

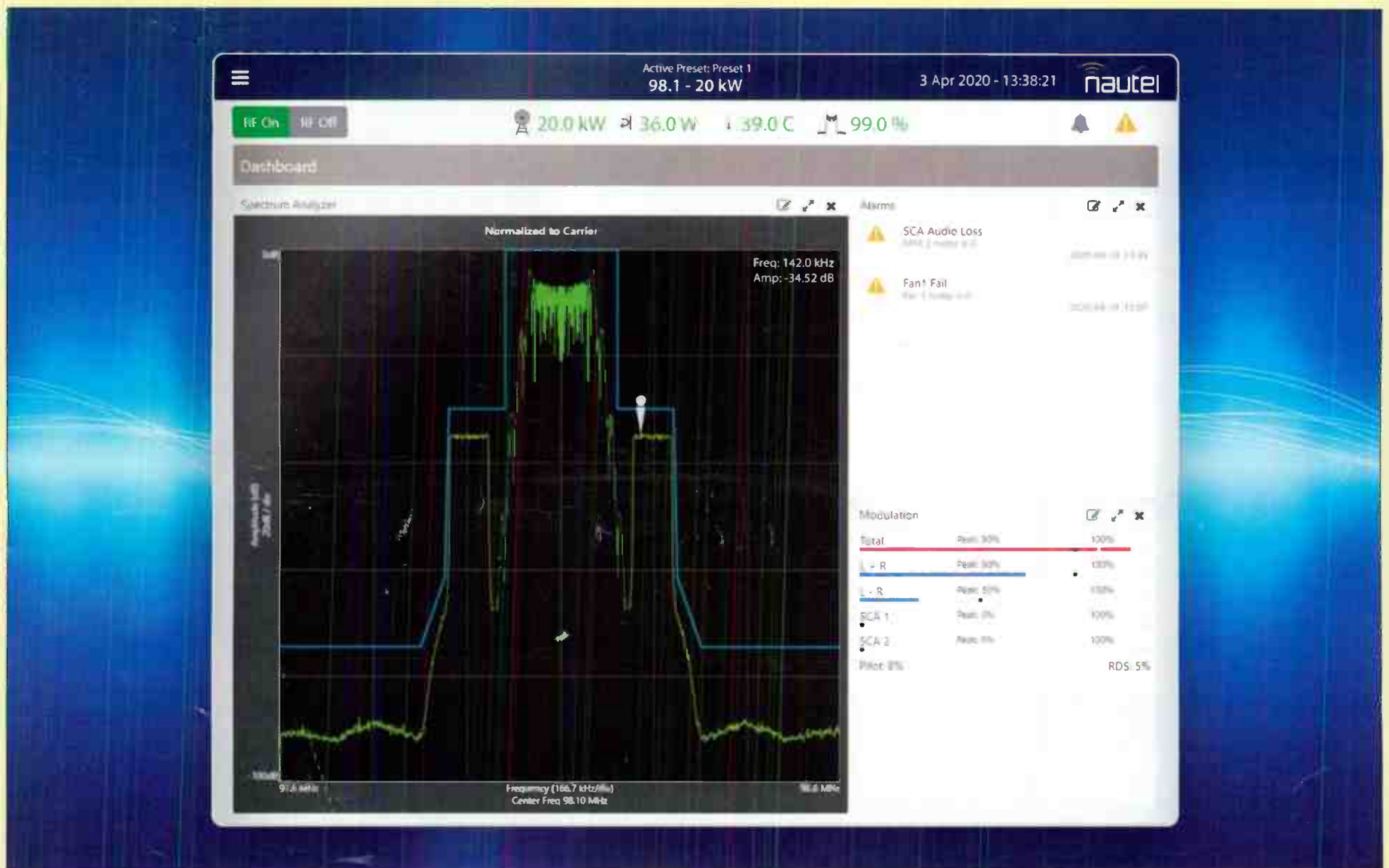
Radio Guide

www.radio-guide.com

Digital Issue Now On-Line

March-April 2020 – Vol. 28, No. 2

Advances in Transmitter Remote Control



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

RACK EM' UP

NEW The INOmini RackPack

AM | FM | HD | RDS | INTERNET RADIO

INOVONICS
BROADCAST

www.inovonicsbroadcast.com
sales@inovonicsbroadcast.com
831-458-0552



Designed by you. Customized for you. Reduced cost to you.

New! Best Protection For Less Cost.



P.O. Box 69456
Odessa, TX 79769
432-943-2588
www.jammin947.com

The new *Series 200* is rated at
200,000 surge-amps per phase.

Hi Hank,

About a year ago I installed a Power Clamp TVSS surge suppressor unit at our AM transmitter site. We were upgrading from 5kW to 12kW and I wanted to protect the new transmitter from "dirty power". We're located in the middle of an oil field about 8 miles out of town, and I replace about 30 MOSFETs each year in our 5kW solid state transmitter.

After reading a testimonial from someone who experienced similar problems, I made sure that a Power Clamp was included in the budget. Now, with 13 months since PowerClamp's installation, I have not had to replace one. The box of MOSFETs is collecting dust.

We recently bought an unbuilt FM station and guess what I ordered for that transmitter site?

PowerClamp has kept us on the air and reduced our maintenance costs.

Thanks for an effective solution!

Bob Souza,

Managing Partner

KCKM 1330 - 12,000 Watts
Monahans, TX 79756



**Stay On The Air
with PowerClamp
Surge Protection!**

Prevent transmitter failure!

The new PowerClamp *Series 200* surge suppressors reduce AC spikes and surges that damage transmitters. They clamp many transients to within a few volts of the AC waveform, preventing shutdown, tripped breakers, and blown power supplies.

PowerClamp *Series 200* features automatic *Sine Wave Tracking*, on-board LED fuse status LEDs, and a Remote Status option. The superb protection of our original Series 10 TVSS, but for **25% less cost**.

For details, contact any Henry Engineering / PowerClamp dealer
or visit www.henryeng.com/powerclamp/

Tel: 562-493-3589

World Radio History



Accuracy, Peace of Mind and Reliability

These are at Least Three Reasons Why the DPS-100D Series Power Meter has Become the Choice of Broadcasters Worldwide



No other power meter on the market meets the stringent and changing requirements like BDI's DPS-100D Series True RMS Power Meters. FM broadcasters, television broadcasters and now AM all digital broadcasters can take advantage of the DPS-100D Series feature set including 40 dB dynamic range, measurement of analog FM and IBOC simultaneously, measurement of multiple carriers simultaneously for master antenna applications and much more. With BDI's exclusive 3-Strike™ VSWR protection algorithm your system is protected from damage. The DPS-100D interfaces directly to our SWP-200 series motorized switch controllers, SWP-300 remote controls and our SWP-206 master antenna monitor system. Email alerts, SNMP IP interface and a host of other features make the DPS-100D series unmatched in flexibility and ease of use.

bdi ... Serving the Broadcast Industry for 35 years

Tel. (914) 737-5032 www.broadcast-devices.com



Radio Guide

Contents

March-April 2020

Cover Story	6
<i>Advances in Transmitter Remote Control</i>	
Studio Site	8
<i>"Going Viral" – The Wrong Way</i>	
Chief Engineer	10
<i>Working at Home</i>	
FCC Focus	12
<i>Corona Virus and Broadcasting</i>	
RF Guide	14
<i>Is It Really Clean, Or Just New?</i>	
Radio Report	16
<i>Inovonics SOFIA Keeps You Listening</i>	
Engineering Perspective	18
<i>It's Only Radio</i>	
IT Guide	20
<i>The Linux Connection</i>	
Radio Management	22
<i>The Back Seat</i>	
Practical Engineering	26
<i>Leaning Tower of AM and a Shocking Component</i>	
Practical Tech	30
<i>Keeping It Cool ... or Warm</i>	

Shop Talk	34
<i>Misc. Tech-Tips and Thoughts</i>	
Small Market Guide	38
<i>Modern Day Cattle Rustlers – The FCC</i>	
Transmitter Site	40
<i>BE Transmitter Screen Failure</i>	
Service Guide	44 & 45
<i>Radio Equipment, Products, and Services</i>	
Studio Stories	46
<i>Kickin' It Ol' Skool</i>	
Final Stage	47
<i>Convention, and Event Register</i>	
Advertiser Information	47
<i>Advertiser Website and Page Information</i>	

Radio Guide

Volume 28 – Issue 2

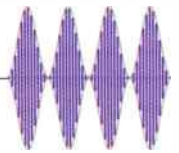
Radio Guide Website: www.radio-guide.com
 Classified Ads: www.radio-classifieds.com

PO Box 20975, Sedona, AZ 86341
 Phone: 928-284-3700 • Fax: 866-728-5764

Ray Topp (publisher & editor) – radio@rconnect.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 2020, Media Magazines Inc., and may not be copied, reproduced, or stored in any format, without the written permission of the publisher.

In This Issue



Critical Content for Radio

Cover Story – by Elaine Jones (page 6)

Advances in Transmitter Remote Control: "A certain amount of information and remote management of transmitters has been available to engineers for decades. Starting as early as the 1950s, remote readings and switching of transmitters were done through some sort of direct connection to the transmitter site. This was usually accomplished via dedicated phone lines with DC continuity and stepping relays."

Chief Engineer – by Scott Schmeling (page 10)

Working at Home: "Where I work, we are limiting access to the radio stations. Sales people are working from home, only staff essential to On Air are allowed in the building. That includes Announcing, News, and Traffic staff (and of course, Engineering!). All interviews are being handled over the phone."

But that may not be enough. We have been discussing the various options that will allow our air staffs to work from home. For some occupations, all it takes to work from home is an Internet connection and e-mail."

FCC Focus – by Gregg Skall (page 12)

Corona Virus and Broadcasting: "CISA specifically identifies these workers as essential:

- Workers who support radio, television, and media service, including, but not limited to front line news reporters, studio, and technicians for newsgathering and reporting.
- Engineers, technicians and associated personnel responsible for infrastructure, construction and restoration, including for fiber optic cables.
- Installation, maintenance and repair technicians that establish, support or repair service.
- Workers who support Broadcast Operations Control Centers.

WORKING REMOTELY?
Take complete control
of your station with
WebDAD.



ENCO.com/VirtualDemo

800-ENCO-SYS

sales@enco.com

**WE LOVE RADIO.
IT TOUCHES US.
IT UNITES US.
IT BRINGS US HOPE
AND HELPS US FEEL
LESS APART.**

THANK YOU FOR BROADCASTING.
TRUST THAT WE'RE HERE TO SUPPORT YOU.

Worry-Free
Transmission



**Because
Radio
Matters**



Advances in Transmitter Remote Control

A New AUI Is Coming to Town

by Elaine Jones

When Nautel introduced the Advanced User Interface (AUI) 12 years ago, it revolutionized access to and management of Radio transmitters, both locally and remotely.

A certain amount of information and remote management of transmitters has been available to engineers for decades. Starting as early as the 1950s, remote readings and switching of transmitters were done through some sort of direct connection to the transmitter site. This was usually accomplished via dedicated phone lines with DC continuity and stepping relays at each end, then with audio signals at the studio that sent pulses to stepping relays at the transmitter. Digital readouts started appearing in the late 1970s, and binary-coded commands provided raise-lower functions, channel selection and so on.

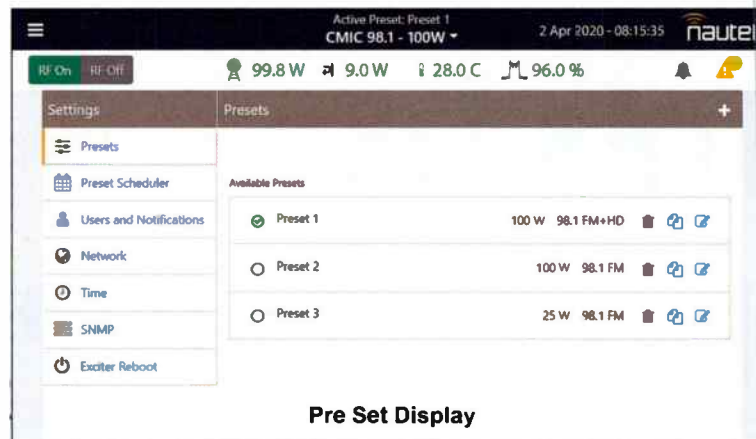
This author was working at Gentner in the 1980s when the VRC-1000 was released. At the time, this product was revolutionary, allowing users to query certain functions and issue commands using DTMF tones, and to receive a verbal response via a synthesized voice, essentially controlling key transmitter functions from anywhere a touch-tone telephone existed. It was the first time that the words “remote transmitter control from anywhere” were used in the Radio market – but was not at all comprehensive by today’s terms.

As the Internet started gaining speed, companies looked to IP access for transmitter control, with better reporting and finer adjustments becoming possible. However, getting the information from the transmitter was often not straightforward and information was still not as comprehensive as users would like. A remote control would let you know if a fan had failed but could not let you know if the fan was showing signs of wear. It would tell you if a module had failed but not warn you of PA efficiency changes. Knowing what was really going on inside the transmitter was reserved for transmitter site visits, with engineers carrying a carload of external equipment to measure and collect all of the data they needed.



Nautel changed this with the AUI. In April 2008 two high-power transmitters, the NV40 (FM) and the NX50 (AM) were released. Each of these products included the new Advanced User Interface – incorporating a 17” color LCD touchscreen on the front panel, and remote Web access to all of the AUI’s display and control functions. This was a departure from other transmitters and control systems which did not provide comprehensive access, either locally or remotely.

“I recall one design meeting where our engineers were asking sales and marketing people what we wanted to access remotely,” says Nautel Head of Marketing John Whyte. “The answer was, ‘everything!’”



Pre Set Display

Attendees at the 2008 NAB were amazed by the breadth of information and control that were available through the AUI. Not only did it provide monitoring down to the individual module level and comprehensive logging, it included an instrument grade spectrum analyzer, and an IBOC modulation analyzer with constellation display. Alarm reporting and other requested information were made available via a tiered e-mail structure.

Icon	Definition
	Forward Power
	Reflected Power
	Temperature
	Modulation
	Alarms active/none
	Warnings active/none
	Change Dashboard Panel
	Close Dashboard Panel

AUI Icon Table

Over the past 12 years, the AUI has remained the industry standard for transmitter monitoring and control. It is now used in all modern Nautel transmitters; in models where the 17” screen is not available, the AUI works through a direct Ethernet connection. Its design has permitted the addition of new capabilities via firmware upgrades; its transmitter functionality, fully operable either locally or via a Web interface, now includes unique features such as optional onboard audio processing, direct digital inputs, asymmetrical sideband operation for HD

Radio™ and audio storage/playback capability. As of 2020, more than 9,000 Nautel transmitters had been deployed using the Advanced User Interface.

There was a problem lurking in the Internet shadows, however: the original AUI operated using the Adobe Flash platform, which fell out of favor in the consumer market when security vulnerabilities were discovered as a potential risk for openly accessible applications. Unlike consumer devices, most Nautel transmitters reside behind firewalls and password protection is available (and strongly encouraged!), so the vulnerabilities of Flash were not a huge issue for Nautel transmitters themselves. All major browsers still support Flash – users can easily “allow” it when warned. However, in July 2017 Adobe decided they would no longer provide updates to the Flash browser plugin as of 31st Dec 2020. The browser vendors then said they would therefore drop all support for the Flash plugin as of the same date, as to do otherwise would put users at substantial risk from the unsupported (i.e. unmaintained with security updates) Flash plugin. Nautel has been aware of this for several years and realized that this would become more of an issue with time.

Enter the HTML5 AUI

The new Advanced User Interface, which will shortly be released by Nautel, is based on HTML5, a powerful Web application. HTML5 uses encryption for added security and can run on any browser – and it is platform agnostic. It is extended by frameworks and libraries that only recently have allowed it to compete with the richness of Flash. Other extensions can provide security and responsive design – the ability to look good on almost any device’s browser. Screens automatically re-size to display the AUI’s information, so it can be used on a desktop, laptop, tablet or smartphone.

As with the current AUI, everything runs from the transmitter itself. To set it up, a user would connect through a firewall, then navigate to the appropriate HTML page that is posted from the transmitter. The AUI would then load on the user’s computer. Matt Herdon, a Product Manager at Nautel, says the new AUI is significantly smaller than the current one so the initial load should be much faster than before.

Herdon believes the new AUI will provide a more intuitive, natural user experience. The front panel/main page will have a similar appearance to the image shown on the front cover of this issue; as with the current version, multiple informational items are presented. The new version will show one graphical display at a time and alternate displays are easily accessed via pull-down menu choices. (The “home page” graphical display will show the spectrum analyzer). As with the current AUI, the current state of the transmitter always appears at the top of the screen no matter what other information is selected via the menus.

Multiple languages will be supported by the new AUI; different language sets are stored in a database and new language sets can be added.

While reinvented for HTML5, the new AUI retains familiar features such as remote I/O, scheduling, and presets.

Nautel had planned to unveil the HTML5 AUI at its NUG@NAB Technology Forum; with this event now indefinitely postponed, the AUI will be demonstrated via upcoming Nautel Webinars. Herdon also plans to collect a list of users who would like to act as beta test sites prior to the formal release of the AUI; interested parties should contact Nautel.

Control your ViA Remotely



Imagine if your talent accidentally changed a setting during a live broadcast...

With the Cloud Codec Controller you can log in and adjust all settings remotely in real-time.

Log in



Change Settings



Real time update



This is just one of many advantages
of the Cloud Codec Controller.



Compatible with Genie, Merlin,
Bridge-IT and Report-IT Enterprise.

Tieline ✓
The Codec Company

317-845-8000 | sales@tieline.com | tieline.com

World Radio History

“Going Viral” – The Wrong Way

Tips for a cleaner studio that can help us all.

by George Zahn

If I hear another person do the send up of The Knack’s “My Sharona” as “My Corona” I think I might just decide to nix “social distancing” by cuddling up to a hungry tiger at feeding time. Like it or not, many of us have been caught in the midst or aftermath of the Covid-19 Coronavirus issue. I also have to say that I feel very badly for the cable company, Covid, that just so happened to have their name long before the latest Coronavirus was renamed.

This led me to revisit a topic we haven’t discussed in this column for quite some time: good studio hygiene. The goal should be to preserve a happy and healthy broadcast team, not just during the recent pandemic, but at all times. Anyone who has seen my office knows that I’m very, very far from a neat freak, but it’s beyond just dusting and organizing. As staffs have shrunk over the years and we try to do more work with less people, a significant sick wave (for any reason) could severely limit our productivity.

I know that some of this may sound like a brilliant grasp of the obvious, but far too often, we end up falling into terrible habits or cut costs by leaving cleanup of the studio to the staff. Some stations are lucky to have that one host or producer who is diligent about making sure things are straightened, but not all stations are that fortunate.

In the wake of the Covid-19 issue, let’s look at some every day, or every month, things we can do to make our studio environment better for our staff and guests. If we’re ensconced in our building or a stand-alone facility, these may not be as vital, but still good practice. For stations that might, in a more unlikely case, be in a building that houses high traffic areas or vulnerable communities (such as mixed-use medical office buildings, areas that include community centers, or even as in my station’s case, a retirement community, the complications are magnified.

Screen Test

One of the true basic additions to most station studios, lobbies, restrooms, and lunch rooms, is fairly inexpensive (albeit harder to buy during pandemics) hand sanitizer. During the recent pandemic, even the hardest core sanitizer-haters have begun using some of the alcohol-based cleanser. Many facilities have added dispensers (many wall mounted) at entrance locations, so visitors can immediately clean after using a door handle or push bar.

Once in the studio, the most obvious areas for cleaning include the parts of the studio that are closest to our T-Zone (the mouth, nose, and eyes), and that happens to be the windscreens of our microphones. Many of us in the past have allowed these key pieces of equipment to literally become grungy, discolored, and sometimes even hardened from age and lack of cleaning. We have all become used to them not looking great, but especially discolored or badly worn windscreens don’t give a very professional appearance. Even worse, they can help transmit pathogens by sheer proximity.

I have asked several engineers about cleaning windscreens, and many have suggested everything from a gentle soak in the sink to actually running the screens through a washing machine. Before doing either of these with an entire studio worth of windscreens, it may be best to try one and see how it survives the cleansing process. It

may take a few tries with different screens to find ones that are resilient enough to handle somewhat regular cleaning.

