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THE RADIO TECHNOLOGY LEADER
January 2009
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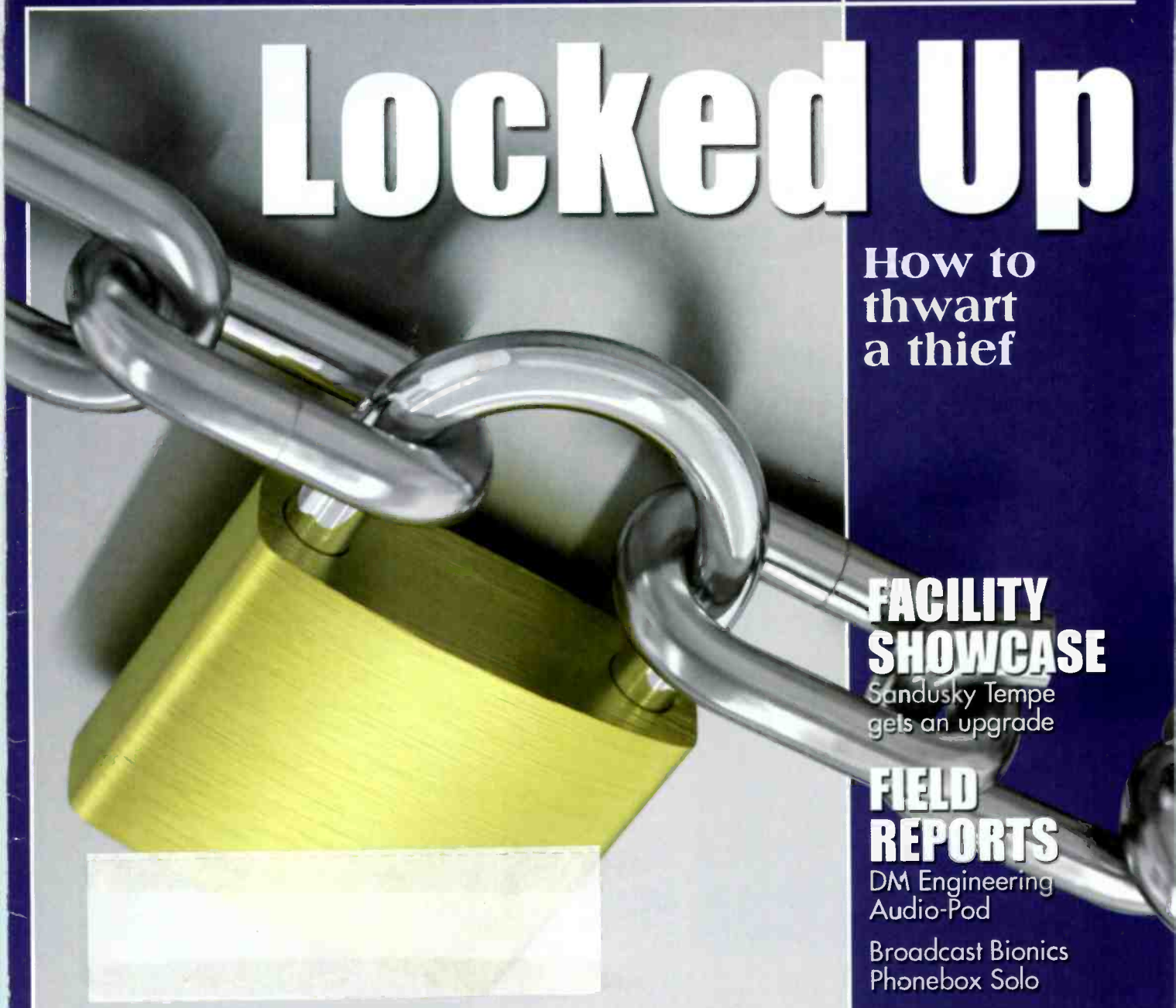
Locked Up

How to thwart a thief



FACILITY SHOWCASE

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FIELD REPORTS

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WINNING THE RATINGS WAR

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Vorsis is the first line of air-chain processors designed for today's 21st century radio listener. It's a complete ground-up rethinking of the tired and traditional approach that is inescapable with those well-known processors. Here we talk about a few of the innovations that make the flagship AP-2000 Spectral Dynamics Processor the incredible tool that it is. Many of these advances are shared among the entire range of Vorsis solutions.

Intuitive Interface and Operation

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Superior Stereo Enhancement

In rethinking Vorsis, it became clear that stereo enhancement HAS to be integral to the processing. It is, after all, a manipulation of the amplitude of the L/R difference signal that creates the perception of a wider sound field. With Vorsis, you'll get smear-free enhancement of the stereo image that can be as wide as you desire. But that's only the beginning – you can also control the stereo image width on a frequency-conscious basis and use L+R to L-R signal ganging to prevent the image from wandering uncontrolled. It's already field-proven to manage wide discrepancies between the recording techniques of various eras (oldies to the over-mastered music of today) and even reduce multipath interference.

Surgical Limiting and Clipping

To some the idea of 31 bands is scary. Not to us. It's simply amazing what can be done with it. Limiting and clipping's primary purpose is peak control to increase loudness; the less audible in its action, the better. 31 bands allow surgical limiting – its dynamic operation is nearly inaudible to the ear so the resulting sound is louder AND cleaner. It also provides unprecedented opportunity to further fine-tune the sound. FM and HD/DAB have entirely different transmission characteristics, so Vorsis processors have completely separate limiting and final peak control sections for analog and digital broadcast.

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- 10-band limiter/clipper

FM-10HD
Digital Audio Processor for FM analog and HD/DAB
- 5-band dynamics controller
- 10-band limiter/clipper

VP-8
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- 4-band dynamics controller
- 8-band limiter/clipper

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- 3-band AGC

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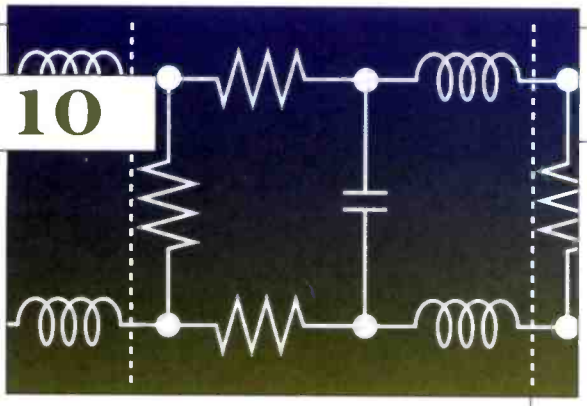
CONTENTS

Features

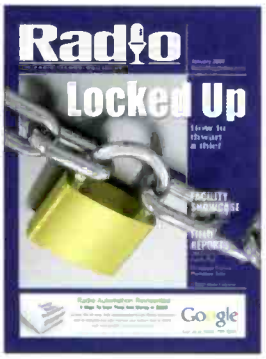


Columns

Departments

ON THE COVER

Copper theft was a rising issue last year. While nothing may totally stop determined thieves, there are some things you can do to make your site more secure. Read about them on page 14. Cover design by Michael J. Knust.



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Currents Online

Selected headlines from the past month.

Appropriate Use of EAS?
Lubbock, TX, uses EAS to warn of a telephone bank scam.

Nautel's Quincy Office Now Open
The office is staffed by Mark Morrison, Nelson Bohorquez and Jim Krueger in customer support positions, and Steve Schmitt in a sales engineering role.

CEA: Consumers Want Green Electronics
The study reports that price and features continue to be the primary purchase drivers for CE products, but green attributes will increasingly be a factor.

House Report Investigates FCC Problems Under Martin
A bipartisan investigation was begun because of allegations that Martin abused FCC procedures by manipulating or suppressing reports, data and information.

Vin Scully to be Inducted Into NAB Broadcasting Hall of Fame
Scully has been with the Dodgers since 1950 when the team was based in Brooklyn.

Greenhut Joins Ibiquity Broadcast Business Development Team
Rick Greenhut will work with stations to upgrade to digital HD Radio technology as director of U.S. broadcast sales.

Site Features

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Looking for change at the FCC

If you don't do your job well or even worse you break the rules to get your way, chances are you won't keep that job very long. You probably don't know many people like that. For the most part, people try to do the right thing and do it well. However, there are those who expend a great effort to dupe and scheme to keep their jobs rather than just do a good job in the first place.

When you observe someone taking advantage of a job situation, it's usually a matter of time before that person gets his due. It's inconceivable to think that someone could get away with poor management practices, suppressing information important to a task, and a general disregard for proper business practices. But someone did, and he kept his job. How is this possible?

I'm talking about FCC Chairman Kevin Martin, if you haven't already guessed. A majority staff report prepared for the House's Committee on Energy and Commerce titled *Deception and Distrust: The Federal Communications Commission Under Chairman Kevin J. Martin* was prepared to address the agency leader's poor performance. The report charges that Martin manipulated, withheld or suppressed data, reports or information in multiple instances; Commission matters were not handled in an open and transparent way; the Commission failed in some of its responsibilities (only some?); Martin's methods have created distrust among all the commissioners; and Commission staff has not been effectively managed.

These are not small shortcomings. It's not like he was always 15 minutes late for work. These are charges of misconduct. Imagine if you did the same in your job. If you were charged with similar errors you would be packing your office long before any report could be filed.

I had heard about the investigation several months ago, and was told it would likely lead to Congressional hearings. Instead, we see a 100-page report. Carrying even less weight, the report was not released by the House Energy and Commerce Committee itself, the committee that oversees the FCC.

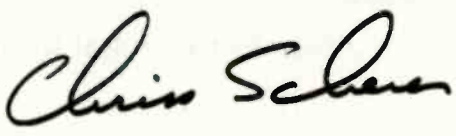
And now that Martin effectively has a few days left until a new commissioner is appointed, he's just going to leave without having to answer for the abuses of his office.

So Martin got away with it. But perhaps the effort is not a total loss. The incoming FCC chairman (still uncertain when this issue was sent to the printer) will have some clear examples of how things should *not* be done.

What else can we expect to come of this? I think we can be more assured that facts will see the light of day instead of being suppressed when FCC rulings are issued (even if the technical facts are still ignored by non-technical commissioners). Perhaps the backlog of actions and applications that have been sitting at the Commission will finally see some activity.

We're due for a chairman who can lead the FCC and make real progress. I expected great things from Michael Powell, who was just OK in the end. I didn't know what to expect from Kevin Martin when he took over, but we have our answer now. Who's the next chairman? Julius Genachowski, Don Gips, Larry Strickling and Blair Levin are some of the names I have heard.

The new chairman will step in just in time for the analog TV shutoff. That alone might cause some headaches, but I expect it will be back to legitimate business shortly thereafter.



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Transmission lines

By John Battison, P.E., technical editor, RF

A transmission line is a far more complex piece of equipment than many people realize. In its simplest form it may be considered as just a pair of wires merely carrying ac power. Usually in these cases the important characteristics are resistance, load-carrying capacity and insulation. With, quite possibly, I^2R losses being among the most important. But as increase the frequency to RF voltages, some new characteristics appear which have far-reaching influences. As the wavelength of the ac signal increases so do the effects of impedance and other transmission line characteristics.

A frequently overlooked fact is that transmission lines can perform impedance transformations in the same way as tee and pi networks, although they take up more space and are not always as easy to calculate. The length of a transmission line where an appreciable current flows through an appreciable portion of a wavelength is involved can result in either low or high output voltages appearing at the end of the line. Obviously, the higher the frequency the greater the possibility of transmission line influence upon the signal.

