

Radio Guide

www.radio-guide.com

Digital Issue Now On-Line

January - February 2010 – Vol. 18, No. 1

Comrex – ACCESS Everywhere



Inside Radio Guide:

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

- 6 - Cover Story: Comrex – ACCESS Everywhere
- 10 - Practical Engineering: Good Questions Improve Station Maintenance
- 12 - Transmitter Site: A Tale of Two Blowers
- 14 - Studio Site: Checking Your CD Interest
- 16 - Xtreme Engineering: Out in Africa
- 18 - FCC Focus: FTC Guidelines on Endorsements
- 22 - Safety and Security: Fire – a Frightening Enemy (Part 2)
- 30 - Chief Engineer: Mounting an FM Translator on a Series-Fed AM Tower

ACCURATE! AM Measurements

This off-air AM Reference Receiver and Mod-Monitor gives accurate AM mod readings, even with IBOC digital transmissions. Includes outdoor antenna.



MODEL 525

For full technical details, visit...
www.inovon.com

Inovonics
1305 Fair Ave. • Santa Cruz, CA 95060
TEL: (831) 458-0552 • FAX: (831) 458-0554
[www.inovon.com](mailto:info@inovon.com) • e-mail: info@inovon.com

Welcome to “Surge Suppression-101”.

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

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

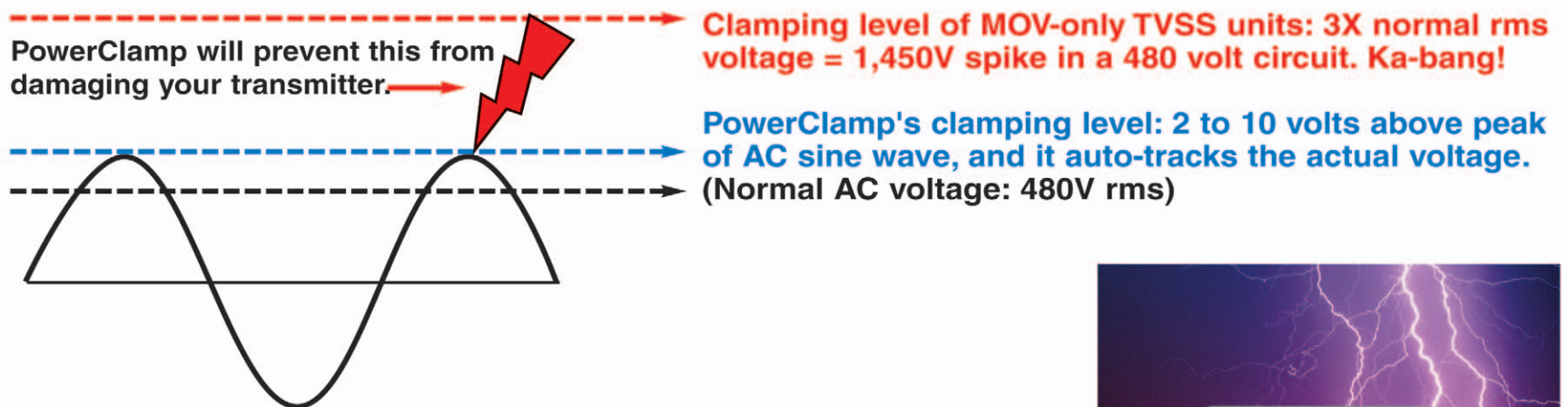
PowerClamp is the performance leader for one simple reason: it's ultra-low Clamping Level.

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

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

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

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



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

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



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

HENRY ENGINEERING

(626) 355-3656



"WOW, I COULDA HAD A VP-8!"



VORSIS VP-8 IS THE BEST AUDIO PROCESSOR FOR UNDER \$3K. PERIOD.

The VORSIS VP-8 Digital Audio Processor delivers clean detailed sound at a great price. In fact, you can easily spend two to three times more and still not match the VP-8's performance.

Installation and setup takes only minutes. The VP-8 is loaded and ready to go for FM, AM, FM-HD, AM-HD, streaming, and studio processing. It's great sounding presets are carefully tailored for your format and media. No need to spend endless hours tweaking, the VP-8 will make your station sound great, right out of the box.

For FM stations, expect a sound that easily holds its own with your high-power major market competitors. Listeners comment that with the VP-8 they now hear the rest of the music! AM stations often experience a dramatic increase in coverage area along with greatly improved intelligibility and sound quality.

The VP-8 is also ideal for streaming audio, studio processing, as a versatile backup processor or as an STL protection limiter.

Of course, if tweaking is your thing, VP-8 lets you under the hood with a complete toolset – in the VP-8, nothing is hidden. With its 4-band AGC/compressor and 8-band limiter, the VP-8 boasts more bands than any other processor in its price range to give you a very clean, loud, competitive sound that doesn't destroy the music.

It also includes features rarely found even on top-of-the-line processors: a reference-grade stereo encoder for FM, built-in test oscillator, diversity delay, multi-point headphone monitoring, and extensive metering.

The bottom line? The VORSIS VP-8 gives more bang per buck than any other audio processor in its class (and then some). And since VORSIS is designed and built by Wheatstone here in the US, you know it'll hold up and be supported 24/7 for years and years.

Intrigued? Call us or visit us on the web to learn more or set up a demo. You'll be happy you did. VORSIS—more listeners listening more.



Radio has evolved. Your sound should too.™

phone 1.252.638-7000 | www.vorsis.com | sales@wheatstone.com

Radio Guide

Contents

January - February 2010

Cover Story	6
COMREX – ACCESS Everywhere	
Practical Engineering	10
Good Questions Improve Station Maintenance	
Transmitter Site	12
A Tale of Two Blowers	
Studio Site	14
Checking Your CD Interest	
Xtreme Engineering	16
Out in Africa	
FCC Focus	18
FTC Guidelines on Endorsements	
Safety and Security	22
Fire – a Frightening Enemy (Part 2)	
Station Ops	26
Streaming for Additional Revenue	
Chief Engineer	30
Mounting an FM Translator on a Series-Fed AM Tower	
Field Guide - Intrinsic	34
The Studio Hawk from Intrinsic - [Remote Monitor]	
Field Guide - PSI	36
Propagation Systems PSIFML-3-DA - [FM Antenna]	

Tech Tips	38
A Good End to a Long Night	
Tech Tips	40
Quick RF Plumbing Solution	
Tool Guide	42
Phone Flashers from DM Engineering	
Service Guide	42 & 44
Radio Equipment, Products, and Services	
Radio Pipeline	43 & 45
New Equipment, Equipment Mods and Updates, Industry Info	
Final Stage	47
Convention, and Event Register – Advertiser Information	

Cover Photo:

The Comrex team at their headquarters in Devens, Mass.

Radio Guide

Volume 18 – Issue 1

PO Box 20975, Sedona, AZ 86341

Phone: 928-284-3700 • Fax: 866-728-5764

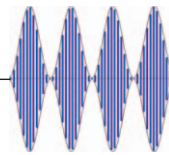
Ray Topp (Publisher) – radio@rconnect.com

Ernie Belanger (Editor) – editorial@radio-guide.com

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

Radio Waves

by Ray Topp – Publisher



2009 Redux?

Here's to the new year ... same as the old year. Well, we certainly hope not!

By this time, the expressions of “poor economy” have grown redundant and maybe a bit tiresome. We've probably all cut back as far as possible, yet it never seems to be enough.

So, will we keep repeating the “mantra,” and go about our business as usual? Or will we find new ways to save money on energy consumption, and reduce down time?

Kilowatts Saved are Dollars Earned

It's always been clear to me that it's the station engineer's responsibility to find new ways to reduce overall facility energy consumption. If it's part of the physical plant, it's usually the engineer's responsibility.

Large capacity, building AC units can be run less frequently if you install low-speed, high-volume fans in most areas of the station. Use your bodies as natural evaporative cooling units. You may be surprised at the effect – and the overall energy savings.

Keeping Down Time Down

Keeping your station on the air 24/7 may be your natural instinct, but what real-world provisions have you made, for when the main transmitter just won't respond?

No signal is lost revenue. It's not that costly to make sure you have a backup transmitter to reach your core audience. Remind yourself what a couple of kW can do. Then find yourself an inexpensive, used backup unit and keep it in top shape. Your station's revenue stream will remain safe – and so will yours. – R.T.

News • Talk • Sports • Music • Audio Logging • Voice Tracking • Traffic & Billing

SUMMIT TRAFFIC & BILLING

- 25 years of experience
- Real time avail reports
- Optimized scheduling (yield management)
- Scalable (small to enterprise)
- Fast and accurate billing
- Open item A/R
- Single-multi-remote user access
- EDI invoicing
- Radio, Television & Cable
- Compatible with all major automation systems

BLACKBOX AUDIO LOGGER

- Record up to 16 channels
- Off air & dear air alerts
- Compliance & verification
- Web browser access
- Talent & market monitor
- Podcast recorder
- Available in Spanish
- Extended support for AM/FM/TV tuner boards
- Mic & time skimming

CDS³² RADIO AUTOMATION

Live Assist, Satellite, and Music-on-Hard Drive

- “Smart Promo” produces professional sounding “Coming up next” style promos
- Watch windows for each commercial break
- Clock synchronization for perfect joins!
- Powerful features allow for complete control
- Interfaces with all major traffic & billing software
- Buffered liners play correctly each time
- Control CDS³² SAT remotely by phone or Internet
- Automate syndicated and local sports
- 24/7 product support available from the company made famous for fast & friendly support



Pristine Systems
over 25 years of
Broadcast Automation

WWW.PRISTINESYS.COM • WWW.SUMMITTRAFFIC.COM

800.795.7234

LIVE & LOCAL

Your Audience Is Out There Grab Them LIVE with ACCESS!

The air is fresh and outside there's SO much going on! Street Fairs. Music Festivals. Sporting events. And everywhere there are people just dying to talk to you, ready to BE your audience!

Whether it's breaking news or a party breaking out, there's your story. And you don't need a full crew to grab it. As fast as you can get there, you can be live on the air, creating pinpoint, relevant programming that keeps an ever-growing number of listeners glued to their radios.

ACCESS PORTABLE lets you send studio-quality live audio, real time to an ACCESS RACK at your studio over POTS, DSL, Cable, Wi-Fi, 3G cellular (EVDO/UMTS), 4G WiMax, satellite and more to make any remote broadcast really stand out.

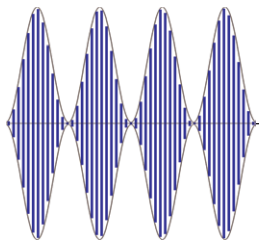
There's nothing more immediate than local— connect with your audience from anywhere with the easy to use, handheld ACCESS PORTABLE!



Put Comrex On The Line.

COMREX

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



Comrex – ACCESS Everywhere

I fondly remember the ride my family would take back in the early 60's through the Massachusetts country side on the way to see my uncle, aunt and cousins. We'd wind our way along Route 2, also known as the Mohawk Trail; it offered some of the best scenery in the country.

The area is a feast of eye candy for those who loved the majesty of rural New England, especially in the fall. The Mohawk Trail is nationally known for leaf peeping opportunities – picture postcard New England – small towns, lots of woods and open fields. As I think back it was an area where you could relax; the kind of place that fosters deep thinking and creativity.



Remote ACCESS From the Top of MT. Washington, NH

Uncle Al was a Sergeant Major at Fort Devens, and eventually became the Command Sergeant Major at the U.S. Army installation near Ayer, Massachusetts. Life on Fort Devens, in contrast to its surroundings, was hustle and bustle with training to keep the troops “battle ready” on the latest cutting edge weaponry. It was located just a stone's throw from Concord, where the first shots of the American Revolution took place.

A Different Type of Revolution

Little did I know at the time there was a different revolution, or should I say evolution, taking place not too far away.

It was one that required deep thinking, innovation and forward vision. It was a revolution that would change the established way of thinking in an industry that was poised on the cusp of technological advancement. Now this is where the real story begins

In the Beginning

John Cheney was founding a “little” company called Comrex. A company that he and his wife Lynn would manage for most of its life.

Back in 1961, John set out to design a wireless microphone for use in Television Reporting and Theatre.

His idea was to “unwire” reporters, giving them freedom of movement when reporting, and to give actors interference-free mics on Broadway

His background in two-way communications helped him look at the mic-to-camera connection in a different way than the conventional thinking of mics with wires.

The Promise of Great Things to Come

Needless to say, the success of that product helped shape our industry and continues to do so because it gave

John the foundation he needed to work on more advanced technology with Comrex.

Vision Drives Advancements

John's innovative vision continued to push the envelope continually, staying on the cutting edge of technology. Over the years Comrex has focused on making radio remotes sound better with a lot less hassle for the talent.

Remember how much gear we had to lug around for remotes, and how, when the radio station needed to do a remote broadcast, we'd call the local Telco broadcast division to arrange to install a custom, carefully equalized point-to-point audio circuit for the event.

(The old quacking broadcast loop, boy did we all love them – NOT!)



Live ACCESS From 37,000 Feet Over the Atlantic

The Use of Existing Connections

Thanks to innovations made by Comrex during the Codec revolution, those days are long gone, and radio stations now have to the same options that are available to consumers for telecom needs: POTS, ISDN, and DSL. And without Comrex products we would also be stuck with their shortcomings, including noise.

The focus at Comrex is to utilize these available networks, and deliver radio customers a product that will transform these networks into something that allows them to be proud of their programming.

I'm sure you remember the pre-Comrex days of listening to those ball games on the air, as they sounded as if the equipment was a couple of tin cans with string. Or worse yet, having the GM on your back because of the poor telco quality. Once the Comrex team came along, poor quality telco, like the bulky old remote gear, was history.

Make it Sound as Good as it Can

John's philosophy was – and the Comrex team's philosophy is – to look at programming provided over the available telco infrastructure purely from a sound quality perspective. Comrex believes that the best, most compelling programming can be diminished if it is broadcast in “telephone quality” sound. Options like satellite and microwave tend to be limiting and expensive. Comrex has dedicated its core business to solving this problem.

Beyond utility, use of these networks offer a side benefit: they enable stations to broadcast from virtually anywhere, at a moment's notice, and at very low cost.

Especially with the advent of IP, Comrex has crafted this gear to be rugged, small and simple, to the point where a reporter can literally “grab it and go,” and be live with incredible quality at the drop of a hat.

R & D Focused

A big part of the company focus remains in R&D. In a wise move, about 22 years ago, John brought Tom Hartnett into Comrex. John was an analog RF genius, and was looking for someone to help bring the products into the digital age. Boy, did John pick the right guy.

John knew that because the state of the telecommunications industry is constantly changing, Comrex must be on the forefront, in order to be ready to leverage networks for broadcasters the day they become available to the public. John gradually moved technical responsibilities to Tom through the 90's until John's passing in 1998. This ensured that Comrex would remain a technology leader well into the future.

Kris Comes on Board

On the other side of Comrex, Lynn hired Kris Bobo into a sales and marketing role in 1994. But Lynn soon learned that Kris had a knack for product development. Kris is responsible, to a large extent, for the look and feel of Comrex products.

When Lynn retired in 2006, Kris moved in to fill her position as Managing Director.

Kris and Tom manage Comrex as co-directors, having received their business “compass” from John and Lynn. This allows Comrex to maintain their legacy while combining their own ideas, allowing Comrex to remain an industry leader in innovative technology.



Live ACCESS to Texarkana From the Turks

For the last four years, Comrex's biggest product line has been the ACCESS IP Codec. This product underwent years of development, and new firmware features are still being added. ACCESS was the first Codec to promote use of the public Internet for remote broadcasts.

ACCESS is successful at this due to a suite of technologies the company has coined “BRIC” (Broadcast Reliable Internet Codec). The primary advantage of BRIC is the ability to automatically balance the two opposing elements of IP audio transmission – stability and delay. Other aspects allow the product to be set up and used by people with very limited technical and networking skill sets.

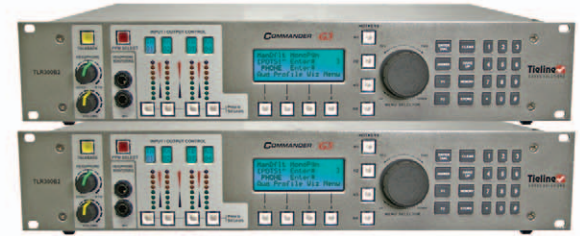
(Continued on Page 8)

Tieline IP Audio Codec Solutions

Low Cost, IP STL and Audio Distribution

Tieline Commander Studio rack mount IP codecs are the ideal solution for STL and distribution links.

- A range of high quality compression algorithms delivering STL quality audio at amazingly low bit rates saving you thousands of dollars per year
- Uncompressed 22kHz audio with ultra low latency.
- Automatic QoS Performance Engine manages IP network jitter and maximizes low delay. Most STL competitors do not offer this.
- Automatic fail detection and switching to optional backup POTS, ISDN or wireless networks (using optional cards).
- Professional high quality audio connectors with relay and RS232 control.
- Control of remotely located units via the Internet.
- Multi unicast to more than 1 destination.



Broadcast Quality IP STL from just

\$2,350
Per Codec

Low cost remote broadcast, mobile reporting and temporary links.



Broadcast quality IP remotes from just

\$2,350
Per Codec

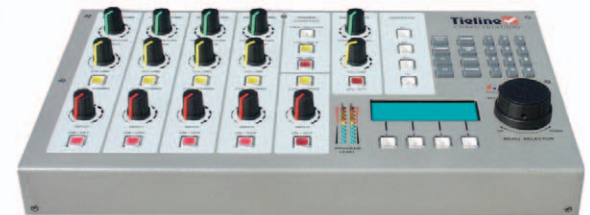
Thousands of radio and TV stations use Tieline remote codecs everyday to deliver studio quality remotes from anywhere. See Tieline.com for pictures and stories.

- Simple to use and feature one-touch dialing to the studio.
- Great for desktop multi talent or mobile single reporter remotes
- Plug into a LAN and broadcast over the Internet live or add an optional wireless 3G module and battery kit to go completely wireless (20 kHz mono or stereo).
- You can even add optional 15kHz POTS or 20kHz stereo ISDN modules.
- Remote control of talent's input audio level from the studio so you don't have to rely on announcers setting levels, or send a technician out into the field.
- Mono, Dual Mono, Stereo, Joint Stereo and Dual Program standard profiles
- Compatible with Comrex over POTS and all other brands over IP and ISDN.

Sports and talkshow mixer/codec

Tieline i-Mix combines multiple products into a single simple box saving you thousands of dollars.

- 6-input digital mixing with incredibly flexible cross point audio routing.
- IP and POTS codecs already on-board.
- Bi-directional audio & simultaneous communications circuits
- 4 headphone outputs and send/return mix monitoring
- An on-board PA control with telephone hybrid to take live callers in the field
- A wireless-compatible IP, 3G/3.5G, POTS, ISDN, GSM & BGAN Satellite card (optional)
- On-board relay and RS-232 with full studio remote control.
- Compatible with Comrex over POTS and all other brands over IP and ISDN.