No matter the washing method, it is critical to allow the windscreen to completely air dry before replacing it on the microphone. This is important on dynamic microphones, but even more critical on condenser microphones. Mics don’t appreciate liquid, but condenser microphones are even more susceptible to poor performance in the case of water or humidity issues.

Other parts of the microphone that can be cleaned are the external mesh grill over the capsule of the microphone, and in some cases, the pop filter under that grill. It’s best to check manuals or official on-line sources for each individual microphone in your studio to ensure that you’re cleaning properly without voiding any existing warranty.

For example, the Shure website (shure.com) gives some basics on cleaning everything from the external windscreen to the wire microphone grill to the pop filter. Many microphones may not give you easy or any access to an internal pop filter, but it’s best to check with your microphones’ manufacturers sites to find out more about the best way to clean the grill of the mic and/or any brand-proprietary windscreens you may have purchased.



The body of the microphone might also be any area of cleaning. It’s best to check manuals as to whether basic anti-bacterial or anti-viral cleaning wipes or slightly moist, soapy paper towel might be best.

Here’s one of the catches on this topic: On cleaning microphone windscreens or mic bodies, most manufacturers of microphones and cleaning supplies warn that they do not guarantee or have an ironclad recommendation for any process that will stop Covid-19. They all seem to defer any questions to health experts.

Wiped Out

During the Covid-19 spread, our station uses some basic Clorox disinfecting wipes to clean off most studio surfaces with no real issues. Ironically, the Clorox brand wipes we were using contain no bleach. It’s also worth trying any wipe on a small area of any device before just wiping the whole piece of equipment down. We have used these on studio tables, mic stands, consoles, and most any surface in the studio – and that goes for the areas often forgotten about such as door handles, telephone receivers, etc.

The key in cleaning is moderation. Too much cleanser moisture is bad news for electronics. You don’t want to damage your devices by over saturating vulnerable access points near buttons, where moisture can seep into a circuit, and cause potential damage. Most wipes are not soaking wet when taken from the container. When in doubt, unplug and turn off devices when cleaning.

Another area near the T-Zone is our ears, and most stations have communal headphones that are used shift-to-shift. This brings me back to an area that I’ve mentioned in past articles: the personal set of headphones. Some stations issue individual sets of headphones to each talent, and each person is responsible for his/her own pair. Some stations renew the headphones perhaps once every year or two.

In any case, cleaning headphones can help prevent the spread of bacteria or viruses. Gentle solvents on headphone pads may work. If you have a dead set of cans around the station, perhaps one ear not working or a broken head band, it might be best to try any planned cleanser on the old set. Not all headphone pads are created equal and some are foam, plastic, or other synthetic material, so trying an experimental cleaning on old, disposable headphones is a good practice.

“Digital” Audio

When was the last time you cleaned your touch screens for your audio delivery system? This is one of the most communal surfaces of every studio. Every manufacturer may have suggestions for cleaning, but daily (or at the very least semi-weekly) cleaning of your touch screens is a good practice, pandemic or no pandemic. We have found that regular cleaning of the touch screens helps improve responsiveness of the screens as well.

Do you still have copy books for liners, spots, or other announcements? Years ago, we started putting our talk sheets in plastic page liners out of convenience. We learned that not only does that procedure keep the sheets from getting ruined or stained from spills or mishaps, but the plastic can even be wiped down from time to time if you wish.

The idea here is not to create an atmosphere of fear, and every station will settle into whatever schedule works best for it. The goal again is a healthy staff and better productivity. Sometimes, just starting one good habit may lead to others and create a better environment (figuratively and literally) in the studio. Just like a chain, any of the areas that can accelerate the spread of germs can be the weakest link that breaks the chain.

Whether due to Covid-19 or not, it may be time (or at least a good excuse) to create a basic staff policy for studio cleanliness and care, maybe even some basic restrictions on food in the studio (or at least placement thereof). In past articles, I’ve conveyed some engineering stories that have included an engineer investigating a non-working CD player only to find that someone, somehow, managed to get what looked like a half bag of potato chips into the internal mechanism of the player.

Have you enacted, or already had in place, some policies that made your studio(s) healthier or cleaner? This is an area that many of us can learn from others to create a better workplace and extend the life of equipment. Feel free to share any ideas, and I can share them in a future article.

George Zahn is a Peabody Award winning radio producer and Station Manager for WMKV-FM at Maple Knoll Communities in Springdale, Ohio. He is a regular contributor to Radio Guide and welcomes your feedback. Share your stories with others by sending ideas and comments to: gzahn@mkcommunities.org

INOVONICS SUPPORTS HD Radio WITH UNIQUE SOLUTIONS

THE LARGEST PORTFOLIO OF HD RADIO PRODUCTS
IN THE RADIO BROADCAST INDUSTRY

JUSTIN 808 FM | HD RADIO TIME ALIGNMENT PROCESSOR



100% Automatic to Within +/- 1 Sample

Precise time alignment between analog FM and HD1, Dynamic Web interface, SMS/email alarms, Data logging with graphic display.

719 DAVID IV FM | HD RADIO AUDIO PROCESSOR



Sophisticated Sound

Ultra low latency, DSP design; 5 bands of dynamic range compression and "graphic-EQ", 25 factory and 20 customizable presets, Stereo-Gen with RDS metering, easy setup and control.

AARON 655 FM | HD REBROADCAST TRANSLATOR RECEIVER



Combines Multiple Processes in a Single Box

DSP-based FM/HD Radio Receiver, Audio Processor, Dynamic RDS Encoder, and Streaming

SOFIA 568HD RADIO SITESTREAMER+™



Critical Remote Monitoring

- Displays HD Radio graphics
- Off-air outputs: Analog, AES Digital, AES67 AoIP
- Internet stream for 10 listeners
- Alarms & Notifications.

679 FM | HD RADIO MONITOR RECEIVER & 638 FM | HD RADIO SITESTREAMER



Compact and Agile

Inomini products provide powerful monitoring in reduced size & cost

INOmni 679

- Professional off-air monitoring
- Analog L/R & AES outputs
- Alarms

INOmni 638

- Remote Monitoring Via Web
- Streaming on-line
- Alarms & Notifications

www.inovonicsbroadcast.com | sales@inovonicsbroadcast.com | 831-458-0522

WHY INOVONICS?

- Quality Solutions. Competitive Prices.
- Quick to install. Easy to Program
- Three-year Factory Warranty.
- Quality after sales service.



Chief Engineer

Working at Home

The COVID-19 Pandemic

by Scott Schmeling

I'm writing this on March 23rd. We are living in a very strange time. I'm sure *most* of us have never experienced anything like this. In the course of just a few weeks the United States has gone from a normal day-to-day routine to some states issuing "Shelter In Place" orders and everyone adhering to "Social Distancing." Restaurants, bars, churches, and many other businesses are temporarily closed, all in an effort to lessen the spread of the COVID-19 virus.

Where I work, we are limiting access to the radio stations. Sales people are working from home, only staff essential to On Air are allowed in the building. That includes Announcing, News, and Traffic staff (and of course, Engineering!). All interviews are being handled over the phone.

But that may not be enough. We have been discussing the various options that will allow our air staffs to work from home. For some occupations, all it takes to work from home is an Internet connection and e-mail. Needless to say, for radio on-air, it's a little more involved. That being said, it's not a lot more than we currently do for remote broadcasting – just on a larger scale for a longer period of time.

As an example, KTOE-AM in Mankato is a Minnesota Twins affiliate. This year, as in the last few years, we have broadcast our morning show (The Morning Blend) live – Pool-side from Ft. Meyers, Florida, during Twins Spring Training Camp. To accomplish the remote (studio quality I might add) they take a Tieline codec (we're still using the Commander G3 iMix) and a couple laptops with them. The Tieline connects to a studio unit and gives us high-quality audio, one laptop makes a VPN connection to another computer in the TOC ... *that* computer has software that allows remote control of the On Air computer. The other laptop is for show prep, news, and Internet browsing. Those are the same basic pieces needed to broadcast from home – a way to connect to the computer back at the station, a way to control that computer, and deliver audio.

I'm going to try to outline what you will need, but I have to present this in very general terms. I have to because there are far too many different IT configurations to be able to be specific. I don't know your network. If you contract with a third-party to maintain your IT infrastructure, talk with them about what you will need. If you maintain it yourself and you don't know what to do, as cliché as it may sound ... Google it! Seriously, I've found a wealth of good information using "The Google!" You'll have to look through the solutions presented and decide which way is best for you.

The basic pieces you will need are a method to connect, a method to control, and a method to deliver audio. You also have to be mindful of your computer security.

There are a number of "All-In-One" remote access solutions available. Connections through **GoToMeeting** (gotomeeting.com), and **TeamViewer** (teamviewer.com) are two. I know there are more.

Windows has a built-in Remote Desktop Protocol (RDP). Remote Desktop will require some port for-

warding on your router and when you log in, you essentially kick out anyone who had been using that computer. GoToMeeting and TeamViewer are screen sharing applications.

Another method requires VPN (Virtual Private Network) software to connect to your network, and VNC (Virtual Network Connection) software to connect to a particular computer. The VPN server is installed on a computer you designate as the one you want to use for making the connection and the VNC server is installed on



the computer you want to control. Both VPN client and VNC viewer programs are installed on your remote computer. You first establish the VPN connection to your network ... then run the VNC viewer to connect to the particular computer.

I must mention here, too, that some firewalls have proprietary VPN software modules for use with their firewall appliance. Such is the case at one of our locations where we have a WatchGuard firewall.

All of the above has addressed connecting to, and controlling a computer back at the station. If your goal is broadcasting *live* from home, you also have to get your audio there, too. Depending on the equipment you have available, that could be as simple as using your home phone line (if you still have one) with either a plain telephone or a remote sports mixer.

You can deliver higher quality audio by using a codec if you have one. The codecs that come to mind are manufactured by Tieline, Telos, Comrex, and Barix, and I imagine there are others. If you have any of these available, they would deliver high-quality audio to your station. If you *don't* have a codec there is a website, **cleanfeed.net**, that can be accessed on an available computer at both the studio and your home using the Chrome browser. If you have something running Chrome you can most likely use Cleanfeed. And multiple people can use it simultaneously, so you can have multiple people on at the same time. Cleanfeed offers a free version with basic functionality and a paid version (monthly charge) with all the options available.

(Full disclosure, we have a new guy in our Engineering department. His name is Keith, and he is both younger and much more computer/IT knowledgeable than I. Keith has been re-vamping our network structures and setting up a remote access where we did not

have it. Keith also told me about the Cleanfeed app.

If you are not as concerned with being able to broadcast *live* from home, there is another option. Some audio storage and playback systems (I prefer not to use the term automation) have a function commonly known as Remote Voice Tracking (RVT).

In general terms, an RVT computer at home (client) will connect to a computer running the RVT server software at the station.

Minimally, the RVT computer at home should have a microphone and headphones connected. Absent a home studio, that could easily be accomplished by plugging headphones into the headphone jack on the computer and using either a USB Microphone (many versions are available in a wide price range) or an XLR to USB adaptor, which allows the use of a higher quality microphone. I know Shure has one (x2u) as does Behringer (XLR3USB).

There are also a number of high quality USB Audio Interfaces that allow easy connection of a microphone and headphones to your computer. Behringer and Focusrite are two that I know of.

Focusrite USB Audio Interface



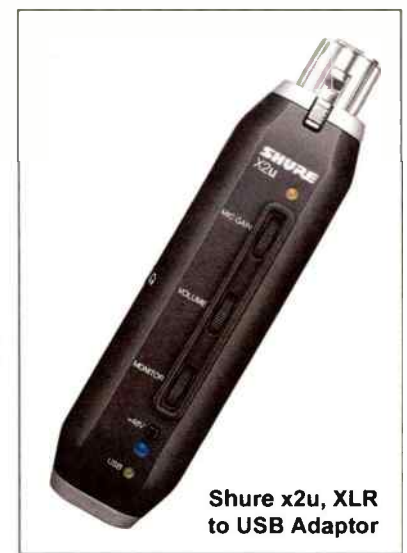
We use iMediaTouch software for audio storage and playback. In response to the COVID-19 pandemic, WinOMT/ iMediaTouch is making available free of charge to any customer with a currently valid support contract, the software necessary to work from home, including Remote Voice Tracking and On Air Remote, which allows control of your on air computer by a remote computer in your home. Check with your software provider to see what they have available.

I have tried not to go into too much detail here because your best option depends on your network. There are too many variables to speak in anything more than generalities. But I must stress ... be aware of your computer security. You are allowing a computer over which you have *no control* to connect to your network. Proceed with caution!

Finally, this pandemic is something most of us have never experienced. My best advice to you is, stay healthy, maintain your social distance, avoid gatherings, stay home if possible and ... *wash your hands with soap and water!*

And of course, until next time ... keep it between 90 and 105!

Scott Schmeling is the Chief Engineer for Minnesota Valley Broadcasting He can be reached via email at scottschmeling@radiomankato.com



Shure x2u, XLR to USB Adaptor

StudioHub

From Angry Audio



We heard you. When you found out that StudioHub™ was gone, you took it pretty hard. After all, it's not every day that one of your favorite brands bites the dust. You weren't happy, and you raised a ruckus from Seattle to D.C.

Well, here's some news that'll make your day. StudioHub is back! All the products you love — cabling, adapters, amplifiers and control panels — and have come to depend on. It's back from the dead, courtesy of the folks at Angry Audio. You're welcome!

Adapters



Audio over CAT-5. StudioHub is the original broadcast adapter.

Cables



High-performance shielded CAT-5 patch cables in nearly every length.

Dongles, Splitters, & Couplers



DSUB to RJ45 converters, level pads, splitters and much more.

Hubs & Patch Panels



Breakout boxes, patch panels and punch blocks.

MatchJacks & DA



Audio balancers, converters and distribution amps powered by StudioHub.

Packages & Harnesses



Prepackaged cable and adapter kits for studio-sized projects.

Power Supplies



Exclusive power injection system enables CAT-5 cables to deliver audio plus power.

Panels



Headphone amps, mic preamps, buttons and jacks. There's a panel for everything.

Mounts



Put your panels in their place with our bezels and mounting systems.



Coronavirus and Broadcasting

by Gregg P. Skall
Womble Bond Dickinson (US) LLP

It seems a moment barely passes before we hear that about another state or community-issued directive to shelter-in-place order. While many non-essential businesses are closed by these orders in an effort to combat the spread of COVID-19, others are considered “essential” that may, or are encouraged to stay open during the crisis to provide for “essential” needs of the public in combatting the pandemic. As of March 23, 2020, there have been state of emergency declarations from the federal government in all 50 states, and in all populated American territories because of the COVID-19 pandemic.

Generally, shelter-in-place orders adopt or reference the U.S. Department of Homeland Security, Cybersecurity & Infrastructure Security Agency (CISA) issued Memorandum on Identification of Essential Critical Infrastructure Workers During COVID-19 Response: www.cisa.gov/publication/guidance-essential-critical-infrastructure-workforce The CISA Memorandum is only advisory in nature and it is critically important that each station examine the shelter-in-place order governing its state or local community. While states have taken different approaches on how closely they follow the CISA list, nearly all follow the model in identifying communications and information technology as essential. CISA specifically identifies these workers as essential:

- Workers who support radio, television, and media service, including, but not limited to front line news reporters, studio, and technicians for newsgathering and reporting.
- Engineers, technicians and associated personnel responsible for infrastructure, construction and restoration, including for fiber optic cables.
- Installation, maintenance and repair technicians that establish, support or repair service.
- Workers who support Broadcast Operations Control Centers.

Past natural disasters have proven the essential value of maintaining broadcast operations to provide critically needed information to the local population in conjunction with other forms of media, and most particularly when other media are no longer able to function. In a 2013 address to the Missouri Broadcasters Association, then Commissioner Pai recalled the critical role that broadcasters play when disaster strikes, citing examples such as local radio and television stations warning residents when severe weather threatened central Oklahoma saving more than a few lives when an EF-5 tornado barreled through Moore, Oklahoma and the catastrophic tornado in Joplin. When mobile phone service and the Internet were all but wiped out, broadcasters provided around the clock uninterrupted coverage for nine consecutive days, including lifesaving disaster relief information and connecting people in need with others who could help.

When faced with a “shelter in place” order or a state’s COVID-19 mitigation initiative, essential service businesses must determine what options are available to maintain its operations (adjusted for COVID-19 risks), or how to reduce operations except for specified activities necessary to provide its essential service while mitigating danger through remote working (commonly referred to as “minimum basic operations”), or, if necessary, close for a period of time. The CISA Memorandum provides crucial guidance on balancing maintenance of critical infrastructure business functions with COVID-19 precautions.

As essential business employers, broadcasters should establish an education and logistics support team to allow critical functions to be performed while minimizing exposure among employees required to perform their essential functions. For example, in consultation with Governor DeWine, the Ohio Department of Health, Governor DeWine included

in its order a requirement for essential businesses to comply with defined social distancing requirements, designate six-foot distances for employees to maintain appropriate distances with signage or tape, how to use hand sanitizer and sanitizing products. Already we have seen examples where news interview show are broadcasting with video conferencing rather than in-person, face-to-face discussion and in-studio production to empty audiences.

Note also that companies that support the operations of exempted businesses may also be considered “essential,” although most of the State orders have yet to fully embrace the supply chain concept in support of specific “essential businesses” to operate. If your operation relies on support of independent contractors, there’s a good argument that they may be deemed an “essential” business as well.

Challenging the Orders: If faced with an adverse decision, either failing to designate a station or a specific activity or function of the station as essential, the station may decide to challenge the order. The power to issue such orders are state specific and are based in a state’s constitutional, statutory, and regulatory frameworks. They must be reviewed on a bespoke basis by anyone affected that wishes to understand their application, enforcement mechanisms, and judicial review availability and proceedings. There are some general characteristics, however, that provide a starting point.

Typically, an isolation or quarantine order is designed to address the outbreak of a communicable disease or condition caused by an infectious agent – when the occurrences of a communicable disease exceed the usual number of cases. The authority of health directors or similar officials to issue such orders is generally limited to severe circumstances: when public health is endangered, when all other reasonable means for controlling the problem have been exhausted, and there are no other less restrictive alternatives.

Isolation authority usually gives an official the authority to issue orders limiting the freedom of movement or action of a person if they have (or are reasonably suspected to have) a listed communicable disease or condition.

Quarantine authority usually gives an official the authority to issue orders limiting the freedom of movement or action of a person who has been exposed to (or is reasonably suspected of having been exposed to) a listed communicable disease.

Some states also provide for health directors to engage in surveillance of people with communicable diseases until there is no longer a threat to public health posed by the people surveilled. Many also give health directors the authority to limit freedom of access to locations thought to be contaminated with an infectious agent. Ignoring an isolation or quarantine order or other state of emergency declaration during the period of emergency may be a violation of state law. With the courts closing or delaying cases, challenging an order will be difficult and not quickly resolved.

Inform your workforce about your “essential business” status, but do not encourage them to defy law enforcement – they should have a number to call within the company should they encounter any difficulty getting to work or performing necessary “essential” tasks outside the workplace.

Management and employees should be aware that the U.S. Congress recognized the essential nature of broadcasting in times of crisis. Under 42 U.S.C. § 5189e, radio and television broadcast and cable service is an “essential service provider” that must be ensured access to its facilities in a federally declared emergency. In Section 302 of RAY BAUM’s ACT of 2018 (enacted as Division P of The Consolidated Appropriations Act, 2018), Congress specifically included broadcasting and cable to ensure them access to their facilities during federally declared emergencies, such as the COVID-19 declared emergency. As DHS recognized in a letter to various broadcast associations, “This means that essential broadcast station personnel should be allowed access to their studios, transmitters, towers and other places of business for purposes of staying on the air.”

Familiarize all employees with the NAB Coronavirus Toolkit, available at: www.nab.org/coronavirus/default.asp

The toolkit includes information for stations on operation resources, editorial guidelines, broadcast-ready PSAs and examples for application to the station’s social media platforms, along with tools in Spanish. Make certain that all employees carry proof of their identity and proof of their employment. Also determine whether other state or federal agencies may have made available assistance letters for your particular industry sector that could assist your employees in performing their functions. CISA has made available generic assistance letters for the communications sector, asking that the bearer be “extended any courtesy” to access facilities or be provided fuel. Obtain copies of the CISA Access Letter and the CISA Fuel Letter and provide copies to all station employees. They can be downloaded at the NAB Coronavirus Toolkit website at the bottom of the Station Operations Resources page.

