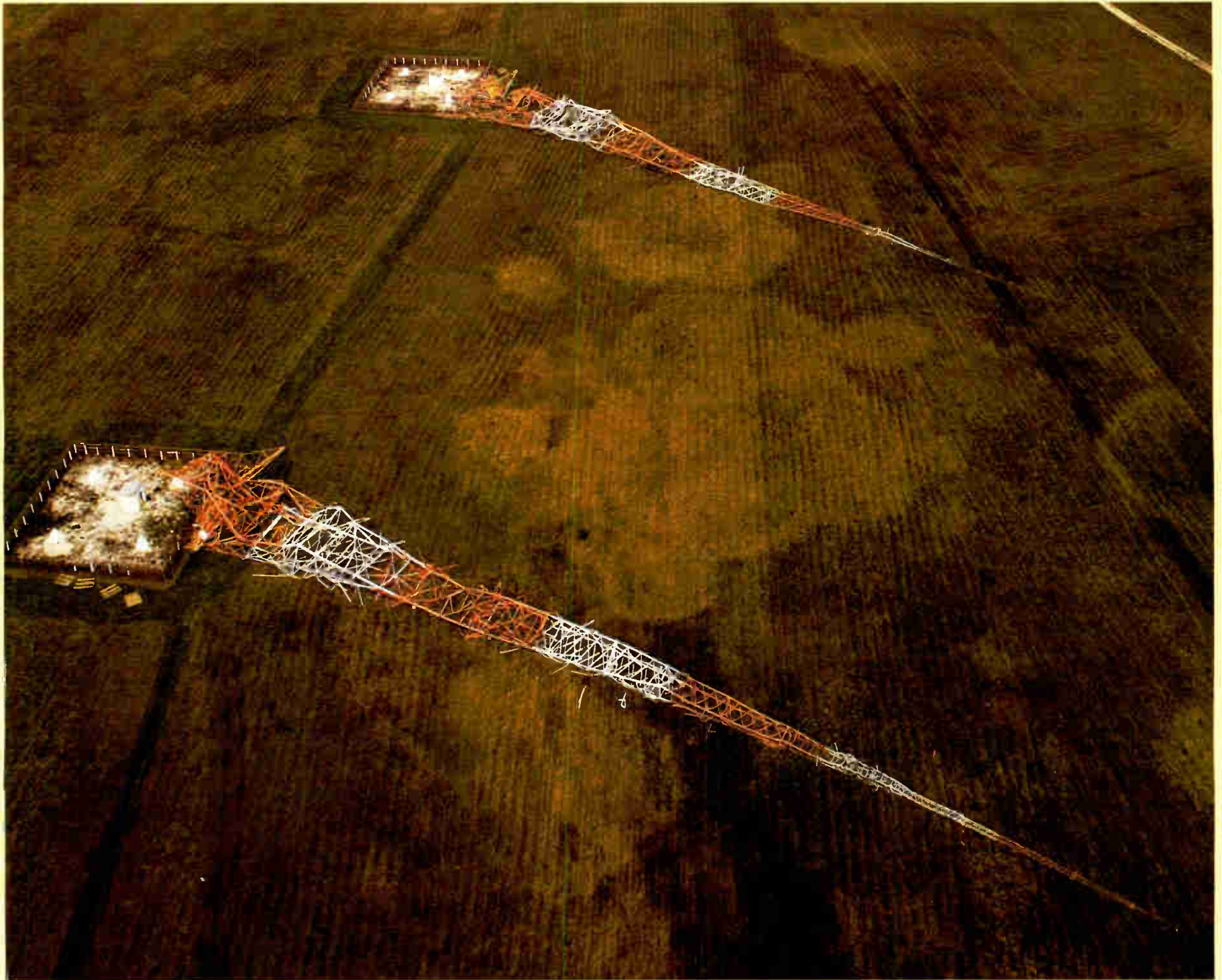


# Radio Guide

Radio Technology for Engineers and Managers

September 2006

## When Disasters Challenge – *Radio Delivers*



### Inside Radio Guide

When Disasters Challenge  
Radio Delivers  
Page 4

Just a couple miles northeast of downtown St. Louis, the tower site of KTRS was hit hard. The four-tower array was built on the Mississippi River flood plain in Illinois half a century ago. Two of the station's four Blaw-Knox towers were felled that July evening. A National Weather Service spotter in nearby Bunker Hill, IL, recorded a gust of 92 miles per hour.

Now, KTRS station ownership must cope with an extensive rebuilding process, made more costly and complicated by the possibility that all four towers are covered with lead-based paint.



**ANTENNAS**  
50 YEARS EXPERIENCE **JAMPRO**

- HD Dual Input
- Interleaved
- Space Combined
- HD Injectors
- Circulators
- Mask Filters

**JAMPRO ANTENNAS/RF SYSTEMS, INC.**  
[www.jampro.com](http://www.jampro.com) 1-866-4JAMPRO

# Don't Get Zapped!



**PowerClamp** surge suppressors clamp lightning-induced powerline transients to within a few volts of normal AC voltage!

**PowerClamp** will pay for itself by reducing expensive damage to transmitter site equipment caused by powerline spikes and surges.

Protect your transmitter and **Stay On The Air with PowerClamp!**



DISTRIBUTED BY  
**Broadcasters  
General Store**

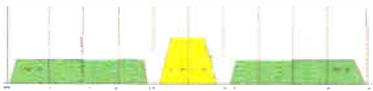
[www.bgs.cc](http://www.bgs.cc)

**1-352-622-7700**

## ENERGY-ONIX CONTINUES TO SELL AT LEAST ONE AM AND ONE FM TRANSMITTER EVERY DAY!

### DRE

You can generate multiple digital stereo on your Existing FM Transmitter



#### System consists of:

- (1) Encoder @ \$9,000.
  - Receiver @ \$150. ea.
- No changes required in your present analog transmitter.

#### Sample Applications:

- Stereo Digital Channel For 2nd language
- Digital Channel for Books for the Blind
- Dedicated Channel for Supermarkets
- STL for multiple station owners
- Normal Radio programs within the 1 mv contour for both analog and digital

### Roadcaster

*Remote Pick up*



- Portable Solid State 40 watt VHF/UHF Transmitter and receiver
- 16 RF Channels Selectable
- 4 Channel Audio Mixer
- Can work from 115v/220v AC and 12 volts DC

#### Selling Prices:

Transmitter - \$ 1,995  
Receiver - \$ 1,495

### Internet STL

*Tele-Link-2*



Stereo Quality STL Link permits duplex operation on the Internet or any other Ethernet connection.

Can be expanded to encode (3) stereo programs. Each terminal contains a LINUX based encoder and decoder with automatic adjustment to match useable bandwidth.

Cost per Stereo terminal including hardware and software **\$3,000.**

### Documentor 2

*(Audio Logger)*



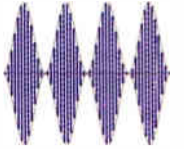
**365 day Audio Logger** capable of driving 10 monitor terminals and selecting pre-recorded programs by minute, hour, day and month.

Can be configured with many Documentors to record and monitor multiple programs.

**\$1,295.**



**Your Source for AM & FM Transmitters**  
Phone: 888.324.6649 / 518.758.1690 Fax: 518-758-1476  
E-Mail: [info@energy-onix.com](mailto:info@energy-onix.com) [www.energy-onix.com](http://www.energy-onix.com)



**When Disasters Challenge Radio Delivers** ..... 4  
*HD Becomes a Hot Deal*

**Digital Guide** ..... 6  
*HD Becomes a Hot Deal*

**Safety Guide** ..... 8  
*Ways to Promote Work Sites That are Safe and Secure*

**Studio Guide** ..... 12  
*Of Mics and Men*

**Operations Guide** ..... 14  
*You Can't Fix It if You Don't Know It's Broken*

**Monitoring Guide** ..... 18  
*Measuring AM Modulation*

**Maintenance Guide** ..... 20  
*Monitoring Generator Temperatures*

**Tech Tip** ..... 22  
*A Simple Way to Time Power Outages*

**The Worst I've Ever Seen** ..... 22  
*Why You Need to Know Who Accesses Your Tower*

**Transmitter Shack** ..... 24  
*Using a Ground Tester to Evaluate the System Ground*

**Tech Support Forum** ..... 26  
*Tech Support Follies: Listening in on Customer Support Calls*

**FCC Focus** ..... 30  
*A Useful Filing System for Stations*

**IT Guide** ..... 32  
*Developing Good Passwords*

**Field Guide** ..... 34  
*Comrex ACCESS Saves Money*

**Radio History** ..... 36  
*John R. Brinkley: Radio's Most Famous Fake*

**Service Guide** ..... 44  
*Radio Equipment, Products, and Services*

**Final Stage** ..... 46  
*Radio Roundup Event Calendar, Advertiser Information*

**Cover Photo**

(and also top left on page 4)

KTRS loses two towers to strong storms in late July 2006. Photo By David Carson/St. Louis-Post Dispatch. Reprinted with permission of the St. Louis Post-Dispatch, copyright 2006.

## Radio Guide

Volume 14 – Issue 9

PO Box 20975, Sedona, AZ 86341  
Phone: 928-284-3700 Fax: 866-728-5764  
www.radio-guide.com

**Ray Topp** (Publisher)

Email: radio@rconnect.com

**Barry Mishkind** (Editor)

Email: editor@radio-guide.com

Radio Guide, ISSN 1061-7027, is published monthly, 12 times a year, by Media Magazines Inc., PO Box 20975, Sedona, AZ 86341. Radio Guide is copyright 2006, Media Magazines Inc., and may not be copied, reproduced, or stored in any format, without the written permission of the publisher.

**THINKING AHEAD**

Time always seems to be an enemy. There is not enough time to accomplish all we need to get done each day. Engineers often relate frustration that their whole job seems to be putting fires out – running from one crisis to another.

While consolidation might be blamed for this situation, the truth is that many stations have deferred maintenance, much less planning for “worst case scenarios.”

It is vital to look ahead. Preventive maintenance is as important as ever before. With many more unmanned transmitter and studio sites, natural disasters, local emergencies, and just the normal course of aging equipment challenge every station. Some are easy to handle, some are more difficult. But planning is essential.

Did KTRS *expect* a tornado to topple two of its towers? Hardly. As Frank Absher notes on Page 4, it was the engineering planning foresight that got them rapidly back on the air. And planning is also an essential part of safety and security, as you will see on page 8.

Changes after original construction can affect a station's situation. Adding antennas and dishes on a tower are examples. The value of planning for *all* aspects of digital transmissions is shown in Phil Longenecker's story on Page 6.

**THE PIPELINE IS FLOWING**

*Radio Pipeline* has likely arrived in your inbox by now. We are happy to hear the many positive comments our new sister publication already has received from folks who appreciate a “heads up” on what new products are being readied for the field.

We also have been pleased to know many of you are enjoying our URL page, www.radio-guide.com/URL.html The goal is to make it easy for you to find the resources mentioned in the articles, without frustrating typos!

And do not forget these other great resources for information and assistance: the Tech Assist, Broadcast, and other mailing lists at www.radiolists.net – *Radio Guide* –

# Broadcast Software

1-888-274-2721  
www.bsiusa.com

**Simian - Radio Automation**

Fully automated or live assist play out software.

Suitable for radio stations, web casts, music-on-hold & retail outlets.



**Complete PC Systems**

Ready to run, broadcast ready or retail play out systems.

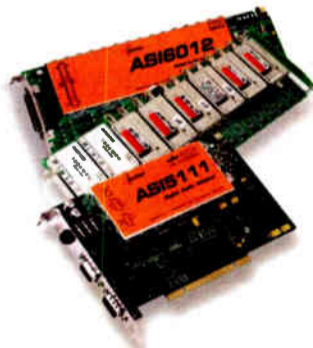
Optional music, advert & promo scheduling software and remote control hardware.



**AudioScience Sound Cards**

Multi-output, pro-quality sound-cards and tuners.

On-card processing and memory for glitch free playback & recording.



**SkimmerPlus Audio Logging**

Advanced radio station or call-center logging with remote web playback.

Satisfies and exceeds the output logging requirements in many countries.



**Broadcast Software International**  
503 E. 11th Avenue  
Eugene, OR 97401 USA  
Direct: 541-338-8588  
Fax: 541-338-8656  
www.bsiusa.com sales@bsiusa.com





# When Disasters Challenge ... Radio Delivers

By Frank Absher

There are many things that can cripple a station and its service to the community. For this reason, many stations arrange multiple program paths, backup transmitters, and generators. But weather has a way of "finding the weak spot" in transmission systems. When a storm flattens a tower or two, it can suddenly render a station "silent" for a long time. Or does it have to be that way? Frank Absher explains.

A decision made several years back to add more flexibility to their transmitter plant proved crucial for a St. Louis station in its effort to stay on the air and provide critical public service when a tornado hit town.

## A SMACK FROM ABOVE

It was a powerful wind that blew through St. Louis on the evening of July 19, 2006. Forecasters did not see it coming, so there was little, if any, chance for broadcasters to get out warnings. But, even if they could have foreseen it, it would not have helped KTRS.

After the fact, a National Weather Service spokesman said the St. Louis region experienced a series of north-northeasterly downbursts, which included several microbursts. The storm, he said, is called a "derecho." Anything in the path of the wind was in danger, including radio towers.

Just a couple miles northeast of downtown St. Louis, the tower site of KTRS was hit hard. The four-tower array was built on the Mississippi River flood plain in Illinois half a century ago. Two of the station's four Blaw-Knox towers were felled that July evening. A National Weather Service spotter in nearby Bunker Hill, IL, recorded a gust of 92 miles per hour.

Now, KTRS station ownership must cope with an extensive rebuilding process, made more costly and complicated by the possibility that all four towers are covered with lead-based paint.



It looked just as if a hand came out of the sky and swatted the towers down.

## 58-YEAR-OLD SITE

The transmitter facility was built by Pulitzer Broadcasting in 1948 for its St. Louis station, KSD. Officially activated on November 22, the towers were constructed during a major expansion of the broadcast facility, which included the establishment of the market's first television station and a signal upgrade that gave KSD 5,000 Watts, both day and night.

A *St. Louis Post-Dispatch* story heralding the site construction noted each tower was 450 feet tall and weighed 70,000 pounds. The westernmost tower ran a 5,000 watt daytime signal and, with the other three towers, provided the 5 kW nighttime pattern. At that time, there were 16 stations on 550 kHz; KSD had to protect WKRC in Cincinnati, WJIN in Lansing, MI, and KFJR in Bismarck, ND.

Each tower leg sat atop a large concrete pyramid base. "At the base of each tower is a small building which houses the apparatus used for tuning the antenna to serve its special part in broadcasting KSD programs and preventing interference with other stations," the article revealed. "The transmitting apparatus is housed in a building about 830 feet from the westernmost tower."



KSD's brand-new site (1948).

Courtesy: St. Louis Media Archive

Development of the site had taken two years, as the FCC construction authorization had come on December 9, 1946, a time when materials were scarce due to World War II. The 68-acre plot of land – rural at the time of construction – is still considered remote today, surrounded as it is by cornfields and a huge landfill. "It's one of the great old tower sites," says KTRS Chief Engineer Mike Breitenstein.

Mother Nature has shown destructive powers throughout history, but recent history in the St. Louis area had been relatively calm. When the wind storms rolled through on that evening in mid-July, the destruction that was left behind was incalculable. Thousands of trees were uprooted or destroyed. A large percentage of them fell on electrical wires.

The local electric utility, Ameren Union Electric, estimated 500,000 homes were without power – it was the largest outage in the history of the utility. The emergency was the logical time for the public to turn on their battery-operated radios ... and the wrong time for a talk-format station to be off the air.

## THE BENEFITS OF PLANNING AHEAD

Breitenstein says the station was quick to recover from the effects of the loss of two towers that night, in part because of something he had done several years ago.

"In the late '90s I created a second non-directional tower," he says. We needed it for those times when maintenance was necessary. It gave us the ability to continue a non-directional signal during those times when we had to perform maintenance on the primary non-directional tower."

So when the July storm hit, felling two of the towers, "I was able to get us back up and running within a couple hours," Breitenstein said. "I took us down to 500 Watts until we got the [FCC's] authorization." After the station's signal was restored, KTRS was able to switch into a local mode in which the programming focused on storm damage and making sure listeners got the information they needed for their safety and recovery.

Station manager Craig Unger says their Washington attorneys were in the FCC offices the next morning. They asked for and got permission to go with a nighttime signal at 1,250 Watts, non-directional, rather than the normal 5,000 Watts, directional. The Commission quickly gave the station an initial six-month Special Temporary Authority (STA) window for repairs.

## ASSESSING THE DAMAGE

In the daylight following the storm, KTRS management was able to gather information on what had transpired. "You don't really understand the magnitude and power of a storm until you see something like this," said manager Unger.

Breitenstein said it looked like the failure point had not been in the towers' steel structure but rather in a much smaller part. The steel, he says, was in good shape, even though the towers were 58 years old. But the Lapp insulators appear to have been the weak points.



The insulators proved to be a weak point

Courtesy: Mike Breitenstein

"Those insulators failed," he said. The National Weather Service spokesman said the highly variable winds at excessive speeds put unnatural stresses on everything. Hardest hit, he said, were trees that were subjected to twisting.

In the case of the KTRS towers, it appeared the winds exerted stresses that shattered the insulators at the base of each tower. One tower simply collapsed. The other, Breitenstein says, looked as though it had been picked up completely from its base and deposited next to it, where the structure collapsed. He said there were distinct prints from the tower's four legs in the soil next to the base.

A station employee had an apt description: "It looked like it had jumped," he said.

## LOOKING AND PLANNING AHEAD

For KTRS ownership, the storm may have a silver lining. They had recently installed a new transmitter in an effort to improve nighttime coverage. Now the loss and subsequent tower replacement could further that effort, by giving KTRS a chance to improve its night pattern. The timeline, says the station manager, is loose right now.

Insurance will help, says Unger, "but as all station managers know, the insurance manual for this sort of thing is usually about 80 pages long. We're getting bids now and weighing our options."

Those options could include relocating the nighttime towers to a new site, but that is not too likely. In any event, nothing can be done until the Illinois Environmental Protection Agency checks out the lead content in the old tower paint. Unger believes there is no real problem there, but station ownership will have to go through proper channels when it comes to disposal of the scrap metal – and that disposal may not be limited to the two flattened towers.

Unger says consulting engineers will probably be brought in to design a new site plan for four new towers. "There's great ground conductivity out there in the flood plain," he says, "and we want to continue to take advantage of that. There are probably a lot of different things we can do with that site."

In the meantime, thanks to Breitenstein's planning, KTRS continues to pump out the Watts, serving its listeners during fair weather and foul.

Frank Absher is a media historian and lecturer at St. Louis University in St. Louis, MO. Contact Frank at [fabsher@stlradio.com](mailto:fabsher@stlradio.com)

Internet remotes...  
there's been talk.



➔ **Live from 37,000 Feet—No kidding—Live Broadcast from a Lufthansa flight!**



... successfully aired his three hour talk show from a commercial airplane [using ACCESS] at 37,000 feet on a regularly scheduled flight between Frankfurt, Germany and New York, US.

*Peter Greenberg—Host of the syndicated radio program Travel Today*

For the complete story visit  
<http://remotebroadcasts.blogspot.com>

➔ **Radio Free Asia—Live from the Himalayas**



"The results [with ACCESS] were especially reliable considering that Dharamsala has one of most "problematic" Internet infrastructures that we have come across." — David Baden, Chief Technology Officer Radio Free Asia

For the complete story visit  
<http://remotebroadcasts.blogspot.com>

➔ **Ski Mountain Remote**



This picture, really demonstrates what ACCESS is about. This product truly has the ability to cut the wires.

For the complete story visit  
<http://remotebroadcasts.blogspot.com>

➔ **JAMN 94.5—Walk for Hunger**



"ACCESS was used on the air exclusively for JAMN945 at this one. It was all over EVDO with a tremendous amount of active cell phones in the area. The ACCESS was connected to the Verizon wireless Broadband...

For the complete story visit  
<http://remotebroadcasts.blogspot.com>

**Put Comrex On The Line.**

Toll Free: 800-237-1776 • [www.comrex.com](http://www.comrex.com) • e-mail: [info@comrex.com](mailto:info@comrex.com)  
19 Pine Road, Devens, MA 01434 USA • Tel: (978) 784-1776 • Fax: (978) 784-1717

**COMREX**

by Phil Longenecker

## HD Becomes a Hot Deal

There are many places where summer means the end of winter and cold and snow – a time to open the windows and enjoy mild temperatures. However, when the temperatures go past mild to “officially hot” and air conditioning is not the local norm, stuff happens – especially when digital transmitters are in play. Phil Longenecker knows. He was there.

It had been better than 95 degrees for two days when the audio started dropping out on one of our FM stations.

### FIRST THE AUDIO, THEN THE CARRIER

The problem was intermittent; we were losing the program audio for about ten seconds every five to ten minutes. Also, our HD transmitter began cycling, shutting down then restarting to full output. Due to the unusual temperature, I suspected there was a heat issue in the transmitter room.

As is common for many stations in Wisconsin, the site has no air conditioning, just a blade fan for general room exhaust and a cage blower for the Continental 816R-3C transmitter. The building itself is concrete block with a brick façade and a gable end built-up roof. At least our outside wall faces east.

The transmitter site is a rented space with TV and FM radio stations occupying the rest of the spaces. The air intake is made up of two 20 x 25 filtered openings below the room exhaust fan.



This FM had an HD upgrade this spring that included a new Optimod 8500HD. The HD transmitter, a BE FMI73, FXi60 and FSi10 combination, runs at just under 200 Watts forward power. It is in a closed rack with an Aztec-Audemat Golden Eagle and a Bird electronic wattmeter readout.

The Optimod is in an open rack with the CDLink STL receiver, Burk ARC-16 remote control, Aztec-Audemat FMB-80, Bird meters and the Digit exciter. This all feeds the Continental, which runs at 21.24 kilowatts TPO, including the loss of just over two kilowatts to heat in the high-level combined system.

The intake is just above the door, the exhaust is just below the roof.



With high level combining, the HD rack, including IP connections.

### A HOT TIME IN THE OLD TRANSMITTER SHACK

When I arrived at the site, after zipping carefully through evening rush hour traffic, the room temperature was 110 degrees. The analog transmitter was producing power, but the modulation monitor was showing nothing at all – 0%.

A quick inspection of the Optimod 8500 showed the front panel display was frozen. However, a few seconds later, the program audio reappeared, the display recovered. Reaching for a thermometer, I put it on the top of the 8500's case while I went out to the truck for a floor fan that I had brought from the studios.



A fan seemed like the best way to cool the audio processor.

After I set up the fan on a stool, plugged it in – and was about to turn it on – the audio died again. Looking over at the thermometer, it showed 120 degrees. I turned on the fan and grabbed screwdrivers to remove extra equipment from the rack and take the cover off the 8500.

### LOWERING THE FLAME

Handling that stuff was like getting hold of a fresh cup of coffee – I could grab on for about a half a minute before I had to let go and cool my hands.

With the cover finally off and the outside door open the whole time, room temperature slowly dropped to 97 degrees. The Optimod roared back to life and has not stopped since.



Microprocessors are much happier when they are not flame-broiled.

Out of curiosity, I looked at the 8500's manual to find the rated operating temperature was 122 degrees maximum. I will assume that is an “inside the case temperature,” which was probably above that 120 degree reading I had on the case when I arrived. I chuckled to myself thinking Bob Orban may have designed a thermal sensor into the power supply that precisely shuts down the unit at 122 degrees.

But the point is the power supply did shut down, protecting itself and the rest of the device, rather than overheating until hard failure. After an hour of uninterrupted operation passed, I left for the evening.

### REASSESSING THE HEAT LOAD

The next day was only a couple of degrees cooler, but we still suffered no additional failures. The following day, temperatures were back in the 80's and I paid a visit to check on things at the transmitter site.

The Burk ARC-16 display had gotten distorted and a reboot cleared that. The HD came up and was running fine. Everything else survived the heat wave without any apparent damage.

Being that this is my first year in this market, I will assume that the weather actually was normal for summer, but it was the addition of the HD equipment that pushed the room air handling beyond capacity. Before next summer I am going to budget for additional cooling.

My preference will be for a full room air conditioner with an exhaust blower of increased capacity for a backup to the air conditioning unit. Of course, as it is a rental space, dealing with the landlord for aesthetics and/or additional ground area is a concern and may dictate to some extent exactly what kind of system can be installed.

*Phil Longenecker is the Director of Engineering for the Milwaukee Radio Group of Saga Communications. This experience has taught him to “think cool.” His email is plongenecker@mkeradiogr.com*

## Radio Pipeline

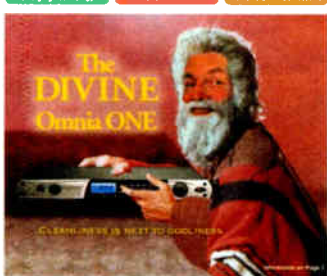
September 2006

with Radio Guide

In the Pipeline

in Production

In the Field



Inside the Pipeline  
In Production

# Radio Pipeline Magazine

## We Help You Find What You Need

We have created a companion to the **Radio Guide** – we call it the **Radio Pipeline**.

Each month in **Radio Pipeline** you will find pertinent information, comments, and quotes from the designers and marketers of the equipment being discussed. This direct “pipeline” to the very people responsible for the equipment and software will help us all in making intelligent purchasing decisions.

We consider **Radio Pipeline** to be, in essence, a quickly read executive summary of upcoming and newly introduced radio broadcast hardware and software. It can be thought of as a mini trade show in your mailbox.

**Radio Guide** subscribers will automatically receive the **Radio Pipeline**. Free subscriptions are available at: [www.radiopipeline.net](http://www.radiopipeline.net) -or- [www.radio-guide.com](http://www.radio-guide.com)



# Wireless Broadband Internet Remotes

Now Shipping



\*Verizon, Cingular and Sprint now offer broadband IP cell phones you can plug into a Tieline codec and deliver reliable, broadcast quality remotes from wherever you're standing



*The first time out with the Tieline was a brilliantly simple experience for everyone involved. For lack of a better phrase, the codec just worked.*

**-Christian Vang Chief Engineer  
Clear Channel St. Louis**



Read the full story and get  
a **FREE** IP demo [www.tieline.com/ip](http://www.tieline.com/ip)

**800-780-4750**

**Tieline**   
[www.tieline.com](http://www.tieline.com)

\*Verizon, Cingular and Sprint are trademarks of their respective corporations

## Ways to Promote Work Sites That Are Safe and Secure

The August 2006 *Radio Guide* featured an article on assessing tower crew safety. Jeff Johnson returns this month to show how safety and security go hand-in-hand.

Broadcast sites may be located in the middle of a city or on a mountaintop, in a cow pasture or a warehouse district. To access a site you may need a police escort, a four-wheel drive, sometimes a boat, a ski lift, or a helicopter. The locale might be a lovers' lane, a hunting ground, an avalanche zone, a flood plain, or a drug rendezvous.

Some sites may be so remote the engineer will be alone should he get in trouble; others are so populous you must ply the neighbors with t-shirts and station trinkets to avoid problems.

Obviously, security and safety concerns will differ as markedly as the location. With proper site security, safety is enhanced for not only the equipment but most importantly for the personnel who must visit and work at a site.

### HAVE SITE RULES AND ENFORCE THEM

At any site, the owners and tenants should set out and enforce site safety and security rules that all must follow. Recently, Keith Retzer, Director of Engineering for KRPS Radio, Pittsburg, Kansas, was soliciting ideas on site security from the Pubtech email list.

Retzer touched on the importance of the "ground lease" as it applies to access and egress. "It seems to be a standard that indicates everybody knows the basic land use rules. What is the implied standard? Maybe it requires some clarification," said Keith.