A complete sports and talkshow commentary solution from

\$4,590

Tieline
www.tieline.com

Get a live video demo right now at
www.tieline.com/videos

800-780-4750
INDIANAPOLIS

Cover Story

Comrex – ACCESS Everywhere (Continued From Page 6)

ACCESS Portable

In particular, ACCESS Portable has created a lot of interest due to its size and form factor. The Codec fits in the palm of your hand, and has an integral rechargeable battery, allowing for operation in both traditional and unusual broadcast venues. The product includes an Ethernet port, a computer-modem-style card slot and a USB port, which can be utilized to connect to a variety of networks including WiFi, 3G, WiMAX, satellite, and wired IP. It utilizes new advanced coding algorithms like AAC-ELD, which minimize both network utilization and delay. Features, like a docking 5-channel mixer and integrated web browser make the product usable in a wide range of situations.

The Future

As always, Comrex is focusing on what the next available network promises for broadcasters. 4G wireless is the next big thing, and it's already deployed in some cities. Coming in two flavors (WiMAX and LTE), 4G wireless offers wider network bandwidth with lower delay and congestion than existing 3G networks. Comrex is busy testing and integrating 4G support into the ACCESS line of IP Codecs.

Comrex Brand

Having been in business for nearly 50 years, Comrex has been able to build a solid brand, and the name has become synonymous with these audio coding processes throughout the industry. Many customers call with questions about "The

Comrex" without regard to model numbers or product names. "The Comrex" is just the little box that does its job.

One of the ways Comrex promotes its brand is through product support. Customers who call or email with problems get direct contact with someone intimately familiar with the product, and in most cases years of experience tackling audio and telecom issues. The support staff has regular, direct contact with the engineering staff for extra tough problems.



WNGC's ACCESS

American Made

Comrex manufactures all its products in the U.S., and final test of all products take place in the Devens, Massachusetts headquarters. All product repairs take place there as well. And Comrex makes a special effort to procure parts for its products before these parts are no longer available from manufacturers. An extensive inventory is carried of parts for products that have long since been removed from production.

If you notice in the previous paragraph, Comrex is located in Devens, Massachusetts. Which brings this story

full circle. You see Devens is the decommissioned Fort Devens where my uncle was stationed. When John and Lynn first started Comrex, Fort Devens was an active base training our troops on the latest weapons technology. Today, thanks to Comrex, Devens is the sight of the latest developments in Codec technology.

But, unlike those up-tight Army types that once roamed Ft. Devens, Comrex has a different corporate style.

Corporate Culture

Comrex maintains a unique and casual culture. The headquarters building was custom designed for the company with open-floor work areas to promote collaboration and team efforts. The building was designed as a south-facing, sunny environment with lots of glass. The building houses all management, sales, accounting, R&D, support, production, and shipping and warehouse functions.

Most Comrex employees are animal lovers, and it's likely you'll find a few well-behaved dogs on the premises.


Employee Owned

Comrex is an employee-owned company. All employees participate in an ESOP (Employee Stock Ownership Plan). This means that all employees are automatically granted ownership of company stock each year. Since all employees are owners, there tends to be a very high commitment to product quality and customer satisfaction. Many Comrex employees have been with the company over 20 years.

Oh, by the way, if you're planning a factory visit, plan it in mid autumn. Plan some time to take in the beauty of fall that the old Mohawk Trail has to offer. I'm sure Kris or Tom can give you the name of a cozy, nearby New England Bed and Breakfast to stay at while you're there.


For information on ACCESS and all Comrex products visit www.comrex.com or call 800-237-1776

- Modular Operation in Op-X allows for a tiered system at a fraction of the cost of its competitors.
- Each studio client is capable of accessing all Audio Server modules on the network.
- Remote voice-tracking allows for creation of content for remote studios also running Op-X.
- The revolutionary design of Op-X's clock builder turns the previous task of scheduling satellite programming into a few simple clicks.
- Share serial devices from any machine using the Op-X Serial Server.
- Importing logs now gets its own module that takes confusion out of the process.
- Engineers will enjoy Op-X's easy installation, maintenance, and auto backup features.




AUTOMATION

SIMPLE • POWERFUL • REDUNDANT




#	Description	Name	Time	Length
715	Marketing Architecture		13:55:45	0:0
716	The Discounters		13:54:45	0:0
717	WGNR - News		13:57:45	0:0
718	WGNR - News		13:57:45	0:0
719	WGNR - News		13:57:45	0:0
720	WGNR - News		13:57:45	0:0
721	Weather Update		13:58:31	1:17
722	Weather Update		13:58:31	3:54



"Op-X is very functional and easy to use. One of the best features is the log merge. On our old system it took minutes and with Op-X it takes seconds."

-John O'Dea, Ops Mgr
WNNK-FM, Harrisburg, PA

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



Broadcasters
General Store
352-622-7700
www.bgs.cc



Kintronic Laboratories, Inc.
 A global leader of world-class
 radio broadcast antenna systems
 and components

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

Site Planning

Design of Digital-Ready AM Antenna Systems

Custom Fabrication of AM Antenna Systems

On-Site Services and Technical Support

Kintronic antenna systems are powering radio in the major markets in all 50 of the United States and in more than 70 countries on six continents. Very few companies do what Kintronic Laboratories does. And none bring the expertise and design to radio broadcast antenna systems and components like Kintronic Labs. Kintronic.com

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

Practical Engineering

Good Questions Improve Station Maintenance

by Daniel Carcopo

Things are often overlooked while the pressures at the studio keep you busy all winter long. Now is a good time to get your Springtime maintenance plans in order – Spring will be here before you know it.

Springtime is a perfect time to evaluate your plant. But do not just write down a whole bunch of issues and leave them on the “To Do” list. Take advantage of the good weather and make plans to really get something done; this could be the start of a new beginning that will ensure reliability of your total plant operations and better prepare you for when unforeseen things happens.

Getting an Overview

So grab the nearest pad of paper and a pen full of ink and we will get started. Please note that a proper maintenance inspection, whether routine or a “yearly checkout,” will highlight both technical and safety concerns. Ask a lot of questions as you go; The more you ask, the better your inspection will be.

We start by pulling up to the front of the transmitter site, and from the outside of the front gate or roadside of the entrance to the site take a look from the outside – the “total picture” as you might say. Is the fencing in good condition around the property? How about around the tower and anchor points? If your AM tower is surrounded by wooden fencing, are all the slats in place? For stations with guyed towers, are the guy anchors fenced in?

Are the proper warning signs (RF warning signs) in place? Is the Tower Registration (ASRN) number visible? Are the signs clearly legible to visitors?



While you are thinking about the tower, take a moment and look at the tower’s condition. Is all of the metal covered by paint, and are the paint bands the proper color? Do the tower lamps appear to be in working order and evenly lit when on? Does there appear to be anything out of order on the tower; for example, are any of the transmission lines unsecured? Are the radomes in place on the FM antenna? (If you have deicers on the antenna, do not forget to check their operation when you get into the transmitter building.)

If you notice any of these items out of place or inoperable it may be time to invite your local tower climber to the site and set things straight.

Inside the Fence

As you open the main gate to enter the property, does the lock open properly, or does it need some oil? If there are multiple locks, do all the users understand the concept of how to put their locks together to create links in the chain, or has one person effectively locked everyone else out? Does the gate open without undue effort?

Once inside, is the driveway in good condition? Or has it become washed out, filled with potholes or otherwise requires a monster truck with mud bog tires to get to the transmitter building? Hiking in during an emergency can be time consuming and annoying.



After parking, walk around the perimeter of the building, checking its condition. Are there any problems with vandals leaving graffiti or causing other damage? Are the gutters in good condition, or are they rusted out or clogged with debris and serving no purpose? Is the outdoor light working? Better to catch it now than find it non-functional in the middle of some night.

More External Checks

At the transmission line entrance point, are the lines properly secured, and grounded? Or is there damage from ice having fallen off the tower and knocked the lines ajar?



Following the lines out to the tower, are they secured properly? Are they grounded to the tower properly? And are the tower grounds properly secured? If an AM station, is the ATU in good condition, free of rust and properly bonded to the ground system? Does the ATU door lock (and is the key available)? At the tower for AM stations are the lightning balls in good shape, and gapped properly? Does the base insulator look to be in good shape? Be sure to make your notes accordingly.

Looking Inside

Moving back to the transmitter building, is the door properly secured, or did a tenant unwittingly leave the door unlocked for the entire world to get into the building? As you look around inside the building, when was the last time the floor was swept? Are there cobwebs hanging all over the place? Are there “critters” in there? Or has it become a dumping ground for all the old equipment that is no longer used at the studio? (Often, old equipment has to be stored at the site but does it have to be lying all over the place?)

By the way, this might be an advantageous time to inventory any excess items, and give the list to the company bean counters to find out when the items can come off the books. Then, when it is permitted to remove these items from the records, a small dumpster can be procured from the local waste collector. If the items are still serviceable and in working order, generate some of your own “non-traditional income” by selling the stuff. Use the funds to purchase new equipment or put the proceeds into a station party fund.

In the long run, a clean building is a happy place for transmitters, support equipment, HVAC and, more importantly, you! Clean air filters ensure the equipment has proper airflow and you will not run the risk of getting a dreaded emergency call due to a clogged filter. Something as simple as sweeping the floor and taking out the garbage can help to boost your morale and also show others with whom you work, including management, that you take pride in what you do.

How is the HVAC (heating, ventilation, and air conditioning)? Has the return air filter been replaced lately? Is the room temperature within specifications for your particular equipment? When was the last time the HVAC system was serviced and the condensing coils cleaned?

Technical Checks

These next things probably ought to be noted on a separate sheet of paper. I suppose the first question to ask is: “Is there a transmitter log, and if so, how up to date and detailed is it?” Such a log is the key to being on top of your transmitter’s condition, and in the long run will help better diagnose any potential problems as they arise.

Start with a record of the forward and reverse power; then check the plate voltage and current, screen voltages and any other readings that your transmitter may offer. For AM stations, check your base/common point current. And if your station is directional add spaces for the monitor point readings. Other things to make note of include the remote control readings. How accurate is the calibration compared to the actual readings? Leave space on your sheet to add notes about the modulation, transmission line pressures, STL receiver readings, etc.

If you have a backup transmitter, open it up and look inside; does it need cleaning in there? Are there any capacitors leaking? Are the interlocks working – are they working properly? Filters clean? Are all of cooling fans working? And most importantly, if for some reason the main transmitter gives up the ghost are there means of easily and quickly taking the backup to air? Did you test those means? (That also gives you the chance to look inside the Main.)

For those stations unable to put the backup on-air due to programming requirements, run the backup into the dummy load (you do have one, right?) and check for normal parameters and log the readings. Do not forget to note other general but important information including generator fuel and oil levels. When was the generator last exercised? When was it serviced?

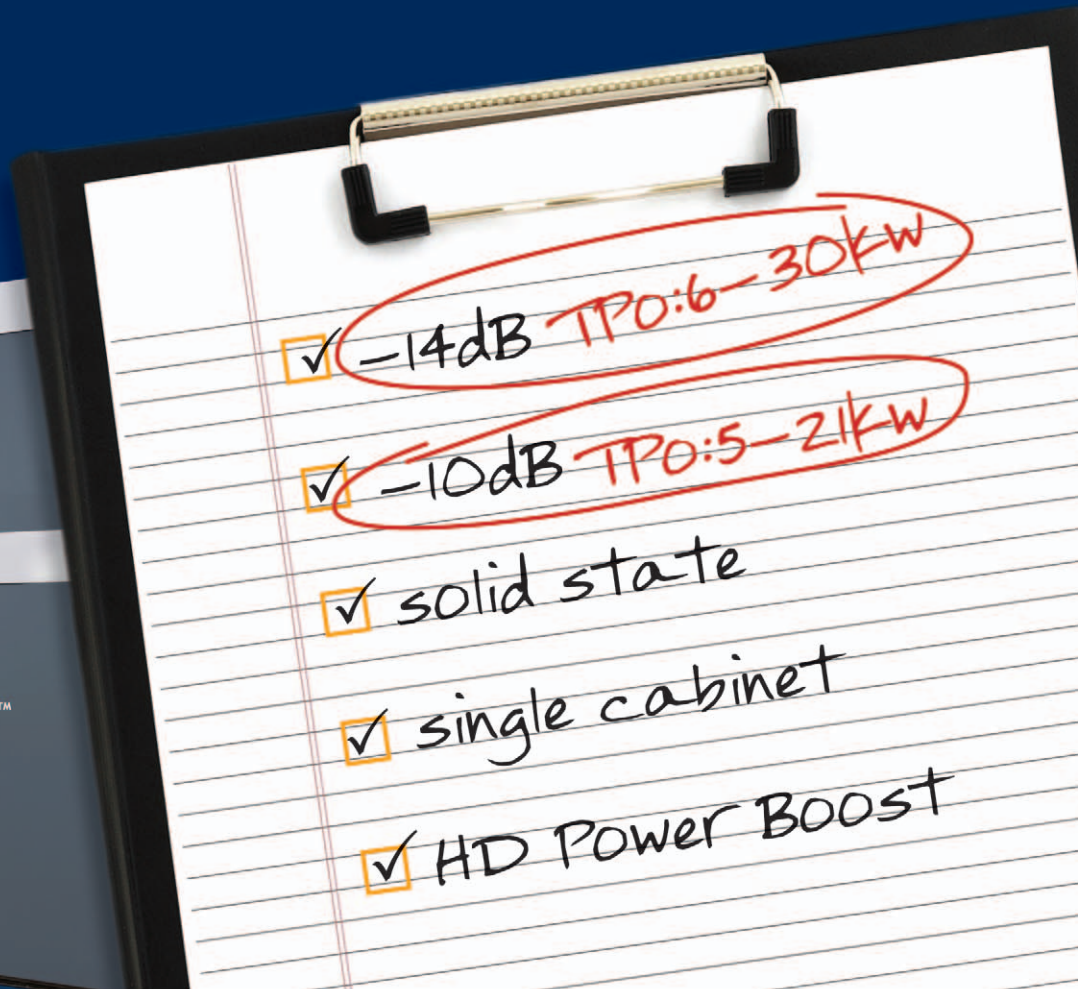
Using the Information

All this data should go back to the office with you, so you can do two important things. First, make a list of priorities; the ones at the top of the list are those problems that could result in forfeiture if you happen to get a surprise inspection. The list continues with each thing that could potentially put the station off the air, if not looked after promptly.

The other important use of the data from your inspection is to produce a printout so that whomever goes to the site (hopefully on a regular basis) now has something more to do than just look at the forward power and run out of the building. A three ring binder will help keep track of these sheets, and effectively create a transmitter log that will demonstrate to anyone the plant is being run cleanly and things are getting done to ensure it stays that way.

Use the information you gathered. With your list in hand and a maintenance plan, you will be able to make your site visits more productive, promote site safety, and keep everything well maintained. – Radio Guide –

more more -14dB -10dB more of your bases covered



No one else builds single-cabinet, solid-state transmitters with power outputs of 6kW – 30kW in -14dB hybrid mode and 5kW - 21kW for -10dB. And only Nautel gives you an option for even more power in the same cabinet with HD Power Boost. That means more flexibility in planning for higher injection levels. Expect more; more engineers, more innovation, more -14db and -10dB power.

Learn more at www.nautel.com/-14dB

Making Digital Radio **Work.**



902.823.5131

www.nautel.com/expectmore/

Transmitter Site

A Tale of Two Blowers

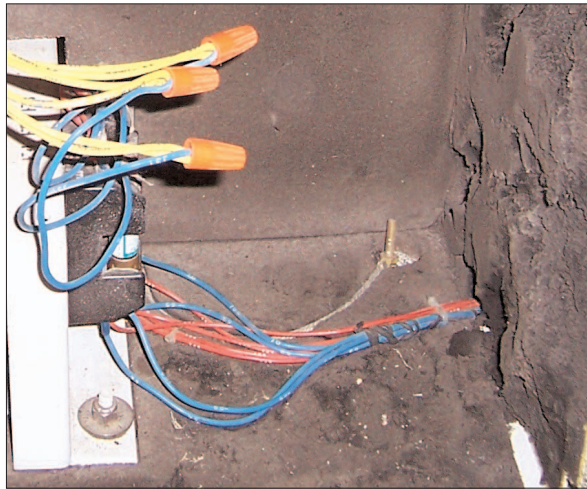
by Scott Schmeling

I love a good mystery. One where you get information, you analyze it, and you solve it. Transmitter troubleshooting is usually like that. But once in a while you're thrown a curve ball – the most logical solution is not correct. I ran into a couple situations like that recently.

Mystery #1

One of our stations is running a Harris FM 20K transmitter. This site has no 3-phase service so there's also a PhaseMaster phase converter installed. We had experienced occasional transmitter outages, and we would sometimes find the PhaseMaster breaker tripped. Sometimes all it took was pressing the Plate button, even though it hadn't come on by remote control. When the transmitter did come up, all readings were normal, and there was no indication of the possible cause.

The last time it happened, I was in the middle of a mock FCC inspection at another site a couple hours away. The station's Operations Manager could not get the FM 20K to come back on, so he switched to the backup. In the meantime, we finished the "mock" and I packed up for a drive.



Transmitter with Foam Sound Deadener

The Clues

When I arrived, I found all breakers up, but the transmitter would not fire up. When I pressed the Filaments button, I could hear a contactor energize, but nothing else was happening. This transmitter has three cartridge fuses on the blower. I checked the fuses and found one blown. I replaced it and hit the switch. Same thing: I could hear the contactor but nothing else was happening.

I checked the fuses and, again, found one blown. I could spin the blower easily by hand. I felt the case and found it warm but not excessively hot. Of course, the transmitter had been off for a few hours so I figured the motor may have cooled down. The motor appeared to be bad.

By then it was early evening, and my regular motor shop was closed for the day. I pulled the blower out and headed for home. I would take it to the shop in the morning and have it repaired.

A Nice Twist in the Plot – But No Solution

Let me pause this thought for a minute to mention something else. In this transmitter, the area around the blower is lined with an adhesive-backed foam for sound damping. Over time the foam has dried out and some of the adhesive has started to break down.

In fact, the transmitter was down a number of years before because a chunk of the foam had broken free and blocked the airflow!

With this in mind, and since the station was on the backup anyway, I decided to remove the foam. For that, I picked up a gallon of mineral spirits, a wide-blade putty knife-type scraper, and a couple rolls of shop towels.

Motor Check – It Works

The next morning I was waiting at the door when the electric motor shop opened – the shop I have always used. When I explained that our transmitter was off, they checked the motor right away.