Documenting That You Are Essential: Be ready to demonstrate clearly that you are implementing procedures that comply with OSHA/HHS Guidance on Preparing Workplaces for COVID-19 or onsite workers – for example, 10 or fewer people in any one space (including creating separate break rooms to reduce gathering); six feet of separation if at all possible; regular sanitizing of work areas and cafeterias; and sending people home who are symptomatic. Make sure to document the precautions you are taking. The Occupational Safety and Health Administration (OSHA) has prepared a booklet “Guidance on Preparing Workplaces for COVID-19, available here: <https://www.osha.gov/Publications/OSHA3990.pdf> that provides critically useful information on how to prepare your workplace to reduce the risk of exposure to COVID-19.

What to Do If You Are Closed: If you have not already done so, prepare contingency planning in case a “shelter in place” order prevents your business from operating or your workers from reporting for work. A “shelter in place” order may restrict the availability of your workforce even if you are an “essential business.” Some employees may not feel safe coming to work or may be unable to commute due to public transportation and travel restrictions.

Also continue to document your business losses related to COVID-19 for use when state or federal benefits are available or for insurance claims. In the coming weeks, monitor for state and federal aid packages that may be implemented, and consider being ready to apply as soon as possible. Consider whether business loans or other credit options are viable and available to your business.

Check any business interruption insurance coverage you may have for application to this crisis. Check with your agent now to understand your business disruption policy, how it works and what it protects, and how to make a claim when necessary. If the closure will cause you to breach your contractual obligations, talk to counsel about force majeure and other contractual defenses.

Firm Resources: Our firm has created a resource page for help in “Navigating the Legal Challenges of COVID-19: <https://www.womblebonddickinson.com/us/insights/hubs/navigating-legal-challenges-covid-19> Available there are recordings of webinars that discuss many of the legal issue employers need to consider including, among other, employee matters including sick leave, paid leave, tax credits and other general issues such as Privacy and cybersecurity, contracting during the crisis and force majeure and contract defenses. You can subscribe there for continuing updates on the COVID-19 crisis.

This column is provided for general information purposes only and should not be relied upon as legal advice pertaining to any specific factual situation. Legal decisions should be made only after proper consultation with a legal professional of your choosing.

Gregg Skall is a partner of the law firm Womble Bond Dickinson (US) LLP. He frequently lectures on FCC rules and regulations, represents several state broadcaster associations and individual broadcasters and other parties before the Federal Communications Commission in their commercial business dealings.

**“Got a moose,
got a moose,
can you do the
fandango?”**



Make misheard lyrics a thing of the past.
Process with Omnia.



SHAPING THE FUTURE OF AUDIO
THE TELOS ALLIANCE®

TelosAlliance.com | inquiry@telosalliance.com | +1.216.241.7225

World Radio History

Is It Really Clean, Or Just New?

by Gary Minker

You are the proud papa of a new transmission installation. You gave out cigars and the party was epic. This new system has every new trick, piece of gear, accessory and monitoring gadget installed in to it. You even got twin transmitters for reliability and back up. You are king (or queen) of the mountain.

The system was installed by a crew that was recommended by a colleague. You never used these hippies before but they came highly recommended. Since your transmission line and antenna were to be re-used, no tower crew was necessary up top, but the installation group hired this bunch of hippies with "So-and-So's Tower Service" on their shirts because the installation guys from the plant and their local agent did not want to run the 200 feet of giant line through your room and the building, which included a gas barrier and Shiny Nitrogen maker.

Wow, like the movie trailer says, this day was in the making for half of forever and a day. Here it is, and you watch as the install crew turns in the proofs of performance, acceptance testing on the groups of equipment and line sweeping. You have been an Engineer for many years but like many Chiefs and Indians, you have only maintained systems and have never been on the installation or burn out mitigation ends of the roman candle.

Scattered around the room and in the trash cans, are empty containers of common cleaning alcohol and thousands of different kinds of rags, shop towels and cloths. Depending on the circle that you run in, and if you do not realize that today is no longer a date between 1930 and 1960, your brain is comforted by the notion that "everyone" uses alcohol and a "rag" of some kind to clean RF parts prior to assembly when they need it. There are many crafts in which I consistently remind people that it is not 1940 any more.

Right there the fire alarm should sound and you should be waving your arms in a screaming panic. I am going say it here and these words might upset the apple cart.

Factories *make* RF related parts, package them and ship them. *They do not clean them.*

OK, here it goes. After 40 years of fixing things that have had the magic smoke let out of them, that involve everything from Melamine to Bakelite to Teflon, along with other scary plastics, when this stuff and the conductive metal items that they support are brand new, they are sometimes sort of shiny but they sure as feathers are *not* clean.

If you have never had the pleasure of unwrapping a new RF line component, I hate to bust your bag but these things ship from the factory in genuinely nasty condition. The photos here are examples of new product that is, as they say, new, old stock. I see people install these tarnished and patina covered things every day without any kind of cleaning.

The two products in **Figures 1 and 2** are examples of new, old stock, right out of the factory bag. On the top, you see a surface patina embedded in the silver plating. On the bottom you see the Silver plating beginning to tarnish.

The three examples in **Figures 3/4/5** of filth are new, out of the bag, anchor inners that have both tarnish and finger mung oil on the Silver surfaces.



Figure 1



Figure 2

Rule 1: If it is not pretty, it will not live very long.

Finger mung or slime on the Teflon insulators are attractive to carbon and other conductive dusts. These dusts form and burn trails in the Teflon and, when they



Figure 3

snap over, they burn tracks into the surface of the Teflon. Finger oils and grease are insulators and, when it burns off from the thermal expansion and contraction of the contacts, it forms a soot that well, need I say more? Visually inspect these parts to insure that the contacts are straight, parallel and the spring clips are in place and that they work to give you a smooth but firm socket insertion, because without this firm contact, soot happens and the end is near.



Figure 4



Figure 5

So how, you ask, can I install new and (dare I say) used parts with some security to believe that they will live a long and happy life?

Here Are the Answers

If you want a connector to be bright and pretty like this guy below, Scotch Brite, Brakleen, and Terry cloth rags are the answer.

Notice the fine brush like finish on this bullet. See how pristine the Teflon insulator is. These three items if used properly will take the patina and tarnish off of your parts.



The next curious question comes in the form of why Green Brakleen. Green is Non-Chlorinated and is allegedly easier on the copper, but this is 100% nasty chemical that pulls carbon in to the rag, moisture from the surfaces, and dries nearly instantly as it is highly volatile (evaporative) and flammable. Use *extreme* caution when applying Brakleen to a rag and then using it on plastics.

Scotch Brite green pads are a very aggressive cleaning pad and some practice is required to give a good surface preparation and not strip off the Silver plating of a connector. However, the stainless steel connectors really buff up nicely with this product.

Brakleen should never be sprayed directly on a target surface. Typically this chemical is sprayed on the rag for better cleaning control.

Brakleen is not good for you and gloves are recommended. Of course you should not breath the fumes and keep it away from sparks and flames.



Scotch-Brite Pads

The information contained in this communication is considered to be Work Product and has an imputed value. Reproduction or dissemination of this information is prohibited without permission of the author.

Gary Minker owns Radio Works R.F. Consulting Email him at: gary@RadioWorksRFConsulting.com or call 561-346-8494. Find Gary on the web at www.RadioWorksRFConsulting.com



Broadcasters General Store

Family Owned & Operated Since 1979

352-622-7700

www.BGS.cc



Brand Your Station



RDS MESSAGING

RDS ENCODING, DECODING, RECEIVERS, & SIGN DRIVERS

- Advanced Dynamic RDS Encoding
- Supports automated playout systems
- Monitor & log your FM/RDS broadcast
- Decode & display RDS data
- RDS Receiver & Sign Driver
- Remote scheduler

EASY as SNMP!



Interface to SNMP Remote Controls with a Single CAT 5 Connection

SWP-200 Series RF Switch Controllers and SWP-300 Site Controllers with Direct Interface to all RF Switches on the Market and BDI's DPS-100D Series RF Power Meters

ALL NOW WITH SNMP CAPABILITY!



The DPS-100D Series RF Power Meters and Companion RMD-100

Rack Mount Remote Meter Display

Tel. (914) 737-5032

sales@broadcast-devices.com

www.broadcast-devices.com



Guest Interviews Don't have to be Complicated.

Quality Interviews, Simple Setup.



PODCAST PROTM BY ACCU-LITE[®]



Broadcast quality for a podcaster's budget!

*Includes: mic boom, c-clamp, cable with male & female XLR connectors. Microphone not included.

PN: ALMBP1

www.accu-lite.com
www.ocwhite.com



Radio Report

SOFIA Keeps You Listening

by Wiely Boswell

As radio electron wranglers, we are responsible to keep the signal strong and the audio great. Simple statement, but a lot of effort. Running your alarm monitor system can also take some effort.

You can receive alarms in different ways, but this one is really different. SOFIA 568, built by Inovonics, is a software defined radio (SDR) that will let you listen from a near, or far off receive location that has an Internet connection. It will email and text on alarms and give relay contact outputs. It will give you a bench mark on signal strength from a distance. You can enter multiple stations in memory, place them in rotation, and be able to alert on a whole lot of different values that encompasses HD audio and advanced HD messaging as well. I have started my unit up by shooting it from the hip (naturally) and it wasn't bad. I will say read the manual before you call tech support.

A lot to discuss here about this compact unit. I have not tested all of it's features yet because it is loaded with more features than any HD station near me even offers, but I will attempt to give you an idea of what it can do. There is a software updating procedure that can provide any bug fixes or add features such as moving displayed items on the landing page around as desired.

Of course it's going to need an IP address. You can set it from the front panel or use DHCP (default) and just have it pull an address. From a smartphone, pull up the page using the IP address and a port, and enter your password – it does not require a user name. That seems kinda different but makes sense in this case. Password is sent unencrypted. Once in, the main landing screen, NOW PLAYING, comes up and if you roll down a bit you will find the manual tune section a little way down the page. You select frequency and below that you select the type of program FM, HDI(-8), or FM/HDI. Once selected, just scroll back up to the top and see, from left to right, a select more menus icon, frequency, peak holding audio LR levels, and live audio stream select icon at the top. In **Figure 1** below, eight blocks display: Signal strength (RSSI), RF signal to noise ratio(SNR), HD level, CD/No, DQ, Multipath reading in %, all with miniature, real time, moving, auto ranging graphs. The last two blocks display stereo pilot lock status and HD lock status, with Locked or No Lock.

The top of this section begins with the settings/ displays drop down, L/R audio VUs, time till next memory rotate (if rotate is on), and speaker icon to bring up the audio stream. Stream can be from 32kbs to 256kbs, MP3 or OGG format, with variable sample rate. Audio Latency can be set from 1-10 seconds and Max Listeners of 10. It appears to be about a five second

delay. If you have poor Internet it might be helpful controlling the buffer. When memories are rotated the audio will be behind the signal monitoring information.

The next section (**Figure 2**) is found, as you roll down the landing page on your phone. On a computer screen or iPad, which is wider, more items are displayed at one time.

Alarms which correspond to receive and activated alarm settings are indicated here. This gives an idea of all the variety of the alarm types that can be generated and acted upon.

The next section is an RDS summary which will scroll generated based on off air reception. RDS can be quite complex and there is a lot more info found under the drop down menu RDS INFO. **Figure 3** shows this drop down menu which is available from any page.

Again, lots of options here. Just about as many as Inovonics could come up with, and he takes input from his customers!

The front and a rear panel views are show below.

From this view you see the connections, and the first thing is dual power-input jacks. If anything will go down it is a small switching wall wart. Now the thing is, it will not know when one fails. So part of a site check would be to pull them one at a time and make sure it stays up.



Figure 2



Figure 3

It has a BNC antenna connector, which can overload if near a transmitter, so a filter could be required. My unit is at a really hot site but is handling well it so far. Outputs are an AoIP port, AES3, analog L/R outs, and GPO alarm outputs.

The unit even has a band scan feature. Hover over bar and it displays frequency and RSSI. This can show if a filter is required. **Figure 4** shows the band scan graph for my unit. RSSI is a signal strength indicator.

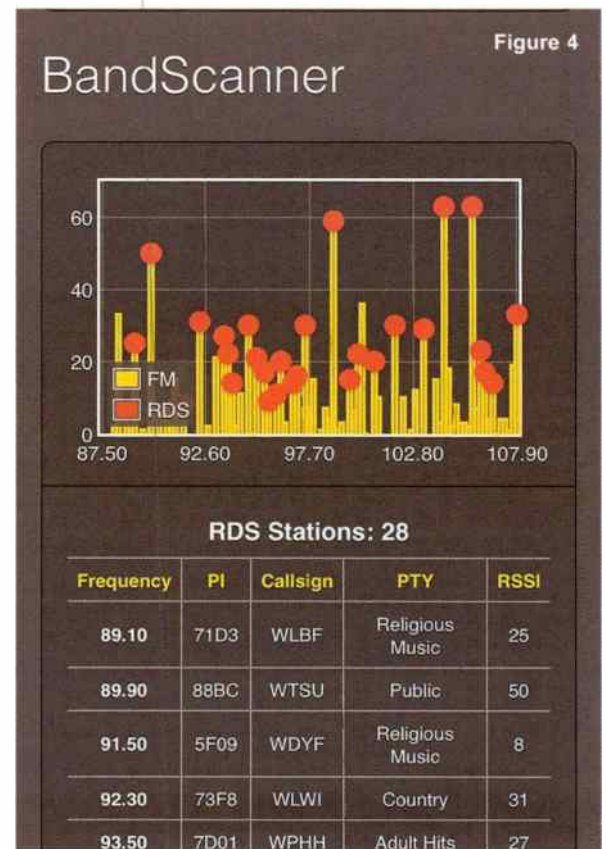


Figure 4

Another feature is found in the tuner section and provides for HD delay testing. It puts HD 1 in the left channel with analog in the right channel for a listening test. Station rotation is set in the tuner section also. The minimum time per station change is 30 seconds. It takes the receiver time to lock on and even longer for the audio stream. It has memories and will walk thru the channels if station rotation is on. The alarms are configurable and GPO alarms outputs can be set for N/O or N/C and for type of alarm.

SNMP is an up and coming application for alarm monitoring. An alarm log is generated in a file and SNMP has a MIB file. Emails and texts can be sent out based on a variety of alarms up to 10 recipients. A test email can be sent out which is quite handy. Daily, weekly, and monthly alarm logs can be sent out. A time server is set up with time and date format options. The backup battery voltage is even displayed – 2.941V, if you can believe it's that accurate.

Audio loss alarm is well done with current level displayed real time with adjustable level on/off thresholds and independent time length of loss and regain settings. The low RF signal level alarms have similar settings. Under graphs and metering, RSSI and various levels are printed out on a variable length time graph, from 1 minute to 24 hours. It even displays L+R and L-R levels.

This unit allows me to monitor two of our distant stations and our main station, all at the same time because of its location. I wonder if the four GPOs could be used to turn a rotor somehow by forcing alarms if you did not use them in an external alarm system. After all, you may not be at a transmitter location.

Wiely Boswell is Chief Engineer of Faith Broadcasting, Montgomery, AL; CBRE, CBNE, and SBE 118 Chairman. He may be contacted at: Wiely@faithradio.org

THE TELOS ALLIANCE®

Control Your AoIP Universe



QUASAR

by **AXIA**

Application-specific controls. Customizable Source profiles. Metering where you need it. User-assignable buttons. All cosmically connecting with networked sources near and far.

Finally, you have the power to create the most brilliant content in the AoIP universe. Harness it.

**To experience
limitless production
possibilities,
contact us today.**

SHAPING THE FUTURE OF AUDIO

THE TELOS ALLIANCE®

TelosAlliance.com | inquiry@telosalliance.com | +1.216.241.7225

World Radio History

It's Only Radio

by Steve Callahan

If it's not a computer virus, it's a Corona virus that seems to be trying to invade our radio stations. Both types of virus have been forcing us to change the way we look at our jobs and stations.

Recently, two well known radio engineers in my neck of the woods passed away leaving our little circle of engineers just a little bit smaller. Their deaths made me think about how we treat ourselves and how many of us put our job before our own health and safety.

Once upon a time, a very experienced and patient Chief Engineer took a very young, just-out-of-school, DJ-in-training and instructed him in the right way to fulfill the technical requirements of a third class endorsed radio operator. His name was Jerry Erickson.

Jerry was a great engineer who could make anything that was needed out of nothing at all. He made a studio switcher out of a rack panel, some switches and some wire. His work was beautiful and it filled the need of a small, local radio station with little or no engineering budget. He obviously had to work at several local stations as a contract engineer to make a livable wage back in those days. There was no doubt that Jerry took each and every one of his contract jobs very seriously and often put his clients interests above his own health and safety.

One winter night, Jerry was working at a TV transmitter on Mount Ascutney in Vermont. The access road was slippery and icy. As he drove down the access road, he had to put his truck in park and then he got out to unlock the chain link gate to get the rest of the way down the steep road. While he was unlocking the gate, he had his back to his truck and didn't notice that it was sliding down the hill, pinning him to the unopened gate, until it was too late. I can only imagine the panic that ensued as he tried to free himself from the death grip of the truck and the gate. He tried to slide down and under the front of his truck, but that didn't work. Jerry died that night on Mount Ascutney in the freezing cold.

His tragedy didn't have to happen if he had someone with him or someone knew where he was and when he was expected home. I wish I had the opportunity to learn a lot more about being a Chief Engineer from Jerry.

All of us take our roles in broadcasting very seriously – almost too seriously. A wise man once told me, "It's only radio, no one will die." Unfortunately, that has been proven time and time again not to be true. I worked on the west coast of Florida for several years which is known as the most thunderstorm prevalent area in the country. Every afternoon around 4:00 p.m. the thunderstorms would hit and our little band of engineers would all head to their respective tower sites to assess the damage and get their respective stations back on the air.

Some of these guys would even start out while the storm was still raging. I counted myself among them

as once I saw 18 lightning hits to my tower while I raced across the city. In hindsight, I got the station back on the air but the price could have been very steep indeed.

We've all read the warning page in the front of transmitter manuals that cautions us not to work alone or while tired. Too many of us have made fatal errors late at night or very early in the morning, when we had to defeat the transmitter interlocks to look for an arc and then forgot that they were defeated.



Admittedly, most rural stations can't afford to pay two engineers for a night's work but having an interested bystander on the scene, whether it's a friend, relative or interested overnight DJ, is a very smart thing to do. Also, make sure someone knows exactly where you are, as many transmitter sites can be tricky to find, especially in the dark and in bad weather. Make sure someone knows what time you're due to leave the site and, if the work keeps you longer than planned, call and give them your updated departure time.

I was at a tower site recently which is infamous for falling ice after winter storms. I was at the site with an HVAC mechanic who was repairing an outside air conditioner condenser unit. The chunks of ice falling from the tower were infrequent but threatening.

I warned him to use a hardhat if he had one but at the very least, to listen to me as I watched out for falling chunks. I later discovered that an ice chunk had sheared off the rear wiper on my car and if it had hit a few inches either side, my rear window would have been destroyed. Fortunately, the HVAC mechanic and I didn't end up like the wiper blade and we left the site as soon as his work was done.

Health and safety doesn't have to be practiced only in the station, but it can also be considered in your personal life. Does your job dominate your personal life? With many stations having only one engineer, it's hard for your job not to control you rather than you controlling it. Do you really like the early morning

calls from the remote control? I spent five years answering at least five silence-sense alarms each and every night on a station with a network that had very loose breaks. In hindsight, that was a task that I really should have shared with the Operations Manager, but out of some misguided sense of responsibility, I took all those calls. When I left that job and finally got a full night's sleep, I was amazed at what I had been missing for the sake of some mis-timed commercial breaks. Share the work load with other staffers who can take some of the load off of your shoulders.

I see too many radio engineers get too little exercise and too much fast food. I can't count how many transmitter sites I've seen that were littered with piles of fast food wrappers. Do I enjoy a good burger? I sure do ... but not every night. Could I use more exercise? Definitely ... and I bet you do too. Take an hour a day a couple days each week to walk for a mile or two. Your heart will thank you for it!

