IF LISTENERS HAVE TO PAY, IS IT 'PUBLIC' RADIO? Page 18

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Own Your Own
The FM auction offers small and would-be broadcasters a rare chance.
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Behind the scenes at Auction 37.
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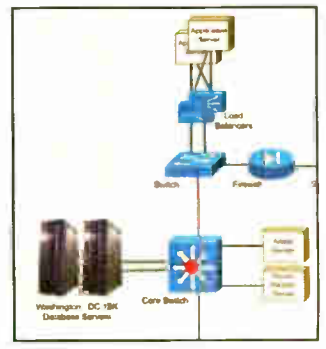
Radio World

$2.50 The Newspaper for Radio Managers and Engineers September 8, 2004



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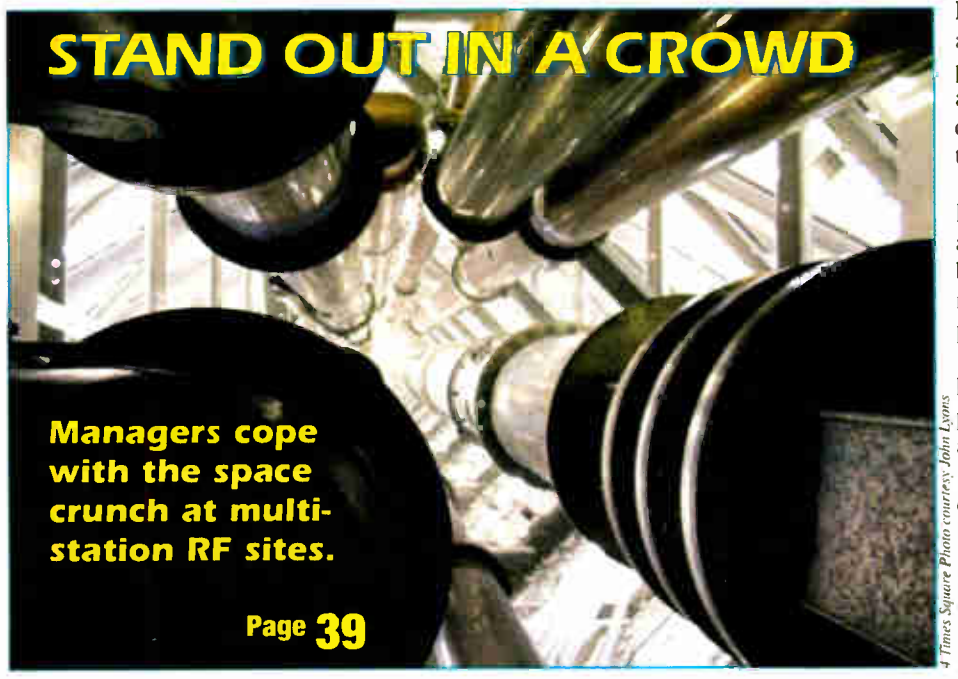
CEs Explore Audio Logging Options

by Randy J. Stine

WASHINGTON Broadcast equipment manufacturers say audio logging equipment could soon replace audio delay units as the fastest-selling type of studio gear, now that the FCC is seeking to bolster indecency enforcement efforts by proposing to require broadcasters to log audio and save it for a recommended 60 to 90 days.

Gone are the archaic Telex analog reel-to-reel recorders and similar devices better suited for industrial applications and which required walls and walls of tape storage. Broadcasters now choose from low-priced software programs that

See LOGGER, page 3 ▶



4 Times Square Photo courtesy John Lyons

NEWS MAKER

Solomon: FCC's Enforcement Whip Cracker

WASHINGTON Since its inception nearly five years ago, the FCC's Enforcement Bureau has increased the agency's activity in matters of indecency, pirates, main studio, RF radiation, EAS and other areas. The crackdown on indecency has been particularly aggressive in the past year.

David Solomon has been chief of the FCC Enforcement Bureau since its creation in 1999. He says complaints about broadcast indecency received by the commission used to focus mostly on radio programming. Now they also focus on TV.

As the number of indecency complaints has increased, so too has the number of proposed fines and their monetary amounts.

In 2000, the commission proposed seven indecency forfeitures for a total of $48,000. So far this year, the agency has issued six Notices of Apparent Liability totaling more than $1.5 million in proposed fines, and it has entered into

See SOLOMON, page 5 ▶

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◆ NEWSWATCH ◆

Stations Aid Hurricane Victims

WASHINGTON As Southwest Florida recovers from the effects of Hurricane Charley, NAB President/CEO Eddie Fritts and Florida Association of Broadcasters President Pat Roberts wanted the FCC to take note of what they call the role of broadcasters as "first responders."

In a nine-page letter to Chairman Michael Powell and copied to other commissioners, Fritts and Roberts said stations played a critical role.

They noted that when "the National Hurricane Center was still predicting a Class 2 hurricane would come ashore near Tampa," local forecasters were able to warn listeners and viewers that the storm's power had increased significantly and it had changed direction.

Radio was vital to listener Jan Ramos of North Fort Myers, Fla. His message to the local NBC and ABC TV affiliates was included in the Fritts/Roberts letter: "When Charley jogged north once again and spared a direct hit on the Bayshore area, our little old $10 battery-operated weather/AM/FM radio and your simulcast radio coverage were our only link to what was happening. We knew we didn't need to use the little safe room, whereas other neighbors told us they stayed in their safe room for hours due to fear and a lack of knowledge of the storm's new track.

"By airing your combined NBC-2/ABC-7 hurricane coverage on multiple radio stations, we were always able to find a clear channel, no matter the weather interference."

Florida broadcasters activated the EAS three times Aug. 13. Messages were sent in English and Spanish, the letter stated. They also forwarded testimonials describing broadcasters' programming, and later, station relief efforts.

Several radio organizations set up relief efforts. For example, Infinity's Orlando stations WOMX(FM), WJMH(FM) and WOCL(FM) organized a blood drive. Clear Channel's WXXL(FM) acted as an information clearinghouse. Clear Channel KZHT(FM) in Salt Lake City arranged to have a truck filled with bottled water driven to the area. Beasley stations in the Ft. Myers area joined several other local firms to raise money for the American Red Cross and Salvation Army.

Emmis, FCC Settle Indecency Claims

WASHINGTON Emmis Communications Corp. is making sure its employees understand its zero-tolerance for indecency policy — part of an agreement with the FCC to settle all outstanding indecency cases against Emmis for $300,000.

As part of the agreement, Emmis admits some of the material it aired was indecent, and commits to following a company-wide plan aimed at preventing future violations.

Emmis President and CEO Jeff Smulyan said the agreement allows the company to move forward.

The agreement settles $42,000 worth of fines against WKQX(FM), Chicago and more complaints that were pending.

Like Clear Channel and other radio groups, Emmis has introduced an obscenity and indecency training program for its on-air radio and TV talent, so they know what is allowed and what isn't under FCC rules. Employees accused of airing such programming will be suspended and the company will investigate the situation. If permitted to return to the air, the employee's material would be subject to a time delay of up to 5 minutes.

Should the FCC issue a fine or other proposed action against Emmis for obscenity or indecency, involved employees will be fired.

Clear Channel reached a similar agreement with the commission in June for $1.75 million.

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Logger

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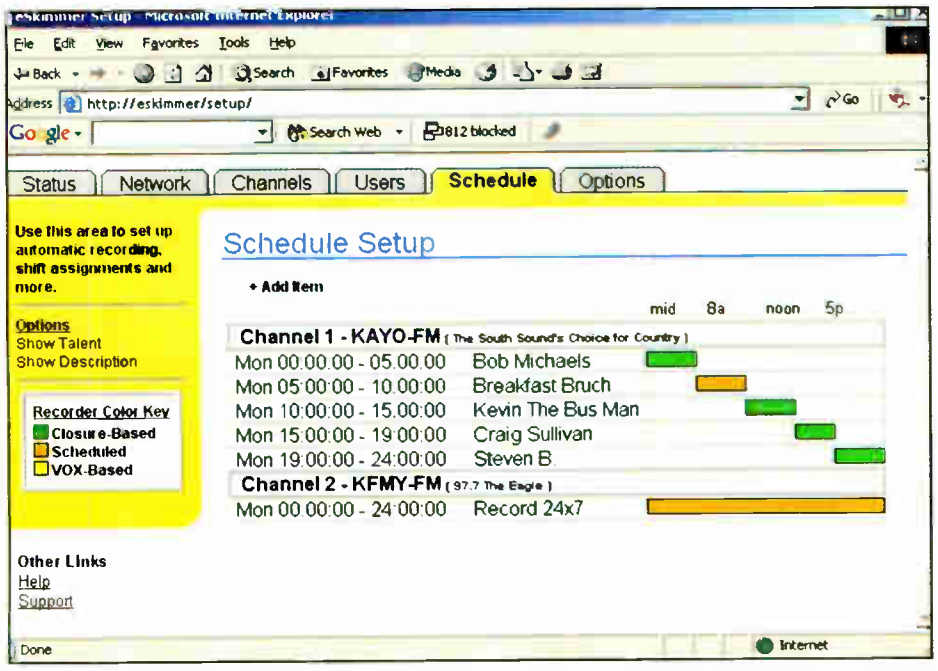
run on a PC to pricier turnkey logging systems.

Engineers and managers should face no shortage of audio logging options when and if the FCC proceeds with the requirement.

Equipment manufacturers say an inexpensive Windows-based solution may cost a broadcaster around $500, while high-end logging gear can start at $10,000.



The LakeSoft eSkimmer logging system shows programming logs for KAYO(FM) in Elma and KFMY(FM) in Raymond, Wash.

In a Notice of Proposed Rulemaking in July, the FCC outlined its proposal to increase the effectiveness of its process for enforcing restrictions on obscene, indecent and profane broadcast programming.

The filing deadline for reply comments for MB Docket 04-232 was to end Aug. 30, and commission staff expected to review that public input.

'Barely audible'

When the FCC announced the proposal, broadcasters immediately began asking manufacturers and suppliers about the availability of logging equipment.

"There has been an uptick in the number of calls we've received," said Denny Sanders, managing director for Telos Systems. "People are checking to see what they need for hardware."

Sanders said the early reel-to-reel recorders used by broadcasters had primitive fidelity. "Barely audible, is what I recall. They were built for the public safety sector, and storage of the tapes was a major problem. It just wasn't very practical," Sanders said.

Most logging products today also can be used for air checking, remote listening and verification that commercials ran as scheduled, Sanders said.

Sanders' company is active in this market, offering the Telos ProFiler automated programming archive. It uses MP3 compression, starts at a tad under $600 and can run on most PCs with Windows 2000 or XP Professional, according to the company.

"This can run well on older Pentium 3 computers with 400 MB RAM. So any old desktop sales computer should work," Sanders said.

U.S. Sales Manager Kirk Harnack said ProFiler records direct to hard drive and, depending on the bit rate setting, can hold up to a month of good audio on a 30 GB hard drive. ProFiler comes with a custom stereo sound card using "off-the-shelf drivers with balanced input and output."

ProFiler can be used as an audio logger or aircheck skimmer; it time-stamps audio in 15-minute blocks, Harnack said.

"A PC can hold up to four ProFiler audio cards, giving broadcasters the capability to record four stereo streams or eight mono streams for cluster applications," Harnack said.

Once a hard drive is filled, ProFiler can dump the oldest audio to a FTP site or other local area network, he said.

Another supplier in this niche is Sonifex Ltd., which sells the Net-Log audio logger, listing for slightly more than $5,400. The Net-Log includes a dedicated hardware recording platform capable of recording four mono channels or two stereo audio streams, which are then encoded MP2, said Marcus Brooke, managing director.

Dedicated hardware, software

"The unit was designed as dedicated hardware for reliability reasons. In fact, there is not a motherboard in this machine. Although PCs are great for playing back audio, they generally are not robust enough for continuous recording," Brooke said.

Sonifex's Net-Log records to a large internal hard disk while playback is carried out by streaming the audio across a network onto one or more PCs, Brooke said.

Software developer LakeSoft Inc. touts its eSkimmer appliance as a "hardware turnkey solution" to audio logging.

President Cory Schruth said, "All hardware and software is included for four stereo channels of logging. Our newest version of eSkimmer 5.0 is embedded-Linux-based and requires little user interaction or upkeep."

eSkimmer's 200 GB system lists for $2,895 and records in MPEG-II, MP3, WAV and Ogg formats. Schruth said a broadcaster could fit four months of audio for four stations on a single drive depending on bit rate settings.

Eventide Inc. was in the digital logging field early; it says it invented the first digital audio logger in 1989. It has several audio logging packages available, including its line of DAT loggers.

The iMediaLogger from MediaTouch shows four different channels.

The Eventide VR204HF can record up to 200 hours of hi-fi audio on a DDS-3 DAT tape. The VR204 can store four channels of audio monthly on a single DDS tape. Both units list for around $7,000.

"What we sell is mission-critical gear. There is preponderance of PC boxes running software, which can leave a customer fearing 'the blue screen of death,'" said Ray Maxwell, vice president of sales and marketing for Eventide, referring to PC computer crashes.

Reliability is the selling point in Eventide's view; the company sells the majority of its audio logging equipment in the public safety sector.

"With hundreds of thousands of dollars of fines possibly at stake," Maxwell said, "broadcasters will need to find and present audio called into question by the FCC."

Eventide Chief Technology Officer

See LOGGER, page 5 ▶

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World Radio History

FROM THE EDITOR

Make a Date at the Golden Gate

by Paul J. McLane

Dave Bialik is taking his act west.

Bialik, a radio engineer and consultant, is the broadcasting events coordinator for the 117th Audio Engineering Society Convention.

He's done it before. What's new is that Bialik usually coordinates broadcast events at AES when the national show is held in New York, on alternating years. Now denizens of the Left Coast can benefit from his good ideas too. The convention will be held in San Francisco next month.

Bialik loves assembling sessions on newsy topics of the day. He's been doing it for years. He likes to recall a joint AES/SBE event 14 or 15 years ago, held at the auditorium of WQXR(FM) in New York, to introduce something called Project Acorn. The acorn has since grown into an oak called HD Radio.

At the upcoming AES, Bialik has put together three "special event" sessions with radio broadcast engineers in mind. Anyone with a show badge, including exhibits-only credentials, can attend.

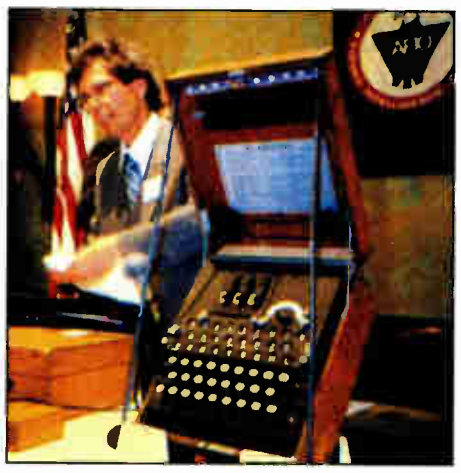
The topics are oriented toward digital radio and your career.

"Broadcasting has gone through a revolution in which engineers were doing analog for years, and suddenly we're doing digital, on new formats; suddenly engineers are expected not to replace a circuit board but to fix a computer board," he said.

Get a job

A 90-minute panel on Thursday, Oct. 28, will focus on "Opportunities for the Engineer in the Digital Broadcast World."

"It's important that a convention like this focus on, 'Hey guys, there are jobs and opportunities out there; this is where they are and this is how to better equip yourselves.' People think they're gonna walk in to AES and be George Martin. But there's TV, radio, commercial production, corporate, so many different areas" in which you can make your professional mark.



Jon Paul of the Crypto-Museum, shown with an Enigma machine, will talk about ciphers, computers and digital audio.

Bialik's panel includes Andy Butler of PBS, Tony Masiello of XM Satellite, Glynn Walden of Infinity, David Wilson of the Consumer Electronics Association and David Layer of the NAB.

"This event will discuss job opportunities and the training needed for the audio professional in today's 'digital broadcast world,'" Bialik said. "It's something I wish I'd had when I was starting out."

Friday at 10 a.m., Bialik himself moderates a three-hour "Digital Broadcast Radio Forum," with discussion of digital copying, HD Radio, satellite radio and Tomorrow Radio, among other topics. Panelists include NPR's Mike Starling, Fred von Lohmann of the Electronic Frontier Foundation, a representative of Ibiquity Digital as well as Layer, Wilson and Masiello.

Saturday morning brings another three-hour session, "Surround Sound for Digital Radio." You know from reading Radio World that this is a fascinating and timely topic. Panelists include Bob Orban of Orban, Rocky Graham of Dolby Labs, Frank Foti of Omnia, Robert Reams of Neural Audio, Alan Kraemer of SRS Labs and XM's Masiello.

Looking back

The schedule also has a track of historical sessions. Project Leader Bill Wray told me they will interest anyone who enjoys the history of technology.

"I suspect many owners, managers and engineers of U.S. radio stations are like me: They love learning about areas of technology outside of their own."

The afternoon of Thursday, Oct. 28, brings a presentation by Mike Adams on "The Birth of Broadcasting: Charles Herrold and the First Radio Station," delving into a controversial topic Adams has written about in these pages.

On Saturday, Jon Paul of the Crypto-Museum has a session I definitely wish I could attend: "Enigma and the 'Ultra Secret': Cracking WWII Ciphers and the Common Origins of Computers, Digital Audio, Internet Security and Digital Rights Management."

He says the research to decode the Enigma and other enemy code machines at Bletchley Park in England led to the digital computer and digital audio technology we know.

In a Sunday session, Peter Gotcher talks about his career with several audio companies, including Digidesign, which he co-founded — a good session for would-be entrepreneurs. Also planned are a panel discussion with Bay Area electronic music pioneers, and a presentation and demo of early microphones.

Wray said, "While Mike Adam's presentation on the first radio broadcasting station is directly related (to radio), I suspect that the other presentations will be equally interesting to anyone with desire to learn more about our rich audio past."

AES was last held in San Francisco six years ago. The convention is at the Moscone Convention Center, Oct. 28-31. We'll have a detailed preview of the show in our Oct. 6 issue. Visit *aes.org* for registration information.

LeClair Named Technical Editor For Engineering Extra

Engineers, this one's just for you.

I'll be telling you more about our exciting new addition, the Radio World Engineering Extra. Today I want to share the news that we've named Michael LeClair, CPBE, as its technical editor.

Michael is chief of the four-station WBUR Group based in Boston and also performs contract engineering. He has 26 years in broadcast engineering, lots of experience working with Radio World — and he's a great guy to boot.

Radio World Engineering Extra is an extra edition of your familiar Radio World, to be published six times a year and targeting strictly broadcast radio engineers with a more deeply technical approach. The first issue appears this fall. To get it, you must sign up separately, and you can do so now at *www.rwonline.com/eng-extra*.

As our publisher, Carmel King, stated in our announcement, the Engineering Extra will complement our existing offerings.

"Radio World is the 'must-read' periodical for everyone in radio; our Engineering Extra is written and edited specifically for engineers," she said. "The goal is to provide stories and analysis in far greater technical detail than is now possible in our regular edition, or any other publication for that matter."

(Fear not; Radio World itself will continue to offer content for the key decision-making audiences in the radio industry. We ain't goin' nowhere.)

Michael LeClair has experience in all facets of broadcast engineering, including the design and installation of digital and analog studios; computer networks; RF systems including HD Radio, analog FM and high-power AM DAs; automation; WANs; regional radio networks and satellite systems; telco; architectural, electrical and HVAC planning; department management; budgeting; training; and legal compliance.

Stay tuned.

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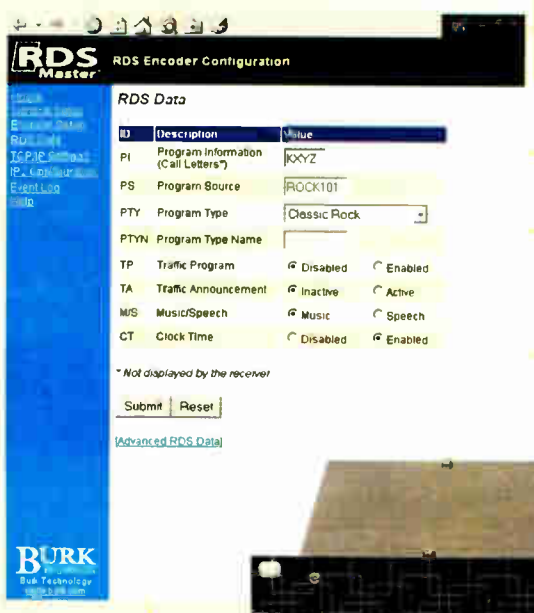

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World Radio History

Solomon

▶ Continued from page 1

consent decrees to settle outstanding indecency cases — for $1.75 million with Clear Channel and $300,000 with Emmis.

The agency has increased the amount of individual indecency forfeitures from a base amount of $7,000 per violation to $27,500 per violation and has begun a proceeding that eventually could result in broadcasters being required to keep program recordings to assist the agency in its indecency enforcement.

Increased scrutiny by the commission on broadcast indecency has occurred against a backdrop of congressional activity in an election year. Both houses of Congress have passed measures to raise the maximum fine allowed for indecency; the Senate by 10 times, the House by nearly 20; at press time, both bills remain mired in conference committee.

Looking towards the bureau's 5-year milestone in November, Radio World News Editor and Washington Bureau Chief Leslie Stimson and bureau Chief David Solomon spoke about issues affecting radio and what could lie ahead.

***RW:** What is going right in regards to broadcasters and what could be improved?*

Solomon: When we started the bureau, we set out with the broad goal of saying we wanted to make the FCC a credible, effective and professional enforcement agency. Not simply for the purpose of doing it, but because strong enforcement would lead to deterrence; deterrence then leads to greater compliance.

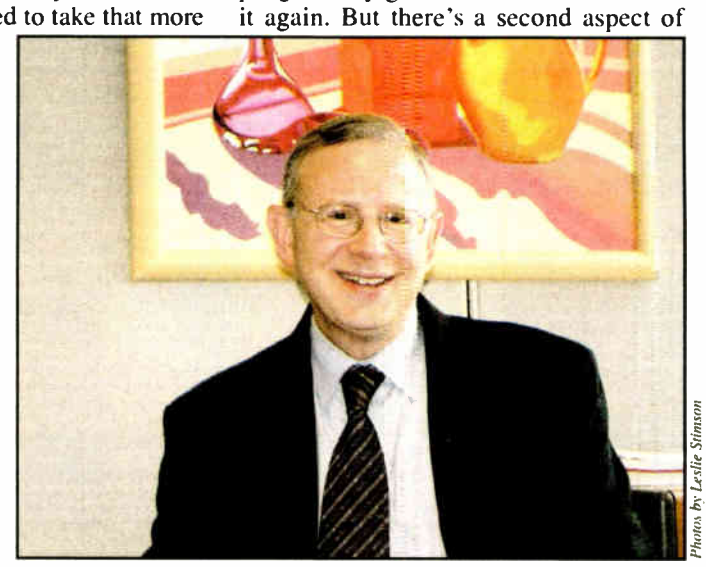
Compliance then leads to consumers benefiting from what Congress and the FCC set out to do. ...

Broadcasters have always, as an industry, taken compliance seriously, but I do think the stronger presence of the FCC as an enforcement agency has increased the compliance by broadcasters with the various provisions.

For example, when we started doing RF radiation enforcement, you could see that broadcasters started to take that more seriously. We issued some NALs. That was a strong signal to broadcasters that that was something they had to be concerned with.

When we did some strong tower enforcement, even when it didn't necessarily involve broadcasters, some of the actions involved wireless carriers; broadcasters really got the message that we were serious about tower enforcement. ...

We updated and renewed the Alternative Broadcast Inspection Program, a program that provides (that) in certain circumstances, we won't do routine inspections if broadcasters have signed up with their state association or, in some cases, others, to do certain kinds of inspections. ...



Photos by Leslie Stimson

Rather than the usual industry photos, David Solomon has decorated his office with paintings by his wife.

***RW:** What could be better?*

Solomon: One area that we continue to give a lot of attention to, and is a high priority, is pirate radio. I do think pirate radio continues to create some real challenges for us.

We're responding to the challenges in the sense that we continue to shut down numerous stations. Every year we probably shut down from 150 to 200 stations through various means.

We've had a lot of success for one portion of the pirate radio problem — for those people or entities who are not really focused on the fact that there are licensing requirements; they're small groups or individuals who go on very low powered and basically without a license, but provide some sort of local community service.

(W)e go and we warn them; those people generally go off the air. And don't do it again. But there's a second aspect of the pirate problem where, it's a continuing challenge; and that's with what you might call the professional pirates.

***RW:** Because they shut down and move, and start up again...*

Solomon: Right, and that's particularly an issue in south Florida where we've taken a number of steps and we continue to adjust our strategies to try to be effective. But it's a challenge, because you have a group, really, of professional pirates down there. ...

We've been recently exploring greater use of injunctions, and greater use of criminal actions by the U.S. Attorney to continue to use a series of measures that hopefully will have a strong effect. ...

We have devoted and are continuing to devote resources to it. One of things we've done is we have increased the size of the Miami office from two to three (people) and we continue to use staff from the Tampa office as well to work on the pirate problem in Miami and in south Florida generally. ...

***RW:** You mentioned the compliance or awareness of RF radiation has gone up since the bureau was formed. Can you expand on that?*

Solomon: One of the things that's been a positive development in the last few years is we've gotten a lot of budgetary support from Chairman Powell and the commission for upgrading the field technical infrastructure. We've been able to buy RF radiation detection equipment for the first time, which has thus enabled us to move into the area of RF radiation enforcement. ...

For RF radiation, as we took the first actions, they got a lot of attention among broadcasters, among consulting engineers and the like. This is somewhat anecdotal, but there does seem to be the sense that a

See SOLOMON, page 6 ▶

Logger

▶ Continued from page 3

Tony Agnello said, "The key in public safety is never losing any data. It will be the same in broadcasting if the FCC requires stations to log programming. We see loggers as an automatic thing that should always work. No failures. No excuses."

Eventide's communications division launched a family of loggers based on the Linux operating system in 2003, Agnello said, that are "very robust and not susceptible to viruses like Windows is."

The company's VR778 and VR615 loggers are being sold only to the public safety sector, but are expected to be converted for broadcast applications by the end of this year, Agnello said.

"It's now possible to record everything with good audio for broadcast because memory is so cheap. We ship with 250 GB hard drives. The 778 can basically log four stations for one year and have the capability to burn to DVD for back-up," Agnello said.

The VR778 will list for just under $10,000 when it's made available to the broadcast market, Maxwell said.

MediaTouch developed the software for its iMediaLogger in 1999, featuring what the company claims is the first codec-based multi-channel logger software for broadcasting. A single-channel logger starts at $595.

It's designed to work with off-the-shelf computers such as a Pentium 3 with 700 MB RAM computer or better, said Ron Paley, senior business developer for MediaTouch. "AM-radio-quality audio can be stored on as little as 5 GB per month. (iMediaLogger) can be downloaded once purchased."