It spun-up just fine and current draw on each winding was normal. The only issue they could detect was a little noise in the bearings. Considering the motor spins continuously, I wasn't surprised. They replaced the bearings while I cleaned the blower blades. Then I hit the road for the transmitter site.

Need More Clues?

During my hour-and-a-half drive back to the site I was re-analyzing my "mystery." When the blower fuses open, the logical assumption is excessive current draw by the blower motor. This theory had just been disproven.

Back at the site I started removing that sound-damping foam. It was a messy job but someone had to do it! In some areas it had already let loose. In other spots it took some mineral spirits and scraping.

I was able to remove all the foam; then I wiped the area down with rubbing alcohol to remove any residual mineral spirits.

Mr. Chafe in the Hole With the Wires

After the foam was gone I discovered that "curve ball." The AC wiring to the motor enters the area through a hole in the wall of the blower compartment. What I couldn't see, because of the foam, was that there was no grommet around the hole.

After years of rubbing and vibration, the wiring insulation had worn down. There was a direct intermittent short to the cabinet!

The Fix Was Easy

I was able to butt-splice the worn wires with crimp connectors and put a grommet around the hole. I looked at another FM 20K and found no grommet on that one either. Is it possible that over time they age and disintegrate?

A word to the wise: If you have a Harris FM 20K transmitter in use, you might want to check this and fix it before your transmitter shuts down.

Mystery #2

The other blower was in a Collins 831 G1 FM transmitter. When I arrived on site and opened the door, I was met with "that smell!" You know, the one indicating something had gotten very hot. In this case, the blower breaker had tripped. Before resetting it, I checked the blower and could tell by the odor at the motor that I didn't want to even try it. This was Sunday night, so I pulled the blower assembly and headed for home.

Back to the Motor Shop

In the morning I again went to my favorite motor repair shop. It was obvious the windings had burned up, so there was no fix for this one. They did not have a comparable motor in

stock, but their supplier in Minneapolis (an hour and a half away) did so I headed up the highway – again. While I was driving, Dave, at the motor shop, was disassembling the blower and cleaning the blades. When I returned with the shiny new motor we re-assembled the blower, checked everything out, and I headed back to the site.

The blower assembly went in as easily as expected. I turned the breaker back on, pressed the Filament On button and everything was good. The transmitter was on and we were back in business.

The Mystery Returns

Six months later the transmitter dropped off again. When Keith Wright, the Operations Manager, got to the site he found the blower breaker tripped. This was a large Heinemann breaker that looked like an oversized, old-fashioned brown light switch. The paddle was down. When he moved it back to the up position, rather than snap into place it flopped back down. He tried a couple more times with the same result. It was obvious the breaker was bad. (I like stating the obvious.)

Replacement Time

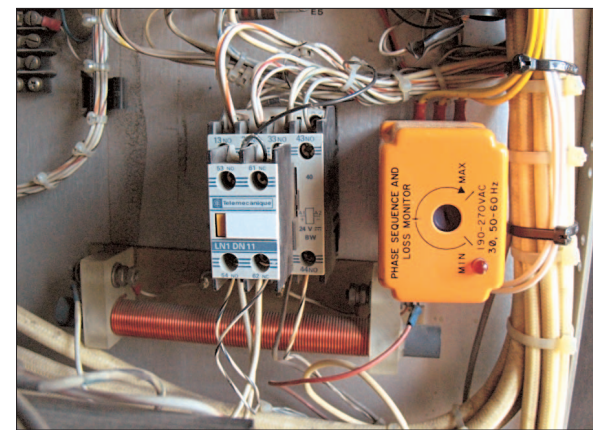
I gathered some things and got ready for a two-hour drive to the site. Knowing the breaker was bad, I stopped at the electric supply house for a triple fuse block and some 10-amp fuses. I figured it was better to have some protection than none at all.

When I arrived, we installed the fuse block in place of the breaker, hit the Filaments, and nothing! One of the new fuses had blown. We took a closer look at the motor and found it had burned up – again!

MS Breaker Drops a Leg

The next morning I headed back up to Minneapolis for another motor. In talking with the guys at the motor shop I asked if the thermal protection should have saved it. They told me if a 3-phase motor is powered and spinning, and one of the legs drops, the motor will continue to spin, overheat, and burn itself up. Which is exactly what happened – twice!

This transmitter design does have a loss-of-phase protection circuit, but it's on the input to the transmitter. We didn't lose a leg to the whole transmitter, just to the blower because of the bad breaker.



The SLA-230-ASA Three-Phase Monitor

The Fix

To prevent this from happening again, I installed an additional phase loss monitor (Diversified Electronics SLA-230-ASA). This one monitors the 3-phase going to the blower. If we lose a leg to the blower, the monitor contact opens, causing the control relay to de-energize, releasing the blower contactor and removing power to the blower. Considering the time and expense – times two – to replace the motor, this was money well spent.

Two mysteries, each with an unexpected curve ball, both solved. Have a great 2010!

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



Your Studio – Wherever YOU Are

Take BluePack On The Road – Keep BlueKeeper At Your Desk



BluePack



Conducting interviews from your desktop or in the field is now easier than ever. With JK Audio's new BlueKeeper and BluePack, it's as simple as making a phone call. Using your Bluetooth™-equipped cell phone, you just pair and go (or stay). Effortlessly capture your voice and the caller on separate channels of your flash recorder or computer. Perfect for broadcast production.

The versatile BluePack (with a convenient beltclip) gives you a balanced mic input with a high-performance microphone preamp, stereo line-out, and an aux send. Together with your Bluetooth-equipped cell phone and a compact portable recorder or computer, it provides an incredibly compact production solution for interviews from wherever you happen to be. OR use it to send live man-on-the-street interviews back to your facility FROM your cell phone.

BlueKeeper gives you the power to mix mic and line level signals with calls from your wireless right at your desktop. It gives you a balanced XLR input with a professional mic preamp for superior sound quality and an XLR output. Mini jacks provide stereo lines in and out, a mono mic-out and a stereo headphone out. As with BluePack, use it to capture an interview or call in a story from Your Studio, wherever that might be.

Whether your interviews are in the field or at your desk, JK Audio's BlueKeeper and BluePack are an integral part of your studio.



BlueKeeper



JK Audio
TOOLS FOR SUCCESSFUL RADIO

www.jkaudio.com

Checking Your CD Interest

by George Zahn

Last issue we looked at some of the aspects of one of the staples of the broadcast industry – the CD player. From an informal survey of some engineers, operations gurus, producers and show hosts, we examined the ongoing battle between the sleek front-loader decks versus the old school, drawer CD players. We also offered tips from the panel on what to do when you get a call from a confused jock about a voracious player swallowing a disc with no apparent desire to give it back, as well as some good maintenance ideas to keep CD players going longer.

On the Way Out?

In this follow up article, we ask the panel some key questions including “Are the compact disc’s days fading fast – is there an apparent crystal ball end date for CDs as we know them?” We’ll also look at creative uses for CD recorders and players, and some alternatives for those who are facing tough and costly decisions as studio CD gear starts to fail. In the last issue, the informal panel indicated that drawer loaders seem to be in greater favor among the technical folk. But are there any clear favorite models?

“The Denons are OK,” says engineer Jeff Johnson. He does warn that newer CD players that read not only standard CD Audio, but now MP3 and WMA files, sometimes “get confused” in his experience.

Another engineer polled suggested that Numark, a company more linked to wedding DJ gear than broadcast studios, is becoming a more affordable option for some stations. Jay Crawford points out that, in effect, the Numark units can often be found for about half the price of some of the “broadcast name” models, and some Numark units even offer balanced outputs.

Home Sweet Home Players?

Many of us have known stations which started out, and may still be utilizing, home CD players for some playback – especially in lesser-used, extra production studios. Some smaller stations, out of sheer financial need, are using home units in air studios. I’ve worked with some stations that still have CD on-air libraries and use home machines – not the cheapest ones, but good “consumer” units.

“The home machines will not have the sophisticated cueing features of the pro units,” says Jay Crawford. He also points out that you can modify the home player (probably voiding the manufacturer’s warranty) and make changes that allow for remote starting.

Jay said, “It varies from machine to machine. On some it’s as simple as installing an optical coupler IC – basically an LED that triggers a photo transistor to close a contact across the start switch. Other machines need a relay installed which works the same way, by isolating the internal from the external circuitry.”

DJ Gear or Pro Gear

If you’ve shopped for CD players and recorders recently (the station I manage has been doing so because two of our three recorders are slowly dying), you’ll find that the pro gear can be an expensive proposition. In the words of one panelist, “You get what you pay for.” But there was also the opinion that cheaper decks, including the wedding DJ models as a mid-range between the pro decks and home units, can often be viewed as “disposable” items.

If you get two to three years out of a deck that costs half as much as a pro deck that might average three to four years of service, it might be worth giving up some of the higher end bells and whistles of the pro deck.

Keep in mind that many “low end” decks must be modified for remote start, and some do not have balanced outputs – two key considerations depending on the engineering staff at your disposal.

From a recorder perspective, some less expensive CD recorders will be more finicky on what brands and types of CDs (Music CD versus CD-R) they “prefer.” It’s a good idea to talk to others in the field before plunking down the cash to buy a cheap deck. The more expensive media could devour your savings quicker than a daughter planning a platinum wedding.

CD Archaeology

Are CDs eventually going the way of the dinosaurs? Don’t count them out just yet, even if it’s simply as a long-term storage medium. “I think the idea of no real hard copy of work is foolish,” says producer/host Mike Farrar, who likes the ability for fairly compact storage that’s easily “rippable” into a system. Jeff Johnson adds, “there will always be CD players, just as there are still phonographs.” Another engineer cited that when you consider that the lifespan of a computer hard drive may be less than five years, CDs aren’t such a bad option – perhaps even DVDs and eventually Blu-Ray for even larger amounts of file storage.

At least one dissenting opinion sees it differently. Operations specialist Dave Schramm thinks the CD as a popularly available storage medium could be out of the broadcast world in ten years. Dave said, “there will be some die-hards who refuse to stop using them.” He projects consumers will have abandoned CDs as a recording option sooner; “maybe five years due to the many means of storing audio already available, including MP3 players, phones, and computers.” Either way, the Mayan 2012 calendar dooms all of us long before even the most pessimistic view of CD longevity.

It is possible that, just as some stations have kept vinyl, reel, and even minidisc going, that CDs may be around longer than some would expect. “CD will be the next reel-to-reel, says Jay Crawford, “hanging around for longer than it probably should have, simply because CD is a good semipermanent storage solution.” That sounds as if we’ll still have our “Tyrannosaurus Stacks” of CDs for awhile at least!

I also asked our panel about their experience of stations playing files other than standard CD audio on the newer players that are MP3 and WMF agile. The only positive comment I received was from an engineer who works with an independent public station in which a number of volunteers bring in their own music for individual shows. Here the consumer/professional line blurs and the consumer volunteers are able to bring more to their shows than just standard CDs. Whether that’s a plus or minus is up to each station’s management, but more and more decks are able to play CDs burned in different file formats – and we need to be aware of the possibilities, pro or con.

The Envelope Please

My favorite part of the questions was learning creative uses for CD players, and I’d like to share two “Zahnie” Awards for out-of-the box thinking and creative application of the technology.

Two different stations were cited by Jay Crawford in our discussion. One is a small Sports/Talk station that does a great number of local sports game broadcasts. In the past, the station used the extended length, lower fidelity setting on a minidisk recorder to archive game broadcasts from local venues. Now the station is using MP3 record capability on CD to archive the same games.

Overall, the CD gives quicker ripping and file access to find highlights or create “vanity” copies for family members of the station’s high school broadcasts. If you’re following me on this, one could utilize just about any PC or Mac audio recording program to log a few hours, or an entire broadcast day, in a very inexpensive format. Many programs have timed recorders. After recording what you need, you can burn the files to CD as audio, or in the case of logging perhaps an entire day, you could still keep a decent-sounding MP3 file or files on a DVD. Storage and access become easy.

The second award goes to the idea of stations utilizing home style CD changers (with some minor modification) to create backup audio at a transmitter. “In the old days, stations felt fortunate to have a reel with an hour to ninety minutes as a backup,” reports Jay Crawford, “now with multiple CD changers, a station can trigger hours of backup audio in an emergency.” An example would be a 5-CD changer with five, 80-minute CDs loaded. One station simply has format-friendly songs on the discs with a legal ID after every second or third song. That’s about 400 minutes, well over five hours of CD quality backup in an emergency, that the engineer can start remotely in a real emergency or when a silence sense goes off. Imagine using a changer at the transmitter that can play quality MP3 files, and you could go more than a day with a multiple CD changer.

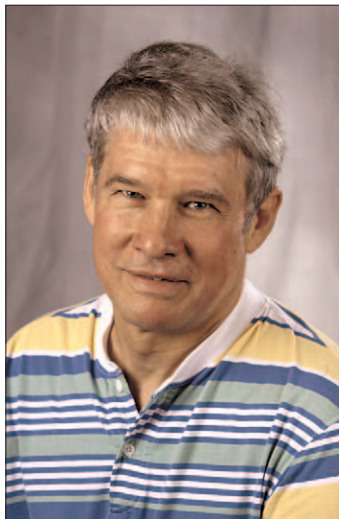
A Flashy Response

So what have we learned so far? If your station is anything like mine and budgets are increasingly tight, you’re looking at many options to replace failing equipment. Each station is different, so there’s no firm answer on what to do. On the recording front, one sales rep passes on that more stations seem to be looking into compact flash (CF) recorders to meet their studio recording needs. There are rack mounted professional broadcast CF recorders that offer real time recording and USB ports for file transfer.

If computer noise isn’t a major issue for you, many stations are also looking into recording directly to computer via audio software, and saving files to fairly inexpensive (and often networked) external hard drives; but hard backups remain an issue.

Let us know what you’re thinking about when it comes to studio recording in this economy, as we learn together at the Studio Site.

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



Jeff Johnson



Mike Farrar



RF Specialties® Group

BIG NEWS!

Welcome Steve Moreen!

Steve Moreen joins The RF Specialties Group as President and General Manager of RF Specialties of California, Inc.

Steve brings remarkable credentials in radio, television and satellite communications as a past Director of Engineering of major market radio and television stations and Owner/General Manager of a large satellite uplink facility.

Steve is just another reason why The RF Specialties Group brings you the experience and expertise you deserve through their knowledgeable sales engineering professionals. And don't forget, as we love to say...."RF" is GOOD for YOU! especially when it comes from the RF Specialties Group!



619-501-3936 or steve@rfsca.com

Call your nearest RF Specialties Office:

RFSCA	San Diego	CA	Steve	619-501-3936	RFSMO	Kansas City	MO	Chris	800-467-7373
RFSCA	Las Vegas	NV	Bill	888-737-7321	RFSMO	Raymore	MO	John	877-331-4930
RFSWA	Mukilteo	WA	Walt	425-210-9196	RFSMO	Richmond	IN	Rick	888-966-1990
RFSWA	Vancouver	WA	Bob	800-735-7051	RFSPA	Ebensburg	PA	Dave	866-736-3736
RFSTX	Amarillo	TX	Don & Mo	800-537-1801	RFSPA	Pittsburgh	PA	Ed	866-412-7373
RFSTX	Dallas	TX	Wray	888-839-7373	RFSPA	Philadelphia	PA	Phil	888-737-4452
					RFSGA	Thomasville	GA	Chris	800-476-8943
					RFSGA	Crestview	FL	Bill	850-621-3680
					RFSGA	Murray	KY	Dave	270-767-7644

Over 400 years of combined broadcast experience, ready and willing to help you!

www.rfspecialties.com

Out In Africa

Editors Note: We've covered two Xtreme builds in the Nevada mountains so far in Xtreme Engineering. This time we're taking a trip to Africa with an engineering missionary. The worst conditions you'll find here in the United States are a piece of cake compared to some of the stuff Dave has dealt with.

The top dipole stands 100 feet above ground and overlooks grass roof huts and open large spaces with sparse undergrowth. The scorching sun reflects off its chrome plated steel as a reminder of the relentless heat.

Within this panorama there are no signs of electricity poles or cell phone towers. It is in these conditions that radio 95.2 is operating.

Spreading the Good News

My name is David Casement and I am a missionary technician with Galcom International. Galcom is a Christian nonprofit mission.

Galcom supplies solar-powered, fixed-tuned radios worldwide and also installs low-power Christian stations. My job is to install these stations; I travel to almost anywhere in the world but my main area of responsibility is Africa.

In these installations I sometimes have small budgets and challenging conditions that require creativity and, at times, extreme engineering. One of the most memorable installations was in Chad, Africa.

Radio 95.2

We worked with T.E.A.M. missionaries Mark and Dianne Vanderkooi. They work among the "Kwong" people in Chageen (TChaguine, French spelling) of central Chad.

It is an eight hour drive south from the capitol city of NDjemena over dirt roads – where the radio station is located.

The Vanderkoois are Bible translators and teach literacy. The Kwong people live almost the same as they did 200 hundred years ago; most do not read or write. This makes Bible translation difficult. The vision for the radio station is to enhance this work, and there are several other Kwong villages in the region which the station will reach.

Extreme Conditions

It was 110° to 114° F (40° to 45° C) each day. (The hot weather came earlier than expected.) We put up a 96 foot tower, and installed a 4-bay antenna and a 250 watt transmitter, which runs on solar power with some energy coming from a windmill.

The Trylon tower was shipped as a knock-down so it did not take up much room in the shipping container. Long before I and another tower climber arrived on site, there was a team that came to assemble the tower sections.

This project took hours of laying out the many pieces, and bolting together one section at a time - it resembled a large Erector set.

Starting the Build

When I arrived, the tower was the first order of business. We checked each section for being "true" and found only a few minor tweaks were needed.

This was a galvanized tower, but the local authorities demanded that each section be painted the traditional international orange and white, since Mission Aviation had a grass landing strip close by.

In order for the paint to adhere to the galvanized tower we "painted" first with vinegar, to thoroughly clean the surface. This was allowed to dry and rubbed down before we started with the "metal paint."

In the searing heat this had to be done under shelter in order to cure properly, and any tool left in the sun could not be picked up with bare hands.



The Local Blacksmith

Stacking Steel

We could only work on the tower until 10:00 AM and then the heat and hot wind became too great. We had to come down, take a break (during which we each drank around 2 liters of liquids) and work on items on the ground. This meant setting up for work each morning at 7:00 AM and knocking off at 5:00 or 6:00 PM.

All the work on the tower was done by hand. Each section had to be carried from the "compound" to the tower, about two football fields away (500 meters/1640 feet), then hoisted by winch and gin pole to its place in the stack – time consuming but effective.

The winch was carried as accompanied baggage all the way from Canada. It was a heavy duty boat trailer winch with 200 feet of 1/8-inch aircraft cable on the spool. Each section went up without problems until the top section. There was one aviation (beacon) light and two lightning rods mounted on it, so it was top heavy. We were thankful when that was bolted in place.