You've all heard the phrase, "Get some balance in your life." Well, it's possible if you really work for it. How many Thanksgivings, Christmas Eves, Birthdays, Anniversaries, cook-outs, dance recitals or Little League games have you missed during your career due to radio station "emergencies?" We all know that the equipment wants to fail on its schedule, not yours. Work out a plan for occasional coverage when you need to take that break for your family. Having someone else who can assess a problem and triage it and then maybe push the ON button for you will work wonders.

Is your job your hobby? It doesn't have to be. Do you have an interest that you haven't explored, or have dropped because your job "took all your free time."

Take the time to get back into that hobby and lose yourself in it a couple if times a week.

I once heard someone say that they "couldn't see the forest because there were too many trees in the way." If you refresh your mind with a hobby, the solution to any work problem that you've been wrestling may suddenly become clear. It works for me all the time.

You can always find a helping hand at the local Society of Broadcast Engineer's meeting in your area. My bet is there is a retired engineer at the SBE chapter that would love to work with you overnight just to get out of the house. That old pro will also bring a wealth of knowledge and maybe a few tricks that you might not know about.

Steve Callahan, CBRE, AMD, is a member of the engineering staff at Entercom Boston. Email at: wvbf1530@yahoo.com

An advertisement for Graham Studios Broadcast Furniture. The top part features the tagline "Precision | Innovation | Proven" in white text on a dark background. Below this are three images showing different pieces of broadcast furniture: a desk labeled "Reunion XP", a desk labeled "Modular", and a desk labeled "On-line Talk Table". At the bottom, the company name "GRAHAM STUDIOS" is prominently displayed in a serif font, with "Broadcast Furniture" underneath. Contact information is provided at the very bottom: "813 222-3454" and "866-481-6676 | www.graham-studios.com".

make your AM
GREAT

...with ORBAN's
Flagship AM Processor!



Louder, cleaner, brighter, FM like audio with a fatigue free quality that attracts listeners and holds them

Call to schedule a

FREE DEMO

Get yours from **SCMS** for **\$7391.**



1-800-438-6040 | www.scmsinc.com

Broadcast Equipment Solutions | 19 reps across the U.S. and Latin America

World Radio History

The Linux Connection

Getting Around "Windows Frustration Syndrome" – continued

by Tommy Gray – CPBE, CBNE

If you have been following this column for the past year or so, you will remember that we have been exploring upgrading aging Windows™ computers by installing a new Linux operating system. The version I have been discussing and the one I use is "Linux Mint Cinnamon." We have explored comparable Linux programs, or as they are called these days "Applications " or "Apps." You can find a download for this operating system at "linuxmint.com" I have installed it on numerous older machines from very old 32 bit computers to newer 64 bit machines, with a variety of hardware in them. So far, and this is a really big thing at least to me, I have had not a single machine I could not upgrade to Linux. The really great thing about it all is that hardware compatibility is really great as well. Many of us have used the Windows operating system for years, and have come all the way through from the old DOS operating system to the latest Windows 10 system – we have found that, with Linux, things just work! We called the Windows "Plug and Play" system usually "Plug and Pray," because what should have been easy was many times really hard, to next to impossible, with regard to getting hardware to work.

I cannot tell you how many hours I have spent in the past trying to get certain drivers to work and certain pieces of hardware to work, even to the point of ending up choosing another route because they would just not work. A recent example I have mentioned was, a while back, a fellow software support engineer friend who had bought a piece of specialized audio equipment and it took him about six hours of frustrating work to get it working on his Windows 10 machine, even with the help of factory support techs. I put him onto Linux Mint Cinnamon and when he installed it alongside Windows (a process I described in earlier articles), as he booted it up, the hardware came up working in Linux! He called me all excited, vowing to never boot that machine in Windows again!

Having said all that, I want to continue talking about applications that are similar to Windows programs many of us used to use. In the last article I briefly touched on hard drive cloning software that is free with Linux and that does a great job to make a clone of your drive, for upgrading drive size, or for creating a fully functional backup drive. Every machine running Linux in my office (and now there are a total of 11 being used here, including a few servers) started out as a Windows machine that we upgraded. Most had moderate sized drives but after they became so popular with everyone here, they ran out of drive space. This was easily remedied by simply cloning the existing drive onto a much larger drive. There is a lot of good information on the web that you can find with a simple search, telling you just how to do it. Most are free apps, but there are some really good (and cheap I might add) commercial apps that do it faster and easier. It all depends on what you want to do and how much time you have to do it.

In previous articles, I have compared the LibreOffice Suite of apps that do what you would do with Microsoft Office™. LibreOffice is great and free, and comes with Linux Mint Cinnamon. You don't have to change filetypes, as they can all save in the same .doc, .docx, xls, xlsx,

formats you are used to without a problem. Sharing files with Windows machines is no problem – I covered that in a previous article as I said. Today I want to go one step farther into the App availability thing. Please keep in mind that 99% of everything I mention in these articles is totally free and most are included with Linux Mint Cinnamon.

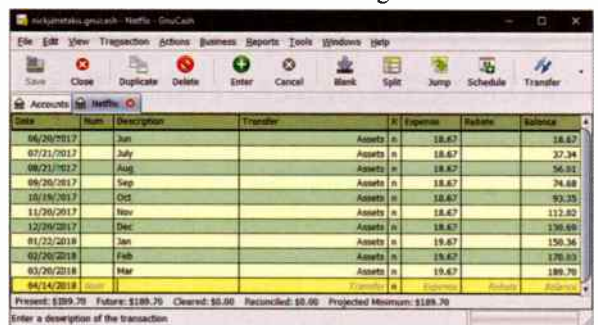
This past week on one of our engineering forums, there were some questions and there was some discussion regarding accounting applications that most are familiar with, Quickbooks™ being one that was mentioned.

There are several free Linux-based accounting programs, most of which can be found in the onboard software manager. If you do a web search for Quickbooks-style Linux programs, or Linux-based accounting programs, you can find reviews of several nice ones.

Of the many free Opensource programs I found in my search, I tried two that, based on the reviews, looked promising to take care of the accounting chores in our engineering business. The first one we tried was "GnuCash." To quote the description I found on the web:

"GnuCash is a free and open source cross-platform accounting software for personal and small businesses. It is designed to be used as a checkbook register with the ability to track income and expenses, bank accounts, stocks, etc."

There are not a lot of full screen shots on their website at <https://www.gnucash.org/>, but here is one shot. They do have a nice website with a lot of good information:

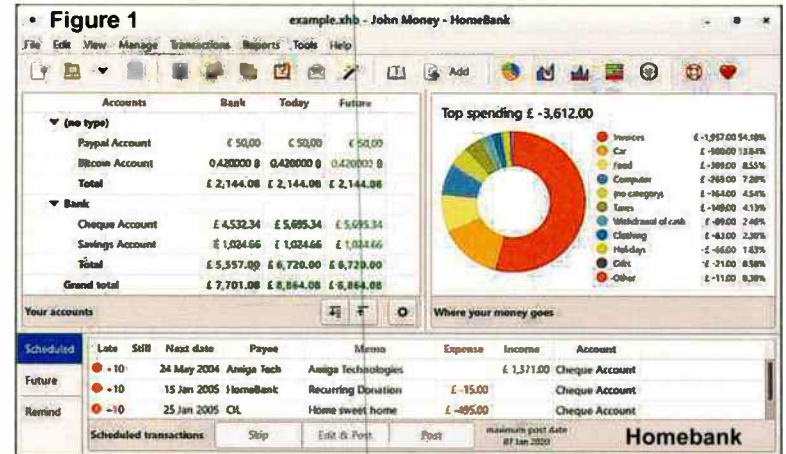


To me it was promising and should work nicely for many applications, but since I was exploring several options to find one that reminded me a little of the old Quickbooks I was used to, I kept looking. I wanted something with a nicer GUI and a few more bells and whistles. The next one I found, and based on the reviews, was the one I ended up using, a program called, "HomeBank." Figure 1 came from their website and is not very clear, but will show you what the main screen looks like.

"HomeBank" is also found in the Software Manager, and is a powerful program that can handle multiple bank accounts (checking and savings, and even investment accounts if I recall correctly), as well as credit card accounts, etc. It has a nice GUI and is fast and powerful. There are numerous tutorials and help files on the Internet. On their website it is listed as a personal accounting tool,

but we have used it to manage numerous back accounts, credit card accounts, etc., without a problem. Their website is located at: <http://homebank.free.fr/en/index.php> Again, the software is easily installed from the Linux Mint Cinnamon Software Manager.

I would remind you of something regarding installing any software into your Linux Mint computer, and that is to avoid installing software from websites, as it has not been screened through the repository. The software in the Software Manager is considered safe. Now sometimes it is a little behind on versions, and you may need to get a newer version through the command line method of using apt-get, etc., but usually these instructions are found on the Linux Mint Cinnamon forum or other approved and trusted sites.



One great feature about Linux is that you don't normally need antivirus programs – that is because you have to enter your password to install anything. However, when you use an install from a website you also have to use the password and there is the remote possibility that you can install corrupted software. Exercise caution and always use the Software Manager if at all possible. Reviews are always helpful to assure that you get what is working and safe for the most part.

Below are listed the names and websites of a couple of other accounting programs that will work well with your Linux Mint Cinnamon computer. The descriptions are taken directly from the vendor's website information. I have not tried these personally but the reviews are your friend with any software you are considering. :

ApacheOfBiz: <https://ofbiz.apache.org/>

"ApacheOfBiz is a free, open source, and cross-platform suite of business apps that offer several out-of-the-box (OOTB) modules for advanced ERP tasks such as order management, contracts, payments and billings, catalog management, e-commerce, and many others."

Manager: <https://www.manager.io/free-accounting-software/us>

"Manager is "the most comprehensive free accounting software in United States. It has all the features you'd expect from an accounting package and we are working on adding even more ..."

"All of your work can be done off-line on your desktop or laptop meaning you don't lose access to your data or program if your Internet stops working or is not available."

Manager also has a cloud version but it is a paid service obviously.

These are just a few options and there are many more out there. Just do a web search and you will find a myriad of options. Linux really shines on programs like this due to its powerful multi-tasking capabilities on limited hardware.

Until Next Time ...

Tommy Gray is a semi-retired veteran broadcast engineer currently staying busy doing engineering in the gulf south, through "Broadcast Engineering & Technology LLC", a Louisiana based Consulting and Contract Engineering Firm, serving the US. www.BEandT.com

50 YEARS
ENGINEERING
THE FUTURE.



PROJECT SHOWCASE
Connoisseur Media
<https://bit.ly/2T3x6R9>



6 stations. 10 consoles. 1 AoIP network.

Welcome to the radio renaissance. Virtual Radio. Visual Radio. Combined plants where radio and TV converge seamlessly. It's a new era of excitement, innovation and imagination, where leading-edge design and IP technologies push boundaries and expand horizons.

Lawo's radio consoles and Power Core units bring a wind of change to radio stations all over the US. Tired of a console that feels like licking the spark plug and hoping that nothing explodes? Meet a "nice and precise" radio solution with endless flexibility over a single IP network.

Meet Lawo's IP solutions – Advanced German Engineering with Expert Lawo USA Support!



www.lawo.com

World Radio History

The Back Seat

by Sam Wallington

Recently I rode in the back seat. Of course, riding in the back seat is not a particularly uncommon experience, but this was the first time I had ridden in the back seat with my 16-year old driving and my wife taking the driving-permit-supervisor front seat.

My wife has long preferred having me drive when we travel. Since I enjoy driving, the arrangement has worked well in our family. However, a couple months ago, the driver pecking order changed when “The Teen” took over! Now every trip is an opportunity to drive more. Those of you who have been through the experience know it is not boring!

While I was in the back seat, I spent some time figuring out the possible source of the squeak in the back door. It has been driving me crazy, and I have lubricated most anything that moves or could possibly be rubbing. Turns out the problem is toward the back and bottom of the door, not at the front as I had assumed. Soon I will spend some time affectionately applying grease in the area. Perhaps, finally, it will be quiet!

I also experienced something my kid had mentioned. Though I had believed them, I had not realized how difficult it is to hear the conversation in the front seat from the back! As you may have guessed by the door squeak, our minivan is aged. As a result, it does not have the latest road-noise-reduction technology installed (wonder if Dolby makes anything...), so there is a dull roar anytime we drive above about 40 miles per hour. The sound is the exact volume and frequency combination necessary to mask the details of a front-seat conversation – though I could hear the radio very nicely from the back speakers. From the back seat I knew they were talking, but I could not make out any of the conversation unless I leaned all the way forward and strained to hear.

After we arrived home, I started thinking about my back-seat experience and realized it revealed some valuable lessons about leadership.

When the Learner’s Permit was first granted and our parental roles shifted from driving to supervision, the ride was, at times, exhilarating! “STOP!” I’ve yelled at my (other) kid as we took a corner way too fast, nearly hitting a car on the far side of the turn. “OK, you are going a little too fast,” as we approach a blind 25 mph corner at about 45. I have had the delightful experience of “grabbed the steering wheel,” saving us from significant adrenaline as we turned left into oncoming traffic instead of into the lane on the correct side of the centerline.

Now, I am relieved to say, we are working on smoothness and planning ahead. Less exciting, true, but also far more conducive to a moderate heart rate. Despite the skill progress, however, I still must bite my tongue to keep from “re-instructing” again regarding skills that are in place but not yet well practiced.

Leadership has the same challenge. If we are promoted and someone else takes on our old job, at first it is quite the roller-coaster ride. We must communicate the non-negotiable points of doing the job and help keep the train on the tracks as our replacement begins to understand the

scope and details of the role. This is a time of very active involvement on our part in someone else’s job. We are, in effect, alongside them in the trenches, demonstrating, instructing, and doing.

Several months ago, I went to renew my passport. The person behind the counter was apparently new at the role, and though she was doing the work, her supervisor was telling her nearly every step. It was a good example of the beginning stages of teaching someone a job.

The hard part starts after the initial learning phase is over. We leaders know the role inside and out because it used to be our role (or we helped create and define it) – we completely understand the job’s needs and responses. Yet once the new person can handle the basics, we need to reduce our input. At first, we might be “hands off,” letting them do the task with us watching. Later, we stop watching unless it is an unusual or particularly complex task. Next, we back up further, making ourselves available for questions. And finally, we move fully into the back seat and trust the training they have received and the proficiencies which put them in the role in the first place.

Too many leaders never move into the back seat. They “helicopter parent” their protégé, never stepping far enough away to let them make any meaningful mistakes. Though I understand it (and have done it!), if a leader is unwilling to let someone do their job by themselves after reasonable training, either the leader is failing to lead (they are micromanaging – or just doing) or the employee is incapable of doing the job – most of the time it is the leader’s failure.

Not getting out of the way so a team member is prevented from doing their job is both a waste of resources (it now takes two to do the job of one) and very demoralizing. If a leader is second-guessing many or most of the decisions their team makes, they are essentially calling them incompetent to their face. Why should they try something new? Why should they innovate or work harder or think carefully when most of the times they have done so, their leader pushed them back into their too-small box? The team member, whether they are conscious of it or not, begins to believe they have nothing to contribute. From there, they will either check out or move out.

How does a leader get out of the way? Start by making an honest evaluation of the team or team member. Are they competent and capable of doing the job? The evaluation may be difficult if most everything has been done for them! If, however, the person is capable, the leader needs to sit down with them and share honestly, something along the lines of: “I have been way too involved in your job. You have the skills and knowledge you need, so I am going to work on getting out of your way. When I ask you to do something, I will try to give you the “why” and the goal (and maybe some guardrails), but then I want to leave the “how” to you. I would like you to let me know when you notice me accidentally trying to do your job again.”

About a year ago, I wrote a note and stuck it to my computer monitor. It says, “What does the team need to know so I do not need to step in?” Too often, I had found myself correcting specific details – the how – but not clearly conveying the why or the goal. Some things had become a guessing game for my team: Wonder if he would prefer it this way or that? I needed a reminder to think about what I had failed to make clear rather than what they had failed to deliver. If I ask for a pencil, I cannot complain if the pencil is green and has no eraser. If those are important to me, I need to be specific: “I need an un-chewed, yellow, number two pencil with a nearly perfect eraser.” If I then get a green pencil with no eraser, the team needs correction. Otherwise, it is my problem as their leader. It is the same with real needs and problems. I need to make sure I am asking for the right thing, because then I can get out of their way.

Remember I mentioned I could not hear the front-seat conversation? This phenomenon happens in organizations too. Those who are driving (and maybe their inner circle) know where they are going, how they are going to get there, why they are going, and perhaps when they will arrive. But too often the other people in the organization have little or no idea about any of those things. They might talk to other people in the back seat, saying things like, “I think I heard,” or “I have no idea, I just do my job.”

What if the people in the front seat made a conscious effort to inform the back seat? Almost every commercial air trip features a few moments where the captain updates the passengers (“This is your captain speaking...”) on things like the current location (including elevation), a reminder of the destination, and perhaps other items of note such as rough air ahead. If every leader had a similar conversation with their team at regular intervals, I suspect those team members would feel more engaged in what they are doing, aware of some of the pitfalls along the way, and hopefully excited about the organization’s goals.

The final lesson I found from my back-seat experience was ... suddenly I had time on my hands! I was not responsible for the van or for supervising the driver. I could have used that opportunity to become a backseat driver. I am quite positive The Teen would have found such behavior most delightful and enlightening! Instead, I was able to use the time to do something productive, chasing down that nagging problem. What will you do with your extra time?

I recommend you take a ride in the back seat. As Coronavirus points out, we may suddenly find we have to trust our team is doing the right thing!

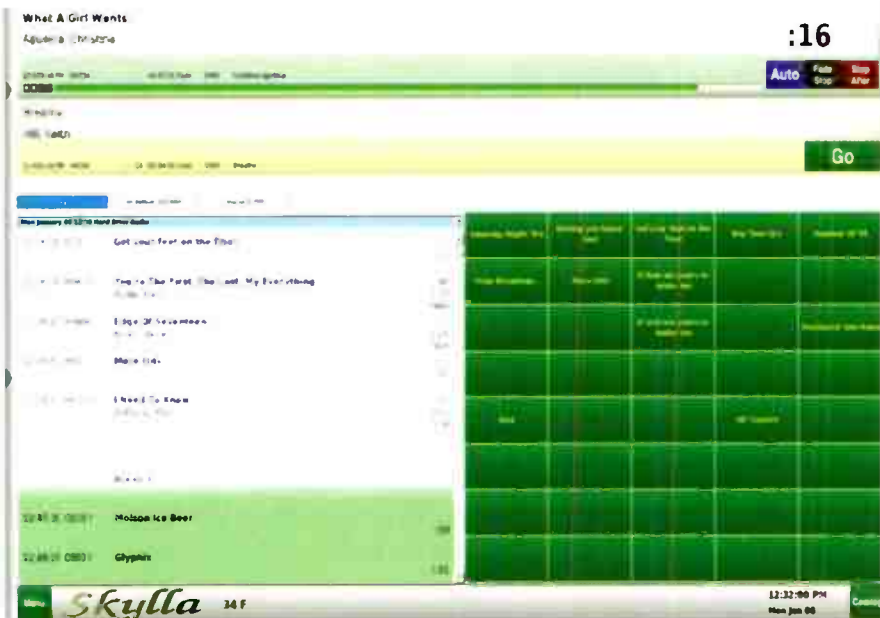
Sam Wallington is VP of Operations and Engineering for Educational Media Foundation, and has 36 years of experience in broadcast engineering. He can be reached at swallington@kloveair1.com

Doug Vernier
Telecommunications Consultants

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

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

Skylla



Skylla's Smart Features:

Smart Special Events like ballgames, national and local.

Smart Satellite support, complete with incoming RBDS data, announcers, clocks, break-tracking, and automatic break fill.

Smart Automatic Downloads of audio from the Internet.

Smart Automatic Unattended Recording by time, closure, or both.

Smart Voice Tracking allowing people to voice track at the same time to the same log, both at the station and remotely. Also allows voice tracking to future yet-to-be-merged playlists.

Smart Design. For uptime and reliability: Linux. For data safety: RAID and machine-to-machine backups of audio and data.