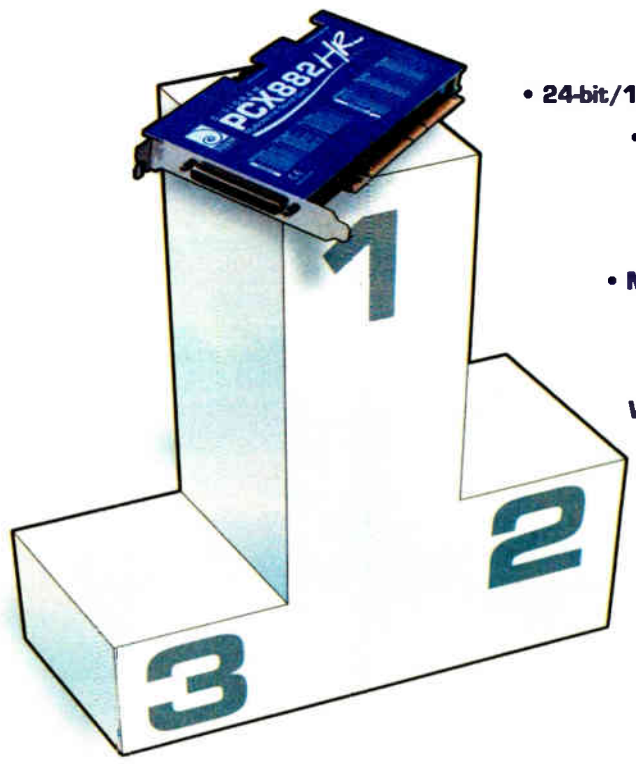
The iMediaLogger offers several recording formats, including MPEG-II, MP3 and WMA. Each record input can simultaneously record up to four internal recordings of different quality, audio formats and functions, Paley said.

Paley said the FCC's proposal has created a lot of interest in audio logging among broadcasters, with the number of quotes "way up."

Yet another approach is offered by Mediaguide, a Web-based music tracking and spot verification service that uses digital fingerprint technology to identify audio content. It also can provide its clients with archival audio storage for up to 90 days or longer, said CEO George Searle.

"We are currently developing special station pricing for continuous monitoring and will have several barter options available," Searle said. Mediaguide monitors programming on 2,000 stations in 200 markets.

The industry standard reaches new heights



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World Radio History

Solomon

▶ Continued from page 5

lot of broadcasters said, "This is something we need to go check ourselves to make sure we're in compliance." It doesn't necessarily mean they weren't in compliance, but it means that they're now paying more attention to compliance. ...

Another area that we've certainly had a lot of action on recently is the main studio rule and public file rule. Field investigations — again, I think it's the case that when people see those kinds of enforcement actions, hopefully more attention is paid to compliance.

RW: *You had mentioned to me awhile back that you were going to start going after companies with patterns of tower violations. Is that working? I've noticed the fines are getting bigger, and you are certainly going after people who have repeat violations.*

Solomon: We do have communication between the various field offices. Rather than just doing an isolated action against a company here and an isolated action there, if there are multiple violations in different places we certainly try to look at those.

The best examples I have actually involve wireless carriers rather than broadcasters, which maybe is a good thing from a broadcasters' perspective. I know, for example, we did more than one NAL involving AT&T Wireless that involved several tower violations. ... We did just have a consent decree with one broadcaster that is having difficulties with compliance at a lot of stations in which they agreed to turn in some licenses and a compliance plan and payments as well. It was the case involving (Bishop) Willis. ...

(Note: In June, the FCC ruled that Norfolk-based Levi "Bishop" Willis had to surrender four licenses and sell two more after their renewals were approved, to satisfy more than $84,000 in fines, some dating to 1999.)

RW: *On indecency, you're increasing the amount of the fines, going to the maximum amount that you can now and also you're dangling license revocation as a possibility. What else can we expect?*

Solomon: There's no question that the commission's gotten tougher on indecency. ... It's using the statutory maximum more ... (Also) the commission is not just focusing on the single station that's the subject of a complaint, but if it was broadcast by co-owned stations, is focusing on that as well.

The commission has also indicated, for example, that it will start looking at whether even within a program or a program segment there may be multiple violations based on so-called multiple utterances, separate utterances. We did one case where the commission found separate utterances based on the fact that they were two people.

It was a Notice of Apparent Liability. Both people were speaking, apparently, indecent language, so the commission proposed to have violations based on what each person was saying as opposed to the overall segment. ...

RW: *Since the commission's been more vocal about what it is going to do in regards to indecency, multiple utterances, higher fines, that kind of thing, how has the number of complaints changed?*

Solomon: Certainly the overall number of complaints has gone up dramatically in the last few years. But you have to look at two numbers to get a picture.

You have to look at the overall number of complaints, but also the number of programs or program episodes about which the complaints have been filed. For example, in 2004, we've received over 800,000 complaints. But over 500,000 of them were against the Super Bowl; almost 300,000 were against one episode of "That 70s Show." ...

What's certainly changed is we've gotten a lot more numbers of complaints. Also, there's been a shift. It used to be virtually all the complaints were against radio. Now, in the last two years, I think 2003 and in 2002 as well, there's been a shift that we're now getting more on television.

'The amount of (indecency) enforcement in the last year has been more than in the last decade combined.'

RW: *So co-hosts each getting a whole set of violations.*

Solomon: Yes. I'm not sure if it was co-hosts or a host and a guest. Two people. So, the commission's definitely getting tougher.

The amount of enforcement in the last year has been more than in the last decade combined. The numbers are very high. ...

At the same time (the FCC) ... has taken steps to continue to be sensitive to First Amendment concerns. For example, we continue not to go out and monitor programming on our own. We do respond to complaints that come in against particular programs or licensees. We're complaint-driven.

We also look at each case carefully. We don't make a decision until we've reviewed all the facts and the law carefully. And when the commission, in some instances, has toughened the law.

For example, when the commission in the Golden Globe case changed the law to say that fleeting use of expletives could be indecent and were indecent in that situation, the commission announced that prospectively.

It didn't propose to fine NBC in that case. It simply announced that this is the way, prospectively, it would look at it again, being sensitive to the First Amendment concerns at issue. ...

RW: *What documentation needs to accompany filed complaints?*

Solomon: At least during the time that I've been chief of the Enforcement Bureau, and frankly, I think before that with the Media Bureau, the commission has been consistent. ...

(W)e need basic information about what was said and the context. What the commission generally looks for ... (is) either a significant excerpt or a full or partial transcript.

You want to know something about what was broadcast. For example, when somebody files a complaint that, "I heard such and such show on the radio yesterday and it was disgusting. Do something about it," we don't investigate that complaint.

On the other hand, if they give us information about what was broadcast that does suggest it might be indecent, then we do investigate it.

RW: *In regards to the proposed mandatory recording of programs, how can this help the FCC?*

Solomon: One of the ways it will certainly help us is to the extent that when we start investigations, in the vast majority of cases, we get enough from the complainant to decide whether or not an investigation is appropriate.

When we ... go back to the broadcast station and say, "Here's what the complainant says you broadcast, either on radio or television, give us a tape or transcript." In some cases they come back and say, "We don't have a tape or transcript." That makes it harder for us to proceed to make a decision.

Certainly it will help in those investigations where, when we start an investigation, because we're concerned it might be indecent, it's easier to determine it if we know for sure what was broadcast. To some extent that will help broadcasters as well. ...

It's not just to help us. We're not out there to say, "The tape helps us prove it's indecent." The tape will help us prove what the facts are.

RW: *What are some creative excuses broadcasters give you for whatever the violation is?*

Solomon: We ... describe one case as the "No, thank you, to the FCC" case. This is the Peninsula (Communications) case in Alaska where the commission, in an order written by the Media Bureau, ordered somebody to go off the air, and they basically said, "No, thank you," to the FCC. That resulted in a forfeiture order, and they still refused to pay attention to the FCC order.

That led to a revocation hearing and it led to an administrative law judge revoking two of their full-service licenses. The issue was over getting certain translators off the air. ...

Their appeal of the judge's decision is pending before the full commission but it's certainly not a good thing for broadcasters to come in and say, "No, thank you," to a commission order, just like it's not a good idea to lie and lack candor. ...

In terms of arguments, some of the fun ones are in the realm of, people coming in and telling you everything you're doing is stupid. It just isn't a good strategy.

You get people who come in ad say, "Look, your proposed enforcement action is stupid, the rule is stupid, the FCC is stupid. Congress is stupid." And that may or may not be right in various contexts, but it's not a smart thing to come in and say that.

The best thing people can do is come in and say, "Here's why you're wrong on the facts and the law." ... It works to convince us that you're right and we're wrong. If that's true, then we're going to go your way.

World Radio History

GUEST COMMENTARY

Tomlinson: VOA Is Not Imperiled

by Kenneth Y. Tomlinson

The author is chairman of the Broadcasting Board of Governors, which oversees U.S. overseas broadcasting. He responds here to a petition circulated in Congress in July. The petition, signed by 450 VOA employees, calls for an investigation of the BBG.

The points in the petition also were discussed by Alan Heil Jr., a former VOA deputy director, in Radio World's Aug. 11 issue. Radio World invited the BBG to respond to that article as well.

Contrary to allegations contained in a petition of Voice of America employees, Radio Sawa's listeners in Iraq and throughout the Arab world learned of Saddam Hussein's capture as soon as listeners to any other media outlet. Indeed, it is difficult to take seriously any document that makes such an erroneous charge.

The VOA petitioners cannot be allowed to distort these facts.

In fact, Sawa expanded its news coverage on the day of Saddam's capture to include live reports from stringers in Iraq, featuring interviews with ordinary Iraqis and Iraqi officials alike.

Of course, all news organizations that operate under the Broadcasting Board of Governors are congressionally mandated to have professional standards similar to those of the 1976 VOA charter. It's in the law — the International Broadcasting Act of 1994.

The Act requires that all services supervised by the BBG follow the "highest professional standards of broadcast journalism," and that its news be "consistently reliable, authoritative, accurate, objective and comprehensive." The VOA petitioners cannot be allowed to distort these facts.

Sawa, Farda, Alhurra

Sawa airs 48 newscasts each broadcast day; its millions of listeners are never more than 20 minutes from the next news segment. Alhurra, the Arabic-language satellite television network, broadcasts 10 minutes of news at the top of every hour 18 hours per day; its lineup includes four hours of newscasts, documentaries, talk shows and a magazine show each day in prime time.

Radio Farda, our round-the-clock radio service for Iran offers its listeners — over the mullahs' jamming efforts — eight hours of news and commentary out of each broadcast day.

BBG's achievements go beyond Arabic-language and Persian radio broadcasts: the VOA Persian language daily television news program to Iran established itself with a huge audience within weeks of its debut a year ago. VOA's newly inaugurated radio service to Pakistan, "Aap ki Dunya," revamped the service and tripled the number of broadcast hours to this key state in the war on terror.

U.S. international broadcasting, far from deserving censure, deserves praise for the successful role it is playing in bringing our ideas — most important among them, this nation's commitment to balanced, objective media as a pillar of modern liberal democracy — to a worldwide audience.

Tomlinson is chairman of the Broadcasting Board of Governors. E-mails can be addressed to him at publicaffairs@voa.gov.

Kenneth Tomlinson

How to Submit Letters

Radio World welcomes your point of view on any topic related to the U.S. radio broadcast industry.

Send letters via e-mail to *radioworld@imaspub.com*, with "Letter to the Editor" in the subject field; fax to (703) 820-3245; or mail to Reader's Forum, Radio World, P.O. Box 1214, Falls Church, VA 22041.

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World Radio History

HD Radio News

Radio World | Covering Radio's Digital Transition | September 8, 2004

CPB Has Money For Data Ideas

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FIRST PERSON

IBOC Template in Paul Revere's City

Greater Media Retrofits a Master FM Antenna System for Digital Conversion

by Paul Shulins

BOSTON We sure do live in an exciting time for radio. After all, how often do you get to live through the dawn of a new era in broadcasting?

The last major improvement in service was the launch of FM stereo back in the early 1960s. When the corporate office called me two years ago and said that we were committed to launching HD Radio broadcasting on our Greater Media facilities throughout the country over the next few years, I was excited.

When they told me that Boston was going to be the template for all the other stations and we would launch first, I was also concerned. Nobody was on the air yet with this service. Equipment manufacturers barely had prototype units out, and the FCC was far from setting rules and regulations for the new service.

So where do you start? In our case we started from scratch.

Five conversions

In Boston, Greater Media owns and operates five Class B FM stations: WMJX, WROR, WKLB, WBOS and WTKK. Their studios have been consolidated under one roof in a 40,000-square-foot studio complex near downtown.

In addition, the transmitter facilities for four of the five are located on top of the Prudential Office Building in Boston. The fifth station transmits from its own tower in a suburb 20 miles to the north. Having consolidated facilities made planning and construction easier; a cookie-cutter approach could be used because we had similar situations for the five stations.

The ERI tower team during the Boston antenna retrofit for Greater Media.

In total, Greater Media has invested more than $1 million in hardware alone to convert these five stations to HD Radio. This breaks out to roughly $200,000 per station, of which roughly $170,000 each was used for the RF plant improvements, such as the antenna retrofit, and new IBOC transmitters.

There are many ways to employ HD Radio broadcasting, and each radio station will have its own unique conditions that will ultimately determine the most efficient approach for your facility. In my case, we decided that we were going to use separate low-power transmitters for HD Radio.

Because our analog TPOs were in the 20,000-watt range, this meant our HD Radio TPOs would be in the 200-watt range (20 dB below analog). At this power level, a small rack-mount transmitter would work, with single-phase power, low power consumption, low cooling requirements, low installation cost and small transmission line size.

We installed two Broadcast Electronics FMi-73 transmitters along with the required FXi exciters, and the FSi IBOC generators for each station. We run them in a main/alternate configuration just like the main high-power analog systems.

Antenna/combiner configuration

Our stations use an Electronics Research Inc. Cogwheel Master Antenna system with its own high-power analog combiner. We worked with ERI on several ideas for feeding the same existing antenna with analog and digital signals.

New hybrids ready for retrofit.

The entire project was made possible by the enthusiastic support from our director of engineering, Milford Smith, who has been a backer of the technology from day one. In addition to his responsibilities at Greater

See BOSTON, page 10 ▶

Imagine a backup audio system that's fluent in ...

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digital
composite
DTMF
MP2
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We did.

Coming this October

World Radio History

The routing switcher gets a new twist.

(About five twists per inch, actually.)

Everybody needs to share audio. Sometimes just a few signals — sometimes a few hundred. Across the hall, between floors, now and then across campus. Routing switchers are a convenient way to manage and share your audio, but will your GM really let you buy a router that costs more than his dream car? Unlikely.

If you need a routing switcher but aren't made of money, consider Axia, the Ethernet-based audio network. Yes, Ethernet. Axia is a *true network*. Place our audio adapter nodes next to your sources and destinations, then connect using standard Ethernet switches and Cat-6. Imagine the simplicity and power of Ethernet connecting any studio device to any other, any room to any other, any building to any other... you get the idea.

Routers are OK... but a network is so much more modern. With Axia, your ins and outs are next to the audio, where they belong. No frame, no cards, no sweat.

Scalable, flexible, reliable... pick any three.

An expensive proprietary router isn't practical for smaller facilities. In fact, it doesn't scale all that well for larger ones. Here's where an expandable network really shines. Connect eight Axia 8x8 Audio Nodes using Cat-6 cable and an Ethernet switch, and you've got a 64x64 routing switcher. And you can easily add more I/O whenever and wherever you need it. Build a 128x128 system... or 1024x1024... use a Gigabit fiber backbone and the sky's the limit.

Are you still using PC sound cards?

Even the best sound cards are compromised by PC noise, inconvenient output connectors, poor headroom, and other gremlins. Instead, load the Axia IP-Audio Driver for Windows® on your workstations and connect *directly* to the Axia audio network using their Ethernet ports. Not only will your PC productions sound fantastic, you'll eliminate sound cards and the hardware they usually feed (like router or console input modules). Just think of all the cash you'll save.

Livewire

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Put an Axia Microphone Node next to your mics and send preamplified audio anywhere you need it, over Ethernet — with no line loss or signal degradation.

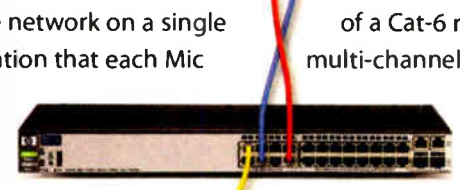
Put your preamps where your mics are.

Most mainframe routers have no mic inputs, so you need to buy preamps. With Axia you get ultra-low-noise preamps with Phantom power. Put a node in each studio, right next to the mics, to keep mic cables nice and tight, then send multiple mic channels to the network on a single Cat-6 cable. And did we mention that each Mic Node has eight stereo line outputs for headphones? Nice bonus.

Put your snake on a diet.

Nobody loves cable snakes. Besides soldering a jillion connectors, just try finding the pair you want when there's a change to make. Axia Audio Nodes come in AES/EBU and balanced stereo analog flavors. Put a batch of Nodes on each end of a Cat-6 run, and BAM! a bi-directional multi-channel snake. Use media converters and a fiber link for extra-long runs between studios — or between buildings.

An Axia digital audio snake can carry hundreds of channels of digital audio on one skinny CAT-6 cable. We know you're not going to miss soldering all that multi-pair...



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A networked audio system doesn't just replace a traditional router — it *improves* upon it. Already, companies in our industry are realizing the advantages of tightly integrated systems, and are making new products that reap those benefits. Working with our partners, Axia Audio is bringing new thinking and ideas to audio distribution, machine control, Program Associated Data (PAD), and even wiring convenience.

Would you like some control with that?

There are plenty of ways to control your Axia network. For instance, you'll find built-in webservers on all Axia equipment for easy configuration via browser. PathfinderPC® software for Windows gives you central control of every audio path in your plant. Router Selector nodes allow quick local source selection, and intelligent studio control surfaces let talent easily access and mix any source in your networked facility.

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World Radio History

Boston

▶ Continued from page 8

Media, he serves as chairman of the DAB Subcommittee of the National Radio Systems Committee, responsible for making recommendations to the FCC on HD Radio.

In addition, Dan Kaiser, R.J. Perkins, Art Pepin and Robby Mossman were on my team to complete the mission. Many thanks to Richard Hinkle of BE, Eric Wandel of ERI and Richard Dudley from Dudley Tower Service for their many long days and nights in Boston.

Eric Wandel takes a break to do an aerial survey of the tower with Paul Shulins.

After much discussion, we decided that a separate low-power combiner unit would be used to combine the HD Radio signals from the other four stations at the Prudential, and feed that combined signal to the existing antenna. The only problem was, how do you then physically get this new digital signal into the antenna?

Through a retrofit of the existing antenna, ERI was able to change out the hybrids on the antenna and effectively provide an additional input port for the IBOC signal. This way, we would minimize any risk to the analog signal, while providing the best pattern match for the IBOC signal.

The output of the transmitters needed to pass through circulators before hitting the combiner to provide the additional isolation needed from the analog system. It all looked good on paper, but a set of airborne "before" and "after" field strength measurements actually confirmed our hopes.

Precious analog

As we all know, the analog audio is still, and will continue to be for some time, our bread and butter. Because the analog needs to be delayed and phase-locked to the digital, in most cases, it's necessary to run it through the IBOC exciter and IBOC processor. While this is fine, and no quality degradation will occur if it done properly, it does add another link in the air chain.

And this link is a computer! If the processor were to fail, it has the potential to take both the analog and digital audio off. It is prudent to have an easy, or better yet, automatic way to bypass the defective gear.

I worked with BE on this matter, and the company provided a contact closure that occurs when an AES audio problem happens, allowing the user to trigger an automatic bypass of the defective gear. This does, however, drop you out of delay quite abruptly.

Studio considerations

In the studio, because the stations are in delay, the talent no longer is able to listen to the off-air signal. Therefore a "processed program" signal is now fed to the studio loudspeaker, and headphones.

The change also means it's necessary to provide some kind of enunciator to allow the talent to know if they are off the air. We used a muting receiver and put a silence sense on it. This drives an LED text display in the studio that the talent cannot miss. The display is right in front of the DJ, and it has worked flawlessly so far. Who wants listeners calling to tell you that you are off the air?

So far, it is too early to get any feedback from listeners on the digital sound; the receivers are just now starting to show up in stores.

Another change to be aware of due to the conversion is that listening to a tuner at a remote broadcast will now be a thing of the past. Because of the delay, you will need to provide an alternate method to get the "pre-delay" to the remote broadcast site.

Low-Power HD Radio Combiner

Talk radio stations are used to this, but the rest of us must now use our own method for carving out this new path. Some options are POTS codec, ISDN, SCA or RPU, the old-fashioned analog leased line.

PAD

We are taking advantage of the program-associated data capabilities of IBOC at our stations. PAD, such as real-time name and artist information, needs a path to get from the studio to the transmitter. In many cases this will be an IP address, and will require the installation of a WAN to the transmitter site, not a bad idea in this age of RJ-45 jacks on everything.

In conclusion, since January all five stations have been on the air with the new service. We have had no major problems with equipment, and our analog coverage has not changed.

Prudential Master Antenna

I was pleasantly surprised to find that after six months of broadcasting, we have received no complaints of interference to adjacent channels. This is especially remarkable despite the additional sidebands generated by the IBOC signal and the crowded spectrum in the Northeast.

Riding around with a Kenwood HD Radio receiver in the car, I can tell you that the sound is spectacular. There is no multipath, and the processing is able to be more open, making the station sound more like a CD than a conventionally processed feed. It is a delight to listen to.

The future of radio is here, and will certainly raise the level of service we provide to the public, while allowing traditional radio to compete effectively with the ever-expanding number of alternatives our audience is offered each day.

Shulins is director of technical operations for Greater Media Boston. Reach him at pshulins@greaterbostonradio.com.

Indecency Processor

No, this product doesn't remove naughty words, but if you do run a profanity delay or simply have a buildup of digital latency, talent can't listen to the processed air signal. Instead, their feed is probably direct from the console. Compared to the air sound, this can seem weak, dull and lifeless.

Our Model 255 Triband Spectral Loading processor has zero delay and can deliver a dense, tight, and punchy 'broadcast' sound to headphones and control room speakers... a sound you can't achieve with a general-purpose "utility compressor." Other 255 applications include the program feed to telephone hybrids and IFB processing.

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NRSC: New Ibiquity Codec Performs Well

WASHINGTON Tests of Ibiquity's AM and FM IBOC systems using its new codec, HDC, prove its performance is better than analog. That's according to an evaluation working group of the DAB Subcommittee of the National Radio Systems Committee.

Dr. Don Messer, director of the Spectrum Management Division for the International Broadcasting Bureau, states in a letter to NRSC leaders, "The EWG is pleased to report that the HD Radio system, with the incorporation of the Gen 3 audio codec, meets the NRSC's goals and objectives for the introduction and use of digital radio in the FM and AM bands in the U.S. by providing a digital signal with significantly improved audio quality over AM and FM systems that presently exist in the United States."

DAB Subcommittee Chairman Milford Smith, also vice president of engineering for Greater Media Inc., said, "What we were trying to do was make the HDC jump the same hurdles the other two (codecs) have jumped."

The group previously had evaluated Ibiquty's tests on PAC and MPEG 2.

The point of the tests was to determine the unimpaired audio quality of the latest generation of Ibiquity's AM and FM IBOC systems using the HDC audio coding, and to confirm that the third-generation hardware performs similarly to the previous version of the systems.

The NRSC has filed its report on the so-called "Gen 3" tests with the FCC. Members continue working on the technical details of the DAB transmission standard they hope will form the basis of the commission's permanent rules authorizing IBOC. The stack of documents they have reviewed or are in the process of scrutinizing is approaching a foot in thickness, said Smith.

— Leslie Stimson

World Radio History

DIGITAL RADIO IS IN OUR FUTURE.

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Whether you're rolling out HD Radio™ or planning a studio move, look to the name you've trusted for over forty years to now provide the smart choice in T1 STLs.

The new Moseley Starlink SL9003T1 has all the payload advantages of digital—including, bi-directional program audio; Ethernet LAN/WAN extension; transmitter remote control; plus, telephone voice channels—delivered over a single T1 link or license-free Spread Spectrum radio.

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World Radio History

Pioneers Share IBOC Experiences

by Daniel Mansergh

As the HD Radio rollout gathers steam, public radio stations are well represented in the ranks of IBOC pioneers, a testament to the widespread support in the public radio community for signal improvements and potential new services offered by the technology.

Driving the trend are the ready availability of funding for digital conversion projects from sources including the Corporation for Public Broadcasting and many nonprofit foundations; CPB money to support local community-centered broadcasters; and enthusiasm for new services such as Tomorrow Radio.

Congress has provided a total of nearly $150 million in digital conversion funding to CPB over the last four years for TV and radio stations. To date, CPB has issued grants to 147 public radio stations totaling around $20 million.

The Tomorrow Radio concept, championed by National Public Radio, Harris Broadcast and Kenwood USA, will allow stations to transmit a second audio channel within the HD Radio bitstream.

As many of the engineers involved in these early digital projects have discovered, converting to IBOC is a fairly simple process; but there's always a few new things to be learned along the way. Several of these engineers shared their experiences at the NPR Public Radio Engineering Conference this spring.

The team wrangles the transmitters into a tight space.

A taste of Tomorrow

When KKJZ(FM) in Long Beach, Calif., was selected as one of the host stations for the Tomorrow Radio field tests last fall, Chief Engineer Ron Thompson was looking forward to learning more about implementing this technology.

As it turned out, he got a crash course in logistics. The shipping company delivering the transmitter from its previous test location in San Francisco arrived at the KKJZ site, only to find that the forklift was incapable of traversing the uneven uphill grade between the driveway and the KKJZ building.

The solution involved the rental of a larger forklift to carry the smaller forklift safely up the grade, where it could be used to move the transmitter into position.

"Lesson learned: do your homework on the transmitter delivery," Thompson cautions.

Once it was safely on the ground, the test transmitter was installed easily, but another hurdle remained. Because of its location at a congested antenna farm, KKJZ had to conduct extensive intermod testing before HD Radio broadcasts could begin.

Once the installation was complete and field testing underway, the remainder of the project was a bit anticlimactic. "It just worked," said Thompson.

The true advantage of acting as a host station for the digital field tests has been in the enhanced awareness of the potential benefits of HD Radio within the KKJZ community, he said.

"It began a discussion with station staff and management about HD Radio and continuing changes in the industry" that grew to include the KKJZ board, Thompson recalled. "It reduced the fear and nervousness, and now they're all very excited about the conversion."

Now some of these former skeptics are urging Thompson to bring some of the advantages of the new digital technology to the legions of analog listeners. "They're asking to see program information on RDS in their cars," he reports with a smile.

Building a phoenix

Director of Radio Engineering Steve Shultis saw his plans for New York public radio powerhouse WNYC's digital conversion suddenly change on Sept. 11, 2001, when the station's transmitter plant came tumbling down in the collapse of the World Trade Center towers.

Almost as soon as the frenetic scramble to construct a temporary 1 kW transmission site on the Empire State Building was complete, planning started for a new long-term transmission facility for the station.

After securing a new lease for additional space at the Empire State Building, Shultis began the space planning to shoehorn a 480V electrical transformer, analog and digital transmitters and all related equipment into a small but adequate room in the landmark building.

The biggest challenge was to accommodate the accelerated timetable to construct a replacement analog plant, while designing for a smooth digital installation later.

Shultis' plan involved bolting the analog transmitters and outboard equipment racks together during the first install, while leaving wiring harnesses long enough and rack bases wide enough to allow the analog transmitters to slide sideways and open up a gap for the digital transmitter in the second install.