The New and the Old

We had to make our own lighting rods for the top of the tower. The idea was to give any static charge build up a place to bleed away, to help avoid lightning strikes. We took copper-clad rods to the local "blacksmith" to be heated and bent to shape.

It was an interesting experience to watch one man stoke the coal fire using goat skin bellows. The black-

smith would then remove them from the fire and place them on a small anvil and hammer them to shape. The shop was an extension of a grass roof house, and the fire was in a small pit in the ground. Old technology, but it worked.

Underground Studio

In order to create an environment that was as cool, noiseless and dust free as possible, Mark put the studio building in-ground. It was constructed out of cement, much like a basement in a North American house but with no ground level floor. The ceiling was cement, with low side walls and treated with water proofing.

A pitched metal roof stood over that. The cement roof was then flooded with water and, between the basement effect and evaporation from the ceiling, the studio was consistently 15° F cooler than outside. It is a one-room studio with audio equipment, transmitter, solar system and wind generator electrical panel, and one small homemade window for natural light (there are two electrical lights).



In ground studio, built to stay cool.

On The Air

There were tears of joy on the day of our first test broadcast. We got one report back from missionaries in a village about 37 miles (60 KM) to the North. They said they heard the station loud and very clear. We tested at 150 and 250 Watts while announcing that on the air.

To them, the signal was the same no matter which power setting it was at. This has made the Vanderkoois very happy. They can most likely reach the desired coverage area with 150 Watts, which is a very good thing when the station is run on solar power. The station is on-air four hours a day, 7 days a week, 365 days a year.

Wrapping it Up

In the end, the equipment was installed and worked perfectly. There were a number of challenges along the way, but the Lord gave wisdom and the items needed to overcome them.

It was also a great time of fellowship with the Vanderkoois, the Davises (the family who volunteered) and with some of the local folk. It was wonderful to visit through interpretation with people like Kinamati, Francios and Pastor Wanang.

You can check out more of Dave's African adventures at <http://dave-kathy.blogspot.com>. Find out about Galcom at www.galcom.org For more information on the T.E.A.M. work with the Kwongs visit www.webmissions.org/ ChageenPhotos by Dave Casement, Diane Vanderkooi, Keith Davis.

Sicon-8 Internet & Voice Remote Control



The CircuitWerkes Sicon-8 Voice Remote Control

- Uses Dial-up, Internet Web server or free Siconcontroller Software!
- 8 channels of metering, status and control (expandable to 32) 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.
- Includes: Function scheduler, auto-logging & alarm reporting.



Internal Web Server



Free Siconcontroller Software

The Sicon-8 lets you control your site via Internet with its internal Web server, via telephone, auto-answering cell phone or with our free software. Setup is a breeze using the Siconcontroller software that also includes scripting, e-mail alerts, multi-site management, virtual metering & much more!

NEW!! Web-Based Silence Sentinel



Introducing the Silence Sentinel
Discover more online at
www.circuitwerkes.com

- Detects Stereo or Dual Mono Silence (independantly adjustable channels).
- User-programmed relays (DPDT) close automatically or via Web control
- Balanced or unbalanced audio inputs.
- External trigger inputs activate user-defined actions.
- Optional Multi-Site monitoring software coming soon!



Remote Broadcasting 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 & 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.

Lots More CircuitWerkes Problem Solvers

- Transcon-16 - Move up to 16 contact closures from room to room over an audio cable
- DT-232 - Turns DTMF sequences into user-programmed serial outputs & action steps.
- FSK Encoders, decoders, tranceivers and contact-to-FSK encoders/decoders.
- SUB-03 Subaudible tone decoder and SEN-6 Subaudible encoder.
- HC-3 telephone autocoupler and AC-12 rack of autocouplers
- DTMF-16 and DS-8 DTMF tone decoders.

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

FTC Guidelines on Endorsements

by Peter Gutmann

As broadcasters, we tend to think of legal requirements mainly in terms of the FCC. Yet sister agencies also regulate many of our activities. This month, let's turn the spotlight on the Federal Trade Commission, which recently issued revised guidelines on endorsements and testimonials.

Before you turn the page, please note that we're not only referring to celebrities on talk shows predictably flacking their latest show/movie/record/book/tour, but also other types of situations that commonly occur at nearly every radio station and to which your entire staff needs to be sensitized. Not just broadcast material or ads written or approved by station personnel, but blogs and Internet activities – not only on the licensee's own official website but those of its *employees* as well.

Please bear in mind, under general legal principles, if an employee becomes liable for an act within the scope of his employment, then his employer can be held responsible as well.

First, a Few Basics

The FTC is empowered by Congress to prevent unfair methods of competition and deceptive acts or practices that are likely to injure consumers – unless the injuries are reasonably avoidable or are outweighed by countervailing benefits. Of course, deliberate deception, as in a knowingly false advertising claim, is always illegal.

The purpose of the revised FTC guidelines is to focus on statements that operate more subtly – they appear to reflect unbiased opinions – when in fact they are influenced by a marketer. The FTC's concern is that in such circumstances consumers are apt to be misled.

The guidelines take the position of a typical consumer and

consider how he or she is likely to react to an endorsement. They update prior guidelines which had been in force since 1980, when blogs and other "new media" were barely imagined.

What Constitutes "Endorsement?"

The FTC defines an endorsement as any message that consumers are likely to believe reflects the opinions, beliefs, findings or experiences of anyone other than a sponsor. There is no distinction between an "endorsement" and a "testimonial."

Endorsements exclude anyone who is identified as being a spokesman for a company, since consumers should understand the reason for their praise. However, endorsements include just about any time someone describes a product or service when consumers are likely to assume that the person is describing her actual experience or personal views.

Endorsers include just about anyone – not just celebrities, critics, athletes and other well-known personalities.

Endorsements also can arise through unusually conspicuous displays or mentions of logos, brand names or other identifying characteristics of a commercial product or service.

New Endorsement Rules

There is nothing wrong with endorsements – so long as a typical consumer is not misled. There are two fundamental rules.

First, if an endorser claims to use a product or service, they must be an actual user at the time the endorsement is presented. (Thus, program reruns or extended ad flights require that the use continue.)

Second, any "material connection" with an advertiser that is not obvious to consumers must be disclosed.

What the FTC Considers Payment

An actual payment clearly comprises a material connection and requires that the fact of payment be disclosed. But the connection can take an indirect form as well, such as receiving free merchandise or an expectation of future goods in exchange for favorable mention.

Even a one-time, free sample can qualify if it was given for the purpose of publicizing a positive evaluation. At the other extreme, there generally is no endorsement when a speaker has bought a recommended product or service with his own funds.

As an Employer You May Have Liability

This and other distinctions under the new regulations are crucial, because previously only the advertiser was held liable, but now the endorser – and their employer – may face liability as well.

If this is starting to sound vaguely familiar to broadcasters, it should – these are the same basic principles that underlie the FCC's payola and plugola policies that have been in place for the last half-century.



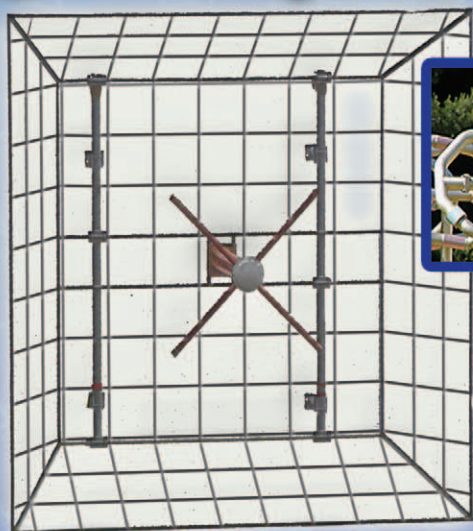

! WARNING

Your Liability is No Longer Just Over the Air

But while broadcasters focus their vigilance on over-the-air assertions and announcements, the FTC rules extend to consumer-generated and -oriented media such as blogs and other websites that fall outside the FCC's jurisdiction. These include not only "official" sites maintained by a station or licensee, but also sites that your staff may run or contribute to on their own.

For example, if an employee boasts about your station on a blog, this could be considered a paid endorsement. Why? Because you are paying them and they may feel pressured (or at least that it is in their best interest for continued employment) to boost your fortunes. *(Continued on Page 20)*

Quality FM & TV Antenna Systems




PSI is dedicated to designing and manufacturing the highest quality product. Working diligently with station engineers, consultants and outside vendors ensures that each project is completed to the customer's satisfaction.

Wide range of antenna models are available at all power levels, directional and non-directional, multi-station and more.

Additional products include..

- Transmission Line
- Combiners
- Filters
- Turnkey Systems



Propagation Systems, Inc.

Phone: (814) 472 - 5540 Fax: (814) 472 - 5676
Email: sales@psibroadcast.com www.psibroadcast.com



\$3299./EAS package

The SAGE 3644 Digital ENDEC was designed for single or clustered analog and HD radio stations as well as analog and HDTV facilities. It uses an Internet connection to allow remote, secure activation, system monitoring and uploading of software releases and redundancy.

DAYTON's AFC3 Receiver System is designed for EAS and other monitoring requirements. Holds three receivers, AM, FM, Weather, or Public Service. Use with receivers:

- AF200AC3 - FM/SCA Receiver
- AF225C3 - FM Receiver
- AF315C3 - AM Receiver

SAGE DAYTON INDUSTRIAL CORPORATION



CALL US for PRICING!

The ZX® series of transmitters offers an ideal solution to stations requiring 50 watts through 5 kW. These transmitters use the field-proven Harris Platinum Z™ transmitter amplifier modules in a small rack-mount footprint. Further, these transmitters are lightweight and easily installed by one person. ZX transmitters include popular options like sliding rack rails for the 500- and 1000-watt units.

And much more!

HARRIS®



Get 2 Sony MDR-V150 Studio Monitor headphones featuring supra-aural design. Included are 30mm diameter drivers for deep bass, high-energy ferrite magnets, reversible earcups for single-sided monitoring.

One Gator Field recorder utility bag stores most field recorders, two microphones, headphones, and cables. Has a viewable window to see recorder control panel while in bag. Excellent for projects on the go!

Get 2 AKG D 880 Dynamic performance microphones for lead and backing vocals, with a high-output neodymium transducer, doubleflex transducer shock mount, and frequency response optimized for intelligibility.

\$249./field package

SONY® **AKG** **GATOR**

YOU KNOW WE KNOW RADIO!



\$845.

DEVA Band Scanner Pro is the tool to evaluate FM broadcast band congestion and to log station identification parameters. Can measure RF level, MPX deviation, Left & Right Audio levels, RDS and Pilot injection levels. System is powered by the USB port of any Windows PC. Free Windows software sweeps the receiver across the FM band, logging every carrier and generating a spectrum display of carrier level vs. frequency. It then analyzes each carrier and creates a station list. Stations with an RDS presence are further refined to show all the radio data groups being transmitted. **And much more!**

DEVA BROADCAST



www.scmsinc.com
1-800-438-6040
 sales@scmsinc.com

- Mid-South: 1-877-391-2650
- South-Atlantic: 1-770-632-1295
- North-East: 1-315-623-7655
- Central: 1-731-695-1714
- North Central: 1-513-376-8600
- South-West: 1-210-775-2725
- Mid-West: 1-513-899-3036
- West Coast: 1-866-673-9267
- Pro Audio: 1-877-640-8205
- Latin America: 1-760-650-1427
- Bradley Div.: 1-800-732-7665

NEW • RENTALS
• USED • DEMOS



The **DIALIGHT RTO Series obstruction light** utilizes a unique optical, electrical and mechanical design. These are the most universal, compact and efficient obstruction light in the world. ETL Certified to the FAA requirements, the RTO series fixture is also ICAO and Transport Canada compliant. Also available as a single fixture for direct replacement of incandescent lamp/lens technology.

\$109.



by Peter Gutmann

– Continued From Page 18 –

However, if the endorser is an air personality whose connection with the station is well known, then they could be considered a spokesperson for the station and that, in itself, would serve to alert typical consumers of the connection to the station, and the probability that they are compensated by the licensee.

More Changes That May Effect Your Station

Since broadcasters already are familiar with the FCC's concerns (right?), let's focus on some of the most important changes in the FTC's regulations for endorsements and testimonials.

Social Media

We have already mentioned the most far-reaching expansion of FTC regulation in this area. In addition to websites and blogs, this includes Facebook, Twitter and all other types of social media—both present and future—through which favorable comments can be shared with others. The post of a blogger who receives consideration of any kind to review a product is considered an endorsement and is subject to the FTC's rules.

But unlike most on-air mentions, these tend to be beyond the realm of broadcast managers to effectively monitor, and thus directly depend upon the training, integrity and vigilance of staff. Again, an honest assessment of a product or service that the endorser actually uses and that was purchased with their own money is fine, but the receipt of free or review copies, or participation in a marketing service, raises an expectation of more benefits in exchange for favorable reviews and thus would be considered an endorsement that triggers the disclosure requirement.

Claims of Typical Results

Under prior guidelines, when testimonials described unusually favorable results of using a product or service all that was required was a simple disclaimer such as "results not typical." Now, there must be a clear and conspicuous disclosure of the specific results that consumers generally can expect. The FTC gives as an example a claim to have lost 110 pounds in six months using a weight loss product.

If the endorser were to clearly describe exceptional circumstances under which she achieved her result, such as combining the product with vigorous exercise and a severely limited diet, then consumers would tend to understand that they could hope to achieve comparable results only by following the same strict regimen—in that instance, disclosure of typical results might not be necessary. Otherwise, though, the testimonial would require a detailed disclaimer such as: "Most women who use this product for six months lose at least 15 pounds."

Claims of Expertise

The credentials of a claimed expert endorser must be relevant to the subject of his endorsement. Thus, a person identified as a doctor who touts a new treatment would need to have expertise in that specific medical field (and certainly could not merely hold a doctoral degree in English Literature). Moreover, the claim must be supported by sufficient actual use of their expertise to evaluate the features of the product, such as by reviewing valid studies or conducting his own tests.

Sponsored Research

References to results of research must disclose any connection between the advertiser and the research organization. Of course, the results themselves must be reported accurately, so as to avoid false or misleading claims.

Ostensible Consumers

When testimonials appear to be genuine responses of actual consumers, they must reflect the speakers' actual expe-

rience, without guidance from the advertiser. To cite another FTC example: if a movie promotion features individuals emerging from a theatre making enthusiastic comments, viewers would assume that these are the patrons' own subjective opinions. Disclosure would be required if a studio representative had urged the patrons to make certain remarks or had offered them free tickets if they agreed to talk about the movie.

Required Disclosure

Understandably, endorsers hesitate to come right out and admit, "I am being paid to say this," or "I really don't know anything about that." But if disclosure of a connection is required, then it has to be made clearly. While the tone and phrasing can be friendly and conversational, the message must be conveyed in a way that listeners will understand.

Train Your Staff

Once you keep in mind the basic principles, much of this becomes a matter of common sense. Yet because licensees are legally responsible for their staff's employment-related activities, and because "endorsers" are now liable along with undisclosed advertisers, it is essential to be sure that your staff is aware of these concerns and assumes responsibility for conducting themselves in compliance with FTC requirements—both at the station and anywhere else where listeners might connect with the station.

Unfortunately, there are many gray areas where lines between the permissible and the culpable cannot be easily drawn. Indeed, some of the FTC's own distinctions and examples aren't crystal-clear. And so, while common sense remains the best guide, I'll conclude with a plug for my fellow practitioners (for which I have received no consideration!)—be sure to consult with your attorney when a potentially troublesome situation may arise.

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

Integration

[in-ti-grey'-shuhn] – noun 1. an act or instance of combining into an integral whole.

It should have been our middle name,
but it wouldn't tell the whole story.

Customized Automation Systems

Studio Design and Project Management

Broadcast Equipment with Exceptional Pricing

Complete Turnkey Installation

Broadcast Equipment Repair

On-site Troubleshooting and Maintenance

For broadcast integration, sales and service
there is only one name you need to remember:

Lightner Electronics Inc.



Your Ultimate Solution.

Toll Free: 866-239-3888

Fax: 814-239-8402

www.LightnerElectronics.com

At Lightner Electronics, we don't just install broadcast facilities. We guarantee, service and repair all of the equipment we sell as well as existing broadcast gear of any type. No matter what electronics you have or plan to have, we are your Ultimate Solution.

BUY AN OMNIA 5FM. GET AN UPGRADE TO AN OMNIA 6EX. ON US.



Limited Time.

Offer will be withdrawn with no notice when we come to our senses.



Radio Never Sleeps. Neither do we. We're here for you, anytime, with free round-the-clock, 24/7 technical support. Call +1-216-622-0247.

© 2010 TLS Corp. OmniaAudio.com

Safety and Security

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

Fire – a Frightening Enemy Part 2

by Jeff Johnson

We learned last month of the benefits of Clean Agents for fighting fire. Here is the definition: The NFPA (National Fire Protection Association) 2001 “Standard on Clean Agent Fire Extinguishing Systems” defines a “Clean Agent” to be: “electrically non-conducting, volatile, or gaseous fire extinguishant that does not leave a residue upon evaporation.”

Flooding Systems

Whole-area “flooding” systems are ideal to protect computer rooms, major transmitter installations, generator plants and other easily damaged high-value equipment where the investment in an area system is warranted. However, what about that safe-looking red fire extinguisher hanging on the wall with its pressure gauge reading “green?” OK? Good? The sprinkler head pictured in column two is a foe of our equipment, but ...

Not so fast! That extinguisher may be the worst thing to douse a fire in the place where it is hanging. Why? A fire is a fire, right? Well, no. There are four classifications of fire – A, B, C, and D. Fire extinguishers are rated for use on these various types.

Types of Fires

A Type A fire is of solid combustible materials such as wood, paper, and most plastics. The burning materials are likely to remain immobile. A cooling agent such as water works here. If your house is on fire, it is a Type A fire.

A Type B fire is of combustible liquids such as gasoline and oil that are likely to spread out and float on water. A smothering agent is required here. If your gas tank is on fire, it is a type B fire.

A Type C fire is an electrical fire. This is the type these articles address most directly. You can see that an electrical fire is different in that energy is being supplied to the blaze in addition to any chemical burning that may be



Identify! Friend or Foe!

taking place. Any fire suppression agent must be electrically insulating. A transformer fire is a Type C fire.

A Type D fire will rarely be encountered. It is a combustible metal fire involving such metals as magnesium, titanium, potassium and sodium. Think back to high school chemistry class and experiments with sodium and even aluminum. A Class D fire requires a Class D extinguisher *ONLY!*

Memory Check

Do you recall the Fire Tetrahedron from the previous article? Fuel, oxygen and heat must be sufficiently present for the chemical reaction we call fire to take place. The contents of that friendly red extinguisher on the wall must contain the proper material to break the tetrahedron and extinguish the fire. It should not, however, do as much damage as the fire in the process!