SkyllaPad

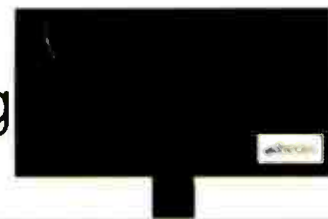


Simplify local sports broadcasts.

With features found only on SkyllaPad, broadcasting remote sporting events has never been easier.

You supply audio, SkyllaPad supplies control. With the touch of a button on a Smartphone, tablet, or laptop, you're on the air and in charge of your remote.

SecGen



Traffic & billing software designed for you.

SecGen, the second generation of our original Smarts program, lets you define the setup by matching the program to your station's formats and breaks. Combined with the ability for single user, multi user, and remote user, SecGen can be customized to fit your needs.



PTEK

FM Transmitters

YOUR MESSAGE MATTERS

PTEK DELIVERS

ALL PTEK TRANSMITTERS FEATURE:

- Wide range input 88 to 264 VAC
- Frequency agile from 87.7 to 108 MHz
- True proportional (VSWR) fold back
- Direct Digital Synthesis exciter with great sonic performance
- Built-in stereo generator (includes composite & SCA inputs)
- Built-in programmable FSK ID
- Front panel metering
- Remote control interface with analog and serial I/O
- Compact, Rack mountable Chassis
- Designed, manufactured & supported in the USA

FEATURING:

ES SERIES

300 Watt
500 Watt
1200 Watt

PS SERIES

2 kW
2.5 kW
3 kW
3.5 kW
4 kW
4.5 kW



ES Series 300-1050 Watt



PS Series 2-3.5 kW



PS Series 4-4.5 kW

ES Series Transmitters range from 300W to 1.2kW

The FM300ES is FCC type certified for use on LPFM stations. The ES Series is conveniently designed to be used as an exciter or a stand alone, low power transmitter. Optional internal Webserver available for the ES300 & ES500. Other models supported soon.

PS Series Transmitters range from 2kW to 5kW

PS SERIES KEY FEATURES:

- Very low cost to purchase
- Low operating cost (reduced power consumption)
- Super High efficiency (80%) LDMOS technology power amplifiers
- Reduced cooling requirements
- Compact and lightweight for ease of installation
- Digital front panel metering & controls
- Spacious design with major components accessible by removing top cover
- 1,500 Watt Hot Pluggable Switching Power Supplies



PTEK

FM BROADCAST TRANSMITTERS

www.ptekpower.com

Ph: 888.889.2958

111 N Vista Rd, Suite 3E, Spokane Valley WA 99212

World Radio History

Sicon-8 Internet & Voice Remote Control



The CircuitWerkes Sicon-8 Remote Monitor & 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!

Web-Based Remote Controls w/Streaming Audio Option

Introducing the SiteSentry4 (4 channel remote control), SiteSentry2 (2 channel remote control) & WAM-2 audio monitor

- Web enabled remote controls with 6 relay outputs & 2 status inputs on all units.
- All units detect Stereo or Dual Mono Silence (independantly adjustable channels).
- User-programmed relays (DPDT) close automatically or via Web control
- All products include onboard temperature sensor
- Internal logging with onboard e-mailing.
- Supports DDNS services and Netbios names
- Upgradable firmware. Keep your product current with downloadable updates!
- Streaming audio option encodes Ogg-Vorbis & decodes mp3 or Ogg-Vorbis.



Remote Broadcasting Solutions

Discover more online at www.circuitwerkes.com



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, transceivers 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

Practical Engineering

Leaning Tower of AM and a Shocking Component

by Dave Dunsmoor

I've never written any memoirs, and probably will never see any reason to do so – not much to be learned there. However, regarding electronics in general, and broadcast engineering specifically, I'd like to paraphrase a line from a current TV commercial: "I know a thing or two because I've seen a thing or two." Well, I've been working on electronic things and systems of various types for ... well nearly 50 years now, and probably 35 years of that in broadcast engineering. So now I'll share some interesting experiences that I've seen, and I would hope that this reminiscing would be useful to newcomers to the industry and perhaps even to experienced readers as well. Read on and enjoy.

Leaning Tower of AM

Many years ago, I received a call concerning the condition of the tower of a small daytime AM station. The tower was located in a bit of a swamp, which when originally constructed was probably just a low area in the field. But over the years it had filled with water and was full of cattails, and the water was about two or three feet deep. The dog house was also full of water to that depth but the ATU components were mounted on the back wall, and were more or less "out of harm's way." However, the footing pillar, and the lower sections of the

tower structure itself, were leaning to the point that I feared that the ball joint might slip apart – the footing having sunk into the mud more on one side than the other. I happened to visit with someone who was around when the tower was erected, and was told that the footing was poured around a utility pole that had been sunk into the ground. So I guessed that the pole had deteriorated to the point that it was no longer providing any horizontal support and the footing was "on its own" in the muck.

So what to do about this? The owner wasn't in a position to replace the tower, so he had found a local construction crew who said that they could stabilize it to the point that it would not continue to tilt, and eventually fall. I was skeptical, but having no better ideas, said OK, but it's on them. I also suggested that we should put up some type of a temporary antenna to be used in case the tower did fall during the stabilization process.

I asked the owner to have the local electric company place a pole adjacent to the studio building and I went about constructing and tuning a dipole, using a friend and his 300 Watt amateur radio antenna tuner. The legs of the dipole were run from the top of the 30' pole to anchors (and I do not now recall what I used for the anchors) on the ground the approximate correct distance from the pole and we tuned the new antenna for lowest

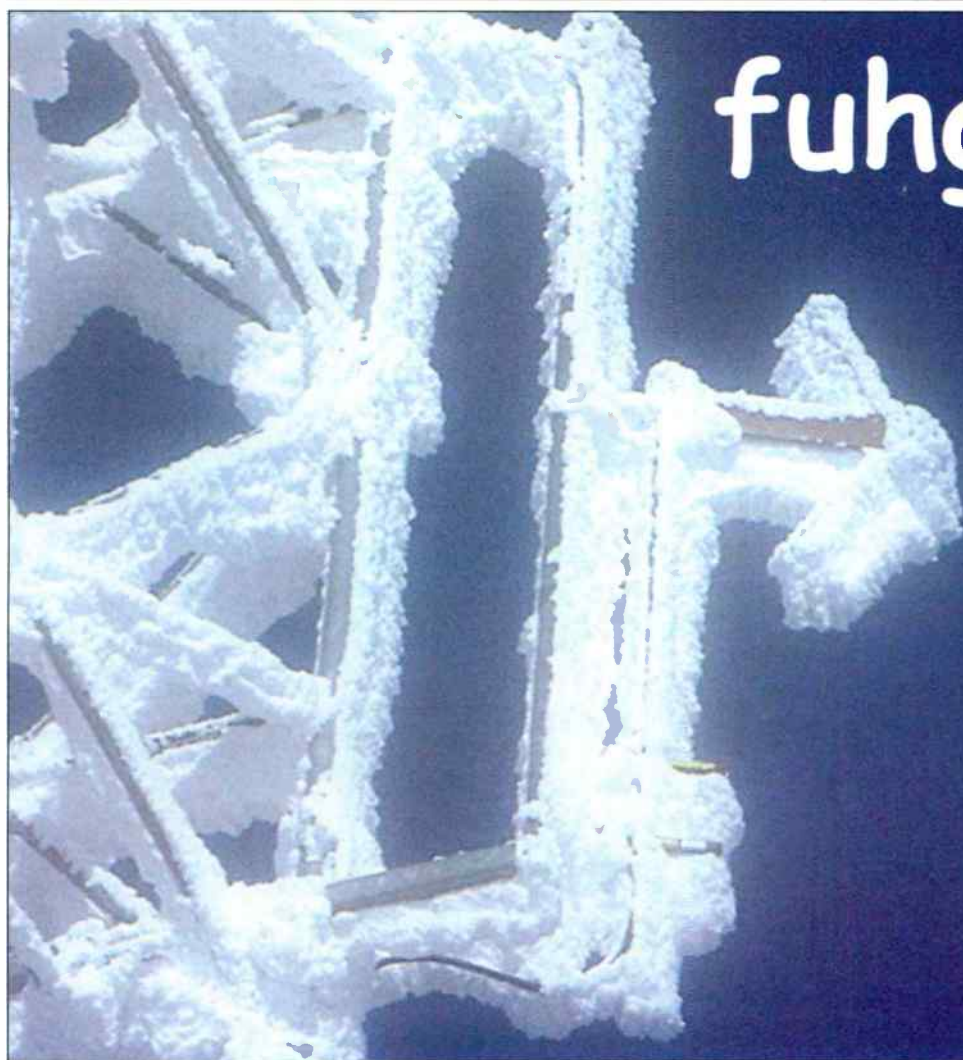
VSWR by folding the ends of the dipole wires back on themselves until a very good match was achieved. Yeah, crude, but it worked. It was late evening and I drove maybe 20-30 miles away listening to the station on the truck radio, and it was clear all the way, so that was a successful effort.

Back at the studio I decided that it would be best to tie the download from the new antenna to ground, to isolate it from station equipment, so I pulled the coax (RG-8) through the building, coiled it up outside and began attaching it to a ground rod driven for this purpose. By now it was dark, and a thunderstorm was approaching from the southwest, but still several miles distant. My partner mentioned that sparks were jumping the tower guy insulators whenever he saw lightning.

Just as I was attaching the now tied together shield and center conductor of the coax to the ground rod, another lightning strike occurred closer and a large spark jumped from the coax to ground. I guessed that the storm was still about five miles away, and this spark quite surprised me. Not only due to the sudden presence of the arc, but also that the antenna picked up enough energy from the distant lightning strike to jump the gap, which was maybe an inch or so. I quickly and solidly tied the coax to ground with a clamp and was finished.

Soon thereafter, the construction crew went to work on the tower. They bolted large steel beams to the footing and anchored these large beams to the ground about 15-20' from the tower in 3 or 4 directions and all looked to be solid. Well ... as solid as it could be in that situation. The tower stayed in place until the station was sold and the new owner had a new one put in place some years later.

(Continued on Page 28)



fuhgeddaboutit!

Admit it; you'd love to forget all about your FM antenna. You'd be perfectly happy if it were to spend decades out of sight, out of mind, and out of your budget. You just want it to work; day in, and day out.

We understand.

Shively designs antenna systems to work flawlessly. Year after year. At any site. Under any conditions. For any power level. Happily, in the background.

FM First.

This was Ed Shively's vision in 1963, when he founded the company; and over 50 years later, we're still doing our best to be absolutely forgettable.

Shively Labs®

A Division of Howell Laboratories, Inc. Bridgton, Maine 04009 USA

Call Toll-Free: (888) SHIVELY

Or visit us on the Web at: www.shively.com

- An Employee-Owned Company since 1995 -

ARC-talk-Blue

5 Mic channels with dual Conferencing Bluetooth Phone interfaces



- Eight channels
- Stereo Program output
- 5 mic, 1 stereo line, 1 PC, & 2 Bluetooth inputs
- USB interface for play and record from a PC
- 2 Bluetooth interfaces for Two Cell Phone callers
- ...or... stream audio from any Bluetooth Audio device



Easy access connectors for Fast installation...



- Fast, easy installation:
- RCA's for unbalanced IO,
 - Cat5s for balanced inputs,
 - XLRs for mics & Program output

NO Hybrids needed

list price **\$1,149**

Mic Mixers Reinvented !!!

Powerful, compact, portable, and not needing a land line to take incoming calls, the 'ARC-talk-Blue' is ideal for applications that require a mic mixer with bluetooth sources or bluetooth telephone caller interface. The revolutionary console features 5 high quality mic channels plus phantom power. Channels 6 & 7 on the console can be paired to any Bluetooth enabled audio device such as your Cell phone, MP3 player, MP3 recorder-editor, and more. Each 'Blue' channel features a button you push to connect an incoming caller and push again to disconnect from the caller. The channel One mic features 'Talk' buttons to talk to each Blue caller off line. No external hybrids are needed. OR... you can pair any Bluetooth enabled audio device such as an Ipad, Tablet device, or MP3 player and stream full bandwidth, high quality stereo (A2DP) audio into the console. The 'ARC-talk-Blue' also features a built in USB PC sound card on channel 8 so that you can play audio from your PC while recording the console Program output with your favorite software. Once again, Arrakis is 'The Leader' in Radio console evolution. Follow the Leader and visit our website today.

...the Bluetooth phone interfaces work with BOTH cell phones and Bluetooth headset enabled land lines.

www.arrakis-systems.com

970.461.0730

ARC-15 advanced Radio console

1 Mic, 4 Mic-line, 10 line channels with optional Bluetooth Phone interface



CAT 5 cables included



Easy access connectors for Fast installation...



- BOTH balanced and unbalanced Outputs
- RJ45 balanced inputs WITH cables supplied
- XLR connectors for ALL mic inputs

NO compromise, take no prisoners design !

Our ARC-15 (Advanced.Radio.Console) is called advanced for many reasons: 15 input channels, 5 assignable mic preamps with optional phantom power, Telco interface, PC USB sound card built in with free Radio software, analog VU meters for high resolution and ease on the eyes, socketed ICs for ease of repair, RJ45 connectors with cables included for fast wiring, electronic switching of all audio for crystal clear performance, LED lamps for highest reliability, optional Bluetooth interface and much more.

list price **\$3,999**

...the Bluetooth phone interfaces work with BOTH cell phones and Bluetooth headset enabled land lines.



optional Bluetooth

www.arrakis-systems.com

World Radio History

970.461.0730

– Continued from Page 26 –

So, the point of this long story is that a little imagination and a lot of work can prevent a complete signal failure even if the primary radiator fails, and this is how I dealt with that possibility.

A Shocking Component

I had the opportunity many years ago to attend a seminar sponsored by Sencore Electronics, and one of the topics presented was dielectric absorption. This discussion caused me to recall a comment that a supervisor of mine made when I was about 15, and that was that the capacitors in the bottom of the boat (submarine, maybe he was referring to) would “pick up a charge from the air” when they were left alone. I didn’t know anything about capacitors, but I just kept that comment in memory.

20 years later, when I replaced the HV cap in a Gates BC-5P AM transmitter, I took the old one back to the shop and left the cap “alone,” behind an equipment cabinet. A few weeks later I went to check the cap, but before I connected my equipment, I re-shortened the terminals with a large screwdriver, and immediately blew apart a corner of the screwdriver blade! That was another surprising (and powerful) arc!

And the point of this short little story is that dielectric absorption is indeed real, and I’m sure that it can kill you as easily as an energized power supply will. And as the old tube transmitters are being replaced by the solid state

versions, it may seem that the “high voltage” isn’t as hazardous as that in a tube transmitter, but the capacitors in a solid state transmitter still contain significant energy, and at a voltage level sufficient to cause serious harm, or death. So I say again—and this is for you “old guys” who are dealing with solid state for the first time as well as newcomers – please remember this!



(c) 1997 - JAMES

BC 5P AM Transmitter
www.j-hawkins.com

The FM Is Off

Now an easy one. Perhaps slightly odd, but easy enough to sort out. I answered a late evening call that, “The FM is off.” I don’t recall now all these years later whether I confirmed this with the shop receiver or not, but I most likely did as I got into the pickup to go see what was wrong with “The FM.” As I drove down the avenue toward the highway, I heard the signal clearly on the truck radio ... well not exactly so clearly. Full quieting, then picket-fencing, full quieting and so on. Something was not right. When I arrived on site, the signal was indeed OK. Troubleshooting quickly revealed that the exciter’s RF

PA power supply pass transistor had failed. And here’s the interesting part (or to me it was very intriguing): the frequency modulated oscillator (output power level in the milliwatts) was on, but the exciter’s output stage (with no collector voltage), the IPA and the RF PA each were passing that small bit of power, significantly attenuated, on to the antenna, and with enough signal level that it could be heard in the valley 15 miles away (although granted, not reliably). Had I been offered that option on a multiple choice quiz, I would have not have selected that answer.

And this observation of FM coverage led me to the idea of using the exciter to provide signal to the city during the time the coax was being replaced following a gradual, but catastrophic failure. The station happened to be using a 950 MHz STL hop to send audio to the transmitter site. STL “hop” meaning that in the 950 MHz band one frequency was sent from the studio (which did not have a line of sight to the transmitter) to a high point which could reach the transmitter site. I found a single halo antenna in the back room, relocated the exciter to the STL hop location, then broke the audio link from the hop receiver to it’s transmitter and fed that audio to the exciter. They were back on the air, ready for the several days of the main transmitter being off air, covering the entire city, to a significant distance with a full quieting signal. Again, the point of these last two stories is that a little imagination led me to a suitable answer to an otherwise puzzling problem. So to conclude, my “old guy’s advice” is when you happen to be presented with a puzzling problem, don’t panic, think – write that down.

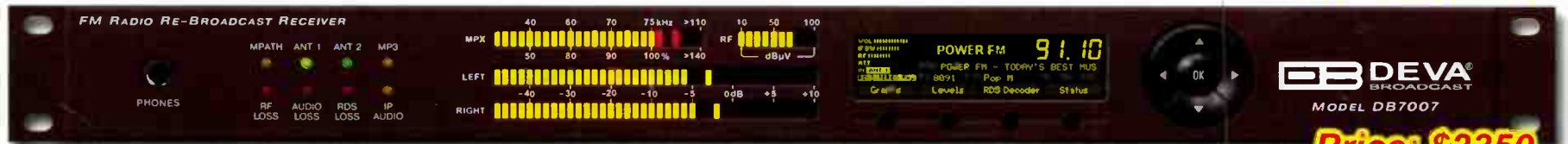
Dave is mostly retired, and does backup engineering for Air-1 and I-heart Media as requested. He can be reached at: mufixit@min.midco.net



Available in stock from
Broadcast Depot, Call: 800-313-7592
www.devabroadcast.com



Price: \$3200



Price: \$2350



Price: \$1950



Price: \$2100

Modulation Monitors • Rebroadcast Receivers • RBDS Encoders • Broadcast Tools

Open the door to *your* possibilities!



ON THE AIR

Powerful, state-of-the-art automation with the flexibility to grow with you...

- The power of OPX in one stand-alone computer
- Easy to learn
- The power to handle the largest audio libraries
- Satellite and live programming
- Additional stations
- Remote voicetracking
- Remote control

OPX ONE



Call (888) 274-8721
(888) BSI-USA-1
or email us at sales@bsiusa.com

Keeping It Cool ... or Warm

by Jim Turvaville

Every now and then an idea comes along that takes my old brain by surprise, and then I realize how handy it might be in other circumstances – and I've just got to share. This is one of those occasions where I was just trying to make something work on the cheap, and it turned out to be just pretty neat all around. So, I'm going to share and maybe it will come in handy for you – this is not exactly a product review, but more a product variation idea that you might be able to use as well.

Let's back up a bit in time and I'll tell you what I needed and why. As most of my regular readers know, I am semi-retired from corporate radio engineering and have a few clients that I still assist on a regular basis – most of them with FCC filing and spectrum analysis at my desk. I spend most of my day in a small office at a little cluster of radio stations which I co-own and keep running, but mostly because I pay the electric bill there already and might as well enjoy the company's heat and air conditioning instead of paying for it twice.

The tiny house where I live is mostly off-grid: water well, septic system, propane tanks, wind turbines and solar panels mean that I do not rely completely on the limited public utilities available in my rural unincorporated area. I still use electrical shore power for large load

items: air compressor, clothes dryer, supplemental electric heating and cooling, etc.; but the great majority of my electrical use is provided by my off-grid power system.

That off-grid electrical system is completely housed in a "utility room" which is 4ft x 8ft in size at the back of my workshop. The battery system is composed of 16 large wet cells that give me 52.8 kW of power in reserve. Between the charging and the inverter system, a lot of heat is generated in the room and, in West Texas, getting rid of heat is a necessity nine months out of the year. But I do have those few days when I actually do need some supplemental heat in the room, when the temperatures drop to the teens with winds in the 30's and 40's (which does generate electricity as a bonus) giving us well below zero chill factors.

For the past couple of years, I've had an electric radiator heater in the utility room, relying on the built-in thermostat to let it run only when the ambient temperature dropped low enough to need supplemental heating. This past fall, the thermostat in that radiator heater failed, and it just stayed on all the time – a great failure mode, at least nothing froze.

