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Clear Channel Radio's Emergency Response team handles a situation in Dickinson, N.D.

Bill Barney, Clear Channel Radio

For RW's story about the incident, see http://tinyurl.com/rwdickinson.

Sept. 11, 2001, Raised Awareness of Redundancy

But a Decade Later, Cost Remains a Real Obstacle to Backup Infrastructure

BY RANDY J. STINE

WASHINGTON — Most broadcasters understand now, even if they didn't before 9/11, that tragedy can strike anywhere. The attacks 10 years ago highlighted the need for resiliency and redundancy in broadcast operations and facilities.

The terrorists who struck the World Trade Center took with them a massive amount of broadcast infrastructure. The stations that lost rooftop transmission facilities struggled to return to the air in the days after the tragedy. From that experience came a heightened sense of awareness among broadcasters about redundancy in the management and design of systems, observers say.

However, the creation of truly redundant major backup systems can be a costly and difficult management challenge.

(continued on page 10)

FCC Is Asked to Okay CAP Converters

Some Also Push It To Accept FEMA Conformance Testing

BY LESLIE STIMSON

WASHINGTON — Comments to the FCC indicate that several equipment-related questions remained unsettled in August, as the commission considered changes to Part 11 rules governing EAS.

Those changes are planned to support the move toward emergency message delivery using a Common Alerting Protocol. CAP is a data interchange protocol developed by the emergency management community; it is used to distribute all-hazard safety notifications and emergency warning information. It allows a warning message to be disseminated simultaneously over many warning systems to many applications.

Proponents say it is an improvement over legacy EAS, allowing for better delivery, higher-fidelity audio, text-to-speech when audio is not available, matching audio and text, and other benefits.

Based on the filed comments, opponents generally are not against the implementation but object to its timing

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2011 Radio Regulatory Fees Rise

Average Fees Go Up $25–$300 Depending on Station Class, Population Served

FY 2011 RADIO STATION REGULATORY FEES						
Population Served	AM Class A	AM Class B	AM Class C	AM Class D	FM Classes A, B1 & C3	FM Classes B, C, C0, C1 & C2
<=25,000	$700	$575	$525	$600	$675	$850
25,001 – 75,000	$1,400	$1,150	$800	$900	$1,350	$1,500
75,001 – 150,000	$2,100	$1,450	$1,050	$1,500	$1,850	$2,750
150,001 – 500,000	$3,150	$2,450	$1,575	$1,800	$2,875	$3,600
500,001 – 1,200,000	$4,550	$3,750	$2,625	$3,000	$4,550	$5,300
1,200,001 – 3,000,00	$7,000	$5,750	$3,950	$4,800	$7,425	$8,500
>3,000,000	$8,400	$6,900	$5,000	$6,000	$9,450	$11,050

Source: FCC

The FCC intends to implement an across-the-board 4.7 percent hike in regulatory fees for FY 2011.

The agency will raise a total of $335.8 million required by Congress in FY 2011 fees from all the industries it regulates.

For radio, the fees the commission proposed in May still hold.

Based on a Report and Order released July 22, AM construction permit holders will pay $490 and FM CP holders will owe $675. That's a $100 increase for AM CPs and no change for FM CPs.

FM Class A, B1 and C3 stations serving populations of 25,000 or less will pay $675, up $25 from 2010, while stations in those classes serving 3 million or more will owe $9,450, a $200 increase.

Stations in FM Class B, C, C0, C1 and C2 will owe from $850 (a $25 increase) up to $11,050 (a $200 increase), depending on populations served.

Class A AMs will owe between $700 and $8,400, with increases of $25 to $300.

The commission plans to open a regulatory fee payment window in September. Late payers face a 25 percent penalty.

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NEWSROUNDUP

N.Y. PIRATES: A new law takes effect in November that makes it illegal to operate a radio station without a license in the state of New York. Gov. Andrew Cuomo signed legislation making pirate operation a Class A misdemeanor. Florida and New Jersey, where pirate radio also is a problem, have similar laws. Proponents say the legislation gives local law enforcement an important tool to help them prosecute pirates and confiscate equipment.

NEW FUNDING FOR LIVIO: Internet radio device manufacturer Livio Radio has a new investment partner, Angel Street Capital. Livio sells Internet products including tabletop Internet radios featuring Pandora and NPR member stations. It said the investment will help it expand offerings in the area of smartphone-assisted car Internet radio services. ASC founders Robert Maccini and Joseph Gallagher are former owners of Internet radio rep firm Net Radio Sales and Internet radio audience measurement and ad insertion company Ando Media. Terms were not disclosed. "We know that CD players and even MP3s are on their way out to make way for car Internet radio, and we are going to be the ones to make sure it's available to the masses with our products and software," stated Livio Radio Founder/CEO Jake Sigal. In May, Dice announced it added the Livio Car Internet Radio application to the Silverline Duo integration kit, which lists for $190. The Duo automotive interface gives users access to their iPhone/iPod, the Livio Car Internet Radio application and Sirius. The connected iPhone app is controlled through the car stereo controls on touchscreen radios, steering wheel or the center console.

GERMANY RELAUNCHES DIGITAL RADIO: Digital radio is getting a second chance in Germany with the Aug. 1 launch of DAB+ services. The first Germany DAB effort began in Bavaria in the mid-1990s, but the technology was not adopted evenly nationwide. On Aug. 1, transmission services provider Media Broadcast completed the first stage of its national DAB multiplex rollout. The network of 27 transmitters covers some 38 million potential listeners. The DAB+ network covers all major cities in Germany. Media Broadcast plans to have the DAB network expand to some 110 transmission sites by 2015.

World Radio History

No Rules, No Community

If Some People Can Ignore the Law, Why Shouldn't All of Us Do So?

FROM THE EDITOR

Paul McLane

In a recent column I mentioned Radio Survivor, a blog I enjoy but took to task for including pirate radio in its mission statement. I wrote: "I do not endorse illegal radio, and neither should you."

The blog's Paul Riismandel believes I forgot my radio history. He wrote a followup giving pirate broadcasting major credit for prompting creation of the low-power service.

"I would argue that former FCC Chairman William Kennard was responding to dual pressures when he spearheaded the creation of LPFM," Riismandel wrote, an opinion shared by some others in the movement.

"Yes, on one hand he was answering the calls made by a growing number of civic, community and religious groups for an expansion of community radio. But on the other hand, Kennard was actively battling, and arguably losing, a war against a rising tide of unlicensed broadcasters that the commission was unprepared to defeat."

He believes that "Kennard and his fellow commissioners wisely recognized that creating a low-cost low-power radio service would help take the wind from the rhetorical sails of many micro-broadcasters, while also making the FCC appear supportive of true community service radio. The commission also was betting that some would-be unlicensed broadcasters would abandon their plans in favor of pursuing an actual LPFM license. ...

"Like so many other underground activities, unlicensed broadcasting often exists to fill a need that is unmet by licensed or legitimized services," Riismandel believes.

He continued, "The most responsible pirates run technically clean operations, taking care not to cause interference with other stations. I am not a fan of pirates who broadcast dirty signals that trounce on adjoining stations and spit out interference."

But he concludes that, "We would not have LPFM if it were not for the pirates and micro-broadcasters who forced the FCC's hand. ... Pirate radio has made significant contributions to broadcasting in the U.S., and our dials would not be the same had it never existed."

Arcane Canticle/Flickr

NOT ALL PIRATES ARE EQUAL

I like Radio Survivor but I respectfully disagree with Riismandel's conclusions. With your forbearance, I'll dwell on the subject a tad longer.

I haven't forgotten my radio history. Radio World covered the conception and rollout of LPFM from Day 1, profiled micro-broadcaster Pete Tridish and covered the opinions of other advocates of change. I knelt on the floor of a convention center lobby with a notebook in hand as I tried to interview LPFM advocates who had bolted themselves together in protest and had to be cut out by police with power tools.

I know that many people, including some of our own contributors and writers, have a fondness for what they deem "pirate" radio, even having started their own garage operations as young people.

Sympathy for such outlets is also an understandable and common viewpoint in our modern age of large media corporations with access to limited spectrum. I understand too that for many observers, benevolent micro-broadcasters who operate clean facilities should be considered as distinct from evil dirty "pirates" who don't give a damn.

But I don't agree that pirates forced the FCC's hand. While micro-broadcasting played a small part in pressuring the FCC to explore wider access, the historic change of LPFM came about due to a great amount of vigorous political and business advocacy, cultural pressure, spectrum wrangling and more. It had many elements and came due to the work of many interests. The commission was not forced into change by illegal broadcasts, any more than it is forced into change now by the many continuing illegal broadcasts that intrude on licensed operations in New York, Florida and elsewhere.

Many broadcasters would love to crank up their power beyond their license, toss their public files or move to an open frequency. But they don't.

LPFM's backers eventually succeeded against institutional resistance because they realized they had to play within that system, identified some high-level political backers and then were able to convince enough regulators and legislators that new stations really weren't a threat to powerful entrenched interests, despite protests from the incumbents. Micro stations may have added some external pressure, but those illegal broadcasts felt mostly like an annoyance rather than a significant factor in the political equation.

But even if we accept the premises that there are "good" pirates as opposed to "bad" pirates, and further that "good" pirate radio somehow drove the FCC to act, I hold to my conviction that people who want to be *part* of radio must start by respecting the *rules* of radio.

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that must be managed if it is to be useful. The system created to manage it may be flawed but it remains the only one we have.

When any individual is free to decide that he or she can ignore rules managing the system — even for well-intended reasons — the system will break down.

LET'S ALL GRAB A CHANNEL

I happen to support legal LPFM and other forms of community radio; in this I differ from some others in broadcasting.

But thousands of hard-working professionals, commercial entrepreneurs, college station managers, corporate engineers, church pastors and others have established radio signals and served their communities while respecting the law — often incurring considerable cost to do so.

Many of them would *love* to crank up power, move to an open frequency, toss their public files or create a new station for themselves; and they could probably articulate convincing "civil disobedience" reasons for doing so. "Hey, why don't we ALL just grab a channel?" But they don't do it because they are responsible citizens of radio's larger community.

We live in a country of laws. In extreme circumstances — when severe societal wrongs have not been resolved by legal means — civil disobedience is appropriate. But the tactic of illegal broadcasting did not deserve a place in the strategy of an otherwise well-organized movement.

TAKE THAT, TILLY

Photos by Mike Lanke

A hearty note of gratitude to the Crosley Radio Players in Terre Haute, Ind., who hosted me during their recent live stage show and allowed me to take a turn at their microphones. I played bad guy "Tilly" in an episode of "Yours Truly, Johnny Dollar" that originally aired in 1962.

Crosley Radio Players, made up mostly of lifelong broadcasters, is an example of what can result when you combine vigorous leadership with talented people.

The idea came about four years ago. Steve Ridge approached Jerry Arnold and suggested staging a Christmas show for the residents of a local nursing home. They decided to recreate a 1941 "Fibber McGee and Molly" episode; it was a hit.

Now the group has a regular gig at a local dinner theater, where it recently signed up for another four months. The shows feature period-correct commercials, news, music and props; and those RCA mics are not just for display. Crosley Radio granted the troupe permission to use its name.

The event has a modern-day sponsor, Caboodle Cupcakes, with its spots woven into the fabric of the stage program. That's Pam Schalburg doing her best Carmen Miranda at left, wearing a cupcake, while Steve Hall does the voiceover.

Jerry Arnold, the energetic organizer, is a true believer in the power of radio and audio to connect with people.

Cast pix and more info are at *www.crosleyradioplayers.com*. And you'll be happy to know that bad guy "Tilly," shown at right, got what was coming to him by the end of the show.

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World Radio History

EAS

(continued from page 1)

so close to the planned national EAS test, and to the fact that stations have been obliged to order gear even though system requirements have not been finalized. Speaking to Radio World, one engineer for a large group described CAP-EAS as essentially still in "beta" mode.

The FCC is reviewing comments filed to Docket 04-296. Beyond the matter of extending the compliance deadline, covered in our Aug. 10 issue, broadcasters and equipment makers express varied opinions about updates to the rules.

Chief among concerns is whether the FCC will accept the use of converters and whether it will conduct its own equipment conformance testing for new gear rather than accept FEMA's findings. Some commenters called for revocation of all exemptions from participating in EAS; all classes of stations then would need both encoders and decoders. Others suggested retiring required weekly tests. Excerpts of comments:

ALLOW CAP CONVERTERS ...

Several executives contributed to a filing by the National Association of Broadcasters. Executive Vice President of Legal & Regulatory Affairs Jane Mago headed the list:

NAB supports the use of intermediary devices as a cost-effective option that will fully satisfy an EAS participant's CAP obligations. These devices, which can later be upgraded or replaced as needed to fulfill one's obligation to implement the next-generation EAS, are typically less expensive than new equipment that is capable of meeting an EAS participant's long-term CAP-related obligations. As the commission notes, several manufacturers are already producing such intermediary devices, presumably in response to market demand, with efficient, cost-effective features that provide options for EAS participants to comply with the upcoming EAS rules.

For certain smaller broadcast stations, and stations in small or rural markets with less financial resources, intermediary devices are particularly useful alternatives. [B]roadcasters take pride in their unique role as the backbone of EAS, but the federal obligation to upgrade one's EAS equipment to a CAP-based system is nevertheless an additional financial challenge that arrives during difficult economic circumstances. Accordingly, any measure of flexibility that the commission can provide in the Part 11 rules that enables broadcasters to better absorb the costs of upgrading EAS equipment, such as intermediary devices, will ultimately enhance the efficient introduction of CAP-enabled equipment. As a practical matter, many broadcasters have already purchased intermediary equipment and it is deployed in the field. Such equipment should be regarded as compliant with commission rules.

As a practical matter, many broadcasters have already purchased intermediary equipment and it is deployed in the field.

– NAB

Prometheus Radio Project Technical and Training Organizer Margaret Avener wrote:

[T]he commission seeks comment on whether EAS participants should be allowed to meet their CAP-related obligations through the use of intermediary devices which receive CAP messages and convert them to EAS Protocol. Prometheus recommends that the commission allow the use of such intermediary devices, in conjunction with legacy EAS units, as an alternative to all-in-one CAP-compliant units. Intermediary devices are currently available at prices substantially lower than the cost of all-in-one CAP-compliant units, representing a significant savings to participants.

Gorman-Redlich owner Jim Gorman writes:

EAS participants should be permitted to use intermediary devices which would allow broadcasters to economically meet the CAP1.2 requirement. ... CAP converters should be classified as "stand-alone devices" by the FCC and not a modification to a certified encoder-decoder.

... BUT CERTIFY THEM

From Monroe Electronics:

We recommend that the commission extend existing Part 11 certification requirements to any equipment that creates EAS protocol tones from a CAP-formatted message, and that this requirement should apply to both EAS encoder/decoders, as well as intermediary devices. We further recommend that the commission incorporate the IPAWS CAP conformance testing of EAS encoder/decoders, as a complete testing of CAP conformity. However, we caution the commission to reconsider whether IPAWS CAP conformance testing of intermediary devices can be relied upon, since that testing omitted several key portions of the IPAWS CAP profile and [EAS-CAP Industry Group] CAP-EAS Implementation Guide.

Rather, intermediary devices receive CAP messages and actively encode them into EAS protocol format. ... By definition, these devices are actually uncertified EAS encoders. There is therefore a critical distinction between equipment that is FCC certified (Part 11 and Part 15 compliant) and intermediary equipment that is performing the same fundamental role, but do not have the required FCC certifications. ...

