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Radio World

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The Newspaper for Radio Managers and Engineers

September 1, 2006

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NEWS MAKER

Grammer Finds the WAY

New DOE of WAY-FM Media Embraces Streaming, Wireless, HD-R Technologies

by Randy J. Stine

COLORADO SPRINGS, Colo. If not for struggling a bit with derivatives and integrals in calculus while an undergrad at Southern Illinois University, Morgan Grammer could have realized his dream of working for NASA at the Jet Propulsion Laboratory.

The space agency's loss has turned into a gain for one radio group.

Grammer, 31, was promoted in April to the newly created position of director of engineering and technology for WAY-FM Media Group Inc. He serves as the company's architect for new technologies such as HD Radio, wireless devices and streaming.

WAY-FM Media is a religious broadcaster that operates 13 FM non-commercial radio stations in nine clusters, includ-

See GRAMMER, page 8 ▶

He's a Legacy Brand

'Oscar Brand's Folksong Festival' is the world's longest-running radio series with the same host.

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Oscar Brand in his first WNYC publicity shot, courtesy WNYC Archives

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Radio Ownership Limits Are in Play

WASHINGTON Everything regarding local radio ownership limits is up for scrutiny, and possible change, in the FCC's latest review of media rules.

Experts predict a bruising fight, with the radio industry supporting higher limits and public interest groups opposing.

The commission has released the text of its Further Notice of Proposed Rulemaking (FCC 06-93). It's clear the notice is open-ended, inviting comment from all parties. Although commissioners voted on the new NPRM in June, details weren't released until late July.

The item encompasses several rule-makings, reviews in 2006 and 2002,

cross-ownership of radio and TV with newspapers, local radio limits, the definition of a radio market and local TV ownership rules. The agency seeks comment on how it should address issues raised by the opinion of a federal appeals court in *Prometheus Radio Project vs. the FCC* and on whether the media ownership rules are "necessary in the public interest as the result of competition," it states in the document.

In 2002, the commission voted that neither the newspaper/broadcast cross-ownership rule nor the radio/TV cross-ownership rule remained necessary, and it replaced those regulations with new cross-media limits. The commission also revised local TV multiple ownership rule, modified the national TV ownership cap and revised its market definition for radio.

Several parties challenged aspects of

the rules and the challenges were consolidated into a single case. In 2004, a federal appeals court affirmed some FCC decisions and remanded others for further commission justification or modification.

In 2005, the Supreme Court declined to hear the case. Most of the new rules were stayed pending the outcome of appeals.

The definition of a radio market was changed, however. In its 2002 order, the FCC decided the old contour-overlap method of determining how many signals are in a market was flawed; it replaced the market definition with Arbitron Radio Metros in rated markets.

The agency also added noncommercial stations towards the station count in a market for radio duopoly purposes. It decided to attribute joint sales agreements to in-market station owners.

The Third Circuit court found that the decisions to use Arbitron Radio Metros, to include noncomps and attribute JSAs to achieve a number for how many radio stations are in a market were justified. However, it disagreed with the commission's decision to retain the local radio ownership limits; it disputed the agency's opinion that the limits ensured five equal-sized competitors in most markets.

The court held that the FCC hadn't justified five as an appropriate benchmark and that the agency hadn't taken into account "actual market shares" of stations.

Market share?

In the further notice, the commission seeks comments on these issues and asks for comment on whether the entire structure of the local eight-station tier system should be changed. It asks, for example, whether additional tiers should be created, and whether the rule should ensure a specific number of competitors in a market or take into account actual market shares of stations.

This last question makes some communications attorneys pause; they recall that taking market share into consideration for the purpose of ownership limits hasn't been required since the early to mid-1990s.

Retaining the AM/FM subcap limits (RW July 19, page 3) is in question, as is whether the limits are even necessary and in the public interest given increased competition.

For unrated markets, the agency developed a modified contour overlap method to determine how many signals are in a market. It said the issues in the unrated market proceeding would be addressed separately.

That piqued the interest of one legal source, who said that because the com-

See LIMITS, page 3 ▶

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Lawmakers Experience Digital EAS

by Leslie Stimson

WASHINGTON "This is a test of the Emergency Alert System. This is only a test. If this had been an actual emergency ..."

In the future, the public is likely to see those familiar words text-messaged on our cell phones or other personal digital devices before we hear them on the radio.

While radio and TV are the backbone of the EAS system at present, the federal government is developing an expanded — and digital — emergency warning system. The White House considers it a priority, the FCC has an open EAS rulemaking and Congress is considering legislation to fund a system coordinated by several agencies that would work in concert with state and local efforts.