Lumped or distributed

In the case of a typical network using lumped constants, the space occupied is usually small and it is possible to calculate quite precisely the actual effect on the signal. However, the transmission line, which usually consists of distributed constants, may be more difficult to tune precisely because of the need to adjust the transmission line length to produce the desired characteristics. One way of looking at this is to compare the characteristics of *component* networks with those of transmission line using distributed networks.

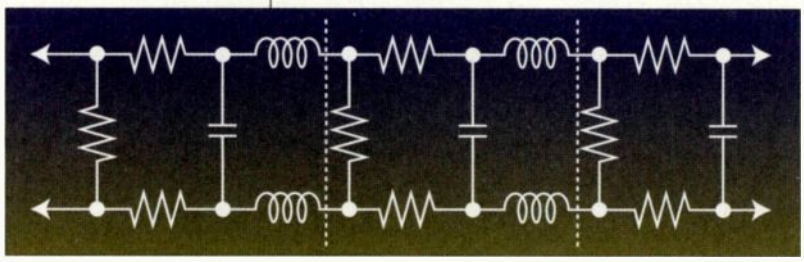

Figure 1. The electrical equivalent of a balanced transmission line. A unit is contained in the dotted section.

A component network is composed of individual inductances and capacitances whose values are known precisely, i.e. "lumped" values. The same characteristics that apply it to a transmission line are line characteristics that are often somewhat variable depending on the physical configuration of the transmission line.

A transmission line that consists of a pair of parallel wires can be considered as a form of going-and-coming circuit. It follows from this that we can think of them as a one-turn coil. We can also think of them as being long thin plates as in a capacitor, because the two wires have different potentials. There is often leakage between the wires because of imperfect insulation. There also may be resistance losses due to thin conductors.

There are various ways to calculate the impedance of paired lines, but most radio engineers are concerned with coaxial cables, which are far simpler to use and are not subject to spacing changes between the conductors as the transmission line moves.

Open wire transmission lines consist of two or more conductors between the transmitter and the antenna. Early types of coaxial transmission line used a single center conductor surrounded by a number of equally spaced outer conductors. Designed to provide more-or-less uniform impedance and carry high power, several variations were developed. I was involved with the construction of a 1MW medium-wave transmitter in Lebanon where the high-power transmission line consisted of a 2" rigid copper center conductor surrounded by 10 or 12 equally spaced smaller rigid conductors. The line had an impedance of around 280 ohms and a fairly substantial current developed.

Balanced and unbalanced lines

Most of the antennas used for medium frequency broadcast transmission utilize unbalanced transmission lines. Figure 1 shows the conventional theoretical presentation of a balanced transmission line and as its name implies both sides are similar. Current transmission line theory considers a line to consist of an infinite number of combinations of inductance, capacitance and resistance.

Figure 2 shows the conventional illustration of an unbalanced transmission line, and as might be expected one side is grounded, and offers very different characteristics from the "hot" side.

A logical development of the unbalanced line with its grounded side is a form of shielded line in which a center conductor credited with specific non-lumped constants is contained within a solid metallic tube. It is essential that the spacing between the inner and outer

conductor remains constant. If this is not maintained, the random changes in spacing will produce impedance discontinuities that can result in reflections and sometimes hotspots. Bulges in the outer conductor, or other mechanical imperfections such as bullets at points in the center conductor where rigid lines sections are joined can also result in discontinuities, which can lead to line failure.

Coaxial transmission lines

Provided that heat and cold expansion and contraction of lines is properly compensated, coaxial transmission lines tend to be more weatherproof than other unbalanced lines. The development of coaxial lines seems to have them spurred by the development of FM and television transmitters with their higher power and higher frequencies.

Dry air or an inert gas is normally used in rigid coaxial cable installations, while the dielectric in flexible cables is usually made of a solid-state dielectric either completely filling the space between the inner and outer conductors or in the form of a spiral dielectric or insulating spacers designed to maintain constant spacing between the inner and outer conductors. The dielectric medium has an effect on the propagation characteristic of the coaxial cable. Fortunately, the various coaxial cable manufacturers provide comprehensive technical data and coaxial cables selection today is relatively easy. Flexible coaxial cable is usually available in convenient cable lengths.

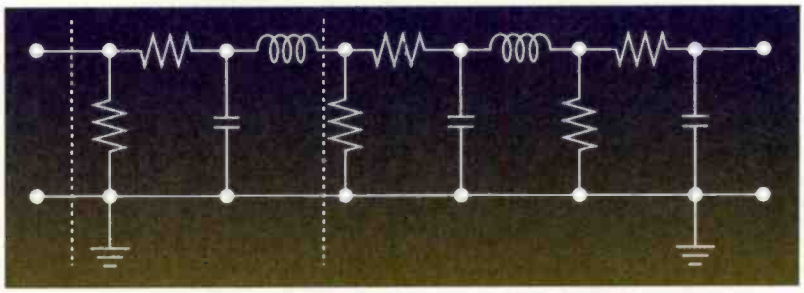

Figure 2. An unbalanced transmission line basically consists of a hot conductor containing resistance and inductance with distributed capacity between it and the ground side.

Rigid copper transmission lines are generally not used for AM radio transmitters. The advent of flexible coaxial cable in larger sizes and greater ease of handling has made it very popular, and it is somewhat easier to handle than rigid copper line.

E-mail Battison at batcom@ohio.net.

FCC adopts new methodology for AM proofs

By Harry Martin

At long last, the FCC is permitting directional AM stations and permittees to submit proofs of performance using moment modeling in lieu of proofs based on extensive field measurements.

In 2007 the Commission proposed to allow some, but not necessarily all, AM licensees to use moment method computer modeling for their directional AM proofs. Use of such modeling would relieve many AM stations of the exceedingly time-consuming and expensive burden of taking and tabulating field measurements. In late September the Commission adopted this proposal but said it would not become effective until the Office of Management and Budget (OMB) had reviewed and approved the revised rules.

The FCC advises that the OMB process is now complete and the new proof methodology is currently effective (as of Dec. 1), "except for the amendments to §§73.61, 73.68, 73.151, and 73.155," which will not be fully effective until new forms are also approved by OMB. Since the listed sections are the only ones that were changed last September, the question is: What can an AM station do now?

The FCC's staff advises that on an interim basis an AM licensee can prepare its 302-AM using moment modeling as outlined in the new rules and file it now, asking for program test authority in the process. There is no need to ask for a waiver. It is likely (but not guaranteed) the staff will favorably and promptly act on the PTA request, which would enable the station-applicant to commence full operation of its modified facilities. While the license application would remain in limbo until OMB approves the forms (thus clearing the way for the Commission to act on the application), the station would be free to operate in the meantime.

Dateline

Feb. 1 is the deadline for submission of biennial ownership reports by radio stations in Kansas, Nebraska and Oklahoma.

Feb. 1 is the deadline for radio stations in the following states with more than 10 full-time employees to electronically file their Broadcast EEO Mid-Term Reports (Form 397) with the FCC: Kansas, Nebraska and Oklahoma.

Feb. 1 is the deadline for radio stations licensed in the following states to place their annual EEO Reports in their public files: Arkansas, Kansas, Louisiana, Mississippi, Nebraska, New Jersey, New York and Oklahoma.

Stricter standards for community changes sought

Commissioners Copps and Adelstein issued joint dissents in two recent decisions involving FM channel moves. In their dissents, they were harshly critical of the manner in which the majority applied the "Tuck" analysis, that has been utilized for decades in the evaluation of proposed city-of-license changes. Both cases involved proposals to allow stations to move into larger, more urban markets.

The Tuck analysis was intended to serve as a brake on such migratory patterns, but the FCC has watered down enforcement by rubber stamping applicants' claims that they do not really intend to serve the metro areas where their new proposed cities of license are located. The preference for stricter enforcement by the two Democrat commissioners is part and parcel of the ongoing localism debate. In their view, a rigorous application of the Tuck standard could and should serve as a check against homogenization of radio programming by ensuring that stations focus on the communities to which they are licensed.

Martin is a past president of the Federal Communications Bar Association and a member of Fletcher, Heald & Hildreth, Arlington, VA. E-mail martin@fhhlaw.com.

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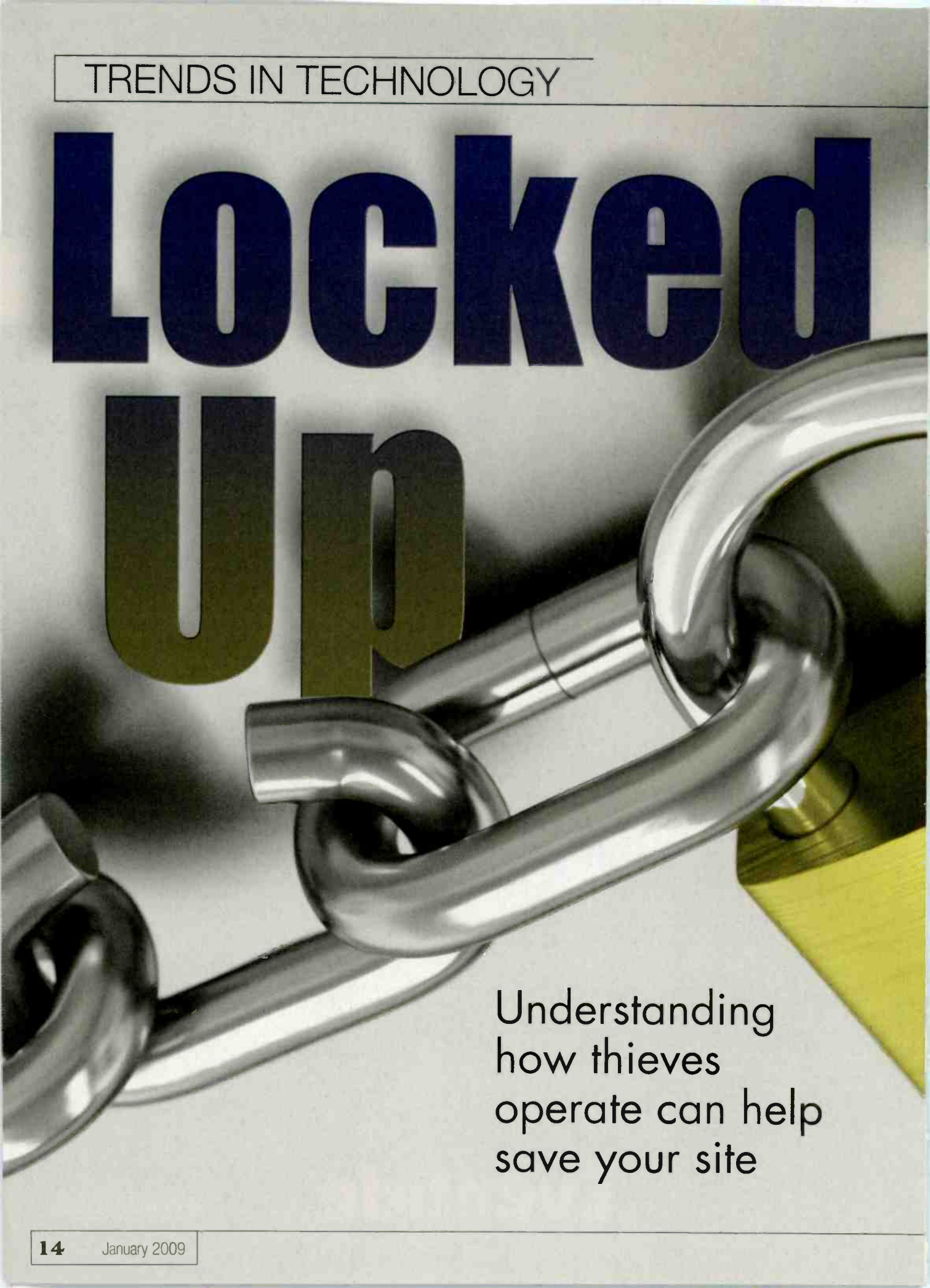


Understanding how thieves operate can help save your site

By Rolin Lintag, CSTE

Padlocks and gates no longer deter a thief. Either thieves are getting bolder (maybe desperate) or we have not yet done our job, or both. You can't help but think there must be something else we can do to secure our remote sites. Although there have been numerous articles written on this subject over the years, a systematic approach can offer a different perspective.