Basically this is a case of uncertified CAP-to-EAS encoders trying to have their cake and eat it too. Uncertified CAP-to-EAS encoders are mimicking the role of an EAS encoder, but circumventing the certification requirement.

SET SUNSET DATE FOR LEGACY GEAR

Broadcast Warning Working Group, a small group of EAS experts, writes:

The BWWG has come to believe that allowing vendors to build and market so-called CAP converters may have been a mistake. Legacy EAS first-generation equipment bought in 1996 and installed for 1997 compliance is now 15 years old. There are known problems in legacy EAS vendor products that have embedded printers, keep-alive battery memory, external power supplies and more. Some manufacturers are no longer in business, meaning questionable support for orphaned EAS devices.

While the BWWG knows it may be too late to rectify this mistake, setting a date-certain for retirement of legacy EAS equipment must be done. ... No matter what the capability of intermediary CAP converter devices, they all have the effect of "dumbing down" information-rich CAP EAS messages. They are at best a patchwork solution that takes that portion of the EAS user experience down a dead-end road. ...

CAP converters will not only delay the inevitable replacement as these devices age more, their manufacturers mislead uninformed buyers into believing that they will be installing a cost-effective solution. EAS equipment buyers should realize that the cost to get completely new CAP-capable equipment is really a long-term wise investment decision.

CONVERTER CONCERNS

This comment is from Sage Alerting Systems co-founders Gerald LeBow and Harold Price:

Intermediary devices should not have been permitted. ... The biggest problem with intermediary devices is that the information available to the device that is actually placing the alert on the air is always only the legacy EAS information. While it is desirable to retain legacy EAS capability for times when CAP is not available, an intermediary device assures that CAP is never available to the device placing the alert on the air. This permanently degrades the performance of the station with an intermediary device in the following ways:

1) Legacy devices typically only handle one EAS message in memory at a time. As CAP messages can arrive more quickly than EAS can play them back, a legacy device can drop CAP-originated EAS messages.
2) EAS legacy devices have no concept of cancelation. An intermediary/legacy combination will sometimes put cancelled CAP messages on the air.
3) The legacy EAS device has no way to receive CAP text from the intermediary device. CAP text is unavailable to video crawl or radio text services equipment if driven by the legacy EAS device.
4) Intermediary devices are not currently required to be Part 11 certified.

Sage feels that if a station chooses to use an intermediary/legacy pair to meet its Part 11 requirements, then the pair should be certified to the same standard as a CAP/EAS single box. ... Sage recommends that the output of an intermediary device be tested to the same standards as other EAS devices.

RECOGNIZE FEMA TESTS

The National Association of Broadcasters also told the commission:

NAB submits that the commission should largely rely on FEMA's conformance testing for determining whether EAS equipment complies with CAP. ... As Sage and others suggest, the commission should merely require that EAS equipment manufacturers file their Supplier's Declaration of Conformity from the FEMA testing lab as a prerequisite of obtaining commission certifica-

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World Radio History

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World Radio History

EAS

(continued from page 6)

tion for a CAP-decoding EAS device. Such a process would conserve commission resources, promote interagency coordination, and most importantly, speed the deployment of EAS equipment that complies with both FEMA and commission requirements, for the benefit of the public.

Moreover, the market for CAP-compliant EAS equipment market is far ahead of the now-contemplated Part 11 rule changes. For almost two years, there has been EAS equipment available in the market designed to process CAP-formatted EAS messages, including intermediary equipment capable of accepting CAP EAS messages and translating them to the current SAME format before retransmission.

Many EAS participants have already installed such equipment, based on FEMA's equipment conformance process. Any additional FCC equipment certification at this point in the process could cause considerable marketplace disruption.

CONFIRM EAS-CAP EXEMPTIONS

Houston Christian Broadcasters Inc., The Moody Bible Institute of Chicago, Augusta Radio Fellowship Institute Inc., Big River Public Broadcasting Corp., Life on the Way Communications Inc. and The Sister Sherry Lynn Foundation Inc. joined on one filing submitted by attorney Jeffrey D. Southmayd of Southmayd & Miller:

The joint petitioners read the commission's Second Report and Order to not require noncommercial, educational broadcast stations operated under a "main studio waiver" to be equipped at each satellite station facility with CAP-based alert messaging equipment.

Rather, it appears that the CAP-based alert messaging equipment must only be located at the parent station site with the capability of ensuring that CAP-formatted alert messages entered into the EAS are converted into and processed in the same way as messages formatted in the EAS protocol at the satellite stations via equipment at the parent station because such messages are to be generally sent and available through the Internet.

However, due to the rural nature of many remote transmitter sites serving smaller communities, IP availability and capability is limited or absent altogether. ...

Accordingly, the joint petitioners respectfully request that the commission confirm that in the case of noncommercial educational broadcast satellite stations operated pursuant to a "main studio waiver," the CAP-based alert messaging equipment must only be located at the parent station site with the capability of ensuring that CAP-formatted alert messages entered into the EAS are converted into and processed in the same way as messages formatted in the EAS protocol at the satellite stations via equipment at the parent station.

ALLOW NO EAS EXEMPTIONS

Adrienne Abbott-Gutierrez is a member of the Broadcast Warning Working Group and chair of the State Emergency Communications Committee in Nevada, though she emphasized that she submitted these comments as an individual, reflecting her experience as one of the FCC's original state chairs, and that they should not be associated with any group or entity. She writes:

[The FCC] exempts the so-called "sat-elator" or "hub" stations and radio and television translators from any EAS requirements other than what the originating stations carry. ... The problem with the exemptions is that the originating stations for translators and "hub" stations don't provide emergency information or EAS activations for these remote communities. ...

As a result, EAS activations that are heard on translators and "hub" stations are meant for communities hundreds of miles away from the community served by the translator or "hub" station. In some cases, the rural audience is hearing activations that were issued for other states and in different time zones.

This not only can lead to confusion, it means some people simply "tune out" EAS activations and other emergency messages because the information never applies to them. ...

With the CAP technology, new EAS equipment could be added to translators or transmitters for "hub" stations and activations could be issued by the local emergency managers for their specific areas without interrupting programming in other communities. The managers of the translators and transmitters would be able to monitor their EAS equipment remotely and perform the necessary record-keeping according to Part 11 requirements.

The FCC should do away with the tables ... that allow certain broadcasters to utilize only EAS decoder equipment and instead require everyone to have a fully functional, CAP-compliant EAS encoder-decoder.

GOVERNOR'S 'MUST CARRY' MESSAGE CAN BE TRICKY IN BORDER AREAS ...

Broadcast engineer Gary Timm writes as an individual:

For EAS participants on a state border, the FCC clarifies they are only required to carry messages from "the governor of the state in which the EAS participant is located." This statement is a good minimum requirement, but perhaps it should read "the governor of the state in which the EAS participant's city of license is located" to further clarify the meaning.

The commission asked if this definition should be expanded to include "any adjacent states in which the EAS participant provides service," but then "provides service" must be defined such as by some FCC-defined service contour and it all starts getting complicated very quickly. ...

In the end, this is only a minimum requirement and most EAS participants will likely elect to carry messages from all governors in their region on their own. A simple city of license requirement seems adequate to cover the rare EAS participant who only wants to do the minimum, and the rule could add that EAS participants are not prohibited from carrying additional governors in their area.

The FCC should ... require everyone to have a fully functional, CAP-compliant EAS encoder-decoder.

– Adrienne Abbott-Gutierrez

... AND IS PROBLEMATIC OVERALL

TFT Senior Vice President Darryl Parker wrote:

There may be at least three methods to facilitate mandatory transmission of messages originated by a state's governor or designee. All but one involve changes in regulations. All but one depend upon adoption of new state plans before implementation.

One state's emergency communications coordinator put forth an ideal solution: Educate governors and emergency management personnel in the use of EAS and its benefits and encourage their origination of CAP-encoded messages into a CAP server for their state or area. Education is a large part of the success of emergency alerting. If the system is so complicated that it cannot be used quickly and efficiently to alert the public to emergencies, then the system will ultimately fail. The "Governor's Must Carry" aspect should be eliminated entirely and rules relating thereto deleted.

ONLY GOVERNOR OR DESIGNEE SHOULD ORIGINATE THE MESSAGE

NAB writes:

With regard to state-level EAS messages, NAB respectfully reiterates our concern with the delegation of mandatory EAS activations below the gubernatorial level. We continue to believe that only the governor or his/her single designee, as specified in a commission-approved state EAS plan, should be permitted to issue an EAS alert. Granting the power to issue an EAS alert to multiple state officials could lead to unnecessary alerts, public confusion, and possibly public desensitization if multiple alerts are triggered for the same event.

END REQUIRED WEEKLY TESTS

Broadcast engineer and RW contributor Thomas Osenkowsky, writing as an individual, states:

The commission has adopted an "as often as necessary to ensure compliance" [policy] with many tests and measurements that previously were required at specified intervals (frequency measurements, remote control calibrations, etc.) The same should be applied to EAS tests. Weekly tests for non-primary stations serve no purpose. No other station is monitoring them for relaying of information.

Monthly tests are a distraction to listeners and if they are continued to be required, should only be relegated to overnight hours. For AM daytimers this is not an issue since the program line is interrupted to transmit the data and message. No primary station is an AM daytimer. Eliminating the requirement would allow states to formulate perhaps an annual test to verify proper equipment operation.

Comment on this or any story. Email radioworld@nbmedia.com *with "Letter to the Editor" in the subject field.*

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World Radio History

REDUNDANCY

(continued from page 1)

A 2008 report by the FCC to Congress highlighted shortcomings still found in the commercial communications infrastructure throughout the country, including radio.

"The commercial communications infrastructure is typically designed and deployed to reliability and resiliency specifications that are less rigorous than emergency responder infrastructure," the FCC stated. "Hence, commercial infrastructure is more likely to be compromised in a large-scale disaster."

The events of Sept. 11 a decade ago "certainly pointed out the importance of having backups," said Steve Davis, senior vice president of engineering for Clear Channel Radio, which owns approximately 850 stations. "We have strengthened our backups in New York City and have extended that throughout our other markets."

Clear Channel, which lost facilities in the WTC collapse, has embraced disaster response throughout every market, large and small, Davis said. In addition to eight regional disaster response hubs — which are home to portable units with antennas, transmitters and satellite equipment to get stations back on the air quickly — the company launched a National VSAT Safety Net in 2006, prompted largely by Hurricane Katrina.

(continued on page 12)

Dave Garner, Hubbard Radio

Hubbard Radio's WTOP(AM/FM) is the Local Primary station in the nation's capital. It has a complete off-site backup studio and reciprocal agreements with other stations to share studio space if needed. Its three transmitter sites provide redundancy; the main back-up facility is shown.

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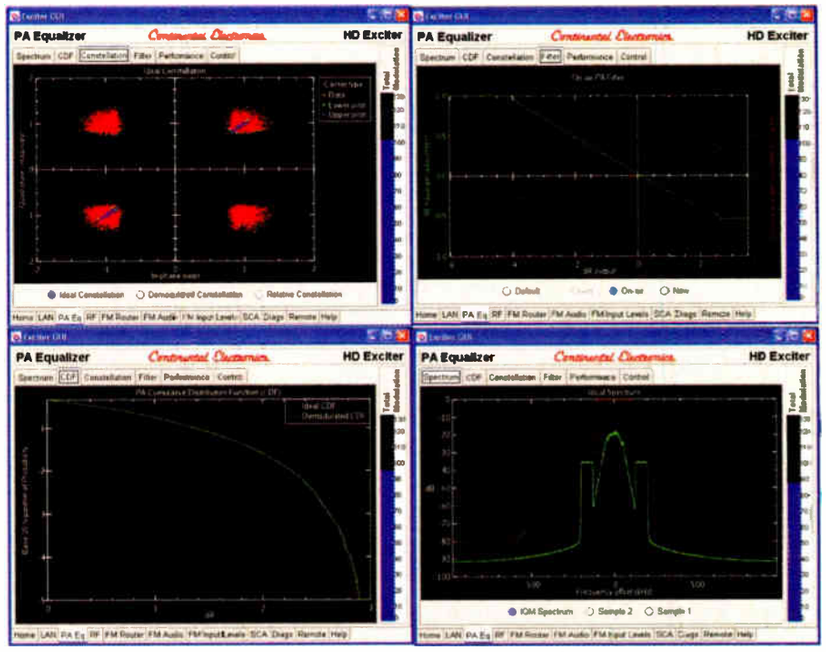

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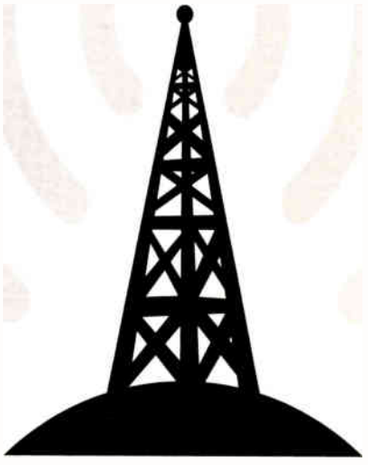

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World Radio History

REDUNDANCY

(continued from page 10)

SATELLITE PROJECT

"We literally have every studio and every transmitter site connected in our system. The VSAT [Very Small Aperture Terminal] Ku-band system allows us to uplink or downlink so we can send audio and data. For example, if we lost all of our Chicago studios, we could move operations to Detroit and broadcast from those facilities and uplink to the tower site in Chicago," Davis said.

The satellite project is the backbone to Clear Channel's disaster plans, Davis said.

"We are retooling our disaster preparation plan this year. The market engineers are focused on making sure generators are working, backup music libraries are in place and we can receive data. We have a plan for every market. Obviously we do have more backup transmitter sites in large markets," Davis said.

Barry Thomas, vice president of engineering for Lincoln Financial Media and former president of the Society of Broadcast Engineers, said 9/11 proved that worst-case scenarios do happen and that the results can be disastrous.

"Engineers, by nature, always consider redundancy and emergency plans. In fact, many have to dial back plans in order to fit the budget. I think the difference since 9/11 is that redundancy is in the minds of the financial decision makers, too," Thomas said.

Lincoln Financial Media, which owns 10 FM and four AM stations, has hardened existing transmitter sites incrementally and added emergency low-power transmitting capabilities. Studio redundancy has been a more recent focus, Thomas said.

Townsquare Media has "very few fully redundant facilities" but is working actively to create more built-in redundancy, said Vice President of Engineering Dave Remund. Townsquare, formerly Regent Communications, operates 62 radio stations in mid-sized markets.

"I suspect that some managers felt redundancy was just another way of saying the engineer was lazy. Redundancy was a way for the engineer not to have to get up and trek to the transmitter site at 2 a.m. to manually reconfigure the equipment to get back on the air in the event of a failure," Remund said.

"As engineers, we always look to build in redundancy, but 9/11 did change the way those who control the purse strings think. I feel they are more receptive to proposals to spend money on redundancy."

LOCATION IS KEY

In one market, Townsquare Media has identified a property with studios and several transmitters all on one property. The broadcaster is taking steps to reduce vulnerability at that location as well as all of its properties.

"In another market we have licensed an aux antenna for each FM and an AM tower located at the studio with a frequency-agile transmitter that nicely covers the central population area." The transmitter "has been used many times and is recognized as a valuable investment," Remund said.

Broadcast engineers contacted for this story said market location plays a role when considering the need for redundancy. WTOP(FM), formerly owned by Bonneville International and now part of Hubbard Media, is located in the nation's capital and is viewed by some observers as crucial to the communications infrastructure in Washington.

"We reviewed critical technical systems after 9/11 and developed both short-term and long-term disaster recovery plans," said Dave Garner, director of engineering for Hubbard Radio and its Washington cluster.