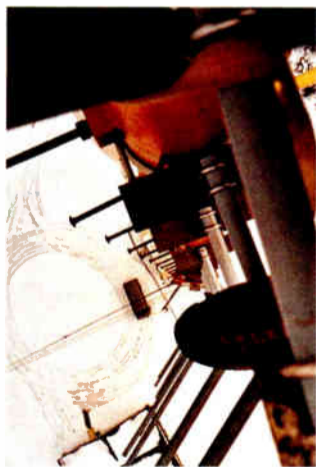
### MAKE THE RULES CLEAR

Whether a broadcaster is the site owner or a lessee, site safety and security should begin with a document setting out access provisions, allowed use of a site, and behavior of personnel while on the site. This list will commonly be included in the lease agreed upon with tenants or in the rules provided by employees of the site owner.

Actual examples are always the most informative. KRPS has granted us permission to use their list.

### KRPS Weir Tower and building access rules:

1. Alcoholic beverages are prohibited at all times.
2. Tower climbing requires prior notice to KRPS. A minimum of 36 hours notice must be given in advance of actual work, and KRPS approval is mandatory. RF safety standards and OSHA regulations apply to all work at the tower site.
3. Access to the grounds is approved at any time.
4. Access to the building is allowed at any time for testing, maintenance, and any other needs specifically limited to the equipment described elsewhere in the attached agreement.
5. Access is allowed to operate the circuit breaker labeled "Cherokee County."
6. Access to any other circuit breakers, equipment, or systems is only allowed under conditions of immediate danger to life to persons present.
7. Adjustment of air conditioning settings is not allowed unless specific approval is obtained from KRPS or the Pittsburg State University physical plant air conditioning department.



When you are on site, do you know who is on the tower? Do you know who is on the ground below you?

8. Use of any KRPS tools or other tools kept in the building is permitted providing they are returned to their proper storage locations. Tools lost or damaged are to be replaced with tools of similar quality and function at the expense of the user.

9. Use of nitrogen, chemicals or other consumables, from any tanks in use or stored by anyone other than their owners or tank lessees is prohibited unless prior permission is obtained for each use.

10. Rags that remain stored in the building are to be placed in the metal container labeled "RAGS."

11. No smoking inside the transmitter building.

12. No outside burning. All trash is to be placed in the trash barrel or removed from the property.

13. Operation of building lighting is allowed at any time. Lights should be turned off when exiting the building the final time for the day.

14. The outside motion sensing light should be allowed to operate in a normal manner.

15. The road gate is to remain locked at all times unless someone is working on the property. All gates and buildings are to be locked when no person is on the property.

16. Generator backup power is provided by KRPS as a benefit and can be removed or altered by KRPS or its electrical utility at any time.

17. Space inside the building is limited. Use of substantial space other than for equipment covered elsewhere in the agreement should be of a temporary nature unless prior authorization is obtained on a case by case basis.

18. Advance notice of work to be done at the site is always welcome.

### DEFINE "EMERGENCY ACCESS"

Another engineer pointed out the importance of planning ahead for access. He has one site located on a hospital roof and only "Hospital Security" has the key. Another is at the top of a ski lift and rides on the lift must be arranged.

Robin Cross, Chief Engineer, KCUR, University of Missouri, adds that many agreements include the provision: "Access will be between (name your preferred hours)."

Cross said, "Emergency access can be after hours, but make sure that you define an emergency. I define emergencies as the 'imminent threat of loss of property or life.' I have had two-way companies call up for regular preventive maintenance and say it was 'an emergency.'"

A tech at a Northwest radio station mentioned another issue of importance: "I would include a couple of non-safety issues. Each user is responsible for hauling out their own garbage (my pet peeve)."

At his site, he said, "Each user has to post his current equipment power and frequencies (input and output) and current contact information near or on his equipment. The posting should include a picture of the antennae as installed on the tower. Users also have to correct problems that result in interference (harmonics, spurs, etc.) in a timely manner."

### ANALYZING SECURITY

Part of the reason for implementing access rules is the physical security of the workers themselves. Workers must be free from worrying about intruders on site, especially when alone, exposed to dangers from equipment, or both.

Ellen Kay, a former safety manager for a high tech Fortune 500 company and now in operations at WHQR, Wilmington, North Carolina, said, "The way I see it, there are three security zones to be concerned about – the approach to the site, the secured perimeter, and the buildings/tower inside the perimeter." Kay has supplied the following formal analysis, including questions that need to be answered:

### THREE ZONES of TOWER SECURITY

#### 1. Approach to the Site

- Public paved roads/terrain
- Private paved/Unpaved Roads/terrain
- Paths up mountains
- Cable cars up mountains
- Via buildings and elevators

Some appropriate questions to ask in assessing the security of the approach:

- How easy is the approach?
- Who maintains the approach to the site?
- Are there special conditions that require training?

Cable car operations is an example.

• Are there seasonal safety hazards? (Heavy snows, landslides, hurricanes, forest fires, etc.)

• What are the emergency plans for these hazards?

• What sort of vandalism has occurred within the approach? (e.g., tower light shooters)

• How do you address vandalism? Is it with local law enforcement, private property postings, etc? (This depends on the specific approach and who is responsible for it.)

• If the site is shared between several businesses, is there an agreement and communication on how the site is accessed and used?

• Is there a mechanism for all parties to be communicate about any issues that arise and agree on solutions that all will use?

#### 2. First Physical Perimeter

##### • Fences

i. Are the fences secured?

ii. What is their type, height, condition?

iii. Who is responsible for the maintenance of the fence(s) and the grounds immediately around it?

##### • Access Points

i. What type of access is used: cards, codes, etc.?

ii. Who grants access, assigns codes, and maintains a current list of personnel granted access? (coded entry to track who is entering/leaving is favored)

iii. Who maintains the access points (sliding gates, access equipment, sensors, etc.)?

##### • Authorized Entrants

i. Which personnel are cleared for entrance, unescorted?

ii. Is there a confirmed, basic training in safety specific to the operation?

iii. Which personnel are cleared for entrance, escorted only?

iv. Is there a confirmed procedure for them to be escorted by trained, approved personnel?

• **Building Considerations** (when the tower is on top of the building)

i. Physical barrier and access procedures are still required.

ii. Similar considerations apply as above for a fenced facility.

#### 3. Inside Perimeter (a second set of barriers to entry, specific to the work being performed)

##### • Access to Tower

i. Is there a procedure for the necessary notifications?

ii. Has there been the necessary training and certification to work on tower?

iii. Are there security interlocks to enter the tower site (coded to track who is entering)?

iv. Are only authorized tower crews permitted, with confirmed safety training and work training?

v. Are the required signs – *Danger, Exit, First Aid Station*, etc – easy to see, read, and secure? Bilingual signs would be ideal.

##### • Access to Buildings

i. Is there a key to the building or another code system?

ii. Is there certification/basic safety training for entry to building?

iii. Are the untrained escorted by certified/trained employee?

iv. Is the entrance to building well lit?

v. Are the grounds clear, mowed, no trip hazards?

vi. Are all required signs – *Danger, Exit, First Aid Station*, etc – easy to see, read and secure? Bilingual signs would be ideal.

##### • General Issues

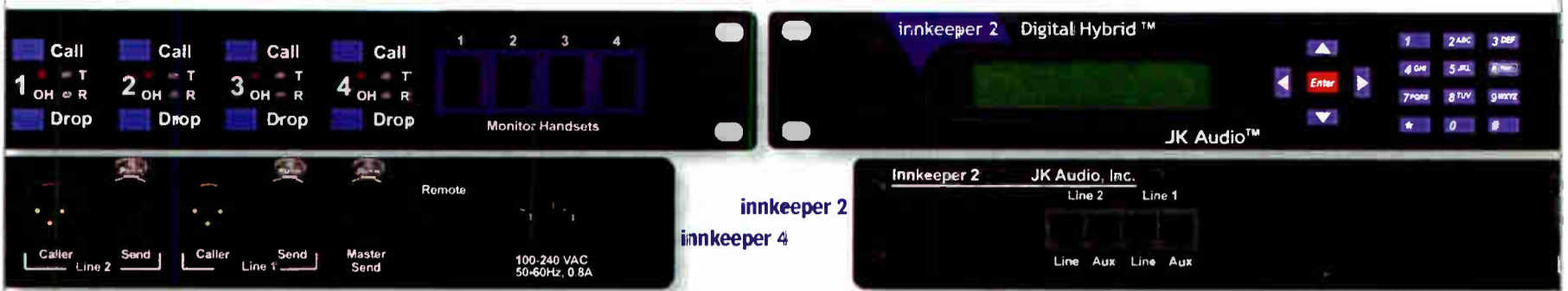
i. Have all staff members had basic training in OSHA regulations and State regulations for the site/operations?

ii. Is there a yearly refresher course for OSHA and State regulations?

iii. Do you have the required number of First Aid responders on site?

(Continued on Page 10)





# REMOTE CONTROL PHONE BOOK. FLASH MEMORY. AUTO-ANSWER.

innkeeper 2 & 4 multiple digital hybrids kinda "redefine" the entire concept of "work..."

The remote interface provides remote control of the Call and Drop buttons, as well as providing LED confirmation of the keypress.



There are times when a single digital hybrid just isn't enough, but rack space is at a premium. No sweat. Innkeeper 2 and innkeeper 4 squeeze two or four independent digital hybrids (respectively) into a 1U rack space.

The front panel keypad, display, and handset jacks provide easy speed dialing and call setup. Digital hybrids allow you to send signals into the phone line while maintaining excellent separation between your voice and the caller. The balanced XLR output jacks contain only the

caller's voice. The Digital Signal Processor (DSP) continuously monitors both the phone line and audio signals to deliver excellent separation. This proprietary, dual-convergence echo canceller algorithm can achieve excellent separation without any setup and without sending a noise burst down the line.

Innkeeper 2 and 4 feature Auto-Answer/Auto Disconnect for use in on-air applications such as telephone interviews and talk shows as well as behind the scenes applications

like intercom, monitoring and conference room full duplex applications.

When your application calls for multiple digital hybrids that are smart enough to know how to handle the workload, innkeeper 2 or innkeeper 4 are your best choice - by a long shot.

## JK Audio

TOOLS FOR SUCCESSFUL RADIO

JK Audio, Inc. Sandwich, IL 60548 USA • Toll Free: 800-552-8346 • Tel: 815-786-2929 • Fax: 815-786-8502 • www.jkaudio.com • info@jkaudio.com



# KinStar

**The first electrically short AM antenna with FCC pre-approved efficiency and radiation characteristics for full time use in the U.S. market.**

## KinStar Features:

- Direct replacement for a quarter wave tower with 67% reduction in height.
- Approved for non-directional Class B, C or D full-time operations.
- Land requirement: Must accommodate 120-radial quarter wave ground system.
- Requires no lights or paint.
- Input bandwidth compatible with IBOC HD Radio.
- Enhanced survivability in hurricane zone due to short height.
- Excellent, low cost auxiliary antenna.
- Suitable for installation near airports.



423.878.3141 fax 423.878.4224 Email: ktl@kintronic.com www.kintronic.com

## Continued from Page 8

iv. Are the First Aid responders currently so certified, and do they get re-certified on a published schedule?

v. Who performs unannounced, randomly scheduled safety and maintenance checks?

### WHERE THE BUCK STOPS

Kay adds, "I agree that the site owner is ultimately responsible and I have found that reviewing the safety training courses and rules that your contractor uses is a good start to ensure that you are working with 'safe' contractors.



All workers should know proper rules for access and conduct on site.

"Have signed agreements with the contractors state that 'if the site owner's employees or site manager see breaches in safety practices, it is mandatory they are reported immediately and corrected immediately – end of story.' Spot checks by the site owner are to be expected. It is important that personnel on both sides have the training and information necessary to work effectively and safely. After all, everyone has to take responsibility for a safe work place."

As practical matters, Kay points to concerns such as:

- Are the warning signs on the property in good condition, easy to see, readable and adequately secured?

- Do you have them in both English and any key local language?

- Do the gates open and close as they should, or has it become common practice to override a system that works intermittently? (Fix it!)

- How long has it been since the entire protective perimeter has been checked for degradation? (Tell the truth!)

- How much copper is visible from the road or perimeter of the building? (There are thieves that will risk life and limb to relieve you of large pieces of copper or even small pieces of copper. Paint grounding straps, etc., so it is not so obvious that they are copper.)

- Do not invite problems inside the fence; especially with visitors who have no idea about safe practices around the site.

- How often is someone on the site? (If it is more than four weeks between visits, security cameras might be helpful. Regular visits should be scheduled to ensure all is OK.)

- If the site is shared, is there a procedure for reporting issues to all parties?

- ☑ Is the procedure documented?
- ☑ Is the information and corrective action reviewed and acknowledged by all parties?
- ☑ Are the contact lists current?
- ☑ How long has it been since the contact numbers have actually been dialed and confirmed as current?

- Is the perimeter uncluttered and free of obstructing objects on both sides of the fence? (Tall grass, bushes, etc., can hide damage or intentional cuts to the fence. They can also hide snakes, uneven ground, debris, etc.)

### COPPER CONCERNS

Copper theft has risen with the value of the metal. Ellen relates this story: "A small but heavy generator was left alongside a building overnight, in a relatively obscure place. When the generator was moved the next day, it was noticed that one screw was missing from the top cover.

"The cover was removed and it was discovered that during the night, someone had opened the cover and cut out all of the visible wires. (Fortunately, they missed the windings.) All of that effort for a very small bit of copper!"

Even small matters can be an issue. "With a little trip hazard (temporary extension cord), an unsecured high pressure gas cylinder, or a dead light bulb creating a poorly lit environment, you could have a real situation on your hands," said Kay.

A broadcast site is rife with potential safety and security hazards. Accessing the site, climbing the tower, servicing the transmitter, and dealing with the neighbors – or lack of neighbors – are all challenges. Written rules understood and agreed to by all parties will ensure the well-being of the site and its visitors.

*Jeff Johnson is a contract engineer working in Cincinnati. Ellen Kay is in operations at radio station WHQR, Wilmington, North Carolina. Contact them via [www.rfproof.com](http://www.rfproof.com)*

## 40 Years as the World Leaders for Vacuum Capacitors

Since 1965, COMET has been manufacturing high quality fixed and variable vacuum capacitors for broadcast applications.

Our commitment to superior product quality and customer service has enabled close cooperation with leading international companies in the RF industry.

COMET vacuum capacitors are utilized in various applications in broadcasting, from medium- and short-wave broadcast and communications transmitters to antenna tuning units or couplers in avionics and mobile equipment. Our fixed and variable capacitors are proven the world over...

Contact us for information on the broadest product portfolio in the industry!

COMET North America  
76 Progress Drive  
Stamford, Connecticut 06902  
USA  
T +1 203 969 2161  
F +1 203 969 2162  
[usa@comet.ch](mailto:usa@comet.ch)

[www.comet.ch](http://www.comet.ch)



# “We outgrew our old studios. With Axia, that won’t happen again.”

“Kaya FM is a trailblazer. We were the first independent radio station licensed in South Africa after apartheid. We invented our own unique format, a mix of music and



talk. We grew into one of the most popular stations in Johannesburg. And we completely outgrew our original studios.

“Moving to Newtown, the city’s cultural and entertainment center, required ‘showcase’ facilities; **dynamic, striking studios** that



mirrored the buzz and excitement of our station and community.

“We also needed a routing system that would **seamlessly link all of our studios** and news facilities — cost-effectively, of course.

“Our equipment search began with the usual suspects, but nothing clicked until we saw Axia. Using Ethernet switches and CAT-6 cable to share audio between destinations makes a lot of sense, and costs a lot less than those expensive mainframe routers. Axia **is more flexible, too.**

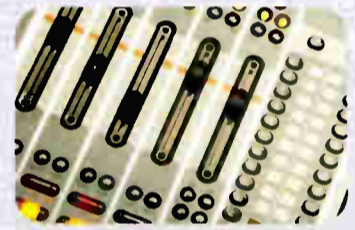


“This is **a system we’ll never outgrow**, because we can expand it by plugging in more audio nodes wherever we add new inputs.

“The on-air **staff loves the Axia consoles**; they’re very flexible and easy to operate. Powerful, too: you can store custom



show setups and call them up with one button. This really simplifies switching between talk and music shows — just load the show profile you want and the board is ready in seconds! And no more worries about setting up mix-minuses when doing remote broadcasts; the surface takes care of all that for you no matter how many callers or remote lines you have.



“I think **Axia was the perfect choice** for Kaya FM. We have all the functionality we wanted, and we got it for half the price of systems with less features. In fact, we’ve already ordered another new Element control surface! Axia is a technical dream... I can’t imagine a better fit for our station.”



— Russell Pope, Operations Manager  
Kaya FM, Newtown, Johannesburg, South Africa



[www.AxiaAudio.com](http://www.AxiaAudio.com)

# Studio Guide

by George Zahn

## Of Mics and Men

I am going to ask you to stop and think about something for just a moment. It is something that all audio professionals know, but many simply take for granted: Virtually every sound that we hear in radio, television, film, and recorded media – nearly the entirety of what we air or commit to tapes or hard drives – starts at a microphone.

It is true that electronic musical instruments are “microphone free,” but even those instruments enter the microphone chain when the electric keyboard or bass player asks us to “throw a mic on their amp.”

### A NEED FOR EDUCATION

Since the microphone is the starting point of almost everything audio, we should understand, and pay more attention to, the details of what makes these devices different from each other. And there are dramatic differences!

The advancement of home theater systems, high definition television (and the accompanying digital audio), and the dramatic advancements in digital audio of all formats has thrust audio, the former “step child” of media, to the forefront of the family picture. Listeners are becoming more discerning, be it surround sound on network television, a feature film in a theater or on DVD, or private listening via headphones to a CD or a radio station.

In a studio or on a set, we are often “trained” to use whatever is there and make the best of it, but my hope is that after reading this series of articles, you will have a more judicious knowledge of what makes microphones tick and how you can make them work for you instead of against you.

### MICROPHONE BASICS

Just as your ear reacts to acoustic waves and creates a chemical energy that our brain interprets as sound, the microphone also is a transducer.

The transducer changes energy from one form to another. In the case of a microphone, it changes acoustic sound waves to electrical signal, or audio. Just as different sets of ears hear differently, one brand and model of microphone may well pick up certain tones or frequencies better than others.

That difference is often determined by the “family” of microphone—exactly how the microphone changes acoustic sound into audio. These families include dynamic, condenser, and ribbon microphones.

### THE DYNAMIC MICROPHONE

If you have worked with a standard inexpensive microphone in a radio studio, you likely have dealt with our first family – the dynamic, or moving coil, microphones. While “dynamic” sounds great as a description, the microphone family itself is quite pedestrian as a group.

The moving parts, or “element” of the microphone, is basically a round, flat mylar diaphragm attached to a cylinder-shaped post which then is wrapped or encoiled in wire. The post with the coiled wires is surrounded by a fixed magnet and resides between the poles of the magnet.

When the diaphragm vibrates from being hit by acoustic waves, the “moving coil” disrupts the otherwise blissful magnetic field and creates an electrical current



RE20 Capsule

which fluctuates at the frequency of the sound hitting and moving the diaphragm.

In general, it is a pretty simple design, cheap and easy to make. Dynamics are durable, but the added weight of the coil on the post attached to the diaphragm makes the moving part (element) heavy and unable to replicate higher frequencies.

### A DURABLE CHOICE

Newsrooms all over use dynamics; the Shure SM 58's or 57's you often see on stage are dynamics. If it might get stepped on or dropped, or if you need to buy many of them to fill multiple radio studios, dynamic microphones are often the best choice, unless you have a small fortune to spend.

Dynamics excel in high sound pressure level situations. If you are recording a jet engine or a kick drum, this is the family you will generally use – in fact, the outer casing of some dynamic microphones might melt in the heat of the jet engine before the element inside the microphone would distort, or overload. On the other hand, as a family the dynamic will likely sound dull and dark for harps, pianos, or bright string instruments.

Broadcasters often find an ElectroVoice RE20 or two in the station – a large diaphragm dynamic that sort of resembles an old German hand grenade in appearance. The ports are added to make the microphone unidirectional are clearly evident.



EV RE20

The combination of quality and price makes this a microphone that can be added in quantity to studios for consistent audio quality.

Many announcers like the larger diaphragm dynamic microphones because the feeling is that the larger diaphragm is much more sympathetic to their wonderful bass tones. However, it is really more a matter of proximity effect, a bass exaggeration peculiar to unidirectional microphones when you work them very close. (We will have more about the proximity effect and bass roll-off switches in a future column.)

### FROM DRUMS TO NAILS

The EV RE20 microphone is actually pretty versatile. In practice, I have used it on kick drums when an AKG D112 was not available. Having recorded more than one hundred programs of *Riders Radio Theater* with Riders in the Sky for public radio, there are actually reports from Woody Paul of Riders that their entire Nashville recordings for the show (before I worked with the group in Cincinnati) were done almost totally with RE20's, even on the Woody's fiddle!

On the durability issue, the Electro Voice 635A quickly became known as the “hammer” microphone when it was first demonstrated at broadcast trade shows.

Legend goes that the demonstrator spoke into the microphone to show its quality. He then potted the microphone down and proceeded to hammer a nail or two into a two-by-four, literally using the same microphone as a hammer.

Then the demonstrator potted the microphone back up and it sounded the same! News departments all around the country immediately added these to their remote kits to the point that the 635A became one of the most recognizable news staples in the U.S.



The EV 635A, AKA “The Hammer”

By the way, ElectroVoice has offered a program in which you can have the outside surface of the microphone refinished or repainted if it becomes marred or scratched in the field. Rarely, if ever, does the internal mechanism need service.

### VARIATIONS WITHIN THE FAMILY

Please note that within any family, you can find some premium microphones that might actually perform as well as, or better than, microphones from the family above it. In this case, a very good quality dynamic might actually be as good a choice as a lower end condenser microphone.

From personal experience if you are lacking options, it might be acceptable to use a higher end dynamic on the high end of a piano or on a string instrument. Examples might include the Sennheiser 421, a sleek black cardioid microphone which looks great on video, or the Sennheiser 441, the supercardioid version of the 421 which closely resembles a flattened out 1960's electric razor on steroids (what were they thinking?).

With these models, smaller diaphragms will likely reproduce high frequencies better than will large diaphragm microphones, simply because the moving part of the element weighs less and can move more quickly.

### SEEKING SOME DIRECTION

Unmodified dynamic microphones are inherently omnidirectional. To make a microphone unidirectional (or cardioid), the addition of ports, or slots on the body of the microphone, allow sound to enter from the rear of the microphone and effectively be cancelled at the diaphragm, making the microphone “hear” in only a forward direction.

The 635A is a typical unmodified microphone, which is its only drawback for news gathering. It might be nice from time to time to be able to aim the microphone away from the fire truck as you interview the fire chief on the scene, but an omni does not give you that option.

The ports on any directional microphone can add some wind noise and possibly handling noise if you have a fidgety reporter, but that is the trade off for directional pickup in the field. Nevertheless, durability often trumps directionality for news remote kits.

### A DYNAMIC PET

In summary, and with all due respect to our canine companions, the dynamic microphone family represents the dogs of microphones. Allow me to clarify – not “dogs” as in poorly performing, but “dogs” as in dependable, predictable, and steady companions. You can pretty much predict exactly how the microphone will perform every time out.

That is why they are commonly used for PA where feedback is a critical concern. There are few variables, and if you know the advantages and limitations of each brand of microphone in your arsenal, you can use them with confidence in many situations.

In our next installment, we will give you a capsule look at the “cats” of the microphone family. They are sleek and elegant, but sometimes sneaky. At times, they can be downright finicky – but boy, they can sure sound great. We will see if condenser microphones can help us produce close to purr-fect audio!

*George Zahn is the Station Director at WMKV-FM in Cincinnati, OH. George can be contacted at GZahn@lifesphere.org*

# Independent Talkback

*A Headphone System with Selectable Talkback for Each User*



## FlexPhones Master

The FlexPhones Master is a professional Broadcast/Studio six channel distributed headphone system with independent talkback capabilities. Each of the six channels provides stereo program monitoring and selective talkback with interconnection via CAT5 cable to multiple Active Headphone Remotes (AHR-1) and/or Monitor Selector Interface (MSI). Multiple masters may be cascaded to form larger systems.

The FlexPhones Master is equipped with inputs for stereo program and talkback audio. Rear panel program and talkback trimmers are provided to pre-set maximum input levels. The microphone/line level talkback input is available via a rear panel plug-in euroblock connector, while the front panel XLR connector facilitates the use of a user-provided gooseneck microphone or headset. The front panel is equipped with a level control for local headphones with both 1/4" and 1/8" stereo headphone jacks. The six front panel talkback switches allow the user to independently communicate with each AHR-1 listener and can be configured to insert talkback audio into only the left or both ears and dim either or both program channels. Any combination of switches may be pressed, while the "All-Call" interrupts all listeners. The Talkback function can be remotely controlled. Six RJ45 jacks are provided to distribute audio and power via CAT5 cable to the AHR-1's, which conform to the Studio Hub format. Low-Z balanced audio distribution is used to preclude audio degradation with long cable runs.

## AHR-1 Active Headphone Remote

The Active Headphone Remote (AHR-1) contains a stereo amplifier designed to work with any combination of high-efficiency headphones with impedances between 24 and 600 ohms. The AHR-1 is equipped with 1/8" and 1/4" headphone jacks, level control, user-configured utility momentary pushbutton and LED indicator. Two rear panel RJ45 jacks are provided for connection via CAT5 cable to the FlexPhones Master. The AHR-1 may be desktop mounted, under counter or with the optional HR-1/MP or HR-1/MP-XLR mounting plates, which may be turret or counter-top mounted.



Manufactured with  
Pride in the USA

**BROADCAST**  
*t o o l s*

support@broadcasttools.com  
www.broadcasttools.com

**INNOVATIVE PROBLEM SOLVING TOOLS FOR BROADCAST**

WorldRadioHistory

### You Can't Fix it if You Don't Know It's Broken

It is an old story. The engineer happens to be fixing something in the Control Room and an announcer suddenly says, "When you get a chance, can you take a look at the \_\_\_\_\_? It hasn't worked right for months." Besides the frustration of more work, there is the deeper issue: how can the air staff and the tech staff better communicate and solve problems. Tim Wright shows how it was done in his shop.

When Clear Channel Chicago began the consolidation of our facilities beginning in November of 2002, one of the things that became apparent early on was the difficulty of managing trouble tickets – the written notations about equipment that had malfunctioned.

#### SOME OLD WAYS NO LONGER WORK

When I was responsible for just one station, I could pretty much handle the "punch list" for the day in my head. Bringing in six other stations meant that the punch list grew exponentially.

Our staff of three senior engineers, two assistants, and two IT techs continued business as usual for another three and a half years, until it was brought to our attention that there was a perception that we were not doing anything. How could that be, since we were busy all the time?

In a word: "communication." It was not happening in an effective way.

Some of the station's staff members were used to filling out paper "trouble" forms, some just "Hall-Jacking" an engineer, and some just hoped we would discover that something was broken by divination or something similar! No matter what was tried no procedure was particularly successful, because the daily process was always be interrupted by a higher priority project for the latest emergency.

#### A CHANGE

The Midwest Market General Manager soon got involved, the "politics" kicked in, and it became apparent that something had to change. But what to do?

We considered a paper-based reporting system, and a PC-based management system. Searches of the Internet soon led us to a solution. That solution was paperless, met our requirements for ease of use, and was free. Now that got my attention. What is this magic bullet you ask? Liberum Help desk from <http://www.liberum.org>



The latest version of the software, as well as detailed instructions for configuration, an on-line demo, and a support link are all available at the Liberum home page.

If you are brave, there are several links to Beta versions as well.

#### INSTALLATION

After downloading the package, I did some quick research and discovered that although the program will run on its own internal database, it runs best when fed SQL.

I built up a spare PC using Windows XP Server 2003, downloaded and installed SQL Express from the Microsoft website (<http://msdn.microsoft.com/vstudio/express/sql/download/>). Also required is the NET Framework 2, which can be downloaded from the Microsoft Update page. All you have to do is follow the instructions from Microsoft for setting up the SQL server and initializing the database engine.