To understand the anatomy of a theft we can use an event-driven process chain. The objective of using an EPC for this discussion is to determine the step-by-step process of how a theft occurs so we can analyze where prevention or intervention can be applied. Hopefully the perpetrator can be stopped prior to any physical damage being done on the property. The cost of lost airtime, replacement and repair is primarily what we are trying to avoid. Catching a thief and bringing him to justice is just a secondary concern.

As the EPC is discussed, strategies to stop the progress of each stage are suggested. Some courses of action are recommended but it is easier to see now that you can add your own to the list. The major objective in this analysis is to deter the process as early as possible.

Locked Up

The survey

The perpetrator starts by surveying the property he hopes to hit. This stage may take from a simple drive by or multiple visits. Chances are he'll hit the same day he visits. One thing is for sure, he is looking for information that will help him decide to break-in or not. Unless he is a professional and knows you are keeping gold bullions in your remote site, he'll definitely look for an easier target if your facility looks like Fort Knox. However, if your site is like a candy store where all those goodies are in plain view, even kids will dare to break in.

Your main strategy at this stage is to give the impression that your facility is Fort Knox. Warning signs, surveillance cameras and public address (PA) systems will give loitering persons the awareness that they are being observed and will be considered as unwelcome guests in such a remote facility. Only the kamikaze-at-heart or the dumber-than-dumb will proceed beyond this point.

Let us say he decides to break in. His first job is to make an entry, preferably with his vehicle inside the property. His motto is "Get in, take with and get out!" Anything that can delay or stop him in the process can be a reason for him to give up the ploy.

A cover around a padlock makes it harder for a thief to cut it.

Communication with would-be thieves could stop them in their tracks.

One strategy is to render useless the tools that he brought with him for the job. Design the locking of the gate in such a way that a hammer, a bolt-cutter or a torch can not help him break in. Another concern is early detection and photo identification while the attempt is at its early stage. This is the best time for police officers to arrive at the scene.

Prospecting

The perp goes around the facility looking for valuable loot he can turn into merchandise. Copper can be a primary target due to its high resale value lately. This is information that the perp already knows so all he needs to do is look for the shiny yellow metal.

One strategy to foil this stage is to hide copper and/or make its re-sale value very low by putting tar on it. Tar may work for copper used as ground wire, on guy wires or any other places not on the ground where you can tread on them. You can cover copper straps on the ground with cement. Another possible action is to glue all copper straps with F26 to the cement floor. After curing, F26 bonds the copper strap so strongly on the floor that it will take a long time even with a pry bar to jolt out the copper. For someone in haste, this can be quite a feat to overcome.

The take-out

You don't want the perp to get to this stage. This is where actual damage to your transmission system can be done and possibly cause off-air time if some live electrical wires are pulled out. Depending on how much time the perp has wasted on the preceding stages, police officers should have arrived at this time. Early detection and a prompt 911 call can make a big difference in preventing damage to your facility.

The thief at this point may use tools to un-screw equipment from a rack or dismantle some copper from the ground. The use of Torx screws or other means that require special tools from dismounting equipment from a rack should be used. Keys to other rooms should be hidden. Tools should be in a tool box that will be difficult to lift (if bonded to the wall or floor) or un-lock.

Surveillance cameras at strategic places can help ID the thief for use later on in the prosecution. A motion activated alarm can still stop a thief at this point. It is better to have a PA system for the Master Control operator to talk him out of the job. The psychological pressure of being in haste, plus the knowledge of being observed, and talked to at the same time can still stop a thief from doing damage to the facility. The thief may have nerves of steel but the annoyance of the ear-piercing alarm may cause him to hurt himself in pulling out the loot or just abandon the job in disgust.

The haul

This is where the thief hauls his loot onto his escape vehicle. He would want to do this as fast as he can so this stage may last only a few minutes.

One strategy you can use is to delay the hauling of loot to give police officers more time to get to the site. If

Deter thieves by letting them know they're being watched.

police officers catch them in the act of hauling copper, the thieves are easier to prosecute. If you have road blocks or other means to prevent their escape vehicles from getting close to where the loot is, it makes it harder to do the hauling.

Once the thief or thieves get onto the vehicle with the loot, it becomes harder to apprehend them since it may require a dangerous chase if police officers arrive at this point. You don't want anyone to get hurt particularly if the chase gets into the highway, possibly involving other motorists or pedestrians. All that trouble for some piece of scrap metal? It is better to get them at the next stage.

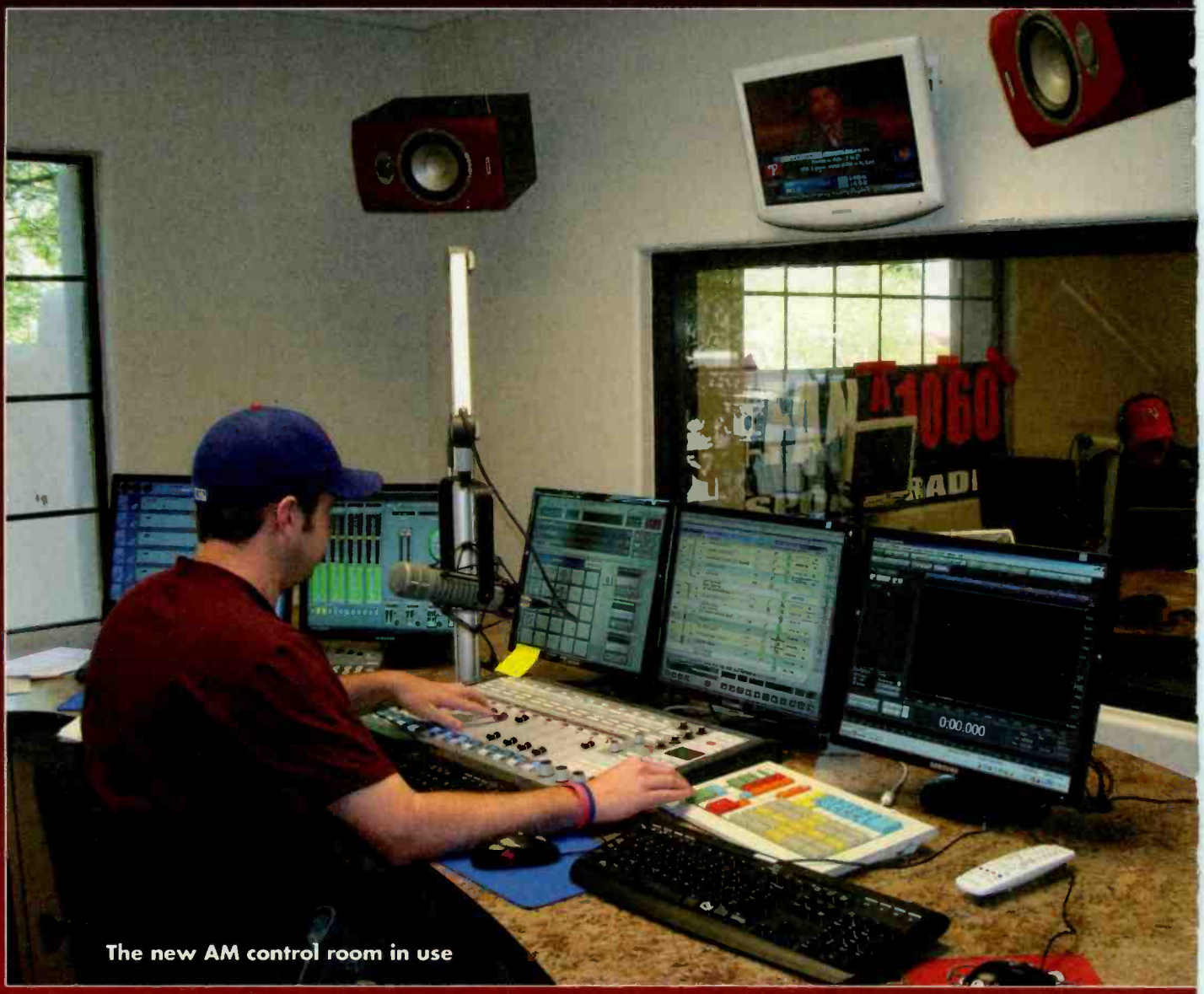
Marketing is where a thief turns into a businessman under whatever guise will get him through the deal. He may sell within the state where he stole the loot or he is already working with a junk shop under a previous arrangement. This is a stage in the process where partnership with local authorities is the only way to deal with the crime.

Working with local authorities, including lawmakers makes it harder for scrap metal shops to participate in transactions involving copper that may be stolen. You need to make previous arrangements with scrap metal shops with regards to their buying of copper metal that look like transmission line parts. These shops should be required to take photo IDs of sellers, inform the police and pay only with checks as preventive measures.

No one wants to be a victim of a theft that may cause the station thousands of dollars in replacement costs. This analysis should provide action steps that will suit your organization's loss prevention objectives and thereby secure your site.

Lintag is an RF engineer for Victory TV Network, Little Rock, AR.

The event-driven process chain can be seen online at RadioMagOnline.com



The new AM control room in use

The Studio Shuffle

Sandusky Radio updates from 20-year-old to state-of-the-art

By Jim Hibbard

As a system integrator, the designs I see for new and remodeled radio stations are as varied as the towns in which they exist. Most have the typical situation: A station is bought or sold, consolidation in a market, the need for more studios, or as was the case at Sandusky Radio, just time to get rid of 20-year-old equipment and décor.

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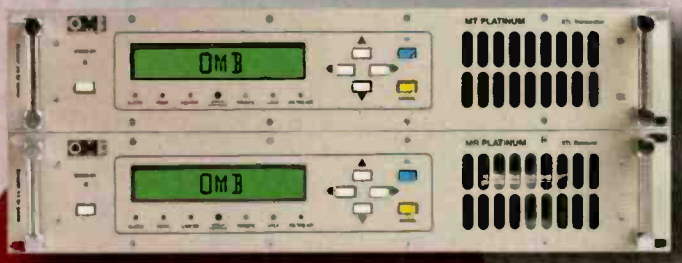
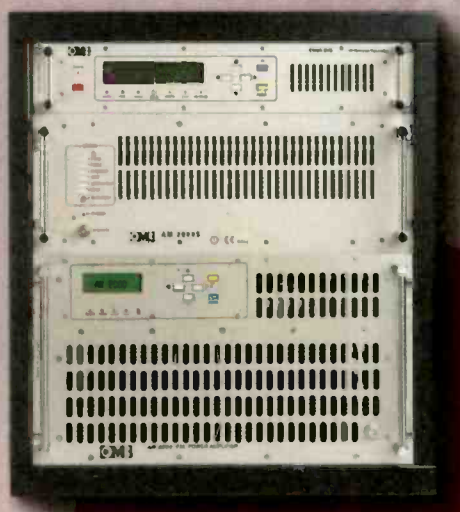


MT/MR PLATINUM >1GHz

is a high-performance Studio-to-Transmitter Link. It is made up of the 5W MT transmitter externally synthesized in 10MHz sub-bands with a step of 100KHz, and the MR double conversion receiver, that is externally synthesized, too. The MT is microprocessor controlled, and includes LCD display for the visualization of the most relevant transmission parameters (frequency (5-digit), forward and reflected power, modulation level), balanced Mono, Stereo (MPX). The MR receiver has the same visualization system as the transmitter. It includes balanced Mono and Stereo (MPX) outputs. Furthermore, the MT/MR Platinum STL includes a jumper in order to get a proper operation with digital signals.