Hubbard's WTOP is the city's Local Primary (LP-1) station. It has a total of three transmitter sites and maintains a complete off-site backup studio, Garner said.

In addition, Hubbard Radio's Washington cluster has reciprocal agreements with other stations in the market to share studio space if needed.

"I think any cohesive backup plan has to consider both the studio and transmitter facilities. One is useless without the other. It's obviously very expensive to have separate redundant facilities, but we have been able to add additional backup transmitter sites since 9/11," Garner said.

It's cost that keep many small-market broadcasters from developing redundancy plans as bold as those of their big-market sisters, said Jay Mitchell, who has owned several stations and is publisher of the Small-Market Radio Newsletter.

"Immediately after 9/11 there was a flurry of activity among small-market broadcasters, but in the absence of any subsequent serious threats, many broadcasters have succumbed to human nature and they are not any more prepared to handle an emergency now than they were before 9/11. Costs are always a major obstacle for small-market broadcasters.

"However, those who are by nature focused on emergency preparedness consider those costs to be necessary, while others may consider them discretionary," Mitchell said.

Any costs to small-market broadcasters that are not directly tied to revenue development — even emergency preparedness — are hard to justify for many small broadcasters, Mitchell said.

Not everyone acted despite the lessons of 9/11.

A medium-market engineer who asked not to be identified said, "We didn't really take any direct actions to deal with the threat — I think, for the most part, because there are so many different ways that we could be affected that it becomes difficult if not impossible to cover every contingency. I know a few people who set up alternative studios, etc., but in most cases I can see many scenarios which would make this kind of effort a waste of time and money."

Did the events of 9/11 prompt changes in how your organization designs its facilities and backups? Tell us at radioworld@nbmedia.com.

FACILITY HARDENING EXTENDS TO PEP STATIONS

In parallel with what broadcasters are doing to increase facility resiliency and redundancy is what the Federal Emergency Management Agency is doing.

As RW has reported (see Oct. 20, 2010 and March 1, 2011 issues), FEMA and its IPAWS Program Management Office are in the middle of an aggressive expansion and enhancement of the Primary Entry Point system. That system is a nationwide network of broadcast stations used to distribute the president's message in the event of a national emergency.

Damon Penn, assistant administrator of National Continuity Programs at FEMA, told the Emergency Preparedness, Response & Communications Subcommittee of the House Homeland Security Committee in July that the original system of 36 PEP stations has been expanded to 49. "By the end of 2012, the number of PEP stations will increase to 77 and will directly cover over 90 percent of American people," Penn testified.

New PEP stations are being equipped with security upgrades like double-walled fuel containers with spill containment and electromagnetic pulse-protected backup power and transmitters. Legacy PEP stations are being retrofitted to meet current PEP stations resiliency standards.

— *Randy J. Stine*

NEWSROUNDUP

KENWOOD, HD ALLIANCE: Kenwood USA and the HD Radio Alliance are partnering to promote the new Kenwood KDC-HD548U CD receiver. The program centers on a $15 instant rebate, in-store demo of the receiver and alliance stations creating awareness of the Kenwood brand and driving traffic to its dealers. The CD receiver has an HD Radio tuner, USB port, aux input and 13-digit display; it features a dedicated iTunes Tagging button. The unit lists for $220. The 700 or so alliance member stations are airing spots to promote the KDC-HD548U while highlighting HD Radio technology along with the rebate; it will be offered through Sept. 4 at participating Kenwood retailers.

FM ATLAS CREATOR DIES: Bruce Elving, the man behind "FM Atlas," a handbook for FM DXers, passed away while in California for prostate cancer treatment. He held a Ph.D. in communications from Syracuse University and cofounded KUMD(FM), a public radio station associated with the University of Minnesota at Duluth, in 1957.

BUCKLEY FUND: The Broadcasters Foundation of America (*www.thebfoa.org*) has established a fund in honor of Buckley Broadcasting's late President/CEO Richard Buckley who passed away suddenly on July 31. He ran the broadcast group, created in 1956, for more than 40 years.

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World Radio History

Monitor Your Tx Temps Cheaply

Put This Low-Cost, Mechanical Water Temperature Gauge to Work

Dan Houg is station engineer for KAXE(FM) in Grand Rapids and KBXE(FM) in Bagley/Bemidji, Mich. He wanted to add temperature monitoring to his main KAXE transmitter; here's how the project went.

WORKBENCH
by John Bisset
Read more Workbench articles online at radioworld.com

He sought to avoid components made of plastic because they could be melted in the stack exhaust. He located a Sunpro gauge sender and capillary tube assembly made of metal at a local farm-and-fleet store. Amazon also sells it, for under $25. Search for "Sunpro CP7975 Mechanical Water Temperature Gauge – Black." Similar units can be found at any auto supply store.

A benefit of this kind of sensor is that you're not working with small wire pieces or hardware above the tube cavity opening on top of the transmitter.

With that in mind, and worried that plastic zip ties might melt, Dan didn't secure the sensor but just laid it on top of the exhaust port of the transmitter, as seen in Fig. 1. The second photo shows the sender cable coiled above the transmitter and connected to the temperature gauge.

Monitoring stack temperature while tuning the transmitter is an excellent indicator of final efficiency. As the tube's efficiency lowers, an increase in temperature (heat) results, which can be read off the temperature gauge. Put the meter right next to the output power meter (Fig. 3) for convenience in making the correlation.

Fig. 1: The temperature sensor is placed over the transmitter exhaust air grate.

Dan added a Taylor thermometer powered by a AAA cell (which he prefers to a "watch cell" because a AAA lasts several years). He stuck the Taylor room thermometer to the equipment rack to monitor the shack temperature.

Dan writes that, just for grins, he placed the Taylor sender unit over the tube exhaust for a few moments; but the air temperature was higher than the 158 degree F limit for this particular Taylor model. But again, any sort of plastic over

(continued on page 16)

Fig 2: The interconnecting cable is coiled atop the transmitter and needs no plastic tie-wraps.

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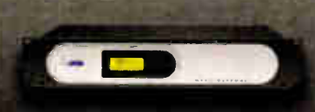

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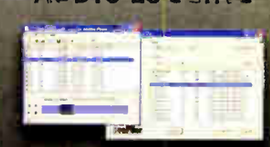

PC Software for archiving and logging all of your stations audio.

World Radio History

WORKBENCH

(continued from page 14)

the tube exhaust is asking for a nasty meltdown. Stick with the automotive thermometer!

Dan Houg is relatively new to radio engineering but comes from a background of tinkering with electronics and automotives.

The automotive water temperature assembly is just one noteworthy item he's added at the station. Another is an inexpensive backup audio device he made using a Broadcast Tools Silence Monitor III Plus and an industrial MP3 player that is activated on a contact closure from the SM-III. Although there are commercial products that do the same thing, Dan's budget-saving approach has been useful during periods of automation hang-ups.

Fig 3: You can easily compare the correlation between temperature and transmitter efficiency by locating the temperature meter near the transmitter PA meters.

Fig. 4: A battery-operated Taylor thermometer monitors the transmitter shack temperature.

Dan Houg can be reached at *engineer@kaxe.org*.

Broadcast engineering is a science that runs on the laws of physics. But there are other laws governing the operation of a radio station, and they are equally powerful.

Frank Grundstein, CBRE, CBNT, director of sales for manufacturer Logitek (*www.logitekaudio.com*), has gathered such laws through his years living on the Engineering Planet. Here are a few:

- A pat on the back is only a few centimeters from a kick in the pants.
- If it happens, it must be possible.
- It works better if you plug it in.
- Nothing is impossible for the man who doesn't have to do the work.
- A theory is better than its explanation.
- The amount of work done varies inversely with the amount of time spent in the office.
- Nothing is ever a complete failure; it can always serve as a bad example.
- Everything goes wrong at once.
- The first 90 percent of the project takes 90 percent of the time, and the last 10 percent takes the other 90 percent.
- The obvious answer is always overlooked.
- There is always an easy answer to every problem: neat, plausible and wrong.
- Anything that begins well will end badly. (Note: The converse of this law is not true.)
- If the facts do not conform to the theory, they must be disposed of.
- Everyone has a scheme that will not work.
- Make three correct guesses consecutively and you will establish yourself as an expert.
- The probability of a given event occurring is inversely proportional to its desirability.
- If it can find a way to wear out faster, it will.
- If a project is not worth doing, it is not worth doing well.
- The more time you spend in reporting on what you are doing, the less time you have to do anything. Stability is achieved when you spend all your time reporting on the nothing you are doing.
- Inside every large problem is a small problem struggling to get out.
- Negative expectations yield negative results. Positive expectation yield negative results.
- Work expands to fill the time available for its completion.
- The other line moves faster.

If you'd like your own copy of the "Laws" to print out and post in your shop, email Frank Grundstein at *frank@logitekaudio.com*. Thanks, Frank, for sharing a lighter (but so true) side to our profession.

Contribute to Workbench! You'll help your fellow engineers and qualify for SBE recertification credit. Send Workbench tips to johnpbisset@gmail.com. *Fax to (603) 472-4944.*

Author John Bisset has spent 43 years in the broadcasting industry and is still learning. He works for Tieline Technology, is SBE certified and is a past recipient of the SBE's Educator of the Year Award.

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World Radio History

How Did That Wireless Tower Get There?

Here's What Happened When a Surprise Structure Popped Up Near KLIZ(AM)

BY MARK PERSONS

It all started on a pleasant summer day.

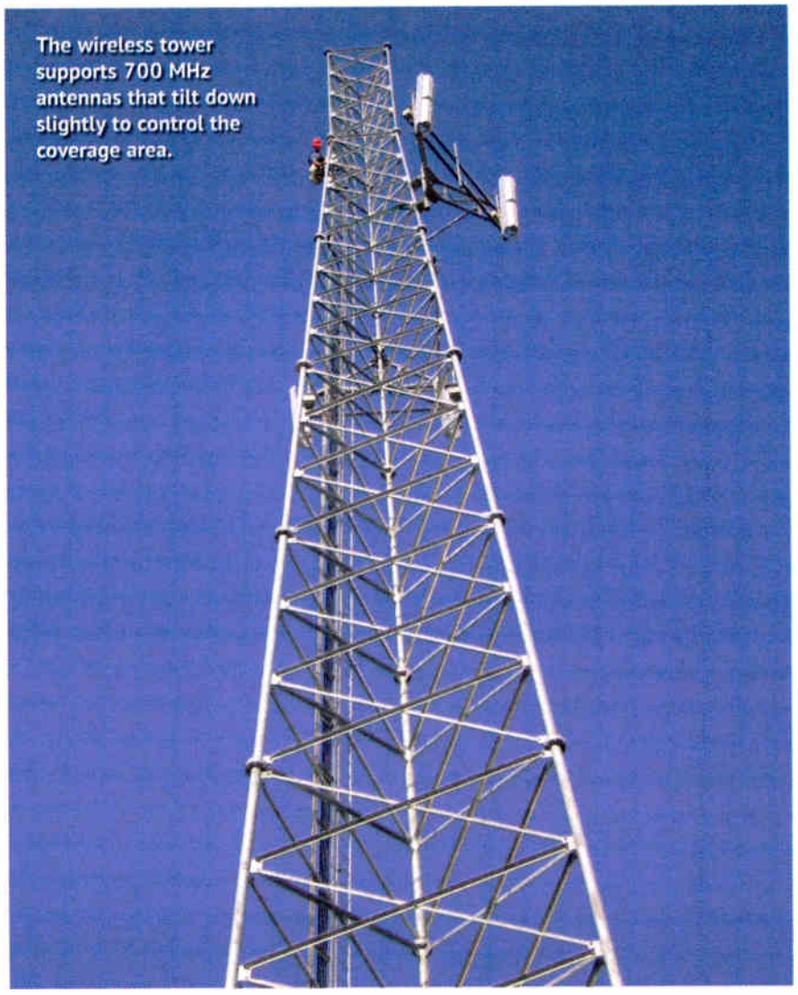
I was driving along minding my own business in my hometown of Brainerd, Minn., when suddenly there it was: a new

TECHTIPS

180-foot wireless Internet tower at the Consolidated Telecommunications Co. building in the Brainerd Industrial Park.

It had all happened overnight, so to speak. One day there was nothing; the next day a crane had lifted the new tower into place for everyone to see.

The tower is just 0.87 miles (1.4 km) west of the KLIZ(AM) three-tower directional antenna system. KLIZ operates on 1380 kHz, which makes the new Consolidated tower almost exactly one-quarter wavelength in height at KLIZ's frequency.



The wireless tower supports 700 MHz antennas that tilt down slightly to control the coverage area.

WHAT TO DO

KLIZ is one of my regular clients so I immediately went out to take AM directional monitor point readings.

The new tower had indeed become a significant re-radiator of the KLIZ signal. It was picking up and retransmitting KLIZ in a fashion that raised the field intensity levels in two nearby monitor points from a comfortable 50 percent of their limits to just at their limits. Ouch! I could even plainly see most of the Consolidated tower from one of the monitor points.

I went into the Consolidated building and asked for the manager. Fortunately we had met before; I was not some "nut" walking in the door claiming they'd ruined the world by putting up a tower.

The project manager, Bill Stroot, found my story interesting but mostly unbelievable.

How was he to know about AM directional antennas? He isn't an RF guy, though he knows a little more now. Bill had done almost all of the proper research, making sure the tower was not near an airport or flight path and that it complied with all city building codes. He showed me an FCC license for the 700 MHz band wireless Internet facility. He inferred that if the FCC said it was OK, it shouldn't be a problem!

Stroot finally agreed to do some homework while I went to my office to look up FCC Rule 73.1692, which I mentioned in an RW article a few months back. The rule about broadcast station construction near or installation on an AM broadcast tower reads:

Where a broadcast licensee or permittee proposes to mount a broadcast antenna on an AM station tower, or where construction is proposed within 0.8 km of an AM nondirectional tower or within 3.2 km of an AM directional station, the broadcast licensee or permittee is responsible for ensuring that the construction does not adversely affect the AM station.

The Consolidated Telecommunications license is for an "area of coverage" and does not have any specifics on tower location or locations to accom-

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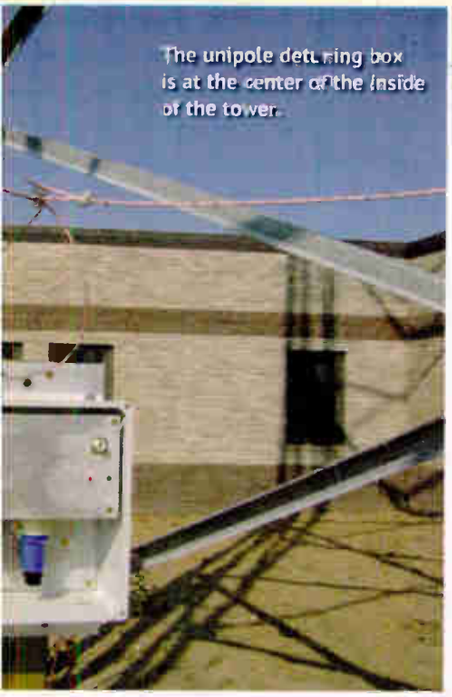
The unipole detuning box is at the center of the inside of the tower.

plish the task. It all makes sense unless there is an AM tower nearby.

The FCC normally looks out for AM stations by issuing licenses or construction permits to two-way, cellular and other wireless facilities with "special operating conditions or restrictions" when they are near an AM. I wonder how many more of these "area" licenses slipped through the cracks at the FCC.