Types of Extinguishers

Type A extinguishers (or APW Air Pressurized Water) should not be hanging around a broadcast facility. They will be the end of any broadcast or computer gear.

Type BC extinguishers commonly contain sodium bicarbonate or potassium bicarbonate powder. These chemicals cover the flaming material and break the availability of oxygen to the flame. Sodium bicarbonate also chemically decomposes at 158 degrees F, releasing carbon dioxide that further lessens oxygen availability. They are mildly corrosive, and should be cleaned off with brushing or vacuuming immediately. The sodium bicarbonate may help settle your stomach.

Type ABC extinguishers are the most often encountered type. Being rated ABC, they may be used on any

(Continued on Page 24)

Introducing Broadcast Electronics' Economic Stimulus Package Affordable Transmitter to Studio Solutions!



STX_{LP}

- Scalable 1kW to 5kW FM Solid State
- IP Connectivity • Compact Design
 - Redundant Controller
 - Integrated Exciter



- Configurations for Smaller, Price Sensitive Stations
- Widgets can be Purchased Ala Carte
 - Shares 4th Generation AudioVAULT FLEX Architecture
- Intuitive, Easy-To-Use Graphics



For more information, visit our website at
www.bdcast.com/stimulus



Tomorrow's Radio Today
Broadcast Electronics, Inc.
(217) 224-9600
bdcast@bdcast.com



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



3MOT S1500 YAV 3DIR SGP 2-R COM LIM3 MMS 412 MIX ONE100

DTP3 TX3000

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

Safety and Security

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

– Continued From Page 22 –

except flammable metal fires. ABC extinguishers contain a dry powder called mono ammonium phosphate. Therein lies the problem for us in the electronic professions. Mono ammonium phosphate is a yellow powder that, while non-conductive, is corrosive and must be cleaned out of electrical equipment immediately.



Ruined by a powder type extinguisher

Still More Extinguisher Types

Other commonly encountered types contain carbon dioxide or AFFF (Aqueous Film Forming Foam). Carbon

dioxide is rated for B and C fires. CO2 extinguishers are especially desirable where no residue is especially important and grease or electrical fires may be encountered. Commercial kitchens are an example. AFFF foam floats on flammable liquids, quenches a fire, and suppresses reflash. It is messy, however, and not for Class C electrical fires. Airplane crashes are effectively controlled by foam.

We discovered previously that a grandfathered and familiar clean agent, Halon, is no longer available. Are there any newer agents that are nearly “perfect” for portable application in electronic environments?

Halotron I to the Rescue

Halotron I appears to be the answer. It is a newer clean agent available in hand held extinguishers, rated ABC. (Halotron II is for flooding systems.) Described as “a vaporizing liquid that is ozone friendly and leaves no residue,” it is promoted as “ideal for computer rooms and telecommunications areas.”

Halotron I is an environmentally acceptable replacement for Halon 1211. It is discharged as a liquid that rapidly evaporates. Halotron is a proprietary three-component chemical blend based on HCFC-123-2, 2-dichloro-1,1,1-trifluoroethane.

In the “heat” of the moment, when the person who discovers a fire is most likely to panic, Halotron I is described as more likely than other substances to be

effective even when used by a non-expert firefighter. It is described as having a “throw distance” of up to 45 feet. Halotron I has a relatively high boiling point of 80.6 degrees F, and therefore can be “shot” further before evaporation. The firefighter can remain away at a safer distance.

P. A. S. S.

In any instance, whatever the technology, use of a portable fire extinguisher should employ the “PASS” technique as recommended by fire professionals.

Pull the pin at the top of the extinguisher. The pin releases a locking mechanism and will allow you to discharge the extinguisher.

Aim at the base of the fire, not the flames. This is important - in order to put out the fire, you must extinguish the fuel.

Squeeze the lever slowly. This will release the extinguishing agent in the extinguisher. If the handle is released, the discharge will stop.

Sweep from side to side. Using a sweeping motion, move the fire extinguisher back and forth until the fire is completely out.

Don't Forget

Operate the extinguisher from a safe distance, several feet away, and then move towards the fire once it starts to diminish. Be sure to read the instructions on your fire extinguisher – different fire extinguishers recommend operating them from different distances.

Remember: aim at the base of the fire, not at the flames!

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

Your Low Cost Solution for Monitoring Audio and EAS Receivers

- + **Monitors** 8 status channels, 8 analog channels and 8 relays
- + **Expandable** to 24 channels
- + **Emails** or **text messages** of alarms
- + **Multiple Contacts** for each alarm with delays between texts
- + **Receive a daily dead air report as a pdf by email**
- + **Receive Monday Morning EAS** verification report
- + **Trigger audible alarms via signaling devices**
- + **Records EAS data** (transmitted and received)
- + **Filters EAS alerts** that can be emailed or sent via text message

THE STUDIO HAWK

Only **\$650**

FREE demo at www.TheStudioHawk.com



Supports Beta Brite Messaging Too!

by **IntrinsicNet**



The new **M Class** Audio Console from SAS.

Upscale Performance.

Downscale Price.

M Class opens the doors of SAS console ownership to everyone.

Engineered from the ground up to be affordable, yet still worthy of the SAS name, the M Class sets new standards in console design, engineering and price. Stand-alone or networked, a typical M Class console is around \$13,000, so it's a perfect replacement for aging analog mixers. Equip an M Class console with a Flex² module and enjoy direct connectivity to SAS 32KD, RIOLink and even 64000 series routers. M Class - it's everything you've been waiting for in an SAS console. Give us a call to see how we can help with your next project.



**SIERRA
AUTOMATED
SYSTEMS**

20 years of listening. 20 years of innovation.

See more at sasaudio.com

818.840.6749 • www.sasaudio.com

Streaming for Additional Revenue

by Chris Tarr

Editors Note: Even a Non-Commercial station can increase revenue by running commercials on their Internet stream while running underwriter announcements on the air. Chris Tarr discusses how this technology can increase your cash flow.

Most stations today stream their programming on the Internet and those that don't probably have plans to do so in the future. One important component of streaming audio is the ability to overlay alternative programming during commercial breaks.

Why the Technology Exists

A few years ago the voice-over artists that voiced national spots insisted that their performance was meant for on-air only, and any on-line "performance" would require a separate royalty payment. Something needed to be done to prevent running a foul of that agreement.

Found Money

The solution was the ability to replace or "overlay" alternative programming during commercials. Out of that solution came a way for a station to create a new revenue stream.

Spot overlays now allow a station to play one set of commercials on the air, and another set of commercials or alternate programming to the on-line audience. This is an excellent way to help pay for your bandwidth, by the way.



There are several streaming providers that provide commercial overlay technology, and the real technically savvy Engineer can certainly "roll their own" solution.

How it Works

Generally, the way that the overlay technology works is by listening to meta-data being sent from your automation system. All modern systems have the ability to send lots of data about the audio that it's currently playing. The overlay system listens for data that says "I'm a commercial!" When the system "hears" that data, it shuts down the live stream and replaces it with pre-loaded overlay audio until a song or promo plays and sends the "I'm not a commercial!" data, triggering the switch back to live programming.

Advance Planning

It takes a little thought and planning to implement an overlay system. For example, do you want to just let it fill with random spots, or do you want to schedule your inventory? Most basic systems have rudimentary scheduling systems, while the top of the line, first-tier overlay providers such as Ando Media and Liquid Compass allow you to have all the control of your on-line inventory as you have with your on-air spots.

These systems also have the ability to generate affidavits and invoicing for your customers. It goes a long way towards easily creating an entirely new revenue stream.

Other Benefits

Overlay systems are also a great way to pre-empt programming that you're not allowed to stream. For example, many stations aren't allowed to stream live sporting events.

With an overlay system you can run "best-of" shows, music, or other time-shifted programming instead of just blacking-out the stream. The only limit on this one is the creativity of your staff.

Timing is Everything

An important consideration when overlaying audio is time aligning your breaks. If you're doing "random play" scheduling, you'll need to have material loaded in various lengths so that your overlay material fits in the same amount of time as your on-air break, otherwise you'll have your overlay breaks rejoining your live programming mid-song!

This is again where first-tier providers shine: most have a buffer system that will delay the live programming so that system will switch seamlessly from overlay programming to live programming. If you use a profanity delay, and you feed your streaming audio post-delay, remember that the audio is going to trigger your overlay in real-time, meaning that it will call for an overlay before the delayed break arrives at the streaming computer.

(Continued on Page 28)

Shively Labs®

Radio is our main line, not just a side-line.

State-of-the-art design

Proven reliability

Cool and blue - no boring black or gray here!

P. O. Box 389, 188 Harrison Rd., Bridgton, Maine USA 04009
(207) 647-3327 (888) SHIVELY FAX (207) 647-8273
sales@shively.com www.shively.com

- An Employee-Owned Company -
ISO-9001:2000 Certified



EVENT 5800

HIGH CAPACITY BIDIRECTIONAL STUDIO TRANSMITTER LINK



TRANSPORTS UP TO 9 RADIO STATIONS, UNCOMPRESSED, OVER A SINGLE LINK



EVENT 5800 IDU



EVENT 5800 ODU

The Moseley Event 5800 — is a carrier class T1/E1/IP Ethernet radio link. Combined with the Starlink SL9003T1, the Event 5800 creates a high capacity bidirectional STL/TSL.

HIGH PAYLOAD CAPACITY

HD RADIO™ READY TODAY

LEVERAGE IP DEVICES AND APPS

EASY DEPLOYMENT

EXCELLENT ROI

Moseley

www.moseleysb.com

Dave Chancey: (805) 968 9621

Bill Gould: (978) 373 6303

Station Ops

by Chris Tarr

Streaming for Additional Revenue

– Continued from Page 26 –

Most overlay systems allow you to set a “trigger delay” to account for the needed time adjustment.

Processing

Remember that live programming and overlay programming come from different sources. It’s generally good practice to feed your combined output (live and overlay programming) to some sort of AGC that then feeds the stream, otherwise there is a good possibility that there will be large volume differences that will get you complaints from your listeners.

For those stations in PPM markets, you’ll absolutely want to set up your audio this way, otherwise your stream will not be encoded during overlay programming, and in the PPM world, if you’re not encoding, you’re not getting rated!

Quality Control

That brings us to another important part of overlays – quality control. I constantly hear streams that have the same four public service announcements running over and over during commercial breaks. It’s a real tune-out!

Keep your overlay material fresh, and be sure to do some quality control and listen to your streams often, paying attention to the overlays. Are the segues smooth? Is the audio consistent? Are you hearing a variety of filler material? You want to create a great user experience to keep your listeners coming back.

Hardware

In most cases you can add overlay technology without adding much to your current setup. With the exception of a second sound card, most computers can easily be upgraded with software to handle overlays.

You’ll need to make sure you have enough drive space to hold your overlay audio, plus you’ll need some sort of connection to your automation system, either via Ethernet or serial data.

Most automation systems only need a slight tweak in order to send data to your streaming system. By the way, a side benefit of linking your automation system to your streaming system is that you’ll be able to send “now playing” information to your streaming radio player.

System Shopping

When shopping for an overlay system, be sure to ask if it’s compatible with your current automation system. Also get a list of other stations that are using the technology so that you can listen to their overlays.

Check for segues, time alignment, and overall quality of the system from a listener’s perspective.

Keep in mind that if the announcers are running very tight on-air segues you’re bound to hear little snippets of the live programming during the transition from live to overlay programming.

You’ll also need to decide how much control you’ll want in scheduling and billing. Plus, just like any service provider, find out from other users how easily the technology was implemented and if there were any problems. Be sure to ask how happy they are with the technical support as well.

Ready to Roll

Once you decide on a provider, it’s then just a matter of getting set up! You’ll want to get your overlay audio loaded up and scheduled.

Another important part of setting up your system is coming up with a way to monitor your stream to make sure your overlays are running.

Unfortunately, a simple silence sensor won’t do, because if you aren’t running overlays then your normal programming will stream instead. The

only practical way to do this is to run spot checks. Even the first-tier providers don’t have real good solutions for this – their solution is generally to have the overlay system “check-in” with their servers.

If they don’t check-in after a certain amount of time (for example if the overlay system has crashed) an alarm is generated.

Smooth Technology

Stream overlay technology has come a long way. It started out as a clunky way to replace commercial breaks with alternate audio.

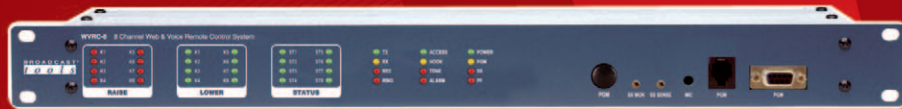
Today’s systems are sophisticated integrated solutions allowing you to not only flexibly schedule and play a alternate programming in place of the content that plays on the air, but also easily generate invoices and affidavits for your clients.

It’s about the closest you’ll get to having your cake and eating it too!

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



Site Control



WVRC-8 Web-enabled and Voice Dial-up Eight Channel Remote Control



Site Sentinel™ 16 Web-enabled Sixteen Channel Site Remote Control System



WVRC-4 Web-enabled and Voice Dial-up Four Channel Remote Control



Site Sentinel™ 4 Web-enabled Four Channel Site Remote Control System



VAD-2 Plus Dual channel Voice alarm Dialer



AUDIO Sentinel™ Web-enabled dual channel stereo silence monitor



I/O Sentinel™ 4

Web-enabled four logic/status input, four relay output module

Relay Sentinel™ Web-enabled three relay module

Relay Sentinel™ 16

Web-enabled sixteen open collector/SS relay module

Schedule Sentinel™ Web-enabled Event Scheduler

Status Sentinel™

Web-enabled three input status/logic module

Status Sentinel™ 16

Web-enabled Sixteen-input status/logic module

WebSwitch™ (not shown) Web Remote Power Switch

USA Proud



BROADCAST
t o o l s

www.broadcasttools.com

INNOVATIVE PROBLEM SOLVING TOOLS FOR BROADCAST

Get your Broadcast Tools from these dealers: Broadcast Depot • Broadcast Supply Worldwide • Broadcasters General Store, Inc. • Crouse-Kimzey Co. / ProAudio • Giesler Broadcast Supply, Inc. • Lightner Electronics Inc. • RF Specialties • SCMS

Sale

ARC console family



Sale

\$1,599
ARC-10U

\$3,495
ARC-15BP

\$5,495
MARC-15-12

Whether stand-alone or networked, the Arrakis ARC and MARC series consoles are feature laden, high performance, and professionally reliable. Ideal for On Air, production, or Internet Radio !!!

Stand-alone ..or.. Networked !

NEW

ARC-8

Intro Sale

\$799



8 channels
Stereo Program output
2 mic, 4 stereo line, PC, Phone in
USB interface for play & record from a PC
Mix-minus in-out for an external Telephone Hybrid
BOTH balanced and unbalanced inputs and outputs for flexibility

What more need be said ?

Innovative & cost effective Radio products from Arrakis Systems

Read what our users say...

KJDL, Lubbock, TX

" I like (Xtreme) a lot! Once we got things together we never have any problems. (Xtreme) is a 9 out of 10 for usability. It didn't take me long to figure out, I picked up most of the major (features) in the first day. (The Xtreme) is user-friendly for all involved."

Jessie Walker, Program Director

DMS Broadcasting, San Francisco, CA

" When we started, we were jumping into something we knew nothing about! We called your tech support & within a day they had a solution. It was miraculous. They helped us get wired up & set up. (Tech Support) had a positive & upbeat attitude. They went above & beyond!"

David Trudrung, General Manager & Co-owner

KSMZ, Alexander, AR

" Xtreme has more flexibility, sounds better & has fewer problems then our stations running (other automation systems). It's easier to program & a 9 compared to other programs out there."

Scott Gray

Join the hundreds...

... of others on air with Digilink-Xtreme, the best automation system in Radio. Full featured, it is easy to install, use, and maintain. Best of all, it is easy to buy. Choose from either the no contract \$100 per month 'Solutions Program' from Arrakis Systems or buy 'Xtreme-Complete' outright for only \$6,500 from Broadcast Supply Worldwide (BSW)

WHY PAY A FORTUNE FOR AUTOMATION ?



Digilink-Xtreme

only \$100 per month
support, training, upgrades
the best automation in Radio, period !

Mounting an FM Translator on a Series-Fed AM Tower

by Steve Callahan

Congratulations! You have acquired an FM translator for your AM station and have managed to get a Construction Permit (CP) to have it moved to your existing AM tower. Here's where the fun really begins.

I strongly suggest you rely on the services of your communications counsel and consulting engineer because every station is different and has its own individual quirks. However, this can be a fun and rewarding project.

Make Sure to Check the Rules

For the sake of simplicity, I'll assume that your station is non-directional and is a quarter-wave radiator.

If you are contemplating locating on a directional AM, read up on Part 73.51 and 73.154 of the FCC Rules and get ready to do a partial antenna proof after you install the translator.

I'll also assume that your tower doesn't have a folded unipole in place. If you do have a folded unipole, it's a breeze to run another piece of coax inside the "skirt" to connect with the FM antenna, above the skirt wires.

Your Best Option

With a series fed AM radiator your best option is an isocoupler which is an inductive coupling device that allows the RF to jump across a gap which is internal to the isocoupler.

You can also consider an isolation coil, which was pretty common on older AM directional arrays, as a way

to get the RF sample from the tower-mounted loop to the antenna monitor.

You can also use a "bazooka section" which is a coax run that is bonded at the top of the tower and is then insulated from the tower down to the base and is then grounded. Let's assume that you've decided to go with an isocoupler.

Your First Step

You will notice that your Construction Permit has a condition on it that mandates you to determine power by the direct method until you have determined the new base impedance of the tower with the FM equipment installed.

Send a letter to the FCC requesting determination of the AM station's power by the direct method. Before you start running any coax, take an impedance bridge and an RF generator out to the tower base and see what impedance you're starting with.

Ask For Help

If you don't have a bridge and generator, call around to some of your fellow SBE members or give a call to the directional AM stations in your area and offer to buy the engineer dinner in return for some assistance.

After sign-off, with bridge and generator in hand, find out what your tower's present self impedance is by measuring it at the output of the Antenna Tuning Unit (ATU) with the ATU disconnected from the tower feed.

Do a sweep of the tower impedance at your operating frequency and four frequencies either side. While you're at it, take a look at the match at the input of the ATU, with the antenna connected and the coax to the transmitter disconnected.

If you're really ambitious, head back to the transmitter building and take a look at the match at the transmitter end of the coax. Write these numbers down and save them. Remember to mark the location of the coil taps or roller inductors on the coils in the ATU – you'll thank me for that later.

Parts and Pieces

Gather up the needed hardware such as the FM antenna and mounts, coax, grounding kits, coax connectors and isocoupler.

You can run the horizontal coax cable from your transmitter building to the tower base above or under ground. Make sure you ground the cable where it comes into your building.