Being the cheap ... uh, I mean conservative guy that I am, I thought maybe I'd find me an external thermostat

that would run that radiator heater and allow me to continue using it to keep my utility room from freezing. So I went shopping (on-line, of course – this rural area is why we all love on-line shopping) and was amazed to find several imported options for electronic controlled thermostats available from Amazon. You know it's got to be an import, when it takes 7-10 days on Amazon Prime for delivery.



Bayite BTC-201

The unit I bought is shown above. There were several choices in this same style and had a variety of options from several different manufacturers. I chose this model because it controlled both heating and cooling – and not to mention it was \$30 as well.

(Continued on Page 32)

Why Not Switch to



Complete FM / TV Product Line



Coax switches available in Type-N and 7/16 DIN and 7/8" through 6-1/8"

- Antennas
- Splitters
- Notch Filters
- Harmonic Filters
- Power combiners
- Channel combiners
- N +1 Switching Matrix

Control panels available.

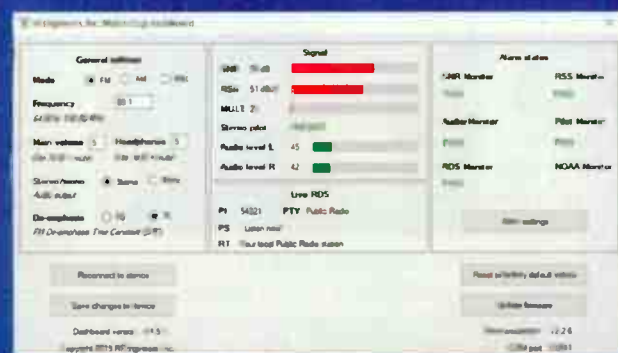
A subsidiary of **MEGA** RF Solutions

www.megaind.com

Toll Free: 800-545-0608 | www.mcibroadcast.com

One Receiver to Tune Them All

**Powerful, Versatile,
Rock Solid
Dependability!**



- **AM / FM / NOAA Weather Receiver & Real-Time RDS Decoder**
- **Industrial Grade: Built to be used 24/7/365**
- **Unbalanced Headphone Output**
- **Balanced Speaker Output**
 - **Analog Standard, AES3 Optional**
- **Extensive Monitoring & Alarm System**
- **User API Makes Automation Easy**
- **Modular Design for easy reconfiguration**
- **Tamper Resistant Settings**

For Full Information Visit

www.rfengineers.com



**Contact your favorite
dealer to order today!**



Keeping It Cool ... or Warm

– Continued from Page 30 –

Having already read the reviews on-line, I knew that the internal relays, which switched based on temperature, were not very heavy duty – the on-line video demonstrating the unit had a desk fan for “cool” and an incandescent light bulb as “heat,” which should have been a clue to everyone of that specific limitation. But I could not miss the great bargain for a device that would monitor ambient temperature with an external probe, and let me set limits on both Heating and Cooling.

The unit works fairly simple, and only took a couple of tries to read the somewhat poorly translated set of directions before I found the magic to its programming. Basically, one sets a desired “neutral” temperature, then the differential to both the hot and cool settings from there. My actual installation is shown above.



The center reading is the neutral temperature, while the top displays the actual room temperature from the probe which I have hanging from the ceiling in the center of the room. My neutral temperature is 65.0 degrees, the cooling differential is 15.0, the heating differential is 25.0 – only those three numbers which I had to set. Those settings mean that when the room temperature reaches 80.0 (65.0 + 15.0) then the exhaust fan kicks on in the room, and runs until the room temperature reaches 65.0. Conversely, when the room temperature drops to 40.0 (65.0 – 25.0) the radiator heat kicks on until the room reaches 65 degrees. Once neither the heat or cooling are running, the room temperature can vary from 40.1 to 79.9 degrees without heating or cooling running. This turns out to be a maximum electrical savings for great efficiency.

The “limitation” of the unit, which I knew before purchasing – the low current capacity of the internal relays – meant that neither the 1200 Watt radiator heating unit nor the 1/3 horsepower louvered power vent would function safely were I to plug directly into the unit. But again, I was thrilled with the bargain price and great function of this particular unit, so decided that it was worth the extra effort to use.

My spare parts box revealed a pair of 24V AC contactors from an HVAC condenser unit that I had salvaged at the scrap metal place (they were recycling the aluminum and steel, not the electronics) and had saved them for just a time as this. I got a pair of plug-in 24 VAC transformers in-line for \$7 each, and put the contactors in a PVC junction box that I had left over from another project. The AC transformers were just too big to plug into the thermostat unit, so I soldered a couple of pig-tails on them and just mounted them on

the wall next to the unit. So the thermostat turns on either the hot or the cold 24 VAC transformer, which in turn closes the respective contactor in the box above, which has a dedicated circuit from the breaker box nearby to feed either the radiator heater or the powered exhaust unit.

What I then realized is that this similar item might find some real use in the rest of my world! Whether it is that back storage room at the station, the server room or the transmitter room; having some way to monitor room temperature and then use that information to control heating or cooling devices could possibly save the day. This particular unit also has hot and cold alarm settings which trigger an internal buzzer, which also might be valuable if this unit was “out of sight and out of mind” in the back of the station somewhere. For the price I paid, and the little extra parts and effort involved, I created a device that can manage small or large loads. The contactors could just as easily be replaced with solid state relays and the large AC transformers be a scrap cellphone charger; and the load could be simple like mine or a large 220V contactor if the need arose.

To quote my good friend and fellow engineer Roger – “if it’s silly, and it works – then it’s not really *that* silly.” Maybe my silly idea can help you have one of your own.

Jim “Turbo” Turvaville is semi-retired from 40+ years in full-time Radio Engineering and lives in Rural Wheeler County Texas in a “tiny house” where he maintains a small clientele of stations under his Turbo Technical Services (www.jimturbo.net) operation providing FCC application preparation and field work.

Kintronic



Labs

Solutions for ALL FM Installations



FM Combiners

Model FMC-1.5 Isocoupler
for low-loss isolation
solution



Full line of Isocoils
for co-locating 1
or more FM
Translators on
AM tower



Introducing Two New Products



LAB4.50 Automatic Dehydrator
with 165,000 hour MTBF



DL-25K-FM
FM Dummy Load
25kW
VSWR: 1.15:1

ADDRESS: P.O. Box 845, Bristol, TN 37621

PHONE: 1-423-878-3141

EMAIL: ktl@kintronic.com



OLD SCHOOL.

Flexiva™ FMXi 4g



HIGHER EDUCATION.

Flexiva™ FMXi 4g

HD Radio® Embedded
Exporter/Importer

- Integrated Diversity Delay
- Dynamic Time & Audio Correction
- Integrated Audio & PAD Monitoring
- No Fans or Moving Parts
- Full Support of SFN
- Fast Bootup Time
- Simplified Artist Experience Setup
- No Windows Operating System

gatesair.com/fmxi4g

gatesair.com/v-events 



No one delivers greater performance and network analytics for your IP audio and data streams



Intraplex® IP Link 100 · 100p · 200 · 200A · MPXp

- Multi-stream encoding lowers channel costs
- Rock-solid, reliable Intraplex connectivity
- Real-time network diagnostics with LiveLook

Highly integrated codecs for next-generation, multichannel radio networks



gatesair.com/codecs

NEW  **Intraplex Ascent** platform for scalable, multichannel SRT audio/video over IP, available as either a 1RU server or a software-only solution 

Misc. Tech-Tips and Thoughts

About a year ago I was asked to write articles for Radio Guide. I thought it would be fun, so I started. I wanted to cover a variety of topics, not just one per issue. So far, I have been pleased with the response from readers who have chimed in with thoughts and suggestions. If you have some helpful technical advice or words of wisdom, please contact me at stuzeneu@sbe.org. Your help will be appreciated by the readers, and I would appreciate it as well.

An interesting thing happened to me a few months ago. I was checking the weather on weather.com and noticed an ad near the top of the page for something I had looked at on another site. I think it was an electronic component that I was researching on another website. I found it odd that the same component should show up as an ad at the top of the weather site. I know what you are thinking right about now. Cookies are everywhere, and at every site you visit now, they want you to be aware that they use cookies to track you. They also want you to know about their new policy, which in essence gives them the right to track you and use that data any way they wish.

Since becoming more aware that websites track your every move, I have wondered what I can do about

it. One day I saw an ad for Brave, a browser that claims to not track your movements on the Internet, and even claims to block sites that do. Since it was free, I thought I would give it a try. Assuming the statistics are accurate, Brave has been blocking ads and websites from tracking my every move. There are several browsers you can use that operate like Brave, but so far I am happy with it. There is no way that I am aware of, to check if the browser really is keeping my browsing private, so I will have to take their word for it.

An engineer friend put an interesting photo up on Facebook (Figure 1). It's a picture of something I have not seen before. If you have ever seen something like this before, let me know, and be sure to describe its function.

I am on at least one engineering forum, and once read where engineers suggest using a virtual private network (VPN) for various purposes in broadcasting. While I think it's a great idea, I watched a couple of YouTube videos that challenged the notion that VPNs are secure. Take a few minutes and watch this: <https://www.youtube.com/watch?v=F2OjDbTeQkU>

You can watch this video as well: https://www.youtube.com/watch?v=_xidFAksUtg



Figure 1

Most of you may have heard of Clean Feed. It's a browser-based service where you can do remote broadcasts for free. I haven't actually tried it myself, but others have and say it works well. In case you haven't heard of it, you can check it out here: <https://cleanfeed.net/>

There is another browser-based remote broadcasting service that I have never heard of before, until now. I actually listened in on a broadcast from my computer, and the sound quality was excellent. It's called Source Connect Now. This service is also free. You can learn all about it and take a test drive at this web address: <https://now.source-elements.com> If you use either of the above services, let me know how you like using them.

If you are like me and enjoy free stuff, here's a great website with several kinds of computer-aided design software. Design Spark offers a small variety of CAD programs which you can download and use for free. If you do any kind of mechanical design work and want to use a computer instead of a ruler and pencil,

(Continued on Page 36)



Coaxial Dynamics

A CDI INDUSTRIES, INC. COMPANY
SPECIALISTS IN RF TEST EQUIPMENT & COMPONENTS

COAXIAL DYNAMICS has been a leading manufacturer of precision equipment for the measurement and termination of RF Power since 1969. Our equipment is used by engineers in a wide variety of applications throughout the world.

Our products include:

- Directional Wattmeters for both Analog & Digital applications from 1 W to 100 kW and from 2 MHz to 2.3 GHz.
- Watchman RF Monitor/Alarm Systems.
- Line Sections & Plug-In Elements.
- RF Loads - Dry, Oil, Water, and Air designs up to 200 kW.
- Low Pass Filters & Power Sensors.

6800 Lake Abram Drive, Middleburg Hts., Ohio 44130, USA
440-243-1100 • Toll Free: 1-800-COAXIAL • Fax: 440-243-1101
E-Mail: sales@coaxial.com • Web Site: www.coaxial.com

- **Broadcast Equipment** •
Watchman - High Power Wattmeters - Elements
- **Line Sections & Meters** •
- **Termination Loads** •
Dry - Oil - Water - Air



mixIT

The Affordable Touchscreen Console

- AES67, Ravenna, LiveWire™ AoIP built in
- Optional Dante® AoIP coming soon
- Mic In, Analog & Digital I/O
- EQ, Dynamics and Mix-Minus

6 Faders - \$4800

12 Faders - \$5800



Logitek

Networked Audio Consoles

Learn more at logitekaudio.com or call 800.231.5870

Misc. Tech-Tips and Thoughts

– Continued from Page 34 –

Design Spark offers a program that just may be what you need. The website describes the software: “With DesignSpark Mechanical we aim to give every engineer the power to quickly design and change product concepts in 3D without having to learn complex traditional CAD software. Results include faster turnaround times, zero investment on procuring/training with new CAD software and true innovation!” There are also software packages that can help with electrical or PCB design. Check it out at: <https://www.rs-online.com/designspark/mechanical-software>

If you need a new automation system to play audio files on the air, you might consider free software. Rivendell is one of those free software packages. It operates on Linux, and does everything the big expensive systems can. You can run it as a complete automation system, live assist, or switch between the two. It can record satellite feeds, capture audio files from an FTP site, and it has a “button box” screen where you can play single audio files for live shows. Need applause? Load that file into one of the buttons on the screen. I have used Rivendell and think it’s an excellent audio play-out system. It works best with more expensive Audio Science audio cards, and you will get less functionality with less sophisticated and less expensive sound cards. Because it works on Linux, this

is not a system for beginners. However, if you are a computer geek, or know one who is willing to help you, using this software will save you a lot of money. There is a Facebook support group, and I believe there is an email forum you can join for support as well. If you have the money to spend, you can have a computer built for you for around \$5,000. To build your own broadcast audio play out system visit: <http://www.rivendellaudio.org/> On that site you will find screenshots and a lot of information about the software and its features.

We engineers usually have an “I can fix that” mindset. There have been times when I tried to fix something with Super Glue, only to discover it didn’t. I was disappointed that this magical glue doesn’t fix everything. Then I learned about this glue that claims to fix everything. It’s called Bondic. I have yet to try it, but I plan to. If you already have, I would enjoy learning about your experience with the product.



Send me an email. At about \$20.00 a tube, it is a little on the pricey side, but if it can repair things like they claim, it could be a great addition to your tool kit. Their website is: <https://getbondic.io/offer-01/>

If you check the rules and regulations on the FCC site, it can be a bit cumbersome. There is another site you can visit to check rules that is quite a bit more user-friendly. Here is the URL web address: <http://www.hallikainen.com/FccRules> When you visit this site, you can do a search and find what you are looking for. You will find this site to be easy on your computer resources as well as your smartphone resources. You can look up rule changes by date, or search by specific documents, like part 74. There aren’t a lot of instructions on how to use the search engine; however, it is fairly easy to figure out.


If you need a computer, but don’t want to spend what it would cost for a brand new one, a great place to buy a good, refurbished laptop or desktop is here: <https://cl3technology.com/> They still offer computers with Windows 7, so you will want to skip those, unless you really need one. I have purchased a refurbished laptop in the past and had a good experience. As they say: “Your mileage may vary.”

Got anything to share? Send me your thoughts. If you have come up with a creative solution to a problem, you can help other engineers by contacting me. I will include your thoughts and ideas in an up-coming column.

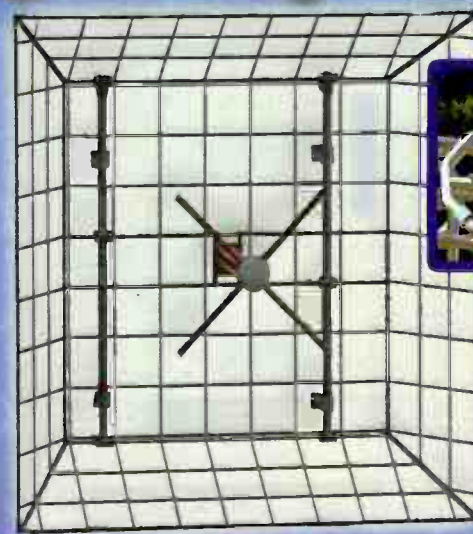
The thoughts, ideas and opinions in this column are my own, and do not necessarily reflect the views of Radio Guide or its publisher.

Steve Tuzeneu, CBT, is a staff engineer with the Bible Broadcasting Network in Charlotte, NC. He is a member of the SBE, and an extra class radio amateur. You may contact him at: stuzeneu@sbe.org


Quality FM & TV Antenna Systems




SLANT-V
DIRECTIONAL



FM PANEL



POWER-TILLER




POWER-TILLER
WITH RADOME

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..

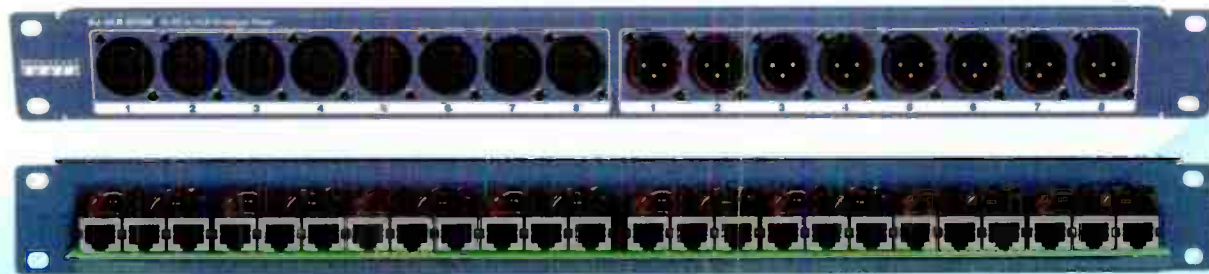
- Transmission Line
- Combiners
- Filters
- Turnkey Systems



Propagation Systems, Inc.

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

RJ45 Audio Made Easy



RJ-XLR Breakout Panels

The Broadcast Tools RJ-XLR Breakout Panels are 1RU 19" rack panels that convert XLR jacks to RJ45 audio jacks using the standard Cat5 audio pinout. The XLR jacks on each breakout panel are paired to feed stereo audio to a stereo RJ45 jack as well as split out to two additional individual RJ45 jacks for mono/AES operation for a total for 8 stereo RJ45 jacks and 16 mono/AES RJ45 jacks.

Available in three models:

- RJ-XLR 8F 8M (8 XLR-F jacks and 8 XLR-M jacks)
- RJ-XLR 16F (16 XLR-F jacks)
- RJ-XLR 16M (16 XLR-M jacks)



Broadcast Tools is a Veteran Owned Business
Designed, Assembled and Supported
in WA State, USA.
www.broadcasttools.com



BROADCAST
t o o l s
PROBLEM SOLVED

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>



Small Market Guide

Modern Day Cattle Rustlers – The FCC

by Roger Paskvan

It's been said that small market stations go on from day to day with little attachment to the political world in Washington. This may be true until the FCC makes a decision that truly affects your day to day operation. Well, this is one of those days, since most of us use satellite technology in some part of our broadcast day. As a matter of fact, this FCC decision may affect rural small market stations more than the big market boys since our stations may be located in areas that are not served by alternate technology and rely heavily on satellite delivery for daily programming.

According to *Law Street Media*, The Federal Communications Commission (FCC) is implementing new rules to auction 280 MHz of mid-band spectrum available for multiple uses, including 5G. The FCC believes that this is an imperative next step to move the nation closer to 5G and to shrink the digital divide, especially in rural communities.

The FCC's move will make a large portion of the satellite C-band available to authorized buyers through a public auction, allowing mobile network providers to quickly utilize the spectrum while creating revenue. This will allow for "continuous and uninterrupted delivery" of programs and content that is currently using the C-band for such operations.

The FCC has divided the satellite band as follows: the FCC will allocate the 3.7-4.0 GHz portion of the band for mobile use and 280 megahertz (3.7-3.98 GHz band) will be

auctioned by the FCC for wireless services in the contiguous United States. Another 20 megahertz (3.98-4.0 GHz) will serve as a guard band while existing satellite operations will be repacked into the upper 200 megahertz of the band (4.0-4.2 GHz).

Looks like the satellite operators got squashed in the middle and it's do or die. The FCC has even given a firm timetable to tell the satellite providers to get out or else! This is a modern day version of the old west cattle tycoons that would force settlers out of a valley so the big cattle boys (cellular) could take their land.

Satellite Today, had a slightly different take of the same message: *The FCC sealed the fate of satellite operators in the C-band spectrum on March 6, voting 3-5 to expand flexible use of the spectrum for 5G deployment, requiring satellite operators to clear the spectrum. The Commission voted to sell the licenses to the spectrum in a public auction, which will begin on Dec. 8 of this year. FCC Chairman Ajit Pai praised the Commission for taking action and defended its legal authority to do so. "The goal of leading the world in 5G is too urgent, the need to close the digital divide to pressing for us to put off action indefinitely," Pai said. "The time to act is now, and we are acting. And we should in part, because the law says we can."*

Satellite providers must clear a certain amount of spectrum in Phase 1 by Dec. 5, 2021, and additional

spectrum by Dec. 5, 2023, with any remaining spectrum will be cleared by Dec. 5, 2025.

Satellite operators with licenses for the spectrum will receive both compensation for the cost to relocate the spectrum and accelerated relocation payments to incentivize them to clear the spectrum quickly – up to \$9.7 billion total, divided between Intelsat, SES, Telesat, Eutelsat, and Star One. The FCC is creating a Relocation Payment Clearinghouse to manage this process.