When we met again, Bill acknowledged that he had talked with someone else who had experienced a similar situation and that we should do something about this. That something came to about

ill Stroot stands near one of the unipole wires.

$12,000, which Consolidated paid.

Consolidated is a cooperative telecommunications utility that started out as a rural telephone company many years ago. They seemed to have no serious problem finding money.

The project turned out to involve a unipole detuning system from Nott Ltd., tower climbers to install the unipole and me to tune (detune) it.

I tried something different on this one. The three near-vertical 145-foot unipole wires are on the "inside" of the tower rather than the outside. This was made possible because the tower is a self-supporting structure 22 feet across at the base. The unipole detuning box sits at the center of the inside of the tower. The vertical unipole wires turn horizontal at 8 feet above the ground and meet just above detuning box.

IN THE END

The project when smoothly and it worked as predicted to detune the tower. This made the structure electrically invisible at 1380 kHz so it would not pick up and re-radiate signal on that frequency. The KLIZ(AM) directional monitor points returned to normal and we all walked away smiling. Bill Stroot, now retired, is shown near one of the unipole wires so you can understand the size of the tower base.

A letter of agreement was drawn up between the radio station and Consolidated allowing reasonable access for checking the tuning of the unipole during regular business hours. Remember, things break!

Mark Persons, WØMH, is certified by the Society of Broadcast Engineers as a Professional Broadcast Engineer and has more than 30 years' experience. His website is www.mwpersons.com.

World Radio History

NETWORK...HEAL THYSELF

No matter how well you maintain your life, there are bound to be ups and downs. Of course, just by selecting WheatNet-IP, you're already practicing the best possible regimen of preventative medicine. Its robust architecture and hyper-intelligence ensure that it's out there racing to the finish line, every minute of every day. Each BLADE (what we call our super smart nodes) knows the full configuration of its network, ensuring there is no single point of failure. And while all networks have a backup system, we go way beyond that: WheatNet-IP offers as many points of recovery as you have BLADES in your system.

But, every now and then, something MAY happen that might call for the replacement of a BLADE. In the exceptionally unlikely event that a BLADE should fail, just plug an alternate in and you are up and running. Since each BLADE has the entire WheatNet-IP Intelligent Network's configuration embedded in its DNA, the new BLADE inherits its function immediately and you are back up and running. Pretty cool, eh?

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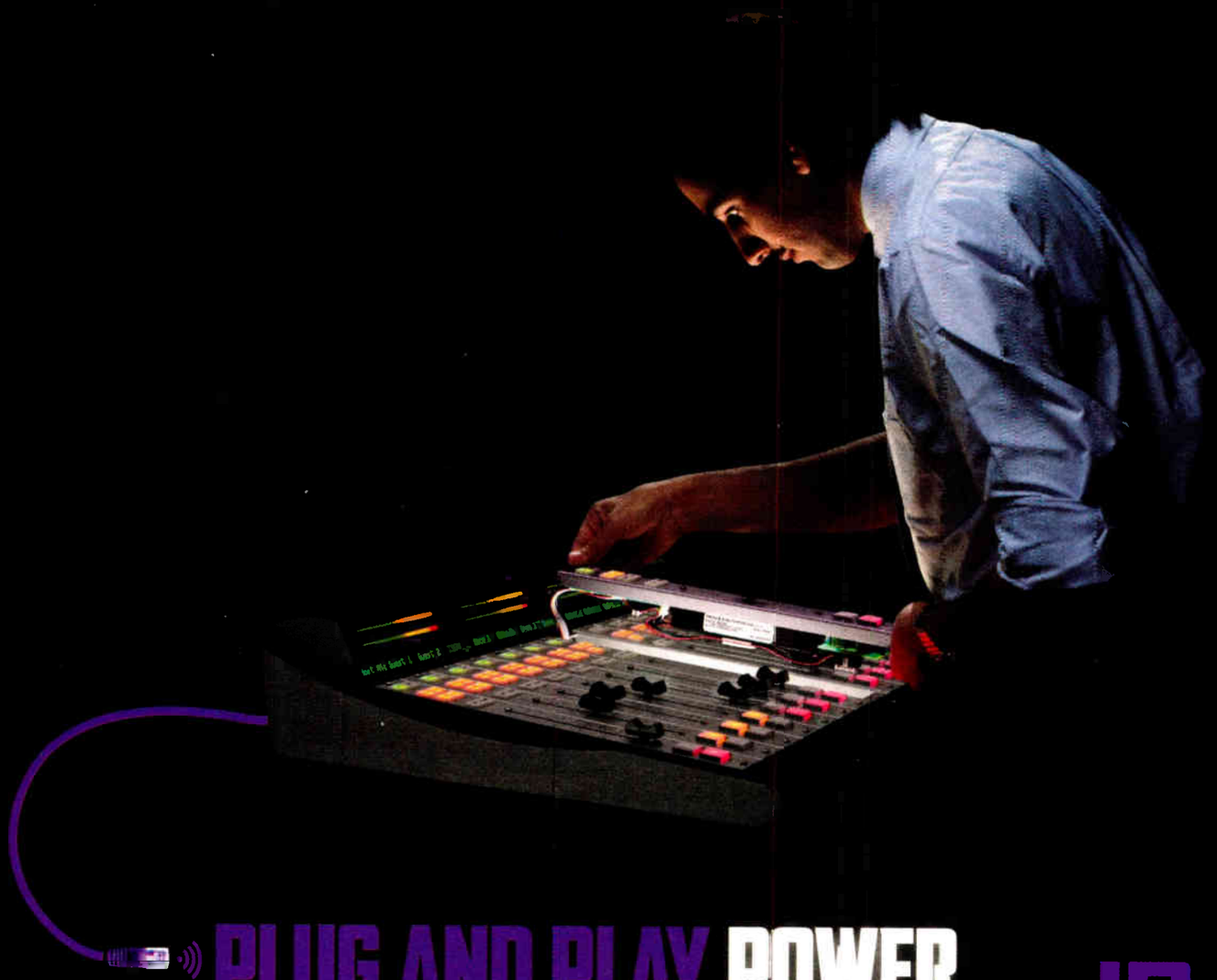
World Radio History



PLUG AND PLAY POWER IP-12

AUDIOARTS MODULAR WHEATNET-IP NETWORKABLE CONSOLE

Here's how easy it is to setup the new IP-12 console: Unbox it. Plug it in. You're ready to go. But don't let its simple setup fool you. It's one very powerful little console...

First, its modern, modular design moves all audio, logic and control outside the control surface and into a single rack-space audio interface/mix engine (called a BLADE). This gives you much greater mixing/processing capabilities as well as the ability to network when you have more than one console. Imagine simply calling up any audio sources on any of your consoles anywhere in your facility. And, if you've already got the WheatNet-IP Intelligent Network, it fits right in.

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AUDIOARTS

World Radio History

MARKETPLACE

MIXER MARRIAGE: It might not be quite the fortuitous collision of peanut butter and chocolate, but AETA Audio Systems has put together two audio tools into one, the 4MinX multitrack recorder and mixer. It utilizes SDHC cards for recording, which can be supplemented by external hard drives via the USB 2.0 port. An Ethernet port provides for file transfer. Features include 48 V phantom

power, low-cut filter, analog I/O, 24-bit BWF file recording and AES3 and AES 42 digital inputs (AES 3 output). Also: M/S encoding/decoding along with timecode recording and synchronization. A 3-inch TFT color display provides information and menu choices. Rotary encoders, soft buttons and four programmable buttons provide navigation and operation. It is powered by a DV-type Li-ion battery and has an integrated charger.

Info: www.aeta-audio.com

ZOOM x 5: Zoom has worked a total of five microphones into its latest recorder, the H2n, a reworking of the four-mic H2. The microphone complement allows for a variety of mic modes beyond two-channel stereo: M/S, X-Y and four-channel surround. The AA battery or USB-powered H2n records to SD/SDHC cards and has a USB 2.0 interface. Performance is 24-bit/96 kHz or MP3 (320 kbps). It ships with Steinberg WaveLab LE 7. An options kit includes a wired remote, windscreen and tripod. Price: $199.

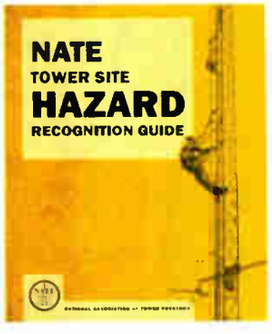
Info: www.samsontech.com

POWER AND LIGHT: Neutrik's PowerCon True1 is a durable, lockable single-phase AC power connector. According to the company it is one of the first of its kind to feature IEC 60320 breaking capacity, designed for 16 A, 250 VAC. It's a system, including inlet and outlet couplers for daisy-chaining of equipment. It also provides for high-density requirements with a duplex chassis connector combining an inlet and outlet coupler. Due to the high breaking capacity, show crew and other production professionals can connect large amounts of electrical equipment without worrying that interruptions to the current will cause a catastrophic electric arc, Neutrik says.

Info: www.neutrik.com

SAFETY GUIDE: A list of safety "red flags" to look for on your tower is part of an interactive safety resource created by the National Association of Tower Erectors. The Tower Site Hazard Recognition Guide is intended for the on-site personnel of tower erectors, carriers, broadcasters, owners, operators, general contractors and other organizations responsible for activities on tower sites. Topics include things like correct ladder use and OSHA-required personal protection equipment for tower technicians. NATE offers the guide free to anyone in the industry, not just NATE members.

Info: www.natehome.com



World Radio History

POWER UP: Utility product maker RDL has a new line of multipurpose amps called the HD Series for commercial installations. The company highlights the environmentally conscious "green" design and says they're

suitable for background music, paging, education, house of worship and corporate environments. There are six models including mixing, multichannel or single-channel models. Three are standard 4 ohm/8 ohm outputs while the other three are for installation duties with 25 V, 70 V and 100 V outputs. Shared features include energy-efficient "sleep" mode, onboard compressor, bass and treble controls, security cover and half-rack wide size. Some offer ducking on input channels. On the rear is room for a single RDL Stick-On or TX module.

Info: www.rdlnet.com/hd.php

INDIVIDUAL OUTLET: Middle Atlantic now offers a family of rack-mountable UPS systems with individual

outlet control, aimed at audio/video applications. Each outlet can be controlled via IP and RS-232. Features include remote reboot of connected equipment; event notification via email and SNMP traps; monitoring via the Web; and auto shutdown to protect servers and workstations from data loss due to power failure. Models include 1000 VA/750 W and 2200 VA/1650 W.

Info: www.middleatlantic.com

DJ MAC-O-MATION: Radiologik DJ, a Mac-only automation program from MacinMind Software, is now available in version 2011.4.1.

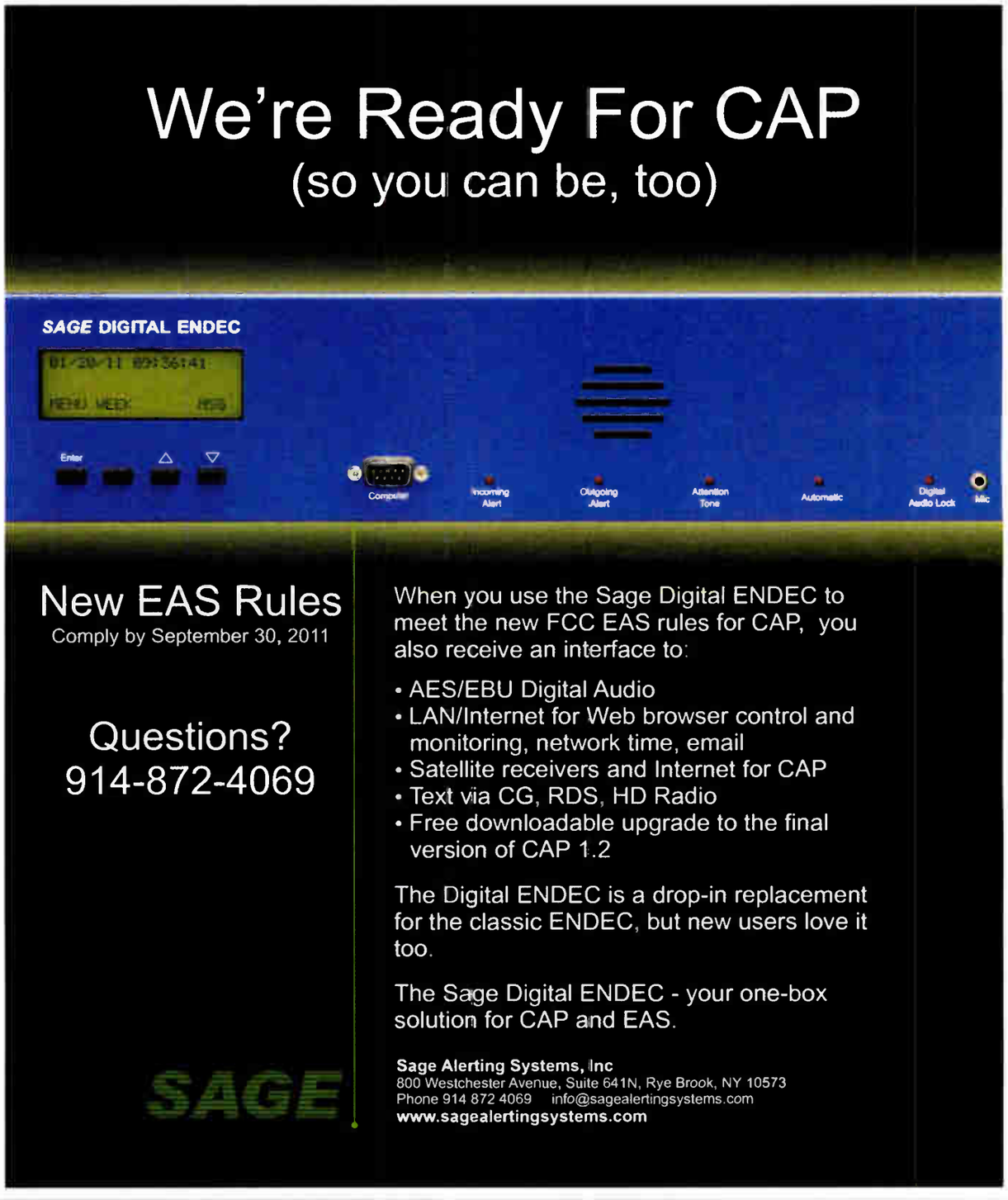
The latest adds "scriptable commands as well as DJ Events that allow

Radiologik DJ to trigger Applescripts on its own events, allowing more customization and more error fallback abilities for 24/7 radio stations both streaming and terrestrial," according to a release.

Radiologik, with scheduling, playout and traffic management modules, aims itself at small radio stations, LPFMs, noncommercials, schools and Internet streamers. Pricing starts at $128. It also offers French and German languages. Radiologik requires Mac OS X Tiger 10.4 or above.

Info: www.macinmind.com

Send product news and photos to radioworld@nbmedia.com *with "Marketplace" in the subject line.*



World Radio History

WFBE's Home-Brew Rig

BY JOHN SCHNEIDER

Factory-made radio transmitters in the 1920s were expensive, so only the largest or best-financed radio stations could afford one. Most of the country's radio stations just bought the parts and built their own rigs.

(In 1923, only 40 out of almost 600 radio stations in the country had factory-built units, all of them made by Western Electric.)