EM 2000

is a 2000W FM transmitter made up of the EM 25 DIG exciter (or EM 20/30 exciter) and the AM 2000 FM amplifier. AM 2000 includes eight 300W high-efficiency MOSFET technology amplifying modules, fed by 2 independent switching power supplies, which are made to withstand the working conditions. The amplifying modules work independently thanks to a power combining structure that provides high isolation between them.

EM 10000

is a 10000W FM transmitter made up of the EM 250 COMPACT DIG exciter and three control units which combine the power of six AM 2000 FM amplifiers. AM 2000 includes eight 300W high-efficiency MOSFET technology amplifying modules, fed by 2 independent switching power supplies, which are made to withstand the working conditions. The amplifying modules works independently thanks to a power combining structure that provides high isolation between them.

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The KUPD air studio.

The stations had outgrown their outdated Tempe, AZ, facilities and wanted state-of-the-art studios for their AM talk station, AM 1060 The Fan, and their FM rock station, KUPD.

The chief engineer, Clayton Creekmore, already had a good idea of most of the equipment he wanted to use when he called me. By the time I arrived for a site survey at the facility near Phoenix, Creekmore, with help from Doug Tharp at SCMS, had compiled a preliminary equipment list. At that time, we discussed their needs in detail and finalized the list.

Creekmore and contract engineer Steve Blodgett had already built a studio (a future FM production room) that was being used as the FM air studio so that the former studio could be remodeled. This included gobbling up an old production room and moving two walls to make the existing TOC larger and the new FM studio spacious enough to accommodate a large morning show and musical guests that frequent the area.

Because we were remodeling most of the rooms, this project needed to be completed in three phases, so that no staff was displaced during construction. Philadelphia-based Studio Technology was hired to build custom furniture, and all the logistics were worked out to get everything to the building in Tempe, but to install in two separate time frames.

The starting point

The first step was to turn a small equipment closet into a temporary production room. We borrowed a small Mackie mixer from the promotion department, added a couple mic pre-amplifiers, an RE-20 mic on a bolt-on mic stand, an old Neumann dynamic on a boom mic stand and an Internet computer loaded with Cool Edit Pro. The new Tannoy R6 monitors were stacked on used cinder blocks we found in the side yard of the building (very college dorm). With the old RCS unit removed from the former production room, the little studio was open for business.

Then it was on to the rack room. After bolting the racks and ladder rack together, we loaded the Wheatstone E-Sat rack cages, installed the pre-made DB-25 cables and punched the tails to Krone blocks located on the back wall. Pacific Mobile Recorders prepared the cables prior to installation. The Telos Zephyrs, Comrex Access, Comrex POTS codecs, plus the satellite receivers were moved from the control rooms to a central location in the TOC. This equipment was now available to be shared studio-to-studio.

Setting up the infrastructure

All the audio trunk lines between the studios and TOC were pulled using stranded, shielded CAT-5e. This cable allowed us to run both analog and digital audio, without the need for 110*ohm* cable. We ran 12 pairs of CAT-3 for the telephones, (12) CAT-5e for network, and then (10) stranded, shielded CAT-5e, (40 pairs) to each room. There were also tielines between the AM talk studio and AM control room and talk studio and AM production that could be used as a backup control room. Even though there was a router, we still ran tielines. All the stranded CAT-5e was terminated to Krone blocks.

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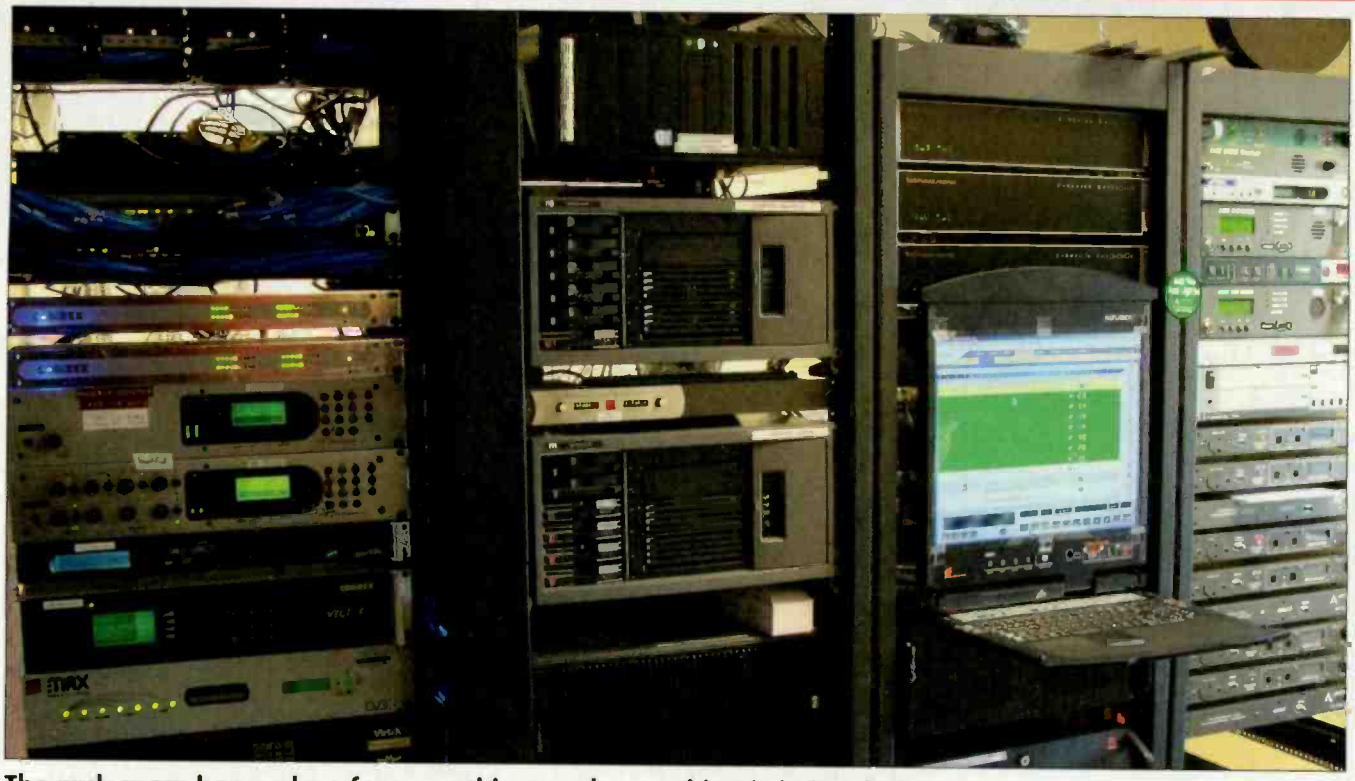


The rack room has a place for everything, and everything is in its place.

The RCS computers for all studios were to be installed in the TOC to eliminate the fan noise in the control rooms. We put 30' tails on the new Whirlwind XLR panels, installed the rack panels in the rear of a TOC rack, and brought the tails out to the Krone blocks on the back wall. This was used to manage the XLR pigtails from the RCS computers. We then cross-connected the audio for the RCS to the local control rooms via the tielines. Gefen EXP-5500 extenders were used for the monitors and keyboards.

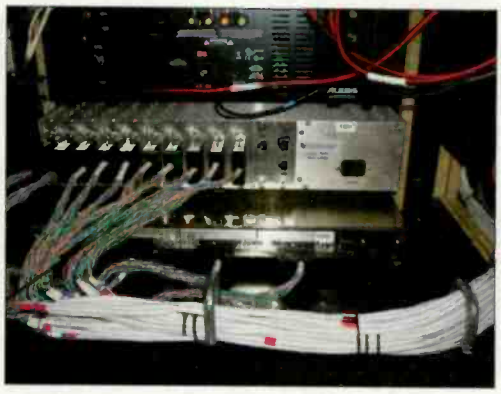
Studio time

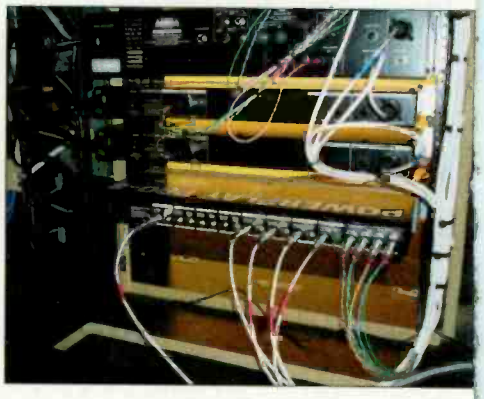
After all this preliminary work, the AM production studio was the first permanent studio to be completed. It would act as a temporary AM control room while that room was being built. The Studio Technology crew arrived onsite to install the furniture for that room. Upon their arrival, we laid out the console (Wheatstone E6), mic stands and headphone jacks. We decided not to use equipment turrets on top of the countertops, as Creekmore was looking for a sleek, clean look to the studios, so all of the equipment had to be installed in racks underneath.

While Studio Technology was working in the AM production room, Creekmore and I set up two E6 surfaces on card tables in the TOC, linked them with the E-Sat cages and got the network up and talking.

Once we knew everything was working together, the daunting task of naming all the sources and destinations (ins and outs) on the E6 system began. I started with a generic input list and made each studio the same as much as possible. (i.e. mics 1-4, CD 1, CD 2, RCS, phone, etc.) Same for the outputs. Program A output was always on the first output card in the cage, then control room, headphone, and so on.

Once all the source gear in the studios was wired, it was time to start configuring the E6 control surfaces.





A neat rack is an easy-to-access rack.

I had spent a lot of time with the air staff learning just what they do and how they do it. I knew it was going to be a big change when they got in the studio with a surface instead of a standard console. Since the E6 control surface is essentially a router, every source and destination was available in every control room, but this was way too overwhelming, plus it opened up possibilities for potential problems in dialing up the wrong source or destination. We limited the source visibility on each surface to only those sources needed by the respective stations.

Once the AM production room was finished and tested, it was time to train the AM staff to get them comfortable in their new home. Even though this was a temporary studio for them, the equipment in their new future studio would be the same.

Because the next rooms to be demolished were the existing AM control room and AM talk studio, the AM staff was left without a talk studio. Programming scheduled remote broadcasts for all local talk shows so they wouldn't need a studio during construction of this area. One of the hosts originated shows from various locations including his home (via Comrex) and even the sales staff kitchen on the second floor of the building.

At this point, I left while the construction crew completed the two rooms. The crew from Studio Technology and I returned to begin the second round of furniture and studio installation, which was much like the AM production room.