If you are thinking about burying the coax, remember your copper radials and copper ground screen at the base of the tower. You might get lucky and not cut any radials, but few are that lucky. Plan to be on the scene and ready to tag and splice any radials that are disturbed by the coax burial.

Hanging the Antenna and Cable

Right after sign-off, with your trusty tower rigger in attendance, mount the FM antenna and the vertical coax. Ask your rigger to ground the coax in a minimum of three places – at the top, at the middle point, and at the bottom of the coax run.

I personally think that a grounding kit on each tower section makes too many intrusions into the outer jacket and each one is a potential failure point.

I also like to put a loop in the coax at the tower base just like the feed from the ATU output to the tower for a little bit of cheap lightning insurance. *(Continued on Page 32)*

ALTRONIC RESEARCH INC.
Performance By Design

**RF DUMMY LOADS
for ALL YOUR
APPLICATIONS**

- AIR-COOLED
- HDTV
- HD
- WATER-COOLED

ALTRONIC RESEARCH INC.
P.O. Box 249 Yellville, Arkansas 72687 870-449-4093 Fax: 870-449-6000
E-mail: info@altronic.com Web Site: <http://www.altronic.com>



StudioHub+ Inside

Save time and money
with the console that
(almost)
installs itself!

Plug and play your next installation with
Radio Systems Millennium Broadcast Consoles now with StudioHub+ inside — the Broadcast Wiring Standard!
StudioHub+ packages feature cables and adapters for every piece of broadcast equipment made.

Call Radio Systems or your favorite broadcast distributor today.

601 Heron Drive • Logan Township, NJ 08085 • Phone: 856-467-8000 • Fax: 856-467-3044
www.radiosystems.com • www.studiohub.com



Chief Engineer

by Steve Callahan

– Continued From Page 30 –

By the way, if your Construction Permit for the FM translator specifies a non-directional antenna, you can continue on and mount the isocoupler and finish the installation.

Directional FM Antenna

If it's a directional antenna, this is an excellent time to call it a night and have your licensed surveyor come out the next day to make sure the antenna bay is mounted in the correct direction. Have a statement ready for him or her to sign and then head, with them, to the local City Hall for a notary to notarize the statement.

While there, it's a good idea to get a photocopy of their wallet card attesting to their state licensing.

Time to Tweak?

I like to mount the isocoupler parallel to and at the same height as the base insulator. Remember, the top of the isocoupler will be at tower potential and the bottom of the isocoupler will be at ground potential. Bond the top and bottom connectors of the isocoupler to the tower and ground respectively, using copper braid.

I don't like to wrap lock the isocoupler to the tower. I saw one mounted like that burn up once and it wasn't pretty.

At this point, make sure that there is a downward facing weep hole in your isocoupler. After lightning damage, a very common problem with an isocoupler is that it may fill up with water, and burn up, and your transmitters will not be happy.

Check Your New Tower Impedance

With the isocoupler in place, all connections waterproofed and tight, you can pull out the RF generator and Impedance bridge to see if there is any change in the tower's self impedance at the output of the ATU with the ATU disconnected.



A Bank of Kintronic IsoCouplers

Make note of the resistance and capacitance measurements if they are different from your originals. If this is not the first isocoupler on this tower, you'll see an increase in the "J" or capacitance component. This is true especially if this is the third or more isocoupler.

If there is a difference between your "before" measurements and your "as built" measurements, while connected to the ATU input, adjust the three legs of your ATU one at a time until you get a good null on the bridge.

Now you see why you mark the location of the coil taps!

With a good match at the ATU input, turn on your AM the transmitter and check its operating parameters for any change. If the AM looks OK, turn on the FM translator transmitter and check for reflected power.

Now Comes the Paperwork

If your FM is non-directional, you can operate at full power without any delay, but if it is a directional, you have to operate at reduced output and ask simultaneously for equipment test authority and program test authority.

Either way, you must file an FCC Form 302-FM within ten days. With a directional FM antenna, you'll need to include a statement from the supervising engineer that the installation was done pursuant to the antenna manufacturer's instructions. You'll also have to include that notarized statement from a licensed surveyor certifying that the antenna is properly oriented.

Change in Base Current

If your installation results in a different base impedance, continue to determine the AM output power by the direct method while you prepare an exhibit for an FCC Form 302-AM with the AM station's new self-impedance and calculated output power.

Ask your communications counsel to guide you through the maze of paperwork in a timely fashion and have your consulting engineer review all paperwork before you file it with the FCC.

Now that your new translator is installed and operational, your station can begin to reap the benefit of providing around the clock service to your local community.

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

When You Want More Than Just An Antenna



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

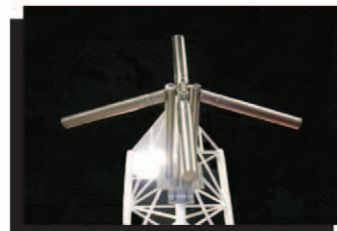


Made in USA since 1954

NAB Booth C2607 Central Hall 1



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 Your Partner for HD Radio Solutions



extend your reach through media



"We who broadcast the Good News of Jesus Christ on a regular basis need the fellowship, encouragement and accountability we receive through NRB. Never in our history has the mission of NRB been more crucial than it is today."

—Luis Palau, World Evangelist

More than 40 Educational Sessions like...

- The Digital Kingdom: Keeping Your Ministry Relevant in a High-Tech World
- Birthing a Broadcast Teaching Ministry
- Expanding Your Ministry with Remote-site Technology
- Internet Evangelism: The Story behind "I Am Second.com"
- Making Sunday Stick
- Does Media Really Have Anything To Do with Worship?
- Social Media: Prepare to Get Connected

NRB
2010
CONVENTION & EXPOSITION

February 27 - March 2
www.nrbconvention.org
Gaylord Opryland Resort
& Convention Center
Nashville, TN



< CHUCK COLSON



KAY ARTHUR >



< GAITHER VOCAL BAND



JIM GARLOW >



< MEREDITH ANDREWS



TONY PERKINS >



< BARRY LYNN



KEITH & KRISTYN GETTY >



Field Guide — Remote Monitor

The Studio Hawk from Intrinsic

by Paul Bjornstad

KWAX, operated by the University of Oregon, is a non-commercial radio network of three full power and five translator stations providing classical music programming to about one-third of the state of Oregon. Our facilities are spread out over 140 miles and provide audio over a mixture of off-the-air, Internet, and microwave feeds.

We needed a good way to detect whether or not audio is present on the distant facilities, without waiting for a listener to call and ask when we will be back on the air. In addition, we also needed to monitor our local analog and IBOC signals, as well as our Internet audio stream.

Enter Studio Hawk

When I first discovered the Studio Hawk, I thought it was a "too good to be true" product. I was wrong. After doing just a bit of research, I decided to order the system from their website, www.TheStudioHawk.com. It arrived in only three days.

After a quick glance at the quick-start guide, I installed the device drivers and software on an existing computer running Windows 2000. To my surprise, the entire installation, including four reboots of the computer, took less than 30 minutes. All that remained was to connect my audio sources and configure the system.

Input Configurations

The Studio Hawk offers two configuration options: eight unbalanced inputs or four balanced option. I chose the eight input option based on the need to monitor seven

discrete sources. The installation could not have been simpler. I found that I did not need anything that was not included in the kit, other than cable and connectors for my particular equipment. The Studio Hawk kit even included resistors for sources that are not terminated.



The Studio Hawk Monitor Screen

EAS Monitoring

One of the big selling points was the fact that the Studio Hawk also monitors EAS. While I do have a different program currently watching EAS activity on my SAGE, it is a rather clunky affair, producing a printed page for each alert that is sent or received.

Not so with the Studio Hawk, which provides a weekly summary using only one or two pages per week. As my

main station is a Secondary Entry Point for our area, we have a lot of EAS traffic, sometimes generating 15 to 20 pages per week. Studio Hawk makes my EAS paperwork much more manageable.

Oops!

I was now ready to fire up the system, and only encountered a couple of minor glitches. First, I had no meters on the screen indicating audio on my sources. Second, I was not receiving any EAS data, even though the link was working through my previous software.

Glitch Fix Via Remote Computer Session

I made a call to the Studio Hawk Support. The call was answered immediately, and we began a remote session with software built into The Studio Hawk.

They found the meter display problem quickly. I had neglected to tell the program how many channels to monitor, and it had defaulted to zero. I now had meters!

The EAS problem was a bit more involved. Rather than have me stay on the line, they continued working on the remote session to find the problem. After working some magic, they called and asked me to send one more printer test from the SAGE. It worked perfectly, and I was off to the races. After a quick session to set up the various parameters for my sources, I was up and running. The entire project took less than three hours of my time, from start to finish.

I now have full-time monitoring of all my facilities and my EAS traffic. Studio Hawk can now contact all my staff members by an audio alarm, email, or text message in case of a failure that requires immediate attention at any of my facilities.

Paul Bjornstad is the Director of Engineering at KWAX in Eugene Oregon he can be reached at 800-422-4301. For more information on the Studio Hawk visit www.theastudiohawk.com

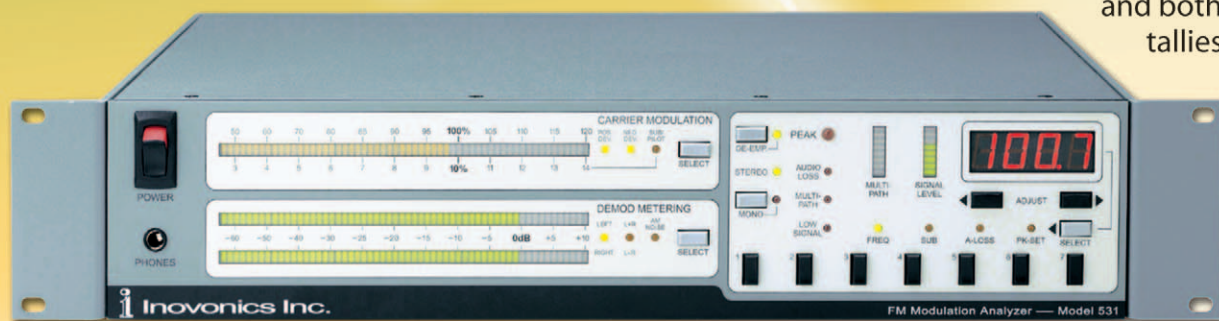
TOP VALUE FM Monitor

This Easy-to-Use FM Mod-Monitor Gives Accurate Off-Air Measurements

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/outs, and both antenna and high-level RF inputs. Alarm tallies are provided for overmod, audio loss, carrier loss and excessive multipath.



For full technical details, visit...

www.inovon.com

*"Other guys imitate us...
But the original's still the greatest."
— Billy Page THE IN CROWD*

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

LOOK TO LARCAN FOR INNOVATIVE IBOC FM SOLUTIONS - ENCORE SERIES

Designed with a difference to ensure the highest quality audio performance - LARCAN's new Encore Series offers a superior range of IBOC FM translators. Customer driven and purpose designed for optimum performance - we bring you the best in IBOC FM broadcast technology. Encore, Applaud innovation.

We hear you. Loud and clear.



IBOC FM Translator
(Model: DRT-01)

Encore Series Features:

- Superior IBOC FM Performance & Coverage
- Extensive Power Range from 25W to 250W
- Broadband Design
- Frequency Agile
- Integrated Features & Adaptable
- Complete Solutions for Analog FM & IBOC Digital Radio
- Innovative 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 Email: sales@larcan.com

Broadcast equipment for less.

Our competition may have led you to believe that you know them, or that you can trust them. But the plain truth is that they just want your cash, and lots of it!

In a time when cash is scarce, a better concept in sales, perhaps a more progressive one, is to work for a smaller profit and pass the savings along to the customer.

Realize the savings you can put in your pocket.

Call, click, or stop by Progressive Concepts today!



THE BEST IN BROADCAST ELECTRONICS SINCE 1990

Field Guide — FM Antennas

Propagation Systems PSIFML-3-DA

by William J. Erickson

A Shady Start

When I think of my experience with Propagation Systems, Inc., I think back on a memory of a pre-dawn rendezvous, along a dark stretch of highway just inside the Pennsylvania border. It involved a couple of police officers and my first encounter with Doug Ross, PSI engineer. (That was the hook, and now that I have your attention ...)

Let's Start at the Beginning

We were building a new non-commercial station, WHEY in Muskegon Michigan. The antenna had to have specific directional properties and one of the companies recommended was Propagation Systems Inc. We had very tight tolerances (and budgets) for a directional antenna with the parameters given to us by our engineers. When we first approached the project, I recall that the question was asked: "Is this a 'do-able' directional?"

We called other companies that could supply the equipment, but PSI made us feel comfortable that they could do the job as well as anybody else, for less money.

Directional Antenna Equals Better Coverage

Some engineers make a fine looking contour map with absolutely unachievable parameters. Our engineer could have come up with an OMNI directional option but the power would be limited to 300 watts at best. With the right directional antenna, we could achieve 1,000 watts ERP and by doing so, reach much more of the population — about 50% more.

PSI Gets the Nod

And so we gave PSI the nod with an antenna pattern that looks very much like a kidney bean — the folks at PSI went to work on a three bay directional (model PSIFML-3-DA). Each bay only weighs about 50 pounds and when stacked vertically provided enough gain to produce 1,000 Watts ERP with only 555.6 Watts into the antenna. They jumped in, started the design, built it, tested it, and had it ready for delivery in plenty of time. So, what about the police officers?

Personal Delivery

We were anxious to get the antenna mounted, tested and operational by November 7th. The new radio station was throwing a big celebration concert to kick off the unveiling. We had hoped to "flip the switch" on the station, on the night of the concert. After talking with Doug Ross over the phone, we agreed that conventional means of shipping would be too slow, so, we would meet part way, make the exchange, and make the deadline.

I ended up pulling off the road in front of a joint called the Beer Barn. Fortunately, it was closed at the time.

Within a minute or two, a set of headlights pulled off the highway and came along side us. This was my first face-to-face meeting with Doug Ross

The Boys in Blue

But, no sooner had we shook hands, when two police officers arrived on the scene. Flashlights out, one hand on

their nightsticks, they approached us. The back of Doug's Jeep was loaded with what looked like a load of copper. "Mighty suspicious."

No arrests were made, but a long-term relationship was sealed. Doug and the rest of the staff at PSI were willing to go out of their way, even for a little station like ours.



WHEY's PSI Antenna

Antenna in the Field

The installation went off without a hitch and when we fired up the transmitter, the reflected power was barely noticeable on the meter.

Because we operate in Michigan, we felt it would be prudent to equip each bay with a heating element. But, now into our second winter, we have not yet had to use the heaters even once. The tubular copper design hasn't iced up at all.

The antenna has been operating flawlessly for over a year now and we couldn't be happier.

Thanks PSI!

William J. Erickson is the President of Muskegon Community Radio he can be reached at 231-563-6280. For information about PSI's FM antennas visit www.psibroadcast.com or call 814-472-5540

Digital R.F. And Audio Management Solutions

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



True RMS RF Power Meter and Switch Controller

The SWP-200 is a true RMS power meter providing accuracy not possible with older generation products.



The SWP-200 can operate in Hands Off (Pre-programmed) or manually controlled modes. One-button control of four port switches, manages interlock closures, and transmitter control in a single rack unit chassis. Includes RF failure detection, and automatic transmitter change over capability. RF sensing circuitry prevents switch damage by preventing switch action with RF present. New optional LAN card provides internet and intranet connectivity. This is a reliable, versatile RF support product that provides around the clock peace of mind.



Make sure your station ratings get counted!

Three new analog, composite, and digital audio switcher/router products, with the flexibility to meet your needs. Packed with outstanding features not found in other single box solutions, you'll think of dozens of applications at both your transmitter and studio sites. Ideal for routing your stations' ratings system encoding stream, providing seamless switch over in case of failure. Dual path switcher provides seamless analog, and IBOC audio path switching at your transmitter site.

ATB-300: 4/8 input switcher DA

GPM-300: 8X8 cross point switcher with programmable features.

DAB-300: Dual path switch designed for use in digital audio IBOC routing. Allows for synchronous switching of analog and digital audio paths simultaneously.

Powerful DSP Architecture provides state of the art control, and allows for future expansion and feature upgrades. Simple front panel menu programming of silence sense delay, priority channel, revert time-out - program up to 8 channels for secondary, tertiary, etc. sources, input mode selection, input/output gain and input phase inversion. Revert feature returns to primary channel when signal integrity is restored automatically. Programmable silence threshold, proprietary "Silent Switch" feature for seamless switching between sources and synchronous AES switching eliminates artifacts. Frame Rate Conversion on all digital inputs, and programmable alarm contacts. Parallel standard, serial interface optional Power Fail Memory - Returns to last channel selected upon power up. Visit our website, or contact the factory for complete details.

www.Broadcast-Devices.com
Tel. (914) 737-5032 Fax. (914) 736-6916





Broadcast Furniture

RAM Systems has been building Broadcast Furniture for most of North America's major networks, group stations, & news organizations for Over 40 years! For your next build-out, let RAM bring their experience in to help you design a package to fit your budget!

For More Information call us at

(800) 779-7575

or visit us at

www.ramsystemsonline.com



AM Antenna Solutions -

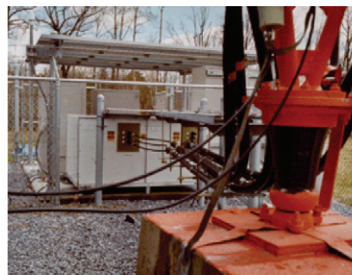
*Reach Farther,
Sound Better!*

LBA Technology - your trusted supplier of digital engineered AM antenna systems. LBA customized products include:

- Antenna Tuning Units
- Diplexers & Triplexers
- Cellular / AM Colocation Systems
- Directional Antenna Systems
- Tower & Ground Systems
- RF Coils & Capacitors
- Turn-Key Projects



Reliable Antenna Tuning Units



AM Cellular Colocation



Broadband Diplexer/Triplexers

NAB Booth# N516



LBA TECHNOLOGY, INC.

3400 Tupper Drive, Greenville, NC 27834
800-522-4464 / 252-757-0279 Fax: 252-752-9155
www.LBAGroup.com/tech



SINCE 1963

Tech Tips

A Good End to a Long Night

by Gary Minker

There you are, at the transmitter site, working on your one and only transmitter trying to figure out why the thing quit and where that wonderful smell of Bakelite came from. Testing, testing, groping for parts, working through the night you go.

It almost sounds like a Christmas Carol but you are sure it is not. The hours run on and progress is slow – but on again, on again, slowly you go. There's that Carol again.

So dawn approaches and you are pretty sure that you have found all of the problems, and after hours of pushing “the button,” you are certain that this push of the run command will be your last and you can finally go home to the comfort of your slippers and chewed up newspaper.