ROOTS OF RADIO

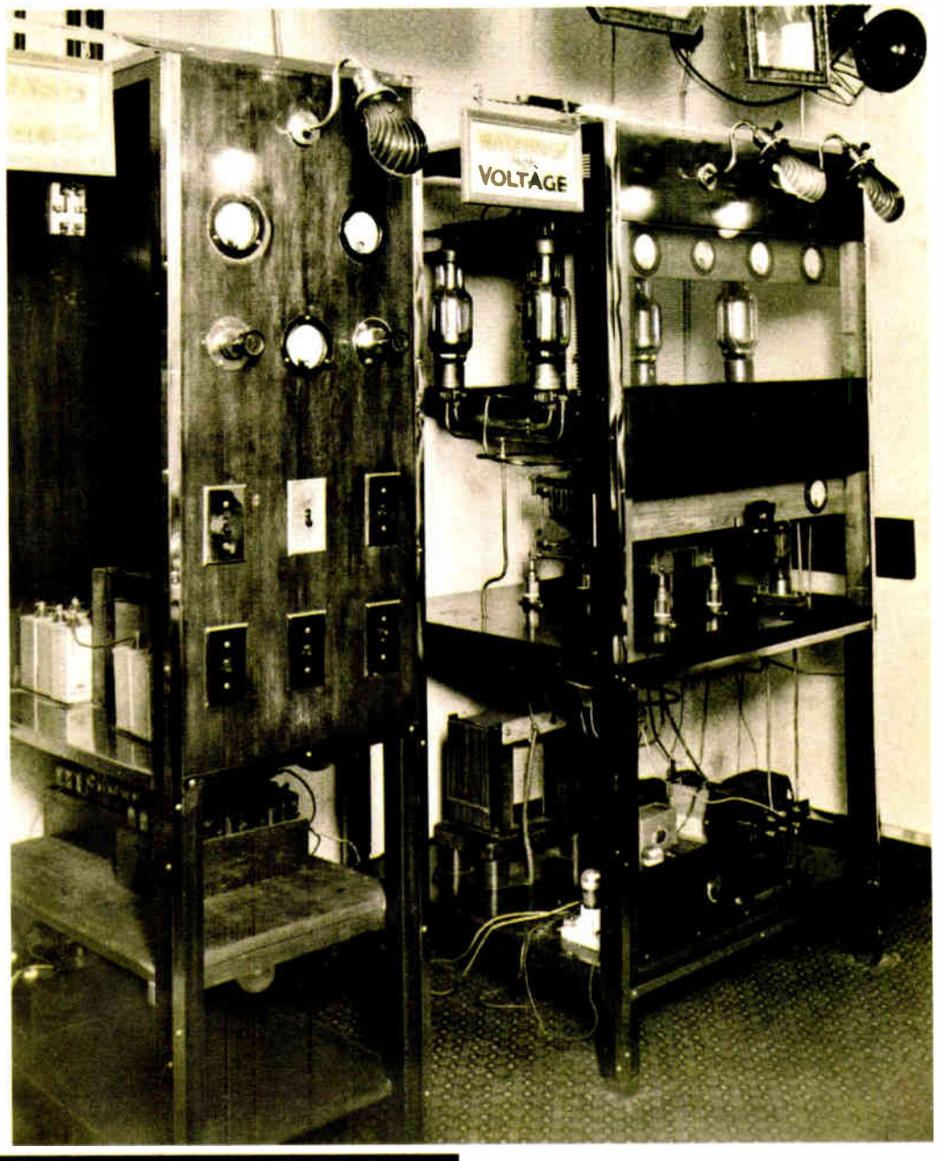
At that time there was nothing like today's FCC type notification process. Instead, a station would call the local government radio inspector who would visit the station, make some measurements and certify the transmitter. Even with that safeguard, the mechanical and electrical quality of these early rigs varied greatly.

Here we see a good view of an early home-brew rig at WFBE in Cincinnati.

In 1927, WFBE was listed as operating with 250 watts from the Garfield Hotel. We see the power supply in the left-hand cabinet, with its light-switch controls, and the RF section on the right. The tubes probably are RCA UV-204As (for more on those, see *http://home.comcast.net/~n6jv/uv204a.html*).

The cabinet appears to be a metal frame with wooden panels, and the front and sides are left open to provide for excellent convection cooling. A "Warning" sign serves as the only safety protection for the operator (OSHA would certainly not approve!).

Even so, this was probably one of the neater construction efforts from radio's first decade. It's similar in appearance to a Loy Barton transmitter seen in a Radio World article by James O'Neal in the Feb. 1 issue.



'INFRINGING'

The use of so many homemade transmitters created some heated disputes during radio's early years.

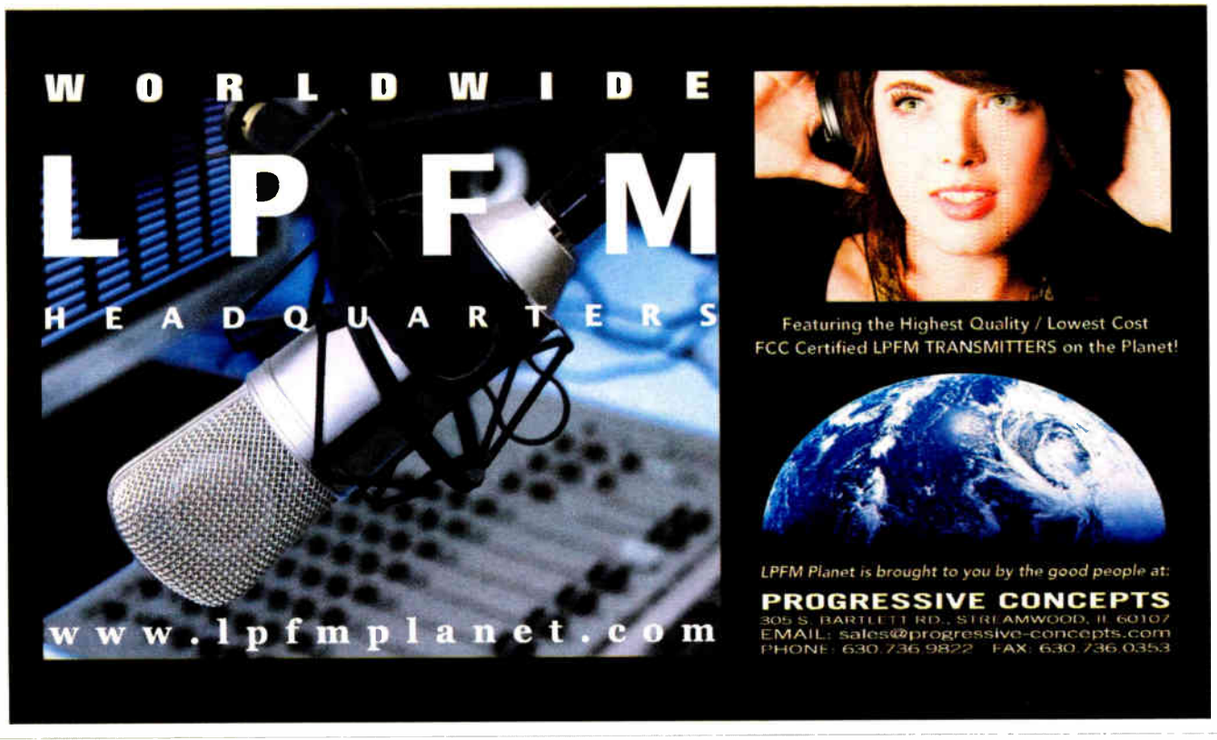
Before 1926, AT&T's Western Electric was the only commercial manufacturer of broadcast transmitters, as it held the patents for many of the basic circuits that were needed to build a broadcast transmitter, including oscillators, modulators and even the vacuum tubes themselves. In short, most radio stations in the country were in violation of their patents by building and using their own transmitters without AT&T's permission.

In 1923, AT&T sent letters to the "infringing" stations offering to license their patents for a one-time fee of from $500 to $3,000 per station, depending on the station's power. However during the next year, only 40 stations acquiesced to paying the fee. The main cause of the stations' resistance was a clause in the contract prohibiting the stations from broadcasting programs for profit (in other words, selling advertising). AT&T went so far as to refuse to lease broadcast phone lines to stations that didn't sign the agreement.

Finally, as a test case, the company brought suit against WHN in New York. The case eventually was settled out of court by the station, which conceded to all the company's terms, but the case had been such a public relations disaster for AT&T that afterwards they quietly forgot about the patent license issue.

Eventually, as the fundamental patents expired and more manufacturers were allowed to enter the transmitter business in the 1930s, factory-made transmitters became the rule rather than the exception.

John Schneider is a lifetime radio history researcher. This is one in a series of photo features from his collection. Write him at jschneid93@gmail.com. *Comment to* radioworld@nbmedia.com.



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World Radio History

Not All Studio Furniture Is Created Equal

System Integrator Builds Relationship With Studio Technology

USERREPORT

BY JIM HIBBARD
Owner
Pacific Mobile Recorders

SACRAMENTO, CALIF. — When radio station management and staff start planning new studios, it seems everyone is concerned mostly with the equipment. While gear is a critical aspect, the question of where to house it must be given a lot of consideration as well. The studio furniture must not only look great but be sturdy and durable. From my perspective, it also must allow easy installation of the miles of cables, dozens of punch-blocks and all that gear that makes the studio "Go."

Studio Technology is a well-established company that noted its 20th anniversary in August. My company, Pacific Mobile Recorders, a studio builder and system integrator based in Sacramento, Calif., has worked with them for about the last 10 years.

DESIGN

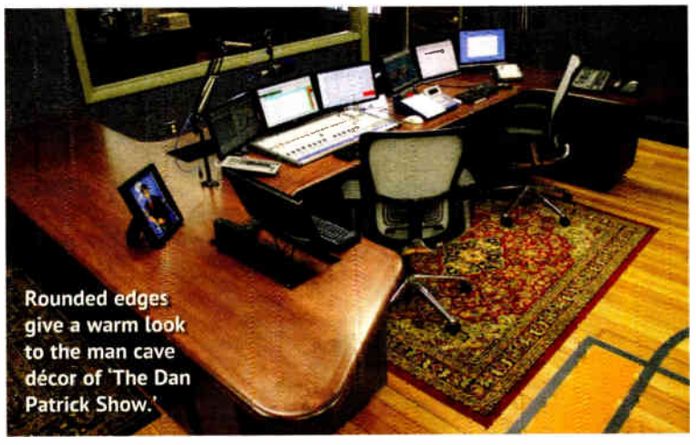
Vince Fiola and his guys build custom studio furniture for radio and television studios, radio control rooms and news work stations. They don't build kitchen cabinets or bathroom counter tops, just real studio furniture.

When you call Studio Technology you will most likely get the owner, Vince Fiola. Supply Vince with room dimensions, console info and rack unit count; and after a little back and forth you will have a finished drawing to show your staff.

Whether the budget is large or small or the studios are simple or elaborate, there are plenty of options. Our clients give Vince an idea of what they need and want, and often, they depend on Vince to help them with a design and what type of materials to use, depending on the budget and the "look" they want.

For a recent studio buildout with Sandusky Radio in Seattle, Vince helped KKNW(AM) staff design their control room furniture to accommodate the control room and talk studio, which were located in the same room.

Sandusky Radio chose Corian countertops for their studios, but other choices include laminate with T-molding or hardwood trim. For our installation at "The Dan Patrick Show," studios have countertops made of stained mahogany to fit in with the "man cave" décor. Studio Technology's base cabinets come with removable doors and punch-block backboards. Roll-around lower racks are available for tiny studios where furniture must go up against a wall.



Rounded edges give a warm look to the man cave décor of 'The Dan Patrick Show.'

As a studio designer and integrator, I want each wire raceway to be a straight shot from one cabinet to another. Studio Technology's base cabinets are designed for the wiring to lay flat on the bottom from cabinet to cabinet. The use of leveling legs with removable kick plates gives us more places for cable runs. Having a place to hide that extra-long VGA or a power supply cable is a plus.

When ordering a room of furniture — or 15 rooms like Sandusky — you need to know when it will arrive on site and who is going to install it. With an agreed delivery date you will have your furniture on time. The good news: You get your stuff on time. The bad news: You have to be ready to have it installed!

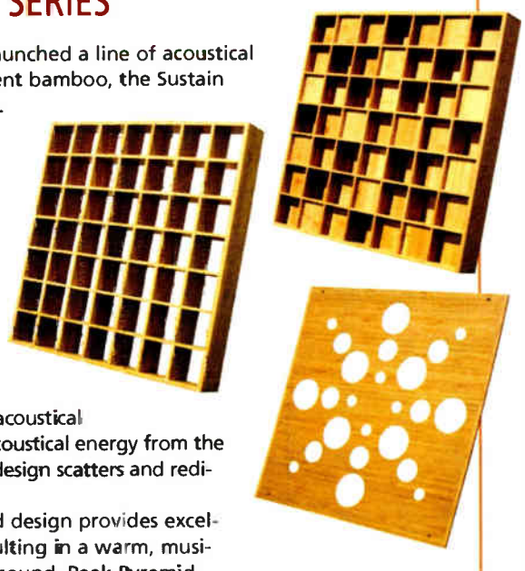
Depending on how many rooms to be installed in an installation phase, Studio Technology will send two to four guys to unload the truck and install the furniture. Cutouts for consoles are done on site. Mic cough panels and computer monitor arms/grommet holes are drilled as well. Having a line of sight from console location to guest positions and being able to fudge a little on the placement of a console is a life-saver.

For information, contact Vince Fiola at Studio Technology in Pennsylvania at (610) 925-2785 or visit www.studiotechnology.com.

TECHUPDATE

AURALEX INTRODUCES SUSTAIN BAMBOO SOUND DIFFUSOR SERIES

Auralex Acoustics Inc. has launched a line of acoustical products made from 100 percent bamboo, the Sustain Bamboo Sound Diffusor Series.



According to Auralex the product line, which consists of WavePrism, WaveLens, QuadraTec, Peak Pyramid Diffusor and KeyPacs, takes advantage of the ecologically and acoustically friendly properties of natural bamboo.

The WavePrism's closed-box design configuration eliminates flutter echoes and other acoustical anomalies without removing acoustical energy from the space. WaveLens' open-boxed design scatters and redirects acoustical energy.

QuadraTec's unusual tiered design provides excellent scattering properties, resulting in a warm, musical character to the dispersed sound. Peak Pyramid Diffusor is optimized to provide high-quality sound diffusion while doubling as an effective bass trap when filled with absorptive material.

KeyPacs are designed to be mounted to the face of absorptive panels, such as Auralex's ProPanels or Studiofoam.

For information, contact Auralex in Indiana at (800) 959-3343 or visit www.auralex.com.

World Radio History

Why do Axia consoles do phones best? (Hint: who's *your* daddy?)

Other consoles treat phones like an afterthought. But Axia's parent company is Telos, so phones are part of our DNA. Consider our Element AoIP console, and the Telos VX broadcast VoIP phone system. Both amazing on their own. But when you connect them — magic. Total integration, so talent can run complex talkshows without taking their hands off the board. Effortless. A dedicated hybrid for each caller, each assigned to its own fader, with automatic mix-minus and talkback. Painless hookup via CAT-5 — no extra I/O or logic connections required. An all-digital path for crystal-clear caller audio, even from cell phones. That's the Telos connection. And only Axia gets it. Axia: the console that talks Telos.

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A TELOS COMPANY

axiaaudio.com

World Radio History

WSMR Gets a Classic(al) Look

Balsys Provides Customized Wood Furniture For New Station at WUSF Public Media

USERREPORT

BY TOM DOLLENMAYER
Station Manager
WUSF Public Media

SARASOTA, FLA. — In the fall of 2010, WUSF Public Media expanded its service to West Florida by purchasing a radio station in Sarasota. The station was to be reformatted into a 24/7 classical music station with a broadcast area ranging from St. Petersburg to Ft. Myers.