The new analog plant was built in September and October of 2002, while the addition of the digital transmitter followed almost one year later, in September 2003.

Although the digital buildout was constrained to the early morning hours by unfortunate scheduling of a retrofit project at the WNYC auxiliary site at 4 Times Square, the installation was completed in only three nights.

On the first night, Shultis and a technician from Harris Broadcast bolted the new rack into place and loaded it with the new equipment. The second night was spent installing cards into the equipment frames and running the system into a dummy load. On the final night, the equipment configuration was fine-tuned. The full system was tested and checked for proper operation, then put on the air at 4 a.m.

Shultis is pleased with how smoothly the two-stage installation progressed, and he credits the planning process for the success of the project. "You can never have too much planning," he said.

Pole position in Tampa

Tampa's WUSF(FM) and Chief Engineer Mike O'Shea became true pioneers of the digital future in public radio when the station began broadcasting an HD Radio signal on Feb. 13, 2003. It didn't happen by accident.

"Management wanted to be the first in the (public radio) system on air with HD Radio," O'Shea said. Along with that mandate came a willingness to commit resources to achieve it.

Because completing the digital installation quickly was important, project planning focused heavily on identifying ways to save time, even where that might lead to increased cost.

He ordered extra transmission line components and connectors to avoid time-consuming delays during the installation if a part came up short. He purchased a pre-wired support equipment rack from Harris, eliminating several days' worth of building cable harnesses on-site.

Even though the integrated unit was more expensive than the individual pieces would have been, O'Shea said, "it saved time, and was cost effective" when the reduced labor was factored in.

Overall, the installation was an easy one for O'Shea, and he couldn't be happier with his solid-state IBOC transmitter. "It's rock solid," he concluded, with obvious pride.

World Radio History

Leading POTS Codecs Compared.

	Comrex Matrix	Tieline Commander	**Zephyr Xport**
Audio Bandwidth @ 24 kbps @ 19 kbps	14 kHz 11.2 kHz	15 kHz 9 kHz	**15 kHz** **15 kHz**
Direct Internet Software Updates	No	No	**Yes, via Ethernet port**
Digital PC Audio Input	No	No	**Yes, via Ethernet port and supplied driver**
Audio Metering (XMIT/RCV)	Transmit only	One-at-a-time	**Simultaneous**
Audio Processing	None	Simple AGC	**Digital multi-band AGC with look-ahead limiter by Omnia**
Remote Control	No	RS-232 and dedicated computer	**Ethernet via Web browser**
Auto Dial Storage	19 Numbers	50 Numbers	**100 Numbers**
Frequently-Used Settings Storage	none	none	**30**
Standards-based POTS Codec	No - Proprietary	No - Proprietary	**Yes - aacPlus (MPEG HEAAC)**
Transmit-Receive Quality Display	No	Yes	**Yes**
Contact Closures	2	2	**3**
Display Resolution	120x32 LCD	120x32 LCD	**128x64 LCD**
Analog Cell Phone Interface	Optional	Standard	**Standard**
Mixer Inputs	1 mic, 1 mic / line	2 mic / line	**1 mic, 1 line**
Phantom Power	No	No	**Yes - 12 volt**
Automatic Voice-Grade Backup	No	No	**Yes**
Power Supply	External	External	**Internal auto-switching**
Local Mix Audio Outputs			
Headphone	Yes	Yes	**Yes**
Line Level	Yes	No	**Yes**
Direct Receive Audio Output	No	Yes	**Yes**
Uses ISDN at the Studio Side for More Reliable Connections	No	No	**Yes - your Zephyr Xstream becomes universal POTS and ISDN codec.**
Available ISDN Option	$850.00 (adds MPEG L3 & G.722)	$850.00 (adds G.722)	**$495.00 (adds G.722 & state-of-the-art AAC-LD for high fidelity and low delay)**
List Price:*	$3,700.00	$3,650.00	**$2,495.00**

The world's most advanced POTS codec
is also the world's lowest priced POTS codec.

Telos
AUDIO | NETWORKS

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CPB Seeks Ideas for Digital Data Services

by Leslie Stimson

WASHINGTON The Corporation for Public Broadcasting is looking for a few good IBOC data services proposals.

CPB has available $250,000 in grant money to fund demonstration projects showing what public radio stations or contractors within the system could do with program-associated data for HD Radio.

Just as some in public radio have encouraged stations in the noncommercial radio system to do more with Radio Data Services on their analog streams, now CPB is encouraging stations to think about what they'd do with their PAD when they go IBOC.

The idea, at a minimum, is to keep up with the receiver text displays now available to major commercial radio groups and satellite radio.

Of the 130 or so stations on the air with HD Radio in early August, roughly 20 percent were noncommercial, according to Ibiquity Digital (*see box*).

According to CPB officials, its recent research suggests that "for FM stations, at least, PAD services and supplemental audio services may be even more compelling to listeners than will be the improvements HD Radio provides in audio quality."

Consistency is key

Despite the promise about what is possible for initial HD Radio data services, however, CPB wants public radio stations, program producers and program distributors to approach the PAD possibilities in an organized way. CPB is looking for easy-to-implement ideas that will place a low operational burden on stations.

"We're looking for proposals on something that will give us consistency" on a system-wide level, said CPB consultant Bruce Theriault, who will help CPB vet the projects along with technical consultant Dennis Haarsager.

Potential applicants may contact Haarsager for help with technical questions that arise before they submit their proposals.

Ideally, the PAD streaming along with the programs broadcast by local noncommercial stations would be somewhat similar to the displays that would accompany national programming, so listeners don't see a glaring difference between the two, Theriault said.

> **We're looking for proposals on something that will give us consistency on a station-wide level.**
>
> — Bruce Theriault, CPB Consultant

But at the same time, stations will want to keep costs for providing data services in perspective. "We need to keep in mind whether the consumer cares and to what level they care, and look at hidden costs," he said.

He and others involved in the project say that with a consistent PAD standard, public stations could, for example, broadcast song titles, update pledge numbers, list the guests being interviewed and so on. But, they say, no one yet agrees on just how that information should look.

For instance, if consumers are listening to "Morning Edition" and then the station switches in and out of local programming, how would that affect the appearance of the PAD data?

Project organizers hope to glean ideas from the grant applications and subsequent project demonstrations.

CPB also wants participants in the public radio system to begin thinking about later-generation data services beyond the basics. The HD Radio receivers are addressable, so they can support several applications such as real-time weather, traffic or personalized news information, HD Radio proponents say.

"Ibiquity has a lot of ideas of what can be done with PAD. We're interested in first-generation PAD that can be used in public radio," said Luis Guardia, CPB's senior director of media technology.

CPB hopes to figure out what services would be delivered by local stations vs. program providers so that everyone works toward a common goal.

Expanding service

CPB is interested in HD Radio and the data applications to investigate what new and emerging technologies can be used to expand public radio service and get it to people who aren't served now by public radio, said Guardia.

"Part of this is examining attendant services, providing people with more information and more services than the audio stream. Another example is the supplemental audio channel," he said.

CPB has awarded $10.8 million in conversion grants to stations in Ibiquity's original seed markets, gave another $6.5 million in a second round of grants and set aside $10.5 million to award in a third round; submission applications were due by the end of August. It has awarded grants to roughly 150 stations and expected another 150 applications in the third round.

One of CPB's mission goals is to provide services to people regardless of the form of technology.

CPB will accept grant applications for the PAD initiative until Sept. 10.

Once the proposals arrive, a peer review group and CPB will decide how to award the grant money, whether as one large sum or in separate, smaller amounts.

CPB is encouraging applicants to apply "additional resources to the initiative, directly or through partnerships," according to its RFP.

Proposals should support the following objectives:

- Identify operational, technical and hardware investments required for broad implementation;
- Extend data services to analog broadcasting using Radio Broadcast Data System encoding and to public radio Web activities, and to extend similar functions to supplemental audio channels in future HD Radio receivers;
- Operational designs for distributors, producers and stations, including cost information, operational impact, organizational design and implementation of the public broadcasting metadata standard for PAD services; and
- Demonstrations of these services to the public radio producer, distributor and station communities.

For details on the Request for Proposals, visit the CPB Web site at *www.cpb.org/digital/funding/pad/*.

DIGITAL NEWS

Texas Instruments Designs New HD Radio Chipsets

DALLAS Texas Instruments has designed its third generation of HD Radio chipsets.

"Depending on their design approach, designers can choose either of the new digital basebands for building an HD Radio receiver," said TI Marketing Manager John Gardner.

The software-programmable chips allow for features to be incorporated into the radio after design begins, according to TI.

For example, receiver makers are planning now for release of HD Radios in 2005 with recording, rewind and multiple channel capabilities, Gardner said.

"We don't know what will happen," regarding FCC approval for these abilities, he said, but the ability to incorporate these functions must be planned for now, he said.

This Kenwood receiver uses the DRI 200 series HD Radio chip.

The ability of a receiver to record and play back audio is controversial for the record industry. The Recording Industry Association of America opposes allowing consumers to record and playback on HD Radios, for fear of illegal song distribution. Broadcasters want this capability in the radios to entice consumers to buy them.

The issue is before the FCC, as is the question of authorizing multiple digital radio channels, as the agency works to determine what to include in final rules governing technical rules for authorizing HD Radio.

The two new digital basebands integrate TI's DSP technology and software by Ibiquity Digital, with the digital functions required to build an AM/FM and HD Radio receiver, in addition to audio post processing and MP3 and Windows Media Audio CD support.

TI's previous chips were released last fall.

For use in automotive radios, the DRI350 combines intermediate frequency-sampled AM/FM and HD Radio processing on the same chip. In addition, TI is responding to what it says are manufacturers' demand for an HD Radio-only solution with its new DRI300 baseband, providing HD Radio functionality, while allowing auto OEMs to continue using their own proprietary designs for AM/FM support.

The chip handles the IBOC modulation and decoding necessary to process Ibiquity's AM and FM waveforms.

According to TI, the DRI300 allows manufacturers to build on existing solutions and add digital radio capabilities.

Samples of TI's DRI350 and DRI300 HD Radio basebands are available, with volume production expected in the fourth quarter.

Kenwood, JVC and Panasonic have HD Radios available to consumers. Ibiquity believes Onkyo will introduce a home unit this fall. Visteon intends to launch an OEM automobile receiver for a 2005 model year vehicle.

— *Leslie Stimson*

Who's On:

Noncommercial stations on the air with an analog and digital signal are:

KCFC(AM), Boulder
KCFR(AM) Denver
KCSN(FM), Los Angeles
KKJZ(FM), Los Angeles
KPCC(FM), Los Angeles
KPSC(FM), Los Angeles
KUOW(FM), Seattle
KUSC(FM) Los Angeles
KUVO(FM), Denver

WAMC(FM), Albany, N.Y.
WAMU(FM), Washington
WANC(FM), Ticonderoga, N.Y.
WBEZ(FM), Chicago
WEMU(FM), Ann Arbor, Mich.
WETA(FM), Washington
WFUV(FM), New York
WGUC(FM), Cincinnati
WNYC(FM), New York
WOSU(FM), Columbus, Ohio
WUMB(FM), Boston
WUSF(FM), Tampa, Fla.
WWNO(FM), New Orleans

Source: Ibiquity Digital, as of mid-August

World Radio History

DIGITAL NEWS

KCSN Testing IBOC Booster

QUINCY, Ill. KCSN(FM) has begun testing an HD Radio booster to fill in its 1 μV/m contour in West Los Angeles. The California State University station in Northridge has experimental authorization from the FCC to conduct testing of a main and booster HD Radio system operating in hybrid mode.

Broadcast Electronics HD Radio transmitters, exciters and signal generators are being used for the test.

KCSN has matching grant money from the Corporation for Public Broadcasting for its digital conversion. The station wants to convert both the main and a proposed booster site. The Santa Monica mountain range has blocked KCSN's signal from reaching part of its licensed coverage area. If the tests are successful, the booster would fill in that portion of its coverage contour.

The station anticipates getting one-third of its coverage from the booster.

"Converting to HD Radio on just the one (system) may have made the aural experience less than it should be," stated Mike Worrall, chief engineer for KCSN(FM), a classical/eclectic station, in the announcement released by BE.

Broadcast Electronics supplied an FMi 73 HD Radio transmitter with Fxi 60 digital FM exciter and FSi 10 HD Radio signal generator for the antenna site in Northridge and an identical transmission system for the booster in West Los Angeles.

The transmission systems are set up in a low-level combine configuration, with 480 watts analog output power for the main and 320 watts analog output power for the booster. Both systems are synchronizing analog and digital broadcasts on 88.5 MHz.

Uncompressed digital STLs are used to simultaneously feed audio to both transmission systems.

Field testing of KCSN's analog and digital, as well as booster and main, signal areas will be conducted this month.

BE Appoints HD Radio Product Manager

QUINCY, Ill. Ted Lantz is now a product specialist for HD Radio at Broadcast Electronics. Lantz has been named product manager of BE's HD Radio line.

Lantz has served in various capacities for BE over a 12-year period, including applications developer for the company's digital audio line.

BE recently expanded its IBOC line to include a data management system, called Radio Data Dimensions, for stations that want to use the data service capabilities of digital radio.

BE said Lantz's background in digital content management complements the company's HD Radio RF team, including BE Vice President of RF Systems Tim Bealor and BE RF Director of Engineering Richard Hinkle, who holds several patents as the innovator of several transmission technologies.

Lantz is located in Quincy, Ill., and can be reached at (217) 224-9600

or via e-mail to *tlantz@bdcast.com.*

KUVO Goes IBOC

DENVER KUVO(FM) in Denver has gone on the air with a digital signal. The non-commercial station, licensed to Denver Educational Broadcasting, turned on HD Radio Aug. 1.

The conversion coincided with the station's 19th anniversary.

KUVO is beta testing the Nautel V-10 hybrid HD Radio transmitter with M-50 exciter.

"Looking at the spectrum analyzer, the Nautel meets the FCC occupied bandwidth mask in HD Radio mode with margin to spare," Chief Engineer Mike Pappas told Radio World.

The digital TPO is 6.2 kW hybrid.

WICR Turns On HD Radio

INDIANAPOLIS Non-commercial WICR(FM) says it's the first pubcaster in Indiana to go digital. Two ham radio operators who own an HD Radio flipped the switch to launch the digital service on the classical-and-jazz station owned by the University of Indianapolis.

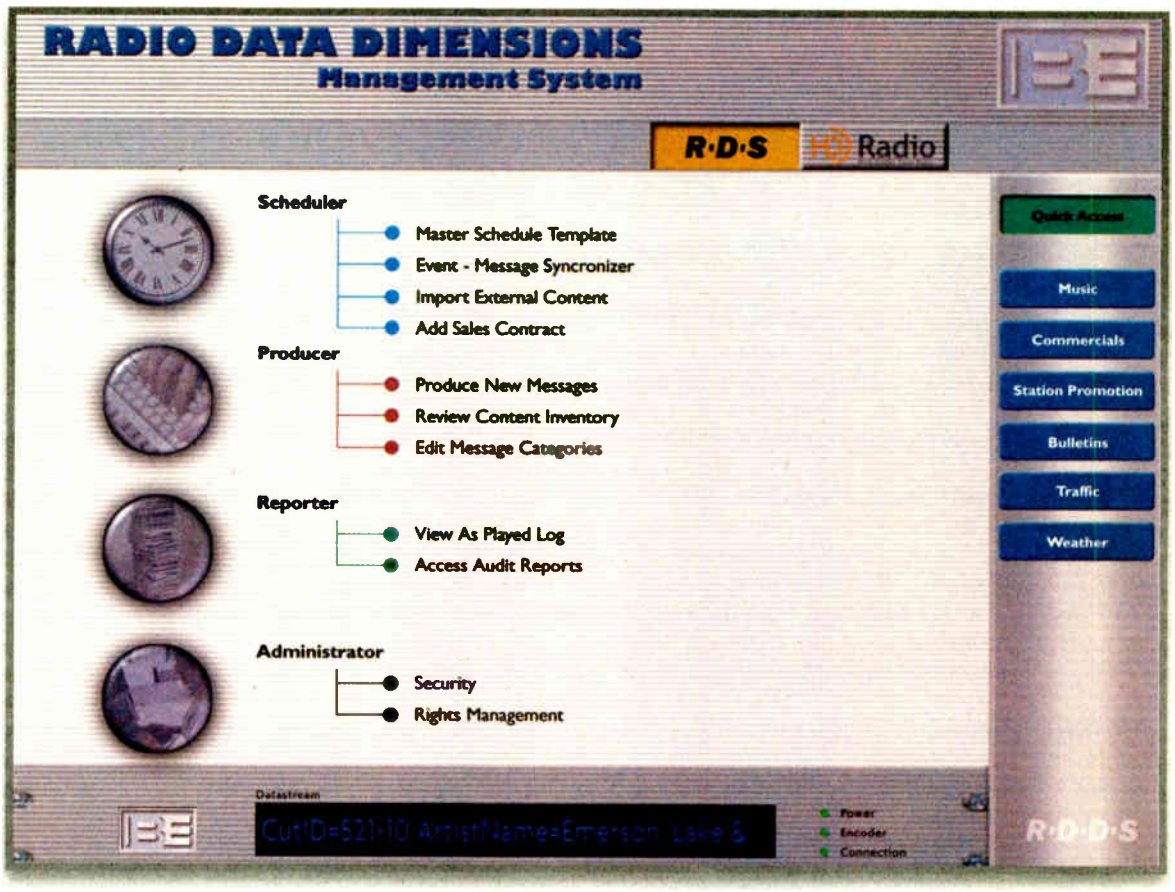
Gary Day and his father, Ken, purchased their HD Radio over the Internet and had been waiting months for WICR to get its new equipment in place.

"AM is where you really hear the difference" between digital and analog, according to Gary Day.

WICR General Manager Scott Uecker said the decision to convert this year was easier because the station needed a new transmitter.

"We had a transmitter that was installed in the early 1980s that needed to be replaced at a cost of about 80 percent of what the upgrade to digital would entail. It wasn't that much more to complete the conversion to digital, and we were able to cover the expense largely through listener donations and underwriting."

Three commercial stations in Indianapolis have gone digital, according to Ibiquity: Susquehanna's WFMS(FM), WGLD(FM) and WGRL(FM).



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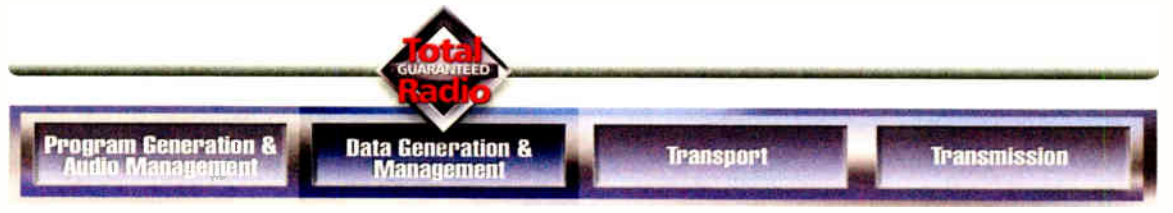

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World Radio History

Consolidating Transmission Sites

The Space Crunch at AM and FM Sites Is Here To Stay, And Managers Must Adapt

by Tom Vernon

Whether it's an AM or FM transmitter site you're building, space probably is at a premium.

Designers of consolidated RF facilities are expected to pack more stuff into less cubic feet. Today's RF sites look very different from the pre-consolidation sites of 20 years ago.

What are the trends in combined facilities? What sort of questions should the modern RF facility designer ask? How does HD Radio factor in?

Looking ahead

For FM broadcasters, the squeeze for space starts at the antenna.

"In New York City, for example, you're effectively limited to 4 Times Square or the Empire State Building," said Tom Silliman, president and CEO of ERI.

"The Armstrong site in New Jersey doesn't give good penetration into the boroughs. On Empire State the space for apertures is critically loaded."

But while New York City might represent the ultimate in space shortages, the same trend holds true in most urban transmitting sites.

Shively Labs Sales Manager David Allen and Manager of RF Engineering Bob Surette see a change in the type of master antenna systems that are being erected.

"Systems used to be designed for the number of stations coming on board," Allen said, "but now the trend is to design for extra capacity, even if it takes years to fill up."

The recently upgraded facility at Four Times Square is a good example, he said.

"It started with 12 stations but is designed to handle 21."

A Dielectric 12-bay DCR-M antenna serves WJCT(FM) in Jacksonville, Fla., sharing space with WJCT(TV)'s NTSC and DTV antennas on a Dielectric tower.

Another trend noted by Allen and Surette is an emphasis on minimum downtime and enhanced reliability.

"Few overnights are available to work on these systems, and that means a lot of careful pre-planning needs to go into the design," Allen said. "The need is all the more pressing, as many stations have both main and auxiliary antennas on master systems."

Surette described a changing relationship between company and customers.

"You used to do a project for a station, and that was it. Now you have more of an ongoing relationship with customers, as systems continuously change and evolve.

"We have weekly phone conversations with some of our biggest customers."

Silliman of ERI said sales of traditional single-frequency antennas peaked in the 1970s. While there is less demand today, his company still sells a number of these antennas in smaller markets where the vertical real estate is available.

Typical of collocation activities is a project underway at Infinity Chicago. All of the company's backup FM transmitters are being collocated on one of its AM towers.

John Valenta, engineering manager for FM stations WCKG, WJMK and WUSN, said, "Most FM sites are on the Sears or Hancock towers, neither of which has emergency power. Our backup site has its own generator, so we're more independent.

"It also makes overnights a lot easier."

Infinity is using Dielectric combiners and interleaved FM antennas, with two transmitters on the analog antenna, and two on the IBOC antenna. The same aperture is used for all four stations. The skirt on the AM tower means there is limited room for antennas, so the compact configuration works well.

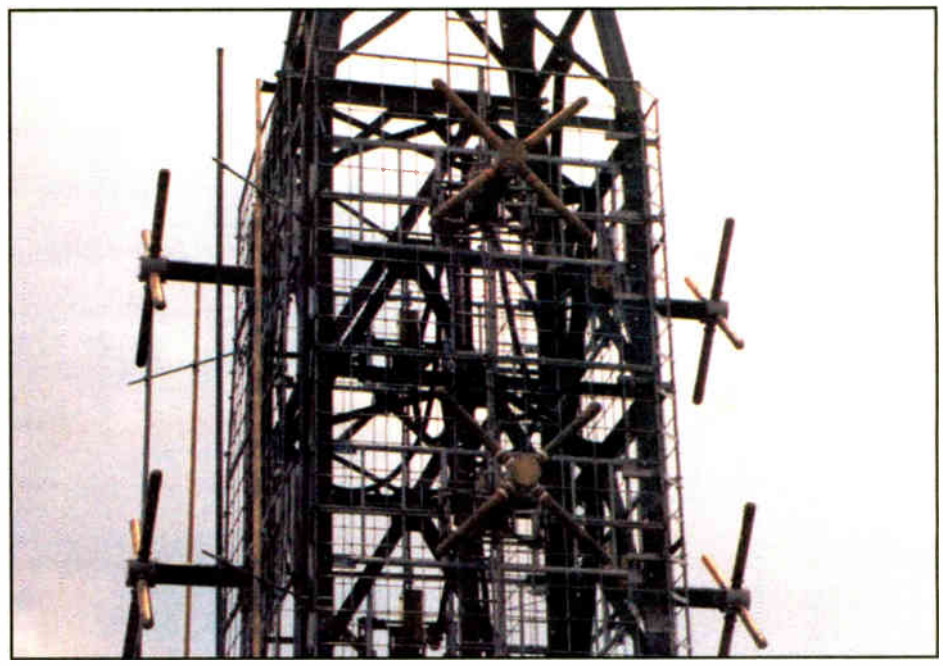
Valenta said there is a slight penalty in antenna gain with a shared system such as this, but the economy of space makes it worthwhile.

Space also is tight in the transmitter building, where Valenta is using Harris Z 10 transmitters.

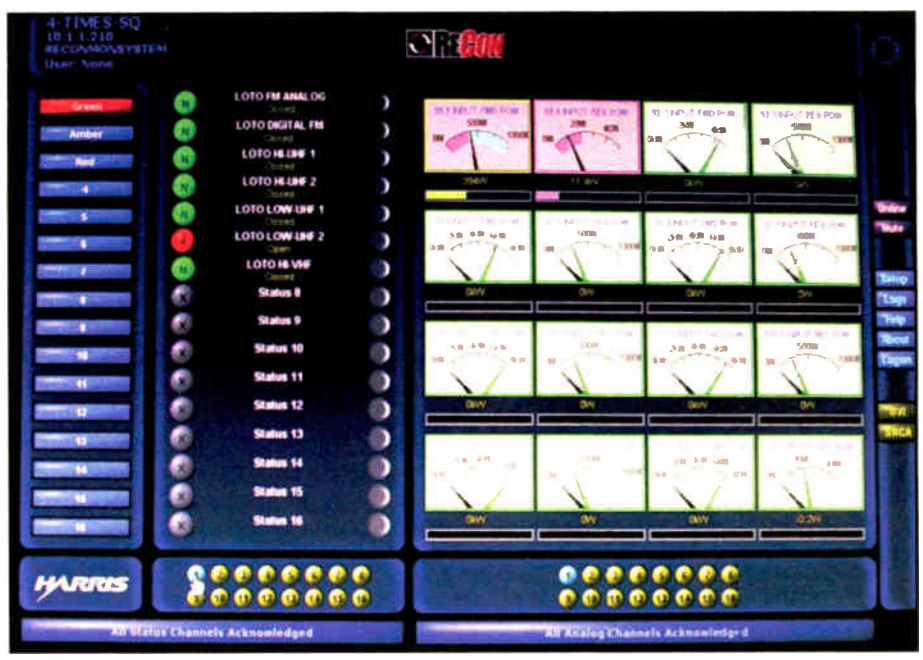
"It's a 10 kW transmitter the size of a refrigerator," he said. Adding to the congestion is the installation of backup servers for the stations' Broadcast Electronics AudioVault units, a common practice these days.

Assembly of gear at the Chicago site has to go in a prescribed order. First the

See SITES, page 17 ▶



An ERI Triplex Antenna undergoes pattern measurements at a test range. This antenna was installed on the Empire State Building as a part of an upgrade for FM stations WPLJ, WQHT and WCBS.



A Harris ReCon system computer screen at 4 Times Square in New York shows RF warning lights on the left, the lock-out/tag-out switch status next and some of the FM station meters on the right side.

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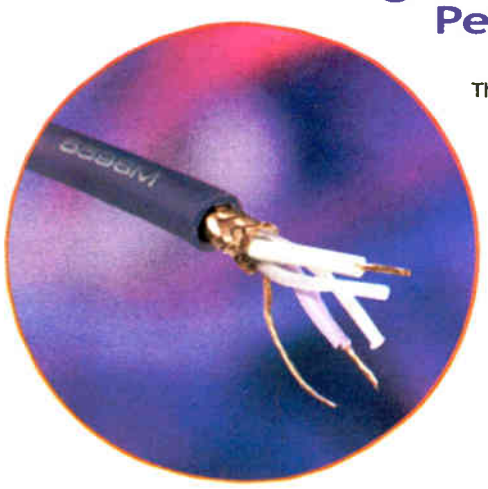
in Digital Audio Cable Performance...