There are good resources for this on-line and if I can figure it out by following the guides then you should have no problem.

Since the software uses an HTML interface for user interaction, installing the Windows IIS service is also required. I am running my server on a dedicated Pentium 4 - 1.5 GHz machine with 256 MB RAM, but I would recommend server-quality hardware if available.

#### CUSTOMIZABLE APPLICATION

Because the main programming is done with HTML and ASP coding, you can use your favorite editor. I like using UltraEdit from [www.ultraedit.com](http://www.ultraedit.com) to customize the look and feel of the user interface. ASP tutorials are available as links from the Liberum home page.

If you are uncomfortable with HTML editing, then Microsoft Front Page will do.



#### The Liberum Admin Screen

As you can see from the graphic above, detailed setup options are available.

- Configure Site allows you to set your base URL, Administrator information, Email configuration, and other options.

- You can test your interface to external email and view detailed system information with the Test Configuration.

- Configure your email options and customize messages with Configure E-mail Messages. An external mail client may be necessary for your specific application to send to the company email servers. We used ASP-Email from Persits software [www.asppmail.com](http://www.asppmail.com) (also free) to make the bridge.

- Manage Users does just that.
- You create and change the categories for the user interface pull down menus in Manage Categories. I created categories like:

- Blackberry's & PDA's
- Computer - Hardware
- Computer - Software
- Copiers - Broken / Jam
- Copiers - Supplies
- Email
- Heating and Cooling
- Key Cards
- Klotz Vadis - Repairs
- Lighting - Ceiling and Track
- Lighting - On Desk
- Office Phones
- Office Supplies
- ORDLogger/Audacity
- Printers - Cannot print
- Printers - Supplies
- Prophet NexGen
- Remotes
- P.A.'s & Sound Kits
- Server Maintenance
- Studio Computers
- Studio Equipment - Not PCs
- Transmitters

As you can see, the categories run the full spectrum. Now lest one poor person be stuck with every ticket, the designated support person (configured in setup as well) can be automatically assigned tickets that relate to what they do. For example, the office manager gets things like supplies and "too hot," "too cold," or "my light bulb is out," while the remote coordinator in promotions gets the PA requests.

- Manage Departments is for record keeping, and statistics. You can pull reports on who is using/abusing the service. More on that later.

- Manage Priorities – things like Time Critical, Normal, Low, and *Not in a Million Years* get entered here or adjusted by the support staff via a pull-down menu.

- Manage Statuses – like Opened, Closed, waiting for parts, need more info, etc.

- Manage Languages – Multilingual support; layout changes via HTML/ASP editors; also many of the simple text items can be changed via an administration menu page.

- Reports – where you can pull detailed reports of the system use.

#### TRACKING THE EFFORTS

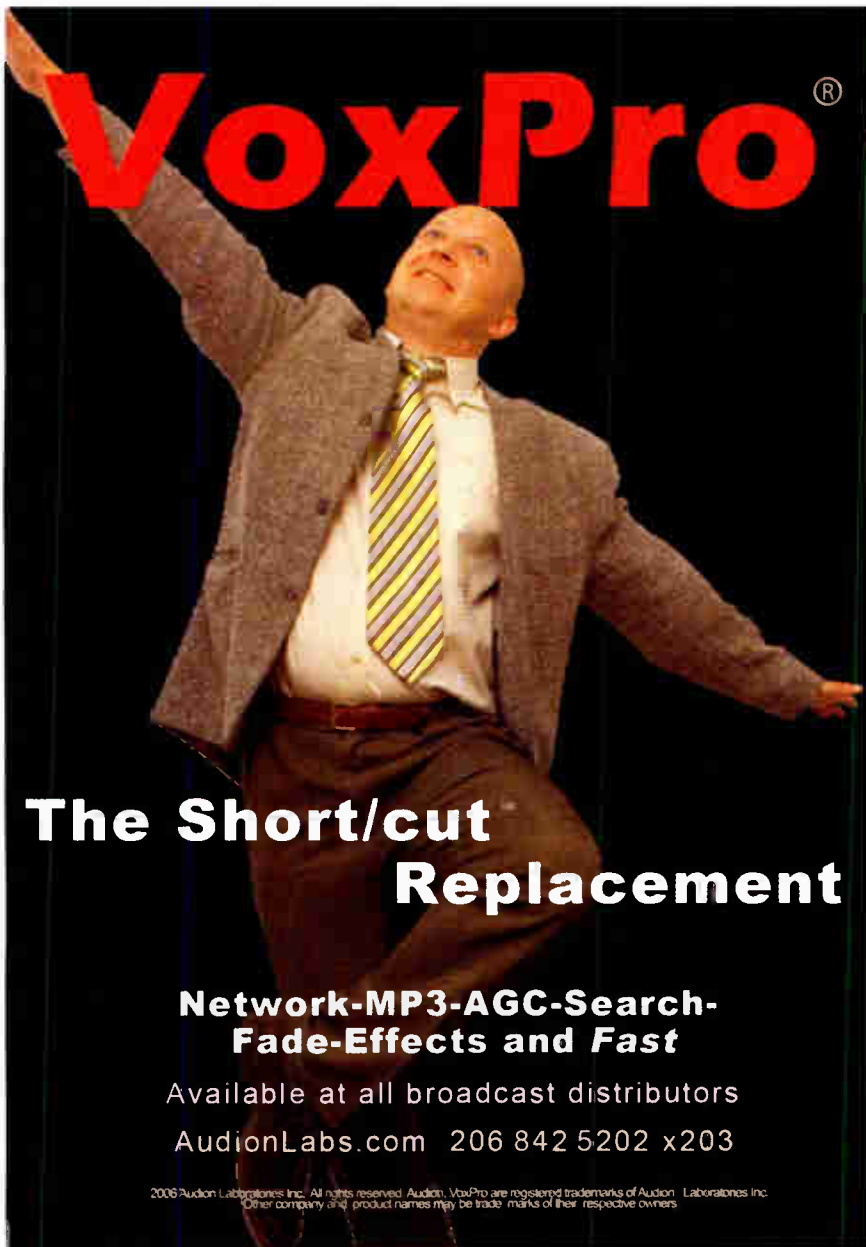
An example of the report page shows exactly how many problems have been reported, which departments have the most issues, and the time spent on resolution. Other data can be added as appropriate.

Reports					
Department	Total	Time	Avg. Time	% of Problems	% of Time
Accounting	39	1166	29.9	4.3%	4.0%
Administration	37	800	21.6	4.0%	2.7%
Engineering	52	11001	211.6	5.7%	37.6%
IT / Computers	80	2051	25.6	8.7%	7.0%
Live Nation	1	15	15.0	0.1%	0.1%
Programming	180	5182	28.8	19.7%	17.7%
Promotions	85	1377	16.2	9.3%	4.7%
Public Relations	17	225	13.2	1.9%	0.8%
Sales	395	7092	18.0	43.2%	24.3%
Traffic / Continuity	28	325	11.6	3.1%	1.1%
UNKNOWN	1	10	10.0	0.1%	0.0%
<b>Totals</b>	<b>915</b>	<b>29244</b>	<b>32.0</b>	<b>100%</b>	<b>100%</b>

#### Notice which departments get all the attention.

If the server is set up properly, it should resolve its name across your network, so the user just has to go to their favorite browser and type the URL. In our case that is ORDHELPDESK. It is not available outside the Clear Channel WAN, but if needed for your specific situation, the IP could be ported out to the web if you wanted to give outside vendors direct access.

(Continued on Page 16)



# VoxPro<sup>®</sup>

## The Short/cut Replacement

**Network-MP3-AGC-Search-Fade-Effects and Fast**

Available at all broadcast distributors  
AudionLabs.com 206 842 5202 x203

2006 Audion Laboratories Inc. All rights reserved. Audion, VoxPro are registered trademarks of Audion Laboratories Inc. Other company and product names may be trade marks of their respective owners.



## fanfare FT-1AP

Some call it  
**"The Ultimate Translator Receiver"**

**W**hy? Because it has so often brought 'iffy', as well as downright 'useless' translator sites to fully airable signal. Add to that, the FT-1AP's established record of reliability, and extraordinarily low maintenance and you have a receiver that will pay for itself many times over with service visits you won't have to make; not to mention a signal that will maintain your listener's attention. In other words, "It leaves you alone to do more important stuff."

The FT-1AP features our acclaimed, high resolution, analog, FM tuner, and state-of-art, digital control system which maintains tuning accuracy at all times, even after power failure. Included also is adjustable Composite Output and +10dB audio (XLR) outputs. To further enhance the FT-1AP's versatility, it offers optional, level- adjustable, Carrier Sense (to assist in meeting FCC regs); an RS232, Serial I/O port, and a gain-adjustable, stereo headphone outlet.

The FT-1AP (FM-only) and FTA-100P (AM/FM model) are available direct or through your favorite equipment dealer.

**fanfare** Electronics, Inc. 1-800-268-8637 (U.S. & Canada)

6509 Transit Road, Unit H-1  
Bowmansville NY 14026  
Email "prinfo@fanfare.com"

Voice - 716-683-5451  
Fax - 716-683-5421  
Website: "www.fanfare.com"

*"Designing receivers that broadcasters can rely on"*

## The Broadcast Industry's **FIRST** 6-channel UNcompressed Digital STL



**Advanced Technology, Only From TFT**

- 6 UNcompressed Program Channels, maximum
- PC Configurable from Front Panel for Frequency, I/O, Alarms, LCD
- Supports 48, 44.1, as well as 32 ks/s Sample Rates
- 256 QAM, 64 QAM, 16 QAM Modulation
- AES/EBU or Analog I/O - Built-In Sample Rate Converters
- Major/Minor Alarms on both Transmitter and Receiver
- 3.125 kHz Step Size

**TFT INC**

Phone: (+1)408-943-9323  
FAX: (+1)408-432-9218

www.TFTInc.com e-mail: info@tftinc.com  
1953 Concourse Drive, San Jose, CA 95131

## TRANSCOM CORPORATION

*Serving the Broadcast Industry Since 1978*

Visit Our Website – [www.fmamtv.com](http://www.fmamtv.com)  
Send your e-mail requests to: [transcom@fmamtv.com](mailto:transcom@fmamtv.com)

### Fine Used AM & FM Transmitters & New Equipment

<b>AM</b>	1 kW	1982	Continental 314R1
	1 kW	1983	Harris MW1A <b>Solid State</b>
	5 kW	1996	Continental 315D <b>Solid State</b>
	5 kW	1974	Continental 315F
	5 kW	1982	Harris MW5A
	5 kW	1987	Harris MW5B
	10 kW	1985	Continental 316F
	10 kW	1982	Harris MW10A
	50 kW	1985	Continental 317C2
	<b>FM</b>	1.5 kW	1983
2 kW		1999	Crown FM 2000A <b>Solid State</b>
2.5 kW		1984	Continental 814R
3.5 kW		1986	Harris HT 3.5
6 kW		1995	Henry 6000D
7+kW		2005	Harris Z16 HD <b>Solid State</b>
10 kW		1988	BE FM 10A
10 kW		2001	Henry 10,000D-95
20 kW		1990	BE FM20B
20 kW		1983	Continental 816R2A
20 kW	1985	Harris FM20K	
25 kW	1980	CSI T-25-FA (amplifier only)	
30 kW	1986	BE FM30A	
50 kW	1982	Harris Combiner (w/auto exciter-transmitter switcher)	

**USED MISC. EQUIPMENT:**  
Bird RF Thru-line Watt Meter, 50S  
Myat 3-Port, 1-5/8" Patch Panel  
Denon 720R Cassette Player  
Potomac Phase Monitor 1901, Digital, 2-tower.

**EXCITERS:**  
Used Continental 802A

Please go to our website  
[www.fmamtv.com](http://www.fmamtv.com) for updated listings.

*Equipment retuning and testing available. Please call for quote!*

**2655 Philmont Ave, Ste 200, Huntingdon Valley, PA 19006**  
**800-441-8454 215-938-7304 Fax: 215-938-7361**

# Operations Guide

by Tim Wright

– Continued From Page 14 –

You have a choice during setup, to use Microsoft authentication of users, or internal management of user accounts. I elected to handle it within the helpdesk program itself so I could allow access to the system for users who are not within the corporate Microsoft Active Directory.

## EASY ENTRY FOR REPORTS

When a user logs onto the system they are welcomed with this screen.

You will notice there is an option for a new user to create an account and, for the password challenged, a gentle reminder link.

Once logged onto the system the user is presented with a form to fill out. Required fields are highlighted, and the page will not let you skip

The Logon Screen

them. I have expanded a drop down menu for categories. These are the ones assigned during the setup stage.

New Problem Entry Form

At the bottom of the screen is a link to another neat feature, the In/Out Board. If you can actually get your users to change their status when they are out of the office, this is a good central location to check for who is actually available. In/Out brings up a list, which can be sorted by department. Clicking on a name pops up

an info page with the user's phone numbers, location, In/Out status, and even a picture if you like.

## FOLLOWING UP ON THE REPORT

After the form is properly filled out and submitted, an email confirmation is sent to the user and a notification email sent to the support person who is assigned to the category that was selected.

All support staff can see all the problems, so the staff here makes it a point to check out the entire list and reassign the problem ticket if they can help in a timelier manner than the primary support staffer could get to it. All changes are emailed to all involved, but if a note or change is internal to engineering, the support person can opt to hide the change from the originating user.

This is what a support staffer sees when clicking on the link to their assigned problem list. Each event is assigned a sequential ID number. Clicking on the link in the title column brings up the detail sheet of the problem.

Problems for joep (Total:6)						
ID	Title	User Name	Date submitted	Priority	Status	
916	Cannot print from Medea Monitors	jeddy	8/1/2006	Low	Opened	
899	NTR Computer	mallewin	7/27/2006	Low	In Progress	
894	Frozen computer	jadewitt	7/26/2006	Low	In Progress	
821	Update CCT Operations E-mail	shena	7/11/2006	Low	In Progress	
613	Best Rate error logging on: access denied	barb g	6/1/2006	Low	Waiting for Parts	
483	Back-up computer station on GCI/YAZ sales area	wagnert	5/5/2006	Low	Opened	

The narrow column marked with the "i" is a link to the user information page from the In/Out board. This is handy in a company as big as ours, since sometimes I do not even know what a user looks like. That picture comes in handy at that point.

For some reason, we have noticed that no one ever assigns a higher priority than Low, which I assigned as the default in the setup stage. Perhaps they have come to trust us?

## RESOLUTION

Once a problem has been handled, the ticket is closed, the user is notified to that effect and the solution can be optionally sent to a master Knowledge Base.

The Knowledge Base is a way to share detailed data within the engineering department. It can be searched using keywords at any time by the support staff. In the example pictured here, I entered "PC" as my search term.

Knowledge Base		
Title	Start Date	Close Date
Button in need of cleaning/repair	2/20/2006	2/24/2006
Maximizer	2/21/2006	2/21/2006
Service Account Needed	2/21/2006	2/23/2006
Microsoft Internet Explorer Error Message	2/22/2006	2/23/2006
Mays PC/Projector issues!	2/22/2006	2/23/2006
Kathryn Donahue KISS to V103	2/23/2006	2/27/2006
Nancy Davis	2/28/2006	3/8/2006
PC in Mays	3/1/2006	3/7/2006
Computer Scans needed and Prob;em with Outlook 200	3/3/2006	3/6/2006
Computer Scans needed and Prob;em with Outlook 200	3/3/2006	3/6/2006
Adobe	3/9/2006	3/15/2006
Need software to work from home.	3/10/2006	3/13/2006
Now Tapcan will not open	3/21/2006	3/22/2006
Earl needs an Arbitron update	3/30/2006	3/30/2006
Need CD Burner on my pc	4/11/2006	4/18/2006
Middays	4/24/2006	4/24/2006
Blackberry is Dying	5/8/2006	5/15/2006
PC Update	6/8/2006	6/12/2006
No access to Beth's PC for Kelly or Beth	6/16/2006	6/16/2006

The Knowledge Base

You can see how easy it would be to add detailed instructions for everything from changing a console program source to locating critical supplies when they run out on the weekend. Additionally, some of this information is also now set up via links on the intranet, so some common tasks can be handled by the general staff members when appropriate.

## A SUCCESSFUL IMPLEMENTATION

The current system has been active since February, 2006. It has been stable as the size of the database continues to grow. The drive footprint is really quite small, since most of the database is just ASCII characters.

The response from the engineering team has been great. What is really appreciated is the power of telling a user to fill out a help desk request when "Hall-Jacked." Our day can now be scheduled and time accounted for with much less time wasted.

The simple rule we instituted is "No ticket, No service." On the surface it seems cold, but that was necessary to get full participation in the system. As response times to a problem have gotten shorter and communication of status has been made an automatic part of the process, we are now getting good cooperation when it comes to following the procedure and filling out the form. It is, after all, that old Pavlovian response.

In a recent all-staff meeting, the Market GM commented that the institution of the ORDHelpdesk has increased productivity 60%. I have no idea where he came up with that number, but he is happy the staff feels that they are being responded to in a timely manner and problems, for the most part, are getting fixed.

*Tim Wright is the Senior Studio Engineer for the Clear Channel Radio cluster in Chicago. His contact email is timwright@clearchannel.com*

## – www.radiopapers.net –

Don't wait months to read the latest equipment technology and application white papers in the broadcast trade publications.

**Get them on-line – right now.**

White papers and technical information from the entire radio broadcast industry.

You can decide what you need – and what to read.

Then sign up for personal email notification, as new radio white papers are released by authors and mfgs.



# Bay Country Broadcast Equipment

Buy • Sell • Trade

Your #1 Source for Quality  
Used Radio Broadcast Equipment

View our latest list of equipment on-line at:

[www.baycountry.com](http://www.baycountry.com)

Or call and we will fax it to you.

All equipment sold with a 15 day return guarantee.

Turn Your Excess Gear Into Cash

Fax or email your list to us and we will respond with our offer promptly. We only buy good working equipment with traceable serial numbers.

Fax Your List Today – 443-596-0212



<http://www.baycountry.com>

(Website Updated Daily)

E-mail: [sales@baycountry.com](mailto:sales@baycountry.com)

877-722-1031 (Toll Free) 443-596-0212 (Fax)

7117 Olivia Rd, Baltimore, MD 21220

**BEXT**

## FROM THE TALL TO THE SMALL

**FM & TV  
Transmitters**  
Solid State or Tube  
Antennas & Combiners

**20 Years of Service**  
Asistencia en Español  
**24 Hour Support**  
**2 Years Warranty**

[www.bext.com](http://www.bext.com)  
Tel 619 239 8462  
Fax 619 239 8474  
[bext@bext.com](mailto:bext@bext.com)

**NEW  
EXCITERS/TRANSMITTERS**  
w/stereo generator & audio limiter,  
field programmable FSK ID keyer, all built-in!

Total Radio. Guaranteed.

**All the Advantages of HD Radio  
In a BE Tube Transmitter**

Introducing BE's FMI T Series for High Power HD Radio

These highly efficient, cost-effective transmitters can help you harness HD Radio's immense marketing potential, such as multistreaming and MessageCast™. Based on BE's best proven T Series, they feature Class C operation and our patented folded half wave technology.

BE's complete design and build a more complete range of analog and digital radio transmitter options than BE. And, thanks to Essential Spectral Pre-correction™ (ESP) and other proprietary BE innovations, no HD Radio system outperforms the combination of BE FM/HD-FM transmitters and HD Radio receivers.

**BE** Broadcast Equipment, Inc. • 4188 North 24th Street • Quincy, WA 98220  
Telephone: (360) 734-4323 • Fax: (360) 676-4822 • Email: [Sales@be.com](mailto:Sales@be.com)  
Website: [www.be.com](http://www.be.com)

# FlipJack FJ-500

**NEW!**

In Use  
Around The  
World

CELL PHONE INTERFACE MIXER

The FlipJack is the latest addition to the Conex line of cell phone interface products. The FlipJack is designed to interface most hand held phones that have a 2.5 mm hands-free adapter jack.

FOR MORE INFORMATION  
**1-800-645-1061**  
[www.conex-electro.com](http://www.conex-electro.com)

**FEATURES:**

- Two headphone jacks ... each with it's own volume control.
- Two Mic inputs and a separate Line Input
- Connection To A Standard Telephone Line.
- Separate headphone cue switch for more flexibility
- Operates on "AA" batteries (Included) or external power (Optional)
- Balanced Line Level Output
- Slots for shoulder straps.
- All IC's socketed for easy maintenance
- Tuner input for off-air monitoring
- LED level indicator

**CONEX ELECTRO SYSTEMS**

1602 Carolina St PO Box 1342 Bellingham WA 98227  
phone: 360.734.4323 fax: 360.676.4822

# Monitoring Guide

by Alan Alsobrook

## Measuring AM Modulation

In a fit of deregulation some years back, the FCC made modulation monitors "optional." Many stations jumped on that and stopped calibrating – or even owning – modulation monitors. However, the requirement to stay within limits was retained. How can a station "prove" they are compliant with the Rules?

In some recent conversations, the question has come up asking how a station with an old modulation monitor – or none at all – can accurately determine compliance with the FCC's AM modulation limits.

### THE RULE

First, we should take look at what your AM modulation limits are according to Section 73.1570(b)(1). We will not worry too much about the minimum (85% on frequent peaks), as most stations today have no trouble maintaining minimum levels.

Section 73.1570(b)(1) reads as follows: "AM stations. In no case shall the amplitude modulation of the carrier wave exceed 100% on negative peaks of frequent recurrence, or 125% on positive peaks at any time."

There is one slight problem with that Rule as I read it: I have never been able to figure out exactly how to exceed 100% on the negative peaks for AM. What they really mean to say is "do not hit -100% very often, preferably not at all." The reason you want to avoid it is that -100% is defined as "carrier cutoff" – where your carrier actually is completely gone. When this happens, you end up creating splatter.

### MONITORING LEVELS

The easiest way to demonstrate compliance is to go look at your properly calibrated modulation monitor and see where the needles are peaking and when the lights are flashing.

With newer processing equipment it is pretty easy to set up AM modulation so that you get the best coverage while remaining legal. I personally try to set up AM's to run at about 96% negative and 122% positive on the peaks. This provides a small (and inaudible) margin of protection in case of a monitor calibration error or transient problem.

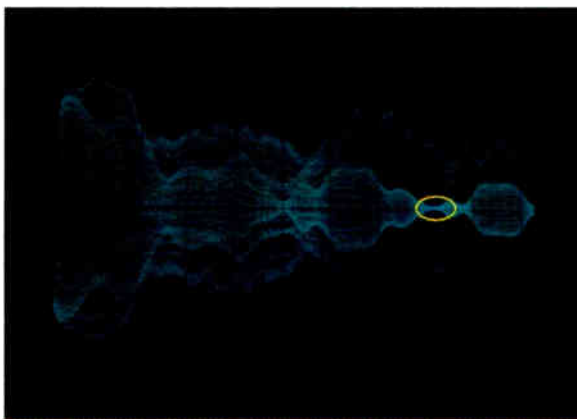


An AM modulation monitor.

Loudness does count with AM and, unlike FM, station coverage is affected by the level of modulation. (Pumping up FM modulation to get "louder" does little, if anything, to improve coverage, while it does promote listener fatigue and generally icky sounding audio.)

### AN ALTERNATE METHOD

If you find yourself at an AM station without a modulation monitor, there is another way to determine how much modulation you have. You will need an oscilloscope and some test leads.



Carrier cutoff occurs at – 100%

The first thing to check is the negative modulation depth. The easiest way is to connect the modulation monitor sample port on the transmitter to an oscilloscope and adjust the scope gain such that the unmodulated wave

form is set for approximately 3/4 of the screen above and below the center line. Once set up and operating, any time you see any flat lines on the zero line it is indicating excessive negative modulation.

While processors may be set to "clip," leaving a flat region above the zero line, this is not a problem (other than distortion). What you do not want to see is when the two halves of the waveform meet in the middle as a flat line, even for a moment. This indicates 100% negative modulation.

We will tackle measuring positive modulation next time.

Alan Alsobrook, a frequent contributor to *Radio Guide*, is a contract engineer, based in St. Augustine, FL. His email is [aalso@bellsouth.net](mailto:aalso@bellsouth.net)

Links to all the website addresses found in *Radio Guide* articles.

[www.radio-guide.com/URL.html](http://www.radio-guide.com/URL.html)

## Ethernet path to...

IP-based equipment control

Remote mirrored servers

Transmitter remote control

RBDS

Surveillance and security

Backup audio path

## ...the transmitter site.

Innovative IP-based applications save money, save time and protect valuable station assets. But how to get IP connections at remote transmitter sites?

**LanLink HS-900** provides IP Ethernet and RS-232 data where no wires or cables exist. And without licenses, leases or new antennas.

Ask the digital STL experts today.

Dave Chancey 805.968.9621 Bill Gould 978.373.6303

[www.moseleysb.com](http://www.moseleysb.com)

Moseley

AM RF Systems...



without the surprises.



LBA Technology is a proven, worldwide supplier of HD radio ready AM antenna systems. Our array of RF products includes directional antenna systems, diplexers and triplexers, ATU's, and components for every power level. LBA systems are designed and custom fabricated to your distinct requirements.

We put our 40 years of AM RF experience into helping you reach farther and sound better! See what we can do for you at [www.LBAgroup.com](http://www.LBAgroup.com) or call us at 252-757-0279



**LBA Technology, Inc.**

Reach Farther, Sound Better.<sup>SM</sup>

252.757.0279 • [www.LBAgroup.com](http://www.LBAgroup.com) • 3400 Tupper Drive • Greenville, NC 27835

## INTRODUCING the FIRST Analog & HD Digital FM Translators



**The TRX-HD Series**  
from



All of your listeners can now hear your analog and HD Radio<sup>®</sup> Programming!

*Shipping beginning in late September.*

HD Radio<sup>®</sup> is a registered trademark of iBiquity Corporation

## FM Broadcasters' First Choice



**SHPX ROTOTILLER<sup>®</sup> FM Antenna**  
HD Radio Ready<sup>™</sup>

- Rugged brass construction
- Stainless steel brackets
- Reliable series fed elements
- Welded internally pressurized feed connection
- Multiplexed versions available

"HD Radio" is a trademark of iBiquity Digital Corporation

**ERI<sup>®</sup> ELECTRONICS RESEARCH, INC.**  
(812) 925-6000 | [www.eriinc.com](http://www.eriinc.com)

# Maintenance Guide

by Warren Shulz

## Monitoring Generator Temperatures

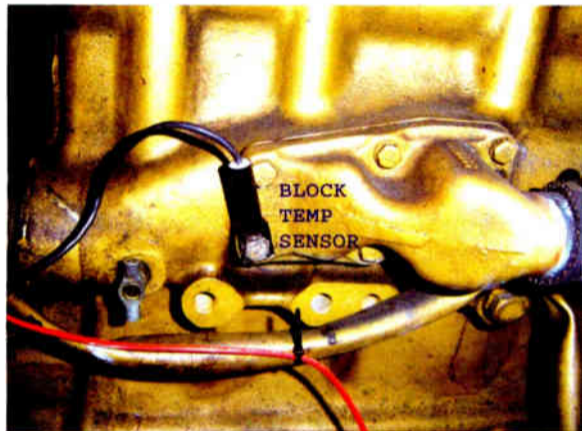
Most radio stations have backup plans to deal with equipment failure, so they can stay on the air. Generators can solve the problem of loss of commercial power – but only if they are kept in good running order. Warren Shulz shows why checking the generator requires more than just turning it on from time to time.

The biggest reason for the failure of a diesel generator to pass a four hour full-load test is overheating; this problem is usually found during the first hour of testing. I would like to share a few proactive maintenance steps that will provide monitoring of two critical temperature points – and which just might save the day for you.