Through a strategic partnership with the University of South Florida Sarasota/Manatee, new studios for the new classical music station WSMR(FM) 89.1 were built inside the main campus building. The facility was designed to satisfy the needs of the new station but also to function as a space for radio broadcasts, live performances and recording of news programs. It occasionally would accommodate TV production needs for the three stations now owned and managed by WUSF Public Media.

The studio features a small equipment room, a moderate-sized control room and a performance studio with a Steinway grand piano as its centerpiece. It was important that the design and finish of the furniture be similar to many of the other fixtures that visually tie together spaces on USF's Sarasota campus.

WALNUT FINISH

The new station, WSMR 89.1, was scheduled to go on-air and the studios open in late January 2011. This created tight deadlines, a tighter budget and the need for a piece of furniture to be a key focal element in the space. WUSF knew that Balsys Wood Arts would provide real wood, handcrafted pieces of furniture that would not only be beautiful but functional.

Balsys provided the custom furniture in our main campus studios from our original concepts and again have helped give our studios the image and flexibility that enhance our operations. Balsys built our furniture for less than I would have paid for catalog furniture and it was designed to fit our needs.

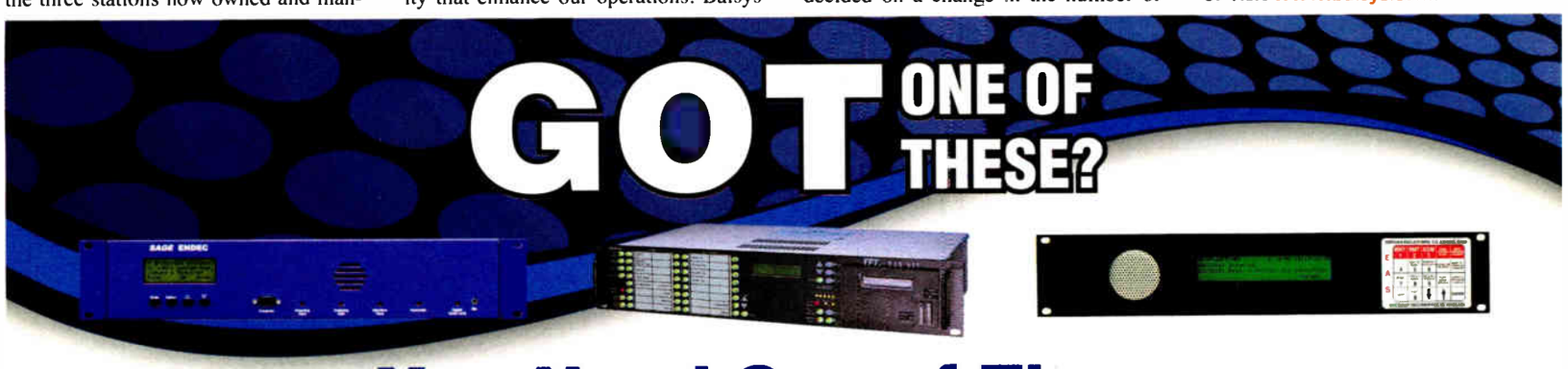
Design and finish needed to be consistent with that of existing fixtures that visually tie together spaces on USF's Sarasota campus.

One special piece incorporated a high-end walnut finish that matches the décor throughout the facility. It was ready at the exact time it was needed to arrive at the studio for installation. I could not be happier with the service and product.

During the end of the project we decided on a change in the number of legs on the piece. We called Balsys and they jumped onto producing the two extra elements. In a short time the extra legs were ready. You can't do that with furniture from a broadcast catalog.

WSMR 89.1 has since used the space to host donor events, live performances and live radio programs from the studios. The furniture is durable and has stood up to the wear and tear of a broadcast operation, still looking as fresh as the day it was ready for delivery.

For information, contact Balsys Wood Arts in Florida at (407) 656-3719 or visit www.balsys.com.



World Radio History

TECHUPDATES

SONIFEX HAS 'SOLUTIONS'

Sonifex describes the S2 Solutions line as high-quality radio studio furniture made of ash and a hard-wearing blue/gray linoleum desktop surface.

The furniture is modular so it can be used for a small L-shaped production or talk studio, through to a larger U-shaped on-air studio. It's easy to fit together, with large internal spaces for cable routing.

S2 Solutions are designed to be shipped, then assembled quickly by the customer on-site. Woodwork is packaged in protective cartons. Simple instructions facilitate rapid assembly with few tools.

Cables can be hidden, allowing a simple, tidy installation. Cable covers can be fitted wherever cable access is needed, for example for microphone leads or LCD monitor cables.

The basic single mixer furniture is L-shaped and can be installed left- or right-handed, with a panel protecting the end on display. An additional side return can be added to make a U shape, allowing more space for turntables, a PC or a further guest position.

The desktop into which the mixer is set can be 51 or 59 inches wide, depending on the studio space available.

The split mixer furniture is for use with the Sonifex S2 split mixer, i.e. a 10–15 channel frame on one side and a second on the other side. This package has space for two guest seating positions behind the mixers and is suitable for small-scale radio, local radio or smaller studios in larger stations.

For information contact Sonifex/Independent Audio in Maine at (207) 773-2424 or visit www.sonifex.co.uk or www.independentaudio.com.

PROBOOM ELITE BUILDS ON 50-YEAR BROADCAST HISTORY

O.C. White says its microphone armatures, introduced in the 1960s, are renowned for holding power, ease of use and longevity. The ProBoom Elite series is the next generation.

The mic arms feature a patented wire channel top arm for fast XLR cable installation. Lay the cable into the channel and install press-fit extruded caps; the wire stays securely in place.

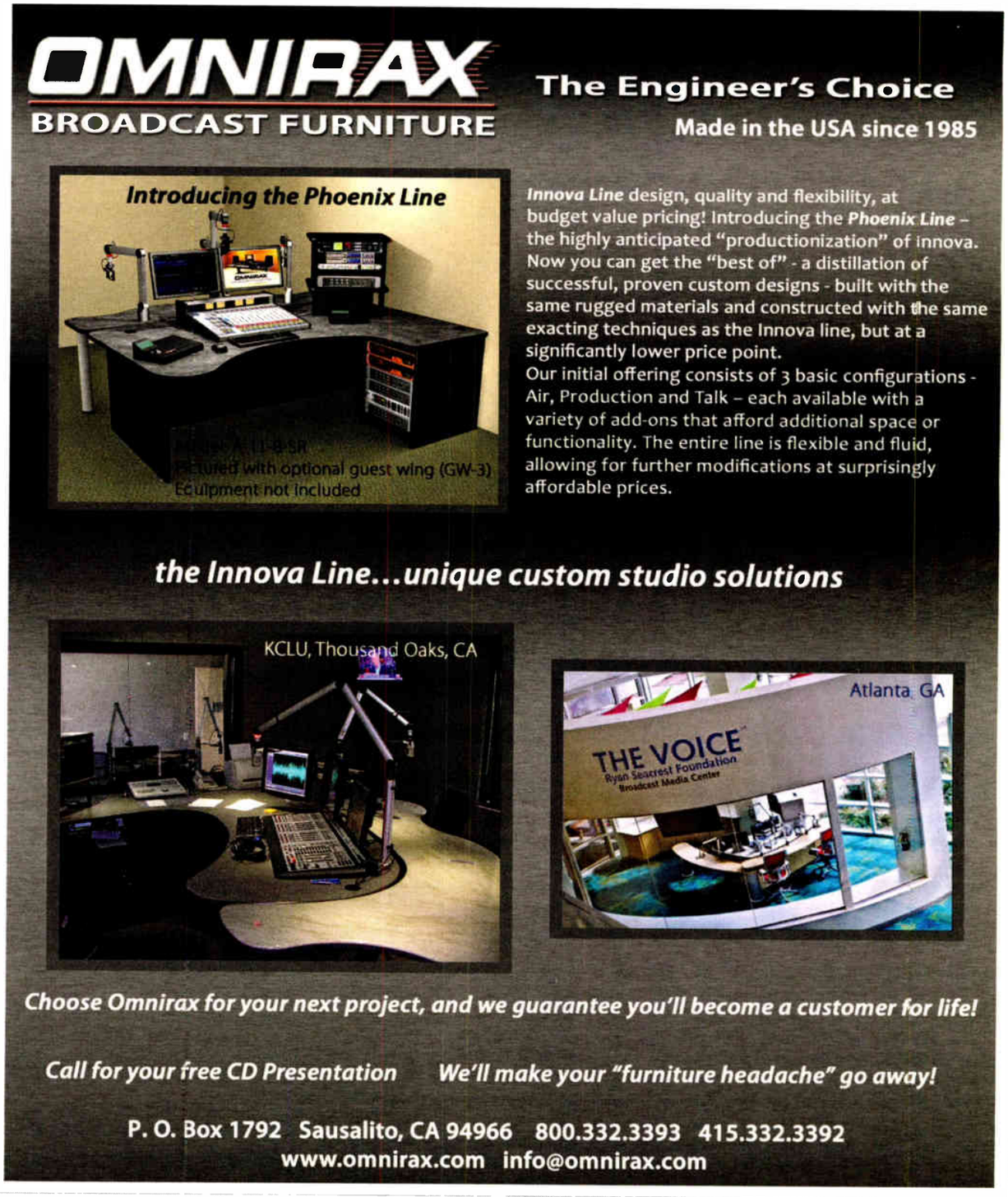
As is standard on all O.C. White booms, the Elite series features music wire springs for silent on-air performance. This specialty material allows for articulation on-air without the spring noise or squeaking associated with some products.

Included is a 15-inch riser assembly with integrated XLR holder. This allows for the mic arm to clear near-field monitors or other accessories. The built-in XLR holder allows for clean installation of XLR connectors. It features both a bottom and side wire exit for a professional appearance.

They are available in reaches of 29 and 45 inches and a choice of arm-only, table edge clamp, 15-inch vertical riser or three-arm "round table" mount.

O.C. White products are made in the United States and have a 10-year mechanical warranty

For information, contact O.C. White in Massachusetts at (888) 629-4483 (OCWHITE) or visit www.ocwhite.com.



World Radio History

Omnirax Makes KCLU Dream Happen

Facility Comes to Fruition for Collegiate Broadcaster

USERREPORT

BY JAMES RONDEAU

THOUSAND OAKS, CALIF. — For 16 years KCLU was located in a cramped California Lutheran University residence hall. Over the years the station used these facilities to cement a reputation as a formidable news & talk source for the region, winning more than 160 awards for journalism and a large, supportive audience.

In 2009 planning began for a new facility to meet the station's growing production and on-air needs. We started with a "wish list" of the many studio, community and office spaces we wanted in our "dream" facility. But, translating rough sketches into attractive, functional work spaces isn't easy and we knew that the consequences of our decisions would last decades.

SATISFACTION

Every dollar spent was another that had to be raised, so we were cautious and looked at a number of off-the-shelf options for studio furniture. Each seemed to sacrifice something that we considered important: work flow, sight lines, ergonomics, space utilization, visual impact. We decided that you don't build a $3 million house and furnish it at Ikea. We needed to do it right.

We first met Omnirax designer David Holland at the NAB Show in April 2010. He showed us photos of the company's projects, from modest to over-the-top. (We were looking for something in between!) Shortly afterward, we began a series of teleconferences to "audition" different shapes and configurations we'd dreamed-up.

Working with Omnirax went beyond configuration and styling. The conversations were wide-ranging, aimed at creating a facility that worked on every level. Sometimes what seems logical on the blueprints doesn't always work in reality.

We puzzled through everything from the placement of studio windows for superior sight lines to the ideal location for computer monitors and desk-mounted hardware. I'm confident that these comprehensive considerations will keep future KCLU staff from cursing our names in future years.

As the project progressed, we discussed the equipment planned for each room and made sure rack and desk space would be adequate for what we envisioned. Later, we selected from a huge variety of colors and finishes that would make our furnishings look "at home" in a custom-designed facility.

We chose Corian finishes for the guest wings in our Master Control and Talk studios. It adds a nice accent to the design and really makes an impression on guests who stop by for interviews.

Assembly of our furniture was overseen by our consulting engineer Tim Schultz. It's heavy-duty stuff, so he pulled two of his brothers in for labor.

The only complication came when we realized that the as-built dimensions of our smallest production booth were slightly narrower than specified. This was a problem, because we'd used every square inch to work that room into our floorplan. Omnirax was able quickly to redesign and manufacture a modified desktop to accommodate the space we had available.

Omnirax designs are known for graceful, curved lines. They're "people friendly," with no hard corners or sharp turns. Each of the microphone positions at KCLU is defined by an indentation that guides talent into their own individual work area. The furniture is also sturdy and beautiful, never failing to elicit a "wow" even from visitors who have seen plenty of studios. Each piece arrived precut for our Axia consoles, with wiring cutouts that precisely met wall conduits for easy access and simplified cable runs.

For most of us, the opportunity to build a new facility from the ground up is rare. Unfortunately, that also increases the chance of making mistakes. Working with Omnirax allowed KCLU to make the most of limited space, while creating a visually impressive and functional facility. We were able to test the feasibility of our wildest ideas and call upon the experience of someone who has worked on some of the finest studios in the country.

I've worked in lots of major-market studios from Los Angeles to Seattle, so I knew Omnirax was great studio furniture. But I was surprised how willing they were to function as a true design partner, together with our architects, contractors and engineer. It gave us the confidence to try new things and maximize what we were able to achieve.

For information, contact Philip Zittell at Omnirax in California at (800) 332-3393 or visit www.omnirax.com.

TECHUPDATE

ARRAKIS PUTS THE ACCENT ON FURNITURE

With the introduction of its Accent line of advanced component studio furniture for radio, Arrakis says it is going a step further. According to the company the metal structure is integrated artfully into the visible design décor of the cabinetry.

With its origins in the console market, Arrakis says, it was an early pioneer the metal post and wood panel construction found in most high-end radio studio furniture in use today. An internal metal structure dramatically improved manufacturing tolerances and made high-quality modularity possible.

Arrakis' wood products manufacturing facility is top-of-the-line, including a large-capacity CNC (computerized numerical control) router for complex geometries and surfaces.

Accent is available in standard as well as custom configurations. The hybrid metal frame and structural panel design combined with Arrakis' CNC manufacturing systems tailor the product to fit a studio's size and shape. Numerous colors and textures to match décor are available.

The Accent furniture collection is stylistic and functional, with brushed aluminum frame and customizable tabletops.

Accent furniture is available for 25 percent off through the end of the year.

For information, contact Arrakis Systems in Colorado (970) 461-0730 or visit www.arrakis-systems.com.

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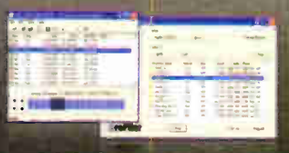

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KCSU: Two Studios, 70 Operators

Harris, SCMS Help Station Create New Studio Lines and Workflows

USERREPORT

BY MARIO CABALLERO
General Manager
Rocky Mountain Student Media Corp.
Colorado State University, Fort Collins

FORT COLLINS, COLO. — Tuesday nights rarely are busy at student-run KCSU(FM). Listeners usually tune in for "The Ramblers," the 7 p.m. sports talk show featuring several students discussing Colorado State University varsity and club sports and the local pro teams.

Things felt a little different at the studio on the evening of Tuesday, April 26. "The Ramblers" were welcomed with a studio redesign, complete with new furniture and a comfortable layout that gave the studio a more professional look. The concurrent installation of new and flexible digital technology helped to avert an unexpected scheduling bottleneck.