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World Radio History

Sites

▶ Continued from page 16

antennas are rigged, then the combiners are hung from the ceiling of the transmitter room. Finally, the transmitters are installed.

Love thy neighbor

On the AM side, space also is at a premium.

The days when a directional array could be erected over hundreds of acres of bottom land on the outskirts of town are long gone. Urban sprawl often has made this once-inexpensive real estate worth more than the stations. Zoning regulations, fear of RF radiation and the "not in my back yard" syndrome can make getting the necessary permits to erect new towers very difficult.

Systems used to be designed for the number of stations coming on board, but now the trend is to design for extra capacity, even if it takes years to fill up.

— David Allen, Shively Labs

At the same time, broadcasters face competition for tower space from pager and cellular companies. While two AM stations on one site is the norm, three or four stations can share a common antenna in areas where real estate is scarce, such as Hawaii.

Cris Alexander, director of engineering for Crawford Broadcasting and a contributor to Radio World, said, "Sharing of towers is nothing new, but it has gone from being a means of generating revenue to a necessity for broadcasters, paging and wireless companies."

Alexander identified three items to consider when contemplating an AM collocation: frequency spacing between stations, electrical height of the tower and location. If any of these is unacceptable, move on.

Most engineers consider 120 kHz to be the lower limit when diplexing multiple AM stations. Spacing closer than this can result in difficult design problems for the diplexer and unacceptably narrow bandwidth.

The electrical height of AM towers determines their efficiency.

"Towers with electrical heights between 75 and 180 degrees should produce acceptable results," Alexander said. "Anything less might be too inefficient. Taller towers may be difficult to match and cause degraded diplexer performance."

Finally, a site location must be selected which will produce the desired coverage with permissible power. To determine this, it's necessary to run day and night allocation studies from the proposed location, compute the permissible radiation and then compute day and night coverage to determine if the FCC minimum community-of-license coverage and the performance goals of ownership will be met.

When a site has been selected, a diplexer can be designed to meet specifications. Station personnel will need to furnish a great deal of information to the designer. Accuracy in making the required measurements is critical, as mistakes at this stage will have a negative impact on cost and the completion date.

Modern supercomputer technology can come to the aid of broadcasters seeking to collocate on a new AM site. Consultants with sophisticated programs can make directional patterns work on small parcels of land with arrays of towers that would have been impossible to design in the days of the slide rule. These DAs bear little resemblance to the conventional in-line and parallelogram arrays we're accustomed to, but they work.

Modern tools

AM collocations with IBOC can add some additional wrinkles to the process.

"Filters, traps and often less-than-optimal antenna impedances can sometimes combine to create unacceptable impedance bandwidth," Alexander said. "For broadcasters wishing to transmit IBOC at some point, this means added attention in the design process, Q-matching whenever possible and employment of broadbanding and slope-correction techniques."

The space crunch at AM and FM sites is here to stay, and management needs to adapt. Today's systems are much more complex than the single-station sites common in days past, so consultants and sales engineers must be involved early in a project's planning.

The trick is to look for the opportunities collocation creates. The guy down the street may be your competitor, but if you can lease him some space on your tower, it could do a lot for your bottom line.

Tom Vernon is a multimedia consultant in Philadelphia. E-mail him at tlvernon@blazenet.net *or call (717) 367-5595.*

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World Radio History

Taking Public Radio Private

XM Is Now Producing Original Programming in the Public Radio Style

The Big Picture

Photo: Gary Hayes, BBC

by Skip Pizzi

Next month's premiere of "The Bob Edwards Show" on XM Satellite Radio will mark a major milestone in the history of U.S. radio. A public-radio-style program will be produced and nationally broadcast by a commercial operator for the first time, on the 24/7 XM Public Radio channel, XM Channel 133.

This implies that the term "public radio" no longer identifies the source of the content, but that it's now become a format label in the truest sense.

For many listeners in the United States, "public radio" has designated such a generalized programming style for some time. Although public stations here are individually licensed, operated by a patchwork of not-for-profit licensees around the country, enough commonality in their programming styles has evolved in the last quarter century that today the public radio name evokes just as concrete a descriptor of content as does "top 40" or "classic rock."

But prior to this recent move by XM, "public radio" also meant that the content had non-profit and non-commercial origins. It remains to be seen how important a distinction this latter point is for listeners, and whether a departure from these roots will affect the reception given to what otherwise will likely be similar-sounding content.

Consider also that the RBDS system includes "Public" as one of the 32 format types in the PTY field. It's unlikely that anyone ever envisioned a commercial operator ever using this label, but there is certainly no constraint from one doing so, just as public stations could choose to use any of the other traditional format names (such as "News" or "Classical") at their option.

In any case, the intriguing evolution of this uniquely American style of radio has taken a distinct new turn.

Birth of a format

Various federal policies can be credited with engendering public radio, but its growth into young adulthood has been largely a private sector affair. Given that privatized, self-sufficiency of the service has become a stated federal policy goal, the development of public radio in recent years has to be seen as a great political success, and a strategic triumph for its originators.

The first step on this path was the creation of the Reserved Band (88.1-91.9 MHz), where most public radio stations exist today — although a few operate at higher frequencies (generally due to some commercial operators having ceded their FM licenses to non-profit organizations for tax benefits back when FM was still a loss leader), or on the AM band.

Today, this fortuitous arrangement allows listeners to scan this part of the FM spectrum fairly quickly to find the now-familiar sound of public radio nearly anywhere in the United States. No other radio network can claim such ease of identification by band location, giving rise to what public radio's resident theme-music composer B.J. Leiderman refers to as "Life at the Bottom of the Dial."

Of course, the reserved band is occupied by many different types of stations, operated by a range of licensees whose only shared attribute is their non-profit status. So this spectral neighborhood houses everything from Bible-thumping religious broadcasters to off-the-wall college stations.

Yet one group of these operators has aggregated a style that mixes classical, jazz, folk, world and other non-mainstream music styles with a particular type of talk programming to create the format now known simply as "public radio." These operators do not share a common organizational style; they include a diverse lineup of universities, municipal agencies and community groups and generally tend toward fierce independence from one another. But these differences are transparent to the fast-growing audience for the services. Although still fairly diversified, there is an almost immediately detectable signature sound to this content package, and its popularity is now driving at least one for-profit organization to try its hand at duplicating it.

The term 'public radio' no longer identifies the source of the content; it's now become a format label in the truest sense.

From NERN to Nipper

The other foundation for the format came from the Carnegie Commission's 1967 "Report on the Future of Public Broadcasting," which recommended the creation of what eventually became PBS, NPR and the Corporation for Public Broadcasting.

The latter was to serve as a private non-profit corporation for disbursement of federal funds to — and insulation from governmental control of — the two networks and their member stations. Based on the report, in 1970 Congress chartered the National Public Radio system out of what had been the National Educational Radio Network, or NERN.

This was the first radio network to consist mostly of FM stations, so audio quality standards were high from the start, along with production values and journalistic integrity. (The relatively few AM stations in the network came about via legacy university licenses or via recent acquisitions, and are now almost always second services attached to a primary FM station or regional network.) Although NPR's original interconnection system was via 5 kHz land lines, these lines were used primarily for news and public affairs content, with music programs generally distributed via reels of tape sent through the mail. In the 1980s, NPR was the first U.S. radio network to move to satellite distribution, whereby all programming could be distributed at 15 kHz bandwidth, and in stereo where needed.

Around this time, the public radio system experienced strong growth and diversification, and notwithstanding occasional government attempts over the years to eliminate federal funding, that growth continues. Funding now comes from a variety of federal, state and private sources, as well as direct listener contributions and corporate underwriting via purchased on-air sponsorship announcements. This financing scheme is unique among public broadcasting worldwide, and also contributes something to the signature sound of U.S. public radio.

NPR is now only one of three major content distributors for public radio, and many local stations continue to create substantial amounts of unique local content. Throughout this expansion and continuing change, the public radio content style has remained fairly constant, and is generally recognizable to any radio listener. Even though the actual content broadcast varies, the overall character of the service has created a distinctive "public radio" brand that distinguishes it from any other U.S. or international radio format.

Low-hanging fruit

It makes sense for satellite radio to adopt the public radio brand into its menu of formats.

Consider that it is the only form of U.S. terrestrial radio (other than religious broadcasting) that has attempted to collect funding from listeners, and it has been relatively successful in doing so. Although research shows that only about one listener in 10 actually contributes, several major market stations each routinely raise millions of dollars per year from listeners, and such funding represents a substantial portion of all public stations' revenue streams. It also continues to rise every year.

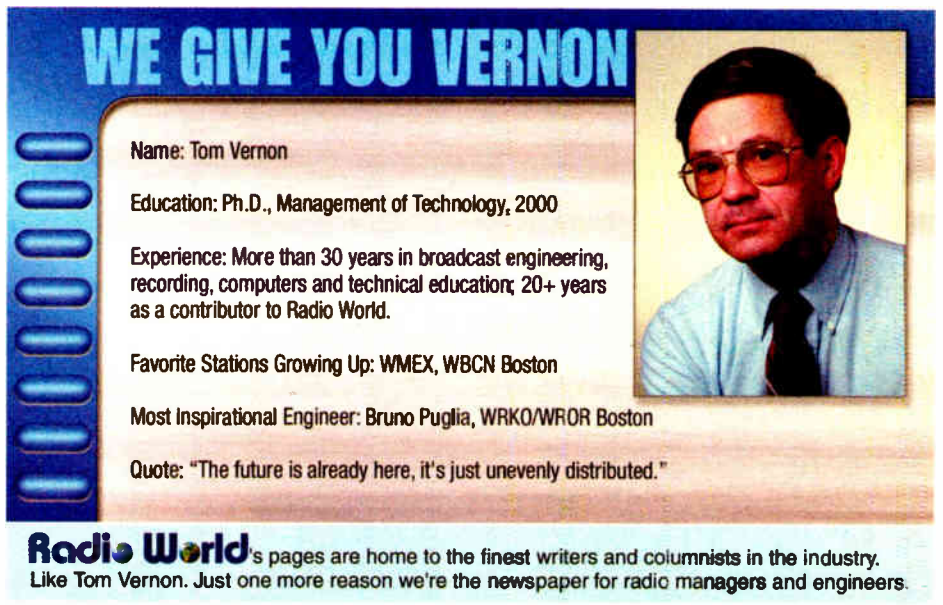
So at least some of public radio's audience has already moved beyond the behavioral issue of paying a broadcaster directly for non-commercial radio service, which is perhaps the largest obstacle to growth of satellite radio. Moving to a multi-channel subscription model for such audiences is an easy step, so it makes sense for satellite radio services to invest in a format that has clearly exhibited its ability to stimulate such unusual listener behavior.

This was behind Sirius Satellite Radio's inclusion of several public radio channels in its initial offerings, and XM is now following suit. Yet XM's approach is more proactive, in that it will create a mix of content lifted from existing public radio operators with content it will create on its own. While "The Bob Edwards Show" is the only example of the latter at this writing, if it proves successful more could follow.

The fact that XM's studios are mere blocks from NPR's headquarters in Washington makes this migration even easier to imagine. XM is the first to cross a line often contemplated with trepidation by public broadcasters, and it may now be embarking on a path that continues to poach staff — and listeners — from the traditional public radio system.

Just as public radio has initiated technologies that the commercial radio industry has later adopted as standard practice, it now may have similarly launched its content brand into the commercial environment. Of course, success always breeds competition, and imitation is the sincerest form of flattery; but such platitudes are likely of little comfort to public radio broadcasters, who will no doubt observe how "The Bob Edwards Show" fares with rapt attention.

Skip Pizzi is contributing editor of Radio World.



World Radio History

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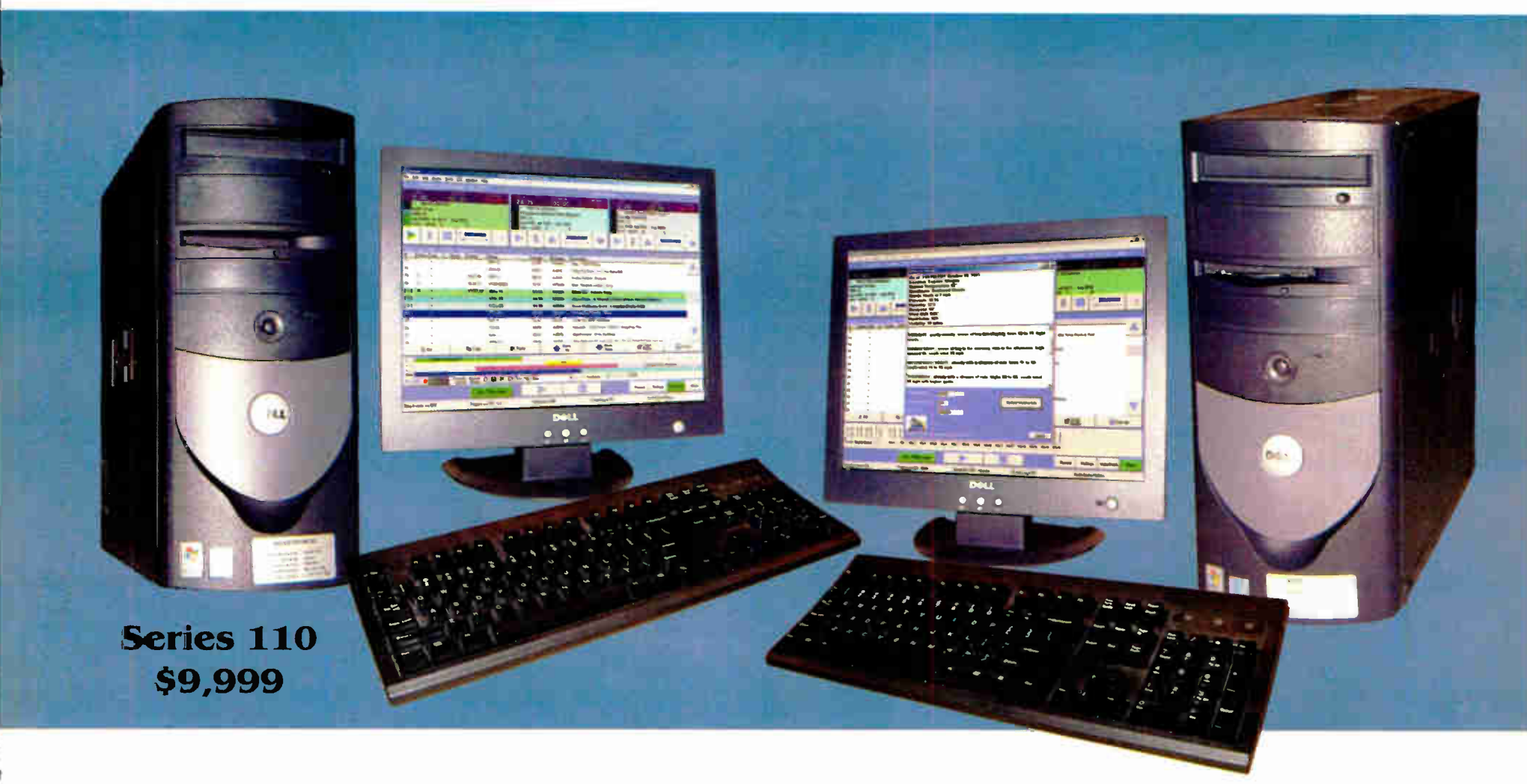

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World Radio History

Moving Day at the Transmitter Site

by John Bisset

What's hiding behind the black curtain, shown in Fig. 1? Read on for the answer later.

★ ★ ★

At least once in your engineering career, move a transmitter.

Not you *personally*, mind you. But the project is an experience an engineer should enjoy. Here are some tips.

If you don't have double doors, measure the door width and height, then compare that to the palleted transmitter. Most new transmitters arrive on a wooden pallet. Remember that wooden pallets are not created equal; verify the height from your manufacturer. The object here is to have no surprises on moving day.

One of my associates recalls a transmitter delivered by a company that didn't do "inside deliveries." Its truck couldn't make it down the road to the transmitter building, and the driver had other runs to make.

ered with plastic, so the transmitter was protected from the rain. Still, not the greatest experience.

★ ★ ★

During my time at Harris, I was at a customer's site as he took delivery of his new transmitter. Most deliveries took place without a hitch; in this case, the driver was late, and it was nearly dark as he backed the truck up to the building and lowered the lift gate. He wanted to make sure the truck was in truck depot and transfer the transmitter to another truck. He tried to pull forward and the gate dragged on the ground. No luck, he's stuck.

All he could do was put the truck in reverse and line back up with the building. It was getting cold, and the driver couldn't reach anyone at the depot.

Someone got the idea of a broken wire, so there we were, flashlights in hand, under a truck on the cold ground, troubleshooting the lift gate circuit. It turned out to be a broken wire, located behind the hydraulic pump.

The transmitter got off-loaded; and although everyone was cold and tired, the story ended on a positive note.

Fig. 1: What's hiding here?

Fig. 2: Double or oversize doors provide easy access for transmitters.

Fig. 3: Measure door and hall entries before the transmitter arrives.

When you buy a rig, the moving issue usually is determined by the manufacturer. Make sure you specify inside delivery.

Another consideration is entry to the building. If you're designing a transmitter building, you will never regret indulging in the luxury of oversized or double doors.

So the driver simply dropped the transmitter by the side of the road.

When the engineer got back with some additional muscle and a lift-gate truck, there sat his pretty new transmitter ,owning the curb. Fortunately, this was a rural area; no one had bothered the transmitter. It was cov-

position so that the gate would be level with the door threshold.

Everything was perfect, so he pulled on the lever to lift the gate. Nothing happened.

A half hour of futzing with the mechanism; still nothing. It was really getting dark.

The driver decided to drive back to the

I relate this to show that even new transmitter deliveries can have their problems.

★ ★ ★

So what do you do if it's up to *you* to

See MOVING DAY, page 21 ▶

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World Radio History

Moving Day

▶ Continued from page 20

plan a transmitter move?

First, consider your liability. Yes, some of the newer solid-state AM rigs can be walked into place by a single person; but should that person be you? If you're a contract engineer and you don't have insurance, and you drop or damage the transmitter, you could find yourself on the receiving end of a lawsuit. If you're an employee, there may be OSHA rules to consider.

Foremost, put your safety ahead of saving your employer or contract client money. As engineers, we sometimes feel we can do most anything; the question is whether it's in our best interest.

So you've just gotten a quote from a rigging company for ten grand to move the behemoth. What are your options? There's the vending machine company we told you about in a previous column.

Mike Pappas, the chief for KUVO Public Radio, in Denver, offers another suggestion. Mike uses Student Movers to move transmitters. They are bonded and insured. The company uses lift gate trucks (that work, I might add). They are reliable and offer reasonable prices.

Mike writes that he has a difficult site for shuttling transmitters in and out. The transmitter must be carried in on its back, then lifted over the corner of a genset. Student Movers handled this without breaking a sweat — or the transmitter — at a reasonable price. Mike can be contacted at *mpappas@qwest.net*.

Mike signs his e-mails with the KUVO Engineering Department motto. For engineers, it says it all: "Never have so few done so much with so little for so many."

It never hurts to toot your own horn.

★ ★ ★

Alan Peterson found an interesting discovery at Radio America in Washington while installing a new Symetrix AirTools 6100 obscenity delay.

This delay box has the ability to readjust ESE time clock displays to reflect the time of day adjusted for the delay time; for example, real time could be 11:59:50, but if the box is set for a 10-second delay, it automatically compensates the clock display to show 12:00:00. This means the talent and producer do not need to do math in their heads to figure out the exit time for a program.

Along the way, they discovered the importance of what flavor of time code drives the house. The AirTools likes to see TC 89 code, a standard code generated by ESE clocks. Radio America is driven by TC 90, a slightly different code with the addition of the date. Changing the code at the GPS receiver to TC 89 made the delay box and rack clock display happy, except it stalled out the clock built into the Wheatstone A6000 console.

Changing one jumper on the Torpey Time CPU7 clock module (OEMed for Wheatstone by Torpey Time) got the clock in step with the rest of the house.

Look for jumpers and alternative means of time code in your studios should you run into these compatibility issues. Early in the studio planning, be sure to ask manufacturers if you will need a time-code converter.

Thanks, Alan, for the solution to this problem. Reach Al at *apeterson@radioamerica.org*.

★ ★ ★

Did you guess what was behind the cover in Fig. 1?

Engineers in colder climes would spot the lock protector right away. The flap of tire inner tube keeps snow and ice from building up on locks. It is located on an AM tuning unit fence. This idea can be adapted with a short piece of metal stock and bolted onto galvanized fences as well.

It's not too early to prepare for winter. Protect your locks and save the frustration of thawing frozen hardware by installing these simple protectors.

John Bisset has worked as a chief engineer and contract engineer for more than 30 years. He is the northeast regional sales manager for Dielectric Communications. Reach him at (571) 217-9386, or john.bisset@dielectric.spx.com.

Submissions for this column are encouraged, and qualify for SBE recertification credit.

Fig. 4: An inner tube protects locks against freezing.

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World Radio History

FIRST PERSON

Listen to the Man at the Factory

by Winston Hawkins

Our new solid-state AM transmitter went through commissioning with only a couple of glitches: a broken wire on a relay and an RF connector issue, resulting from the blend of 1970s-vintage, spiral-wound coax and a concentric EIA flange.

Both were resolved; the new AM unit now sat beside the new FM transmitter, both from Nautel; everything was working just fine. These units were replacing transmitters that had been in place for 16 years.

A week went by and I got a call from the board operator, telling me that the AM transmitter was unhappy, its power level going up and down and alarm lights flashing. (I was several hundred miles away working on another transmitter.)

Always tell the tech support guys anything that is out of the ordinary, no matter how unimportant it seems.

The operator informed me that they were experiencing heavy rains; I figured that had something to do with the problem. I had him reduce the power to a point at which the transmitter liked the load; we would see what happened when the rain stopped.

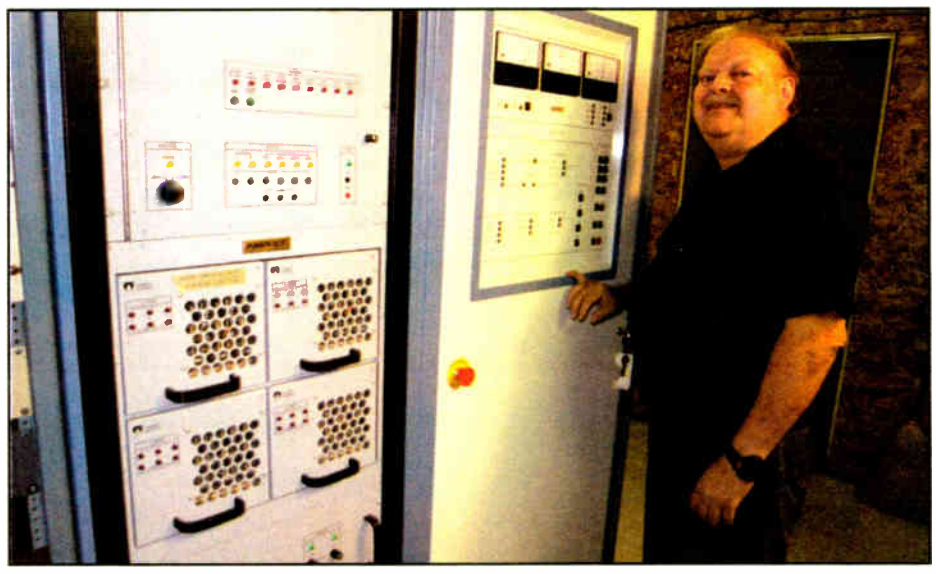
Well, the sun came out and dried everything up; but the problem remained.

A new cap

We had just performed a frequency sweep on the unipole antenna within a few weeks of installing the AM transmitter, and had retuned the ATU so that the input was 50 j0. We checked it again with our Delta OIB-1 and it was right on the money.

Worth mentioning is that we have a 4-inch copper strap from the tower to the ATU and from there to the 6x12, 1/2-inch-thick brass bulkhead plate in the transmitter room. From that plate, a heavy copper-braided cable is cad-welded to three eight-foot copper-clad ground rods placed eight feet apart. From that plate, separate copper straps run to the AM and FM transmitters ground points, as well as another strap to the equipment rack.

Thinking that there might be a problem with the folded unipole antenna, I enlisted the help of Dave Wittkamper, our tower climber, heavy lifter and all-around doer of hard work (everyone should have one of these). We were joined by Larry Schropp, our contract engineer of long standing.



We saw right away that the transmitter ran fine at 4 kW; however, when power was raised to the normal operating level of 7.7 KW, it started shutting back after 3 to 5 minutes.

The transmitters are in the basement of the studio building and the tower is some 100 feet away, next to the building that houses the ATU. We placed a dummy load at the input to the ATU and brought the power up to normal levels. After 10 minutes with no indications of shutback, it appeared that the problem was in the ATU or the unipole.

The ATU was the standard "T" network, with input, shunt and output coils and shunt cap to ground. A pair of caps was in series at the output of the network. Using a laser thermometer, we saw that the shunt cap was running about 20 degrees hotter than the other components. After consulting with some folks more knowledgeable and experienced in this kind of work, we thought that the shunt cap was possibly heating up and changing values.

Because we had been at reduced power for a while and were interested in resolving the situation as quickly as possible, I drove five hours, round trip, to acquire a new Sangamo 293, .001 mf cap. With great confidence we brought up the transmitter, looked at our watches, and waited for the 3 to 5 minutes to pass.

And then ... same problem.

Chasing the goose

So we thought maybe we could see arcing in the ATU if we monitored it at night. (By "we," I include my friend "Goose" at Warmus and Associates, aka Elmer Stiengass, who offered assistance on the phone.)

Looking closely at it in total darkness, with the transmitter running about 8 kW, I tried hard to see any faint arcing. This is an ATU that is built on a large plate on a wall, with components mounted on it. I thought I had plenty of clearance from it. Suddenly, as my forehead touched something in the ATU, I saw a whole lot of arcing. I must have moved back very quickly, as I had only a slight burn on my forehead.

It occurred to me that this was possibly not the best means of finding the problem. I was well aware of the hazard, but I guess you would have to have been there to understand.

We talked to the main man at the company that designed the unipole, and he thought something might have corroded or loosened or otherwise changed on the tower. So Dave took every connection apart on the tower and inspected, cleaned and reconnected them. He reported that nothing was corroded, loose or in any way out of the ordinary.

The next good idea was that possibly the unipole lacked sufficient bandwidth for the highs the processor was supplying. We reduced the top end and backed off on the modulation, but still had the problem.

Going to ground

My company has 27 Nautel transmitters, nine FMs and 18 AMs. I have had the pleasure of putting each into operation, one by one, and maintaining them, after installation, with the help of Jeff Welton at Nautel. Problems have been few, but Jeff has made me look good by having the answer to whatever situation has occurred.

I have always, when installing a transmitter, gone down the line with the instructions, step by step, checking off each procedure in the manual. Anything that doesn't seem to follow the manual produces a call to the folks who made the gear. Transmitters are expensive; the last thing I want to do is make a mistake by assuming that the instructions have to be wrong and what they *must* mean is — ZAP!

We caught up with Jeff on the phone while he was driving in a snowstorm in Nova Scotia. After exchanging our usual good-natured insults, I mentioned that the ferrite ring that Nautel provides to be placed on the coax as it leaves the transmitter was very hot to the touch.