Equipment list

Alesis RA 500
Behringer HA8000
Comrex Access, Matrix, Stac-12
Electro-Voice RE-20
Focusrite Voice Master Pro
Fostex CD master recorder
Gepco wire and cable
Harris World Feed Panel
Marantz flash recorder
Middle Atlantic MRK-4031
Neutrik connectors
Pacific Mobile Recorders PMR-100 speaker hanger kit
RCS Master Control
SCMS equipment dealer
Studio Technology furniture
Tannoy R6
Tascam CD player
Telos Zephyr Xstream
Unicom stranded shielded CAT-5e
Wheatstone E-net 8, Evolution 6, Evolution satellite cages
Yellowtec Mika

The production studio is a scaled-down version of the other studios.

It should be noted here that when Studio Technology installs its custom furniture, I make sure I'm there with them. Together we plan the placement of the consoles, mic stands, headphone jacks, etc. as well as the Krone block placement inside the cabinets, and they do the cutting and drilling of their cabinets so everything is finished perfectly.

And finally, Phase 3

The KUPD-FM control room was much the same as the AM control room, but everything was on a larger scale, including the control surface mainframe (20 input), several microphones, and the room itself. The KUPD morning show is a live call-in show, along with music, while the rest of the day is a typical FM rock format with calls taken offline. We were able to configure the Wheatstone E6 to accommodate both types of shows by programming events: a snapshot of the console, one for the morning show and a second one for the rest of the day. This included program buses, mix minus assignments, and aux sends used for their remote broadcasts. In addition, we built

salvos (router presets) for the different remote gear the AM and FM studios shared.

Once the FM staff was moved into their new showcase studio, the previously remodeled FM production room that had housed the FM air staff during construction was converted back to a production room, which required resetting the source visibilities on the Wheatstone D75 six-channel router section, along with a few cross-connect changes.

Construction and scheduling being what it is, during installation of all these studios, an electrical crew was installing all new electrical in the remodeled and new rooms, as well as a new master UPS and new generator. Of course, we were tripping over one another but both crews managed to get their jobs done.

After the studios were completed, we measured the finished walls for Sound Soak, which added the final touches to the acoustics of each studio.

A project this large requires many heads and hands, including Kelly Parker (Wheatstone), Darrin Paley (Wheatstone), David Clark (TC Perfect), and contract engineer Steve Blodgett who was there for the entire three-month project. Also, VNC software which is proving invaluable as a tool in providing continuing customer support to Sandusky Radio.

The KUPD morning show in the new studio.

Hibbard is president of Pacific Mobile Recorders, a studio design and systems integrator, Sacramento, CA.

Photos of the construction in progress are posted at www.RadioMagOnline.com

Tips, tricks, hints and more

By John Landry, CSRE

Give me a break

Sometimes a difficult task has an easy solution. Recently a colleague spent hours working on what he thought was a software issue, only to find that the data cable was faulty. In this installation, the cable was quite long and had been pulled through the ceiling for about 70' through a few twists and turns. It was late and we were tired. And since it was only serial data, we opted to find the break, make a good splice and be done with it. The question was how to find the break.

A simple way to find a cable break is to use the regular telephone tone generator and the inductive amplifier (sniffer). By sliding the sniffer along the cable, the tones should be loudest where the break is. There are some drawbacks to this method: Sometimes the cable in question is in a conduit. Or it is one of thousands in a cable tray. Still other times an adjacent cable will have some signal that overpowers the tone generator.

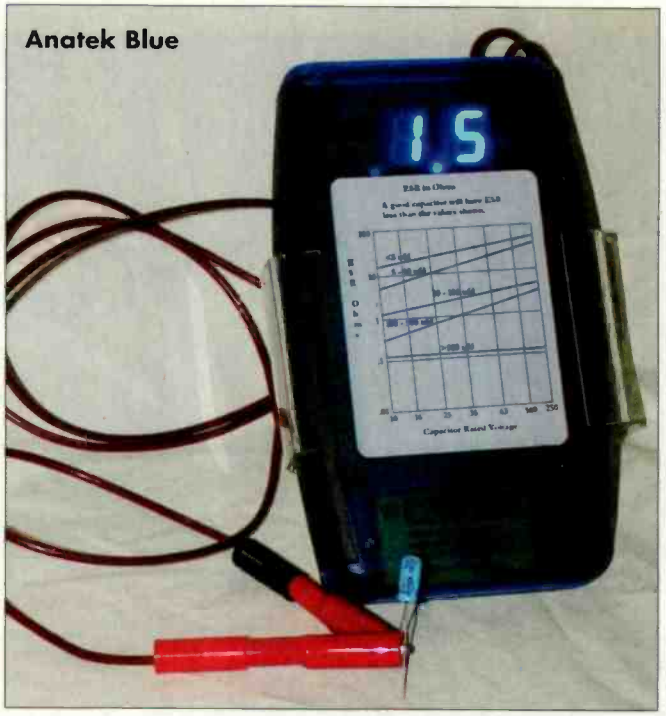
Some time ago, a fellow engineer at ABC Radio and I were trying to locate an intercom cable and were running into the same problem. We got around this problem by plugging the tone generator into a Crown D-75 amplifier, and connecting the bad cable to the speaker terminals. We tried this trick again with a Radio Shack speaker amplifier that was on hand and sure enough we were able to find the break in this data cable. Fifteen minutes later (with the addition of two DB-9 connectors) everything was working.

Sencore Z-meter

Look higher

Yet another cable search and repair technique is to replace the audio tone generator with an RF signal generator. Then a portable AM radio (FM will not work very well for this use) allows you to find the break. This method works especially well for long data and logic circuits, such as alarm wiring or the command wiring at an AM transmitter site (as long as the transmitter is off).

Anatek Blue



High tech cable testers are readily available. Many use time domain reflectometry and can measure overall cable length, velocity factor, give impedance and reactance values, as well as locate kinks, splices and breaks. For some applications, such as finding a break in the transmission line on a tower or underground, the TDR-based tester is the only option.

Another simple tester that is very valuable on the work bench is the Electronic Series Resistance (ESR) tester. Many failures in equipment made in the past 10 years can be traced to the failure of electrolytic capacitors. Typically as they age, the electranic series resistance of a large electrolytic capacitor will change, leading to heating and eventual failure (sometimes catastrophic).

ESR testers used to be very expensive. The Sencore Z-meter, one of the first, cost several hundred dollars, but it is still one of the best tools for evaluating capacitors. Sencore has a nice PDF on their website showing its capabilities: www.sencore.com/uploads/files/LC103gold.pdf.

However, a handy and affordable tester has been introduced by Anatek. The Anatek Blue will test a wide variety of capacitors and read out the ESR on a display. An ESR vs. capacitance graph is an the front panel for handy reference. www.anatekcorp.com/blueesr.htm.

Landry is an audio maintenance engineer at CBS Radio/ Westwood One, New York.

Do you have a tech tip? Send it to us at radio@RadioMagOnline.com

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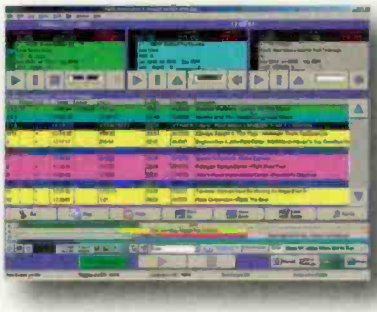

Simian - radio automation and digital play out system

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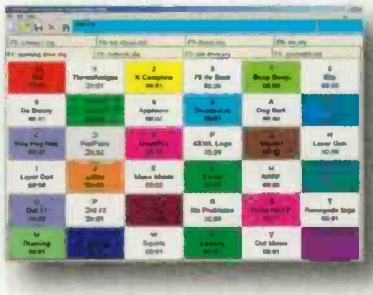

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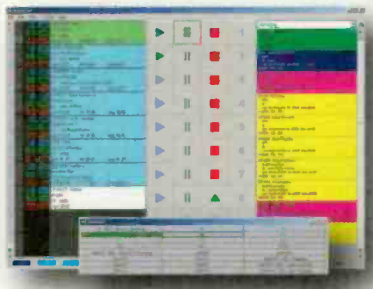

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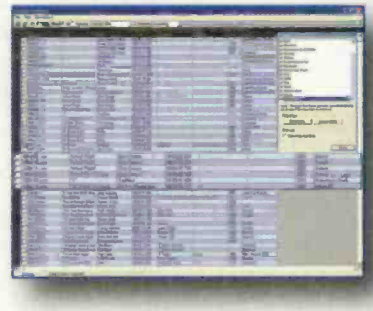

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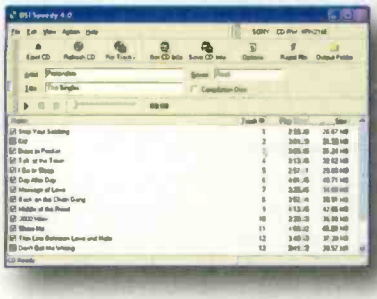

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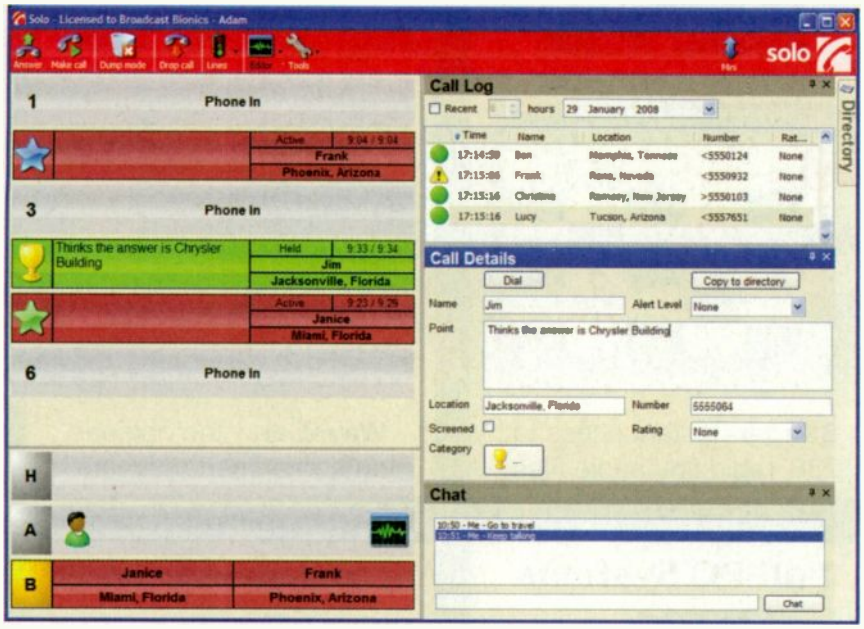


Broadcast Bionics
Phonebox Solo

By Geoff Peacock

While rebuilding a studio for our AM talk station I decided to investigate options to replace our aging Gentner TS612 studio phone system. It had served us well but it was time for a change. I had recently upgraded the office phone system to a Linux-based VoIP phone system using the open source software package Asterisk. I was looking to use a spare T1 port on the Asterisk system to use excess capability on our incoming PRI lines and eliminate some POTS lines in the process. I happened upon a new product announcement of a software-based VoIP product from Broadcast Bionics. The Phonebox Solo product seemed almost too good to be true.

The Solo product is a smaller version of the company's Phonebox 2 product, a software-based call handling and caller information system. Solo turns the studio PC and sound card into a dual hybrid with caller recording and playback, caller ID and caller tracking. It also has the Buddy call screener option that allows caller flagging, comments and an integrated chat screen.