### TEMPERATURE MONITORING

A generator has a hard time starting when very cold. The usual solution is an engine block heater, which keeps the engine warm and ready. Untimely failure of that block heater can be a real pain.

We added a Burk temperature sensor to monitor our diesel engine block temperature. The normal reading is about 120 degrees (with the sensor mounted near the heater discharge). We set the status alarm for this first sensor to a lower temperature reading in order to check for a block heater failure.



Temperature sensor is bolted to the engine block just above the block heater output pipe.

During the “run” condition with a 50% load, the block temperature at the point monitored rises to 160 degrees. (The temperature of the coolant entering the top of the radiator when the engine is running is approximately 190 degrees, controlled by the thermostat.)



The second sensor is clamped to metal radiator outlet pipe.

A second temperature sensor then was added to the radiator return line to observe the heat dissipation of the radiator.

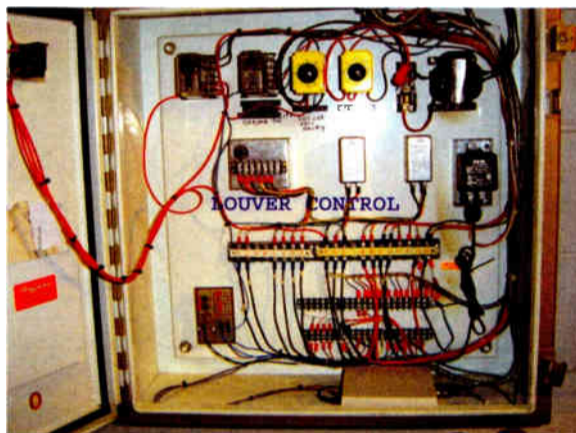
Once the generator is at the nominal run temperature (that nominal 190 degrees, as controlled by the engine’s

thermostat), the radiator return temperature gives an indication as to the condition of the radiator dissipation, the load on engine, and if an over-temperature shutdown is imminent.

### HOOKING IT UP

Of course, it is necessary to ensure there is sufficient intake air volume for the generator to operate properly. So, in this installation, we use motorized louvers to provide the ventilation.

During operation, this louver control box opens the louvers—and confirms they actually are opened. Failure for the louvers to open causes a local alarm. Two pairs of wire run from the Burk temperature output box to the Burk control chassis in the rack on the main floor of the transmitter room.



The louver control box with the temperature sensors attached to the box at the bottom.



The temperature probes are connected to the Burk processor, installed in Louver control box.

### TYPICAL TELEMETRY

Here are some examples of the past testing results of the radiator return water temperature – measured with an infrared non-contact thermal readout:

- April 2002:  
129 degrees after a four hour full-load test.
- November 2003:  
126 degrees after a four hour full-load test.
- September 2005:  
171 degrees after a four hour full-load test.  
*This reading seemed to indicate the radiator flow was being restricted.*
- July 2006:  
120 degrees with a 50% load after one hour run.  
*This reading was taken just after the radiator was cleaned.*

### RADIATOR FIN CLEANING

In May 2006, during a service call to change hoses and coolant, we found the diesel motor stopped with an over-heat shutoff while supporting a 40% load. Our follow-up investigation showed that the coolant level was low as the air pockets had worked their way out of the block. The fluid level was restored with about three gallons of antifreeze.

At the time, it was also noted that the radiator fins appeared to be blocked with debris. The radiator had been installed in May 2001; since then the generator has accumulated some 300 run-hours. A water pressure power-washer with a pre-soak of 409 soap was used to clean the fins. After the power wash you could now see light passing through the passage ways.



We determined that to reduce debris problems in this installation, it might be preferable to add air filters on the generator room inlet air supply duct. If you have any oil engine leaks, it is good to realize that this tends to coat the radiator, collecting more dirt.

Take a look at the used radiator above, going to the re-coring contractor. Could a good fin cleaning have “bought some time” before it needed to be replaced?

### CALIBRATION

The Burk Temperature package uses a three-lead IC pack for the sensor. It outputs one millivolt per degree Fahrenheit.

When connected to the Burk ARC-16 remote control unit, there is a “DEG” mode for this sensor output to read the temperature directly in degrees without the need to calibrate the reading. For this feature, Burk gets an A+ from my grade book.

Using this system we have been able to observe the generator system operation closely (in addition to the temperatures sensors, we measure the generator operating voltage and current). This way, we have an early warning about any issues that might prevent the generator from being available when we most need it.

*Warren Shulz is the Chief Engineer at WLS in Chicago, IL. Over the years, Warren has gained a lot of experience in keeping a transmitter plant running smoothly, and is happy to share the knowledge. His email is: Warren.G.Shulz@abc.com*

## Stay Safe

Use the Radio Guide non-contact AC tester to find live circuits.

- 90-240 VAC Range
- Audio Beeper
- LED Indicator
- Batteries Included

Only \$10.00  
(includes shipping)

## The Radio Guide VT-6 AC Voltage Tester



Credit Card Payments Accepted at:  
[www.radio-guide.com/products.html](http://www.radio-guide.com/products.html)

# Pristine Systems

## CDS<sup>32</sup>

### Radio Automation

- Music on Hard Drive
- Satellite Operations
- AutoPromo Builder
- "Wet" Voice-Tracking
- WEB/RDS Radio Text
- HD Radio Ready
- CobraNet & LiveWire
- LAN/WAN Operations
- Content Depot Ready
- Easy to Use!



Pristine Systems

[www.pristinesys.com](http://www.pristinesys.com)

[www.summittraffic.com](http://www.summittraffic.com)

1•800•795•7234

## BLACKBOX Audio Logger

- Record up to 16 Channels
- Off Air & Dead Air Alerts
- Compliance & Verification
- Web Browser Access
- Talent & Market Monitor
- PodCast Recorder
- Available in Spanish
- Extended Support for
- AM/FM/TV Tuner Boards
- Mic & Timed Skimming



SUMMIT  
TRAFFIC & BILLING

# LARCAN

We hear you. Loud and clear.

## LOOK TO LARCAN FOR TRULY MADE TO MEASURE FM SOLUTIONS

Designed with a difference to ensure the highest quality audio performance - LARCAN offers a superior range of solid-state FM solutions from 25w to 5kW. Customer driven and purpose designed for optimum performance - we bring you the ultimate in FM broadcast technology from 'start to service'.

We hear you. Loud and clear.



25w FM Translator  
FMT-25

### Custom Fit Features:

- Superior Audio Performance
- Modular Design
- Wideband Operation
- Automatic Tuning (front-end)
- High Selectivity
- Fully Synthesized (Tx and Rx)
- Internal FCC Code Key Module
- Compact 1RU Design

U.S. Tel: 1-303-665-8000 • Fax: 1-303-673-9900 Canada Tel: 1-905-564-9222 • Fax: 1-905-564-9244

[www.larcan.com](http://www.larcan.com)

Email: [sales@larcan.com](mailto:sales@larcan.com)

## A Simple Way to Time Power Outages

When commercial power goes out it can be difficult to figure out how long the outage was – and the resulting drain on your backup system – unless your remote control logs it accurately. Even if you have a standby generator, the hour meter may or may not give you enough resolution to know how much fuel was used. Inspired by an old joke, Sam Garfield came up with a simple, cheap way to tell how long outages last.

Here is a question for your consideration: Which is more accurate, a clock that runs one minute behind for each hour or a clock that has no power to it?

The answer: the clock that has no power connected to it. After all, it is correct twice a day.

### TRACKING BATTERY TIME

At one of our relay sites, we were concerned as to how much time we were running on battery power. It was that old joke that led us to the solution – a good old fashion wall-powered mechanical alarm clock. I found this AC powered mechanical alarm clock for about \$10.00

The clock is plugged into a wall outlet and is set for the correct time. The next time I visit the site, I check the time again on the alarm clock. The error in time is the amount spent with on time with battery power. Please keep in mind that this type of measurement is only good for less than twelve hours at a time.

Another way to use this clock would be to set it up to measure the time your transmitter was off the air or on generator power. Just remember to attach the clock to the incoming commercial power line or transfer switch as appropriate, so that it stops running when the commercial power drops.

### LESS CRITICAL, BUT STILL OF INTEREST

Still another use is at your home. Coming home, you know that the house lost power during the day by the fact that your microwave is flashing “Reset.” Looking at the time error will give you an approximate timing for the power outage.

By the way, finding a mechanical AC powered alarm clock was quite a search. There are not a whole lot of them being produced these days. However, at least here in North Carolina, I was able to find one at the local CVS Pharmacy.

Sam Garfield, a veteran broadcast engineer, owns and operates Dilicast Advisors, LLC in Raleigh, NC, a contract engineering firm which cares for both radio and television station needs. Contact Sam at sgarfield@dilicast.com



Low tech, but it does the job.

# The Worst I've Ever Seen

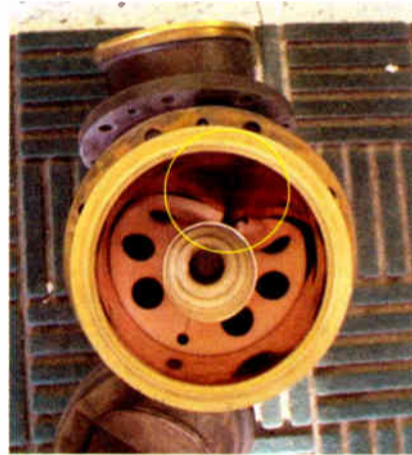
A Visual Display of the Good, the Bad, and the Plain Hard-to-Believe

## Why You Need to Know Who Accesses Your Tower

by Gary Peterson

At shared sites it has been common practice, in spite of warning signs, for tower crews to show up and climb the tower without notifying other tenants. In addition to possible exposure in excess of human RF exposure guidelines, they may do damage to someone else's equipment and leave undetected.

Recently – without my knowledge – a tower crew was on the TV tower on which two of my diplexed FM's lease space. A ten-foot length of conduit accidentally was dropped over one hundred feet, punched through the ice bridge, and nailed a 4-1/16" Myat elbow. The outer conductor caved in sufficiently to short to the inner conductor. This, of course, VSWR tripped the combiner and both HT-30s dropped off.



Fortunately, when I arrived at the site, the tower crew had not yet packed up and left. After seeing the VSWR trip indications, I quizzed them if they had damaged anything. At that point, they showed me the caved-in elbow where the line leaves our TX building. It looked like it had been run over by a truck.

The elbow was disassembled, hammered out, and re-soldered at a local welding shop. This got us back on the air after six hours at 25% power – pressurizing the line was not possible with this much damage – until a new elbow could be installed.

I still wonder if the tower crew would have left the site without telling anyone if I had not been able to get out there quickly enough.

Gary Peterson is the Corporate Engineering Manager for Triad Broadcasting Company in South Dakota. He can be contacted at kzerocx@rapidcity.net

# AM Ground Systems Co.

## Ground System Construction, Evaluation & Repair

### 1-877-766-2999

### www.amgroundsystems.com

- ◆ Has your station lost coverage over time?
- ◆ Is your AM ground system over 30 years old?
- ◆ Do you have a new CP or are moving transmitter sites?
- ◆ Has your ground system been damaged or vandalized?
- ◆ Is your base impedance or directional pattern unstable?
- ◆ Just wondering if you are getting all of the range your station is capable of?

If the answer to any of these questions is YES Call today for a free construction, repair or evaluation quote.

### Reliable On-time Installation

### Quality Workmanship

### Tower Tune-up

### Free Budgetary Estimates & Quotes

## “Who says IP-Audio is the future?”

## “They do.”

Some very well-known companies are embracing IP-Audio using Livewire™.



The Livewire logo is proof your new studio equipment can connect compatibly to IP networks for linear, high-resolution audio.

Livewire: professional networked audio over Ethernet.

© 2006 Axia Audio. Livewire TM TLS Corp.; all other marks TM their respective owners.



# Shively Labs®

FM Antennas and Components

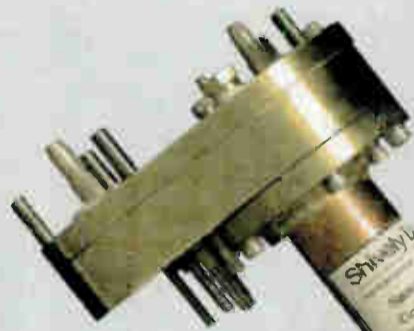
From Multistation to Multicasting  
Quality signals require quality components.



Model 2600  
Bandpass  
Filter



318F-9C  
Field Flange



Model 9413  
Power  
Splitter



318F-62  
Adapter



Model 6813  
FM Antenna

A Division of Howell Laboratories, Inc.  
Bridgton, ME 04009 USA  
(207) 647-3327 (888) SHIVELY  
sales@shively.com

- An Employee-Owned Company -

www.shively.com

# RADIO SYSTEMS' CONSOLES DAS HYBRIDS CLOCKS



Year after year, broadcasters depend on Radio Systems' studio products.  
For performance, price and dependability **THERE IS NO BETTER VALUE.**

Millenium 6, 12, 18 & 24 Channel Analog and Digital Consoles • 4x4a & DA-16 Distribution Amplifiers  
DI 2000 & TI-101 Telephone Hybrids • CT-2002 Clock and Timing Systems w/GPS and Infrared Remote

radio  
SYSTEMS

Radio Systems, Inc.

601 Heron Drive, Logan Township, NJ 08035  
phone: 856 467-8000 Fax: 856 467-3044 www.radiosystems.com

# Transmitter Shack

by John Stortz

## Using a Ground Tester to Evaluate the System Ground

In his previous installments John Stortz described how important it is to fully understand and implement good grounding systems for a transmitter site. This month John shares with us information on how you can test your system to evaluate its potential effectiveness.

In most cases, the tower ground is out of sight and often forgotten. But natural corrosion is likely causing a slow loss of the grounding system.

On an AM station tower, a change in the tuning impedance may be a warning of a deteriorating grounding system. However, the only symptom exhibited on an FM tower usually will be increased equipment damage from lightning.

### MEASURING THE "GROUND"

When the engineer thinks of measuring resistance, he naturally reaches for his favorite VOM. But ground resistance cannot be measured with a conventional Ohmmeter. Only a ground tester designed specifically for this purpose can provide meaningful measurements.

Soil chemistry greatly affects a VOM's accuracy, especially in highly acidic or alkaline soil. Buried dissimilar metals, can introduce subtle galvanic DC voltages into the circuit.

To demonstrate this effect, place a voltmeter between a ground rod and the rest of the ground system. You will likely observe a small DC voltage or current flowing between the two. What you are seeing is a galvanic voltage – the result of an electrolytic action occurring between dissimilar metals of the grounding system.

When measuring resistance, the VOM assumes the entire test current is coming from the Ohmmeter battery. Any galvanic voltage in series with the VOM will introduce major errors.

### VOM CAUSED CHANGES

Furthermore, if you connect an Ohmmeter between two earth ground systems for several seconds, you will notice the Ohm reading changes. The DC current (from your Ohmmeter battery) is passing into or out from the ground rod, causing a small electroplating action.

Indeed, a minute amount of material is being removed from one grounding electrode and deposited on the other. In effect, one electrode of your grounding system may be dissolving into the soil. The rate this happens is dependent on the amount of foreign voltage and the degree of soil acidity or alkalinity.

This is the reason why copper-clad ground rods should always be used with underground copper strapping or copper ground cables; never use zinc (galvanized iron) ground rods.

### MEASURE THE GROUND, NOT THE METER

Your VOM can compensate for the short test leads, which have little influence on the resistance under test. But a ground test loop might involve a hundred feet, or more, of small wire. In this case, the interconnecting wire could contribute a meaningful amount of resistance to the circuit.

A ground tester overcomes this problem using three electrodes. Additionally, the better ground testers overcome stray current problems by using high frequency (typically around 500 to 1000 Hz) alternating current – avoiding the galvanic problems mentioned above.



A Hioki 3151 Ground Tester Kit

As the schematic (Figure 1) shows, current flows from the Oscillator, through  $R_c$  [representing the Common electrode], through the earth ground to  $R_x$  [representing the earthing ground rod whose resistance is to be measured], and the current transformer. Since this is a series circuit, the current transformer creates a voltage across the potentiometer, which is proportional to the current passing through the ground rod  $E$ .

Ground rod  $P$  also has an unknown resistance. But since no current flows through  $P$ , there is no voltage drop across  $R_p$ .  $P$  is a voltage probe, sensing the ground "voltage" as seen at the earth ground. The voltage between  $P$  and  $E$  represents the voltage drop across ground resistance  $R_x$  – the value we wish to measure.

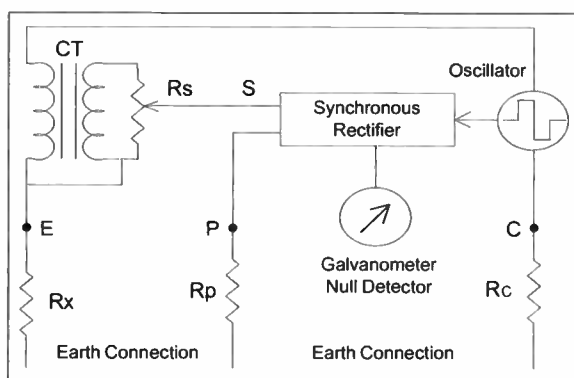


Figure 1 - Measuring a ground system.

The synchronous rectifier converts the AC sample back to DC, so a simple galvanometer can be used as a null detector. When the potentiometer is adjusted so that  $R_s = R_x$ , the voltages will indicate a null on the galvanometer. The potentiometer is calibrated in Ohms and indicates the value of  $R_x$ .

There are two additional benefits to using the synchronous detector. Incoming voltages are rectified in synchronization with the oscillator. Any stray voltages at other frequencies will appear as random noise and cancel out. Stray currents from power lines should not affect the accuracy of this meter. Neither will the DC galvanic currents mentioned earlier.

### GETTING ACCURATE MEASUREMENTS

It is very important to realize that these ground testers are unable to measure the station's entire ground resistance accurately unless all utilities are disconnected from the site – power ground, telco ground, and possible grounds to water pipes or well pumps.

This is because any of these sources could be inducing current into the ground, causing chemical reactions (as above) and distorting the results.

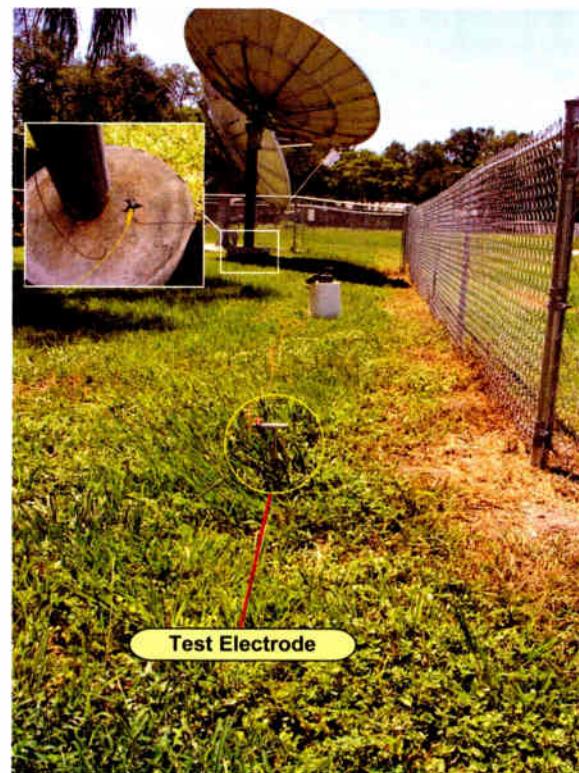
For example, at our site, a ground test revealed the ground at a satellite dish was 11 ohms, but it gave a false reading of 1.6 ohms when the coax was left attached to the dish ground.

### RUNNING OUR OWN TESTS

Recently we were able to seize upon such an opportunity at WHGN, when the power company cut all of their lines to our building in order to work on the meter box.

We were fortunate to have been able to obtain a Hioki Model 3151 Earth Tester for less than what it would have cost us to hire a testing company to make two tests.

The Hioki 3151 is simple to use. You start by connecting the two electrodes plus the ground rod to be measured.



Setting up the Ground Tester

Then you check the battery condition, select one of three ranges [x1, x10, x100], set the potentiometer to the null and read the resistance on the dial – allowing for the multiplier selected.



The author using the Ground Tester.

We found our station ground measured 17.2 ohms, while the ground rod for the power company's last pole was about 19.5 ohms.

The 3151 produces up to 50 VAC from six AA batteries; they are rated for approximately 1,400 tests. Even if the original batteries still test "good" we feel it is best to replace the batteries after two years (if a cell becomes reverse-charged, it could leak into the tester).

While not something we would use daily, a ground tester is the only way to measure and assess the important parts of the station's lightning protection system.

John Stortz is Chief Engineer for the Moody Broadcasting in Central Florida. John can be contacted at KA4FLX@aol.com

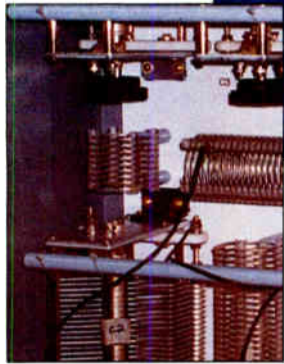
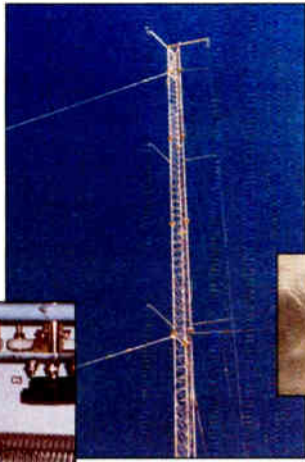




# nott ltd

3801/4001 La Plata Hwy  
Farmington, NM 87401

Manufacturers  
of the  
**Gila-Stat**  
Lightning  
Prevention  
System



Design and Manufacture of  
**Folded Unipole Antennas**  
Structure Detuning Systems



Distributors of  
**Nello Towers**  
and Accessories

**N E L L O**  
CORPORATION

Phone: **505-327-5646**

Fax: **505-325-1142**

Website: [www.nottltd.com](http://www.nottltd.com)

Email: [info@nottltd.com](mailto:info@nottltd.com)

Over 40 Years  
Broadcasting  
Experience



- Model MBC-1 Message Board Controller**
- converts status inputs to LED display data
  - 15 prioritized logic-level signaling inputs
  - momentary or maintained signal inputs
  - fully programmable color display with graphics
  - pre-programmed "starter" messages
  - multiple displays from one controller



- Model ACU-1 Audio Control Unit**
- 8 input by 1 output stereo audio switcher
  - 8 momentary or maintained output relays
  - 16 logic-level status inputs
  - silence sensing with adjustable sensitivity
  - optional temperature sensing capability
  - computer controlled via "multidrop" RS-232

## innovative solutions

**Model CAS-1 Con/Air Switcher**

- eliminates delay from studio headphone monitor
- immediate warning on air signal failure
- adjustable EQ and compression of monitor audio
- air signal is not altered in any way
- balanced audio input and output
- optional rack mount available



**Model TAS-1 Telephone Announcement System**

- digital message storage--no moving parts
- variable outgoing message format
- inactive or defective telephone line indicator
- resettable incoming call counter
- temperature delivery in Fahrenheit or Celcius
- battery backed AC synchronized clock



 **Sine Systems**, inc

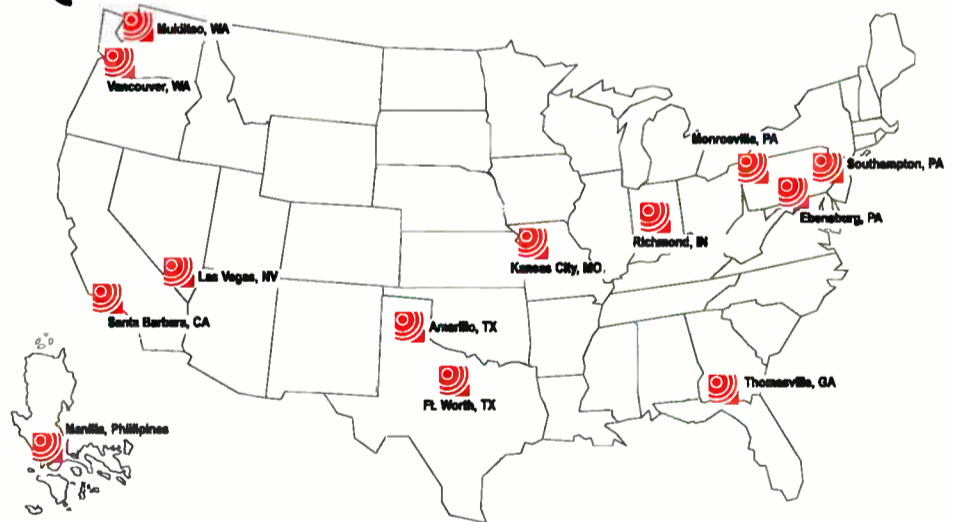
615.228.3500  
[www.sinesystems.com](http://www.sinesystems.com)

# RF Specialties® Group

Hi, thanks for reading our ad.  
Most sporting events are off and running.  
The **RF Specialties Group** has the remote  
equipment you'll need to do a  
bang up job covering the games.  
Microphones, Sports-Headsets, Mixers,  
POTS, ISDN, Marti RPU equipment  
and the list goes on.

**Give us a call!**

The call is free and you'll discover,  
**RF Specialties** is your ticket  
to a perfect Sports Season.



## RF is Good for You!

Visa and Mastercard are welcome.  
Offices Independently Owned and Operated.

[www.rfspoc.com](http://www.rfspoc.com)

Sam Lane	.....Santa Barbara, CA	.....1-800-346-6434
Bill Newbrough	.....Las Vegas, NV	.....1-888-737-7321
Bob Trimble	.....Vancouver, WA	.....1-800-735-7051
Walt Lowery	.....Mukilteo, WA	.....1-425-210-9196
Don Jones	.....Amarillo, TX	.....1-800-537-1801
Wray Reed	.....Ft. Worth, TX	.....1-888-839-7373
Chris Kreger & John Sims	.....Kansas City, MO	.....1-800-467-7373
Rick Funk	.....Richmond, IN	.....1-888-966-1990
Ed Young	.....Monroeville, PA	.....1-866-412-7373
Dave Edmiston	.....Ebensburg, PA	.....1-866-736-3736
Harry Larkin	.....Southampton, PA	.....1-888-260-9298
Alan Slaughter & Chris Hall	.....Thomasville, GA	.....1-800-476-8943

Ed Edmiston .....RF Specialties of Asia .....+63-2-412-4327  
(Manila, Philippines)

# Tech Support

## Forum

by Ted Alexander

### Tech Support Follies

#### Listening in on Customer Support Calls

No matter how much care manufacturers take to send equipment out in perfect order, problems can develop. Given the time pressures under which many stations and engineers work, getting timely, useful tech support is critical. As Ted Alexander shows, accomplishing this is a team effort. The question is who is on the team?

First off, let us pause for this important announcement: "Ladies and gentlemen. When you call for technical support, please come "armed" with the necessary information."

#### HELP US HELP YOU

It really saves us both a lot of time and prevents false starts if you know the make and model of the equipment you are calling about. As we discussed last month, it always helps to read the instruction manual; often you can solve a problem instantly with the instructions in the box.

On the other hand, there are many problems whose solutions are not immediately obvious. So it helps a lot if you have a complete description of the problem behavior. What does the unit do? And where in the process of operation does it fail?

If you want to return something for factory service, have the serial number ready – and please have your own company's address and phone number at hand. (Yes, we do get calls from people who do not know where they are!)

Of course, when you need help, we want to make sure you get it quickly. We will happily offer some tips to look for at the beginning of the troubleshooting process, but until we can get some hard data while the box is in "failure mode," it is tough to pin down the exact cause.

Our goal is to be there for you. But, please – be prepared when you call. After all, you are our "remote eyes and ears." With teamwork, we can locate and troubleshoot the problem rapidly, and get you right back to work.