Jeff said, "It sounds like you have a ground loop. Ground the coax at the point it leaves the transmitter building."

I replied that there was nothing in the instructions that says to ground the coax at the point that it leaves the transmitter building. Jeff said, "Humor me. Ground the coax."

I ground the coax. Problem solved.

Go figure.

Bottom line: tell the tech support guys everything that is out of the ordinary, no matter how unimportant it seems. Sometimes this can save a lot of goose-chasing.

The author is technical director of Positive Radio Group in Blacksburg, Va. Reach him at winhawk@parfm.com.

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World Radio History

APT signed a three-year licensing agreement with **Moseley Associates** for the latter to use APT's Standard and Enhanced apt-X algorithms. APT's John McCaffrey said Moseley has been a user of the apt-X technology in its STLs.

"With a new generation of products in the pipeline, the company saw an opportunity to extend this very successful relationship by migrating from APTX100ED chips to a more versatile licensing model," he stated ...

ABC Radio Networks chose a **Wheatstone** Generation 4/Bridge Router System to upgrade studios in New York and Washington. Two studios in New York and three in Washington will use Wheatstone studio furniture.

Moseley Director of Engineering Sunil Naik and APT Licensing Manager John McCaffrey signed a licensing deal.

Separately, Wheatstone said **Clear Channel** bought a Gen-4/Bridge system to upgrade facilities in Rochester, N.Y. Studios for five stations will be equipped with Bridge Satellite Router Cages to create a networked audio/control system. Gen-3 and -4 Worksurfaces will interface with them. Audioarts D-16 consoles and Wheatstone Tech Series furniture are part of the project.

And **WHCR(FM)**, owned by the City College of New York, purchased a Wheatstone D-8000 audio mixing console. Studioline furniture and a Wiremax pre-wiring system were included for the operation, a "broadcast laboratory" and community station for the Harlem area. ...

Telos Systems said its Series 2101 Talkshow System is in use at **Clear Channel's** new consolidated Los Angeles radio facilities. The installation has 20 broadcast studios and voiceover stations.

Separately, a 2101 was installed at **Bonneville's** Washington cluster, which includes WTOP(AM-FM) and WGMS(FM). And the **University of Iowa's** public-radio stations, WSUI(AM) and KSUI(FM), are using Telos ProFiler automated program archiving software to log program audio and create airchecks at the NPR-affiliate stations. Jim Davies is chief engineer; he said the station had used a Shafer slow-speed tape logger, then VCRs, before switching to the ProFiler. ...

Logitek Electronic Systems said it has shipped its 600th production unit of the Audio Engine digital audio router. The company said it has shipped 900 console control surfaces to accompany the Audio Engines. ...

Broadcast Electronics said it supplied the U.S. Air Force with equipment for a new FM station in Iraq. BE supplied the military with an AudioVault digital audio system last year for Freedom FM 107.7.

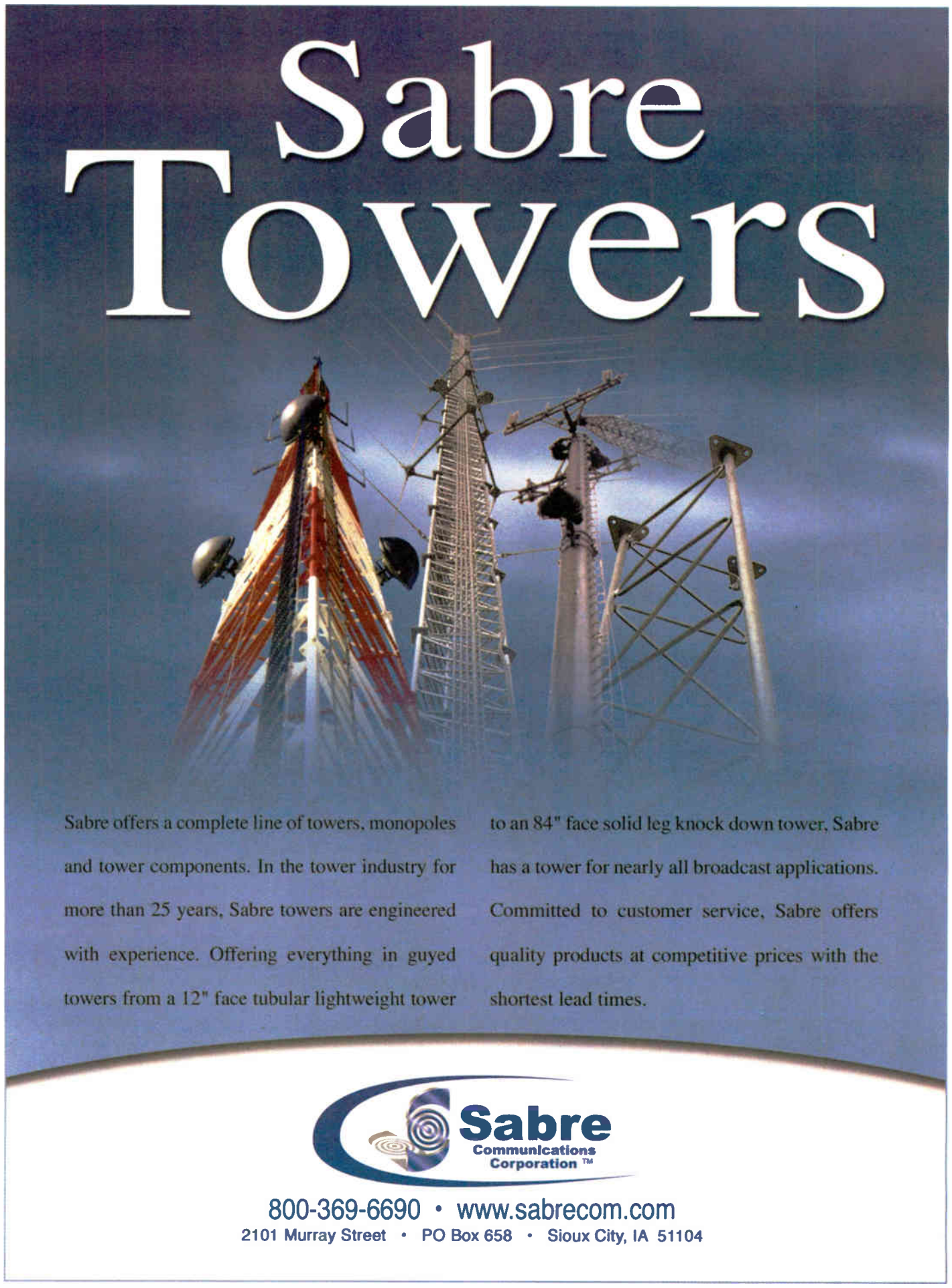
Freedom FM was also using BE transmitters previously purchased by the military to broadcast music and information to U.S. troops from an undisclosed location in the Iraq "green" zone.

"Broadcasting is dispersed across multiple low-powered transmission sites throughout the country ranging in power from 100 watts to 1 kW to reach concentrated areas where troops are deployed," the company stated.

"Two BE FM-1C1 1 kW transmitters are located in Baghdad, where troop concentration is the highest. The program feed is also picked up in Kuwait, where it is rebroadcast by two BE FM-5C 5 kW transmitters there." The AudioVault system is used to automate satellite programming and for breaking into programming with news and local command information.

BE supplied the military with 30 transmitters in the first Gulf War and received an award in 1992 from the Sacramento Army Depot for support of American forces.

Radio World welcomes Who's Buying What information from both stations and suppliers. Write to radioworld@imaspub.com.



World Radio History

Charting Radio's Future

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Wednesday / October 6

Programming Executive Super Session

Moderator:

Erica Farber
Radio & Records

Programming Executives:

John Dickey
Cumulus Media

David Gleason
Univision Radio

Tom Owens
Clear Channel Communications

Pat Paxton
Entercom Communications

Mary Catherine Sneed
Radio One

Thursday / October 7

FCC Breakfast

Event sponsored by: EDWARDS

Jonathan Adelstein
FCC Commissioner

Kevin Martin
FCC Commissioner

Thursday / October 7

Group Executive Session

Group Executives Include:

Judy Ellis
Citadel Communications Corporation

David Field
Entercom Communications, Inc.

Chesley Maddox-Dorsey
Access.1 Communications

Mark Mays
Clear Channel Worldwide

Peter Smyth
Greater Media Inc.

Co-Moderators:

Jay Mitchell
Small Market Radio Newsletter

Tom Taylor
Inside Radio

Event sponsored by: INTEREP

Thursday / October 7

NAB Marconi Radio Awards Reception, Dinner & Show

Hosted by:

Bob & Tom

The Bob & Tom Show
Premiere Radio Networks

Friday / October 8

Breakfast with Charlie Cook

Political Analyst

Event sponsored by: RBC Capital Markets

Friday / October 8

Radio Luncheon

NAB National Radio Award Recipient

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Radio Ink Magazine
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Thursday, October 7

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Wednesday, October 6 - Friday, October 8

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**HD Radio is a trademark of iBiquity Digital Corporation*

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DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP — Legal Innovators

Wednesday, October 6

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World Radio History

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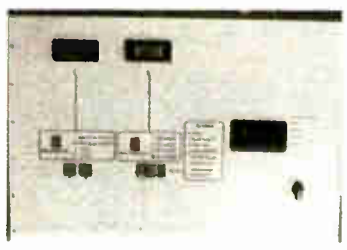

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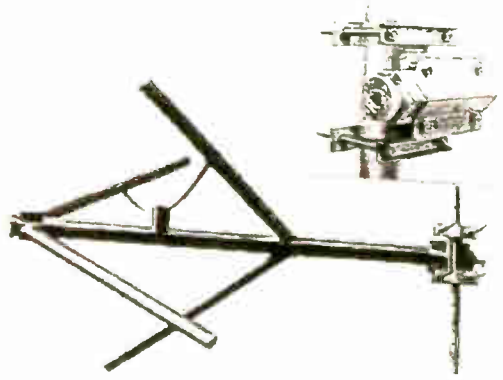

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World Radio History

SUPPLY SIDE

Pristine Systems Inc.

"Supply Side" is a new series about radio broadcast suppliers you don't know, and facts you don't know about companies you do. This Q&A is with George Thomas, vice president of research and development for Pristine Systems.

What does your company do?

Pristine Systems Inc., established in 1984, is a developer and supplier of digital audio storage and automation systems with customers in 40 countries. Pristine's Legacy products include MMCS, Rapid Fire and CartWorks.

Our latest product, CDS32 version 2.0 (Content Delivery System), is the second-generation result of merging the best features from Rapid Fire and CartWorks into a comprehensive, flexible and easy-to-operate solution.

Because Rapid Fire and CartWorks were developed by two competing companies, we have had the opportunity to combine two successful products that used different approaches into a single platform that offers a much broader range of solutions. CDS32 Live Assist, Satellite and Music-on-Hard-Drive systems are full featured and versatile.

Is automation now a growth market, or a replacement market?

Pristine Systems is focused on the broadcast software and hardware market. We do have a number of exciting new ideas and products under development. You can be sure Radio World will get the scoop as soon as we're ready to announce them!

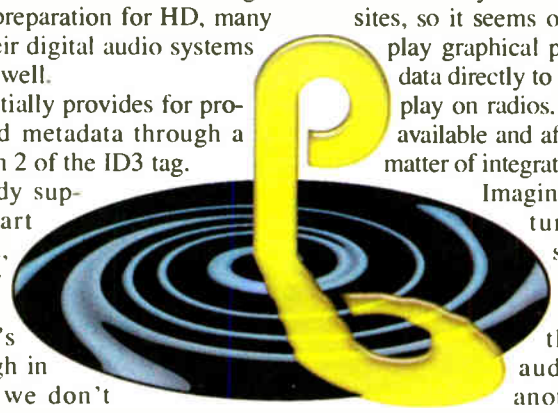
You are correct in calling automation a replacement market. By now virtually every station has had at least one digital experience. However, technology marches at such a rapid pace where it makes sense for stations to upgrade their digital systems at some point. For some large stations this may be every couple of years, for others it may be five or six.

Pristine has seen modest growth in the past 12 months, but I doubt this is an industry trend.

Comment on the industry's movement toward HD Radio.

It will have some impact on Pristine Systems. First, as stations convert to digital consoles in preparation for HD, many will upgrade their digital audio systems to digital I/O as well.

HD Radio initially provides for program-associated metadata through a subset of version 2 of the ID3 tag. Since we already support the Cart Chunk standard, ID3 is easily added.



However, it's still early enough in the game that we don't know everything that HD Radio is capable of yet. I suspect we will be adding new features for several years as stations learn what all is possible.

It shouldn't be long before we deliver album artwork along with the artist and title data. We already do this for station Web sites, so it seems only natural to display graphical program-associated data directly to the color LCD display on radios. The technology is available and affordable, it's just a matter of integrating it.

Imagine, radio with pictures. Seems like someone tried that once before. We've read about the secondary audio channel as another service that FM HD stations could offer. Who say's that couldn't be a video channel?

HD Radio will offer new opportunities for delivering new or additional content. Rather than add another computer to the control room, I believe digital audio delivery systems like our CDS32 ("Content Delivery System") should including capabilities to generate and manage these additional content streams.

What should radio engineers know about you?

Engineers might be interested to know that our company is owned by the software developers. Both of us have electrical backgrounds as well and know enough to design, wire and operate a typical broadcast studio. I also worked as a radio and TV engineer for over 30 years. We believe these things are reflected in the logical way our products are designed and function.

You might say CDS32 was written the way radio engineers would do it.

Info:

Company: Pristine Systems Inc.

Founded: Pristine Systems was founded in 1983. CartWorks/dbm Systems Inc. was founded in 1993 and merged with Pristine Systems in 2002.

Headquarters: San Pedro, Calif., with branches in Overland Park, Kan., and Jackson, Miss.

Ownership: Privately held corporation owned and operated by D. Kevin Loper, president, and George A. Thomas, VP, R&D.

No. of employees: 12

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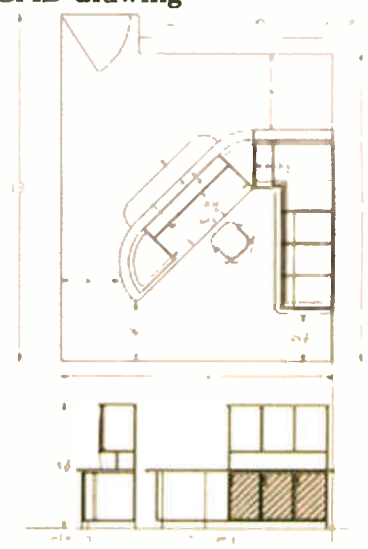

CAD rendering

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World Radio History

Special Software Tools Propel FM Auction

Behind the Scenes at the FCC's 'Electronic Simultaneous Multiple Round' Event

by John Merli

An article in the Aug. 1 Radio World examined the pending FCC auction of FM CPs from its historic, regulatory and political angles. This article examines its specific procedures and technological support.

The FCC Wireless Bureau describes Auction No. 37, which begins on Nov. 3, as an "electronic simultaneous multiple round auction."

That simply means everything will be put into play at exactly the same time — all 288 construction permits will go up simultaneously. There will be multiple discrete rounds of bidding during the auction, with each round lasting for a pre-determined length of time (most likely in the two-hour range to start, with shorter periods as rounds progress). A timer will be displayed to indicate time remaining.

The bidding process will use a Web-based system — with bidders connected directly into special software available on the Internet, or simply by good, old-fashioned telephony. Bids will be entered electronically by selecting from a system of click-boxes that designate specific monetary amounts.

"If you enter a wrong bid, you can remove it before that particular round is over by using the (auction) software," said Craig Bomberger, associate chief of the FCC's Auctions and Spectrum Access Division.

Bidders will be required to remain relatively busy during each round. Bomberger said there will be "activity requirements" in force, requiring participants to bid generally throughout the auction process.

According to an FCC seminar held for prospective bidders in July at commission headquarters, this required activity will be determined by taking into account a bidder's new bids placed in a round, and his or her standing high bids from prior rounds, as measured in special bidding units.

Much like chips in a casino, bidding units work in place of legal currency (i.e., Construction Permit FM042 for Bayfield, Colo., will have 10,000 bidding units). These units are used to measure both a bidder's activity and eligibility. Units are assigned to each CP in the auction and listed in Attachment A of the Procedures Public Notice (DA 04-1699) on the auction, available at the FCC Auctions Web site at *http://wireless.fcc.gov/auctions/*.

The number of bidding units assigned to each CP is constant and does not change as bids increase. A prospective bidder would need 10,000 bidding units of eligibility to bid for CP FM042, for example, regardless of the dollar amount of the bid itself.

Payments

All auction applicants must submit upfront payments in advance. (Differing amounts for each CP are listed in Attachment A of the Public Notice.)

Bomberger cautions that applicants do not have to submit an upfront payment for each CP they select on their applications. However, they must submit a payment sufficient to cover at least one of the CPs selected. (Applicants who may be "former defaulters" — who have previously defaulted on a payment to the FCC or were delinquent on any non-tax debt to the federal government — must pay 50 percent more in payments.) Upfront Payments, to be transacted via wire transfer, are due at the commission by 6 p.m. EDT on Friday, Sept. 24.

Bomberger said the entire auction ends after there is a round in which no new bids, withdrawals or proactive waivers have been submitted. (The FCC may enter automatic waivers on behalf of bidders, but such waivers do not keep the auction open.) While the bidding itself will be confidential during each round, once the round ends, results will be posted online as soon as possible. Therefore, all bidders can see where they stand as the auction proceeds.

Automated setup

The behind-the-scenes technical resources that will fuel the multi-faceted auction are considerable.

John Giuli, technical director for FCC Auctions, told Radio World the auction will employ an Automated Auction System, a custom Web-based N-tier system employing Web, application and Sybase database servers. (The "N" in "N-tier" refers to the number of tiers involved.)

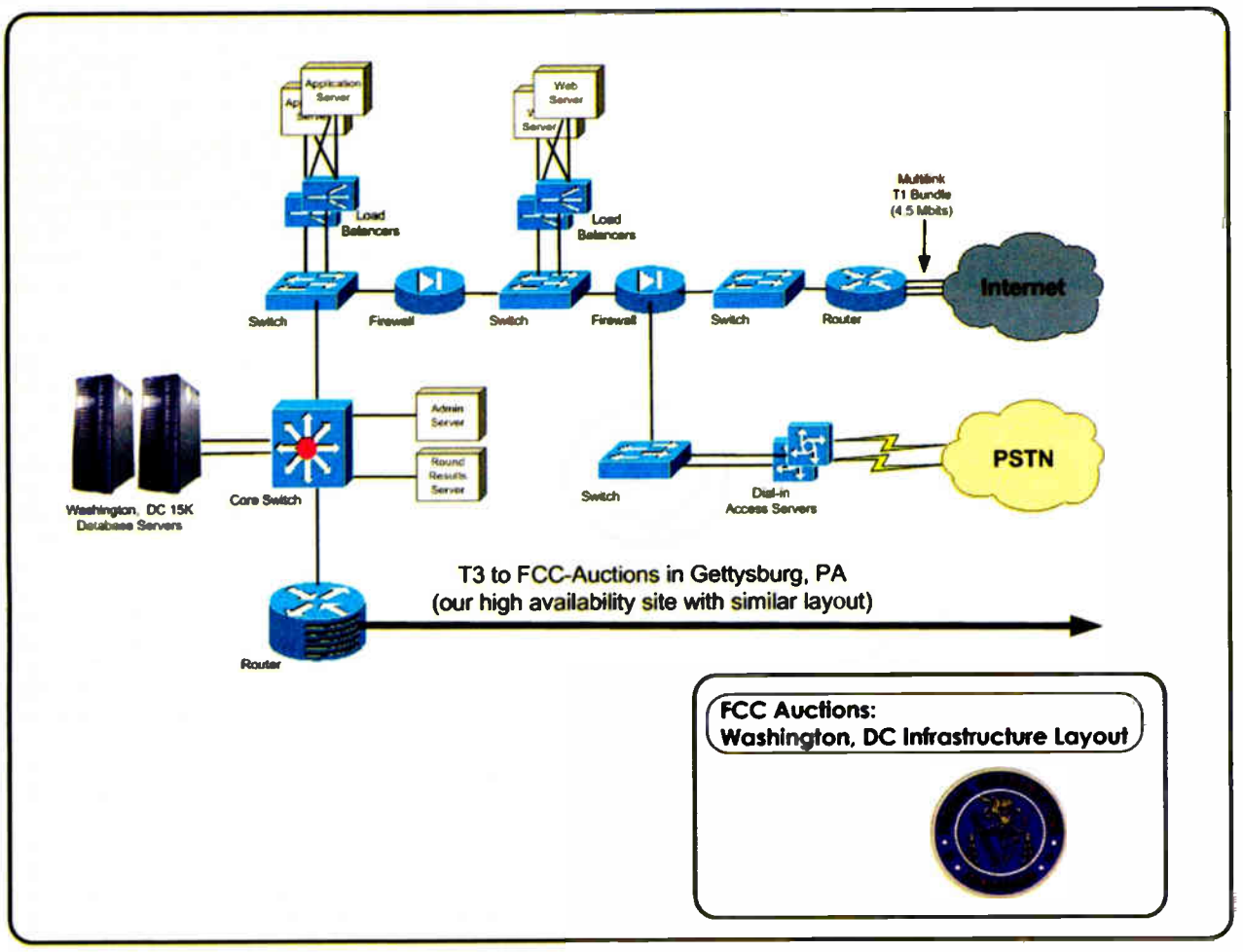
"Bidders will interact with this system through the Internet, or by dial-in access or voice-bidding through the public telephone system," Giuli said. "A multi-link T1 bundle and dial-in access servers connect the Auctions Network directly to the Internet. The T1 interface is connected through routers, switches and firewalls to load-balanced Web servers running on UNIX."

All bona fide bidders will be identified for each round using authentication systems that require passwords. Giuli said the various servers deployed for the auction communicate with Sybase databases that run on SUN Enterprise 15K servers.

Various security devices will be used, including Intrusion Detection (IDS) and Host-Based Intrusion Detection (HIDS) systems, log-network monitoring and event analysis and correlation systems, and network packet and telephone recording devices.

"With built-in redundancy at dual sites in Washington and Gettysburg, Pa., we will be ready for Auction 37," Giuli said.

A mock auction will be held on Oct. 29 to allow prospective bidders to test-drive the auction software prior to the real event starting on Nov. 3.



Redundant computer hardware-software infrastructures in Washington and Gettysburg, Pa., will provide the technical backbone of the FCC's Auction No. 37 of FM spectrum.

Sold! And The Permit Winner Is ...

Bidding at Auction? With a Little Homework, You May End Up With Something of Value

by Jim Withers

By the time this issue of Radio World goes to print, everyone who is going to participate in FM Auction No. 37 has filled out the Form 175 and maybe even wired their upfront payment to the commission. But prior to the auction event itself (which looks like might actually be held this time!), it is useful to remember what lies ahead for the winners.

When the auction ends — which will not happen until there is a "round" in which no new bid is received, nor any automatic or proactive waiver placed for any construction permit — winning bidders will have 10 days to submit the difference between their upfront payment and 20 percent of their winning bid(s). Your permits will not actually be issued until the FCC receives your payment in full.

So, at this point, assuming that payments have been made, you are the proud holder of a CP in Bethel, Alaska, or wherever.

What now?

Where are you?

Time to build, that's what.

Although any holder of a permit has three years to complete construction, again making an assumption, most successful bidders will want to put their investment to work for them and build out the station in a timely manner.

With that in mind, the first issue will be the transmitter site. Many of the auction allotments — Kiowa, Kansas comes to mind — use the community coordinates as the allotment reference coordinates.

Community coordinates are useful in making certain that the allotment will "fit" when considering the Rules, but that's about it. I have not found a city or town yet that will allow a tower to be built smack in the middle of town. (I once did try to convince an aldermanic board to condemn an unused intersection on the outskirts of a town and let me put a tower in the middle of it. Bam! Request denied.)

In addition to the allotments that specify the community coordinates, other allotments being auctioned come with site restrictions that limit the transmitter location, sometimes severely. In either case, you will have to do some homework before deciding on a location. Remember, the station must put a 70 dB/u, or city-grade, signal over the entire community of license, although waivers can sometimes be had, if the lack of coverage is *de minimus*.

Also, for any tower over 200 feet, FAA approval must be sought. This can take quite some time, so start early. If the tower is near an airport, it will likely be denied, so avoid those locations, unless

See AUCTION, page 29 ▶

World Radio History

Auction

▶ Continued from page 28

you are desperate for a fight with a very large federal agency.

If you get a CP in an area of hills or mountains, and there is acceptable access and power (see below), take advantage of mother nature. Put the tower as high as you can get it, consistent with your class of license. You might get that C1 operating height with a very short stick; ask the guys at Mount Wilson how well this works!

Think about power

Also important is electrical power. I once bought a CP with an existing site approval. Only problem was, I needed three-phase power and there was none within several miles. The power company, needing improved quarterly earnings and sensing my desperation, quoted me an amount roughly equal to the GDP of Nicaragua to bring three-phase to the site. If you are building out a 6 kW Class A, single-phase will no doubt work fine. A 50-100 kW behemoth is three-phase all the way. In any event, make sure power (and the right kind) is close by.

A trip to the county courthouse will also do wonders for your construction schedule. Zoning in small communities is generally not too much of a problem, but towers are anathema to some (all those bird strikes, you know).

Maybe spread on a little community service in the form of offering to locate city/county emergency communications antennas on the tower for free; it can only help. Be aware also of environmentally sensitive areas; one allotment lists coordinates in the middle of a lake, with few alternatives other than what looks like wetlands nearby. The need for an environmental showing will absolutely ruin your day.

When it finally comes time to build, my general rule of thumb is to spend money on things you can't reach; and skimp, if you need to, on everything else. In practical terms, this translates as new or otherwise guaranteed antenna, line and tower ("tower" in this case means steel, lighting system, guys and anchor points). Save money (again, if needed) on things on which you can work easily.

I have not addressed studio issues primarily because thanks to technology, the average small/medium-market studio can be a laptop and two iPods in a closet. Find an available office building; you can sometimes trade the rent by offering to make hourly IDs that identify the building; i.e., "Broadcasting from the spacious and tastefully appointed, yet surprisingly affordable Podunk Arms Office Suites ..."

Put in a mic and the laptop and go to town.

Other than going the LPFM route, this auction offers the first chance in years for new or experienced small broadcasters to 'own their own' without paying through the nose.

Other than going the LPFM route, this auction offers the first chance in years for new or experienced small broadcasters to "own their own" without paying through the nose. With a little homework and attention to detail you can also make sure you end up with something of value.

Jim Withers owns KSIX(AM) in Corpus Christi, Texas and has filed for, built and owned radio stations in several states for the past 20 years. Reach him at jim@koplar.com or call (314) 345-1030.

NEWS WATCH

SBE Election Underway

Ballots are due to SBE by Sept. 9 in elections for its 2004-05 board and officers. The only race among the officers' positions is for vice president, where incumbent Sam Garfield of Dilicast Advisers faces Chriss Scherer of Radio magazine.

Raymond Benedict of Viacom is unopposed for reelection as SBE president. Ralph Hogan of Washington State University and Robert "R.J." Russell of KYMA(TV) are unopposed as secretary and treasurer, respectively.