Performance at a glance

- Software-based call system
- Uses existing studio PC
- Displays on-screen details
- Optional integrated call screener program
- Call recording and editing
- GPI capable
- Four and eight-line systems available

I didn't have to tie up a T1 port on our Asterisk system because the Solo just looks like another telephone extension to the PBX. Integrating the Solo and Buddy system was as easy as setting up the studio extensions in Asterisk, configuring Solo as an SIP-based phone and adding a USB headset to the Buddy PC for call screener connectivity. I had to configure the extension the Asterisk points incoming calls to, the user name and a password, if any, and the Asterisk PBX IP address. These settings are accessed from the Solo toolbar along with audio card settings, license management and other general settings. Solo can connect to any industry-standard SIP gateway or a PBX that supports SIP. SIP gateways are available for POTS, ISDN or PRI services.

In our installation, the studio PC is an HP Compaq DC7100 and is also used for Internet access, RCS News Builder and has a TV/DVR card installed for cable TV access, so the Phonebox installation does not require a dedicated computer.

Inside the system

Our system uses an Audio Science ASI5000 audio card for the caller audio and the PC on board sound card for on-hold audio. We chose that card because of its low latency. Two of the outputs are used to feed the console, one for callers and the second for a VIP line. Either output can be used to conference multiple callers. The additional audio outputs are used for the TV card, Internet audio and News Builder.

On-screen timers show how long a caller has been on hold, ringing or on-air. Calls are answered with the mouse or keyboard function keys. The call screener can mark calls with preset category icons, ratings, alerts and comments. Each caller's information is also stored in an SQL database for tracking. Outgoing calls are made by clicking on an open line and using

the on screen dialer. There is currently no way to send DTMF once the call is established to access voicemail or automated attendant menus, but that feature is being added in the next version (to be shown at the 2009 NAB Show). An optional handset connected to the Solo PC could be used for those situations.

Our experience overall has been positive. Broadcast Bionics tech support has been helpful and responsive. Setup took minutes, and in the rare instance of a system crash, a built-in e-mail program can send the captured log and error files to the company's tech support email. Documentation is online and up to date.

I'm the engineer, so the real test is to ask the system users. Morning show host Chris Smith likes that it works very well with our dual screen setup. "As a matter of fact," he said, "the program works so well I don't give it a second thought".

Call screener Trey Iane finds the caller database function and chat screen useful but wishes the chat screen had the ability to change font sizes. I am told this will be available in an upcomgin release. The only feature I would like added would be DTMF capability while connected so our talent could access their voicemail for editing and storage while in the studio. DTMF is available on the big brother Phonebox product. I would also like to see a concurrent user license for the buddy system rather than a per-machine license so a call screener could easily be moved to different PC locations.

Broadcast Bionics

P 888-363-4844

W www.phonebox.com

E info@phonebox.com

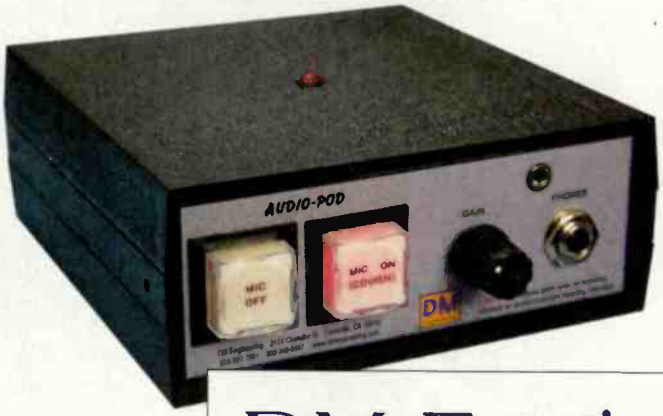
A screenshot showing audio editing capabilities.

Peacock is chief engineer for Clear Channel Radio, Mobile, AL, and Pensacola, FL.

Editor's note: Field Reports are an exclusive *Radio* magazine feature for radio broadcasters. Each report is prepared by well-qualified staff at a radio station, production facility or consulting company.

These reports are performed by the industry, for the industry. Manufacturer support is limited to providing loan equipment and to aiding the author if requested.

It is the responsibility of *Radio* magazine to publish the results of any device tested, positive or negative. No report should be considered an endorsement or disapproval by *Radio* magazine.



DM Engineering Audio-Pod

By Mark Bohach

Engineers are always looking for problem solvers. If you're responsible for engineering remote broadcasts, the Audio-Pod from DM Engineering is one such problem solver.

As our ability to deliver high quality remote broadcasts from just about anywhere has developed, morning shows, sports discussion shows, political talk shows and the like are moving out of the studio and into the field. And while these are technically remote broadcasts, show hosts and their guests need the same amenities they have in the studio. Engineers meanwhile are more pressed for time and looking for ways to provide those amenities while simplifying and speeding the remote setup. That's where the Audio-Pod system really shines.

The Audio-Pod system includes up to four Audio-Pod modules and a power supply capable of powering four modules. Power hookup to each module is via standard eight-pin PS2 style cables and 10' cables were supplied.

The Audio-Pod system combines several tools into a sturdy plastic case. The microphone section includes a low-noise preamplifier with a rear-panel variable gain control that can be adjusted to any level from microphone to line output. Connection to the microphone input and output is via standard XLR connectors. There is also on-board switch-selectable phantom power. Large LED-lighted on and off switches are included with cough-mute logic integrated into the microphone on button. A small red LED is mounted on the top of the unit to indicate when the microphone is turned on. There is also rear panel output logic to drive external indicators. The microphone's on/off functions can also be remotely controlled.

The integrated headphone amplifier contains some interesting and useful features. First, the headphone gain is controlled by a voltage-controlled amplifier (VCA) and includes a rear-panel trimpot to set the maximum allowable gain. A small pushbutton switch is included to select between low and high impedance headphones. Another switch inverts the phase of the headphone feed 180 degrees. This is useful where bone conduction phase cancellation is an issue.

The headphone output is via standard ¼" and 3.5mm jacks located on the front panel. On my model, the headphone feed input was connected via a Euro style terminal on the rear panel.

Performance at a glance

Mic preamp and headphone amp

Remote control of all functions

Phantom powered mic input

¼" and 3.5 mm headphone jacks

VCA-controlled headphone amplifier

Use on remote

WLOH presents a weekly one-hour talk show from a different business location each week. We use a POTS codec for these broadcasts and while our audio quality is good, each location presents its challenges. I have been using four microphones fed directly into a mixer with a built-in compressor. I decided to integrate the Audio-Pod system into this setup.

I adjusted the Audio-Pod's microphone gain for a -6dB output to feed the mixer's line inputs. For an average voice, this gave me a 3/4 fader position with plenty of gain available for the soft talkers. The Audio-Pod instruction manual mentions that the FET switching can be overloaded if excessive gain is used. I had no problems at all even when I turned up the preamplifier output to 0dB. Overall the sound quality of the microphone preamplifier is very good.

I fed the show host and producer's headphone input with a mix of the audio return (mix minus/IFB) from the station and the local microphone mixer. I fed the other two headphone inputs with the local microphone mix. The results were very good: The show host likes being able to control her own mic and headphone volume, and guests aren't distracted by the IFB audio. The red LED tally lights allow the producer to know which microphones are on or off.

Other applications

While I found the Audio-Pod to be a natural fit for remote broadcast applications, engineers will find this system useful in permanent installations where microphones and headphones are needed but not a complete audio console, such as a news-announce booth or a voice-tracking station. This would also be a very handy way to add on/off and cough switching to existing studios.

While preparing this review, I had the opportunity to discuss some ideas with Dave Mandelbaum of DM Engineering. First, I asked about the bleed-through issue mentioned in the manual. He responded that under normal conditions this is not a problem. They only mentioned it because there is always someone who wants to get +20dB out of an amplifier.

I also inquired about the possibility of producing a version of the Audio-Pod without a microphone preamplifier for users that employ external microphone processors with a built-in preamp. I was told that the microphone preamplifier would be optional.

Regarding the headphone input connection, I told Mandelbaum that I thought the Euro style block takes away from the quick setup appeal of the Audio-Pod. My units were pre-production units, and he informed me that production units would have a 3.5mm input jack for the headphone input along with the screwdriver connection.

Mandelbaum also mentioned that optional mounting brackets would be offered for tabletop mounting that would hold the Audio-Pod module at an angle. Also, the microphone on and off switches can optionally be located on the top case of the module.

If you are looking for a way to improve your remote broadcast setup and make your show hosts happy, the Audio-Pod is a handy and cost-effective problem solver. DM Engineering has combined many of the studio features we take for granted and made them available virtually anywhere.

Bohach is co-owner/general manager of the WLOH Radio company, Lancaster, OH.

DM Engineering

P 800-249-0487

W www.dmengineering.com

E info@dmengineering.com

Editor's note: Field Reports are an exclusive *Radio* magazine feature for radio broadcasters. Each report is prepared by well-qualified staff at a radio station, production facility or consulting company.

These reports are performed by the industry, for the industry. Manufacturer support is limited to providing loan equipment and to aiding the author if requested.

It is the responsibility of *Radio* magazine to publish the results of any device tested, positive or negative. No report should be considered an endorsement or disapproval by *Radio* magazine.

NEW PRODUCTS

www.RadioMagOnline.com

by Erin Shipps, associate editor

Portable recorder
Yamaha

Pocketrack CX: Yamaha is now shipping its new Pocketrak CX. Yamaha's previous portable recorder offering is the Pocketrak 2G, an ultra-slim recorder with an omni-directional mic. The Pocketrak CX adds an upgraded stereo microphone system and expanded memory capability. It supports a variety of different recording formats, an onboard speaker, stand adapter, and Cubase AI DAW software. The CX then adds a larger AA re-chargeable battery built in to allow up to 40 hours of continuous recording and playback, a 90-degree X-Y microphone and Micro SD card capability. A 2GB card is included.

714-522-9000
www.yamaha.com/proaudio
infostation@yamaha.com

HD production elements
Blastwave FX

Titlewave: A compilation of Blastwave FX's six imaging elements libraries, including 10,000 stereo and 1,300 5.1 surround production elements, Titlewave gives professionals everything they need to accent, drive and punch up their productions. Categories include: 5.1 SSFX, ascends, beats, beds, choppers, compositions, descends, data FX, feedbacks, glitches, hits, lasers, logos, noise, shimmers, static, sweepers, tape rewind and tuners. Titlewave contains 240GB of HD sound effects and comes pre-installed on a premium hard drive.

www.blastwavefx.com
info@blastwavesfx.com

Wireless mic system
AKG

WMS 4500: Like the WMS 4000, the WMS 4500 offers a wide range of available components for operational versatility, but has been modified for more durable use and greater flexibility with wireless applications. The WMS 4500 is available in two new frequency bands: Band 7 (500-530MHz) and Band 8 (570-600MHz) that offer more options for multi-channel systems in today's crowded RF environment. The system's components, the SR4500 receiver unit, the PT4500 emitter, and the HT4500 handheld microphone unit all offer new features and sleek new construction.

818-920-3212; www.akg.com; akgusa@harman.com

Audio level processing system
Audessence

Pod Blaster: This entry-level digital audio processor is designed for podcasters, broadcast studios and program production applications, but can also be used for dual-microphone level control. It features analog and digital inputs and outputs, GUI set-up via USB and nine pre-set audio profiles. The Pod Blaster produces smooth sound, ends listener annoyance and tune-out due to sloppy levels, allows presenters to concentrate on the content, improves audibility and clarity of the program and eliminates overload distortion.

+44 1444 880 444; www.audessence.com

Portable Wi-fi Internet radio
C. Crane Company

Revo Pico: This portable Wi-fi radio runs nearly eight hours on just two hours of charging. The splash-resistant radio has good audio for its size (2.1 pounds), and also features a built-in FM radio, stereo headphone jack and an audio-in/HP jack. Choose between several equalizer settings to adjust the audio tone to personal preference. Includes user manual, remote control and power/charging cord.