During a July hearing, lawmakers were able to see how a new digital version of the EAS would work. The meeting focused on how to expand EAS by incorporating communication devices such as wireless phones, BlackBerrys and the Internet.

Whether the role of broadcasters role would change, and whether participation in all facets of EAS would become mandatory, isn't yet clear.

Executive order

Expanding the alert network must be handled with care, said Rep. John Shimkus, R-Ill., sponsor of H.R. 5785.

The Shimkus-Wynn Warning, Alert and Response Network Act would devote \$106 million to expand the alert network and help coordinate a variety of government efforts to improve the systems.

The bill would require the National Alert System to "incorporate existing emergency alert technologies, including the NOAA All-Hazards Radio System" and "shall not be based upon any single technology or platform."

The WARN bill was discussed soon after President Bush issued an executive order calling for an "effective, reliable, integrated, flexible and comprehensive system to alert and warn the American people."

Shimkus said, "During major events where we can give people warning and it's coming down the pike, we ought to use all the technology available, and we shouldn't hinder new technological development by dictating what that technology should be." He spoke during the House Telecommunications and the Internet Subcommittee

hearing on the WARN Act.

"We need to make sure that those who make those decisions have been well trained, so you don't get the 'cry wolf' syndrome and people disregard the alerts."

With many agencies poised to issue alerts — from the Department of Homeland Security to the National Weather Service — Christopher Guttman-McCabe, vice president of regulatory affairs for the Cellular Telecommunications and the Internet Association, said a single organization must act as an "aggregator" to coordinate warnings.

Several witnesses and members of the subcommittee said expansion of the network is needed and participation in all aspects of the digital EAS should be mandatory for all alert participants.

Currently, stations must install and maintain EAS encoders/decoders so they can receive and re-transmit a national presidential message.

The acting chief of the FCC's Office of Engineering and Technology, Julius Knapp, said re-transmitting local alerts is voluntary for stations. In its pending rulemaking, he said, "The FCC is asking whether that voluntary nature leads to missing pockets of delivery and whether that's appropriate today." The agency also is deliberating how to effectively reach those who speak English as a second language.

One thing the commission has decided is to extend EAS requirements to satellite radio and TV, as reported here earlier. As of Dec. 31, satellite digital radio will be required to carry presidential EAS messages, Knapp said.

Rep. Ed Markey, D-Mass., said Congress has "zeroed out funding that public broadcasters were going to use to upgrade their EAS," referring to TV stations. The issue of voluntary vs. mandatory participation in EAS must be re-visited, he said, because in the pending FCC action it's been suggested the issue could become an unfunded mandate.

Handset replacement costs

As an example, he asked rhetorically what it would cost to replace all cell phones so that they could receive the new alerts.

"It makes no sense to spend all this money and not have to upgrade," said Markey, referring to those who transmit as well as those who receive the messages.

But Shimkus pointed out that some areas still don't have basic 911 coverage, and mandates could undercut free market incentives to improve the network.

Co-sponsor Rep. Al Wynn, D-Md., said 30 of his constituents died in the Pentagon crash on 9/11. "The EAS has not kept pace with a mobile society. The bill establishes a national alert system working group. We need this input," he said.

Witnesses discussed the benefits of their various warning capabilities. Radio and commercial TV representatives were not invited; the committee staff said lawmakers wanted to hear from those in new technologies.

Association of Public Television Stations President/CEO John Lawson said the WARN Act is the next logical step towards DEAS and builds on local, state and regional warning capabilities.

The 356 public television transmission systems in the country are interconnected with satellites and can reach 99 percent of the population, said Lawson.

"We can reach a million receivers with-



Rep. Fred Upton looks at his PDA to view an EAS text message sent during the hearing.

Washington metropolitan area, that uses public television stations as the backbone. Washington-based XM Satellite Radio and Bonneville station WTOP(AM) were also able to receive and re-transmit the alerts, he said. Text message versions of the alerts were sent to the cell phones or PDAs of several lawmakers at the same time and the message was streamed over the Internet.

Lawson is concerned about funding if the project goes national, saying that stations might have to incur the cost of upgraded equipment and them be reimbursed.

Pagers vs. cell phones

CTIA is working to establish a voluntary effort among members to carry presidential alerts for customers who opt in. The group would need to study the likely cell phone turnover if existing devices don't have the capability to carry the new warnings, he said.

Paging services are more robust and have more redundancy than cell phone services, according to Vincent Kelly, president and chief executive officer of USA Mobility.

Kelly said his company's service remained working during and after Hurricane Katrina.