Contending for six open seats on the board are the following 13 candidates, with (*) indicating an incumbent: Ralph Beaver, James Bernier Jr., David Carr, Joseph Geerling, Ted Hand(*), Jeffrey Hugabone, Keith Kintner(*), Vincent Lopez(*), John Lyons, Thomas Ray(*), Jeffrey Smith, Barry Thomas(*) and Larry Wilkins.

Separately, the SBE reported recently that its membership at the end of June was a record 5,939, which is 66 more than the previous record set the year before.

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Scott Studios' is the easiest to use. Also, SS32 has many capabilities the others don't. Scott cart walls are so *intuitive* that anything you want is effortlessly on the air in a second or two.

Shown above is Los Angeles morning personality Shawn Parr of KZLA (FM) at his SS32. Emmis also uses Scott systems at KPWR (FM) in LA, in Chicago, St. Louis, and more.

When jocks think creatively, Scott's SS32 touchscreen enhances the flow and adds to the show.

Scott Studios' systems are powerful, yet simple to use. Jocks can color code labels, play Hot Keys at a touch, find anything fast on Cart Walls, and preview anything at any time—even audition the ending while the same cut is on the air.

New look...new features

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Promos with hooks—short clips of upcoming songs—are easy to build in SS32.

Internet control and remote

SS32 auto-imports digital audio from wireless PDAs, laptops, weather services and MP3s.

Voice Tracker

Scott's Voice Tracker via Internet doesn't require corporate or duplicate music libraries. A number of our stations sound better Voice Tracked than in their live shifts.

Fast phone editor

If a jock works alone, editing great phones is as fast as a flash! If air talent works with a co-host or producer, one can take calls while the other edits.

Free logging software

The FCC is likely to require all stations to archive broadcasts, New customers get free logging software you can run on any office computer. Why pay extra?

Not proprietary

SS32 works with ***any*** computers and sound cards. You only pay for the software features you'll use, so it's in ***your*** price range.

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World Radio History

Time Check Radio, All the Time

Despite Its Rather Spare Talk Format, WWV Remains One of the World's Most Popular Radio Stations

by James Careless

It's not exactly what you'd call compelling programming: a recorded voice methodically stating the time and station call sign over and over again 24 hours a day, 365 days a year.

But this is exactly what listeners to the National Institute of Standards and Technology's radio station WWV want to hear. From all around the globe, they tune into AM time broadcasts from this Fort Collins, Colo., station.

Granted, the caprices of the Earth's electrically charged ionosphere can play havoc with signal propagation. This is why WWV broadcasts simultaneously on 2.5, 5, 10, 15 and 20 MHz; if one frequency doesn't get through, chances are another might.

In addition, the NIST's WWVB broadcasts a "time pulse modulation" signal on 60 kHz from the same facilities. Sent at one beat per second, it is used to calibrate radio-controlled clocks automatically.

What makes WWV so appealing is its connection to the NIST-F1 cesium atomic fountain clock.

Developed and operated by the NIST at the agency's Boulder laboratories, NIST-F1 is the U.S. standard for the second. Without getting too technical, NIST-F1 measures the precise vibration of laser-cooled (that's right; laser-cooled) cesium atoms as they interact inside a vacuum chamber.

Close enough

Brought into service in 1999, NIST-F1 is accurate to within a second over 30 million years. It is five times more accurate than NIST-7, a cesium atomic clock that was in service from 1993 to 1999, and one of the most accurate clocks in the world. Electronic pulses generated using NIST-F1's readings are the basis of WWV and WWVB's time checks.

"The accuracy of NIST-F1 explains why WWV and WWVB are trusted by anyone who requires an accurate source for time," said WWV Station Manager John Lowe.

"This includes power plants, telecommunications networks and anyone else in industry who needs the most accurate time available. As well, the National Association of Securities Dealers is now requiring all electronic financial transactions in the NASDAQ stock exchange to be time-stamped with a traceable link back to the NIST, which is why many of these companies are now tuned to WWVB.

"Finally, there are consumers with 'atomic' clocks and wristwatches; these devices also use WWVB's 60 kHz broadcast to automatically calibrate themselves. At last count, there are several million of these radio-controlled timepieces in operation today."

Early music

The roots of WWV go way back. In fact, it was October 1919 when the National Bureau of Standards, forerunner of the NIST, was assigned the WWV call sign (the letters themselves have no particular meaning).

Seven months later, WWV signed on at 500 meters (about 600 kHz) from the NBS offices in Washington, with an effective coverage of 25 miles. The 1 kW ERP broadcasts consisted of Friday evening concerts broadcast live from a local hall, by engineers from the NBS' Radio Laboratory.

"This music can be heard by any one in the territory near the District of Columbia having a simple amateur receiving outfit." reported the October 1920 edition of the Scientific American Monthly. "It is, therefore, obvious that music can be performed at any place, radiated into the air through an ordinary radio transmitting set and received at any other place, even though hundreds of miles away."

It is worth noting that Pittsburgh's KDKA, which many cite as the first U.S. radio station licensed for broadcasting, didn't sign on until Nov. 2, 1920.

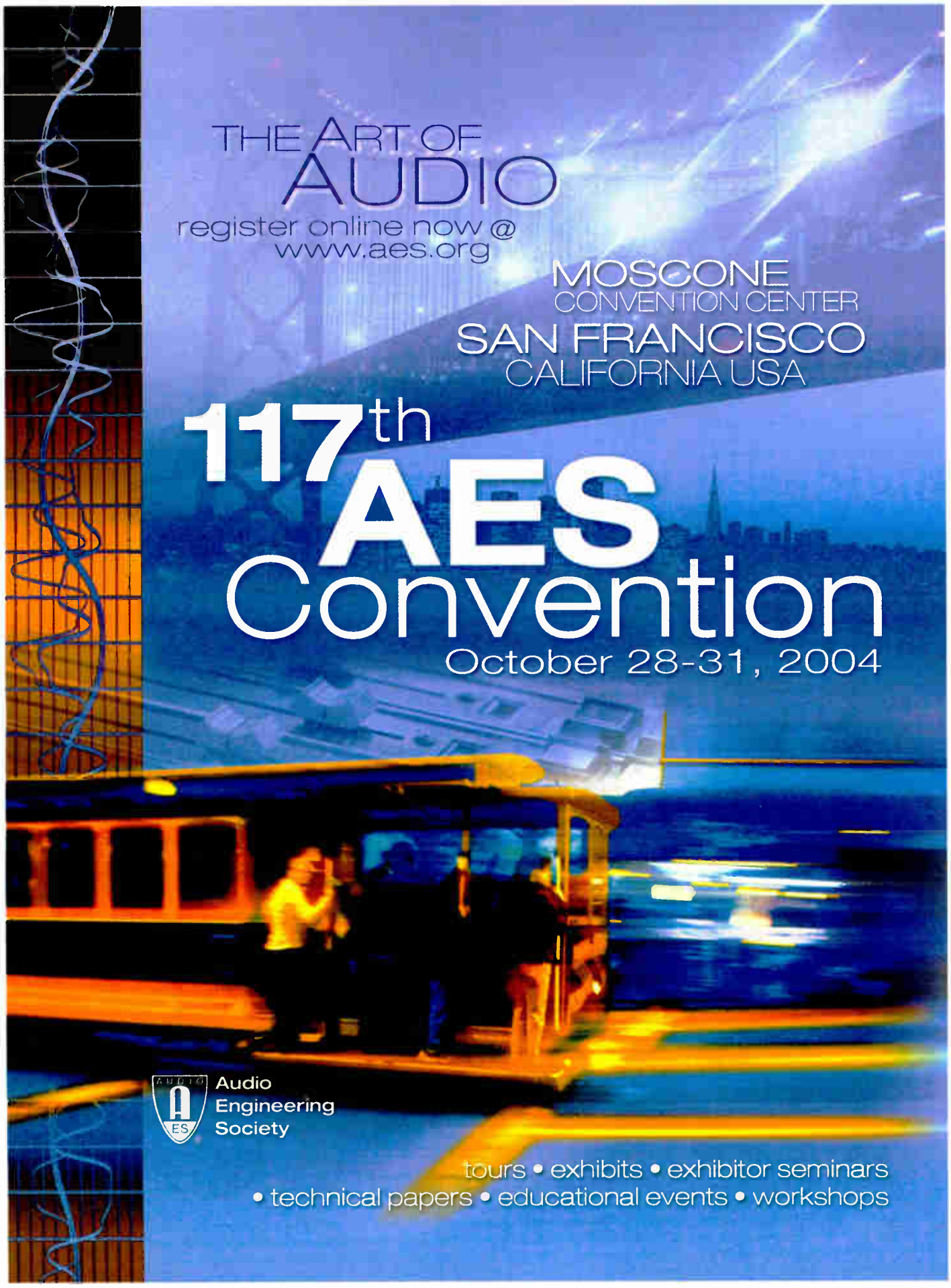
This said, WWV ceased competing with KDKA in 1921, when the government decided that WWV should be a source of standard frequency broadcasts, against which radio operators could calibrate their equipment. Initially these broadcasts were in the 200-545 kHz range. However, after WWV had relocated from Washington to nearby College Park, Md., in 1931, and to Beltsville, Md., the next year, the station was broadcasting its time signals on 5 MHz with a 30 kW ERP.

Programming changes

The NBS chose 5 MHz because of its ability to propagate over wide areas, the relative lack of other assigned stations in this band and "its convenient integral relation with most frequency standards," says the NIST's official WWV history at *www.boulder.nist.gov*. Also chosen were 2.5, 10, 15 and 20 MHz, due to their harmonic relationships to 5 MHz.

In 1996, WWV was moved to Fort Collins because the NIST's time laboratories were nearby and because LF NIST station WWVB was there.

See WWV, page 31 ▶



World Radio History

WWV

▶ Continued from page 30

WWV's role as a frequency calibration source meant that its post-1921 programming was limited: just call signs and its carriers waves, to be precise.

However, the widespread availability of its signals was too good to waste. As a result, the station began broadcasts of a 440 Hz tone in August 1936. Known to musicians as "the A below middle C," it was added at the request of several music organizations so that they could tune their instruments uniformly.

To follow were the addition of "second pulses" in June 1937 and geophysical alerts during the "International Geophysical Year' of 1957-58. The latter included forecasts about the sun's 11 solar cycle and solar flares — one might term this content "space weather" — which affect the Earth's ionosphere and radio signal propagation. Today, WWV also broadcasts marine storm warnings and reports from the U.S. Coast Guard on the status of the country's Global Positioning Satellite fleet.

However, it was the launch of regular time announcements that brought WWV to the attention of shortwave radio listeners. WWV began airing Morse Code messages in October 1945 and launched recorded voice time checks on Jan. 1, 1950. The actual hours and minutes were recorded by a male announcer on metal drums, which were lined up and played every five minutes.

This mechanized approach accounts for the legendary robotic vocal style of WWV's early time checks: "At the tone ... 5 hours ... 17 minutes ..." Eventually, the time checks were transferred to a continuous tape loop, and upgraded to once-every-minute playback. Today, digitized copies of human voices are stored on a computer hard disk and played by WWV's server in a concatenated fashion.

Until 1967, WWV provided its time checks in Mountain Time. Afterwards, the station changed to Greenwich Mean Time, then to Coordinated Universal Time (UTC).

WWV sister station WWVH Hawaii signed on in 1948. It uses the same frequencies as WWV; to allow listeners to distinguish between the two, WWVH uses a recorded female announcer who speaks after WWV's male-voiced station ID is played.

A big complex

To put it mildly, WWV's reach is impressive. Collectively, the station's 2.5, 5, 10, 15 and 20 MHz broadcasts cover the Americas, Europe and Africa, while WWVH takes care of Asia and the Pacific Rim. Meanwhile WWVB's signals cover North America and some parts of South America depending on the time of day.

"We've even been picked up in Patagonia and New Zealand," Lowe said.

To get its signals out, the 400 acre-plus WWV site has five antennas, one for each of its frequencies. Each is a half-wave omnidirectional vertical antenna, connected to its transmitter using a rigid coaxial cable. Not surprisingly, WWV's 2.5 MHz antenna is the tallest at 200 feet, while the shortest antenna is the 20 MHz at 25 feet. WWV's transmitters produce 2.5 kW of power on both 2.5 and 20 MH, and 10 kW on 5, 10 and 15 MHz.

"The lower-power transmitters are TMC GPT-10Ks," said Lowe, "while the higher-power are CCA AM-10,000F/HFs."

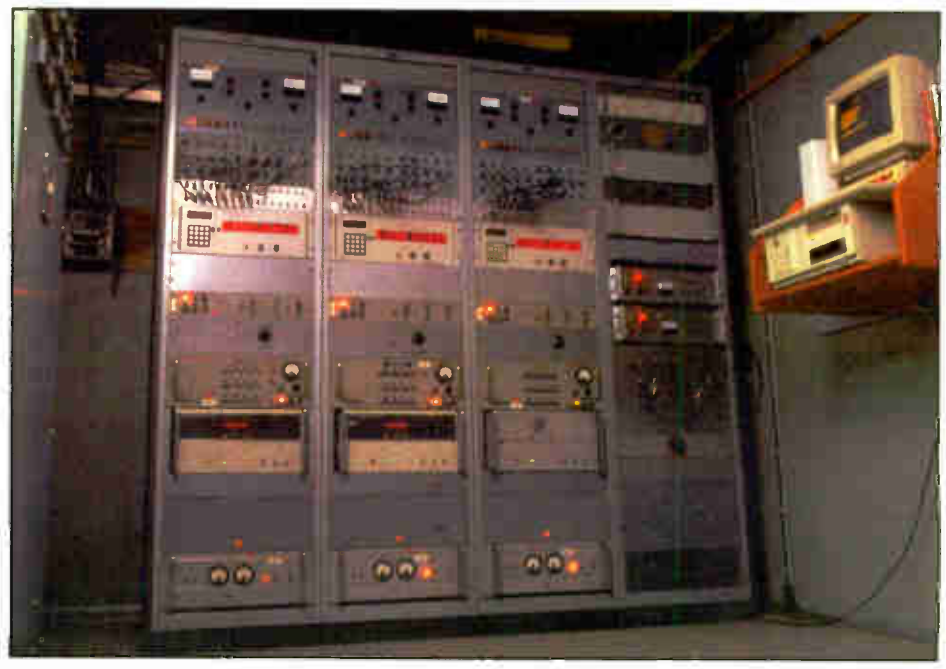
Meanwhile, because building a half-wave 60 kHz antenna for WWVB would require a vertical of 8,202 feet tall, the NIST has instead built four 400-foot towers arranged in a diamond pattern. At the top of these towers is mounted an electrically-isolated "capacitance top hat" from which a single downlead is centrally suspended. The combination of the downlead and top hat serves as WWVB's actual radiating element with a 50 kW ERP.

Total annual cost for the service: $500,000 a year to cover the facilities, power and staff of one engineer, three technicians and one part-time administrator.

Despite its rather spare talk format, WWV remains one of the world's most popular radio stations.

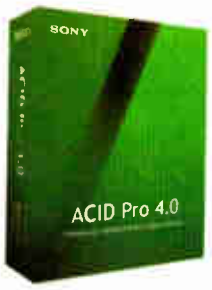
In fact, "Millions of people receive the NIST signals every day, using equipment ranging from low-cost wall clocks and wrist watches to sophisticated laboratory quality receivers," states *www.boulder.nist.gov*. As for broadcast plans? "We are discussing a lot of new time services, such as enhancing our LF broadcast," Lowe said. "It all depends on our federal budget allocation, since WWV doesn't charge for its service."

The WWV/WWVB site occupies 390 acres near Ft. Collins. The eight towers of WWVB are prominent, each about 400 feet. Those comprise two capacitance top-hat antenna systems, each with an array of cables suspended from four towers.



Control room for WWV, broadcasting time and frequency information. This screened room contains electronics to generate the time and frequency signals and voice announcements.

World Radio History



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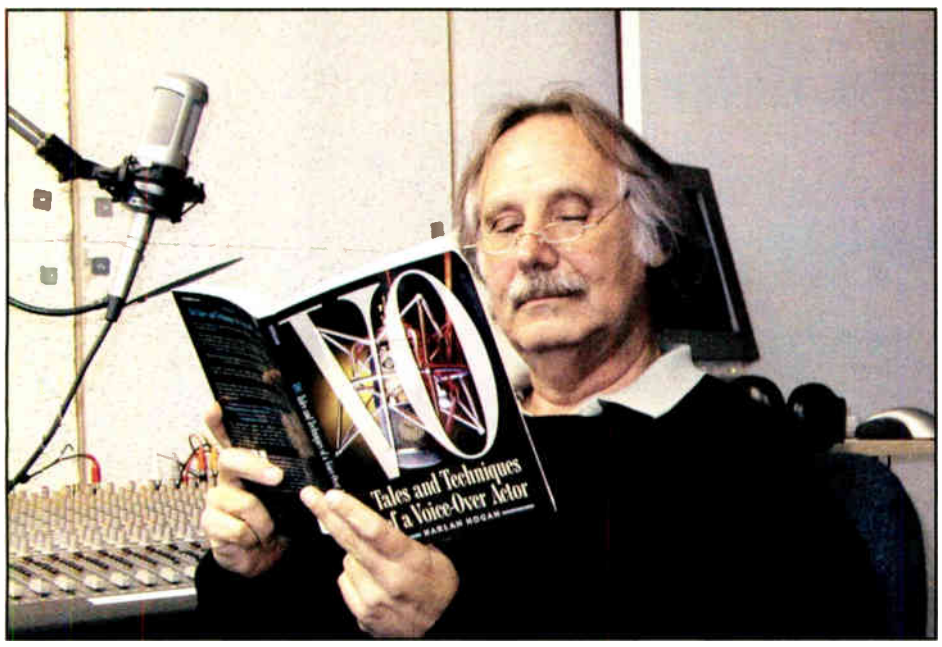
Book Speaks Volumes on Field Success

Harlan Hogan Offers a Factual and Reflective Account of His Life as a Voiceover Artist

by Travis the V/O Guy

When I received an e-mail from Radio World asking me if I'd like to write a review for a book written by fellow voiceover artist Harlan Hogan entitled "Tales and Techniques of a Voice-Over Actor," I realized it's been many decades since my last book report. But I figured, "Hey, I wrote a bunch of those in high school — without a computer — so this should be easy."



Travis recommends Tales and Techniques of a Voice-Over Actor.'

New sheriff in town

Nobody gave me a deadline for handing in this homework assignment. I figured I could read the book and write the review in my spare time. Of course, without a deadline, I kept putting it off until "quiet" periods — those depressing times when it seems nobody wants me for any kind of voice work. Next time that happened, I could bury myself in the book and the review until things pick up. I kept thinking, next week or next month.

My general hatred of deadlines is one of the reasons I went into voiceover in the first place. In the voiceover field you do have deadlines, of course, but it's impossible to put anything off. You either show up in a studio somewhere when you're supposed to, or you don't.

Last month I got an e-mail from the new Radio World Studio Sessions editor, inquiring about my long-overdue book report. The usual excuses from grade school ran through my mind, but I presumed a story of how the dog ate my computer's hard drive probably wouldn't do the job. I responded that I still wanted to complete the piece, and was then given a deadline. Now, I couldn't put it off.

Over the years, I've read quite a few books on the voiceover profession, and I understand the incentive for writing a book on the subject. Most of us in this business have found that the job is quite different from our expectations though we have enjoyed our career, so we like to share our experiences. I also am inundated with questions about our field, as it seems everybody I meet has at one time considered getting into the field. I figure if I got a couple of bucks each time I was asked...

Had I written a book on the vocation, the next time I'm asked about getting into the voiceover field, I could simply say, "Well, buy my book and you'll be on your way to an exciting, profitable career, etc., etc." And then I would be on my way to an exciting, profitable career as a voiceover book writer. Having said that, I highly recommend Hogan's book, for it provides a detailed account of a successful voiceover professional's experiences in the field.

Tricks of the trade

In previous Radio World articles, I've mentioned that most successful actors and voiceover performers I've known have claimed their success to be a matter of dumb luck. Harlan Hogan is no exception to this rule. He clearly states so by the time you get to page three: "I'm not sure why I was lucky enough to become a successful voice over performer...." However, I have observed that the successful performers I've known are good at creating their own luck.

Hogan, based in Chicago, is a familiar voiceover actor, responsible for delivering recognizable advertising campaign slogans such as "It's the cereal even Mikey likes" for Life and "Good things come to those who wait" for Heinz Ketchup. Additionally, he has written approximately 50 radio and TV commercials and 25 corporate and educational videos.

Unlike performers who write books, Hogan shares and demonstrates many of the methods he uses to create such luck. In fact, many of the pages of the book feature cartoons from a calendar he published and sent to advertising agencies and other potential clients. The subject of the cartoons: voice-over.

Each chapter in the book is divided into two sections. The first section, printed on a regular white paper background, is largely

See TRAVIS, page 34 ▶

Twenty Studio Commandments for VOs

The following is an excerpt from "Tales and Techniques of a Voice-Over Actor."

1. Thou shalt not slur thy words, nor spitteth on the microphone.
2. Thou shalt not sticketh thy gum on the studio easel.
3. Thou shalt not touch the microphone — ever.
4. Thou shalt not demand unto thy producer playback of takes they did not like.
5. Thou shalt not blasphemeth thy copy.
6. Thou shalt not direct thy fellow actors.
7. Thou shalt not bear false witness that thou hast other sessions today.
8. Thou shalt not covet thy partner's parts or sayeth their lines.
9. Thou shalt not talk in the tongues of actors — speaketh not of "shaping the read" or of being "in the moment."
10. Thou shalt not make of thyself a graven fool — demonstrating all thy clever voices ... unasked.

Furthermore ...

11. Thou shalt arriveth on time
12. Thou shalt honor thy producer and writer and be thee a pleasure to work with.
13. Thou shalt gird thy loins with clean clothes that maketh not noise.
14. Thou shalt remember thy beeper and thy cell phone belong outside the booth.
15. Thou shalt stayeth on mike.
16. Thou shalt committeth to silence when others are performing.
17. Thou shalt understandeth thy script and accepteth direction.
18. Thou shalt cast asunder thy jangling jewelry.
19. Thou shalt quiet thy stomach, filling it with food, and partake of God's little green apples if dry be thy mouth.
20. Thou shalt perform thy part, signeth thy contract, and be thee gone.

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Think Inside the Production Box

A Beginner's Guide to Digital Audio Editing, From Workstation Assembly to Audio Segment Layouts

by David Casey

If you are new to or have not kept up with the way audio is produced for radio, a lot has changed, and it is easier and faster than ever. The era of splicing tape with razor blades is now long past. Computers have evolved in this world of multimedia and have revolutionized the way we gather, store and reproduce audio.

This article will provide a starting point to learn more about digital audio production. You'll want to delve more deeply into the topics mentioned here through user manuals, online resources and classes.

Software

The first step in producing quality audio productions is picking the right tool.

When shopping for an audio editing product, keep in mind the type of audio you plan to produce. You do not need to spend tens of thousands of dollars on a setup capable of recording symphonies if you only plan on editing phone calls. Higher price tags do not always indicate a better product or more features. Take the time to read and educate yourself on the various products before you invest.

There are two main categories of audio editors: two-track and multi-track editors. As you might guess, two-track editors are designed to record and edit stereo, two-track files. These editors typically are used in the radio setting for editing news events and phone calls. More simplistic than multi-track editors, they're suitable for use in air studios where speed is critical. Examples of two-track editors for the typical PC are Audion Labs' VoxPro, 360 Systems' Short/cut and Minnetonka Audio's Fast Edit.

Multi-track editors are more complex than two-track editors, as they allow the user to stack multiple tracks of audio instead of limiting the user to just two tracks. Multi-track editors are handy in production studios where a user might layer multiple pieces of audio such as a music bed, a voiceover and sound effects to create a commercial. Examples of multi-track editors are Adobe Audition (formerly known as Cool Edit Pro), Digidesign Pro Tools, SAWStudio, Orban Audicy, MOTU AudioDesk, Steinberg Nuendo and Sonic Foundry's Sound Forge.

Hardware

Because most of these audio editing products are software, remember you'll need a computer and a sound card before you edit.

Each piece of audio editing software has minimum requirements for the computer. Check the one you choose, and make sure your computer meets or preferably exceeds these minimum standards. A CD burner will be a good addition to your audio editing workstation, allowing audio productions to be saved, sent out and archived.

The best way to learn to use an audio editing product is a hands-on approach. Start by learning to record off the sound card,' suggests Dave Casey.

Most audio editing software is designed to work with a variety of sound cards, which come in all shapes and price tags ranging from $12 consumer-grade cards to $1,000+ multi-channel soundcards. Luckily, prices have dropped considerably in the past few years, creating an intermediate league of sound cards ranging from $80 to $400. Three main points to keep in mind when picking a soundcard are:

Compatibility — Will the sound card work with a PC or Macintosh? Will the sound card work with the audio editing software chosen?

Inputs / Outputs — Because the sound card is used to interface to the rest of your audio equipment, what type of inputs and outputs do you need? Balanced? Unbalanced? Digital S/PDIF / AES? Do you plan on recording live music? If so, you might consider a multi-channel soundcard.

Performance —Does this sound card have a good signal-to-noise (S/N) ratio? A number that is below -70 dB means a card is capable of professional audio performance.

Now that your audio editing workstation is assembled, it's time to start editing.

The good news is, the hard part is over. While each piece of audio editing software works slightly differently, editing audio is similar to word processing. If you can cut, paste, copy and delete text, you can edit audio.

Some audio editors even work with add-on control surfaces to provide faders, a jog wheel and transport controls that look and feel like familiar tape deck controls. Most quality audio editing products include a step-by-step tutorial to walk users through basic and advanced editing.

The best way to learn to use an audio editing product is a hands-on approach. Start by learning to record off the sound card. Once you've mastered this, learn to open an existing audio file from your computer or a Flash audio recorder. Some audio editors offer CD ripping, a feature that allows you to import tracks directly off an audio CD much faster than playing them back real-time.

Once you're comfortable importing audio into the editor, take the next step and edit the audio file. Practice the Cut, Paste, Copy, Delete and Undo commands by highlighting a section of audio and rearranging it to other areas of the file. Most editors allow you to do these commands with your mouse or through keyboard shortcuts.

After you have edited the audio to your satisfaction, save it to the hard drive. Most editors will allow you to save the audio in many different file formats. This flexibility is handy because not all audio file formats are made equal. Some, such as WAV, produce huge files but preserve the audio quality just as it sounded when it was edited. Some, like MP3, compress files small enough to be e-mailed across the Internet, with the tradeoff being a permanent degradation of the audio quality. Consider the destination of the audio when you're choosing your format.

Multi-track editors

The features we've explored up to this point are common to almost all editors. Now let's focus specifically on the more complex multi-track editors, which enable you to lay out and rearrange audio segments over multiple tracks and time. Imagine having several two-track editors all stacked in one box.

In radio production, it is common to place a voiceover on one track, a music bed on a second track and sound effects on a third. By placing each of these elements on its own track, the elements can be played simultaneously while still maintaining a unique volume level and panning location, allowing the voiceover to be played back louder than the music bed.