Ready, Set, Go

After hours and hours of pushing that nifty little green button much too fast and too many times, you keep hoping to make your troubles go away, and suddenly you notice that the transmitter wants to come up and run. The earth stands quiet and the meters all come up – only for that weak long instant of 4-6 seconds and “Clunk,” you are down again.

Now What?

You've fixed the blown fuses on the IPA, checked the automatic power control, poked and fixed and checked. It ran, so *now what?* It ran, you saw it ... didn't you? Oh Maaann ... *now what?!*

So back in to the box you go, searching for the latest show stopper. “Ah,” you say, as you find another fuse out. You easily replace the fuse and around you go, keeping one hand

in your pocket, holding on tight, and you press the little green button. Run baby run, as you hum a Cheryl Crow song – 3, 4, 5, 6 – the meters are up, the music is playing from the speakers and not from your mind. Then “Clunk.”

Here We Go Again

After a few minutes of searching, you come up with the same fuse, so now after a few deep breaths you realize the fuse belongs to the blower and you just happened to *NOT* hear the thing spool up and you *DID* hear that nasty humming right as the fuse blew.

After running through the inventory of parts you have on hand – after all of four seconds – you realize that you do not have a new motor.

You rip into the blower and find that the start cap is open and there is, thankfully, no run cap needed; you remember that your inventory doesn't include a start cap for the blower. So you frantically start thinking of what you can tear apart to steal a capacitor from – any capacitor – just anything that might handle 240 Volts for 30 seconds and might accidentally have about 12 uF for a value. You know deep in your stomach that you have nothing and it's Saturday in outer Mongolia – you are toast!

A Glimmer of Hope

But wait, your next door neighbor is a service technician for an appliance company. There is only 19 inches of snow on the ground, but hey, he might have just the thing you need. You sheepishly call, wake him up, and ask that all embarrassing question, “Do you have any capacitors?”



The Truck Pack

Yeah Baby!

To your great joy he brings you not just any capacitor but the Holy Grail of Capacitors!

He bestows upon you an AmRad Engineering Turbo 200 Run Capacitor.

This is just the thing you were looking for. This handy little cap is actually five capacitors in one, and can be ganged up in parallel to create 200 combinations of capacitor designed to allow you to keep your job.

With the set of these that is called the “truck pack,” you can substitute virtually any start or run capacitor for 220 VAC to 440 VAC and get back to your slippers. No more trying to stock a dozen or more spare, oil filled Electrolytics for your Air Conditioners, UPSs and Blowers. While you can never have enough spare parts, you should always have the right parts to deal with these sudden surprises.

Gary Minker owns Radio Works R.F. Consulting Email him at: gary@RadioWorksRFConsulting.com or call 561.969-9245 Find Gary on the web at www.RadioWorksRFConsulting.com

Time is Infinite



Measure
and
Display
it with

ESE

www.es-web.com

Broadcasters have counted on ESE precision master clocks and timing-related products for over 35 years. ESE products accurately synchronize broadcast operations using a choice of GPS, WWV, Modem, Crystal or line frequency for affordable, reliable, perfect time.

Spend a few seconds on www.es-web.com to discover a vast universe of timing systems that are designed for easy installation, set-up and operation.

MAKE WAVES



MADE IN USA

EXPECT MORE FROM YOUR AM TRANSMITTER

Presenting the Armstrong Transmitter X-1000B

Bring major market sound to your radio station with the dual, hot-swappable 600 Watt RF modules capable of 150% modulation in Armstrong Transmitter's X-1000B, (1KW HD & DRM ready AM transmitter).

Engineered with the latest technology advances, X-1000B offers high reliability and built-in redundancy. Get ready to save money while improving your sound and reliability. Call us today!



Tel 315-673-1269 ▲ sales@armstrongtx.com ▲ www.armstrongtx.com

NEW ECONCO

New Power Tubes



Newly manufactured tubes are now produced by Econco in Woodland California



Phone: 530-662-7553 • Fax: 530-666-7760
Toll Free: 800-532-6626

www.econco.com

1318 Commerce Ave, Woodland, CA 95776

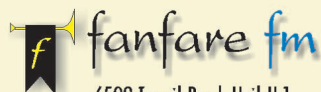
fanfare fm FP-TRO



The Ultimate IBOC Receiver/Translator

Designed to accommodate "full envelope" baseband signals (IBOC and analog), Fanfare's new age receiver/translator, the TRO, is fully self-contained and does not require an IBOC exciter. In fact it arrives in a 2 module configuration ready for deployment under all existing FM modulation forms. The "TRO" offers considerable versatility requiring only connection to the receiving antenna and a linearized PA. If necessary, the receiver and translator modules can be separated by up to 200' of coax, or by STL. The latter would be of value for some repeater applications as well.

At the heart of the TRO design is our patented, Omega NTP-based technology which enables the TRO to establish a noise floor that is often below normal measure. This significant noise reduction manifests itself in significantly increased sensitivity and adjacent noise rejection which is essential to assure reception of low-level IBOC signals.



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

1-800-268-8637 (U.S. & Canada)

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

"Designing receivers that broadcasters can rely on"

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

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

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

7117 Olivia Rd, Baltimore, MD 21220

Tech Tips

by Richard Rudman

Quick RF Plumbing Solution

When you are making emergency AMRF repairs involving transmission lines, would it not be great to be able to go to Home Depot, Lowes, or any good full service hardware store and buy the parts to make almost any flange type coax connector you need?

Consider the benefits. No floor pacing while waiting for FedEx or UPS to show up. Even better, you are not paying for emergency connectors as if they were made of gold.

A Need Arises

A situation came up with one of my clients where we had to build a pass/notch filter for a new solid-state transmitter that refused to work into the existing two-tower DA phasor. A new phasor network was already on order, but delivery was months away.

The mission: Get the new transmitter on the air so the site power bill would not no longer go into heating a bank of resistors every night.

Building the temporary filter design involved providing new terminations of 7/8" and 1/2" foam-filled line. I have often looked at the bright copper and brass fittings in hardware stores and mused that they might be used in some way to make coax connectors. The time had come to find out.

Shopping for Hardware

With some short pieces of transmission line in hand, I surveyed the available hardware at my local outlets. I found out that there were some copper and brass fittings that might work.

For the 7/8" line, I bought copper tubing to 3/4" pipe thread adapters and a section of copper tubing to fit inside the tubing end of the connector. This provided a snug fit for the copper jacketed coax. For the 1/2" line, I found a 1/2" hose connector to 1/2" pipe thread connector that looked promising.

How do you adapt 3/4" pipe to a flange that could be solidly bolted and grounded to the filter network? I had to leave the world of brass and copper for that. But, as I reminded myself, this is temporary, and everything would be indoors.

Suitable Substitute

Pipe floor flanges found in hardware store electrical departments were the answer I chose. They come in a variety of pipe thread sizes including 3/4" and larger. I bought the cast iron variety, but they are available in brass at specialty home or office decorator supply houses that are not always open in the middle of the night.

If you have a little time, I found a source on-line called the Hardware Hut:

www.thehardwarehut.com/catalog-product.php?p_ref=6739

The smallest size they offer is one inch, so some added copper fitting creativity would be involved to adapt from the copper tubing or hose connectors that actually secure the copper coax jacket.

Putting it Together

Some details: for the 1/2" adapter to the flange, I had to use an iron 1/2" to 3/4" adapter. I know these are available in brass, but even full service hardware stores run out of stock.

Back at the site, I cut slots in the copper tubing adapter, the copper tubing section for the 7/8" adapter, and the 1/2" brass hose adapter so I could mechanically secure and provide a good RF ground to the copper coax jacket. I used standard automotive stainless steel hose clamps for my

makeshift connector. All grounding surfaces were filed and deburred.

The flanges were bolted to a section of pre-drilled angle bracket. I drilled matching holes in wide copper strap for bolts.

Problem Solved

After assembly and tuning, we checked the effectiveness the new connectors and their grounding by using heavy clip leads to look for any changes to the filter's tuning. We saw no changes.

This emergency work-around could well apply to larger coax sizes up to three inches for AM service. I will let you know if the future takes me back to hardware land with a section of larger line.

This project brought back a lot of memories of ham radio Field Day activity, including not having all the right connectors on hand and the strange but effective things we came up with to get on the air! — Radio Guide —



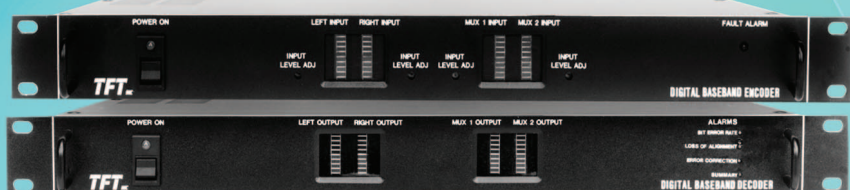
A usable 1/2" adapter from the hardware store.



A custom-built 7/8" adapter.

Need Digital?

Add AES/EBU digital ports to your composite STL with TFT DMM92 Digital Encoder and Decoder.



Model DMM92 STL Digital Model/Multiplexer

Add AES/EBU to your existing analog EAS with TFT Model 629 Dual Digital Insertion Unit for two AES/EBU digital channels.



Model 629 EAS Digital Insertion Unit

Advanced Technology Only From TFT



ph:(+1)408-943-9323 fax:(+1)408-432-9218

1953 Concourse Drive, San Jose, CA 95131

www.TFTInc.com e-mail:info@tftinc.com

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
Tel 619 239 8462
Fax 619 239 8474
bext@bext.com

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



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

AM Ground Systems Co.

www.amgroundsystems.com

1-877-766-2999

Physical AM Site Services

eng@amgroundsystems.com

- Construction
- Evaluation
- Repair
- MOM Modeling Preparation work
- Sample, Feed & Control Line Replacement & Repair

Serving the Technical and Construction needs of AM Broadcasters for 25 Years



A division of

KK Broadcast Engineering

COMMERCIAL RADIO COMPANY

Original Parts – New and Used:

RCA • Harris/Gates • Energy-Onix • Continental/Collins
CCA/CSI • ITA/Wilkinson • Sparta/Bauer • Ratheon

Capacitors:

Mica Capacitors • Ceramic Capacitors
Fixed and Variable Vacuum Capacitors
Non-PCB Oil-Filled Capacitor Transmitter Replacement Kits



Misc. Components:

Resistors • Rheostats • Weschler AC, DC and RF Meters
Custom Calibration of AC, DC, and RF Meters
Rebuild, repair and calibration of General Radio Co. Instruments



OVERNIGHT SHIPPING – MANY STOCK ITEMS

PHONE: 802-226-7582 • FAX: 802-226-7738

www.commercialradiocompany.us

DISCOVER, VISA, MASTERCARD, AMEX, C.O.D.'s
and pre-approved P.O.'s accepted.



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: 800-545-0608 • Fax: 603-624-4822

www.mcibroadcast.com • sales@mcibroadcast.com



Phone Flashers from DM Engineering

Several years ago Radio Shack discontinued their Phone Flasher that was used in many studio applications, so we decided to design a Phone Flasher that would cover the unique requirements that the broadcast industry needed.

Let's see ... the basic flasher would need a high visibility display and an audio sounder that could be turned off when desired. In addition, a selectable audio level that would be externally mutable by a contact closure or logic low, a separate input for a door bell button or other application such as an alarm or alert input that would give a different audible and visual indication would also be nice. And how about including an output that could drive a solid state relay for lighting flood lamps, etc?

While we're at it, what about applications where there are multiple incoming lines, and what if the customer wants Indicator Modules in more than one location. So began our Studio Hotline series of Phone Flashers.

Single Line Phone Flasher

The Studio Hotline Single Line Phone Flasher features high intensity flashing yellow LED's and a "ringing" audible for incoming calls, high intensity red

LED's for indicating a door bell or any other alert the customer wants with a "ding-dong" audible. Included is a three position switch for adjusting the audible volume between off, low, and high, and a terminal block with connections for the door bell/alert input, for muting the audibles with a contact closure or logic low, and an output to drive a solid state relay.

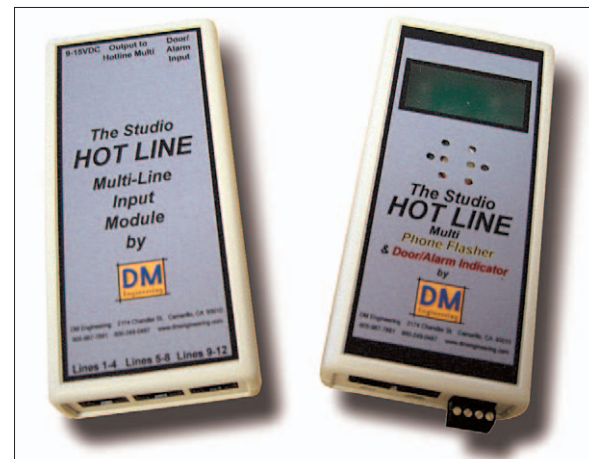


Relay Pack Available

By the way, we also manufacture a very economical Solid State Relay Pack that will switch 120 VAC and up to 5A loads. The Studio Hotline Single Line Flasher is connected to the phone line using a 6 foot long cord with an RJ11 modular connector and is powered by a supplied 9 VDC "Wall Wart."

Multi-Line Phone Flasher

For multiple line applications we included the same features as the Single Line unit, but added an Input Module that houses the ring detection circuitry and external door bell/alert input terminal block as well as power distribution. Power for the system is provided by a supplied 9 VDC "Wall Wart."



The Input Modules come in 4, 8, and 12 line options and each line connects to the customer's backboard using the supplied modular connectors, or may be staked to "66" blocks if desired. The Input Module connects to Indicator Modules by means of supplied 50' flat telephone type cables. Up to 5 Indicator Modules may be "daisy chained" for multiple studio applications. Power to the Indicator Modules is derived from the Input Module.

For more information on these and other innovative products for the broadcast industry, please visit us on the web at www.dmeengineering.com

Alarmed to death
by your remote control?

The Davicom MAC won't!

Its advanced filtering functions let you sleep, unless you're REALLY needed!

davicom
Site Monitoring Systems by Comlab

Intelligence & Innovation

t. 1.418.682.3380 | f. 1.418.682.8996
www.davicom.com

TRANSCOM CORPORATION

Serving the Broadcast Industry Since 1978

Visit Our Website – www.fmamtv.com
Send your e-mail requests to: transcom@fmamtv.com

Fine Used AM & FM Transmitters & New Equipment

AM	5 kW	1982	Harris MW5A
	5 kW	1987	Harris MW5B
	5 kW	1987	Harris SX5A Solid State
	5 kW	2002	Nautel ND5 Solid State
	10 kW	1985	Continental 316F
	50 kW	1989	Nautel Ampfet 50
FM	1.0 kW	2009	Crown FM 1000E (demo) Solid State
	2.0 kW	2004	Crown FM2000E
	5.0 kW	1989	Harris FM5K1
	5.0 kW	1997	Harris HT5
	14+5 kW	2005	BE Fmi1405 Solid State
	20.0 kW	2005	BE FM20S Solid State
	20.0 kW	1983	Harris FM20K
	27.5 kW	1984	Continental 816R-4B
30 kW	1994	Harris HT30CD	
	50 kW	1982	Harris Combiner (w/auto exciter-transmitter switcher)

USED MISC. EQUIPMENT:

Bird RF Thruline Watt Meter, 50S

EXCITERS:

New 30W Synthesized Exciters
Used Harris Digit 2nd Generation
Used Nautel NE-50 Exciter



Please go to our website for updated listings. Retuning and testing available – call for quote!

OMB STL systems for radio, complete with antenna and cable for under \$5,000!

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



HERE TODAY. HEAR TOMORROW.

Your passion for creating great radio got you where you are today. Now it's time to take advantage of the techniques and technologies at the NAB Show™ to ensure your programming will be heard everywhere your listeners are tomorrow. This is the ultimate venue for exchanging strategies and identifying sound solutions at the global level. And the smartest way to guarantee the programming you create reaches more consumers — at home, at work and at play.

At the NAB Show you'll find virtually every innovation driving production, editing, programming, transmission, ad sales and new media solutions for your thriving radio enterprise. Visit the unparalleled exhibit floor to see, touch and test

advanced technologies that enable HD, live audio streaming, video archiving/streaming, revenue-generating Web sites and more. Then experience a wealth of hands-on educational opportunities presented by top talent, producers, advertising managers, PDs and Web developers, the stars influencing today's best radio content.

Join professionals who share your passion for radio excellence at the NAB Show this year. For more information, visit www.nabshow.com.

**FREE
EXHIBITS-ONLY
PASS
USE CODE A530**

NABSHOW™
Where Content Comes to Life™

Conferences April 10–15, 2010 :: Exhibits April 12–15
Las Vegas Convention Center :: Las Vegas, Nevada USA



Service Guide Radio Equipment Products and Services

Personal RF Monitor Value!



The SafeOne™ alerts to hazardous RF above FCC limits from 10 – 10,000 MHz!

Easy mount to belt or tower harness, rugged nylon holster

Long battery life

Simple operation

SCHOMANDL KOTHAEM NAB Booth N9115

Meet OSHA rules for 50% less than competitors!

Call 800-522-4464 or order on line at www.LBAGroup.com/Safeone

LBA TECHNOLOGY, INC.
Greenville, North Carolina
RF Systems Since 1963

VSoft COMMUNICATIONS
R.F. Communications Software and Engineering Consulting

The Leader in Broadcast Engineering Consulting Software!

- Use Probe 4™ to create stunning “real-world” coverage maps using Longley-Rice and other models.
- Run AM-Pro 2™ to perform AM skywave and groundwave allocation studies, interference analysis, & coverage mapping.
- Run Terrain-3D™ to plot STL paths and Longley-Rice coverage over 3D terrain.
- Use FMCommander™ to study FM allocations using contour-to-contour protections. and minium spacings.

www.v-soft.com • info@v-soft.com • 1-800-743-3684



Chris Scott & Associates
Visit our website www.scott-inc.com

Ph: (270)781-5301
Fax: (270)781-1232
Bowling Green, Kentucky

AM-FM Notch Filters



NRSC Loop Antenna

Alert Monitors

BA6 self contained, 6 channels, free labels **349.00**
New lower price!