#### THE RIGHT NUMBER

Then there are those thankless times, when we meet a frustrated customer who does not realize that he is in queue with a half dozen other callers. Of course, he is positively sure of his make and model of equipment, and who manufactured it, until it is his turn with the tech support engineer.

Tech Support Rep: "Hello, tech support."

Frustrated Customer: "Ahhhh - Finally! You know that blue box of yours has never worked right. We got it brand new, three months ago, and it has never worked right. It keeps dropping calls, it is hard to dial up, and I just wish we never bought it in the first place."

TSR: "Well, sir, can you be more specific about what you find so wrong with it?"

This goes on for several minutes and, as the customer goes on, it becomes apparent that the piece of equipment he is complaining about is not one of ours.

TSR: "If you wish, sir, could you put that in writing so we could use it in our next advertising campaign?"

FC: "Huh?"

TSR: "Sir, the equipment you are describing – that is our competitor's box."

A long pause occurs at this point.

FC: "Oh, that's right. Oops. I wish I had your box. I used to have one until I had to send it to another station in our group and they gave me this one. I hate it. Thanks, anyway."

All is well that ends well. Unless, that is, you are the tech support person at the other company.

#### THE RIGHT TERMINOLOGY

Sometimes, callers who are seeking help just do not know the right words. So, before the troubleshooting can start, the tech support rep gets a chance to play "Guess what gear I have?"

Tech Support Rep: "Good morning, tech support"

Caller One: "Hah gize. Ima havin' trouble with my High Bird."

Tech Support Rep: "Hello, tech support"

Caller Two: "Hi. I'm having trouble with my Zeffler..."

Tech Support Rep: "Hello, how can we help?"

Caller Three: "Do you guys know how to find out if my IDSN line (or IDNS, SIDN, NIDS, etc.) is having a problem?"

TSR: "We certainly can try. What is your problem?"

C3: "They say I need some help with my SPIT?"

And then there are those questions that seem to identify non-technical callers rather quickly: "What's my Kodak?" "What's a POTS?"

#### "HELP ME QUICK!"

Then there are the panic calls. Something has happened that is affecting the on-air signal. And it needs to be resolved *right now*.

Tech Support Rep: "Hi, tech support"

Panicked customer: "Good morning. I need help. My processor's output has dropped to about 40%."

TSR: "OK. What's the model of your processor?"

(Continued on Page 28)

**DYNAMIC!**

Prophet Systems  
is your  
TECHNOLOGY RESOURCE.  
Look no further.

Digital Content Asset Management  
Over 2,000 stations trust NexGen to keep them running everyday.

HD Radio  
Prophet's Importer is leading the way, with new iBiquity features first.

Music Scheduling  
Perfect music scheduling AND perfect promo scheduling with MusicGen.

Podcasting  
XLR8R creates podcasts 8 times faster than real time.

Newsroom Software  
NewsBuilder gives you the features you expect, with a smaller learning curve than you expect.

Streaming Software  
Use the same technology the big boys use. PSI101 gives you the control you need over your sound.

Logging  
Digillogger makes logging up to 8, 16, (insert any number) stations simple.

WANcasting  
Send your audio and logs anywhere by clicking a button with WANcasting.

PrizeWatch  
Central location for contest inventory and reconciliation.

On-Line Academy  
Train on the latest software updates from your own desk. Live Web-ex sessions.

**PROPHET SYSTEMS**  
1-877-774-1010 • Sales@prophatsys.com • www.prophatsys.com

Visit Us at  
NAB Radio  
Booth #209

# WE GIVE RADIO SUPER POWERS



**YES. REALLY.**

Continental Electronics' 816HD FM offers the highest power transmitter on the market for low-level combined digital HD and analog FM. The 816HD can deliver 28kW of power for the strongest, cleanest signal on the airwaves. And since the 816HD FM is built "Continental" tough, its performance and reliability will make you a superhero! For more information, call 800.733.5011 or visit our web site at [www.contelec.com](http://www.contelec.com)



## Digital and Analog Transmitter Audio Switching Solutions, Analog to IBOC!



The AES-302 Digital Audio Switcher/DA/D to A Converter



The CDS-300 Composite Audio Switcher/DA



The CDS-302 Automatic Composite Audio Switcher/DA

Introducing the next generation transmitter audio switchers from BDI. Now you can have complete confidence in your signal path with this series of switcher/DA systems. We have composite and digital solutions for your routing and distribution requirements. If your system is all digital, choose the AES-302 to automatically switch, distribute and monitor your transmitter audio feeds. Still running an analog STL or stereo generator? Use either the CDS-300 or 302 to switch and distribute your baseband audio signals. Select one of the optional modules for the CDS series and convert your analog signal path into an AES digital output suitable for digital excitors and IBOC implementations. Visit our web site and download complete information about these problem solver products.

**Broadcast Devices, Inc.**  
Tel. (914) 737-5032 Fax. (914) 736-6916  
Website: [www.Broadcast-Devices.com](http://www.Broadcast-Devices.com)



75412 Highway 25 • Covington, LA 70435 - U.S.A.  
800-624-7626 • 985-893-1243  
Fax: 985-892-7323 • [www.freeland-inc.com](http://www.freeland-inc.com)  
Email: [freeland-inc.com@freeland-inc.com](mailto:freeland-inc.com@freeland-inc.com)

**LOOKING TO CUT YOUR BUDGET?  
LET US HELP REDUCE YOUR  
ENGINEERING COSTS WITH REBUILT TUBES.  
WE OFFER A GREAT WARRANTY, QUICK  
SERVICE, AND A MONEY SAVING PRICE!**

**We also buy used tubes.  
Recycle those unwanted duds for \$\$\$ CASH \$\$\$**



We are a third generation,  
American owned and operated company,  
rebuilding quality tubes since 1940.

### Freeland Products, Inc.

75412 Highway 25 • Covington, LA 70435  
1-800-624-7626 • 985-893-1243 • [freeland-inc.com@freeland-inc.com](mailto:freeland-inc.com@freeland-inc.com)

**Take  
10% Off**

**— THE COST OF YOUR NEXT  
REBUILT TRANSMITTER TUBE.**



This original *Radio Guide* coupon must accompany the used tube when sending it in for rebuilding, for discount to apply.

This coupon is only valid for one rebuilt tube.  
COUPON COPIES ARE NOT VALID

### Tech Support Follies

Continued From Page 26

PC: "It's an Omnia."

TSR: "An Omnia what?"

PC: "An Omnia FM processor."

TSR: "Well, we have the original Omnia Classic, the Omnia 3, the Omnia 3 Turbo, as well as versions 4.5, 5, 6, and several varieties of the HD model."

PC: "Oh man, I don't know."

TSR: "Well if you describe it, we can determine which one it is and get specific about the troubleshooting."

PC: "Oh, well, it's about 50 miles from here, at the transmitter."

TSR: "Can you remember anything about it?"

PC: "It's got a black front with a big knob."

This went on for a short while. To save you from excessive grinding of your teeth, it took a while but we finally got enough information from the caller to determine what model he had and arranged for the appropriate service.

In situations like this it sure would be nice if we were able to have the remote viewing ability that Art Bell talks about on occasion.

#### THE RIGHT PROBLEM

However, sometimes it is no better even when a piece of gear is sent in for us to look at on the bench. We run it through the same series of tests that we do on a new piece of equipment. It still is not always clear why the customer returned it.

Tech Support Rep: "Good morning. This is Ted calling you back from tech support."

Warranty Customer: "Hi there."

TSR: "I'm calling to let you know that the unit you sent in for service is working fine. We had it on the bench for three weeks and could not make it fail."

WC: "Well, are you guys sure you tested everything on it?"

TSR: "Yes. We gave it as thorough a test as we do to each piece of new equipment. Can you give us any more information as to what trouble you had with it?"

WC: "No. The note from the intern said it doesn't work. Can't you find what's wrong?"

Pardon me. My magic wand's battery ran down this morning.

#### "CAN YOU PLEASE REPEAT THAT"

Cell phones are wonderful, are they not? They compress the audio, throw out 95% of the data, and magically reconstruct the voice frequencies with amazing precision.

They work at transmitter sites and in very low signal strength environments, too. They are even better when using the speakerphone function:

Tech Support Rep: "Hi, this is tech support"

Mobile Caller: "Gmaun. I'm caulnfrum dubyalumf. Hou-subnif-pp-pupnin?"

TSR: "I'm sorry, you're breaking up, can you try a land line, or move to a better spot?"

MC: "whoosh ... ut-ut-ut-mitter site, it's noisy here ... can you hear me now ... sssss."

TSR: OK, how can I help you?"

MC: "t.....ut-ut-ut ...."

TSR: "Hello?"

At this point, the line disconnects with a click. A few minutes later, the caller tries again.

TSR: "Hello. Tech support"

MC: "... pft-cell phone-puh-whoosh-can you hear me now?"

TSR: "Just a bit ..."

MC: "OK, good. Our box that we use 24/7 on a dialup ISDN line has been dropping the line every three or four weeks. What's wrong?"

TSR: "Have you observed what happens when it drops? Do you lose sync? Does the modem light show an interruption?"

MC: "I don't know, both sites are unmanned and we'd have to send someone there to look at them. Can't you just tell me what the problem is?"

TSR: "Well, have you at least checked to be sure all your wiring is tight and clean?"

MC: "We can't get there that often. —ut-ut-boss says—budget-fith-nunc-ut-hear me now 'bzzzztspffft'...."

TSR: "Hello? ... Hello?"

Cell phones; you have got to love them. Can you hear me now?

As you can see, tech support can be a challenge. Still, I enjoy it, even with the occasional "strange" call, and look forward to it each day. If you have a problem, please call. Tech support is here to help!

*A well experienced chief engineer for many Cleveland area radio stations, Ted Alexander is now one of the friendly voices at Telos/Omnia/Axia tech support. You can also email Ted at AMFMTV@aol.com*

### Radio Guide on CD

The Broadcaster's Desktop Reference  
Now Includes PDF Archives of Radio Guide

[www.radio-guide.com/products.html](http://www.radio-guide.com/products.html)



## Ready for Digital. Ready for Anything.



#### Virtuoso V5

1.5 kW Digital, 4 kW Hybrid, 5.5 kW Analog Transmitter

##### More Versatility

- Digital adaptive pre-correction
- Integrated Engine
- Programmable pre-selections for frequency, power and audio source
- Frequency agile: N+1
- Better than 62% overall efficiency
- AC Voltage: 185-250VAC, Single and Three Phase

##### More Robust

- Redundant ventilation fans
- Dual IPA power supply
- Dual low voltage power supply
- Dual IPA

##### More Service-Friendly

- Hot-pluggable RF modules
- Hot-pluggable PS modules
- Dual digital exciters
- Compact, light weight rack (23"W x 72.5"H x 34.5"D) is ideal for tight spaces



Phone: (207) 947.8200 Fax: (207) 947.3693 info@nautel.com www.nautel.com  
HD Radio is a trademark of iBiquity Digital Corp. All rights reserved.

## Making Digital Radio Work.

**TITUS  
TECHNOLOGICAL  
LABORATORIES**

**3-DRX**

DIGITAL AUDIO SWITCHING  
THE LOGICAL WAY

Automatically switches between two AES digital audio signals or a stereo analog signal. Analyzes digital signal errors (CRC, bit framing, etc.) and checks for loss of audio on the digital signal. User programmable.

**800.806.8851 WWW.TITUSLABS.COM**

**GR**

**GORMAN-REDLICH**

257 W. Union Street, Athens, OH 45701  
Phone: 740-593-3150 – Fax: 740-592-3898

30 Years Experience with  
Alerting Equipment



Model CRW-S Weather Receiver

**Model CRW-S Weather Receiver**

For receiving alerts from the National Weather Service (NWS). Redesign of our Model CRW now with the "SAME" decoder feature.

**Easy to Use and Reliable EAS Equipment\***

- Pre-programmed for your location.
- Program interrupt relays built in.
- Six audio inputs.
- 2 minutes stored audio.
- All operations via keypad.



EAS1 Encoder-Decoder

**EAS1** Encoder-Decoder

**EAS1** Decoder

**EAS1-CG** Encoder Decoder with built-in character generator.

\*Optional DTMF interface available.



Model CMR Digital Antenna Monitor

**Model CMR Digital Antenna Monitor**

- Remote Controllable
- True ratio readings.
- Phase sign automatic, no extra operation.

Contact Jim Gorman at: 740-593-3150

jimg@gorman-redlich.com – www.gorman-redlich.com

Design » Build » Installation

Ram Broadcast Systems builds studios for most of North America's major networks, group stations, and news organizations.

Ram offers comprehensive studio design, fabrication, systems integration, and components. Put Ram's 35 years of experience to work for you:

- Studio Design & Fabrication
- Pre-Wired Systems
- Broadcast Furniture
- Switchers
- Metering
- Amplifiers
- Wire & Cable
- Racks
- Accessories
- Used Equipment
- And More!



Radio and Television Studios



RAM Broadcast Systems  
www.ramsyscom.com  
**800.779.7575**

### A Useful Filing System for Stations

*Everyone hates paperwork. Well, almost everyone – government agencies and lawyers do seem to live for paperwork. Ken Benner shares some suggestions that should both satisfy the regulatory agencies and still help us find what we need.*

Among the handouts I provide to the stations I inspect under the Alternative Broadcast Inspection Program (ABIP) is a method for controlling station files.

Most stations really seem to appreciate a simple system that provides a place for every document in any station.

#### VALUABLE PAPERS

Broadcasters have long expressed frustration about maintaining the required files – and determining whether they go in the Public File or somewhere else. The lack of the right files in the right folders can cost valuable time and money should the FCC visit.

The following method is an effort to simplify this problem by defining what does and does not belong in various areas of a station's filing systems. It was developed as an educational aid under the State Broadcaster Association's ABIP program and should not be construed as legal advice.

All stations should maintain four distinct, separate filing systems defined as follows:

#### THE PUBLIC FILE

The Public File should include *only* the 16 folders (for radio, 19 for television) as defined in our Alternative Broadcast Inspection Program. The radio folders were described in the May and June 2003 editions of *Radio Guide*.



The folders must be maintained so that the least experienced staffer assigned can properly maintain the Public File and assist members of the public who have the right to review it.

I suggest the appropriate file descriptive paragraphs from the FCC's EB-18AM or EB-18FM be reproduced on the front of each folder to show exactly what belongs in each folder and – more importantly – when it comes out: three years for letters from the public, two years for political material, immediately for applications that have been denied or, if approved, when the license has been modified to reflect that approval.

#### AN "EXTRA" FILE?

I have received several email questions about why I suggest a separate Public File folder, entitled "Non-Candidate Issue Advertising," since it is not addressed in any of the FCC Self Inspection Checklists nor in the FCC Rules addressing Public Files.

The reason is that while the Commission suggests both candidate and issue ads are essentially "political," the fact is there are substantial differences between the two. In fact, the NAB has produced separate forms for each.

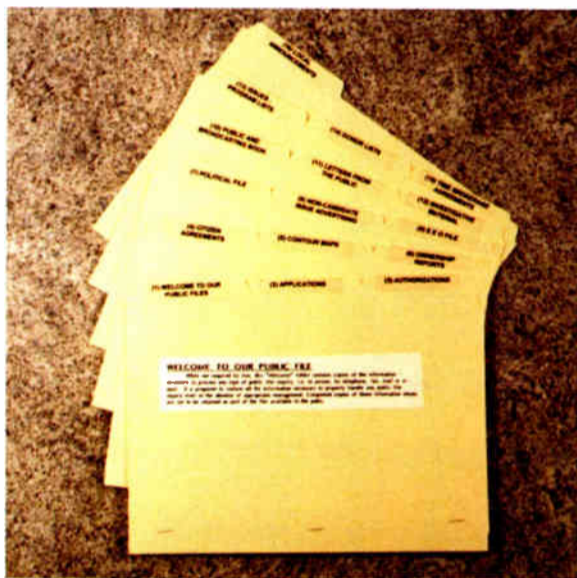
Among those differences:

1) "Lowest Unit Rate" (LUR) does not apply to "issue" ads.

2) There is no applicable 45/60 day "window" before a primary and general elections involved with issue ads for which these varied rates apply.

3) Nor are issues such as tax increases, abortion, stem cell research, and other referendum issues in any way related, in most cases, specifically to any candidate.

Furthermore, the Commission's previous Personal Attack Rules were vacated back in October of 2000 by the D.C., U.S. Court of Appeals. Thus, my suggested separate Public File folder for issues and attack ads serves well to differentiate between these two quite different types of ads despite the FCC's and the NAB's frequent categorizing of each as "political."



Ken's 16 Public File Folders

In a recent memo, received from the Commission responding to my question about the necessity of the "Issues/Non-Candidate" folder, I was advised; "Section 315(e)(3) of the Communications Act requires that this information be maintained in the station's Political File. We have not yet amended our Rules for a conforming Rule."

Thus for convenience I suggest individual folders.

#### WHEN IT DOES NOT APPLY

Please note: it is likely *all* stations typically will have several Public File folders that will, from time to time, be empty. An example would be the "Applications" folder when there are no applications pending, the "Time Brokerage" folder if the station is not operating under such an agreement, the "Donor List" for commercial stations, or the "Letters from the Public" folder for non-commercial stations.

For those folders that do not apply to current operations, it is a good idea to insert a memo sheet stating "This Public File Folder Is Not Applicable To This Station At This Time" into such files.

By the way, for FCC purposes, a copy of any official document is just as valid as the original unless it has been modified. *Never* place the originals of anything in the Public File – since you never know what to expect from the public. (More than one station that I have inspected has learned this lesson the hard way!) I suggest the originals be kept in a fire-proof strongbox off site for obvious reasons.

#### MANAGER'S FILE

The Manager's File includes all manager business-related items, the sales manager's files, the news director's file, personnel files, insurance files, internal office memos,



If nothing is required for a particular file folder, simply make that fact known.

station correspondence and other obsolete items previously placed in the Public File.

For example, these would include license renewal applications following the actual renewal, obsolete political files, investigative reports, EEO reports, Time Brokerage Agreements, etc. that could possibly assist management in the future if it was necessary to address those same issues again.

#### THE ENGINEER'S FILE

The Engineer's File includes: all technical reference material, equipment manuals, EAS logs, Quarterly Tower Inspection reports, annual NRSC-II AM bandwidth measurements, schematics of all equipment, and maintenance records.

It is also the place for processed technical modification applications – for example, power increases, new antenna, change of tower locations, STL location changes, meter calibration logs, etc. – items that no longer belong in the Public File. Obviously such information will be very valuable years later so the engineer can determine whether or not things are as compliant today as they were when the modification in the application was implemented.

It is no longer required – but certainly good engineering standards strongly suggest – that you include in your maintenance records things like air filter changes, motor lubrication, details of defective equipment repair, manufacturer's customer service memos, and a comprehensive diary of maintenance.

For stations that employ contract engineers it is absolutely essential these files be reviewed and preserved by management as personnel changes occur.

#### THE OBSOLETE-HISTORICAL-SCRAPBOOK FILE

The Obsolete-Historical-Scrapbook File includes all other items. For example, expired licenses, items of historical significance (the very first license issued to the station, the first day's program log, photos of the first day on the air), letters of appreciation from prominent people, commendatory news clips – anything that does not belong in any of the above files, but does not quite qualify for the wastebasket.

Hopefully, this has provided a helpful answer for any stations which have saved stacks of useless material out of fear of a large FCC fine. Sometimes the filing system gets so overwhelming that no one is willing to purge the obsolete and it just grows into an unmanageable beast.

Perhaps it will help you avoid being like one station I inspected several years ago. They hauled nine – yes, *nine* – 55-gallon drums of obsolete "Public File material" to the dump following my inspection.

*Ken Benner is an active Alternate Inspector with the ABIP in several states. Based in Tucson, he's happy to answer your questions at [bennerassoc@comcast.net](mailto:bennerassoc@comcast.net)*

# DYNAMIC DIGITAL DUO!

Digital DA 2X8 and DigiMatch 2X6 are ideal whenever you need to **distribute** digital audio, or **convert** between AES/EBU and SPDIF formats!

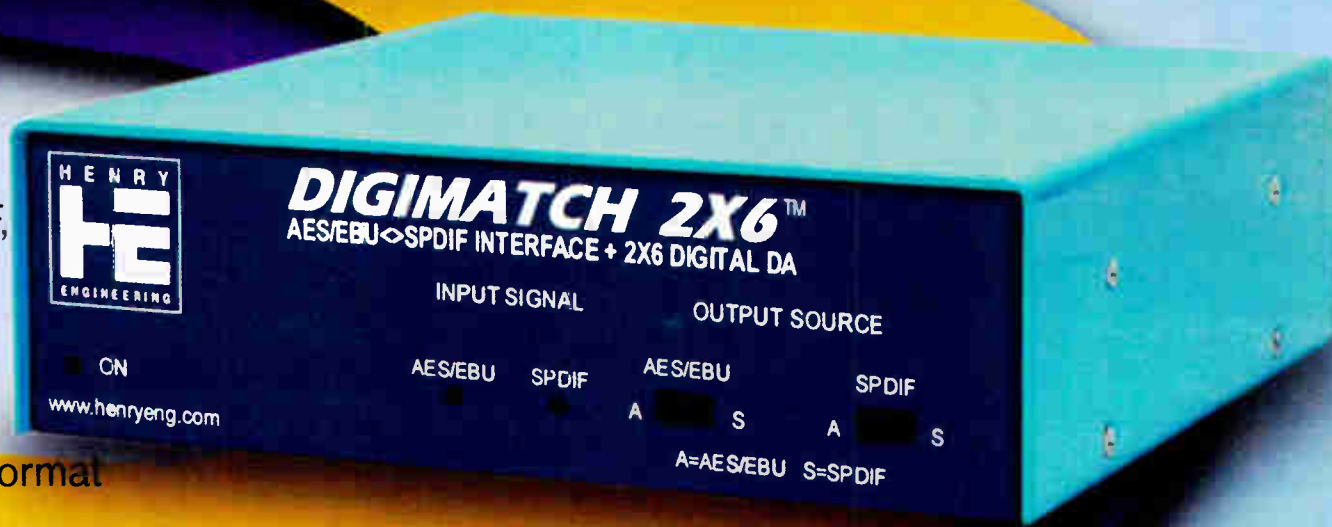


**Digital DA 2X8** distributes AES/EBU signals to 8 places. Use it as either a 1X8 DA, or as a pair of independent 1X4 DAs!

- Transformer balanced I/O
- Zero delay or latency
- Built-in AC power

**DigiMatch 2X6** converts between AES/EBU and SPDIF, and functions as a mini-DA!

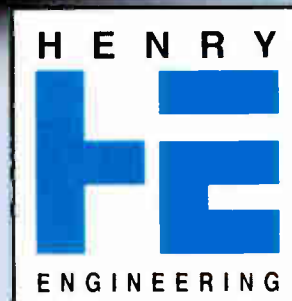
- Format-converts in both directions
- 3 outputs for each format
- No changes to data



*In stock at all Henry Engineering dealers.  
Visit [www.henryeng.com](http://www.henryeng.com) for full specs.*

**626.355.3656**

***We Build Solutions***



## Developing Good Passwords

What makes a good password, you ask? Or are any old passwords good enough? You know what the Bard wrote: "A rose by any other name would smell as sweet."

Actually though, you may be surprised – some passwords really stink!

### PASSWORD POLICIES AND PEOPLE

Recently, an on-line mailing list for broadcasters (the *Broadcast* list at [www.radiolists.net](http://www.radiolists.net)) had a discussion about password practices – some good, some bad. Some of the experiences were, frankly, amazing.

Obvious passwords are bad, but strings of characters so complex they get written down are much worse.

For example, some company employees have e-mail, but often find they cannot access it – they seem to get locked out of their accounts regularly because they forget their passwords. Or how about the company that uses a lengthy line of letters and numbers for the login and password, only to find the staff taping them to the studio monitors?

This is exactly why lengthy strings of random characters are a really, *really*, bad idea. Posted passwords are, in effect, no password at all.

### BAD PASSWORD IDEAS

Posted passwords are as bad as passwords like "password" or "123go."

Many more examples are possible, such as anything a bank or credit card company has ever used. These would include your mother's maiden name, *any* digits out of a social security number or credit card numbers, and addresses.

Worse, passwords that are complex are unlikely to change very often. Unchanging passwords in a world of three-gigahertz-plus speed password-crunching attack computers is not a good idea.

The exception would be machines that auto-logon and do not have number of character restrictions, like the individual's company workstation, or roving profile. There, a 245-character "random" string that is entered once and never again seen by human eyes is entirely workable. Most likely, the machine will be replaced long before a password generator would have had time to crack it.

### PASSWORDS FOR PEOPLE

Moving targets, like changing passwords, are much harder to hit. For human use, pass-phrases are much better, provided they are not too obvious. Something like *The Quick Brown Cat Jumped Over The Lazy Fox Back* – slightly changed, long, but easy for human memory.

Also good are apparently random strings derived from a pass-phrase, something like *MBWhiO14* derived from "My beloved wife's birthday is October 14" (This has the double-advantage of reminding one to buy that birthday present).

Of course, using the actual phrase as the password is better.

### INTERNET CONSIDERATIONS

The use of actual phrases is definitely a good idea for any machines that are exposed to the Internet. The reason is that while *any* combination of "random" characters can be broken by a brute-force password generator, it is unlikely such a generator could re-create your phrase.

In many cases, a fair "generic" password would be something like the first and last letter of each word in the station slogan, in order, and including at least one real word. These things are easy to remember, yet difficult to decipher if one is not familiar with station operations or the details of an individual's life.

On the other hand, someone who is trying to crack your account might know some details of your life, so your child's name is a bad idea. Remember "Joshua" from *War Games*? Likewise, names of persons you admire, spouses, parents, etc. are bad choices.

It is also a not bad idea to change passwords anytime an employee leaves, for whatever reason. Anything taken from anything that would eventually end up in a trash can, like non-shredded credit card statements or old program logs, is a bad idea.

### DEVELOPING STRONG PASSWORDS

Good are seemingly random combinations of words; constructs like *spatula&motorcar*. They have enough characters to be secure, but with no apparent relationship between the words and the random character separator. It is my opinion that these make some of the best passwords.

Want to be even more secure? Use three words, such as *ThE%paSsword\*was* with random letters capitalized. The more words, the more non-standard characters, the stronger the password will be.

Hopefully, you are getting the idea.

### HOPELESS USERS

Of course, for the personality whose password is her own surname – and she manages to forget it at least once a week – there just is no hope!

This is one of the reasons on-air and other such mission-critical machines should be set up to auto-logon to whatever account is necessary to maintain normal operations – and this should not be the same as the account used for administration.

A password for a critical system, forgotten because it was a long string of unguessable random characters for "high" security, can be much, much worse than no password at all when that system goes down. Even a post-it note password will cause unnecessary delays in getting those machines back on-line and making money.

Of course, none of these machines should be exposed to the Internet without a very secure firewall between (and things like web browsing severely restricted), but that kind of system security is the crux of another article.

### STOPPING PASSWORD CRACKERS

Most crackers will try a dictionary attack first or simply try the more obvious permutations in common use, like *password*, *PaSsWoRd*, *Passw\*rd*, *letmein*, *letmein45*, *root*, *toor*, etc.

It is not safe to assume that 14 characters are enough (because that was a common limit for Microsoft for many years), but it probably is sufficient unless a determined cracker uses the "brute force" automated generation of many random characters until they hit one that works.

By the way, most current brute force generators will normally filter and skip actual words, because it is well known that the common "random" password web sites do not generate real words. They also skip the common dictionary permutations.

I have often wondered just how secure it would be to use a combination of common permutations, separated by a few random characters, something like *webmaster\$#@root*. The words will be tried by a dictionary attack, but the random characters will not. Likewise the random characters would be tried in a brute-force attack, while the real words will not be used.

Oh, that bit on TV where the password generator ticks off single characters "found" to be part of the password? Pure fiction. I know of no system that signals pass or fail until the entire password is entered, rightly or wrongly.