Because each of these elements is on its own track, they can be moved, edited and replaced without affecting the other tracks. You could re-record the voice track without affecting the music bed. Spend some time creating your own commercial while focusing on adding, deleting and rearranging audio within the multi-track editor.

Multi-track editors also offer advanced processing tools like reverb, equalization, compression and noise reduction. Until recently, these were not available without spending a large amount of money on outboard equipment. With these features, it is easy to fix flawed audio or add flavor when needed. Because most multi-track editors support plug-ins, other effects can be added or plugged in over time without replacing the entire program.

Take time to grow comfortable and fine-tune these effects to your liking. Many programs allow you to save your presets for future sessions. As added practice, try applying compression to the voiceover track, or adding heavy reverb if you happen to be producing a Monster Truck Show commercial.

The final step in multi-track production is the mixdown phase. Mixdown is the process of combining multiple tracks of audio back into two tracks of audio. Once a file is saved back into two tracks of audio, it can then be burned to a CD, sent via e-mail to a client, or stored directly into a digital automation system. Practice the final steps of mix-down and move the two-track file to its final destination.

Congratulations, you have made it through your first digital multi-track production. We live in an amazing time for audio. With recent developments in affordable professional audio software, there is little that cannot be done with a computer, a sound card and some ingenuity. Think inside the box.

David Casey is assistant chief engineer for Infinity Seattle and teaches audio editing classes to its staff.

Travis

▶ Continued from page 33

autobiographical and includes Hogan's life story, rife with good stories and tales. The second section is printed on a light gray background, and offers valuable technique and skills information.

Using this chapter system, Hogan avoided one of the problems I've noticed in other books on the subject — before you get tired reading of his life, he switches to hard factual information. And just when you tire of the hard "teaching" segment, he switches back to his life experiences.

I've found that I tend to agree with most of Hogan's statements about the voiceover industry, as I've shared similar experiences. One instance is just downright weird: the first place he heard his recorded voice was at Chicago's Museum of Science and Industry when he was a child. Me, too!

If I was to teach a course on voiceover, I could easily take the gray pages and use them as a complete textbook. He includes all the basics: definitions and terms, descriptions and illustrations, techniques and links to audio examples on his Web site. Additionally, he includes lists of things *not* to do at a voiceover session. If Hogan's book had been available years ago, I could have saved myself considerable grief.

"Tales and Techniques of a Voice-Over Actor" also explores in depth the business of voiceover, including good information on what you need for the IRS once you start making money in the field. There's introductory information on building your own voiceover studio, suggestions for working with agents and a good deal of material on self-promotion, which, after all, is the real job of the voiceover performer.

Hogan provided a great deal of humor throughout the book, and if you have any interest in the voiceover profession, the text will never get boring. Aside from the cartoons, there are several hilarious quotations from well-known figures in the entertainment industry, and dozens of funny tales from his own life. Also included are excellent lists of valuable information, such as "The 20 Studio Commandments for VOs."

The only complaint I have about the book is the size of the type in the "gray" sections is too small. But then again, I've been complaining about the size of the type in voiceover copy quite a bit lately. So, if you're under 30, it may be just fine for you.

So there it is. My first book report in decades — late as usual.

"Tales and Techniques of a Voice-Over Actor" by Harlan Hogan. Published by Allworth Press, October 2002, list price $19.95.

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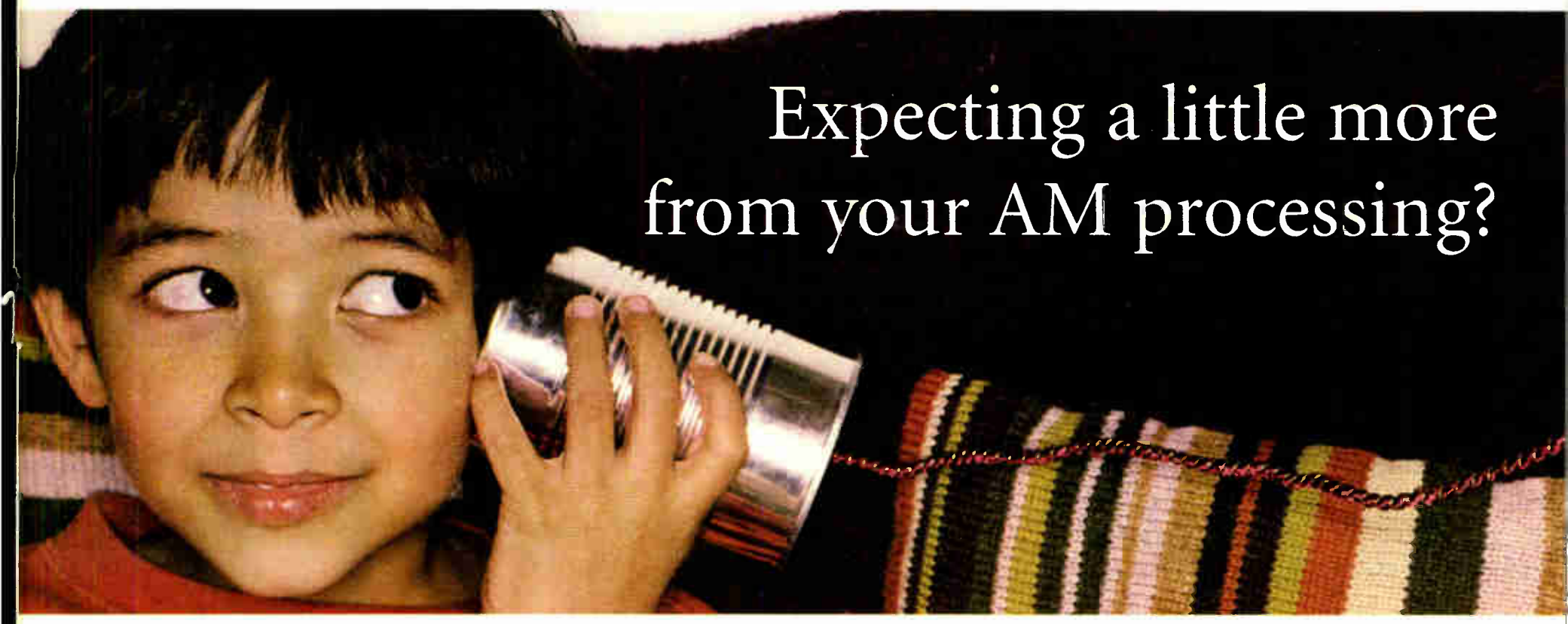

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World Radio History

Back to the @#%&!! Future, Part III

by Alan R. Peterson

Note: All right, I lied. I'm depending on the resemblance between this article and a certain well-known movie and its sequels, right down to their implausible use of technology, to carry me through a third and final episode. — Al

(From the conclusion of Episode 2)

The quest of Doctor Brown and Marty to find the genesis of shock radio brought them to 1960, pointing them to a particular scene from the classic movie "Inherit the Wind." But altering the movie itself to delete the scene would irreparably alter film history, and could cause more harm than good.

Now huddled in a concealed area on the soundstage where that very movie was being shot, the two were busy on a strategy. A short distance away was the customized DeLorean automobile Dr. Brown had converted into a combination time machine and broadcast delay.

Marty spoke up, "We never fixed that power surge in the DeLorean, did we, Doc?"

Doctor Brown shook his head. "No. The surge that momentarily knocked Bono off the air is probably going to happen again. Why?"

Marty stood up and broke into a slow smile. "I think there's a way to save radio, save the movie and fix the future all at once, Doc. Let's head back to the DeLorean!"

(And now, the conclusion to our three-part tale.)

Setting their broadcast delay lines to the future, the two blasted their way back into the time stream as Marty began to describe his idea to Dr. Brown.

"Think about it, Doc. It's 1960. There are no cable channels to speak of yet. If we are going to find a telecast of the movie, we should be looking at independent TV stations. They dot the landscape during this time, all looking for programming to fill."

"I see where you're heading, Marty," the Doc nodded. "We're looking for a local TV station — not a cable superchannel — about to air 'Inherit the Wind.' But how do we find one, and what do we do when we find it?"

"All we have to do is check an old copy of TV Guide," Marty offered. "I remember my folks used to like watching a show called 'Million Dollar Movie,' so let's start there."

Dr. Brown gave the flux capacitor a short nudge into the year 1962. In a flash, the two appeared behind a King Kullen supermarket in Syosset, Long Island. And just as quickly, Marty ran inside and spent the 15 cents it took to buy a copy of TV Guide.

Grand plan

"Here it is, Doc," Marty pointed. "Tomorrow morning at 8 a.m., the 'Milkman's Movie' will be 'Inherit the Wind.'"

"Very interesting," Doctor Brown replied, "but I fail to see where you're going with this, Marty."

"Doc, you're just not thinking like a broadcaster," Marty grinned. "Back in the '60s, these indies needed to fill out the whole broadcast day before signoff."

"Signoff?" the Doc gasped. "You mean TV stations actually used to go off the air at night instead of run programs for useless exercise machines? In-credible..."

"Right," Marty continued, "so they would often re-run the same movie again a day or two later. In fact, some would tell you when to tune in again in case you missed the show or wanted to see it again."

"So if I'm reading you right," offered the Doc, "then you're proposing going ahead to tomorrow and jamming the telecast the same way we did for the Golden Globe Awards. That might buy us some time, Marty, but what will it fix?"

"Try this on for size, Doc," Marty shared. "We zap out the soundtrack during all that stuff between Drummond and the radio engineer. Everybody saw the original movie in the theater and probably forgot that whole scene anyway, so nobody will miss it. But then, when the film is rerun two days from now..."

Doctor Brown's eyes widened as he caught on to Marty's plan. "...Two days from now, we don't jam the transmission, so viewers hear the line as it was originally filmed!"

"Right," followed Marty. "People freak out, jam the phone lines to the station, everyone screams for purity and wholesomeness and apple pie and that other junk. We don't touch the film itself and our work is done!"

"Brilliant, Marty!" blared Doc Brown. "Now all we have to do is wait until tomorrow."

The next morning

Bright and early, the two drove over the bridges and through the tunnels from Long Island to the New Jersey meadowlands, where TV and radio transmission facilities peppered the swamps.

The trip was not without its moments, like trying to explain the almost alien appearance of the DeLorean to the toll-booth operator.

"Um, er..." stammered Marty, "It's a 'Car of the Future' we're getting ready for the World's Fair in New York."

"Seattle," corrected the Doc. "This is 1962."

"Oh yeah, Seattle. Heh heh..." Marty tried to continue. Instead, he just flipped the man his coin and took off.

"We don't want to arouse any suspicion, Marty," the Doc confided. "Let's just park the DeLorean behind some brush in the swamp behind the TV station and do our job. You've still got your PDA, right?"

"Right here, Doc," replied Marty. "I haven't changed anything since the other night."

While Doctor Brown started setting up the delay lines and auxiliary time circuits to create the same power surge in the field that disrupted the Golden Globe TV show, Marty started fiddling with the receiver in the dashboard.

"Hey Doc," Marty announced. "There's something wrong with your radio. I'm trying to find a rock station and I can only get a couple of FM stations. And they're all playing the same crummy violin music."

"It's 1962, Marty," the Doc reminded him again. "AM radio is king. FM is in mono and owners are trying to figure out what to do with it. You wouldn't even find an FM tuner in a car of this time."

This time it was Marty's turn to whistle and exclaim, "In-credible!" How would he have even survived in such a primitive era? Doc Brown caught his expression and grinned at what Marty was likely thinking.

> **It's 1962, Marty. FM is in mono and owners are trying to figure out what to do with it.**
>
> — Doc Brown

At last it was time. The TV station began airing "Milkman's Movie." On a portable LCD TV, Doc Brown and Marty waited for the pivotal scene when Henry Drummond encountered the radio engineer setting up the courtroom microphone. And at just the right moment, Dr. Brown hit the delay lines as Marty switched on his PDA, recreating the surge they experienced earlier.

The air was filled with an odd smell of Jersey swamp gas mixed with ozone, a huge electrical field crackled around the DeLorean, and both Marty and Doc Brown could see on the TV receiver that the entire radio engineer scene of "Inherit the Wind" ended up a garbled mess.

"So far, so good," offered the Doc as he spun around the DeLorean for another leap into the timestream. "Let's jump ahead a few days and see if it worked."

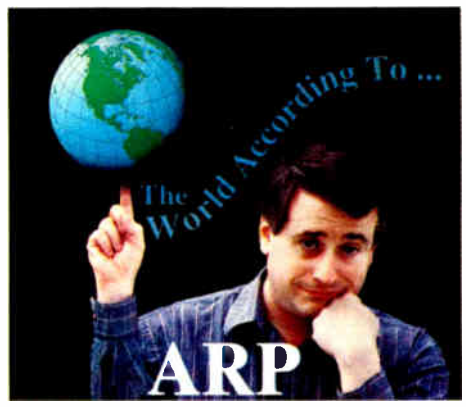
Voice of the people

The two rematerialized a handful of days later to find their luck was holding. Local papers were reporting FCC officials in the Varick Street office were swamped with viewer mail and telephone calls expressing shock and dismay over such language as it aired in the rebroadcast of the movie. Evidently, a lot more folks forgot the dialogue than Marty and Doc gave credit for.

So vibrant was the outcry from the public that Marty and Doc Brown felt there was no need to stick around. Confident they had saved radio and television broadcasting from indecent programming for generations yet to come, they pointed the DeLorean back towards 2004 and hit the Big Red Button.

In another flash they were home, only mere moments after they had left on their earlier journey to Hollywood. In fact, "Inherit the Wind" was just ending on the TV.

Doc Brown was content to be back in



familiar surroundings. Marty just wanted to hear some rock, so on went the FM. And there, as always, were contestants battling for concert tickets by getting spanked by naked, left-handed, married same-sex Druidic tuba players.

Not believing what he was hearing, the Doc went beyond shock and his voice leapt two octaves. "How could this happen, Marty? We went all the way back to the beginning! This can't be happening!"

"Calm down, Doc," Marty offered, quite concerned for his friend. "There has to be something we missed. Some kind of link that didn't occur to us."

As Marty helped Doc Brown over to his sofa, a name in the closing credits caught the eye of both of them: the actor portraying the radio broadcaster was Norman Fell.

Marty spoke first. "Hey Doc, wasn't he one of the Ropers?"

The Doc realized the significance of Marty's observation. "Great Scott, Marty. He certainly was! From the TV show 'Three's Company.' He played the landlord! That show made TV history for its sex jokes, double-entendre and what they used to call 'jiggle TV.'"

The two sat speechless for a few moments until the light dawned on them. "Doc," Marty inquired, "Are you telling me that, somehow, destiny did an end run around us? That no matter what, this was going to happen anyway?"

"It would seem that way, Marty," the Doc continued, exhausted from his outburst. "We thought we covered it all ... 'Bewitched,' 'M*A*S*H,' all of the TV shows that featured actors from this film ... it never occurred to me that something from the timestream would slip through."

"So we could still go back and fix it," Marty offered, trying to build the fires again under Dr. Brown. "This time we'll go back to when they auditioned the actors ..."

His voice trailed off as Dr. Brown punched the remote. On one channel, Teresa Heinz Kerry told a reporter to "shove it." On another was a summary of Vice President Cheney's go-blank-yourself comment. Further up the channels was a still photo of former Vice President Nelson Rockefeller flipping the bird. A history program was running a retrospective of Lorena Bobbitt while another channel was tackling women's cosmetic surgery.

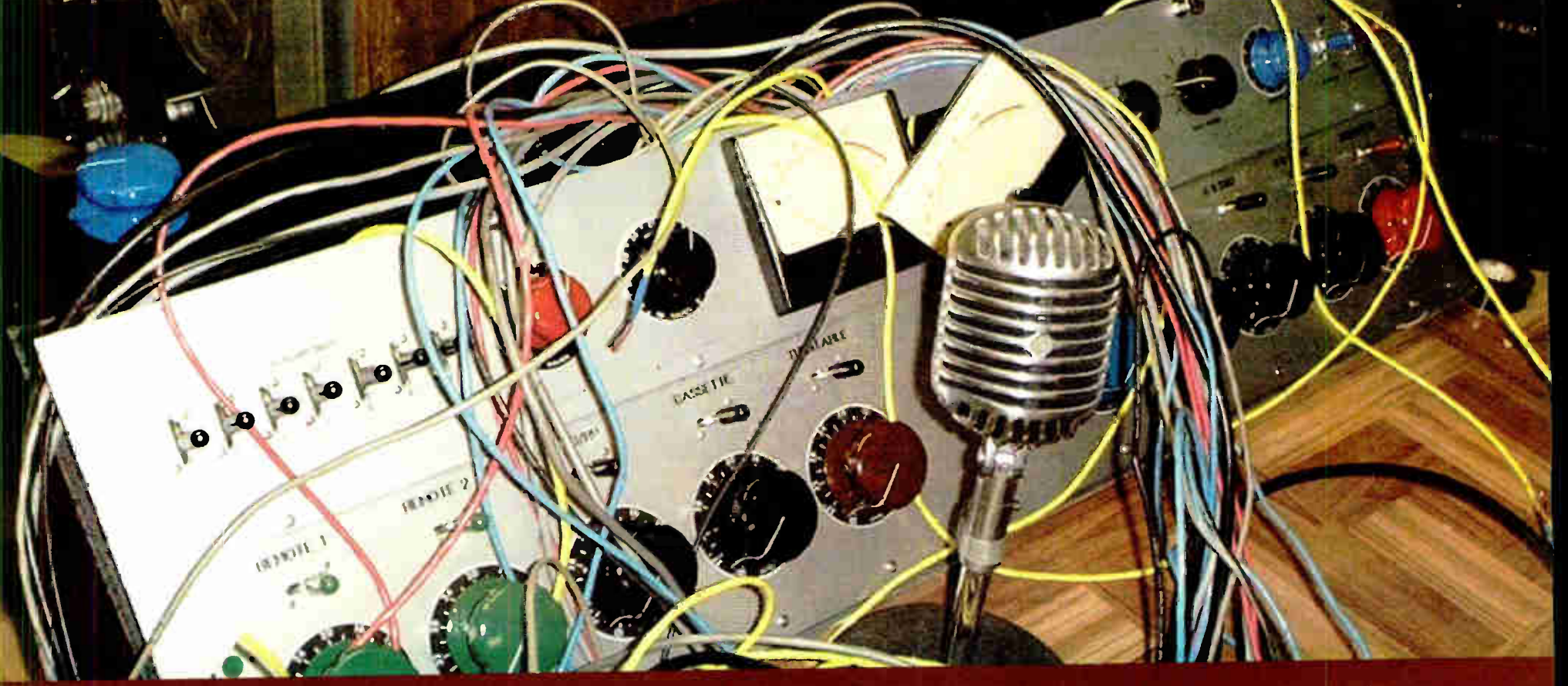
"Where do we begin, Marty?" asked the Doc in a resigned tone. "It's not up to you and me, no matter what we do. We'll just have to let nature and the industry take its course."

Marty shrugged. "Well, in that case, I'm getting my #*@ home and listening to the radio."

"Don't forget your #*!€§¿%$ skateboard this time, Marty," the Doc barked back. "I almost busted my &^* last time you left it here."

"Cram it, bozo." Marty replied with a grin. The Doc cracked up too. "See you tomorrow."

World Radio History



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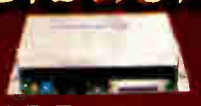

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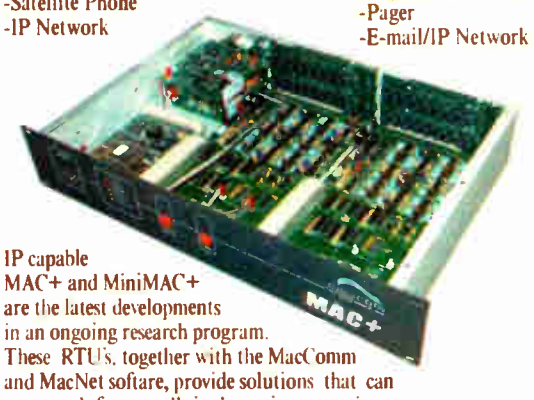

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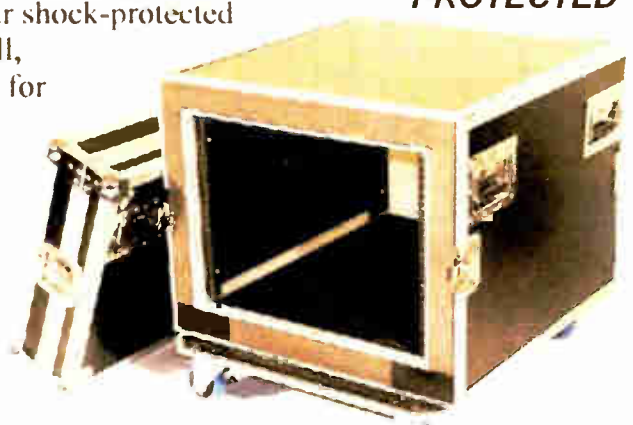

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World Radio History

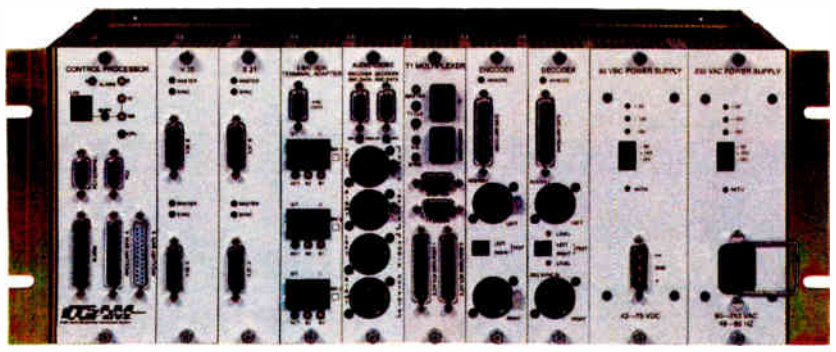
Alternatives to Conventional STLs

Spread Spectrum, T1/E1 Circuits, the Internet And Lasers Accommodate a Redefined STL Criteria

by Tom Vernon

Many broadcasters use some sort of studio-transmitter link, or STL, to get program material from one studio to the other. This connection traditionally was made with 15 kHz equalized lines provided by the phone company; 950 MHz microwave links provided an attractive alternative, particularly for remote mountaintop locations, although line-of-sight has always been a consideration.

The digital revolution has changed the requirements for STLs. Existing STL microwave systems lack the capacity to transfer program and data for HD Radio. Also, traditional microwave gear does not answer the need for bi-directional communications.



Musicam USA's TEAM T1/E1 audio multiplexing system.

Alternate technologies — such as spread spectrum, T1/E1 circuits, the Internet and fiber and optical connections — are being deployed to meet these demands.

Numerous vendors are active in the area of transporting program material; many offer unconventional or new-technology approaches. They include Broadcast Electronics, Harris/Intraplex, Moseley, TFT, Musicam USA and Energy-Onix. Talk to your favored vendor to learn about the options. We sampled opinion for this article.

Line-of-sight

For stations with line of sight to their transmitter sites, spread-spectrum communication may be an attractive option, particularly when the 950 MHz band is overcrowded.

Bernie Wise, president of Energy-Onix, lists the advantages: "Spread spectrum on the 2.4 and 5.8 GHz bands is unlicensed, so there are no FCC charges, and no monthly bills from an ISP. The service is full-duplex, with the potential for multiple T1 capacity."

Each link of the Energy-Onix Tele-Link system can provide four uncompressed AES/EBU, or balanced 22 kHz analog stereo channels. Such systems have a theoretical range of 40 miles, although eight to 10 miles is a more realistic figure for reliable service.

Wise adds that products such as the Tele-Link can select non-compressed or several compression rates from 32 to 384 kbps. A remote control option can provide control of eight relays and transmission of five analog meter readings.

In the event of a loss of connection between studio and transmitter, or prolonged silence, the system can provide program fill from a hard drive at the transmitter site, and automatically page station personnel.

Wise said the Tele-Link system is popular where signals must cross the Mexican or Canadian borders. In the case of crossing the Canadian boundary, microwave links are illegal, and connecting with both U.S. and Canadian phone companies can cost up to $2,500 per month. To date, 100 Tele-Link units are in the field.

One disadvantage to systems such as the Tele-Link and other spread spectrum devices is the delay incurred, which can be four to seven seconds, although Wise said efforts are under way to reduce this figure. Dave Chancey, sales engineer for Moseley, notes that while interference to spread spectrum systems is rare, trouble-shooting it when it does occur can be difficult. In cases where interference from industrial or other users is experienced on 2.4 Ghz, success can usually be achieved by moving up to 5.8 Ghz.

Connection

Where line-of-sight connections are not feasible, a dedicated T1/E1 circuit is a popular option.

Art Constantine, vice president of business development for Musicam USA noted several advantages.

"T1/E1 service enables users to send bi-directional CD-quality uncompressed stereo audio over a 1.536 Mbps pipe."

He adds that rates for full T1 service traditionally have been high, but are becoming more affordable from some providers. Because T1/E1 circuits are synchronous, with a clock at each end, the amount of delay is minimal.

Constantine said that products such as Musicam USA's TEAM enable broadcasters to connect to several T1 lines for multicasting. Open slots are available for a variety of user-selected modules, including encoders, decoders and T1 and E1 multiplexer modules, as well as ISDN and RS-422 modules. Compression algorithms can be assigned to different cards for maximum flexibility.

T1/E1 solutions typically will auto-connect in the event of an outage. Should the dedicated data line be disconnected, the device can dial an ISDN connection automatically. Constantine said this system still leaves broadcasters vulnerable to a power supply failure in the card cage. A more thorough solution would be to have two separate T1/E1 units connected to data lines with different paths to the transmitter.

Codecs, IP and lasers

When the expense and bandwidth of a full T1 is not necessary, a 128 kbps synchronous data circuit with codecs at each end provides an attractive option. Such a system can provide bi-directional stereo audio and eight contact closures, along with an RS-232 connection for ancillary data. Chancey said the downside for these types of connections is the need to compress audio.

While there are standards for data compression, a certain subjective sound characteristic exists regarding the way different manufacturers program the compression algorithms. Constantine said that if a codec with a superior compression algorithm is on the transmitting end, an overall improvement in audio quality may be noted.

TFT's digital STL receiver. 'While more stations may use "alternate" devices as their main link to the transmitter, we've noticed they tend to keep their RF systems as a backup,' said Darryl Parker.

As a backup, should the dedicated data line fail, most devices can automatically dial an ISDN connection.

IP, or Internet Protocol-based systems, are gaining in popularity.

"The world is moving towards IP systems for audio transmission. The only operating cost in the charge for a wideband Internet connection," said Constantine. Products such as Musicam USA's NetStar can send and receive full-fidelity, real-time stereo audio, contact closures and ancillary data, not only via ISDN and dedicated data lines, but also via IP. The system can use a host of compression algorithms, or send uncompressed linear audio. An on-board Web server enables control of NetStar from any Web browser.

Dropouts and poor fidelity have given the Internet a bad reputation for sending audio, but the medium can be broadcast-quality and reliable. Wise cites a one-month test of Tele-Link in which a signal was sent from Fort Collins, Colo., to the Energy-Onix factory in Valatie, N.Y. The signal traveled over ,3000 miles through 25 local servers with no degredation in signal quality or interruptions of service,

See ALT.STL, page 40 ▶

Studer OnAir 500 Console Available in Modulo Format

Studer says its OnAir 500 Modulo digital mixing console is suitable for integration of mixing consoles into custom studio furniture. The self-op DJ unit is compact in size, and the company says it is suited for smaller stations and mobile use.