800-522-8863; www.ccrane.com
ccraneco@aol.com

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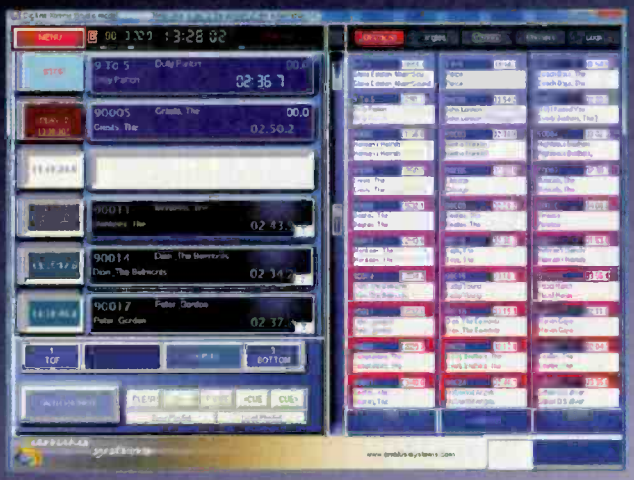

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- 2 players for Air & Cue

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www.arrakis-systems.com 970-461-0730

AM broadcast processor
BW Broadcast

DSPX Mini-AM: BW Broadcast has developed an AM version of its exceedingly popular entry-level DSPX Mini processor. The DSPX Mini-AM packs four bands of AGC, four bands of limiting and an anti-aliased clipper into 1RU. Other features include adjustable low-pass filtering, high-frequency equalization, asymmetrical clipping, low-frequency transmitter tilt compensation and a tone generator.

888-866-1671; www.broadcastwarehouse.com; info@broadcastwarehouse.com

Relay changeover system
Broadcast Devices

8/16 Channel A/B Switcher: This product allows for A-B switching of multiple audio, AC/DC control or logic functions. The 8/16 has 16 sets of form C contacts that can switch multiple stereo audio pairs, control signals or just about any signal desired. The 8/16 can handle studio or facility changeover providing complete backup redundancy. The unit features front panel control and logic and simple momentary remote control and remote position status. There are additional remote control outputs that can be connected to additional units to create a larger switcher if desired. The 8/16 series switchers are housed in an all-steel chassis and use a switching power supply for minimal hum pickup. All connections to and from the 8/16 series are made via standard DB-25 connectors. Commonly available break out cables can be used to connect between DB-25 and XLR connectors. Cable assemblies are also available from BDI.

914-737-5032
www.broadcast-devices.com
sales@broadcast-devices.com

Analog telephone hybrid
Axel Technology

Boxtel: Boxtel is a very small analog telephone hybrid that provides automatic line compensation, transformer-balanced audio connections and local and remote control capabilities. Boxtel does not require ac main voltage; power comes directly from the telephone line.

+39 51 736555
www.axeltechnology.com
info@axeltechnology.com

NEW PRODUCTS

Multi-screen video extenders Adder Technology

Adder Link X50-MS: The Adder Link X50-MS is a link-transparent USB and high performance video extender that delivers industry leading video quality at up to 1920x1200 together with 44.1kHz digital stereo audio over a single CATx cable. It enables USB peripherals such as keyboards, mice and graphics tablets to be extended up to 165' from the computer. The Adder Link X50-MS adds a second video and transparent, high speed RS232 connection, up to baud rates of 19200. The extra functionality allows for the extension of computers with dual monitors commonly used in a variety of KVM extension scenarios including industrial applications.

888-932-3337
www.addertec.com
enquiry@addertec.com

UPGRADES and UPDATES

Vorsis released software version v1 3.0 for the company's AP2000 and FM2000 processors. (www.vorsis.com)... **V-Soft** has recently has acquired a new 30 sec. terrain database to use with FM Commander, Probe 3 and other V-Soft programs that access terrain. (www.v-soft.com)...**Logitek Electronic Systems** has slated the sale of the first Jetstream IP-based console system. KFCF Radio, Fresno Free College Foundation, a Pacifica affiliate station based in Fresno, CA, ordered a Jetstream Mini router and a Remora control surface. (www.logitekaudio.com) ...**Yangaroo** has integrated its Digital Media Distribution System (DMDS) with Powergold, the music scheduling software produced by Micropower. (www.powergold.com, www.yangaroo.com)

RF mapping application
Softwright

Radio Path Analysis: Softwright, developers of the Terrain Analysis Package Software (TAP) now provide the capability to visually see the details of a radio path analysis or RF coverage map using Google Earth. The application can be used to visualize virtually all types of radio system paths. Softwright has developed a way of graphically modeling not only the portion of the Fresnel zone that lies below the actual line-of-sight path, but also on both sides of the exact path, where additional path losses are created. Up to now this degradation would have been undetected. With this newly designed RF modeling tool, the engineer can fly an entire path and look at the areas that would cause signal deterioration down the entire path including the side lobes of the protected Fresnel zone. Only when one knows precisely where these obstructed locations are, can an engineer proceed with strategic solutions to seek to eliminate locations where the signal is unreliable.

303-344-5486; www.softwright.com; sales@softwright.com

Ambisonic soundfield mic
Core Sound

Tetramic: Based on the principles of Ambisonic recording, Tetramic allows the placement of a single tetrahedral microphone in a sound field, recording of four channels of audio in "A" format, transform them using software into "B" format (W, X, Y and Z), and later interpret those four channels to essentially any single-point configuration of microphones. The four channels of "B" format can also be interpreted into almost any playback format.

888-937-6832; www.core-sound.com

Unisex XLR
Neutrik

Convertcon: Convertcon is a new three-pin male and female cable connector in a single housing. It is available with black chrome housing and gold contacts. By sliding the housing back and forth, Convertcon is transformed from a male to female connector. This new male/female cable end XLR allows for use of one connector, as it can mate with either a male or female three-pin XLR. Convertcon shares some of the features and benefits of Neutrik's best-selling XLR XX series. It also features an improved chuck type strain relief that provides higher pull-out force and makes assembly easier and faster.

732-901-9488; www.neutrik.com
info@neutrikusa.com

Power conditioners
Furman Sound

Classic Series: Furman's Classic Series offers all the technologies of the Series II line, including Linear Filtering Technology (LIFT), Series Multi-Stage Protection (SMP) for the highest level of surge protection available, and automatic Extreme Voltage Shutdown (EVS) to protect connected equipment from overvoltage conditions. For rack illumination, the units feature Smooth Track LED rack lights and a rear-panel BNC connector to power any standard gooseneck lamp. The Classic Series includes three 15-amp models, the PL-8C, PL-PLUS C, and PL-PLUS DMC, along with the two 20-amp Pro models, the PL-PRO C and PL-PRO DMC. All units in the Classic Series feature nine outlets with two rear-panel isolated outlet banks to lower intercomponent noise interference, along with a Protection OK indicator on the front panel to alert users to the operational status of the unit. To accommodate bulky transformers, the power management solutions feature wall-wart spacing.

707-763-1010; www.furmansound.com
info@furmansound.com

CD burning software
Yangaroo

DMDS Burn: DMDS Burn brings watermarked CD burning to the desktop. Created in response to client needs, DMDS allows clients to use their DMDS Agent to produce audio CDs at their desktop that are individually watermarked with any data the user specifies. The entire process can be done in a few minutes, with the watermark data embedded into a CD quality audio file. Currently, record labels either have to purchase very expensive watermark burning hardware, or ship the tracks out to an external service to complete this task. Both of these alternatives are inefficient and time consuming.

905-763-3553; www.musicrypt.com

Coupled combiner
Myat

IBOC Lo-loss: Myat's patent-pending technology combines FM and digital signals in a way that others said couldn't be done. It uses filters to combine digital and analog transmitters efficiently to create an IBOC signal for transmission. This method is significantly more efficient than other high-level combining techniques currently in use. Applications include use with the proposed digital sideband power increase. Up to 86 percent efficiency for digital insertion is possible. It is available for primary and extended mode IBOC operation.

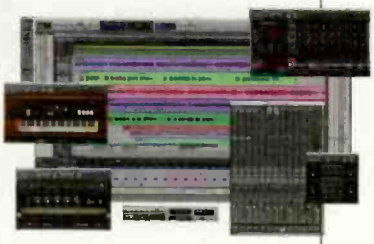
201-767-5380; www.myat.com; sales@myat.com

Condenser vocal mic
Sennheiser Electronic

Evolution E 965: Not only is the Evolution E 965 microphone the company's flagship product within the Evolution range, it is also its first large-diaphragm true condenser microphone. A wide frequency range, extensive dynamics, and extremely low distortion are among the mic's features. The E 965 also features a dual-diaphragm transducer, which allows users to switch between cardioid and super-cardioid pick-up patterns. When the ambient volume is loud the user can select the tighter pattern. For high sound pressure levels, users can switch on a pre-attenuation of -10dB. A low-cut filter reduces impact noise and reduces the low-frequency overemphasis during close miking. Handling noise is efficiently reduced by the shock-mount design, while an integrated pop shield and windshield make the microphone very user-friendly.

860-434-9190; www.sennheiserusa.com
lit@sennheiserusa.com

Audio editing software
Digidesign



Protools 8: Completely updated with a new user interface, more than 70 plug-ins and virtual instruments, fully-integrated MIDI and score editors, and an expanded array of editing features, the new Pro Tools 8 software provides everything users need to create, compose, score, record, mix, produce and broadcast all in one application. At first glance, the most noticeable new feature in Pro Tools 8 is its redesigned user interface, which frames an expanded set of creative tools and a host of features. Enhancements, such as dockable Editor windows and a configurable Edit window toolbar, make it easier to navigate than ever before.

800-333-2137; www.digidesign.com
prodinfo@digidesign.com

Advanced Wattchman monitor/alarm
Coaxial Dynamics

81094: The Model 81094 is the first in a series of Internet/intranet accessible Advanced Wattchman wattmeter/alarm systems that will monitor forward and reflected power in two transmission lines with only one controller. The front-panel display shows power on both systems simultaneously. Operating conditions may also be displayed on a PC from any location on the Internet/intranet. The Model 81094 is designed to work with a series of specialized line sections from 7/8" to 6 1/8" and standard Coaxial Dynamics elements for analog or digital applications. Elements are available from 1W to 100kW and from 2MHz to 2.3GHz.

800-COAXIAL; www.coaxial.com
sales@coaxial.com

Floor-mounted connector boxes

Rapcohorizon

Floor Pocket Box/Mini Floor Boxes: The Floor Pocket Box is designed for permanent installations requiring multiple microphone, speaker and/or video connectors. Available insert plates include a 5" plate that can accommodate up to eight connectors, and the 8" plate, which holds up to 16 connectors. The mounting flange and lid are fabricated from sturdy 3/16" steel with a black finish. The Mini Floor Box is intended for installations requiring up to only four connectors for microphone, speaker and/or video applications. This product is additionally perfect in consort with the larger Floor Pocket Box to add connection accessibility to a remote area of a larger installation. The Mini Floor Box is constructed from 16-gauge steel with a black finish and comes in only a 5" depth version. Standard size electrical conduit knockouts are provided left and right for easy cable insertion and strain relief. The Mini Floor Box ships with a blank insert plate that can be user configured. Custom factory configurations are also available.