### PASSWORD POLICIES TO AVOID

Unfortunately, many on-line banking systems will signal that the user name was correct, but the password failed. What are they thinking?

Older Microsoft systems are known to work in reverse. Give them a valid password, and they do not even check the user name. If you are using any NT4 systems, be aware that they and Windows 3.x, as well as Win9x systems, do work this way – at least, in part.

Pass-phrases and common words in uncommon combinations are far more secure than long strings of "random" characters. They will not be in the dictionaries and it will take a brute force attack years to hit that "random" combination – *if* it has been reprogrammed to include real words. If you have a cracker after you that is that determined, you have worse problems than simple net scans and weekend visitors.

### SOME USEFUL IDEAS

In an air studio, where "talent" is not known for good password retention, I would recommend using something like the first and last letter of the names, both first and last names, of each person on the morning show.

Use their real names, not their air names, and include at least one real word; it seems in many situations that is about as good as it gets. If you find that they have written this down, it is past time to reconsider.

Another idea is something like the old authenticator list we used to get for EBS, where the password de jour changed daily. If the passwords on the list follow the above rules for combinations of words, this will be hard to beat, but has the disadvantage that no one can remember them, so they will be written down.

### REALLY STRONG PASSWORDS

In a data processing center or the IT department, if one wishes to get really secure and one can assume some degree of intelligence on part of the authorized people, passwords that change with time of day and date are almost impossible to crack, unless it is too obvious. Even then, a cracker has to know that this happens in that IT center.

Real good would be some easily manipulated algorithm that uses the date and hour of the day in conjunction with a word list. Better would be for the words of the day to be generated by one of the machines and passed from shift to shift. Even written down, they will expire at the end of the day.

Something like the words *apple* and *lawnmower* taken from the daily list, then using the date and time – two time zones removed – can produce a password like *apple914061217lawnmower* for a station in Massachusetts when it is actually 2:17 PM on September 14 2006.

It does help to know that I am considered one of the more paranoid system administrators out there. Therefore, you can imagine my glee when I discovered that some UNIX systems will accept the back space as a valid character.

Tricks like that virtually insure that accessing some of the machines I have set up is not going to happen by random chance, nor by using Internet password finders. I am pretty sure Microsoft systems will not even transmit the back space character, so a large portion of the "script kiddies" we worry about have been easily blocked by this "simple" trick. Learning to think outside the box can have advantages.

### VPN PASSWORDS

There are secure "VPN" type applications that generate passwords for each session. The applications agree on a temporary password for the moment, encrypt and then use that secure channel to negotiate the password and encryption that will be used for that session.

A caution: while this may be easy for machines, it may not be so good for the Traffic person.

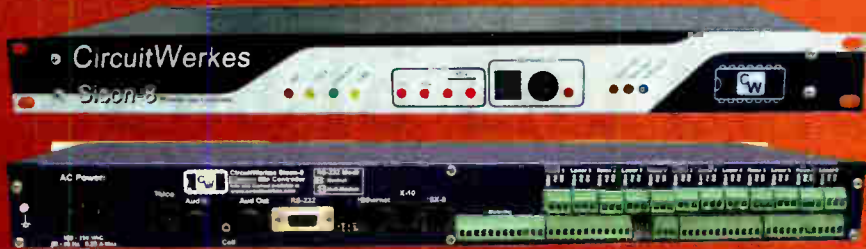
We can wax poetic, but the most secure passwords likely, are for *you* to invent what method(s) or combination thereof that you will use – introducing a bit of randomness, you being you, into the methodology.

In the end, just keep in mind that simple, yet really secure, passwords are possible, but they are not going to come from random character generators.

*Curt Flick is a contract engineer based in Akron, OH. Known as "Cowboy," he can be seen almost anywhere in the country as he works on a variety of broadcast station projects. Contact him at [curt@spam-o-matic.net](mailto:curt@spam-o-matic.net)*



# The New Sicon-8 Voice Remote Control



## The CircuitWerkes Sicon-8 Voice Remote Control

- ▶ Use our pre-recorded voice responses or record your own!
- ▶ 8 channels of metering, status and control (expandable to 16) and up to 5 alarms per channel.
- ▶ No accessories necessary to control your site right out of the box.
- ▶ Auto-ranging, auto-calibrating meters make setup a snap.
- ▶ Function scheduler, auto-logging & alarm reporting included.

Introducing the Sicon-8, a revolutionary transmitter site controller with custom voice recording technology for perfectly natural sounding dial-up or radio link control. All of the I/O, including 8 channels of relays, are included on the main board so there is no need to buy anything else. All metering, status and control connections are on depluggable screw terminals. An expander chassis, the SX-8, adds eight channels of metering, status & control to an existing Sicon-8 for a maximum of 16 channels. Designed to be controlled from any dial-up telephone, an auto-answer cell phone or from its serial port, the Sicon-8 gives you the control options that you need. A free, Windows program, the Sicontroller, gives you full access to all of the Sicon-8's programming and control functions. Basic logging functions are included. Live Internet interfacing is accomplished with an inexpensive accessory. Visit us online at [www.circuitwerkes.com](http://www.circuitwerkes.com) for complete info on the Sicon-8.

# Remote Broadcast Solutions



## MicTel Mic/Line to Telephone Interface

- ▶ Outputs & Inputs for telephone handset, cellular phone or balanced line level at up to +10dBm.
- ▶ Operates up to 36+ hours on two 9V alkaline batteries.
- ▶ High quality, user-switchable, internal limiter prevents clipping.
- ▶ External power input with silent, auto-switching battery backup.
- ▶ Individual gain controls for send, receive and headphones levels.



## Unattended Dial-Up Broadcasts with the DR-10

- ▶ The DR-10 is a Dial-Up remote control with balanced, telephone audio input & output that can control many automation systems or your audio console for unattended remote broadcasts.
- ▶ Our Silencer™ option removes control tones from the audio path.
- ▶ Use the DPDT relays to insert the phone audio directly into the program path when necessary, especially for emergencies.



## TelTap Pocket-Sized Manual Telephone Coupler

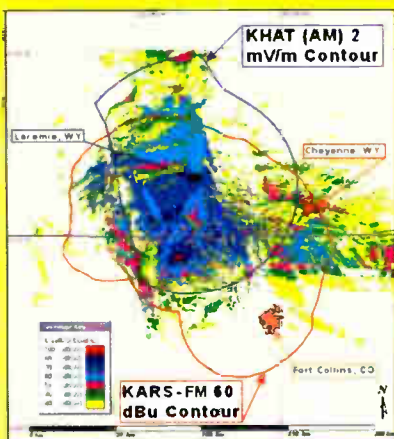
- ▶ Can be used as a phone tap or a passive manual telephone coupler.
- ▶ Send or receive telephone audio.
- ▶ Compact size & low cost makes the TelTap a great addition to your remote kit for main or backup capabilities.

Discover more online at [www.circuitwerkes.com](http://www.circuitwerkes.com)



CircuitWerkes, Inc. - 2805 NW 6th Street, Gainesville, Florida 32609, USA. 352-335-6555

**rfSoftware** has the engineering tools you want and money saving features that you'll love!



**rfInvestigator** is a tool for analyzing FCC spacing, FCC contours & much more! Population data, LULC data, terrain data, Longley-Rice models, Topo! maps & drive test data can all be displayed in **rfInvestigator**. It offers a host of advanced features, many of which are not found in similar programs or are offered as expensive additions, like a terrain profile tool and our antenna design tool that can automatically calculate your antenna pattern for you. Add our **DB-Builder** program and **never buy another FCC database!** Ever!

Although **rfInvestigator** offers sophisticated features, the user interface is intuitive & simple to use. **rfInvestigator's** power makes it useful to the experienced engineer while its easy-to-use menus make it friendly for station and group owners.

## Need AM Tools? Call Us!

**rfSoftware, Inc.**  
innovative engineering tools

Visit us at [www.rfsoftware.com](http://www.rfsoftware.com) or call us at 352-367-1700 for info on our AM & FM tools!

by Marvin Walther

## Comrex ACCESS Link Saves Money

We originally had a fractional T1 running from our studio in Alpena, Michigan to our main broadcast center in Tawas City, Michigan, over 60 miles away. The T1 crossed LATAs for Verizon and AT&T, and the link was becoming cost-prohibitive, at more than \$1,000 a month.

We have replaced the old gear with a router and a dedicated business IP connection. We now connect from studio to studio via Charter Internet services at both locations – and the Comrex ACCESS. We no longer cross LATAs and with our broadband connection, our monthly bill has been cut by 75%

### RELIABLE

We are using this product as a continuing service (always on) from one studio to the other, with a bi-directional connection that provides air monitor back to the originating studio location. The Comrex ACCESS rackmount is reliable and delivers as advertised on an Internet connection of only 368 kbps upload and 3 Mbps download speed.



The Comrex ACCESS Rackmount

We use a static IP and the Comrex units are configured to be static as well, through dedicated routers on a separate WAN from our existing in-house Internet access. Andy at Comrex was wonderful with helping me set up these units;

in fact, he went beyond normal working hours one evening to help me set up the receive-studio end.

Because of this dedication to their product and customer service, I would recommend the ACCESS.

### ADJUSTING ACCESS

There are a couple of caveats you should watch for, though. For example, in our situation the HQ2 audio codec caused too much "swishing" of the highs of the audio to suit me. Initially at set-up, the HQ2 mode had drop-outs, and even more frequent drop-outs when accessing the ACCESS via the Internet browser.

With Andy's help we changed the codec to HQ1 and the highs improved drastically. But then the midrange seemed to become more sensitive to flanging effects, midrange boosts in equalization from processing, and from Rock music program content. However, with some EQ tweaks in the processing, the midrange tamed down and the MP3-like artifacts became very acceptable for a remote STL-type broadcast.

The unit has operated for nearly two weeks in the HQ1 mode without a single audio drop-out or interruption in service. Of course, because of the way the packets arrive at the receiver for reassembly, this may not be related to the Comrex product directly. (Every network is dynamic and, although it seems to defy logic, some networks behave better with larger packets at slower bitrates.) But given that time domains in the IP environment are always shifting, the type of servers and routers used, and other variables, I suppose anything is possible.

### HELP THE ACCESS HELP YOU

It is important to ensure the audio source material you pipe into the transmit end of the ACCESS is as good as possible. Any bad or marginal quality MP3's will have their inherent audio flaws accented by the ACCESS in any of the HQ modes (in my humble opinion, HQ1, without the AAC plug-in, is the best transmission mode, right out of the box).

The HQ codecs operate at different bit rates than what is found in standard MP3's, so avoid bit rates below 128 or 192 on your transmit end (320 kbps performs very acceptably through the ACCESS). And do not let your jocks play audio scavenged off the Internet at questionable bit-rates through the ACCESS; you will probably notice the effect on the air if you do.

We plan on using the ACCESS in linear mode when we get our own IP pipeline from the studio to the transmitter, then any concerns about audio quality will be moot. However, if you have the extra money, buy the AAC codec plug-in for the ACCESS to save you some bandwidth and improve the audio quality.

I also like the fact that these units can upgrade software codecs just like a computer, and they have a bullet-proof Linux core OS so these babies can sit right on the network and not get hit by all the crazy stuff out there on the web.

### RECOMMENDED

Overall, the Cost versus Performance ratio is excellent.

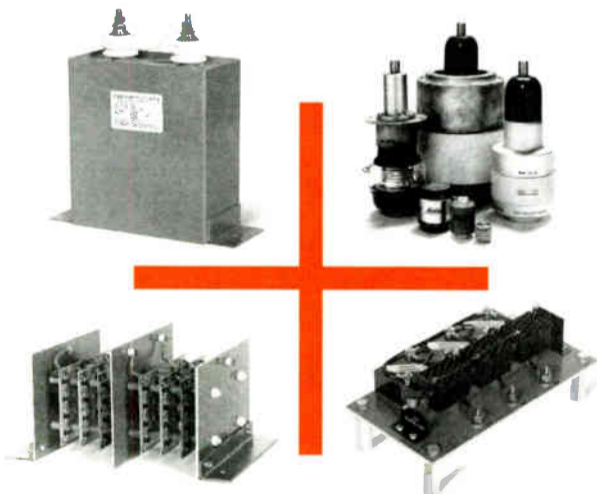
I would recommend the ACCESS as a great replacement option to cut costs for T1 or ISDN service and still perform acceptably for FM broadcast. If using ACCESS for an AM STL, I would think the performance would be just as good as any standard STL. (Although not designed explicitly as an STL, the ACCESS reliably performs well as one in this engineer's experience thus far.)

By the time we take the additional phone circuits off our T1 as well as the T1 itself, our savings will be about \$1,100 a month even after paying for the dedicated network connection through Charter Internet. Thanks Comrex, for an alternative, affordable solution that finally gives the phone company a run for its money. Competition is a good thing!

*Marvin Walther is the Chief Engineer for Carroll Broadcasting's stations in Alpena and Tawas City, MI. Contact him at [wkjc@wkjc.com](mailto:wkjc@wkjc.com)*



## the PETER DAHL CO. for custom transformers



DC filter capacitors • variable capacitors  
custom rectifier assemblies • transient suppressors  
and then some...

### Peter Dahl Co.

write or fax for an extensive catalog

915 751-2300 • fax: 915 751-0768 • 5869 Waycross • El Paso, TX 79924  
[www.pwdahl.com](http://www.pwdahl.com) • [pwdco@pwdahl.com](mailto:pwdco@pwdahl.com)

New Broadcast equipment at exceptional prices.

Quality pre-owned equipment.

Customized automation systems.

Complete turnkey installation

Console pre-wiring packages.

Broadcast equipment repair.

Complete engineering services.

Studio design and project management.

Lightner Electronics Inc.  
Your Ultimate Solution.

Toll Free: 866-239-3888

Fax: 814-239-8402

[www.LightnerElectronics.com](http://www.LightnerElectronics.com)



# PHASETEK INC.

## Quality

PHASETEK'S manufacturing facility and components expertise are available to design and fabricate any type of inductor or special RF component.

Our engineering and production staff's years of experience and commitment to quality are available to fill any special requirements.

## Dependable

### RELIABLE & DEPENDABLE RF COMPONENTS & PARTS

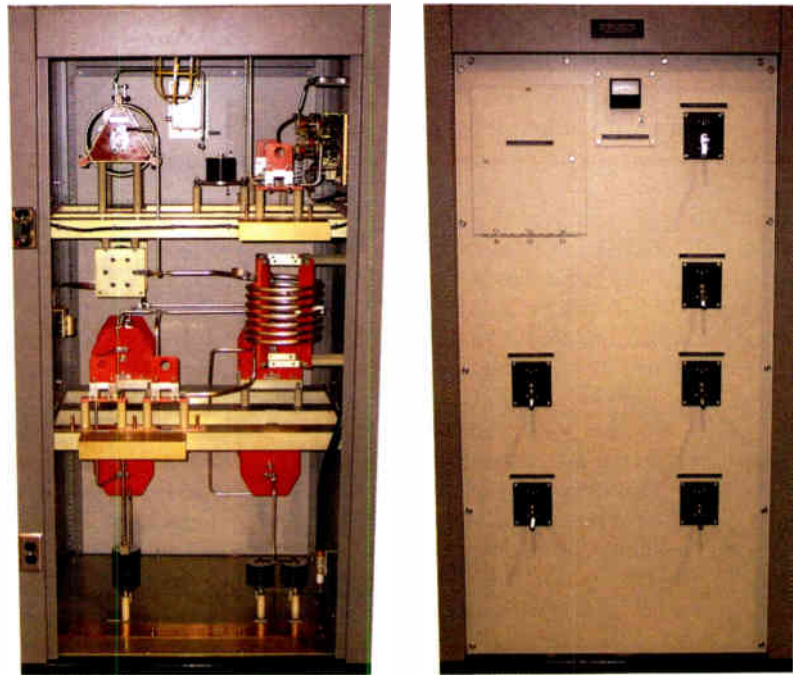
- Variable & Fixed Inductors
- Variable & Fixed Vacuum Capacitors
- Fixed Mica Capacitors
- RF Contactors
- Vacuum RF Contactors
- Test Jacks and Accessories
- Static Drain and Lighting Chokes
- Isolation Inductors
- Sampling Loops
- Dial Counters and Couplers
- Transmission Line Terminations
- Ribbon Clips and Tubing Clamps
- Horn Gaps
- Toroidal Current Transformers
- And More!

550 California Road, Unit 11  
Quakertown, PA 18951

Phone: 800-742-7383 215-536-6648  
Fax: 215-536-7180 Email: kgpti@epix.net  
Website: www.phasetekinc.com

## Custom Manufactured

- Antenna Phasing Systems
- Control Systems
- AM/MF Antenna Tuning Units
- Diplexers (NDA/DA and expanded band)
- Triplexers
- Transmitter Combiners
- Dummy Loads (with matching networks)
- Tower Detuning Units/Skirts
- Broadband Matching Networks
- Tunable Skirt Assemblies (TSA's)
- Isolation Transformers



Custom Phasing Systems

## Experience

Phasetek's experienced staff of engineers and production personnel are dedicated to provide the broadcast industry the highest quality, custom designed phasing equipment.

## Value

**OTHER SERVICES AVAILABLE:**  
Phasing System Design  
Engineering & Technical Field Support  
AM & FM Installations.

**Wizard 4 Windows**  
now brings  
**Multi Station**  
Monitoring  
to your desktop  
with true multitasking

www.belar.com 610-687-5550  
Email sales@belar.com

Start | wizwin | Adobe Photoshop Elements | Inbox - Outlook Express | Desktop | 3:53 PM

# Radio History

## John R. Brinkley Radio's Most Famous Fake

by Donna L. Halper

P.T. Barnum never did say "there's a sucker born every minute," although the quote has been attributed to him (it was a competitor of his that actually said it in 1869). But whoever really said it, those words can certainly be applied to the first decade of broadcasting.

### THE FULL RANGE

Even though radio was new and the Rules were still being written, the majority of 1920s radio programs were honest and informative. They brought up-to-the-minute news and weather to audiences that had never had such access, provided church and synagogue services for shut-ins, and allowed listeners who could not afford to attend a concert the opportunity to hear the most famous performers.

But increasingly, radio also became home to a variety of quacks, fakes, and charlatans. In the midst of the educators, news reporters, comedians, and opera singers, there were a growing number of mind-readers, mediums, faith healers and astrologers plying their craft on radio stations all over the United States.

Perhaps the best known of them all was the man who called himself "Doctor Brinkley." He was not really a doctor, but the public believed everything he said. That willingness to believe whatever claims a speaker made became a major problem in radio's formative years.

### STRANGE COMMUNICATIONS

It may have started in 1922, when the famous author Sir Arthur Conan Doyle told a gathering that he expected the spirits would soon be able to communicate with us by radio. A believer in psychic phenomena and the occult, he was not the only one to make this claim. Wireless experimenters, Marconi among them, had been trying to contact other planets since about 1920, but without success.

By early 1923, radio was bringing news of an exciting new fad: autosuggestion. The father of this trend was a French pharmacist named Emile Coué. Coué never claimed to be a doctor, but he believed all illnesses were caused by the mind. He believed that by reciting "every day, in every way, I'm getting better and better," people could train themselves to overcome most ailments.

Newspapers first brought his "miraculous healings" to the attention of the public; reporters found him charming, humble, yet magical. Soon large crowds came to see him wherever he gave a talk. Coué did not speak on radio, but practitioners of his method did, telling the public how successful autosuggestion was at curing a variety of diseases.

### STRANGE COMMUNICATORS

Early radio also brought people like Leona Lamar, "The Girl with the Thousand Eyes." Popular on Broadway, Lamar came from a long career in vaudeville, where she claimed she was a mind-reader, astrologer, and mentalist. She went on radio in the summer of 1923, appearing on WHN, New York, and offering to answer any questions mailed to her by listeners.

Also on WHN (which evidently had a fondness for mind-readers), magician Joseph Dunninger claimed his "supernatural powers" could hypnotize his subjects using only radio waves. Dunninger predicted that hypnotism by radio would soon be used by doctors to perform surgery without anesthesia.

In 1926, a British psychic asserted that he had received messages from Mars and, he told his audience, he was sending messages back to that distant planet's residents. There were some skeptics, but many listeners stayed awake

late into the night to find out if the psychic could really talk to the Martians, as they believed he could.

Evangeline Adams gave radio talks on astrology as early as 1926, asserting that everything in life was decided by the stars, including health, presidential elections, even when one will die, and, naturally, she was the best one to read the stars and tell people what they needed to know. She was still on the air in New York in 1930, as were a number of astrologers in other cities.

Meanwhile, more and more alleged healers came to radio, each claiming they had a miracle cure for every problem from obesity to cancer. Some offered potions, others offered prayers, but all were adept at separating the public from their money. And no matter how many times government officials and actual physicians tried to warn the public, the popularity of these phony doctors seemed to grow.

### "DOCTOR" BRINKLEY

That brings us to John R. Brinkley, born in North Carolina in July of 1885. It appears the "R" originally stood for Romulus, but was later changed to Richard.

All through his life, Brinkley wanted to impress people. It may have come out of his early childhood experiences; not only was he born in poverty, but there is evidence his parents were not married – which would have been considered shameful back then and might have gotten him teased by his peers.

Brinkley did attend college, although one we might call "non-traditional" – the Kansas City (KS) Eclectic Medical University. He got his degree in 1915. Schools like this one accepted a wide range of healing methods, many of which were considered totally unreliable by the medical establishment. Brinkley probably studied homeopathy, chiropractic, and various herbal methods for making patients feel better.

Later, the school and others like it would be attacked by the medical establishment as little more than "diploma mills" where anyone could pay \$500 and get credentials (which is what John R. Brinkley did). He would always

(Continued on Page 38)







- \* Gibraltar IV Series
- \* Horizon to Horizon

- \* Standard AZ-EL
- \* Heavy Duty Polar

## ANTENNAS

## ANTENNAS

## ANTENNAS

## ANTENNAS

## ANTENNAS

## ANTENNAS

**COMMERCIAL QUALITY**

(.6m, .9m, 1.0m, 1.2m, 1.5m, 1.8m, 2.4m, 2.7m, 3.0m, 3.3m, 3.7m, 3.9m, 4.2m, 4.5m, 5.0m)

**Call For Info**

**800-627-9443    608-326-8406**

[www.dhsatellite.com](http://www.dhsatellite.com)

**Offering:**

- \* Feed Horns
- \* LNB's
- \* Multi-Cable
- \* Receivers
- \* Controllers
- \* Antenna Covers
- \* Custom Fabrications

**OVER 600,000 Manufactured**

- \* High Efficiency
- \* Custom Fabrications
- \* Fast Direct Delivery
- \* 5 Year Warranty

Fax: 608-326-4233  
Email: [dhsat@mhtc.net](mailto:dhsat@mhtc.net)

**Buy Factory Direct & Save!**



**NEW**

# **ECONCO**

## **New Power Tubes**



*Newly manufactured tubes  
are now produced by Econco  
in Woodland California*

**ECONCO 1318 Commerce Ave., Woodland, CA 95776**  
**Phone: 530-662-7553 Fax: 530-666-7760**  
**Toll Free: 800-532-6626 Website: [www.econco.com](http://www.econco.com)**

# MS2721A

## Spectrum Master™

### Handheld Spectrum Analyzer

100 kHz to 7.1 GHz Frequency Range

Anritsu's Spectrum Master is a fully-functional handheld spectrum analyzer designed to conduct highly accurate analysis on the new wave of wireless signals, including 802.11a, 3G, ultra-wideband, and WiMAX. Providing continuous frequency coverage from 100 kHz to 7.1 GHz (tunable to 9 kHz), the MS2721A has the performance necessary for the most demanding measurements. It has the highest input power capability of +43 dBm and much more:

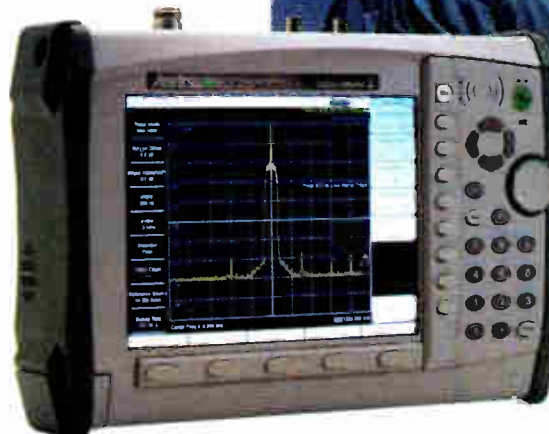
- Dynamic range >80 dB
- Capable of making AM and FM NRSC measurements
- Makes Field Strength Measurements
- Demodulates AM and FM signals

Learn more about the Spectrum Master at [www.us.anritsu.com/spectrum-master](http://www.us.anritsu.com/spectrum-master)  
To order or schedule a demo, call 1-800-ANRITSU.



A Family of Measuring Tools

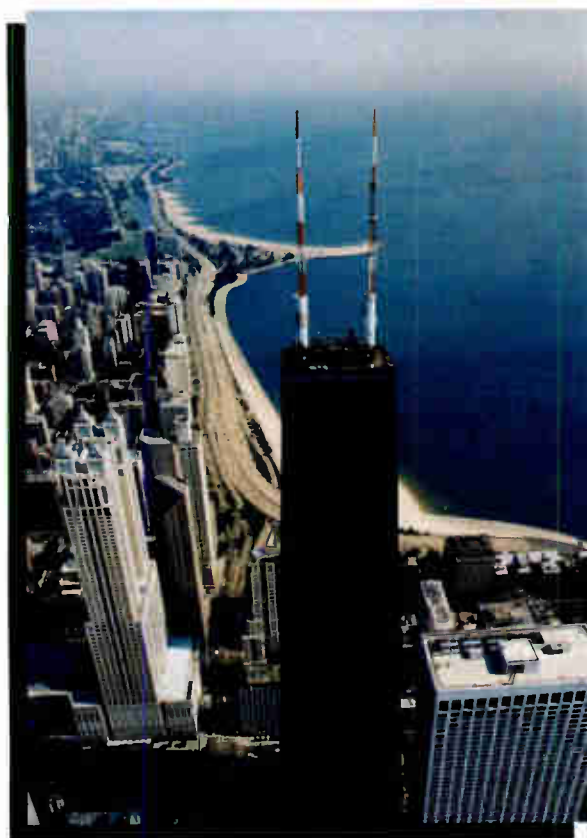
Sales Offices: USA and Canada 1-800-ANRITSU, Europe 44 (0) 1582-433433, Japan 81 (46) 223-1111, Asia-Pacific (852) 2301-4980, South America 55 (21) 2547-6922, [www.us.anritsu.com](http://www.us.anritsu.com) ©2006 Anritsu Company



# Anritsu

Discover What's Possible®

# When You Want More Than Just An Antenna



**Full line of  
HD Radio Accessories:  
Circulators, Mask Filters,  
Reject Tuners, and  
Rigid Components.**



Made in USA since 1954



**MASTER FM  
DUAL INPUT  
HD ANTENNA**



**JSHD DUAL INPUT  
HD SIDEMOUNT  
ANTENNA**



**RCHA 10dB  
HIGH LEVEL  
HD INJECTOR**

JAMPRO ANTENNAS/RF SYSTEMS, INC. • P.O. Box 292880 • Sacramento, CA 92829 USA • Phone (916) 383-1177 • Fax (916) 383-1182 • [www.jampro.com](http://www.jampro.com) Your Partner for HD Radio Solutions



## History

Continued from Page 36

insist on being called "Doctor Brinkley," despite never graduating nor attending any accredited medical school. Yet his lack of a traditional scientific education did not stop him from claiming extra medical expertise. In fact, on the 1920 U.S. Census, he listed his occupation as "surgeon."

### UNUSUAL SURGERY

Brinkley was best known for his "goat gland" surgery, which he began performing in cities like Chicago before setting up his own hospital and clinic in Milford, Kansas.