The OnAir 500 Modulo is based on the platform of the OnAir 500, but offers the choice to place individual modules in the most convenient spot for users. It consists of one or two fader modules, one master module, the meterbridge and a 19-inch electronics rack, which results in a six- or 12-fader mixer. Technical specs and configurations are identical to those of the standard OnAir 500.

For more information, contact Studer USA/Harman Pro North America at (818) 920-3212 or visit www.studer.ch.

Model 220 Offers Main And Talkback Outputs

Studio Technologies says its Model 220 announcer's console serves as the audio control "hub" for announcers, commentators and production talent. The tabletop unit also is suited for sports and on-air radio broadcasting and voiceover/narration booths. Standard connectors are used to interface microphone, headphone, on-air, talkback and IFB signals.

A microprocessor provides logic, enabling control of operation. A microphone preamplifier circuit is included for low-noise/low-distortion amplification over a 20 to 60 dB gain range. The gain is adjustable in 10 dB steps. The input is compatible with balanced dynamic and phantom-powered microphones. The microphone power source is 48 V nominal and meets the P48 phantom standard.

Fatures include one main and two talkback outputs. The main output serves as the on-air, or other primary feed. The company says it is an interface with high output capability, low distortion and low noise. The talkback outputs are intended to provide production trucks, control rooms or support personnel with talent-originated cue signals. These outputs are transformer-coupled with +4 dBu nominal signal levels.

A compressor circuit controls the dynamic range of the signal coming from the mic preamp, and uses a laser-trimmed voltage-controlled-amplifier integrated circuit for level control. The signal from the compressor is used by the talkback outputs.

For more information, including pricing, contact Studio Technologies in Illinois at (847) 676-9177 or visit www.studio-tech.com.

World Radio History

Alt. STL

▶ Continued from page 39

he said.

"We believe that the reliability of an IP-based Tele-Link system is better than 99.99 percent, but we cannot be responsible for broadband servers with the system."

The success of any wired data transmission scheme hinges on having a guaranteed bandwidth available 24/7. Wise urges users to proceed with caution when signing up with a provider for these services.

"Some of the biggest telco providers in the business will give you written guarantees for bandwidth, but not live up to them."

Constantine agreed, adding that many of his customers have had good luck with providers such as Amerinet or Qwest. In any event, when choosing a provider, all agree it is important to get customer lists and investigate thoroughly.

For short hops of 900 feet or less, lasers are an alternative. Whirlwind's E BEAM sends Ethernet or CobraNet data over a modulated Class One IR laser beam. 100 Mb full-duplex bandwidth is available for data or 128 channels of CobraNet audio in real time. A 1 Gb version of E BEAM is to be released shortly.

The laser beam is unaffected by the effects of rain, fog, heat or visible light. Heating elements in the antenna are powered by a copper wire embedded in the fiber optic cable to keep the lenses free from condensation. Laser connections also are immune to RFI, radiated noise from nearby electronics or ground loops.

Existing STL microwave systems lack the capacity to transfer program and data for HD Radio. Alternate technologies are being deployed to meet these demands.

Telecommunications experts cite hundreds of miles of dark fiber that were pulled during the Internet's boom years when discussing the surplus capacity of the digital infrastructure. It is unlikely however, that fiber optic links will be major players in the STL for the forseeable future. Constantine said the effort to pull fiber that last mile to customer sites and install terminal equipment might make the costs prohibitive, and adds that it is unlikely there is fiber running anywhere near rural transmitter sites.

All of the interest and activity surrounding alternate STL schemes raises the question of whether the traditional 950 MHz STL will go the way of the dinosaur.

Darryl Parker, senior vice president for TFT Inc., thinks not.

"When stations started using these alternate products, we had some concerns about the future of microwave STLs. But broadcasters discovered that no system is 100 percent reliable. While more stations may use these 'alternate' devices as their main link to the transmitter, we've noticed that they tend to keep their RF systems as a backup."

Constantine agrees, adding that the 950 MHz service will probably be around until the FCC has a more pressing need for the spectrum space.

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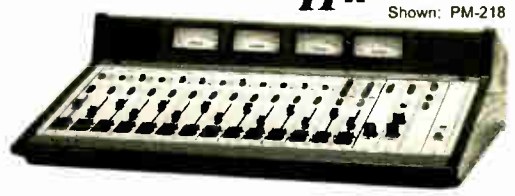

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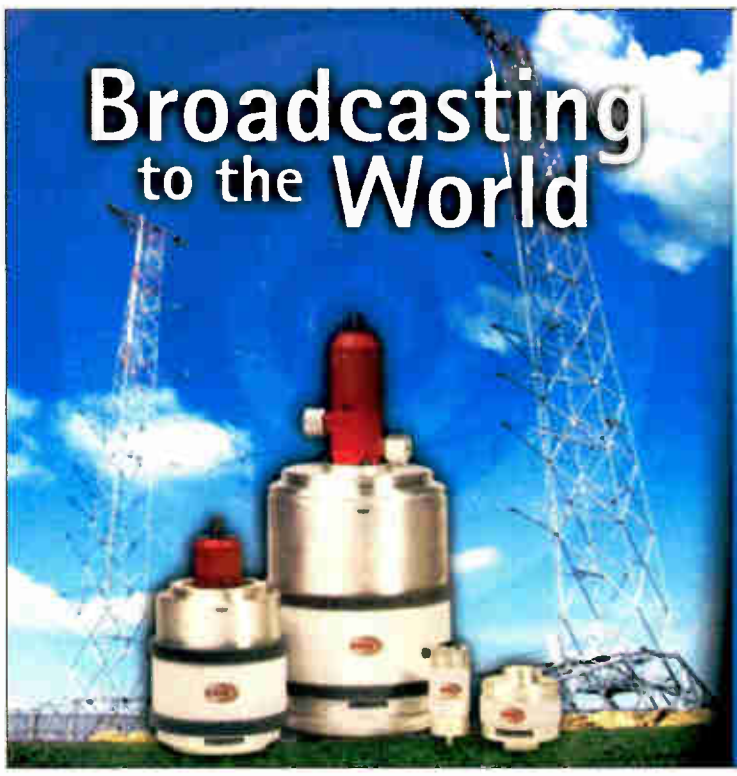

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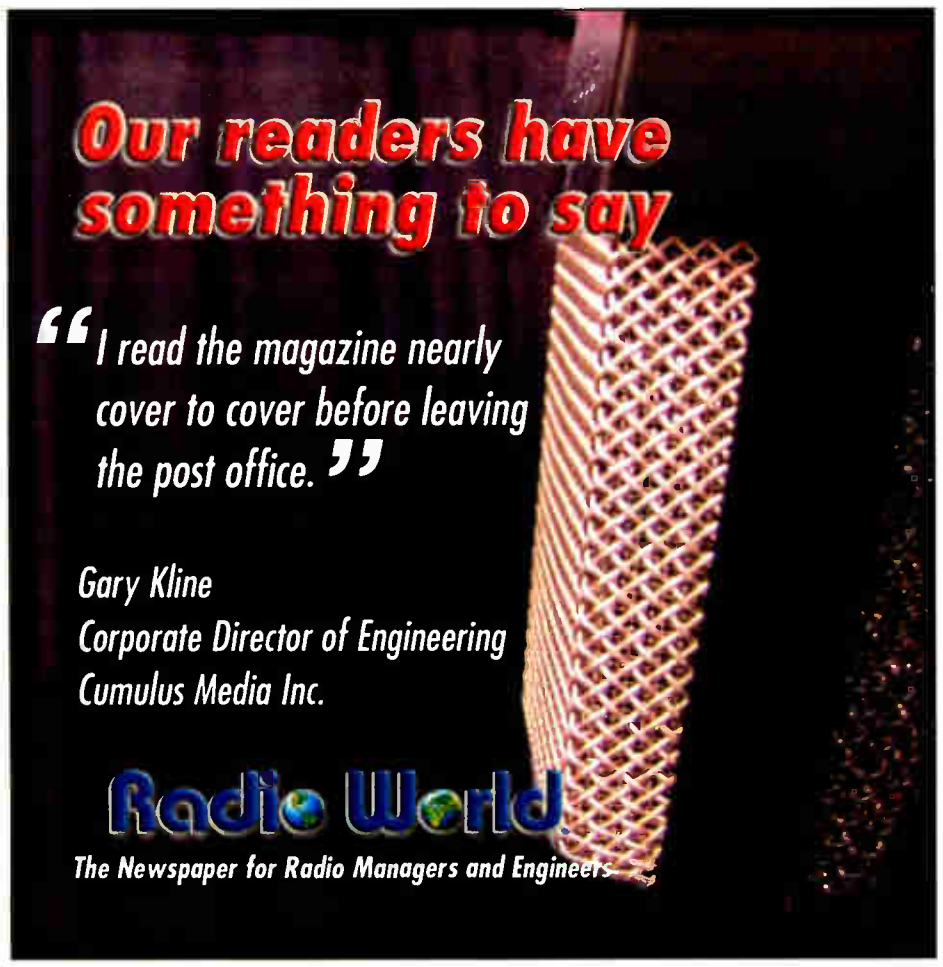

◆ READER'S FORUM ◆

Christian Non-Comms

In a recent article about Calvary Chapel's acquisition of four frequencies in the North Jersey area, it was mentioned that they will be the only non-commercial Christian FM in the region.

Actually, WFME at 94.7 FM, a Family Radio owned and operated station, has had the privilege of broadcasting non-commercially to the N.Y. metro and North Jersey area for over 40 years.

I am sure Calvary Chapel will provide more places on the FM dial for Bible-based family programming without commercial interruptions and I wish them good success in this venture.

Mike Zeimann
Station Manager
WKDN(FM)
Family Stations, Inc.
Camden, N.J.

Ominous Skies

My office is on the third floor of a condominium. As I gazed out over the golf course below, the sky was turning purple and yellow in the distance.

I then heard the severe weather-warning siren. Rain and hail began slamming down. This storm came up quite suddenly, as they can do during an Ohio spring. Having lived through many such episodes, I knew how serious this could be. A tornado can form in a few minutes.

I tuned the radio to our local news/talk station, WSPD(AM), now owned by Clear Channel Communications, hoping to hear some news. A syndicated talk show was on and I listened through four minutes of commercials, another 12 minutes of the show and finally an entire top of the hour newscast without hearing any mention of the storm.

The lead story on the local news was about the University of Toledo increasing its dues.

When severe weather strikes, *that* is the most important story. Unfortunately, the station is automated from 10 a.m. until 3 p.m. While I'm sure there are people in the building, no one thought it important enough to break away from business as usual. The fact that news on this station is voice-tracked from another city may have had something to do with it.

I ended up turning on my secretary's TV to find out what was going on.

C'mon, people. When I have to turn to TV for breaking news, that's pathetic.

I'm not singling out Clear Channel because we all know that in medium and small markets across the country, this is how it is. But as a former broadcaster, I had to shake my head.

Ken Deutsch
Toledo, Ohio

The author is a freelance contributor to Radio World. The opinions are his own.

Give IBOC a Chance

The HD Radio systems for both FM and AM have taken quite a few concerns into account during the development phase. Concern over the radio sounding "funny" as it flips back and forth between digital and analog is not the issue many thought it would be. The blend function between the conventional (analog) and digital channels will occur in a seamless manner, as long as phase matched audio processors are used and the system is correctly aligned when it is installed.

I've been in the field at quite a few FM and AM HD installations, and I can say that the transitions sound quite nice.

The other item I wish to comment on is the apparent loudness topic. A noticeable volume disparity between the two channels will only occur if the broadcaster chooses to set up their system in this manner. The audio processors that have been designed for IBOC usage provide exceptional "normalization" capabilities between the two channels. The conventional channel will maintain its signature "texture." Yet, the HD Radio signal will not fall off the dial, or blast your eardrums out. There is a normalization factor that exists, which ensures volume parity.

I am sure Calvary Chapel will provide more places on the FM dial for Bible-based family programming without commercial interruptions.

— Mike Zeimann

Additionally, significant testing was done to ensure that the digital system would provide enough audio headroom to allow the digital path to be presented at the same loudness level, or even a tad louder if desired. Again, I default to real-world on-air performance, where there are no issues regarding perceived volume level differences between the conventional and the HD signals.

A point that everyone should consider: HD Radio is in the rollout phase. In many markets, the number of radios that exist are still just a few — but growing. We as an industry need to look at, and work on, the elements that will take our business forward.

This does not mean that issues and concerns should not be raised. Obviously, progress does not occur unless the challenges are met. Our job is to seek out the valid issues and concerns, and then rectify them.

Frank Foti
Omnia Audio
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World Radio History

Radio World, September 8, 2004

GUEST COMMENTARY

ISBA: United Against Consolidation

by Francisco Montero

Hispanic-Americans are the fastest growing segment of the United States population. Currently, 13 percent of the population, or 38.8 million Hispanics, reside domestically, making them the largest ethnic minority in the country.

In August of 2003, a group of roughly a dozen independent Spanish-language broadcast companies (including regional group owners in TV and radio, both Hispanic-owned and non-Hispanic owned), as well as financial institutions, networks and other service providers to the Spanish media industry, met unceremoniously in Washington to discuss the formation of what has become the Independent Spanish Broadcasters Association, or ISBA.

The motivation behind the gathering was the development of a collective voice for independently owned, non-publicly-traded Spanish-language broadcasting companies in the face of massive consolidation in the Spanish-language media industry. Recent corporate mergers involving Telemundo, HBC and Univision have facilitated this consolidation, thereby increasing the competition threshold for independently owned Spanish-language media companies.

Strength in Numeros

As a result, these companies saw a need to promote and develop opportunities for capital formation, acquisitions and advertising revenue in the rapidly expanding Hispanic media industry.

Rosamaria Caballero, one of the founding members of ISBA and the president of Caballero Television and General Counsel for the MasMusica TeVe Network, noted, "As the operator of 11 TV stations, and in my dealings with the independent station owners who are affiliates of our Spanish-language network, I see first-hand the need for us to garner strength as a group for legislative and policy initiatives, for capital formation and increased advertising revenues."

In October of 2003, ISBA was officially formed; in early 2004, the association launched its Web site. ISBA's primary membership focus is independently owned, non-publicly-traded, Spanish-language broadcasting companies, regardless of ownership.

ISBA held its first constitutional meeting during the week of the NAB convention in Las Vegas. At this meeting, ISBA members elected a board of directors, president and other officers. Additionally, members identified certain initiatives to be proactively pursued by the association in 2004. Specifically, their goal is to interact with advertisers, ratings services, financial institutions and government to find ways to increase and improve the market for such independent broadcasters.

There should be a united voice to address those issues of importance to independent Spanish-language broadcasters.

ISBA hopes to continue holding periodic meetings to afford its members the opportunity to network with each other and discuss business strategies and opportunities. Amador Bustos, another of the organization's founding members, emphasized, "In the face of massive industry consolidation, the purpose of ISBA is the promotion and development of ownership, business opportunities and access to capital for independent Spanish-language broadcasters."

As counsel for ISBA and the association's acting executive director, I feel that the formation of this association has been long overdue. Spanish-language media, as well as Latino-themed English-language media, have expanded so rapidly in this country that there should be a united voice to address those issues of importance to independent Spanish-language broadcasters — as well as issues important to business partners, such as lenders, advertisers and ratings services. The response has been overwhelming.

For information about joining ISBA, visit *www.spanishbroadcasters.com* or contact me at (703) 812-0480 or *montero@fhhlaw.com*.

Francisco Montero is of counsel to Fletcher, Heald & Hildreth, ISBA's acting executive director and an occasional contributor to RW.

Write to Us

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'Reinvent Radio'

The early HD Radio adopters continue to appear on the FM dial regularly, and the consensus is that the commission will shortly let the AMs come out at night. It looks like HD Radio is going to fly; but the greatest driving force is external XM and Sirius.

Both services continue to grow, and receiver manufacturers are chasing the market. Because the technology to fold satellite reception into car receivers duplicates that for HD Radio, it only makes sense that the receivers provide IBOC reception, as well. So, the HD receivers will come as they arrive with new cars equipped to receive satellite radio.

What's driving the market for satellite radio? Do people want it because it's digital? No, their listeners really don't care — and many don't even know — whether the medium is analog or digital. They want the program content.

You could argue the broadcast bands already offer more than 100 channels of program choices. We do, but at what price? We ask listeners to enjoy highly processed audio interlaced with 18 minutes of commercials per hour. The growing success of XM and Sirius shows that our listeners aren't buying it anymore, even if it is free.

Should we expect salvation from satellite radio if our HD Radio programming is treated as "business as usual," only digital? A pig wearing pearls is still a pig. The time has come to reinvent radio.

No one is growing new radio listeners. The Millennium Generation isn't listening to radio, and every time there is a funeral we lose a listener. How do we make radio a growth industry again?

Are you old enough to remember the last time broadcasters made a change that prompted people to spend money for new radios? In the 1970s, FM was as new as satellite radio today.

Early FMs experimented with new formats, breaking the top-40 mold. Because it was uncharted ground, the commercial load was low. Young listeners turned on FM for the full-fidelity stereo audio and the different music they wanted to hear. The change was great enough that listeners spent their money for new FM radios and converters.

That was 30 years ago. What have we done lately? Put on your listeners' shoes and answer the question, how will it be better than what you already give me?

The IBOC proponents promise new "killer applications," which involve putting ads and song titles on the face of HD Radio receivers. They claim these will justify the expense of conversion and save us from satellite radio. Maybe we should be looking instead at programming on demand or surround sound in cars.

The next generation of HD Radio radios promise soft keys that deliver audio stored in memory and available on demand. Think TiVo for radio. Today if I want traffic information or news I wait until the station's PD says I can have it. I would buy a new radio if I could get in my car, push a button and listen to traffic information before I leave the driveway. If you have heard music in 5.1, you know it blows the doors off two-channel stereo.

Will IBOC be a solution in search of a problem, or an opportunity to improve radio? It's up to station owners and programmers. Start thinking about it; you have less than two years to have a plan in place.

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Surette on Digital Antennas

In Steve Fluker's article on split-level combining ("For IBOC, a Better Way to Combine," July 14), he states a problem with using dual antennas for HD Radio implementation: "In fact, this method is not permissible for directional FM radio stations."

If the e-mail in my inbox is any indication, there are a number of engineers seriously considering this method of HD Radio implementation — and who are now concerned that it may not be permissible.

In fact, the FCC does permit this method of HD Radio implementation.

The March 17, 2004 Public Notice approving the use of separate antennas to initiate digital FM transmissions lists three criteria that must be met: the digital transmission must use a licensed auxiliary antenna; the auxiliary antenna must be within 3 seconds of latitude and longitude of the main antenna; and the height above average terrain of the auxiliary antennas must be between 70 and 100 percent of the height above average terrain of the main antenna.

The Public Notice does not exclude directional antennas from this approval. In fact, nowhere in this Public Notice is a distinction drawn between omnidirectional and directional antennas. Once again, I have confirmed with the engineering staff of the FCC that as long as these three criteria are met, the dual antenna method may be used for directional applications.

It is incumbent on the broadcaster, of course, to prove the digital antenna will meet the appropriate directional requirements as part of the process of being licensed as an auxiliary antenna — but this is routinely done for analog directional auxs every day.

Bob Surette
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World Radio History

GUEST COMMENTARY

On Air Digital In Defense of Linux

by John F. Schaab

The author is GM of On Air Digital, a division of Smarts Broadcast Systems, in Dallas.

I realize why an article on Linux ("Opening the Linux Window," May 19) failed to mention two companies that are and have been selling Linux-based studio automation systems for the last few years.

We didn't attend the NAB this year, just couldn't justify it based on the ROI. I am sure your writer was told to roam the radio hall and get interviews with people concerning Linux. He interviewed whom he could, but failed to do the research necessary to provide a fair and balanced presentation — one that is beneficial to today's radio broadcaster.

On Air Digital sold its first Linux-based system in 1999. We were purchased by Smarts Broadcasting in 2001, and adopted our Linux media engine to the Smartcaster in 2002. Since that time, we have installed Linux-based systems around the world, including New Zealand and Swiss Radio International. The writer should reconsider his statement that Scott (Systems) is the center of the Linux movement.

I would like to give your readers an idea of what a company that depends on Linux for its very survival thinks about the system, and reasons why we think it is "our" way to go.

No moving target

We chose Linux because we needed our own system, and were frustrated with the moving target that Windows provided — 95 was making way for 98, etc. We also had a legitimate Linux guru in our employment. These situations started us on this journey, and there has been no looking back.

In those early years, Windows reliability was suspect, but it has improved since then. We chose to put Linux into applications that benefit from the OS, and Windows into applications that are better served with the Windows OS.

Today, Linux is used in the 24/7 applications of on-air delivery. Distribution on a LAN/WAN/VPN or Internet basis is done with Linux for security reasons, and Windows is used in all production- and office-based applications. One of the great things about Linux is its ability to interface with Windows-based systems and networks.

The availability of device drivers in the Linux domain was an issue in the early days, but no longer. We support a variety of sound cards from consumer to professional, and have general audio tools from the GNU Public License domain that boggle the mind. From USB2 to advanced low-cost mass storage, there is no lack of solutions for our clients.

Original art by Joaquin Araya

Never Forget

Linux is still the fastest-growing OS in the world, with more and more radio IT people becoming familiar with the system. We know; we talk to them. Additionally, no system is sold without a modem, and knowledge of Linux is not necessary. As our customers will attest, Linux has not been an issue with regard to service and support. No increased cost, just good reliability with service and support.

Tied tight

As I said, Windows has gotten a lot better. Calling XP Pro the OS of the Century is a bit much, but XP pro is reliable.

However, it is questionable in the areas of security. Almost all viruses are aimed at Windows. Hardly a week goes by without reading of another security breach in Windows. They attempt to fix it, but are trying to make a system both open and secure — those two don't go hand in hand.

Linux developers don't want the system to be open, and most don't even want it to be friendly. They love command lines and the pure efficiency of getting a computer to do what you ask it to do without all the hassle. As a result, Linux systems can be tied down extremely tight. To this date, five years after putting Linux systems on the market, we have not had a virus get further than our Windows applications. Security is an important issue and will continue to be one of the main benefits of Linux.

Linux is an OS you control, not one that controls you. Ok, Mr. XP Pro. How great will it be when Longhorn finally makes it? Will your stuff run on Longhorn? Will the 98 stuff that barely ran on XP Pro run on Longhorn? What is it going to cost you to upgrade your application, and what is it going to cost your clients? Linux gives us something that MS just can't — the ability to create our own OS.

Having said that, On Air Digital announces the release of RadioSuite Linux, honed with all the right drivers and to be upgraded as new features and capabilities arise. But it will evolve, not throw out the old and bring in the new.

Lastly, Kevin Lockhart (former president of Prophet Systems) mentioned that they have run their Windows applications on the Windows emulator available in Linux but saw no advantage. Running a Windows program on a Linux Windows emulator does not a Linux provider make.

I also want to commend the direction that BE has taken in the soft adaptation of Linux.

The fact is that today's vendors are solution providers. Linux will never over take Windows. It is not the OS of the masses, but rather the right application for certain jobs.

> **I would like to give your readers an idea of what a company that depends on Linux for its very survival thinks about the system.**
>
> — John F. Schaab

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Behind Every GOOD CONSOLE There's an EVEN BETTER ROUTER

GENERATION 4

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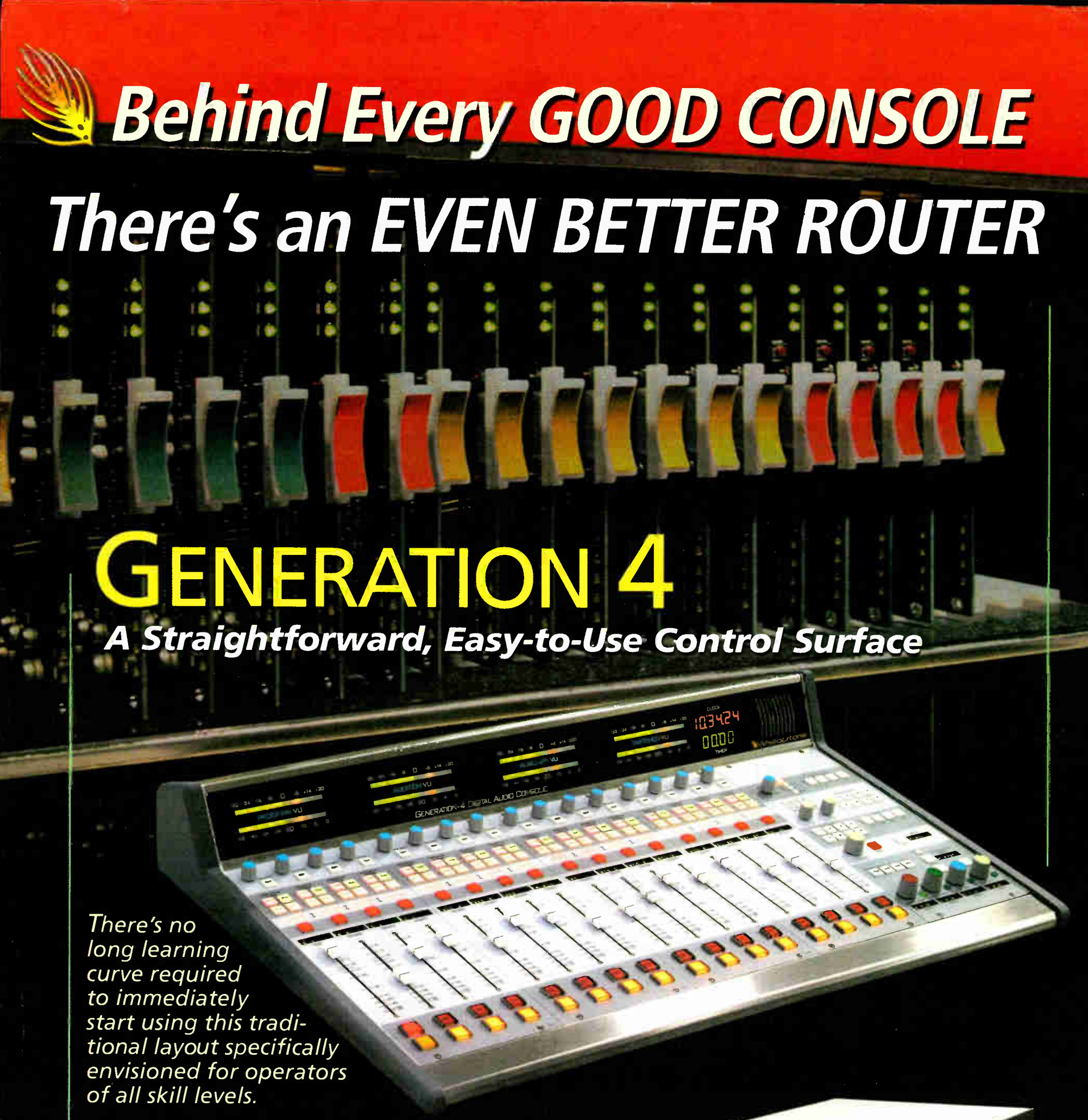

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