So the big boys win and the settlers lose their homes.

Any remaining providers must squash into the (200 MHz) 4.0-4.2 GHz space that is still left. The rest are heading to the Ku band or going bankrupt. It's not premature to say that down the road, the 5G cellular carriers will also want that 200 Megs on top, too. Looks like your small market radio operation will need some new Ku dish hardware and receivers, if you still want satellite delivered music. Of course, if you're lucky enough to enjoy high speed broadband Internet or other means of new technology, that option is available to some. A lot of rural small market stations are stuck with few technology providers and the satellite dish must remain their only means of receiving programming on a 24 hour basis. Well, small market, we have a little over a year and this will be the new reality. I think they mean business!

Roger Paskvan is a Professor of Mass Communications at Bemidji State University, Bemidji, MN. You may contact him at: rpaskvan@bemidjistate.edu




Studio Items Inc




Mic Booms
On-Air Lights
Speaker Mounts
www.studioitems.com

TORPEY TIME
(The Good Time People)




Clocks
Up/Down Timers
www.ram68.com





News Mixers
Line Matchers
www.ram68.com



RAM Systems




Broadcast Furniture
Sound Absorption Panels
www.ram68.com

DIGITAL AUDIO SWITCHING



THE LOGICAL WAY 3-DRX

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

TITUS
TECHNOLOGICAL
LABORATORIES

860-633-5472

WWW.TITUSLABS.COM

davicom

SERIES CORTEX



Take Your Remote Site Intelligence
to the Next Level

Monitor, Control and Automate Your Transmitter Site

- Completely Customizable HTML 5 GUI
- Powerful SNMP Manager & Modbus Master
- Smartphone Application Dav2You



The Cortex series is more affordable than you might think!
Ask your favorite dealer for a quote.

cortex.davicom.com



T. 1 877 282-3380 | dvsales@davicom.com

Transmitter Site

BE Transmitter Screen Failure

by Michael Bradford

I was awakened at 06:05 a.m. on a recent Monday when the cell-phone sitting in the charger next to my bed started playing "Stand Tall" by Burton Cummings. It was my latest song selection from the bygone days when I was on-air at WCCW in Traverse City starting in 1961. As I came out of the mist of a sound sleep, I grabbed the phone and heard the familiar voice of a client in a nearby community. "I think we have an issue" he said, "as there are no meter readings anywhere on the BE transmitter!" After a few quick questions to clarify "No meter readings anywhere," I determined that an on-site trip was necessary.

Funny thing is that I was able to hear the Class A FM station at about 17 miles away – if it was truly dead in the water, I was certain the exciter bleed-through wouldn't get the signal 17 miles out. In any case, I felt better and moved into "Let's talk this over with myself mode" with my internal memory bank. The final tube could be the culprit because, thanks to filament management, that tube had been performing well for close to three years. Could be a screen voltage failure, could be final voltage failure, could be air interlock issues ... and on and on.

Upon arrival in the transmitter room, I noticed there were in fact some meter readings, including a tiny Forward Power value, and IPA output and filament voltage. No screen voltage was indicated but the screen breaker was not tripped. I toggled it on and off a few times but still no screen voltage. I was able to slide out the controller drawer and observe the motor-driven screen voltage transformer with my flashlight. I could see the motor shaft move in both directions when using the "raise" and "lower" buttons on the controller.

I turned off the plate and filament voltages and let the transmitter cool down a bit and watched the Plate Voltage meter indicate the slow dissipation of the Plate Voltage. When the meter was down to zero, I opened the back door and, using the "dead man" stick, made sure the capacitors were all fully discharged. I got down on my knees and took a closer look at the motor-driven transformer (Figure 1).

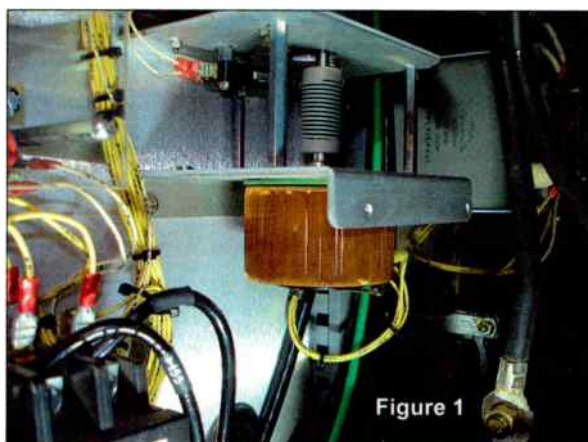


Figure 1

It seemed OK but I looked in my tool box for the little dentist mirror I had and managed a better look at the bottom of that transformer. It was not a pretty site (Figure 2). It appeared that the little contact on the rotating arm on the transformer had broken and fallen off and the windings were shredded beyond repair. As the signal was audible in the city of license, even with no screen voltage, I decided to turn the transmitter back on

and place a call to BE parts in Quincy, Illinois. For whatever reason, it seems that UPS can deliver next day without paying for next day service into this portion of Michigan. I was assured the part was in stock and was confident that it would be there the next day.

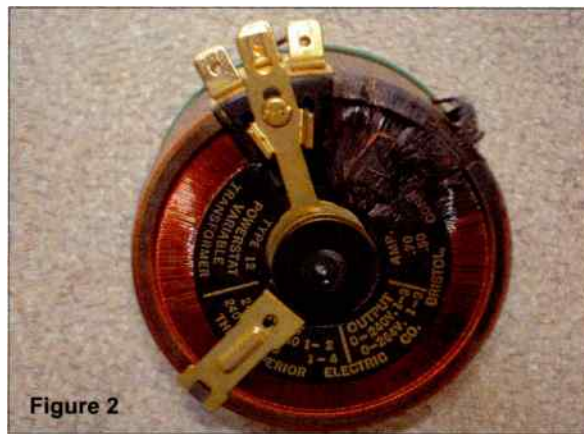


Figure 2

As I never like to work alone when doing transmitter repairs, I called in a long-time friend and fellow Engineer, Ralph Haines, to assist. He is a little younger and a lot more nimble and we worked together to install the new transformer the following day. After carefully adjusting the motor "stops" to coincide with the wiper location on the new transformer, we closed the rear door and turned the filament on. It was then we noticed that one of the two rear-cabinet blowers did not restart. As luck would have it, I had a spare on hand and it was replaced in a few minutes. Now with the filament on and both blowers functioning I hit the "plate on" button and up came the plate voltage but still no screen voltage. The breaker was not tripped and we scratched our heads wondering what else might have been damaged. We removed the front cabinet panel, pulled out the interlock switch and Ralph made a careful measurement of the AC leaving the two-pole screen breaker – there was only voltage through one side of the breaker! Luckily I also had a spare breaker in stock and we replaced it in a few minutes.

This time when I hit the "plate on" button, the screen voltage came up and the transmitter made full power after a few adjustments of the IPA tuning. I was glad that I had those critical spares on hand to get the transmitter up to full output. This situation sure proves the value of getting the manufacturer's suggested spares kit when purchasing a new transmitter. Most manufacturers have several levels of spares kits. You can choose the "entry level" set of spares, all the way up to, "Everything you'll ever need but the main cabinet."

I sure appreciated the help and remember it's never a good idea to work alone on any hi-power transmitter. It was time for a coffee break and to call the station owner and give him a full report.

Repairs of a Harris DX-10 RF module

During my routine visit to a client's transmitter site, I decided to repair the last two RF modules I had set aside for the Harris DX-10 AM transmitter. I had bought four new modules from Harris when one failed several years ago, so I would have them in stock and ready to go. I had repaired two failed modules late last year but held off repairing the last two until calendar year 2020.

I thought some of you that haven't repaired this type of module would appreciate the comments. The task is not difficult but attention to detail is necessary.

Figure-3 shows the basic DX-10 RF module out of its socket and ready for repair. Notice the empty fuse holders on this unit. The tiny LED indicators on the front of the module alert you to a failure of one or both MOSFETs directly behind the indicator on-board the unit. I remove the blown fuses immediately when I begin a replacement/repair project, so I know which pair of MOSFETs is suspect. Although it is possible to test the individual MOSFETs, I believe if one-half of the pair is shorted, then the other half has suffered from stress at the very least. I believe it is best to replace the devices in pairs even though one may test OK.

I think the time it takes to test the MOSFETs is better spent replacing them both out of hand. I have also discovered, over the years working on the DX series of transmitters, that ordering replacement MOSFETs from Harris (or Gates Air today) is the best choice. I have ordered replacements in the past from other vendors, only to find the parts are inferior to factory parts, even though I spent a lot of time checking parameters to match the original parts.

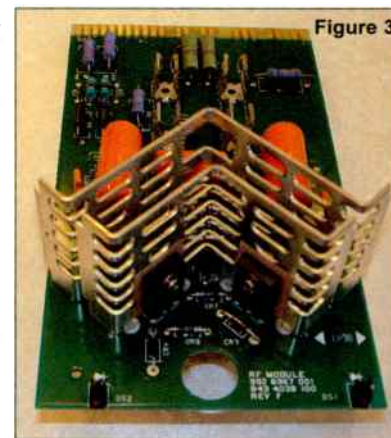


Figure 3

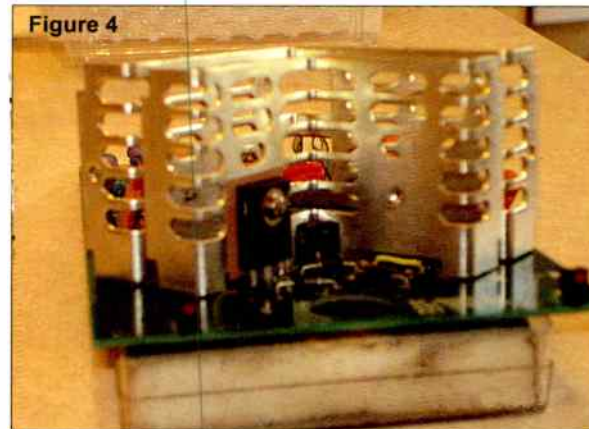


Figure 4

Figure-4 shows the module with the right hand MOSFET removed, the heat-transfer pad removed and the heat-sink cleaned and prepared for the new component. I use a wooden-handle swab and isopropyl alcohol to clean the surface and remove remnants of the heat-transfer compound.



Figure 5

(Continued on Page 42)



**Antenna Sizes Available
.6m to 5.0m**

DH Sectional C/Ku Band Antennas Available:

- 1.8m ~ 2.4m ~ 2.7m ~ 3.0m
- 3.7m ~ 4.2m ~ 4.5m ~ 5.0m

Mount Options:

- Fixed Az-El, Polar Tracking, Horizon to Horizon,
- Fixed & Dual-Powered Gibraltar Az-El
- Dual-Powered Gemini Az-El

Options:

- Hot Dip Galvanizing, Electronics, Cabling, Filters, De-icing,
- Non-Penetrating Roof Mounts & Concrete Template Kits

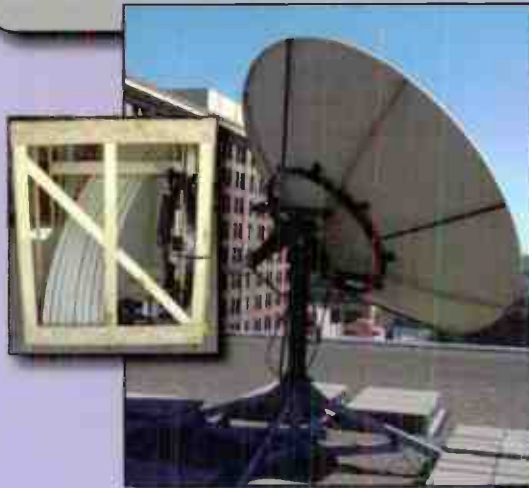
For More Information: dhsat@mhtc.net

**DH Satellite
Is The Industry Standard!**

Outperforming the rest for over 35 years!
Our 3.7m 4-piece sectional antenna with computer
generated ribs has been the industry standard

FOR DECADES!

- Superior Quality Quick Delivery
- Inexpensive Shipping & Simple Installation
- Low Maintenance 10,000's Installed Globally



**Visit us at NAB
Booth OE12015
Las Vegas
April 18-22**

DHSatellite.com ~ 800-627-9443

WALLTIME
NTP Clock & Notification System

\$295

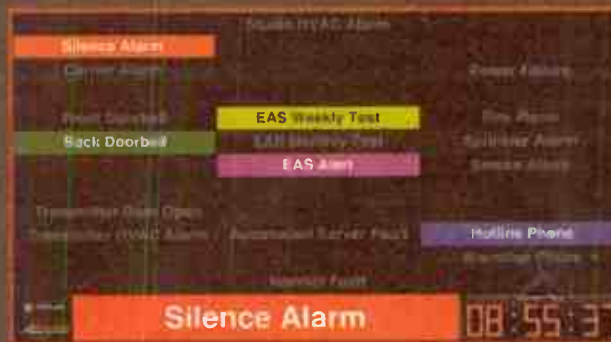


- Display Styles with Analog and Digital Clocks, Multiple Time Zones, Notifications & Alerts
- Built-in NTP Client & Server
- Widgets for On Air Light, Segment Counters, Status Notifications, Livewire Audio Meters and More
- Customize with Your Logos
- Supports Livewire, WheatNet & Ethernet GPIO Interfaces

www.paravelsystems.com

(877) 44-PARAVEL

(877) 447-2728



BE Transmitter Screen Failure

– Continued from Page 40 –

Figure-5 (page 40) shows the Harris part number for the MOSFETs while Figure-6 shows the part number for the silicone heat-sink pads from Harris. They are pre-cut, self-adhesive and exact replacements for quick installation. Figure-7 shows the 0.025 inch lead-free solder I like to use for electronic repairs, along with a well-used Sal Ammoniac (ammonia chloride) soldering iron cleaning block. The small diameter solder is easy to work with on module repairs and requires less heat, thus less chance of circuit board damage. The cleaning block keeps your soldering iron tip clean, bright and ready for quick heat transfer to the solder and intended component.



Figure 6 – Silicone Heat Pads

Once you have removed the MOSEFT mounting screw/washer, you can use a 1/8-inch flat-blade screwdriver with the blade vertical inserted into the MOSFET mounting hole and, bending gently downward, loosen the device from the heat-sink. You can then cut the individual leads and remove the defective part.



Figure 7 – Lead Free Solder & Sal Ammoniac

Using your soldering iron and good engineering practice, clean the remaining component tips and solder from the circuit board mounting holes for the MOSFETs. Use the wooden handle of a swab and coax the remaining heat transfer compound off the heat-sink. (Do not use a screwdriver or anything sharp as you could easily damage the mounting surface) Then soak the swab-end in at least 90% isopropyl alcohol to clean off the remaining adhesive. This procedure will lead to a nice smooth and clean mounting surface for the new MOSFET. Do not use rubbing alcohol for cleaning any electronic device as it

may contain water, fragrance and oil to keep your skin from chaffing; nice for your body but bad for electronics.

Remove the heat-transfer pads from their backing sheet and locate them properly on the heat-sink surface. Place the mounting tabs of the MOSFET into the circuit board mounting holes and secure the device with its screw/washer. Do not over tighten the screws. Now you can turn the circuit board upside-down and solder the new devices into place. Keep your soldering iron tip clean and tinned – without too much solder. When you're done, clip the remaining mounting tab tips off under each MOSFET.

Once the devices are replaced, check each solder pad for good flow and install a new fuse. Remember to use the exact fuse for replacement. Harris recommends the Buss BAF-3 – anything else is asking for trouble. You may have a hard time finding the correct fuse at Bubba's Hardware, Live Bait and Prom Dresses location, so you may want to get the exact fuses ahead of time.

Time to turn your DX transmitter off, remove primary power and install the repaired RF module for testing. Note that some modules mount component-side up and some mount component-side down. Turn the transmitter back on and observe the LED indicators on the module you repaired. In this case, no light is a good thing.

Remember to keep your working area clean and well-lit for proper repair of any electronic device. Having an insulated mug of fresh coffee nearby is a nice touch but keep the lid closed just in case you bump that bad-boy.

Michael Bradford began his career at WCCW in 1962, A CPBE since 1984, and currently a contract engineer. You may reach him at: mbradford@triton.net



RF Specialties[®] Group

The most trusted Nautel dealer for 35 years

Contact your local RF Specialties office
for more information

rfspecialties.com



nautel

ECONCO

Rebuilt Power Tubes



Approximately One Half the Cost of New

3,000 Hour Unconditional Guarantee

Call for Your Quotation



Phone: 530-662-7553 • Fax: 530-666-7760

Toll Free: 800-532-6626

www.econco.com

1318 Commerce Ave, Woodland, CA 95776

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	1 kW	2005	NautelJ1000
	5 kW	2015	GateAir DAX5
	5 kW	2004	GateAir DAX5
	6 kW	2016	Nautel XR6
	10 kW	1995	CCA AM10000HF
	50 kW	1999	Harris DX50
	50 kW	2006	Harris 3DX50

Please see our current listings on our website.

FM	55 W	2000	Harris DIGIT™ CD
	1 kW	2018	Radio Partes 1000
	10.0 kW	2009	Nautel NV10 - <i>Solid State</i>
	20.0 kW	2005	BE 20T
	25.0 kW	2004	Harris HT25CD

Please see our current listings on our website.

Used Misc. Equipment:

Bird Model 8932, 10kW Air-Cooled RF Load

Exciters:

Harris DIGIT™ – New 30W Synthesized



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!

PO Box 26744, Elkins Park, PA 19027
800-441-8454 • 215-938-7304 • Fax: 215-938-7361



The Broadcasters' Desktop Resource

... edited by Barry Mishkind – the Eclectic Engineer

HOME | NEWS | ARTICLES | MANUFACTURERS & VENDORS | SERVICES | SUPPORT | RESOURCES | USED: BUY/SELL | SITE SEARCH | CONTACT

Looking for an Internet archive of broadcast news and articles on technical, IT, and managerial issues?

The Broadcasters' Desktop Resource is at: www.theBDR.net

Avoid missing out on anything – you are invited to sign up for the one-time-a-week BDR Newsletter. We promise to never flood your inbox!

Check it out now! – <http://www.theBDR.net>

- **Cost-Efficient: The GatesAir Flexiva FAX 20** - Robert Wynne
- **NAL Watch: FL Broadband admits C-Band Interference; pays \$16k**
- **Major Layoffs at iHeart Media**
- **CES 2020 - First Look**
- **Windows 7 Reaches EOL - Upgrade to Windows 10 At No Cost**
- **NAL Watch: Consent Decree costs \$1.13 million for tower mess**
- **NAL Watch: NCEFM's to Pay \$76k for Underwriting Violations**
- **2020 Law: Broadcast Engineering Compensation** - Barry Mishkind
- **The History of Audio Processing - Part 7** - Jim Somich
- **FCC Reacts to 3rd Circuit Ruling by Requiring Renewal Amendment**
- **UK Government Threatens to End Licensing Fees**
- **FCC Issues a Report and Order on NCEFM and LPFM Processes**
- **What Do We Really Know About Reginald Fessenden** - Donna Halper
- **Building It Right The First Time** - Dave Dunsmoor
- **Are the C-Band Changes the Death Knell for Radio** - Ronald Johnson
- **Knowing When to Replace a Tube Transmitter** - Elaine Jones
- **FCC C-Band Plans Put G5 Ahead of Broadcast** - Karen Johnson
- **Inspecting the FCC Self-Inspection Checklists** - Tim Berry
- **The Story Behind: - 50 Ohms** - Barry Mishkind
- **The Heimdal Anti-Ransomware Suite** - Ron Castro
- **More newsy items here**

NiCOM

HELPING YOU SEND CLEAR SIGNALS SINCE 1997

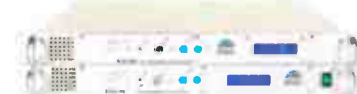
AMERICAN



MADE



FM & TV TRANSMITTERS



STL SYSTEMS



FM & TV ANTENNAS

619.671.9500

NICOMUSA.COM



THE FUTURE OF BROADCASTING IS BRIGHT WHITE



All the features you want in the new line of transmitters from the company you can trust

Call Bext today to learn more about the many built-in features of the new XD White Line of Transmitters

BEXT

888 239 8462

bext.com

Service Guide Radio Equipment Products and Services

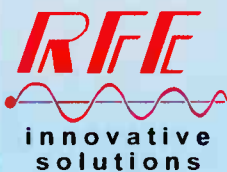
RFENGINEERS, INC.