His assertion was that if goat glands were transplanted into a man's scrotum, it would give the man extra virility and a longer life. The operation was available for "only" \$750 and Doctor Brinkley offered the media interviews with some men who supposedly had experienced wonderful results from the operation, but there was no objective proof that goat gland surgery worked.

When organizations like the American Medical Association heard about it, they were horrified. As early as August 1920, a group of Chicago physicians, including the director of the Illinois Red Cross and the former head of the Chicago Medical Society, told the media that such an operation was nonsense; not only could it be dangerous to introduce animal tissue into a human being, but it would result in the patient being seriously depressed when he realized he had been duped.

However, Doctor Brinkley had long since mastered the art of getting positive publicity.

He understood the 1920s was a time when many Americans felt overwhelmed by all the new technology and new inventions; they did not know who could be trusted or believed. Doctor Brinkley positioned himself as somebody who would always tell the public the truth and who would let them know the "hidden secrets" of good health that certain un-named forces in the medical establishment did not want people to know about – a tactic still successfully used by charlatans today.

Brinkley told anyone who would ask that his surgeries were wildly successful, and some journalists actually printed enthusiastic articles about this



J.R. Brinkley

Courtesy: Kansas State Historical Society

miracle man who could help older men recover their lost potency. Typical was an article from April 1923 claiming Doctor Brinkley was the toast of Japan, where physicians all were copying his methods. Evidently the source for this claim was found to be the good doctor himself.

By all accounts he was a charismatic and very persuasive speaker, as well as an excellent interview. As word of his many "successes" spread, thousands of people descended on his Milford hospital in hopes of getting the secret to eternal youth.

### THE RADIO DOCTOR

But being a success in Milford was not enough for John R. Brinkley. The radio craze was sweeping the country and Brinkley saw an opportunity to spread his message nationally, as well as giving himself even more publicity.

Doctor Brinkley got a license to put KFKB on the air in September of 1923. (The call letters were supposed to stand for "Kansas' First, Kansas' Best.") It was at 1050 kHz with 1000 watts – far more than most stations of that time – and used the slogan "The Sunshine Station in the Heart of the Nation."

The station's schedule of programs appeared to be much like any station of the early 20s: there was music

performed by local artists, lectures by educators (including French lessons from a nearby college), and church services on Sundays.

But KFKB had one unique feature: listeners could write in with their ailments and Doctor Brinkley would prescribe medicine for them, even though he did not know them and was only going by the descriptions they sent to him. He dispensed medical advice several times a day and his nightly show "The Medical Question Box" became quite a sensation. It probably was not a coincidence that the medicines he prescribed just happened to be sold in his own pharmacy.

All this turned into quite a lucrative endeavor for the doctor, as eager listeners sent money to get the medicines they were told would cure them.

### WHOM DO YOU TRUST?

Today, dissatisfied listeners can complain to agencies like the FCC but, back then, the FCC had yet to be created. In fairness to people of the 1920s, the healthy skepticism of our Internet age had yet to develop. In 1923, a man who said he was a doctor (and claimed to have a number of degrees), had his own hospital and even operated a pharmacy sounded very credible to the average person. Plus it was more difficult to check the veracity of the claims Doctor Brinkley was making.

However, Brinkley had at least one influential critic. His name was Dr. Morris Fishbein, an actual doctor with a reputation for writing books and articles debunking the quacks and phonies of medicine. Dr. Fishbein thought it was bad enough when these fakers advertised in newspapers or found new customers at county fairs. But, thanks to their exposure on radio, some of these fakes were gaining in popularity and Dr. Fishbein was not happy about it.

As the editor of the prestigious Journal of the American Medical Association, he had the ear of thousands of legitimate physicians and the mainstream media took him very seriously. So, he began speaking out about what he saw as the danger from the growing number of radio charlatans, Doctor Brinkley among them.

### ATTACK AND COUNTER-ATTACK

Part of the problem was that the same newspapers which published Dr. Fishbein's opinions often published positive articles about some of the same people the doctor was trying to debunk.

A master of the art of publicity and self-promotion, Doctor Brinkley was able to persuade a number of newspapers that he was being persecuted by the cold-hearted and greedy medical establishment. Referring to himself as "the Radio Doctor," he said that all he was trying to do was to help people in need – yet "Dr. Fishbein and others were trying to silence" him.

Brinkley told sympathetic newspaper reporters his enemies were jealous because he could cure people and they could not. When the American Medical Association's criticism of him intensified, he played the religion card: he did a series of interviews in 1926 in which he claimed that God had told him to do these operations, "for the good of humanity."

He claimed his station was losing money but he planned to persevere because God wanted him to; he claimed to be what today we would call a born-again Christian. He also began to state his opposition to evolution and other modern ideas that he said were satanic, and he told interviewers about all the char-

ity work he and his wife Minnie loved to do. He also promised to dedicate more airtime to preaching the gospel.

While he did add some more religious programming to KFKB, the only gospel Brinkley himself preached was the gospel of consumerism, encouraging listeners to keep buying the amazing medicines he was selling. He had a very warm and conversational radio delivery, and was able to sound like the listener's favorite uncle.

His frequent radio talks helped to turn the public's attention away from critics like Dr. Fishbein and win new believers, as he grew even wealthier in the process. Nevertheless, Dr. Fishbein was not about to give up without a fight.

Appalled by Doctor Brinkley's popularity, and convinced that this man was no hero, Fishbein saw Brinkley as somebody who was giving people false hope while lining his own pockets at their expense. If there was a way to get Doctor Brinkley off the air, Morris Fishbein was determined to find it.

It would not be until 1930 when Doctor Brinkley's string of successes came to a surprising halt. And while Dr. Fishbein certainly played a role, he was not the one who caused Doctor Brinkley to have to say goodbye to both Kansas and KFKB.

### CALLED TO ACCOUNT

According to Gene Fowler and Bill Crawford in *Border Radio*, Doctor Brinkley's troubles began when he got a power increase for KFKB. The Kansas City Star newspaper operated a radio station too (WDAF), but their request to the Federal Radio Commission (FRC) for a power boost was denied.

Needless to say, executives at the Star were not amused. They launched a series of exposés on the Radio Doctor and suddenly KFKB was under scrutiny from fellow broadcasters in addition to the American Medical Association. Never one to miss an opportunity, Dr. Fishbein did write an editorial in the AMA's Journal, reminding everyone that he had always said the Radio Doctor was a quack.

The bad publicity, which included exposés by several more newspapers, soon reached both the FRC and the

(Continued on Page 40)

# Rectifier Problems? We Have The Solution.



OUR 51000 SERIES RECTIFIER IS VIRTUALLY "ONE SIZE FITS ALL." FOR SINGLE PHASE TRANSMITTERS LESS THAN 15 KILOWATTS TO THREE-PHASE TRANSMITTERS UP TO 35 KILOWATTS, WE HAVE A QUICK, EXPERT SOLUTION.

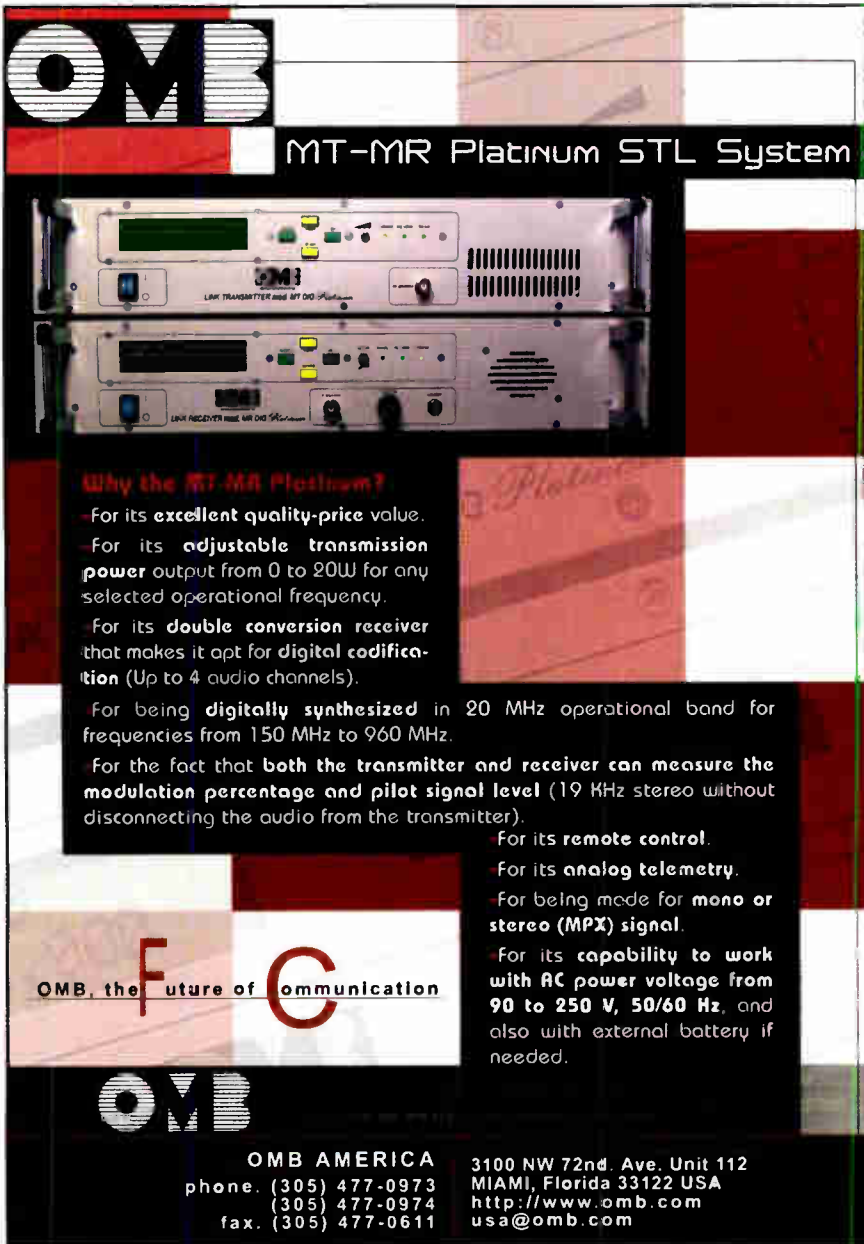
Same Day Shipments  
Upgrades Available

We Have CCA Rectifiers

No matter what transmitter you own, we can provide quality rectifiers from stock. We have a reliable, cost-effective solution to meet the requirements of most AM and FM transmitters built since the 1950s at prices better than the manufacturers'.



www.rectifiers.com ■ 800-649-6370



**OMB**  
MT-MR Platinum STL System

**Why the MT-MR Platinum?**

- For its **excellent quality-price** value.
- For its **adjustable transmission power** output from 0 to 20W for any selected operational frequency.
- For its **double conversion receiver** that makes it apt for digital **codification** (Up to 4 audio channels).
- For being **digitally synthesized** in 20 MHz operational band for frequencies from 150 MHz to 960 MHz.
- For the fact that **both the transmitter and receiver can measure the modulation percentage and pilot signal level** (19 KHz stereo without disconnecting the audio from the transmitter).
- For its **remote control**.
- For its **analog telemetry**.
- For being made for **mono or stereo (MPX) signal**.
- For its **capability to work with AC power voltage from 90 to 250 V, 50/60 Hz**, and also with external battery if needed.

OMB, the **F**uture of **C**ommunication

**OMB**

**OMB AMERICA**  
phone. (305) 477-0973  
(305) 477-0974  
fax. (305) 477-0611

3100 NW 72nd. Ave. Unit 112  
MIAMI, Florida 33122 USA  
http://www.omb.com  
usa@omb.com



**Micro Communications, Inc.**  
Full Line of FM Products

**FM Antennas**  
Horizontal Polarization  
Vertical Polarization  
Circular Polarization  
Top Mount  
Side Mount  
Leg Mount  
Custom Patterns

**Coaxial Components**  
Coax Switches  
Filters  
Power Combiners  
Channel Combiners  
Transmission Line Components

**Micro Communications, Inc.**  
PO Box 4365, Manchester, NH 03108  
Phone: 866-329-3394 Toll Free  
Fax: 603-624-4822  
E-Mail: jim.destefano@mcibroadcast.com  
www.mcibroadcast.com

# Top-Value FM Monitor


**Retains FM measurement accuracy with IBOC digital broadcasting\***

A wealth of features makes Inovonics' second-generation 531 the undisputed value leader in FM monitoring. In addition to the high-resolution total-mod display, the 531 also shows stereo audio levels, SCA and RDS subcarrier injection, plus a relative indication of incidental AM noise. A digitally-tuned preselector with programmable presets lets you quickly compare your station's parameters with those of market companions.

Signal strength and multipath readouts simplify antenna alignment and help validate all measurements. Rear-panel appointments include balanced audio out, composite in/out, and both antenna and high-level RF inputs. Alarm tallies are provided for overmod, audio loss, carrier loss and excessive multipath..

**Model 531 - \$2700**

\*+4% max. Total-Mod offset with IBOC carriers on



**Compatible with... IBOC DIGITAL RADIO**

For full technical details, visit **www.inovon.com**

**i Inovonics**  
1305 Fair Ave. • Santa Cruz, CA 95060  
TEL: (831) 458-0552 • FAX: (831) 458-0554  
www.inovon.com • e-mail: info@inovon.com

# Radio History

by Donna L. Halper

Continued from Page 38

Kansas State Board of Medical Examiners. Suddenly, it no longer mattered that the Radio Doctor had thousands – if not millions – of fans, had donated to all sorts of charities, and was generally seen as a philanthropist and good Samaritan by his listeners. Questions were raised about his prescribing over the air, as well as his claims that his patent medicines could cure most diseases.

At first, Brinkley tried his famous charm, but the Medical Examiners continued to investigate. He then turned to his attorneys and filed lawsuits, saying he had been libeled. The FRC was not intimidated. It voted 3-2 that his station was not operating in the Public Interest and revoked his license. He appealed, but to no avail. Spurred on by the AMA, the Kansas Board of Medical Examiners did what it should have done years ago – it took away his license to practice medicine.

## A PITCHED BATTLE

But Brinkley was not about to give up without a fight. He decided the best arena was politics and, in September of 1930, he launched a campaign to become the governor of Kansas.

Using his well-honed public speaking skills and some populist rhetoric, he portrayed himself as a Christ-like figure, persecuted by elitists who were jealous of his success. He understood that many people in Kansas were already suffering as a result of the Great Depression and he campaigned on a platform of lowering taxes and standing up for the average person against those who had brought Kansas such economic and moral decline.

Tapping into popular anger and resentment, as well as suspicion of politicians, he pledged he would be totally

accountable to the public and that he would improve the Kansas economy. Although he was a write-in candidate, he was so popular that he nearly won the election. He got over 180,000 votes (some of the signatures he gathered were judged to be fraudulent and excluded from his vote total), an amazing testament to how much people liked him and believed what he said.

## HEADING ACROSS THE BORDER

Doctor Brinkley lost his appeal to the FRC, which decided his station was not broadcasting in the “Public Interest” – but only in his own personal interest.

While it seemed his luck had run out in Kansas, he was by no means finished with broadcasting, nor with his so-called medical career. Doctor Brinkley sold the physical assets of KFKB for \$90,000 and was ready for his next great adventure. He was also ready to reinvent himself in another part of the country – and Texas seemed as good a place as any.

In April of 1931, he announced his plans to build a high-powered radio station in Villa Acuña, Mexico, just across the border from Del Rio, TX. He promised the town fathers in Del Rio that he would bring lots of business to their town; they evidently accepted his assertion that he had to leave Kansas due to petty jealousy and the vendetta the AMA had against him.

He persuaded them that he had done nothing wrong and was ready to bring his successful medical practice to Del Rio if the community wanted him there. They did, proving yet again that there was an endless supply of gullible people. In 1932, Doctor Brinkley, his wife and son, officially moved to Texas and he prepared to put his new station, XER, on the air. With 75,000 watts, more than any station in the United States, XER could be heard hundreds of miles away, in cities all over the US. Doctor Brinkley was back in business.

## BORDER BLASTERS

Brinkley was not alone in finding a home in “Border Radio.” A number of broadcasters who had been denied licenses in the States found it easier to get on the air in

Mexico, among them Norman G. Baker, owner of XENT in Nueva Laredo.

Baker had owned station KTNT (“Know the Naked Truth”) in Muscatine, Iowa, from which he pedaled as many phony medical cures as Doctor Brinkley. Baker also had no medical degree – having come from a career as a mind-reader and psychic in vaudeville. He claimed he could cure cancer and used his station to promote his “hospital.”

When he too ran afoul of the Federal Radio Commission, and the medical establishment in Iowa tried to shut down his medical practice in 1931, Baker simply packed up and headed for Mexico, where his station got permission to use 150,000 watts.

Meanwhile, Brinkley was busy bringing lawsuits against journalists who, he believed, had unfairly maligned him. In 1932 he sued the editor of the Amarillo (TX) News-Globe – who had accused the Radio Doctor of being a phony and a quack.

None of the expensive suits were successful, but it seemed to give Brinkley yet another opportunity to present himself as a misunderstood and unfairly reviled miracle worker. Perhaps he had used the persona of a persecuted saint for so many years that he had come to believe it. Unfortunately, the courts did not have such faith. By the late 1930s, his determination to sue anyone who criticized him would lead to his downfall.

Meanwhile, Brinkley was determined to run again for governor of Kansas, since he truly believed he had been robbed. He ran twice and each time he got fewer votes. Ultimately, he gave up on his dream of getting back at his enemies in Kansas and concentrated on running his medical business in Texas. He also continued to garner plenty of publicity, both for his station and for the money he donated to local causes in Del Rio.

## HIGHLY RATED

In fairness to the Radio Doctor, the programming on XER was more than just his medical shows. He also gave exposure to many excellent performers, including a talented soprano named Rosa Dominguez, popular singing cowboy

(Continued on Page 42)

Broadcast Monitoring  
RDS Datacasting  
Mobile RF Measurement

# Remote control and Facilities Management

A new generation of remote control with TCP/IP built-in

Starting at \$2,075 with our most affordable SILVER Remote Control

**Audemat-Aztec**  
Broadcasting Innovation

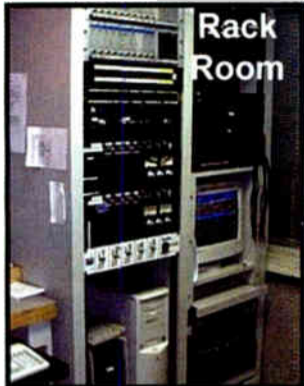
[www.audemat-aztec.com](http://www.audemat-aztec.com)  
Miami, FL USA - Tel: 305 249 3110 - [ussales@audemat-aztec.com](mailto:ussales@audemat-aztec.com)



# End-to-End Solutions From SCMS

## Moseley SL9003Q Studio Transmitter Link

Get your **STL** Solution from  
the Dealer That Knows Radio.

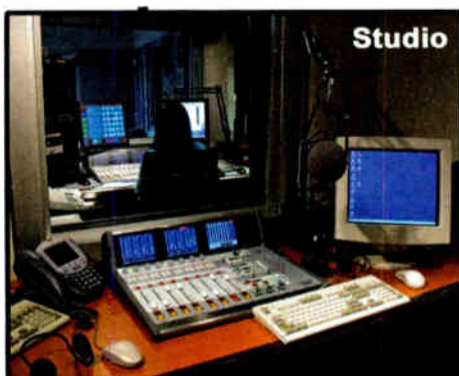
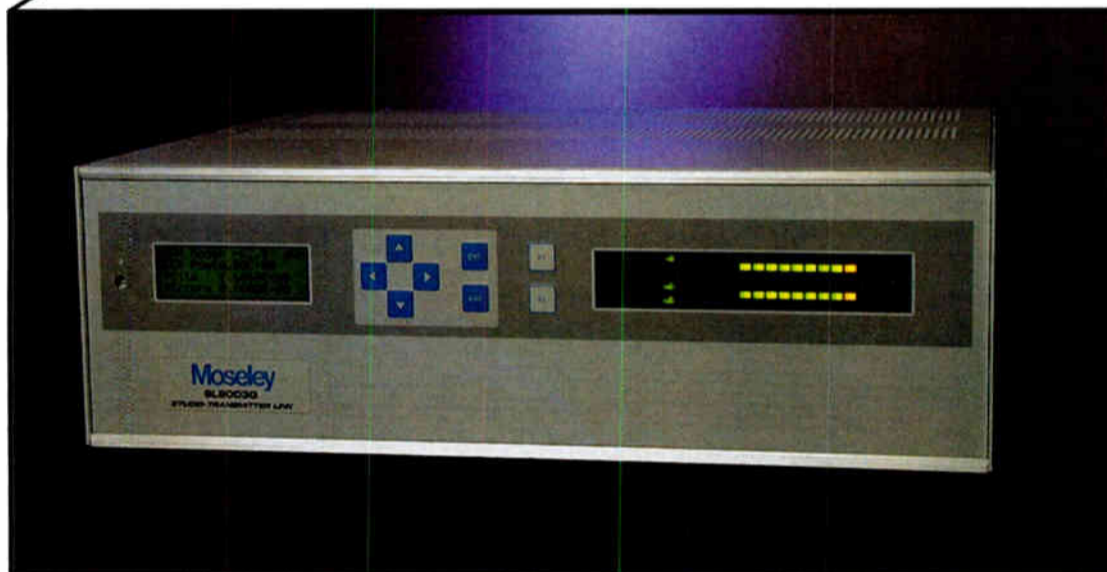


Whether you are faced with a studio move or IBOC conversion, make the right STL choice for today and tomorrow.

Moseley Starlink SL9003Q-2SLAN is the first STL to provide AES digital audio and Ethernet over the traditional 950 MHz STL band.

For T1 lines and license-free links, the Moseley Starlink SL9003T1 gives you bidirectional digital audio, Ethernet LAN extension, remote control, and telephone.

Your best value for the future is the right STL choice today.  
Moseley Starlink is available from the most reputable supplier in radio broadcast – SCMS.



**Contact SCMS**  
at any of its offices  
to discuss your needs.

**1-800-438-6040**

**Bob, Ernie, Matt or Mike**  
**HQ in Pineville, NC**

Mid-South: 1-877-391-2650 Bob Mayben  
Central: 1-731-695-1714 Bernie O'Brien  
West Coast: 1-866-673-9267 Doug Tharp  
Mid-West: 1-513-899-3036 Mary Schnelle  
South-Atlantic: 1-770-632-1295 Art White  
North-East: 1-315-623-7655 Jim Peck  
South-West: 1-877-699-9151 Tyler Callis  
Pro Audio: 1-877-640-8205 Ric Goldstein



**www.SCMSinc.com**

## History

Continued from Page 40

Roy Faulkner (who had also worked for Doctor Brinkley at KFKB), various bluegrass musicians, and even a yodeler or two. He stayed on the good side of the Mexican authorities by hiring some Mexican vocalists and orchestras.

On the other hand, he broadcast programs by his "personal astrologer" (a woman who used the name Rose Dawn), and a other shows by faith healers, numerologists, and mind-readers.

For a while, Doctor Brinkley appeared unstoppable. His lavish mansion was a tourist attraction. He brought in as much as \$30,000 a week, and he owned a yacht, a private airplane, four limousines, and the aforementioned villa. He traveled to foreign countries where he was greeted like a dignitary. But Doctor Brinkley was about to see his run of good fortune come to a halt.

### TROUBLE AGAIN WITH AUTHORITIES

While XER could be heard throughout the United States, including in Kansas, some in the Mexican government were not happy about the sudden influx of Americans running "Border Blaster" stations. The cures the Radio Doctor promised – and he had long since moved beyond relying solely on goat gland surgery to espouse new and exciting miracle drugs and even better surgeries – were causing skepticism among print journalists.

Despite the expensive prizes the Radio Doctor had been offering his listeners and the large number of people who came to see him at his clinic, the Mexican government began to feel that he was doing more harm than good. They started citing Doctor Brinkley for several minor violations. Arrogantly, he ignored them, determined to boost the power with or without government approval.

Given the strained relationship he developed with the Mexican authorities, it was not surprising that when he wanted to increase XER's power, he ran into resistance. Ultimately the government of Mexico decided it was time to take stronger action, rather than just sending him letters or threatening to fine him.

Some sources say the American Federal Radio Commission had been encouraging the Mexican authorities to stand up to the Radio Doctor, no matter how many fans he had; other sources say it was American stations like WGN in Chicago who demanded action, since their signals were being interfered with by XER. But however it came about, the Mexican government finally did act decisively: by early 1934, XER was off the air.

### DIVERSIONARY APPROACH

But getting rid of Doctor Brinkley was not going to be that easy. The Radio Doctor told the newspapers that it was all a big misunderstanding. He claimed he was on good terms with the Mexican authorities and said he had sold XER to a local businesswoman named Esther O. De Crosby.

However, a closer look showed that he was really still calling the shots. In September of 1935, XER was reborn – returning to the airwaves as XERA, 840 kHz on the dial. This time, according to most newspaper reports, the Radio Doctor was finally able to get his power boost. XERA had the equivalent of 500,000 watts, thanks in large part to his engineer, James Weldon. The Radio Doctor told anyone who would listen that actually XERA had over a million watts and thus was the most powerful station in the world.

But the good doctor's ego was about to contribute to his final downfall.

### A RAPID FALL

When his old nemesis Dr. Fishbein published yet another highly critical article about Doctor Brinkley in 1938, calling the Radio Doctor a charlatan and a fraud, Doctor Brinkley sued, asking for \$250,000 and claiming the AMA's persecution of him had hurt his business. The case made its way slowly through the courts but, although

Brinkley was able to bring in various "witnesses" who attested to the man's saintly qualities, the evidence showed that Doctor Brinkley was not all that he claimed to be.

The court sided with Dr. Fishbein. That seemed to open the proverbial floodgates, as suddenly disgruntled patients appeared and spoke out about how disappointed they were with Doctor Brinkley's work. Some even initiated lawsuits of their own.

With even more scrutiny upon his life and his business, the Internal Revenue Service stepped in and told him he owed back taxes – and lots of them. With former patients suing and the IRS demanding payment, suddenly the untouchable Doctor Brinkley was in deep trouble.

By 1942, he had declared bankruptcy and many of his assets were seized to pay outstanding bills. The hospital he ran in Del Rio and another he had opened in Little Rock, AR in 1938 were also closed down. XERA was no more, closed by the Mexican government. Brinkley and his wife were about to be prosecuted for mail fraud. For all of his promises about giving patients eternal youth and virility, Doctor Brinkley himself suffered a heart attack and died in late May 1942. He was only fifty-seven.

It would be nice to say that the world learned something from the rise and fall of Doctor Brinkley, but as Barnum's apocryphal quote points out, there is no shortage of suckers, even in our modern era. We have Internet scams, pyramid schemes, plenty of late-night TV infomercials, and, of course, commercials regularly heard on the radio, promising to cure baldness, improve memory, add years of life, or give one much more energy.

Even now, Doctor John R. Brinkley's legacy lives on.