STRATEGY

KCSU received a long-overdue upgrade this spring when Harris Broadcast and SCMS Inc. came together to package and strategize the new studio design.

Harris PR&E QuickLine studio furniture has transformed the look and feel of the room, with new Harris PR&E NetWave audio consoles and VistaMax audio networking systems bringing new life to the on-air and production room studios.

KCSU is a relatively small operation, with only two studios, but it has a large staff to train and manage. A minimum of 70 students, mostly volunteers, will operate the studios throughout the week — assuming all the DJ time slots are filled.

The new QuickLine furniture created an organized studio with a sleek, contemporary look. The students requested a seated furniture arrangement, and the new layout and furniture design allows for one host position and three guest positions. The furniture also fits the studio better, as the previous furniture was much too large and space-consuming.

The studio upgrade also cleaned up miles of old wiring. The new wiring, designed and arranged by Harris offsite prior to installation, is far superior. The QuickLine furniture accommodates cleaner wiring runs and bundles, in a far more efficient manner than the previous furniture. The built-in harnesses create a compact and organized flow, and make the wiring accessible.

The design process required a review of the old layout with equipment lists, drawings and detailed discussions about what the station required in the new setup. This was accomplished via email and phone, exchanging photos and documents along the way. Actual installation took less than a week for the main air studio. The production studio was delayed because of winter weather, but would otherwise have been completed the same week.

The NetWave consoles helped to achieve a great sound to go with the improved look. The NetWaves replaced Harris PR&E Airwave 12 consoles that had been in place since 1998 and served us well.

The new layout and workflow on the NetWave consoles are similar to the Airwaves, thus making the training process intuitive for veteran DJs. New volunteers have embraced the consoles.

The VistaMax audio networking system offers students the ability to route sources between the studios quickly. That flexibility was needed on this Tuesday evening, as a local five-piece band was setting up to play in the performance area of the on-air studio.

This also happened to be at the same time that the sports crew needed to establish a remote ISDN connection from an arena across campus for a women's volleyball game. The DJ was doing a live show from the air studio, handling a play-by-play broadcast scheduled to air after the band's appearance. The strengths of the Harris digital studio equipment and open studio design helped everyone achieve their goals with ease.

The new studio design has set a tone of professionalism that KCSU strives to maintain. The new furniture, audio consoles and audio networking system helped the radio station look better and sound great.

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TECHUPDATES

REALTRAPS FOR RADIO STUDIOS

RealTraps believes its MegaTraps are the largest and most effective "off-the-shelf" corner bass traps. They are suitable for studio live and control rooms.

MegaTraps are about three feet wide for maximum effectiveness below 40 Hz. They are modular units two feet tall that can be stacked to 12 feet without requiring permanent mounting or creating wall damage.

Units are available in white, wheat (off-white), gray or black. Despite their size they can be unobtrusive. An optional rigid top of 1/4-inch Masonite is available where a shorter stack (one or two MegaTraps) will serve as a corner table, counter surface or speaker stand.

For information, contact RealTraps in Connecticut at (860) 210-1870 or visit www.realtraps.com.

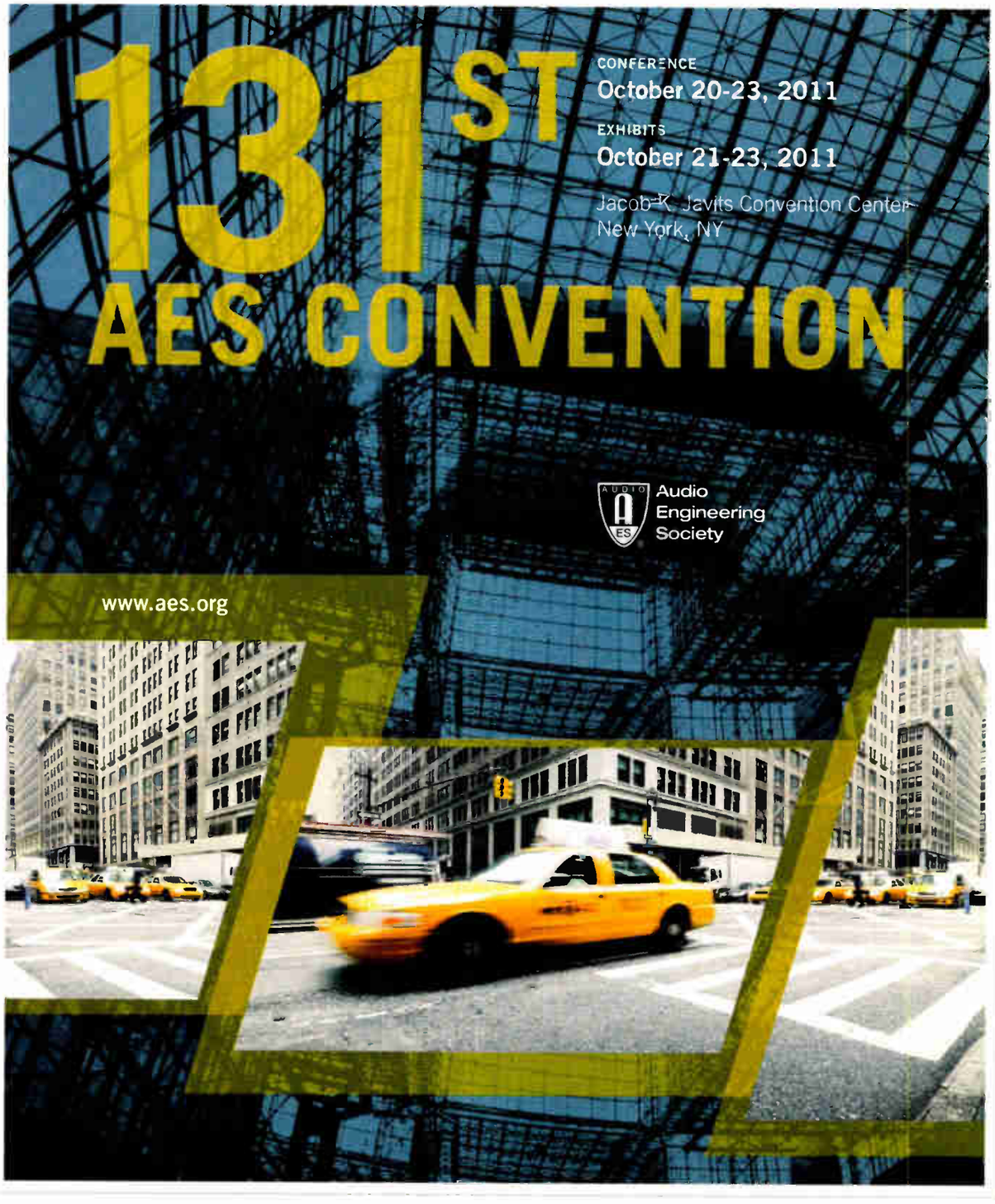
ENGLEWOODWORKS INSTALLS FURNITURE AT MPR

Englewoodworks manufactures custom, adjustable-height broadcast "consoles." It recently installed a new one in the "89.3 The Current" studio of Minnesota Public Radio.

Englewoodworks consoles incorporate standard features like racks, access panels, monitors and space for mixers and controls. The height adjustment feature meets ADA standards for handicapped access. In addition it allows for preferences of stand-up or sitting positions during use.

The countertop moves up or down in a few seconds at the touch of a button. Heights range from 30 to 46 inches to accommodate individual preferences. Overall size is usually about 11 feet long by 5 feet deep but each console is customized to fit its environment. Englewoodworks offers a choice of materials and finishes including Richlite countertops.

For information, contact Englewoodworks in Wisconsin at (715) 268-4641 or visit www.englewoodworks.com.



World Radio History

TECHUPDATES

WHISPERROOM ADDS XLR PANEL

WhisperRoom makes sound isolation enclosures for recording and broadcasting.

The most recent addition to the product line is the XLR Panel, a 40-inch wall component with a prewired insert consisting of four XLR jacks and four 1/4-inch stereo jacks. This feature comes with a 26-inch x 36-inch window above and a 2-inch cable passage below the panel.

WhisperRoom now also offers ceiling-mounted ventilation on units that can accommodate the ventilation duct boxes on the ceiling. The standard system consists of two or more duct boxes (depending on the size of the WhisperRoom) mounted on an exterior wall and protruding 5.5 inches off the wall(s). The ceiling-mount option is suitable for situations where space is a concern or the client prefers the ventilation system not be visible. The user should determine first that the host room ceiling will allow for the addition of this optional feature.

WhisperRoom offers 20 sizes and two levels of sound isolation, Standard (single-wall) and Enhanced (double-wall). Standard models can be upgraded to Enhanced at any time to accommodate client needs. Sizes range from a modest one-person unit (3.5 x 2.5 feet) to a room-size unit (8.5 x 15.5 feet).

For information, contact WhisperRoom in Tennessee at (423) 585-5827 or visit www.whisperroom.com.

HOST CAN SEE GUEST WITH HEIL SB-2

A new array of microphone desk stands, booms and mounts has been released by Heil Sound.

In the company's view, broadcast studios have become filled with so many large articulated arms that hosts can hardly see their guests. Heil claims to have solved this problem with its low-profile SB-2 small boom.

The SB-2 is adjustable from 6 to 24 inches. It can mount with the unique DT-1 mount, a C clamp or on top of the Heil 13-inch riser.

For the host, the award-winning PL2T Topless is one of the leading booms. Internal springs make this a quiet boom and the Heil trademarked Topless feature allows the microphone cable to be laid into the channel without removing the connector.

Heil Sound's latest is new Heil HB-1 Economy boom, retailing for $70.

Heil mounts hold up to 3 pounds and fit all of Heil's C clamps, risers and wall mounts. The Heil CB-1 PTT desk stand is a reproduction of the original RCA desk stand, including chrome trim. An SPST button can be wired for push to talk or cough button relay control.

For information, contact Heil Sound in Illinois at (618) 257-3000 or visit www.heilsound.com.

MIDDLE ATLANTIC DEBUTS VIEWPOINT CONSOLE FURNITURE SYSTEM

Middle Atlantic Products says it took an application-driven approach to create what it calls the industry's first seismic-certified console furniture system.

ViewPoint is seismic-certified to UBC, CBC, IBC, ASCE and NFPA requirements. The UL-listed consoles feature strength and reliability to protect mission-critical equipment in broadcast monitoring and production environments. They also meet BIFMA standards and are Greenguard-certified, which, according to Middle Atlantic, reflects the company's commitment to environmental responsibility and may be used to obtain LEED credits.

ViewPoint technical consoles consist of welded Uni-Frame workstation bays that simplify installation and can be configured for individual project needs. An array of customization options includes wedges, bay extenders for rackmounting deeper equipment, turrets for smaller equipment, work surfaces tailored to each system, side panels and monitor mounts. Designed to maximize functionality and installed system reliability, the ViewPoint system incorporates ergonomic factors, equipment cooling and cable management features.

Middle Atlantic's free Designer 3D layout software simplifies creation and visualization of ViewPoint console designs. It is available via download from the Middle Atlantic Products website.

For information, contact Middle Atlantic Products in New Jersey at (800) 266-7225 or visit www.middleatlantic.com.

ACOUSTICS FIRST 1014 ACOUSTIKIT IS IMPROVED

Acoustics First says its 1014 AcoustiKit is designed to provide necessary acoustical treatments for a studio control room or a critical listening environment with dimensions up to 10 feet wide by 14 feet deep.

The studio package has been upgraded to include 48 pieces of 1-foot x 1-foot Cutting Wedge studio foam. This material treats the front wall and the first reflection points on the ceiling and side walls. This adds versatility over 2 feet x 2 feet pieces of foam, allowing the user to spread the material over a greater surface area to increase absorption and allow more design options. The 1-foot x 1-foot dense-blade design allows users to create an anechoic parquet pattern or an aesthetic tailored to preferences or the room.

The Bermuda Triangle Trap provides broadband absorption and prevents bass buildup in rear corners. These traps also can be used to treat horizontal corners where the wall meets the ceiling or behind audio monitors in front of the listening position.

This is the only kit to include patented two-dimensional Model F Art Diffusors. These binary array sound diffusors scatter the sound and aid in creating a space that sounds larger than it is, according to Acoustics First.

This room system has been designed to give a basic and necessary acoustical treatment, but additional material can be added as budget permits. A room design guide is included and is available as a PDF; see the website under 1014 AcoustiKit.

For information, contact Acoustics First in Virginia at (804) 342-2900 or visit www.acousticsfirst.com.

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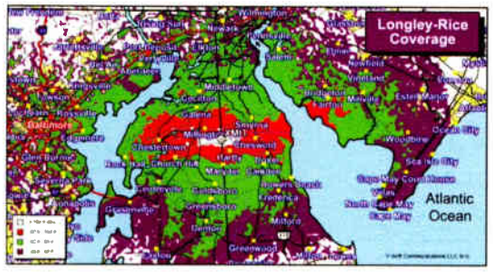

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Free to good home: Classic Schafer 903 automation system, contains 5 reel to reel decks, Audiofile-48, Carousel, manual entry keyboard, tape punch reader/coder, live assist switching control, instruction books and documentation, worked absolutely perfectly when removed from service, more info and pics at MEGDick@verizon.net.

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Wanted: old analog automation equip, filters and EQ, tube amps, reel to reel, cart machines and parts. Pacific NW area. 503-493-2983.

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Collector wants to buy: old vintage pro gears, compressor/limiter, microphone, mixing consoles, amplifiers, mic preamps, speakers, turntables, EQ working or not, working transformers (UTC Western Electric), Fairchild, Western Electric, Langevin, RCA, Gates, Urei, Altec, Pultec, Collins. Cash - pick up 773-339-9035.

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I'm looking for San Francisco radio recordings from the 1920's through the 1980's. For example newscast, talk shows, music shows, live band remotes, etc. Stations like KGO, KFRC, KSFO, KTAB, KDIA, KWBR, KSFX, KOBY, KCBS, KQW, KRE, KTIM, KYA, etc, I will pay for copies... Feel free to call me at 925-284-5428 or you can email me at ronwtamm@yahoo.com.

Looking for a broadcast excerpt of a SanFrancisco Giant's taped off of KSFO radio from 1959, interviews with Willie Mays, Dusty Rhodes & some play by play excerpts, also features a homerun by Willie Mays and Felipe Alou stealing second base, running time is 18:02, also looking for SF Giants games and/or highlights from 1958-1978 also taped off KSFO Radio. Ron, 925-284-5428 or ronwtamm@yahoo.com.

Looking for KFRC signoff radio broadcast from 1930 Andy Potter, running time is 0:22 & also the KLX kitchen the program guest is Susanne Caygill, a discussion of women's affairs with a long promotion for Caygill's appearance at a local store. Anne Truax, Susanne Caygill, running time is 13:44. Ron, 925-284-5428 or email ronwtamm@yahoo.com.

Looking for KTIM FM radio shows from 1981-1984 if possible unscoped. R Tamm, 925-284-5428 or ronwtamm@yahoo.com.

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World Radio History

JUMP TO 4G

(continued from page 38)

Verizon has been surprisingly accurate in their deployment predictions so far. Verizon also is the "Backhaul King" in many major markets, owning much of the fiber needed to connect cell sites together.

Verizon has one other major feather in its cap, which is the ownership of the cherished "Block C" of wireless spectrum nationwide, won in the great spectrum auction of 2008.

Located in the 700 MHz band and formerly used for UHF television analog channels, it has the ability to penetrate buildings much more effectively than higher frequency systems. Our early testing shows LTE working well deep within offices, elevators and basements.