"Paging offers a superior network to cell phones. Our network relies on satellites, so damaged trunk lines do not affect our services. Our towers are higher off the ground and (their signals) can penetrate

See WARN, page 10 ▶

Limits

▶ Continued from page 2
mission has decided the contour overlap method is flawed, it will either have to develop another method for calculating the number of stations in unrated markets or somehow justify its use in unrated markets but not in rated markets.

The commission urged commenters to discuss the potential effects of current media ownership rules and proposed changes on the ability of minorities and women to own stations, advertising markets and the amount of indecent or violent programming on the air.

The comment period for FCC 06-93 has been extended to 120 days, with initial comments due Sept. 22.

— Leslie Stimson

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Reflections on 10 Years at Radio World

A few days ago I marked my 10th anniversary at IMAS Publishing. For most of that time, I've filled the post of editor, then editor in chief, of the U.S. edition of Radio World.

It is the longest I've worked for one employer and the longest anyone has held the RW editor's job in the company's 30 years.

When Luci Cobo hired me, she discussed the reasons on this page, noting my background in broadcast equipment as well as journalism. She was kind in her comments; but her words also remain a succinct summary of the standards I use to judge how I'm doing:

"[Paul's] journalism education and experience will help us to continue striving for that balanced, fair and honest coverage you've come to know and appreciate in today's RW," Cobo wrote in 1996, "and his experience on the manufacturing/distribution side will help us shore up the technical, equipment and product coverage throughout the rest of the paper."

The key phrase in that paragraph is "balanced, fair and honest." That's the gold standard for me. In an era when we are faced with information overload, openly biased "reporting" and vitriolic insults traded via listservs, Radio World occupies a special place in the industry, one I inherited but seek to maintain and nourish.

My aim is to serve U.S. radio broadcast engineers, owners and other managers by providing balanced, fair and honest coverage of technical and business trends. I intend for our content to have a positive impact in your life, as you experience it daily.

If our stories help you to advance in your job, work safely, enjoy your chores more, produce a better broadcast or converse intelligently with your professional peers, I've succeeded. If you smile because of a radio history piece or humor column, we've done our job.

One of my goals has been to provide a "marketplace of ideas," and when I look at our expanded opinion section, our many Guest Commentaries and our publication of RW Engineering Extra, among other content, I'm pleased.

10 Years Ago

What were we talking and writing about a decade ago?

The first issue on which I worked — as the managing editor under Editor in Chief Luci Cobo — included stories about Jacor Communications' purchase of Noble Broadcast Group; the timetable for launch of satellite digital audio radio services, with discussion of "pioneer preferences" among the four contending companies; and tests of a Seiko FM subcarrier data system to disseminate travel information to wristwatches.

There was a profile of Stephen Dunifer, founder of Free Radio Berkeley and guru of the "micro" radio movement; a discussion of Millman's Theorem by Harold Hallikainen; a review of the portable Tascam DA-P1



DAT recorder (\$1,899) by Ty Ford; and a visit by Al Peterson to the Washington auditorium of Voice of America to watch the production of a radio drama starring Ed Asner.

Inovonics was giving away an "old radio" poster. Anna Mae Sokusky had just joined Netcast, an entertainment network on the Internet. Letters to the editor dealt with the "rebirth" of the MiniDisc format and the use of T1 for digital STLs. And the company Hicks, Muse, Tate & Furst had signed a deal that would help it toward its goal of growing a new company, Capstar Broadcasting Partners. The sale gave Capstar 50 stations in 14 markets and \$49 million in annual revenue, according to BIA figures.

We are by no means perfect. But I'm proud that RW, more than any other publication, offers you space in our pages to tell us when we fail.

Like radio itself, we face competition now from more sources including new media. In that environment our staying power is even more gratifying. I've also had the satisfaction of seeing many of our ideas influence practices in other publications. Radio World has led through our often-imitated white papers; opinion pieces; coverage of people news and who's buying what; our emphasis on real-world engineers; and our understanding of the vital bridge between technology and management.

Meanwhile, non-technical publications, prone in the past to dismiss RW as "just for engineers," now ignore it at their risk. Consider digital radio and multicasting as just two examples of how, month after month, the topics we explore here are the same ones that "top brass" and decision-makers will have to confront soon, issues that literally can decide the business success of the industry.

My position has offered the opportunity

to have interesting experiences — visiting radio stations, networks, satellite headquarters, the research facility at Ibiquity and the engineering lab at NPR, just to cite a few. However, memories of any job usually have more to do with people. So it is with me.

As I look back over 10 years, I recall reading letters addressed to me from Steve Allen and James Quello and the daughter of the late Jesse Maxenchs, who had been touched by my remembrances of her father. I remember the day I hit a \$400 jackpot in a slot machine at the Stratosphere on an NAB trip. I remember bumping into James Earl Jones and meeting Bob Kingsley at conventions.