573-651-6500; www.rapcohorizon.com; info@rapcohorizon.com

Transmitter power increase

Nautel

HD Power Boost: Nautel's new HD Radio technology, HD Power Boost, allows broadcasters to increase digital transmitter power while improving efficiency. Unlike traditional FM transmission, the IBOC signal presents the broadcast transmitter with a widely varying signal envelope. The peak power compared to the average power in the signal is defined as the peak-to-average-power ratio (PAPR). By using advanced algorithms, peak power requirements are reduced, allowing new Nautel transmitters to transmit higher digital power levels while at the same time achieving greater transmitter efficiency. This effect is even more pronounced at higher digital carrier injection levels.

207-947-8200; www.nautel.com
info@nautel.com

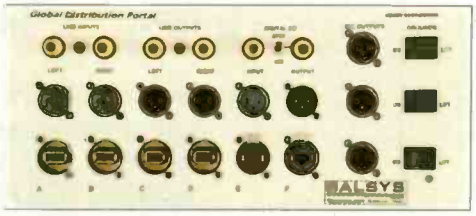
Anti-slip cable pad
Middle Atlantic Products

ASP-OWP: The ASP-OWP Series anti-slip cable pads are designed to improve cable management and performance in broadcast applications. When cable is dropped in from the top of racks and enclosures where hook-and-loop or wire-tie-type fasteners are used, the weight of the cable creates a significant and often problematic strain on the tie, connection and horizontal to vertical transition points. The pads have been designed to remove close to 40 percent of the cable weight off the tie point, while reducing pull tension where cables are fastened to meet or exceed cable manufacturers' requirements. These pads eliminate the need to over tighten the cable fastener to the point where it deforms or kinks the cables, an issue that can interrupt critical broadcast transmissions.

973-839-1011; www.middleatlantic.com
sales@middleatlantic.com

Distribution panel
Balsys Technology Group

Global Distribution Portal: Balsys Technology Group's Global Distribution Portal panel provides convenient two-way interface between any studio/central audio system and external equipment. Active circuitry supports both analog and digital stereo I/O in both professional and consumer formats, utilizing the most commonly encountered audio connectors. Three mono summed output feeds at mic level are provided, each with ground-lift switches, and are spaced to permit use of wireless transmitters. Also included are six utility feed-through connectors. Standard configuration is two each USB, Fire Wire, and RJ-45, but all are interchangeable and can easily be field configured as desired. The unit is 3RU in height, and intended for mounting in walls or broadcast furniture. Rackmount adaptors are optionally available.



407-656-3719; www.balsys.com; balsysflorida@cs.com

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Contributor Pro-file

Meet the professionals who write for *Radio* magazine.
This month:
Field Report, page 28.

Geoff Peacock
Chief Engineer
Clear Channel
Mobile, AL,
& Pensacola, FL

Peacock's broadcast career started in 1973 as a weekend overnight board operator, but he soon discovered a knack for engineering. His first engineering position was with Bristol Broadcasting WKAZ-AM and WQBE-FM in Charleston, WV.

After a stint with a non-profit organization bringing the Internet to Mobile, he returned to radio in 1996 to work for Capitol Broadcasting, which was later acquired by Clear Channel.

Radio
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Written by radio professionals
Written for radio professionals

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ADVERTISER INDEX

This index is a service to readers. Every effort is made to ensure accuracy, but *Radio* magazine cannot assume responsibility for errors or omissions.

by Erin Shipps, associate editor

That was then

Here are a few photos from Johnny Beerling's new book, *Radio 1 – The Inside Scene*. Beerling worked inside Radio 1 from its beginning and was the boss from 1985 to 1993. He joined the BBC in 1957 as a technical operator, then studio manager, before becoming a producer. Ten years later, the closing of the pirate stations led the BBC to set up Radio 1.

Radio 1 DJ Christmas lunch

In 1973 Beerling conceived and launched the *Radio 1 Roadshow*, which ran for 27 years, growing from a small caravan operation on Newquay Beach to an 80' mobile stage show housed in a series of articulated trucks, supported by a giant outdoor TV display.

Steve Wright and producer Malcolm Brown at Radio 1 week in Scotland.

In 1985 he became controller of the Radio 1 Network. Under his control Radio 1 was recognized as one of the leading music broadcasting stations in the world, with a weekly audience of more than 25 million listeners. In 1992 Beerling was the first non-broadcaster to receive the Ferguson Award for an Outstanding Contribution to Music Radio from The Radio Academy and in 1993 was elected president of the Television and Radio Industry Club of Great Britain. More recently he was made a Fellow of The Radio Academy.

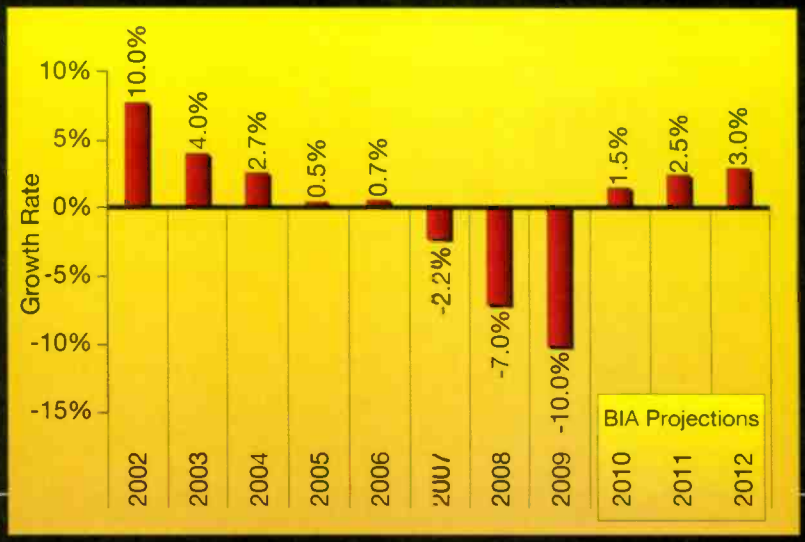
To purchase *Radio 1 – The Inside Scene*, visit Beerling's website at www.johnnybeerling.com.

John Peel, Producer Mike Hawkes and Beerling in front of the Kremlin while broadcasting a week from Russia.

Sample and Hold

Radio Industry Revenues Continue to Slide Downward

By the end of 2008 the radio industry will have experienced its second year of negative growth by tripling station revenue losses to -7 percent, according to the estimates of BIA Advisory Services. BIA's fourth edition of the quarterly *Investing in Radio Market Report* also reports that 641 stations have been sold in transactions valued at $698 million from January through October 2008. BIA estimates radio station revenues will hit $16.7 billion in 2008, the lowest in more than five years and the beginning of a downward spiral that will go as low as $15 billion next year before possibly rebounding in the next decade. The chart shows historic and projected radio revenue growths in Arbitron markets from 2002 through 2012, including BIA's expectations for the coming four years. Read more at www.bia.com/081202_2008IIRadio4thEdition.asp.



Source: BIA's Media Access Pro, BIA Advisory Services

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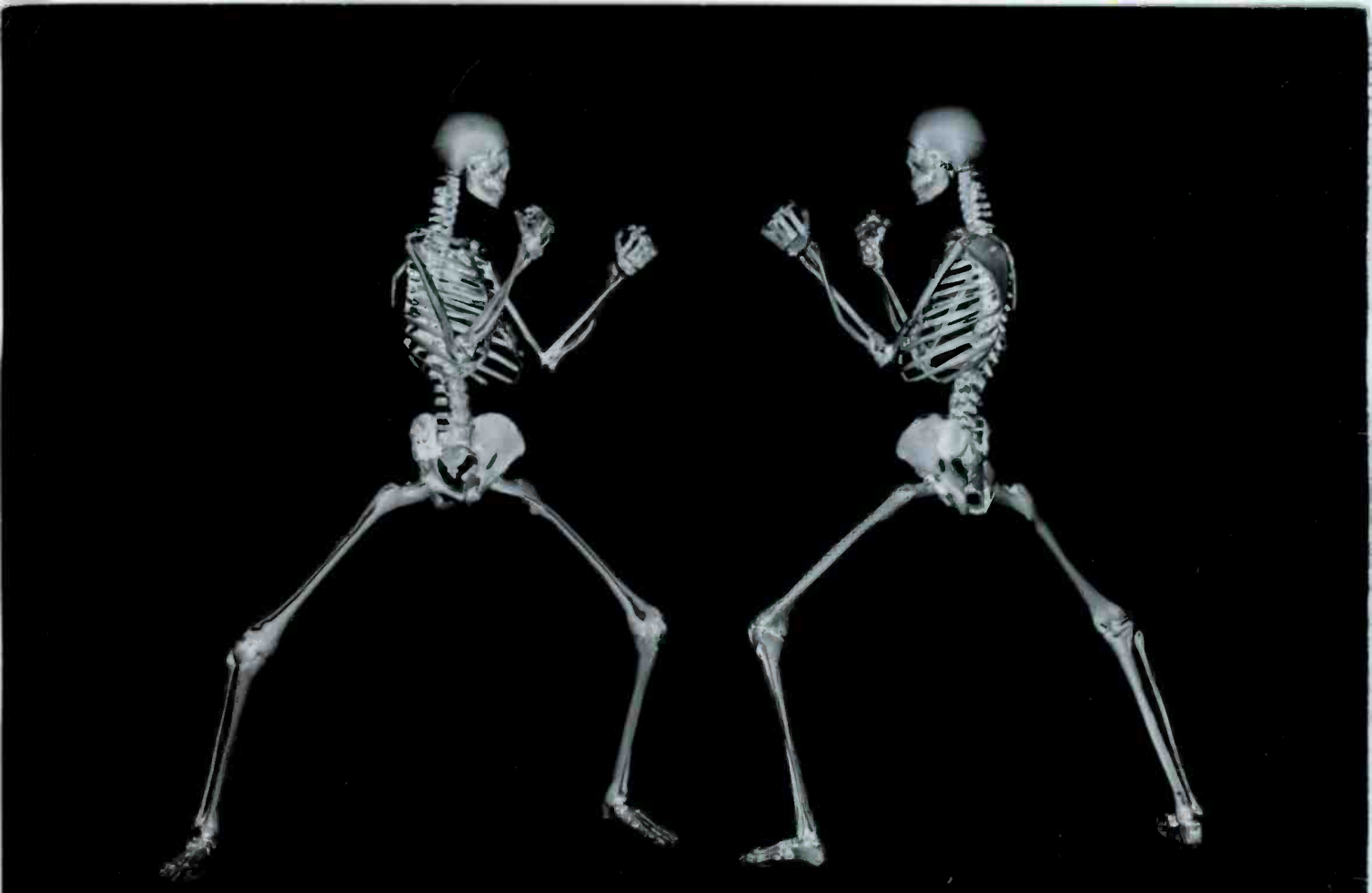

While the two usual suspects slugged it out in the loudness war, we quietly developed the ultimate weapon for the REAL challenge:

WINNING THE RATINGS WAR

Basic loudness is simply not the draw it was in the last century. Today, with so many options for audio delivery, getting and keeping listeners means you need to SOUND GREAT across all media. That's why we developed VORSIS – to deliver clean compelling audio that cuts through the muck without fatiguing those all-important ears.

With Vorsis, we rethought the whole process – developing new tools to let your station deliver the best possible sound to each and every one of those 20th century radios, not to mention the great new standard and hi-def radios being produced in THIS century.

With Vorsis, you're never stuck with your processor's signature sound. You have a full toolset to create your own magnificent sonic signature – one your listeners can key into just by scanning the dial. For the first time, you have the capabilities of bringing true fidelity to FM, AM, and HD/DAB radio.

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

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