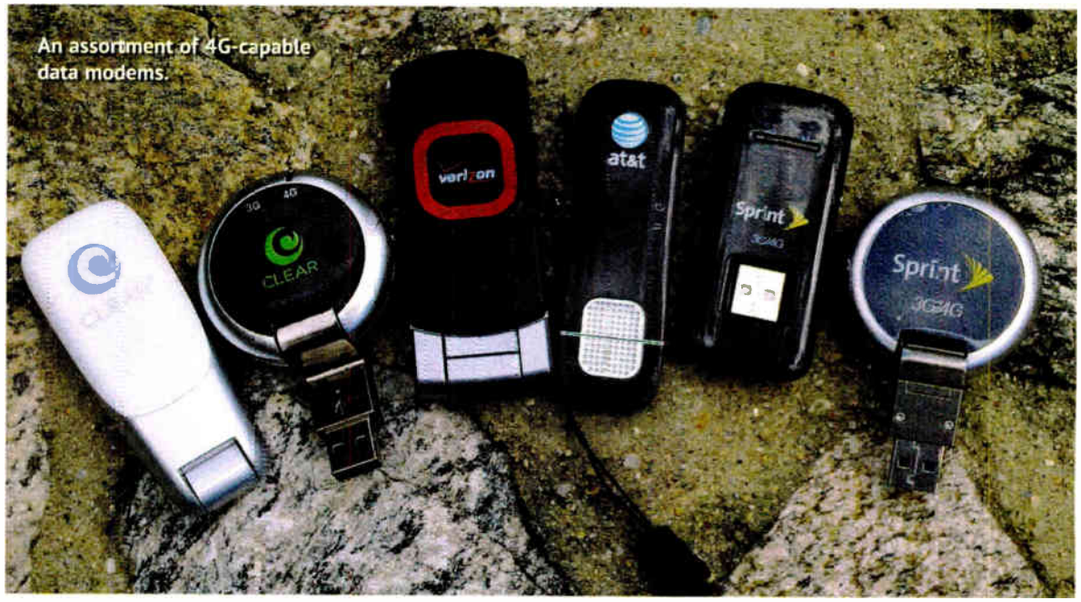
NETWORK VISION

Sprint was the first to market with 4G solutions, based on a competing technology called WiMax. To get to 4G quickly, Sprint partnered with (and now owns part of) the Clear WiMax network. Clear and Sprint have hit some rough patches (supposedly settled now) and that has affected deployment, which still remains spotty in many markets.

Sprint made a big announcement about their roadmap early this year which should have an impact on their services. The initiative is called "Network Vision" and is a way for them to unify the diverse spectrum they currently hold: the former Nextel push-to-talk band at the coveted 800 MHz band, the PCS band where they currently deliver 3G and voice at 1900 MHz, and the 4G WiMax band at 2500 MHz.

Network Vision involves allowing all services to operate across their various spectrums, and enhancing backhaul with point-to-point microwave links. In between the lines of their various press releases are hints the Sprint may move to LTE, which is close enough to the WiMax technology to be done relatively seamlessly. But the real advantage will come when 4G can be run on the 800 MHz band.

Our testing of WiMax shows a marked improvement over 3G for data transfer, but the high frequency limits it to "single wall penetration," which means you're better off near a window when using it indoors.



An assortment of 4G-capable data modems.

AT&T/T-MOBILE

Likely to merge this year, AT&T and T-Mobile have similar 4G strategies, although AT&T's roadmap is a bit longer.

Both companies have applied the 4G tag to what is an incremental upgrade to their 3G service, HSPA+, running on the same frequencies as 3G services. Our testing so far indicates an improvement in jitter and delay (to the already superior numbers of their 3G systems), but upload speeds are still somewhat limited by backhaul deployment. By "limited" I mean slightly below 1 Mbps, which is still very usable for media streaming.

The combined entity will own large chunks of spectrum in the 700 MHz and 850 MHz bands, as well as 1700 MHz and 1900 MHz. AT&T has already begun deployment of LTE in several markets in 2011, and you can expect to see that accelerate as they strive to keep up with the competition. Many of the data devices for sale now are LTE upgradeable. Within two years, this LTE network should rival Verizon's in most of the U.S.

SUMMARY

Our testing at Comrex shows that, given decent coverage, the jump to 4G is very much worth the investment for media streaming.

Before you sign a long-term contract, you'll need to research which company covers your venues with which technology. But whichever network you choose, you're sure to see a dramatic improvement in live streaming capability. As more markets come online and competition heats up further, the choices are likely to only get better.

Comment on this or any article. Email radioworld@nbmedia.com.

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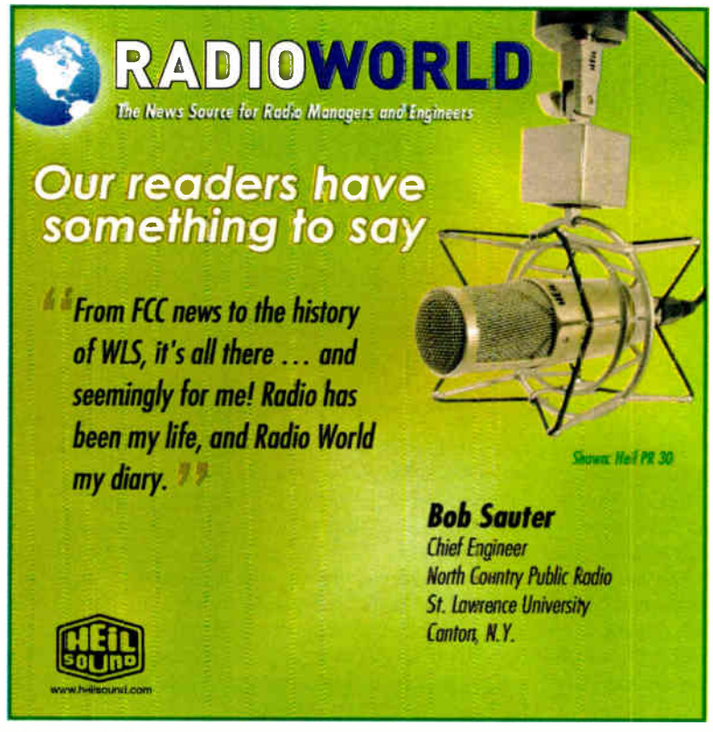


World Radio History

Should You Make the Jump to 4G?

Our Testing Shows You Can Expect Big Improvement in Streaming Capability

COMMENTARY

BY TOM HARTNETT

The author is technical director of Comrex.

American cellphone carriers turned up the heat this summer, each making bold claims that their 4G solution is better than the competition's. Doubtless you've seen the ads, featuring lightning bolts, company CEOs and pretty girls in pink dresses.

For once, the United States is ahead of the curve on wireless data service, as our European and Asian friends are still mostly stuck in the 3G domain.

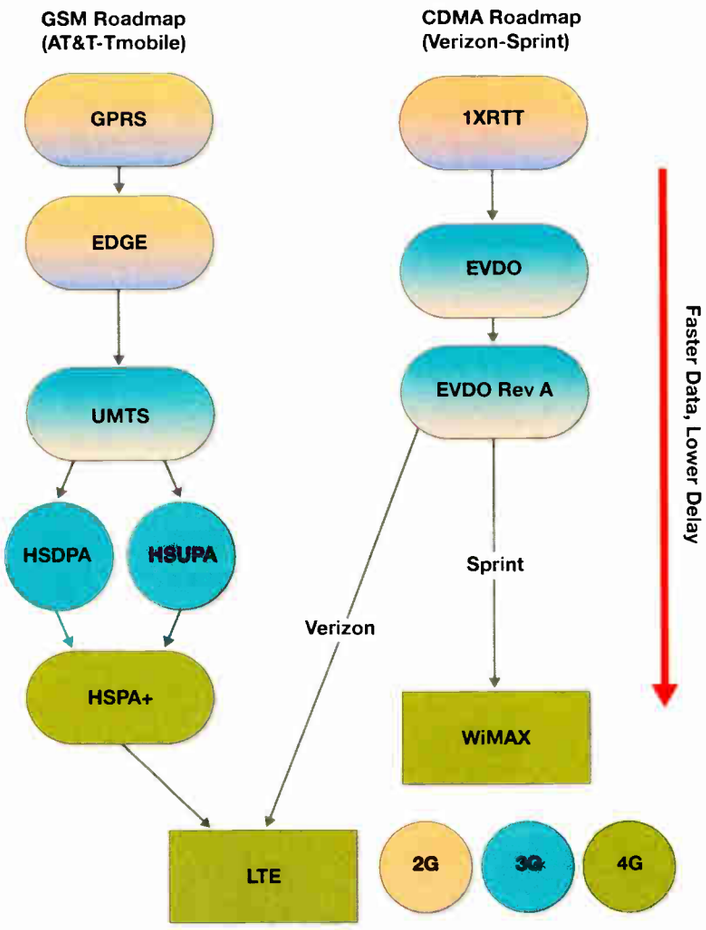
"4G" means different things to different folks, so for the purposes of this discussion we'll call 4G the highest level of data service available from each of the four major carriers. There's certainly room to argue whether some services offer enough of an incentive over 3G to qualify, but we'll use the marketing terms for the sake of comparison.

Fig. 1 shows the evolution of each of the American wireless carriers toward 4G.

CONSIDERATIONS

Most of the carriers will tout download speeds as the main advantage to 4G, but to professionals interested in doing things like live remote streaming of audio and video (like using Comrex gear), there are other factors just as important.

If you're sending media from the field, upload speeds are even more important than download speeds, and none of the 4G systems available is symmetrical in upload vs. download rates. Many systems deliver only a fraction of the marketed speed on the upload side.



The evolution of American wireless carriers toward 4G.

If you're sending media from the field, upload speeds are even more important than download speeds, and none of the 4G systems available is symmetrical in upload vs. download rates.

In addition, ping time, or latency, is very important to live media streaming. If your plan is for two-way interactive audio or video, you can't tolerate substantial delay. Overall latency can also change dramatically over a time period, resulting in what is called jitter on the network.

The best possible 4G network will deliver upload speeds well over 1 Mbps, with low jitter and latency below 100 mS in each direction. With codecs that can perform an entire encode/decode cycle in less than 100 mS, total interactive delay can be kept to around the same as you would experience with a digital mobile phone.

Other factors weigh into the evaluation of 4G, of course, the most important being availability. A 4G modem isn't useful without a signal.

But deploying 4G involves more than turning on a new radio. With increased wireless bandwidth comes the need for higher backhaul bandwidth, i.e. increasing the amount of data that must be moved from the cellular towers to the Internet gateways.

Cost is always a factor, although in the current competitive environment it's not such a major one, since 4G is marketed to consumers. Some carriers are introducing data caps and throttling to cut costs, and not all offer automatic switchover to 3G in non-4G territory.

There are lots of variables at play so let's tackle each carrier one at a time:

RULE THE AIR

In terms of the criteria we've defined, the Verizon 4G LTE network is the one to beat. Virtually all wireless data roadmaps end at the LTE concept, and Verizon is way ahead of all others in spectrum ownership and deployment. The company announces dozens of new markets every month, and expects to have their entire network upgraded by 2014.

(continued on page 37)

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Email: radioworld@nbmedia.com
Website: www.radioworld.com
Telephone: (703) 852-4600
Business Fax: (703) 852-4582
Editorial Fax: (703) 852-4585

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SUBSCRIPTIONS
Radio World, P.O. Box 282, Lowell, MA 01853
TELEPHONE: 888-266-5828 (USA only 8:30 a.m.–5 p.m. EST)
978-667-0352 (Outside the US) FAX: 978-671-0460
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T: +B6-755-B3B62930/40/50 | F: +B6-755-B3B62920
CLASSIFIEDS: David Carson, dcarson@nbmedia.com
T: 212-378-0400, ext. 511 | F: 866-572-6156

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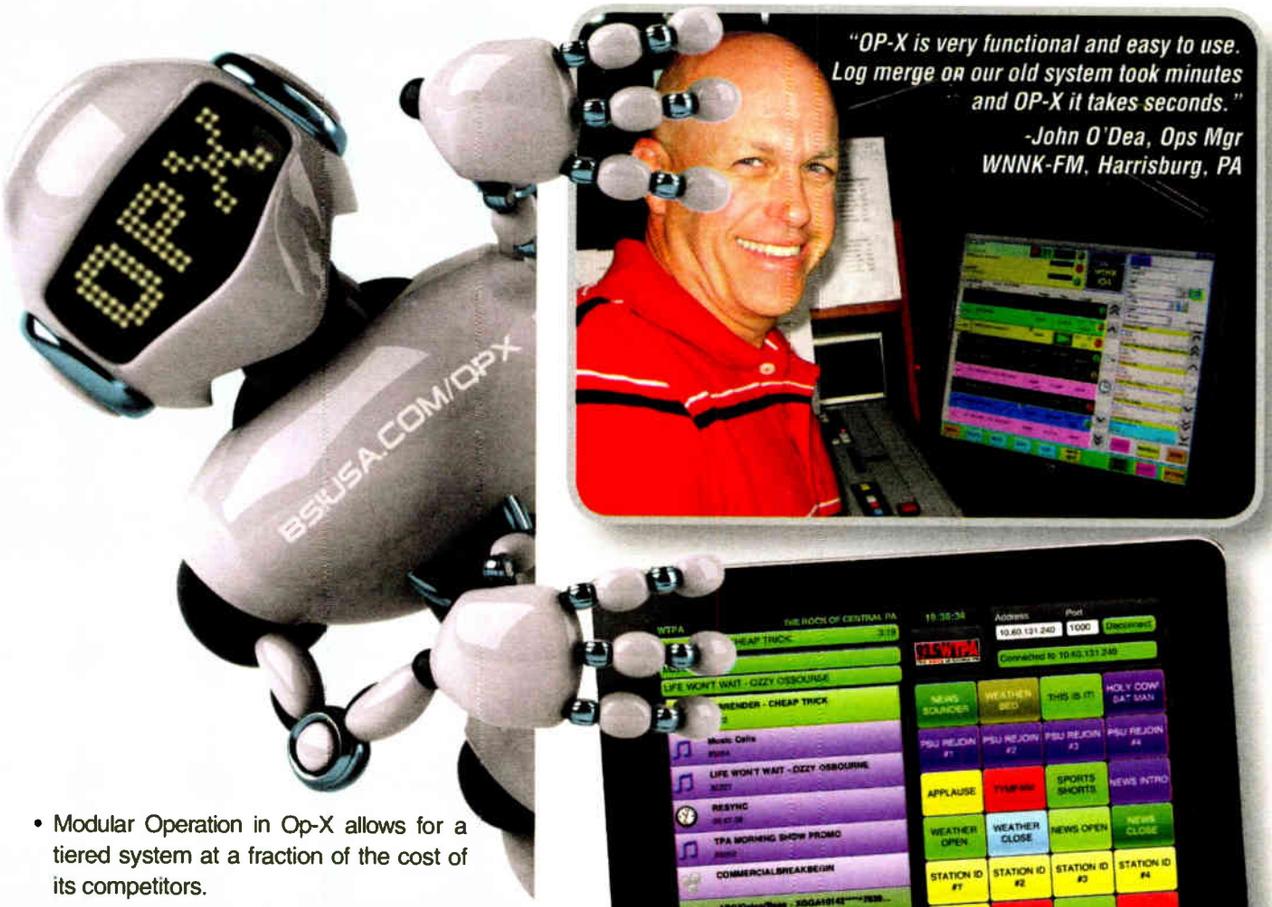

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