- Tower Grounding & Lightning Protection
- Coverage Modeling & Maps
- RF Exposure Studies
- FCC Applications

Call us to discuss your project needs.

352-367-1725

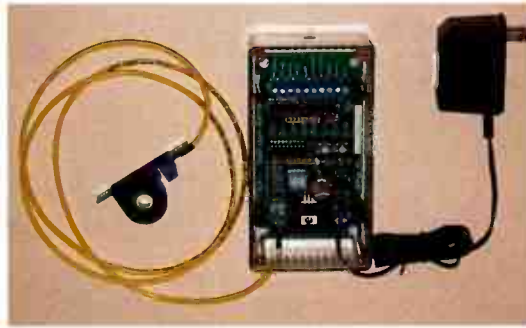
rfengineers.com/services



A
**Professional
Engineering
Company**

TLM-2 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

ICE KRACKERS®

The Solution Since 1979

NEED ICE DAMAGE PROTECTION FOR YOUR TOWER?

With the higher levels of atmospheric moisture, we may have very high snow and ice levels this year. Be prepared with **Ice Crackers**®.

Protect your tower site investment by protecting your anchor hardware and dampers with an inexpensive **Ice Cracker**.

Ice Crackers are galvanized and supplied with all mounting hardware and can be installed within minutes.

The average cost for equipping **Ice Crackers** at the tower is about \$500.

Contact us for a quote:
icecrackers@comcast.net
icecrackers.com

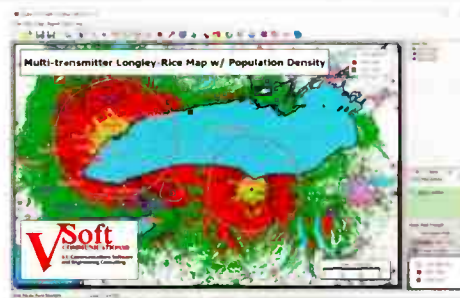
800-747-8921



The Leader in Broadcast Engineering Software!

- Create stunning "real-world" coverage maps, interference studies, and population reports with Probe 5™
- AM Pro 2™, used daily by FCC engineers, performs skywave and groundwave allocation studies and AM coverage mapping

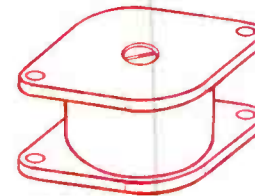
- Find STL broadcast auxiliary and Part 101 microwave frequencies and generate PCN letters with Microwave Pro™
- Map FM stations and find upgrade possibilities using FCC minimum separations and contour-to-contour methods with FMCommander™



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

TRANSMITTING CAPACITORS

MICA-VACUUM-CERAMIC



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

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

(Website Updated Daily)

All equipment sold with a 15 day return guarantee.

Turn Your Excess Gear Into Cash

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

Send Your List Today – sales@baycountry.com -or- Fax 443-596-0212



E-mail: sales@baycountry.com
877-722-1031 (Toll Free) 443-596-0212 (Fax)
7117 Olivia Rd, Baltimore, MD 21220



AM-FM Transmitters

Pre-Owned – Tuned and Tested to Your Frequency

www.Besco-Int.com

Rob Malany – Owner

321-960-4001 • sales@Besco-Int.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



We use V-Soft Software!

www.v-soft.com consulting@v-soft.com 800-743-3684

YOUR ULTIMATE SUPPLY & SERVICE SOLUTION



From our Facility to yours



Design & Integration



Repairs & On-Site Service Calls



LIGHTNER ELECTRONICS www.lightnerelectronics.com

Toll Free 1-866-239-3888 Shop online www.broadcastavsales.com

The HIGH EFFICIENCY BROADBAND ANTENNA

- is about ¼ the height of a standard AM tower
- requires no aviation lighting
- conforms to typical zoning and planning bylaws
- does not need guy wires
- does not need a buried ground system
- fits on a single-family-dwelling plot of land

If you have problems with aging towers, increasing land value or an expiring land lease, the World Wide Antenna Systems HEBA is your answer. After ten years of research and development, the HEBA is a reality. Our first production antenna has been on-the-air at full power since December, 2017. The FCC issued a license for operation of that HEBA in June, 2018. The HEBA has been stable for more than two years with no adjustments necessary, and meets or exceeds FCC efficiency requirements. The station using the HEBA reports a better, more consistent signal throughout the coverage area by their former tower that was dismantled in 2010.

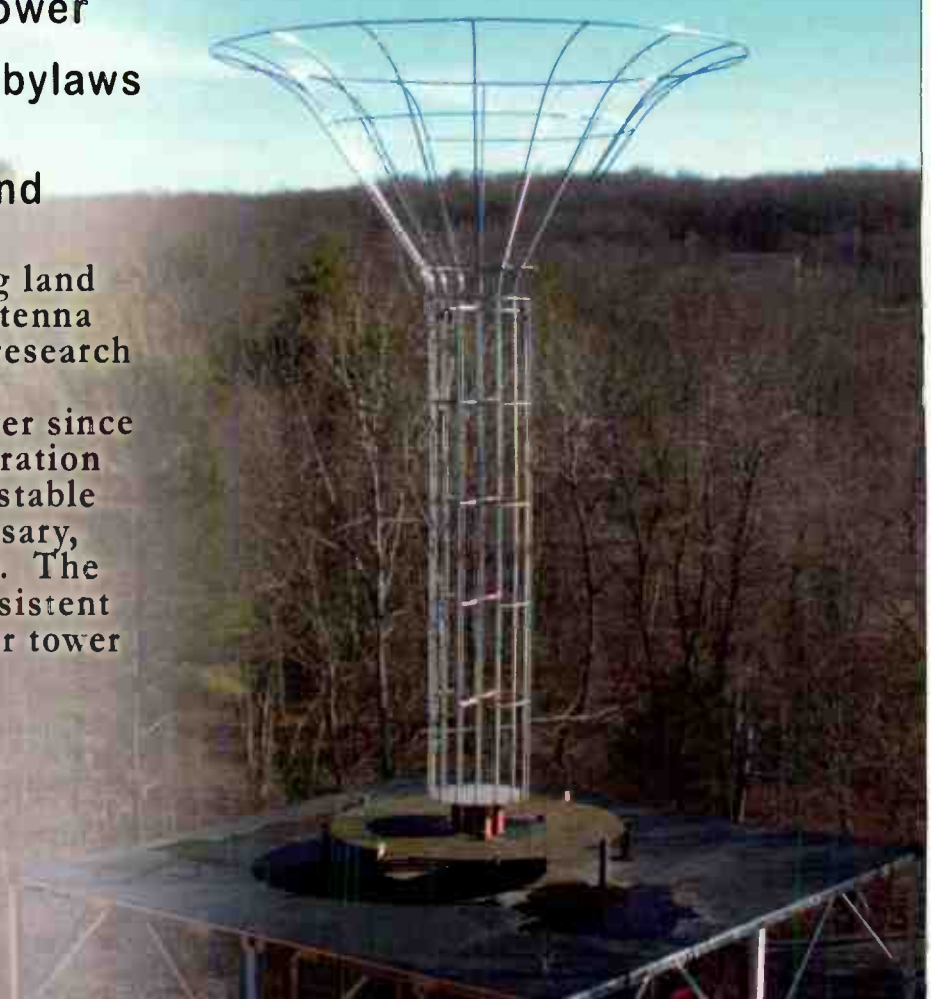


WORLD WIDE
ANTENNA SYSTEMS

781 275-1147

800-946-7007

www.worldwideantennasystems.com



"Kickin' It Ol' Skool"

STUDIO SERIES CONTINUED

ON AIR



By Ron Erickson

The phrase "Kickin' It Ol' Skool" means doing it the way it used to be done or hanging with a buddy you grew up with. For the purpose of this article both meanings could apply. If you've ever worked an airshift at any station that was live 24/7, you probably have made a lot of friends with whom you worked with over the years. Hence the second definition. The first is much less likely to ring true due to the fact that real radio talents seem to be retiring faster than cookie cutter automated formats can replace them. Who is left to be "live," still doing it the way it used to be done. Vinyl went away, replaced by CD's, CD's were replaced by digital hard drive files and then a strange thing happened. Consumers started re-collecting records! Used record stores started ordering new copies of The Beatles, The Eagles, Bob Dylan and many, many more well known artists on vinyl.

I doubt very much if there are any radio stations left that have turntables mounted in the control room. For that matter, are there any announcers working in today's broadcast environment that even know how to cue up a record? It may take retired radio pros to bring back the art of playing records live on the air. Local LPFM stations may be the only broadcast source for vinyl enthusiasts. If you do want to add a pair of turntables to your studio you need to either find a pair of a Gates, QRK, Russco or Sparta broadcast turntables, most likely on ebay. Once purchased you'll either need to pay someone to completely refurbish them or do it yourself. Not wanting a rim drive older style turntable? I think a good second choice today would be a quartz, direct drive Audio Technica or other similar brand turntable.

Radio station furniture has changed a lot since the days of desk mounted turntables. I've seen weighted turntable cabinets separated from the main desk with a "double mounting" system. This kept accidental bumping of the needle and vibration minimized. Back in 1972 at 92-KGAL in Lebanon Oregon, I worked on the air. The turntables were under a bridge which held a Sparta Board. Records were stored along the left side in the U shaped furniture. Three Sparta Cart machines were on the right side with all of the carts in a custom rack mounted above them. It was easy to work and left a lasting impression upon me. I recall that later in the mid

70's this studio design was also at KORE 1050 in Springfield / Eugene Oregon with different brand gear.

I'm in favor of using commercial broadcast furniture whenever you can. Real broadcast furniture can be ordered in standard designs or almost any special custom designs are available from Graham-Studios Furniture in Colorado. Rod Graham may be retired now, but new father & son owners, George and Jason Neil are doing a great job. I told Jason about some of the studios I've seen throughout the years where the turntables were under the console. The studio I'm going to show you today was the result of those discussions. Jason called it, The "Kickin' It Ol' Skool" package.

This new furniture package was delivered to a Low Power FM that is programmed to sound similar to the famous Los Angeles station, 93/KHJ. Several people who were on the air at the original KHJ have volunteered their talents to help this station be as true to the Bill Drake concept as possible. While the station currently does not stream audio, it has received multiple requests from all over the country to do so.



KHJJ-LP in Albany Oregon received this furniture package as a stand-up or tall stool version. This furniture, just like any other from Graham-Studios, can be ordered in virtually any color scheme. This one featured solid black cabinet sides with a red-hatched color scheme on the desktop.

Three words that could describe this color scheme might be; "clean," "handsome," or even "macho." The design starts with a traditional "L" shape with a good sized hole in the counter under which they mounted a hanging shelf which adequately supports two direct drive turntables. There is a special re-enforced equipment bridge over the counter-top, mounted just far enough to allow the air talent easily reach underneath to cue up a 45 or record album. I look forward to doing a live show here.

After the L shaped base was ready, I installed the counter-top, with an LED strip light underneath the bridge, purchased at Home Depot, although I'm sure you could order it factory installed. The top portion of the bridge allows for almost any sized console – in this case an ARRAKIS ARC10 – which was elevated in the rear to allow for easier reach to the sliders and buttons.

The turntables and CD decks all remote start from the "On" buttons on the ARC10. Jason Neil supplied a perfectly matched "stick" that mounted in front of the ARC10 preventing it from slipping forward. On the right side you can see a custom pod built for the two CD players, like everything else, easy to reach. On the left, a rack was installed containing a digital Program VU, KVM switch, AC panel and an old Gentner phone hybrid. Station jingles & liners are on Mini-Disc cartridges.



Graham-Studios has a long history of creating custom broadcast desks for TV and Radio Stations – above are two examples. Custom broadcast furniture is really more affordable than you might think, so if you've got something in mind you might contact George or Jason at 866-481-6696.

Ron Erickson is a writer, Voice Talent, Engineer and a Radio Consultant. He may be reached at 541-460-0249 or at ericksonradiosales@gmail.com

Plug & Play Distribution



2x16 DA/RJ Analog Distribution Amplifier

The new Broadcast Tools 2x16 DA/RJ is the perfect choice for analog audio distribution. Standard pinout RJ45 audio jacks for easy installation with Cat5 cables. Configurable stereo (2x8) or monaural (1x16) outputs. Balanced RJ45 and unbalanced RCA input jacks eliminate the need for external input level conversion.



Broadcast Tools is a Veteran Owned Business
Designed, Assembled and Supported
in WA State, USA.
www.broadcasttools.com

BROADCAST
tools
PROBLEM SOLVED

TIME TO SYNCHRONIZE

ES-185E/NTP6 GPS Master Clock

Accurately generate time code with ESE's Master Clock via the 12-channel GPS receiver and output multiple types of Time Code, SMPTE-LTC/EBU, ESE, IRIG-B, ASCII (RS-232 & USB), and an extremely accurate 1PPS signal. Further reliability with dual battery back-up, and new control panel software. ESE's NTP6 feature provides an NTP server compatible with the latest version of Internet Protocol, IPv6. You can also easily interface with new or existing computers, automation and clock systems. Visit www.es-web.com for all your time synchronization needs.

www.es-web.com
+1-310-322-2136

FINAL STAGE



RADIO ROUNDUP

The Radio Guide Event Register

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

NAB 2020 Spring Convention

As of publication, the NAB Show has been postponed due to COVID-19 issues. Check for future show dates at: nabshow.com

Dayton Hamvention

May 15-17, 2020
Greene County Fairgrounds & Expo Center, Xenia, Ohio
<https://hamvention.org/>

Texas Association of Broadcasters (TAB)

July 29-30, 2020
JW Marriot Downtown – Austin, Texas
www.tab.org/convention-and-trade-show

NAB Radio Show

September 13-16, 2020
Omni Nashville – Nashville, Tennessee
www.radioshowweb.com

WBA Broadcasters Clinic

October 13-15, 2020
Madison Marriot West – Madison, Wisconsin
www.wi-broadcasters.org/events/broadcasters-clinic-2/

Midwest Broadcast & Technology Conference

November 17, 2020
Columbus Convention Center – Columbus, Ohio
mbmtc.oab.org

Radio Guide Advertiser Info – March-April 2020

Advertiser - Page

Altronic - 37
Angry Audio - 11
Arrakis - 27
Bay Country - 44
Besco - 44
BEXT - 43
Broadcast Devices - 3
Broadcasters Desktop Res - 43
Broadcasters General Store - 15
Broadcast Software Intl. - 29
Broadcast Tools - 37, 46
CircuitWerkes - 25
Coaxial Dynamics - 34
Davicom/Comlab - 39
Deva - 28
D&H Satellite - 41
Econco Tubes - 42
Enco - 4
ESE - 46
FM Services - 44
GatesAir - 33
Graham Studios - 47
Henry Engineering - 2
Inovonics - 1, 9
Kintronic Labs - 32
Lawo - 21

Website

www.altronic.com
www.angryaudio.com
www.arrakis-systems.com
www.baycountry.com
www.besco-int.com
www.bext.com
www.broadcast-devices.com
www.thebdr.net
www.bgs.cc
www.bsiusa.com
www.broadcasttools.com
www.circuitwerkes.com
www.coaxial.com
www.davicom.com
www.devabroadcast.com
www.dhsatellite.com
www.enco.com
www.enco.com
www.esweb.com
www.towermonitor.com
www.gatesair.com
www.graham-studios.com
www.henryeng.com
www.inovon.com
www.kintronic.com
www.lawo.com

Advertiser - Page

Lightner Electronics - 45
Logitek - 35
Mega Industries/MCI - 30
Nautel - 5
Nicom - 43
Owl Engineering - 47
Paravel - 41
Phasetek - 47
PTEK - 24
ProAudio.com - 48
Propagation Systems (PSI) - 36
RF Engineers - 31, 44
RF Specialties/Nautel - 42
SCMS - 19
Shively - 26
Smarts Broadcast Systems - 23
Stackley Devices - 47
Studio Items - 38
Surcom - 44
Telos Axia - 17
Telos Omnia - 13
Tieline - 7
Titus Labs - 39
Transcom - 43
V-Soft Communications - 44
Worldwide Antenna Systems - 45

Website

www.lightnerelectronics.com
www.logitekaudio.com
www.mcibroadcast.com
www.nautel.com
www.nicomusa.com
www.owleng.com
www.paravelsystems.com
www.phasetekinc.com
www.ptekpower.com
www.proaudio.com
www.psbroadcast.com
www.rfengineers.com
www.rfspecialties.com
www.scmsinc.com
www.shively.com
www.smartsbroadcast.com
www.stackleydevices.com
www.studioitems.com
www.surcom.com
www.telosalliance.com
www.telosalliance.com
www.tieline.com
www.tituslabs.com
www.fmamtv.com
www.v-soft.com
www.worldwideantennasystems.com



OWL ENGINEERING, INC.

Consulting Communications Engineers
5844 Hamline Ave. N., Shoreview, MN 55126

651-784-7445

- AM/FM/NCE Applications
- Allocation and Upgrade Studies
- Pre-Purchase Inspections
- ANSI and NRSC Measurements
- AM Directional Array, Design, Tuning and Proof using Method of Moments
- Tower Detuning
- Intermodulation Studies
- Radiation Hazard Evaluation and Measurements

Fax (651) 784-7541 E-mail: info@owleng.com "Member AFCCE"

Precision | Innovation | Proven



GRAHAM STUDIOS

Broadcast Furniture

866-481-6696 | www.graham-studios.com

PHASETEK INC.


Custom Phasing Systems

Phasetek, Inc. is dedicated to provide the broadcast industry high quality AM Phasing and Branching systems, Antenna Tuning units, Multiplexers, and RF components.



Phone: 215-536-6648
sales@phasetekinc.com
www.phasetekinc.com

Remote Reboot of AC Powered Devices



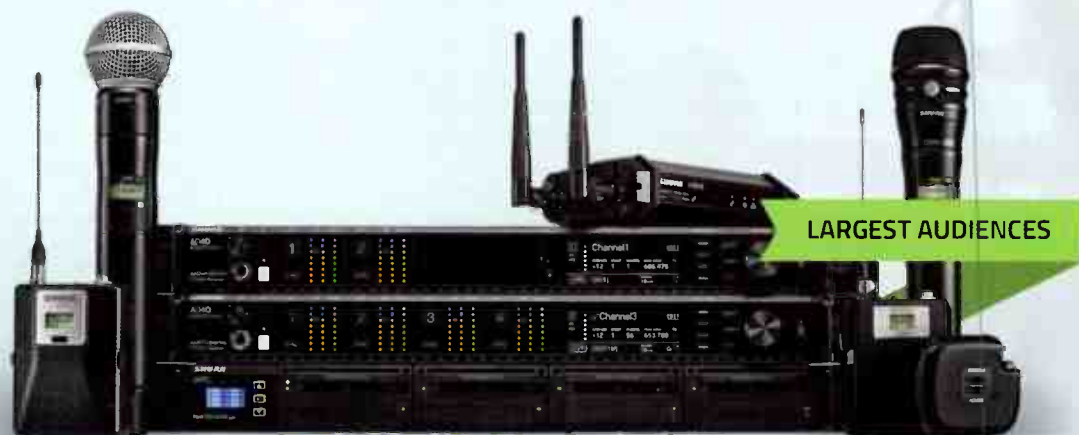
Stackley Devices LLC
(609) 647 9677

RemOutlet Reboot Mini \$179
Adjustable Power OFF Time

www.RemOutlet.com

SHURE

UNBEATABLE CLARITY & FLEXIBILITY.



LARGEST AUDIENCES

Axient® Digital Wireless Systems

Engineered for performances commanding the highest degree of attention: complex setups, high channel counts, and constrained spectrum for major events and tours.



BROADCAST + PODCAST

SM7B Vocal Mic

Popular radio and TV mic featuring excellent shielding against electromagnetic hum.

Twin:Plex™ Subminiature Lavaliers

Stands up to the toughest conditions to make every word a clear statement of quality.

*New! TwinPlex™ TH53
Subminiature Headset*

SONG + SPEECH



Learn more at proaudio.com
or call us at (800) 433-2105 for more information.

PROAUDIO
com
smart sound solutions

World Radio History