If you would like to learn more about J.R. Brinkley, you might be interested in the book *Border Blasters* from the University of Texas Press or *The Bizarre Careers of John R. Brinkley* from the University Press of Kentucky. Links to these books, the Kansas State Historical Society, and an audio clip of J.R. Brinkley can be found on the **Radio Guide** URL page: [www.radio-guide.com/URL.htm](http://www.radio-guide.com/URL.htm)

*Donna L. Halper is a media historian who writes on a variety of topics when she is not consulting radio stations or teaching at Emerson College in Boston. Contact her at: [dlh@donnahalper.com](mailto:dlh@donnahalper.com)*

# Consultant Guide

# Radio Consulting Engineers

**Consulting Communications Engineers**  
**EMC Test Lab**

- FCC Applications
- Frequency Searches and Coordination
- AM-FM-CATV-ITFS-LPTV
- EMC Test Lab - FCC and European (IEC)

**OWL ENGINEERING, INC.**  
651-784-7445 Fax: 651-784-7541  
Email: [info@owleng.com](mailto:info@owleng.com)  
5844 Hamline Ave. N., Shoreview, MN 55126 Member AFCCE

**RFE Professional Engineering Services**

- ★ FCC Applications
- ★ Coverage modeling
- ★ RF exposure limit reports
- ★ STL & microwave path analysis
- ★ Co-location and interference studies
- ★ Expert witness testimony by P.E.s

**RFEngineers, Inc. 352-367-1725**

**Doug Vernier**  
**Telecommunications Consultants**  
**Broadcast Engineering Consulting**

- AM/FM/TV/DTV
- Custom Mapping Service
- Frequency Searches
- Propagation Prediction
- FCC Application Preparation
- Directional Antenna Design

**VSoft COMMUNICATIONS** [www.v-soft.com](http://www.v-soft.com)  
consulting@v-soft.com (800) 743-3684

**The Coverage Map Store**  
**REALcoverage.com**  
**High Performance Engineering for Maximum Coverage**

**EVANS ASSOCIATES**  
**Consulting Communications Engineers**

FCC Applications • Design • Field Engineering • Tower Detuning Upgrade & Relocation Studies • AM Directional Array Tuning & Proof

**EXPERTS IN:**  
**FM • Directional Antennas • RF Exposure • TV • DTV Transition**

210 S. Main St, Theinsville, WI 53092 • 262-242-6000 • Fax: 262-242-6045  
[www.evansassoc.com](http://www.evansassoc.com) Member AFCCE

**MBC Consulting**  
**FM Broadcast Engineering Specialists**

- Applications & Upgrades
- Frequency Search \$199
- Custom Mapping

**800-219-7461**  
[www.MBCRadio.org](http://www.MBCRadio.org)

**ERI Structural Analysis**

**REGISTERED PROFESSIONAL ENGINEERS**  
**STRUCTURAL ANALYSIS**  
**ERI Incorporated 1943**  
**TOWER REINFORCING**

**Electronics Research, Inc.**  
812.925.6000 [www.ERInc.com](http://www.ERInc.com)

**Communications Technologies Inc.**  
Radio Frequency/Broadcast Engineering Consultants

**AM • FM • TV • LPTV**  
**Cellular/PCS Site Analysis**

P.O. Box 1130, Marlton NJ 08053  
Phone: 856-985-0077  
Fax: 856-985-8124  
[web:www.comtechrf.com](http://web:www.comtechrf.com)

**Clarence M. Beverage**  
**Laura M. Mizrahi**

**Your Ad Here Only \$50.00**

Over 10,000 Readers Every Month

*Reach those who will specify your services.*

Email: [radio@rconnect.com](mailto:radio@rconnect.com)  
or call: 928-284-3700

# We're all talk.

# And all action, too.

All talk and no action? That certainly doesn't describe any radio station we've ever seen. With guest interviews, news and traffic feeds, live reports and listener calls to juggle, a talk studio is one of the most active places on the planet. Seconds count, and there's no room for mistakes.

That's why we created Status Symbols® for the Telos TWOx12 Talkshow System. Instead of flashing lights to decipher, there's easy-to-understand picture icons that give talk pros the information they need with just a glance. What caller's next? Who's screened, and who's just holding? With Status Symbols, you'll know instantly. And only Telos has them.

TWOx12 has lots more benefits. Like Digital Dynamic EQ, for uniform caller audio despite less-than-perfect lines. Twin DSP-powered hybrids for quick, no-hassle conferencing. A unique Dual Studio Mode that lets you use your 12-line phone system like dual six-line systems for extra flexibility. And TWOx12 is the world's only talk show system that can work with either POTS or ISDN lines to deliver exceptional caller clarity. Impressive? You'd expect no less from the company that *invented* the digital broadcast hybrid.

Is TWOx12 the perfect union of word and deed? Thousands of broadcasters worldwide think so. Why not see for yourself?

*Telos*  
AUDIO | NETWORKS



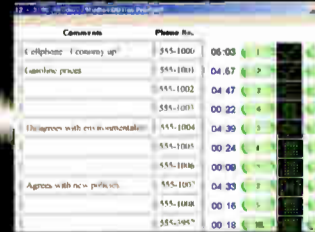
12 lines, two digital hybrids, and superior audio performance. Desktop Director controller features handset, speakerphone and headset jack. Drop-in controls available for popular consoles.



New Call Controller has Status Symbols, DTMF pad and recorder controls (like Desktop Director), but lets talent use their favorite wireless phone or any standard handset for call screening.



Status Symbols show exactly what's what. Intuitive icons show calls locked on-the-air, which hybrid they're on, who's next in queue and more. So much better than a panel of blinking LEDs.



Assistant Producer enables talk show production via LAN or WAN. Status Symbols, Caller ID support, instant messaging and caller database are just a few benefits. Supports touchscreens, too.

# Service Guide Radio Equipment Products and Services



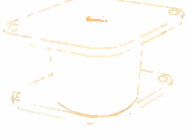
**Rebuilt Power Tubes 1/2 the Cost of New!**

## ECONCO

Tel: 800-532-6626 Web: [www.econco.com](http://www.econco.com)  
 Intl: +1-530-662-7553 Fax: +1-530-666-7760



**TRANSMITTING CAPACITORS**  
 MICA-VACUUM-CERAMIC



**SURCOM ASSOCIATES, INC.**  
 (760) 438-4420  
[LINK@SURCOM.COM](mailto:LINK@SURCOM.COM)

**Silver Plating Powder**  
 Silver Plate On-The-Job with Cool-Amp!!

<p><b>Cool-Amp</b>  <i>Silver plating powder</i>                  *Maintain your RF frequency                  *Keep your PCBs cool                  *Increase conductivity                  *Minimize power loss from corrosion &amp; oxidation</p>	<p><b>Conducto-Lube</b>  <i>Silver based lubricant</i>                  *Reduce resistance                  *Prevent power interruptions                  *Prevent data errors                  *Prevent power failure</p>
--	--

**COOL-AMP COMPANY**  
 Ph: 503-624-6426 Fax: 503-624-6436  
[www.cool-amp.com](http://www.cool-amp.com) 60 years customer satisfaction! email: [sales@cool-amp.com](mailto:sales@cool-amp.com)

**RF PARTS COMPANY**  
 From Milliwatts to Kilowatts™

Eimac • Amperex • Svetlana • M/A-Com  
 Motorola • Toshiba • Philips • Mitsubishi

Se Habla Español • We Export

**800-737-2787**

760-744-0700 Email: [rpf@rfparts.com](mailto:rpf@rfparts.com)  
[www.rfparts.com](http://www.rfparts.com)

**AM Ground Systems Co.**

Ground System Construction,  
 Evaluation & Repair

**1-877-766-2999**

[www.amgroundsystems.com](http://www.amgroundsystems.com)

**BAUER TRANSMITTERS, INC.**  
[www.bauertx.com](http://www.bauertx.com)

**BAUER - ELCOM BAUER - SPARTA - CETEC**


Re-Manufactured  
 Bauer Transmitters Available

AM/FM – 2.5 kW to 25 kW  
[www.bauertx.com](http://www.bauertx.com) [paul@bauertx.com](mailto:paul@bauertx.com)  
 915-595-1048 Fax: 915-595-1840

**Now Available! New Sections!**

The updated 2004 version of Eimac's *Care & Feeding of Power Grid Tubes Handbook* is now available.

Contact Richardson Electronics today for your **FREE** copy.



**Richardson Electronics**  
 Engineered Solutions

Toll Free: 800-882-3872  
 630-208-2200  
 Internet: [broadcast.rell.com](mailto:broadcast.rell.com)  
 E-mail: [broadcast@rell.com](mailto:broadcast@rell.com)

**DA HOOK DA GAP**  
 Safety Grounding Hook Lightning Dissipation Gap




Solid Brass Hook & Hardware  
 Fiberglass Rod Handle  
 #10 Copper Cable & Alligator Clip

Available with Horn or Ball Gaps  
 Patented (#5,661,262)  
 Hot Adjust Mechanism

**Wilk Science and Technology Inc.**  
 1112 North Grove Avenue, Oak Park, Illinois 60302  
 Telephone & Fax: (708) 524-8588

**D&C Electronics Co.**  
 - New Tubes -

*We have the alternatives for all your needs, at the lowest prices, direct from our stock!*

EIMAC, SVETLANA, PRO-TEK®, EEV, and many others.

**352-688-2374 or 800-881-2374**

  VISA & MASTERCARD Accepted

**Chris Scott & Associates**  
 Visit our website  
[www.scott-inc.com](http://www.scott-inc.com)

Ph: (270)781-5301  
 Fax: (270)781-1232  
 Bowling Green, Kentucky



**NRSC Loop Antenna**

**AM-FM Notch Filters**



**CCA PARTS & SERVICE**  
 V&J Electronics

Can supply all parts, schematics, and manuals for CCA, CSI, Sintronic, and Visual transmitters. Field service and complete rebuild transmitters available.

Call Van or Jerry Meier: 770-907-2694  
 Fax: 770-907-2694 – 24/7 Service  
 COD, Visa, Master, Discover, NET-15/30  
[www.ccaelectronics.net](http://www.ccaelectronics.net)

Board Traces for Attenuators  
 Bal to UnBal  
 UnBal to Bal  
 Bal to Bal

**1500 V.D.C.**  
 Pri - Sec  
 Isolation

Quality Transformers

1/8" Mounting Holes

Industrial Glass Epoxy Board (2"x2.3")  
 Plated thru Holes

**Audio Lightning Isolator (& Hum ISO)**

Hertel Engineering & Newman Kees Measurements  
 8611 Slate Rd  
 Evansville, IN 47720  
 812-963-3294  
[nkeene@insightbb.com](mailto:nkeene@insightbb.com)

**\$27.50 ea.**  
 Free Shipping w/ an Order of 4 or more

Response 40 - 20 K

**DCS** **DIVERSIFIED COMMUNICATIONS SYSTEMS**

*"SERVING BROADCASTERS SINCE 1981"*

**BROADCAST EQUIPMENT REPAIR**  
 Audio/RF Equipment - AM/FM Transmitters  
 Free Consultation/Loaners Available

**[www.divcomm.biz](http://www.divcomm.biz)**  
 814-756-3053 • [rpgson@aol.com](mailto:rpgson@aol.com)



Around the County      Around the Country      Around the World

George Whitaker Owner

**[www.mikeflags.com](http://www.mikeflags.com)**

Practical Radio Communications  
 Arlington, TX

**OWN A LPAM STATION! LICENSE FREE!**

- 1-2 Miles Range Possible
- FCC Part 15 Type Accepted
- Best sound in the business!

Tel 919-362-9393 Fax 919-367-0607 Visa/M/C  
<http://www.am1000RANGEMASTER.com>  
[sales@am1000RANGEMASTER.com](mailto:sales@am1000RANGEMASTER.com)

# Service Guide Radio Equipment Products and Services

**ST Connectors for 66 Blocks...**  
**Bag of 10: \$ 6.95**  
**Bag of 100: \$65.00**  
*(Ridiculously Expensive!)*

Squeeze them on Jumper Wire. Great for temporary or permanent jumpers. You need 2 per pair!

We also have Punching Doublers, 66 Blocks, Single Pair Jumper Wire in Assorted Colors, 66 Block & Modular Attenuators, and many other Unique, Problem Solving Telecom Products.

**Fix RF Problems!**  
**99% Success Rate!**

Handset Modular: \$18.95  
 1 Pair Modular: \$14.95  
 2 Pair Modular: \$18.95  
 1 Pair Hard Wire: \$ 8.95

**RF Filter**

Choose the frequency range for maximum rejection:  
 • 5 to 3mhz (AM) • 3 to 30mhz • 25 to 60mhz • 60 to 150mhz (FM)

Now Available... Combination AM & FM Filters!  
 See the RF Troubleshooting Flow Chart and four page RF Tech Bulletin at:  
[www.sandman.com](http://www.sandman.com)

Mike Sandman... Chicago's Telecom Expert  
 Call for FREE Catalog: 630-980-7710

**rf Investigator V 3.0**  
**FM...AM...or Both**  
**You choose!**  
**rfSoftware, Inc.**  
 innovative engineering tools

Are you tired of switching from program to program to complete a project?

How about displaying your drive test output on top of your Longley-Rice prediction to SEE how your station is operating.

Save *time, money, and hard drive space*, with software that gives you all the tools in one program to work *smarter not harder*.

Call 352-367-1700 for Details!  
 Visit [www.rfsoftware.com](http://www.rfsoftware.com) Today

**MOORETRONIX**  
 BROADCAST & INDUSTRIAL ELECTRONICS

**Our 5<sup>th</sup> Year**

Our client list continues to grow. Thank you for your confidence and equipment purchases.

**We Re-Condition**

Pacific Recorders BMX I-II-III, AMX, ABX and RMX, Stereo-Mixer and Mixer News-Mixer products.

Solve Your System Wiring Problems Fast!



With **STEREOTRACER**  
 See our Web News-Update page, for details.

Tel: 800-300-0733 Fax: 231-924-7812  
[WWW.MOORETRONIX.COM](http://WWW.MOORETRONIX.COM)

**RF Engineers, Inc.** Professional Engineering Services

- ★ FCC Applications
- ★ Coverage modeling
- ★ RF exposure limit reports
- ★ STL & microwave path analysis
- ★ Co-location and interference studies
- ★ Expert witness testimony by P.E.s

[www.rfengineers.com](http://www.rfengineers.com)  
**RF Engineers, Inc. 352-367-1725**

**DANGER**  
**NO ENTRY FOR ANY PURPOSE**  
 RF TRAINED PERSONNEL ONLY  
 DO NOT TOUCH TOWER  
 HIGH RF VOLTAGES  
 OPTIONAL- PHONE OR ASR HERE

**ANTENNA ID PRODUCTS 610-458-8418**  
 FCC compliance signs for AM & FM tower sites  
 ASR signs - Guy wire protectors - Antenna tags  
[www.antennaid.com](http://www.antennaid.com) [antennaid@msn.com](mailto:antennaid@msn.com)

**BESCO INTERNACIONAL** World Leader in AM-FM Transmitters  
*"Now in Our 34th Year"*

**AM & FM Pre-Owned Units in Stock**

All Powers and Manufacturers  
 Instruction Books - Spares - Complete

Visit our Website: [www.besco-int.com](http://www.besco-int.com)  
 Or Call Rob Malany at: 321-960-4001

**IBS CORPORATION** Let IBS plan your new Studio Build or Site Renovation

Contact:  
**Olen Booth or Houston McDavitt**  
**24 Years in Business**  
**with over 300 build outs.**  
 662-324-6934 • [www.fixmystation.com](http://www.fixmystation.com)

**Global RF Solutions<sup>SM</sup>**  
 RF Engineering Consultants  
 "We've Rewritten The Book on RF Safety"  
[www.grfs.net](http://www.grfs.net)  
 (480) 814-1393  
[rfolutions@cox.net](mailto:rfolutions@cox.net)

- FCC Compliance Specialists
- RF Safety Training
- Site Surveys, Narrowband & Broadband
- MPE Software Analysis, Sales, Training
- Safety Programs

**Professional Equipment Repair**

- ▶ Consoles at Lightner Electronics, Inc.
- ▶ Exciters
- ▶ STLS
- ▶ Automation Systems
- ▶ Audio Processors
- ▶ Transmitters
- ▶ Remote Equipment

Toll Free: 866-239-3888  
[www.LightnerElectronics.com](http://www.LightnerElectronics.com)

**McPherson Radio**  
 Specializing in pre-owned QEI transmitter products.

**QEI - 6 Month Warranty - QEI**

All equipment tuned and tested on your frequency. MRC has a repair facility to meet your broadcast needs, for repair of QEI exciters and low power transmitters. Other broadcast manufacturer products are welcomed too.

Bob Brown at 856-232-1625 Fax: 856-232-2075  
 Email: [mcpersonradio@comcast.net](mailto:mcpersonradio@comcast.net)

**VSoft COMMUNICATIONS** Innovative and Reliable R.F. Engineering Software  
 R.F. Communications Software and Engineering Consulting

**Longley-Rice Coverage Map**

- Create stunning "real-world" coverage maps and interference studies using Longley-Rice, PTP, Okamura/Hata and FCC with Probe 3™
- Search FM channels under spacings and contour protection using FMCommander™
- Prepare AM skywave and groundwave allocations studies and map AM FCC contour coverage with AM-Pro™

The Leader in Broadcast Engineering Software  
[www.v-soft.com](http://www.v-soft.com) [info@v-soft.com](mailto:info@v-soft.com) (800)743-3684

[www.digitalradioengineering.com](http://www.digitalradioengineering.com) Phone: 845-355-4001

**digitalradio engineering**

**Professional Broadcast Engineering Services**

Consulting • Project Management • Contract Engineering  
 FCC Alternative Inspections • Due Diligence Inspections  
 Engineering Staff Oversight • Engineering Staff Assistance  
 Facility Inventory • Broadcast Equipment Acquisition  
 New & Pre-owned Broadcast Equipment Sales

**Zonum Industries**  
**Quality Rebuilt Tubes**  
**4,000 Hour Guarantee**  
 - Se Habla Español -

Phone: 530-476-2400 Fax: 530-476-3210  
[zonumindustries@yahoo.com](mailto:zonumindustries@yahoo.com)  
[www.zonumindustries.com](http://www.zonumindustries.com)

**Who you know can make all the difference...**

**SBE**

- 100+ Local SBE Chapters
- 5,400+ Members
- Nationally-Recognized Certification Program
- JobsOnline & ResumeBank

[www.sbe.org](http://www.sbe.org) • (317) 846-9000



## Radio Guide Ads: September 2006

Advertiser - Page	Website
AM Ground Systems - 22	www.amgroundsystems.com
Anritsu - 37	www.anritsu.com
Armstrong Transmitters - 19	www.armstrongtx.com
Audemat - 40	www.audemataztec.com
Audion - 15	www.audionlabs.com
Axia - 11	www.axiaaudio.com
Bay Country - 17	www.baycountry.com
Belar - 35	www.belar.com
BEXT - 17	www.bext.com
Broadcast Devices - 27	www.broadcast-devices.com
Broadcast Electronics - 17	www.bdcast.com
Broadcast Software Intl. - 3	www.bsusa.com
Broadcast Tools - 13	www.broadcasttools.com
CircuitWerkes - 33	www.circuitwerkes.com
CKE - 38	www.rectifiers.com
Comrex - 5	www.comrex.com
Comet - 10	www.comet.ch
Conex Electro Systems - 17	www.conex-electro.com
Continental - 27	www.contelec.com
D&H Antennas - 36	www.dhsatellite.com
Econco Tubes - 36, 44	www.econco.com
Energy Onix - 2	www.energy-onix.com
ERI - 19	www.erinc.com
Fanfare - 15	www.fanfare.com
Freeland Products - 27	www.freeland-inc.com
Gorman Redlich - 29	www.gorman-redlich.com
Harris - 48	www.broadcast.harris.com
Henry Engineering - 2, 31	www.henryeng.com
Inovonics - 39	www.inovon.com
Jampro - 1, 37	www.jampro.com
JK Audio - 9	www.jkaudio.com
Kintronic Labs - 9	www.kintronic.com
LBA Technology - 19	www.lbagroup.com
Larcan - 21	www.larcan.com
Lightner Electronics - 34	www.lightnerelectronics.com
Micro Communications - 39	www.mcibroadcast.com
Moseley - 18	www.moseleysb.com
NAB - 47	www.nab.org
Nautel - 28	www.nautel.com
Nott Ltd. - 25	www.nottltd.com
OMB America - 39	www.omb.com
Orban - 48	www.orban.com
Peter Dahl - 34	www.pwdahl.com
Phasetek - 35	www.phasetekinc.com
Pristine - 21	www.pristinesys.com
Prophet Systems - 26	www.prophetsys.com
RAM Broadcast Sys. - 29	www.ramsyscom.com
Radio Systems - 23	www.radiosystems.com
RF Specialties - 25	www.rfspec.com
SCMS Inc. - 41	www.scmsinc.com
Shively Labs - 23	www.shively.com
Sine Systems - 25	www.sinesystems.com
Telos - 22, 43	www.telos-systems.com
TFT - 15	www.tftinc.com
Tieline - 7	www.tieline.com
Titus Technology - 29	www.tituslabs.com
Transcom - 15	www.fmamtv.com

2006 - 2007



## RADIO ROUNDUP

The Radio Guide Industry Date and Event Register

Email your dates and information to: [radio@rconnect.com](mailto:radio@rconnect.com)

National & SBE • Regional & State • FCC Applications & Deadlines

### BOS-CON 2006 Boston SBE Regional Convention

September 13, 2006  
Marlborough, MA  
[www.bos-con.com](http://www.bos-con.com)

### BOS-CON 2006 Ennes Workshop

September 12, 2006  
Marlborough, MA  
[www.bos-con.com](http://www.bos-con.com) – [www.sbe.org](http://www.sbe.org)

### NAB 2006 Radio Show

September 20-22, 2006  
Dallas, Texas  
[www.nab.org/conventions/radioshow/2006/](http://www.nab.org/conventions/radioshow/2006/)

### 34th Annual SBE22 Broadcast & Technology Expo

**SBE 2006 National Meeting**  
September 26-27, 2006  
Verona, New York • [www.sbe22.org](http://www.sbe22.org)

### 121st AES Convention

October 5-8, 2006  
Moscone Convention Center, San Francisco, CA  
[www.aes.org/events/121/](http://www.aes.org/events/121/)

### SBE Chapter 20 – Pittsburgh Regional Expo

October 12, 2006  
Monroeville, Pennsylvania  
[www.broadcast.net/~sbe20](http://www.broadcast.net/~sbe20)

### NAB New York

October 23-26, 2006  
New York, New York  
[www.nabnewyork.com](http://www.nabnewyork.com)

### 2006 Broadcasters Clinic

October 24-26, 2006  
Madison, Wisconsin  
[www.wi-broadcasters.org](http://www.wi-broadcasters.org)

### CBI Conference

October 24-30, 2006  
Adam's Mark Hotel, St. Louis, Missouri  
[www.askcbi.org](http://www.askcbi.org)

### SEA-CON 2006

Fall 2006  
Seattle, Washington  
[www.broadcast.net/~sbe16](http://www.broadcast.net/~sbe16)

### Texas Association of Broadcasters (TAB)

**53rd Annual Convention and Trade Show**  
August 9-11, 2006  
Austin, Texas  
[www.tab.org/convention.php](http://www.tab.org/convention.php)

– 2007 –

### National Religious Broadcasters NRB2007

February 16-20, 2007  
Orlando, Florida  
[www.nrb.org](http://www.nrb.org)

### Great Lakes Broadcasting Conference & Expo

March 2007  
Lansing, Michigan  
[www.michab.com](http://www.michab.com)

### NAB 2007

April 14-19, 2007  
Las Vegas, Nevada  
[www.nabshow.com](http://www.nabshow.com)

### OAB Annual Convention and Engineering Conf.

Spring 2007  
To be announced.  
[www.oabok.org](http://www.oabok.org)

### SBE Certification Exam Dates

Exam Dates	Location	App. Deadline
Nov 10-20, 2006	Local Chapters	Sep. 22, 2006
Feb 9-16, 2007	Local Chapters	Dec 29, 2006
April 17, 2007	NAB Las Vegas	March 2, 2007
June 1-11, 2007	Local Chapters	April 20, 2007
Aug 10-20, 2007	Local Chapters	Jun 8, 2007

Send your event info to: [radio@rconnect.com](mailto:radio@rconnect.com)

## NEW Alert Monitors



[enbergelec.com](http://enbergelec.com)

## BIONDO

### Internet Solutions for Broadcasters

- Live Streaming Media
- On Demand Streaming
- Podcasting
- AV Encoding
- Web Design / Web Hosting
- Search Engine Marketing

Call Us: 215-778-8530

Email Us: [sales@biondocomm.com](mailto:sales@biondocomm.com)

Visit Us: [www.biondocomm.com](http://www.biondocomm.com)

[www.radiopapers.net](http://www.radiopapers.net)

On-Line Now!

Radio White Papers  
Radio Technical Reports  
Radio Application Notes  
Radio Technical Manuals

# Microphone Flags



800.450.6275  
[micflags.com](http://micflags.com)

All our Mic Flags feature our PRO-TECH paint (non-chip). All shapes and sizes, CUSTOM and BLANK mic flags.  
camera stickers-promotional products-label pins  
*your first choice for quality and service*

# redefining

# radio



Evolving formats. Changing listener habits. And a fluid landscape that is anything but business as usual. Tackle the top challenges facing today's radio broadcasters at The NAB Radio Show®.

The NAB Radio Show offers a one-of-a-kind opportunity for station professionals representing all formats and market sizes. Explore an exhibit hall showcasing technologies, tools and solutions you won't find anywhere else. Join your peers in Dallas and gain a greater understanding of everything Radio: from studio innovations to HD Radio™ to podcasting. Plus, learn to master the latest programming trends to ensure that you and your station connect with the next-generation marketplace.

#### **New Hours for Conference and Exhibits!**

Programs begin at 8:00 am on Wednesday and end 12:00 noon on Friday. Arrive early for the Tuesday evening networking event and don't miss a minute of the most important week in Radio.

Register today at [www.nabradioshow.com](http://www.nabradioshow.com).

#### **Radio Luncheon**

Wednesday, September 20

#### **Special Guest**



Troy Aikman  
NFL Hall-of-Famer  
and Sports Analyst

#### **NAB National Radio Award Recipient**



David Kennedy  
Former CEO  
Susquehanna Media

Luncheon Sponsored by:



**THE NAB**  
**RADIO**  
**SHOW**

Co-located with:



TWO MAJOR EVENTS + ONE GREAT LOCATION  
= THE MOST IMPORTANT WEEK IN RADIO

September 20 – 22, 2006  
Hilton Anatole Hotel  
Dallas, Texas

[www.nabradioshow.com](http://www.nabradioshow.com)



## Harris is your end-to-end radio solution provider.

AM/FM Analog or HD Radio™ • Audio Consoles • Broadcast Studios  
High Power AM • Systems and Service • Intraplex Transport

HD Radio™ is a trademark of iBiquity Digital Corporation

Harris PR&E NetWave console with optional networking. Available in 8-16-24 channel frames, all with fully modular construction.



FlexStar HDx exciter—the gold-standard for FM and FM-HD exciters, featuring RTAC (Real Time Adaptive Correction for best mask compliance) and Engine, the latest iBiquity platform in HD Radio.



ZX1000, 1 kW tri-mode FM/FM-HD or digital only transmitter. FM transmitters available from 250 W to 70 kW, in analog or HD Radio.



Destiny 3DX-50, 50 kW medium wave direct digital drive high efficiency, high reliability AM transmitter. AM transmitters from 1 kW to 2 megawatts, all fully compatible with HD Radio.

Imagine Harris transmitters...  
combined with legendary Orban audio processing.



### OPTIMOD 9400-AM Digital

No-compromise, independent, multiband processing for analog AM and digital radio—in one box!

For over 20 years, OPTIMOD-AM has dominated the sound of major-market AM radio. Orban's new 9400 offers even better analog AM processing, while its unified analog and digital design substantially reduces costs compared to a two-box configuration.



www.orban.com

Contact Harris at 800-622-0022 or email [autoconfirm@harris.com](mailto:autoconfirm@harris.com)



assuredcommunications™

Government Systems • RF Comm • Broadcast • Microwave

www.harris.com

PRSR STD  
U.S. POSTAGE  
PAID  
PERMIT NO. 410  
BEAVER DAM WI

### – Radio Guide Websites –

Radio Guide: [www.radio-guide.com](http://www.radio-guide.com)

White Papers: [www.radiopapers.net](http://www.radiopapers.net)

Used Gear: [www.radio-classifieds.com](http://www.radio-classifieds.com)

Radio History: [www.olderadio.com](http://www.olderadio.com)

Radio Web Links: [www.radiolinks.net](http://www.radiolinks.net)