BA12 with controller, 12 channels, free labels **549.00**

PC12 with controller, 12 channels, software CD **299.00**




enbergelec.com

TRANSMITTING CAPACITORS
MICA-VACUUM-CERAMIC




SURCOM ASSOCIATES, INC.
(760) 438-4420
LINK@SURCOM.COM

DA HOOK Safety Grounding Hook



Solid Brass Hook & Hardware
Fiberglass Rod Handle
#10 Copper Cable & Alligator Clip

DA GAP Lightning Dissipation Gap



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

BAUER TRANSMITTERS, INC.
www.bauertx.com

BAUER - ELCOM BAUER - SPARTA - CETEC
Re-Manufactured
Bauer Transmitters Available
AM/FM – 2.5 kW to 25 kW
www.bauertx.com paul@bauertx.com
915-595-1048 Fax: 915-595-1840

RF PARTS COMPANY
From Milliwatts to KilowattsSM

Eimac • Amperex • Svetlana • M/A-Com
Motorola • Toshiba • Philips • Mitsubishi

Se Habla Español • We Export

800-737-2787
760-744-0700 Email: rfp@rfparts.com
www.rfparts.com



BROADCAST WORKS

Full Service Broadcast Engineering

Project Management - Studio Build Outs
Transmitter Sites - IBOC Installation
Automation Systems - STL & RPU Repairs
Full Service Shop - Emergency Equipment Rental
24/7/365 Tech Support

We can team up with your engineer to supply extra manpower for big projects – or we can see your project through turn-key.

Serving Broadcasters for over 12 years.
888-509-2470 • www.broadcastworks.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
RF Engineers, Inc. 352-367-1725

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: 770-996-8225 – 24/7 Service
COD, Visa, Master, Discover, NET-15/30
www.ccatransmitter.com

Doug Vernier
Telecommunications Consultants

- FCC Applications for AM, FM, TV, DTV, LPTV, STL
- Upgrade and Due Diligence Analysis
- Frequency Searches
- Site Relocations
- Propagation Prediction with Custom Mapping
- Demographic Analysis
- Directional Antenna Design

VSoft COMMUNICATIONS
We use V-Soft Software!
www.v-soft.com consulting@v-soft.com 800-743-3684

AM Ground Systems Co.

Ground System Construction, Evaluation & Repair

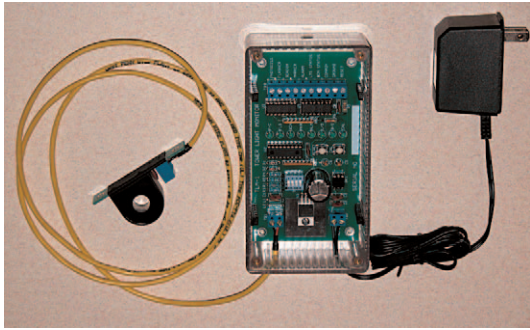
1-877-766-2999
www.amgroundsystems.com



Service Guide Radio Equipment Products and Services

TLM-1 TOWER LIGHT MONITOR

Total Monitoring for Older Lighting Systems



A microprocessor based system designed to monitor the status of FAA type A incandescent tower lights.

- Individual alarms for photocell, flasher, beacon & marker.
- Status outputs for lights on/off and beacon on/off.
- LED indicators for each alarm and status output.
- Opto-isolated fail-safe outputs for each alarm.
- Easy setup – one button calibration.
- Installs at the circuit breaker panel.
- Available through broadcast distributors.

FM Services

www.towermonitor.com • 336-667-7091

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 Today



MOORETRONIX
BROADCAST & INDUSTRIAL ELECTRONICS

Our 8th 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.

We have replacement Wind Screens and Blast Filters for the SM-5B microphone.

We now have SM-5B hanger hardware as shown in the photo.



See the "News-Update" page at our website.

Tel: 800-300-0733 Fax: 231-924-7812

WWW.MOORETRONIX.COM

RECEIVERS

OUTSTANDING specifications and pricing on professional quality receivers for **EAS**, station monitoring and translator applications.

The **AFC3** is a three receiver rack mount that is configured for your **EAS** or monitoring specific application.

Our **AF210FM** receivers meet today's Translator application specifications for reliability, linearity and cost.



DAYTON INDUSTRIAL CORPORATION

2237 Industrial Blvd., Sarasota, FL 34234 Tel: (941) 351 4454
Quality Receivers Designed and Manufactured in the USA
Email: sales@daytonindustrial.com Website: www.daytonindustrial.com

Give us a call at 352-344-2983

Repairs and Maintenance • Project Management • Engineering Assistance • Studio Build Outs
Transmitter Site Builds • HD Installs and Upgrades • Due Diligence Inspections



At **Itinerant Engineers**, we are committed to seeing you get the most out of today's technology. We have helped many smaller market stations and know how to stay within a budget and still achieve the highest quality facilities. We work with several manufacturers to provide the best equipment at the lowest prices.

Visit our website at www.ieengineers.com • E-mail us at info@ieengineers.com



World Leader
in
AM-FM
Transmitters

Complete Inventory at:

www.Besco-Int.com

Pre-Owned AM-FM units in stock!

R.E. Witkowski - President
Rob Malany - Vice President

Info: (972)-931-6055

Sales: (321)-960-4001

Email: Sales@Besco-Int.com

TOWER SIGNS

antennalD@msn.com

E-MAIL US FOR A FREE PDF CATALOG

STANDARD FCC OR MADE TO ORDER METAL SIGNS
FCC TOWER REGISTRATION SIGNS WITH PHONE #
COMMERCIAL GRADE - NO FADING - NO EXTRA COST

RED GUY WIRE MARKER BALLS AND YELLOW GUARDS
COAX & ANTENNA NUMBERED TAGS

ANTENNA ID PRODUCTS
610-458-8418 www.antennalD.com

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

Radio Pipeline

New Equipment

Updates and Modifications

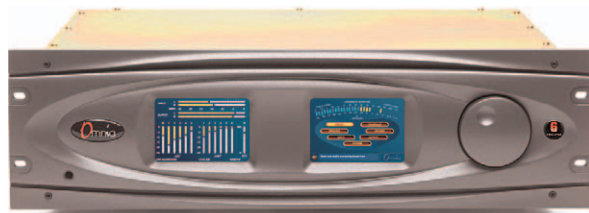
Industry Information & News

Enberg Electronics – Fybush Media – Omnia Audio

Omnia Audio Free Omnia-6EX Upgrade

Start the New Year off right with this irresistible offer from Omnia.

Here's a can't-miss, limited-time offer from Omnia: buy an Omnia-5FM and Omnia will buy you an immediate upgrade to an Omnia-6EX! That's right – a top-of-the-line Omnia-6, the processor winning stations use to blow away their competition, for the price of an Omnia-5. That's a \$3,900 value; their way of saying "thanks" for making Omnia the number one choice of top-rated broadcasters around the world.



Omnia-6EX has become radio's gold standard, thanks to pioneering features like dual simultaneous processing paths for HD Radio and conventional FM, the world's first non-aliasing digital clipping system (with composite clipping for the ultimate in competitive loudness), and a high-precision codec-optimized look-ahead limiter for perfect HD Radio processing. Six bands of limiting for conventional FM coupled to a 5-band AGC with adjustable crossovers give you surgically-precise control over your signature sound. There's even an integrated Dorrough Loudness Meter™ for added confidence.

Why do broadcasters love Omnia so much? The sound. The clean, pure, crystal-clear sound that comes from Omnia's unrivalled bass punch and vocal clarity makes your station sound more exciting and captivating than ever. So powerful, musical, natural, and free of artificial constraints, you'll crave it the first time you hear it.

Their upgrade offer is a limited-time offer, so contact your dealer today. Purchase an Omnia-5FM, and tell them you want the Omnia-6EX upgrade – on them!

To find your dealer, point your browser to omniaaudio.com/buy

Omnia Audio

216-241-7225 • www.omniaaudio.com

Fybush Media 2010 Tower Site Calendar

Fybush Media's 2010 Tower Site Calendar is hot off the presses – the ninth year this unique 12-month wall calendar has been on sale.

The calendar, which features a monthly photo of a well-known broadcast transmitter site, is photographed and written by Scott Fybush, the creator of "Tower Site of the Week" (www.fybush.com/featuredsite.html) and "NorthEast Radio Watch" (www.fybush.com/nerw.html).



The full-color monthly calendar has become a tradition for many radio engineers and a curiosity for those who think all radio towers look alike.

"The calendar has become a tradition over the years," says Fybush. "For many people, they are a very popular gift."

In addition to tower photos, the calendar's monthly pages include significant dates in radio and television history, as well as civil and religious holidays and the start of each season.

The 2010 calendars cost \$18 each, postpaid (\$19.44 including sales tax for New York State residents), and can be purchased by check (payable to "Scott Fybush") or money order to: 92 Bonnie Brae Avenue, Rochester NY 14618. Orders can also be placed with major credit cards at www.fybush.com

Scott Fybush

585-442-5144 • www.fybush.com/calendar.html

Enberg Electronics Model 3L Logo Light

Enberg Electronics new model 3L LED logo light comes complete with power supply/controller and your station's logo printed on high resolution plastic film.

Standard ON AIR or MIC ON (recording) are combined with your logo, or you may submit your own art (pdf or ai file) with any design and text you desire. Generic (no logo) lights are available as well.



Heavy duty all aluminum construction with non-glare glass front, side view lights, and only 8 watts power consumption. The 3L controller allows steady or flashing operation with a simple change of jumper, and both the on and off flash rates are individually adjustable. It also features an opto-isolated input, both 120 VAC or 220 VAC operation, constant current DC output and a color choice of black or beige. The 3L will mount on a standard electrical box or through (2) wall anchors – easy to install, a drilling template is included. (See installation video at enbergelec.com). An in-wall, flush mount version is also available. Dimensions 7.75 x 7.75 x 2.75 inches.

The 3L logo light with power supply/controller is only \$259. Instruction manual and more info at enbergelec.com

Enberg Electronics

317-683-8792 • www.enbergelec.com

WARNING

Wrong Safety Sign.
When Danger's inside,
Warning goes outside.

RFSigns.com

- ANSI Z535.2 Compliant
- Easy to order

Running to the site?
Time to Remote the site!
Several Models Available
Stackley Devices, LLC
(609) 647-9677

Remotely Control
Your AC Devices
Today!

www
remote-outlet
com

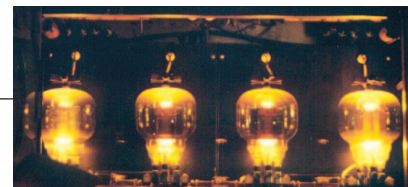
StackleyDevices
CREATIVE ELECTRONICS & SPECIALTIES

Summit Audio-Video Services

- Radio and Television Voiceovers
- Any Audio Transferred to Compact Disc
- Radio/Television Brokered Shows
- VHS, BETA, 8 MM to Transfer to DVD
- Business "On-Hold" Phone Ads
- Church Service Duplications
- DJ for Weddings and Parties
- Special Video Effects

Jim Davison – 216-832-9564
summitavservices@aol.com

FINAL STAGE



RADIO ROUNDUP

The Radio Guide Event Register

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

National Religious Broadcasters - NRB 2010

February 27 - March 2, 2010
Nashville, Tennessee
www.nrbconvention.org

NATE 15th Annual Conference and Expo

February 15-18, 2010
Lake Buena Vista, Florida
www.natehome.org/AnnualEvents/Index.cfm

Michigan Assoc. Broadcasters & SBE-91 Convention

March 2-3, 2010
Lansing, Michigan
www.michmab.com/conferences/glbc_main.html

NAB 2010 Spring Convention

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

NAB Radio Show

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

Broadcasters Clinic & National SBE Meeting

October 26-28, 2010
Madison, Wisconsin
www.wi-broadcasters.org

Radio Guide Advertiser Info – Jan/Feb 2010

Advertiser - Page

Altronic - 30
AM Ground Systems - 41
Armstrong Transmitters - 39
Arrakis - 29
Bay Country - 39
BEXT - 40
Broadcast Devices - 36
Broadcast Electronics - 22
Broadcast Software Intl. - 8
Broadcast Tools - 28
CircuitWerkes - 17
Commercial Radio - 41
Comrex - 5
Davicom - 42
DM Engineering - 47
Econco Tubes - 39
ESE - 38
Fanfare - 39
Gorman Redlich - 41
Harbach (Peter Dahl) - 47
Henry Engineering - 2
Inovonics - 34
Intrinsicnet (MySine) - 24
Jampro - 32
JK Audio - 13
Kintronic Labs - 9

Website

www.altronic.com
www.amgroundsystems.com
www.armstrongtx.com
www.arrakis-systems.com
www.baycountry.com
www.bext.com
www.broadcast-devices.com
www.bdcast.com
www.bsiusa.com
www.broadcasttools.com
www.circuitwerkes.com
www.commercialradiocompany.us
www.comrex.com
www.davicom.com
www.dmengineering.com
www.econco.com
www.es-web.com
www.fanfare.com
www.gorman-redlich.com
www.pwdahl.com
www.henryeng.com
www.inovon.com
www.plussine.com
www.jampro.com
www.jkaudio.com
www.kintronic.com

Advertiser - Page

LARCAN - 35
LBA Technology - 37
Lightner Electronics - 20
Micro Communications - 41
Moseley - 27
NAB - 43
Nautel - 11
NRB - 33
OMB America - 23
Omnia - 21
Patton - 47
Pristine - 4
Progressive Concepts - 35
PSI (Propagation Systems) - 18
Radio Systems - 31
RAM Systems - 37
RF Software - 45
RF Specialties - 15
SAS - 25
SCMS - 19
Shively - 26
SystemsStore - 47
TFT - 40
Tieline - 7
Transcom - 42
Wheatstone - 3, 48

Website

www.larcan.com
www.lbagroup.com
www.lightnerelectronics.com
www.mcibroadcast.com
www.moseleysb.com
www.nabshow.com
www.nautel.com
www.nrb.org
www.omb.com
www.omniaaudio.com
www.michaelpatton.com
www.pristinesys.com
www.progressive-concepts.com
www.psibroadcast.com
www.radiosystems.com
www.ramsys.com
www.rfsoftware.com
www.rfspecialties.com
www.sasaudio.com
www.scmsinc.com
www.shively.com
www.systemsstore.com
www.tftinc.com
www.tieline.com
www.fmamtv.com
www.vorsis.com

Baton Rouge, Louisiana

225-752-4189

ENJOY THE SOUND.

Michael Patton & Associates

www.michaelpatton.com

Radio Engineering Contractors

- ✓ AM/FM DA/FM site design-build & rebuild
- ✓ Phasor/diplexer design-build-install & rebuild
- ✓ AM DA site controller design-build-install
- ✓ Studio site design-build, digital & analog

Licensed—Certified—Insured

SystemsStore: Your Premium Source for the various supplies required to create and maintain technical infrastructure, including Wire & Cable, Connectors, Racks, Punch Blocks, Tools, Test Equipment, and a wide variety of "Problem Solver" devices

SYSTEMS STORE .com

www.SystemsStore.com

Tel: 407-656-3719 Sales@SystemsStore.com Fax: 407-656-5474

PETER DAHL transformers

Now Available from Harbach Electronics



Magnetics for Broadcast, Communications and Amateur. Also rewinding selected transformers and chokes



Harbach Electronics, LLC

Phone: 419-945-2359 • Email: xfmr@pwdahl.com

www.pwdahl.com

EVERYTHING ENDEC

SALE! Thermal Printer Paper - 9 meter x 38 mm rolls, 10 per pack 1-10 pack... Now \$20.00 Save \$5
2-10 packs... Now \$18.00 ea. Save \$14
3 or more 10 packs... Now \$16.00 ea. Save \$27+

- Replacement Thermal Printer Modules \$57.00
 - Replacement Heavy Duty Switching Power Supplies \$41.95
 - Multi-Station Relay Adapter, Control up to 4 Stations with one Endec \$529.00
 - RWT Automation Interface Modules \$109.00
 - RWT & RMT Automation Interface Modules \$153.00
 - Remote Controls ranging from \$109.00 to \$399.00
- For details on these and other innovative products for the broadcaster please visit us on the web at:



www.dmengineering.com 1-800-249-0487

All items other than sale paper are available from our many fine Distributors or directly from DME
2174 Chandler St. Camarillo, CA 93010 805-987-7881 800-249-0487

PRSRST STD
U.S. POSTAGE
PAID
PERMIT NO. 410
BEAVER DAM WI

RADIO GUIDE

www.radio-guide.com

FINALLY...FAILSAFE NETWORKED AOIP. WHEATSTONE E-SERIES & WHEATNET-IP ARE YOUR BEST CHOICE BY A LONG SHOT.



When it comes to networking your facilities, there's only one best choice. Wheatstone. For years, we've been the network/control surface choice of top broadcasters. And with good reason – we care. Wheatstone's Audio-Over-IP product is the best in the business. Here's why:

1. WheatNet-IP is easiest for a station to implement and configure. It is, hands down, the easiest in the industry. No need for Wheatstone to provide factory on-site assistance unless you really WANT us there. The manual and app notes will have you up, running and stable in less time than any other system.

2. WheatNet-IP is a natural for large facility multi-station networking (and for smaller facilities too!). It uses the IGMP features of Ethernet Layer 3 switches to identify a multicast packet, see which ports are requesting that packet, and send it only to those ports. Traffic control is maintained and system bandwidth is optimized.

3. Redundancy is critical. A typical WheatNet-IP installation has multiple levels of redundancy. Each BLADE holds the complete map of the entire system within its onboard memory – we call it distributed intelligence – a system with 50 BLADEs has

49 backups with failover in the event of a failure. Cisco Stackwise technology provides redundancy in the central core TOC switch. A WheatNet-IP/E-Series console studio complex can stand alone, even if the TOC goes down, with backup analog or digital program audio feeding a back end router independent of the core Gigabit infrastructure.

4. Modular is better. Why would you want to combine your switch, mix engine and I/O into one box? Beats us. With WheatNet-IP, you install only what you need, where you need it. We believe in not overselling.

5. Manufacturing quality is very important. Wheatstone is proud to have the best track record in the business for build-quality, reliability and intelligent functionality. With far more up-and-running installations than anyone else, this is where we really shine. An investment in WheatNet-IP and E-Series control surfaces today will reward you with a future-proof, failsafe networking/control environment that's infinitely updatable and in for the long run.

6. WheatNet-IP has an advantage. Take a look at your entire environment. Wheatstone is a perfect partner because we are always there, always innovating. Built into every WheatNet-IP BLADE are features others just didn't think of – handy utility mixers, silence detection, crosspoint routing control, headphone monitoring of any source, lots of logic GPIO, and comprehensive metering of audio I/O, not just signal-presence indicators. And, in the hugely unlikely event that a BLADE needs to be replaced, you just plug in a new one and enter the BLADE number. That's it.

7. Wheatstone is local. WheatNet-IP and the E-Series, just like ALL Wheatstone products, are designed, engineered and built from start to finish in our New Bern NC USA facility. Everyone who works on our products is 100% knowledgeable and immediately available. You can relax – as with the famous insurance company, you ARE in good hands.

With WheatNet-IP, we think we've done our homework. In fact, we know we have. And we're happy to say that we've got the best product on the market. To learn more, and there's a LOT more, get us on the phone or visit us on the web. We'll be happy to meet with you and get you everything you need.



WHEATNET
WI!



 **Wheatstone**

Audio Networking—Simply Evolved
phone 1.252.638-7000 | www.wheatstone.com | sales@wheatstone.com