I also remember the morning Terry Hanley told me that an airplane had struck the Twin Towers in New York, five years ago this month, and minutes later watching fire engines scream down Columbia Pike outside my window, on their way to the Pentagon.

I recollect joking around with FCC Commissioner Rachelle Chong about her Star Trek collectibles; meeting with Gary

From the Editor



Paul J. McLane

Snow on his boat off North Carolina's Neuse River; writing the letter inviting Skip Pizzi back to our pages; and suiting up for the IMAS Bluelines softball team.

I'm grateful to the publishers and editorial directors who have trusted me with the "senior" IMAS publication, which remains a key part of the IMAS business, and to the advertisers who support it. I also appreciate the fantastic team of contributors and columnists who make RW possible. They are too many to name, including several dear friends. But in particular I am grateful to the brain trust who provide constant editorial advice and opinions: Tom McGinley, John Bisset, Michael LeClair, Skip Pizzi, Cris Alexander, Leslie Stimson, Kelly Brooks, and, for strategic matters outside of editorial, John Casey, who has been more partner than publisher.

I could describe the lengthy mission statement for our publication, involving the many industry angles we cover from new products to regulation and new media. But my commitment to you, as long as I hold this job, is to do the following:

- Help the reader do his or her job.
- Celebrate the radio broadcast engineering profession.
- Report on people as well as hardware.
- Be open to all opinions.
- Build bridges between engineering and other management.
- Allow criticism of our publication.
- Value radio's history.
- Be balanced, fair and honest.

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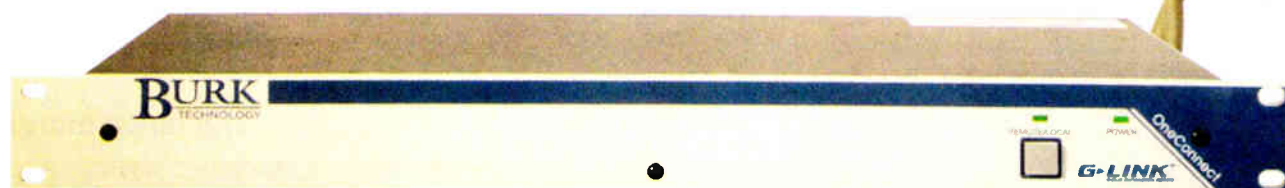
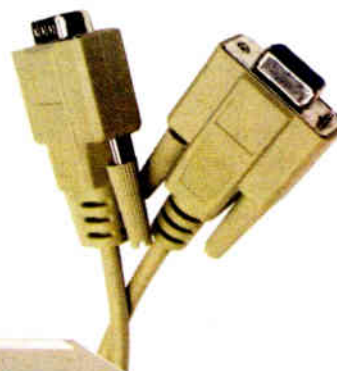
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V10 FM Transmitter

NPR Finds Objectionable Interference

Lab Study Identifies Significant Signal Leakage From FM Modulators in 'Real-World' Test

by Leslie Stimson

NPR Labs has conducted what it describes as a real-world test of how FM modulators are used, to determine how much signal leakage from the consumer audio adapters is affecting the lower part of the FM band.

The modulators typically are used for iPods, MP3s and other personal audio devices such as satellite radio "plug and plays" to enable them to be heard through installed car receivers.

In a field-strength measurement study on two FM channels in the Washington area, NPR Labs found that approximately 1 percent of the cars had FM modulators; and of those, about a third exceeded Part 15 emission limits.

Given that the average U.S. driver spends 55 minutes per day traveling 29 miles, based on Department of Commerce figures, a driver could pass thousands of other vehicles and dozens of FM modulators in that commute, NPR believes.

"The study found that approximately 40 percent of these devices are producing

respectively, of the \$750 million personal audio player accessory market, or a total of \$172 million in 2005.

NPR calculated that, assuming an average cost of \$50 per unit, approximately 3.4 million modulators were sold in 2005, based on CEA figures.

"This does not include a significant number of modulators sold with portable satellite radios to connect to vehicle radios," NPR wrote.

While NAB measured emissions with no obstructions between the modulators and the antenna in a static environment, NPR wanted to use measure the signal strength of the emission leakage from a moving car to its antenna at a fixed point, based on the FCC's Part 15 limits of 250 $\mu\text{V}/\text{m}$ at 3 meters.

The modulator is used inside the car and a steel vehicle partially shields the emissions from the modulators, so signal leakage is what can become a problem for radios in other cars.

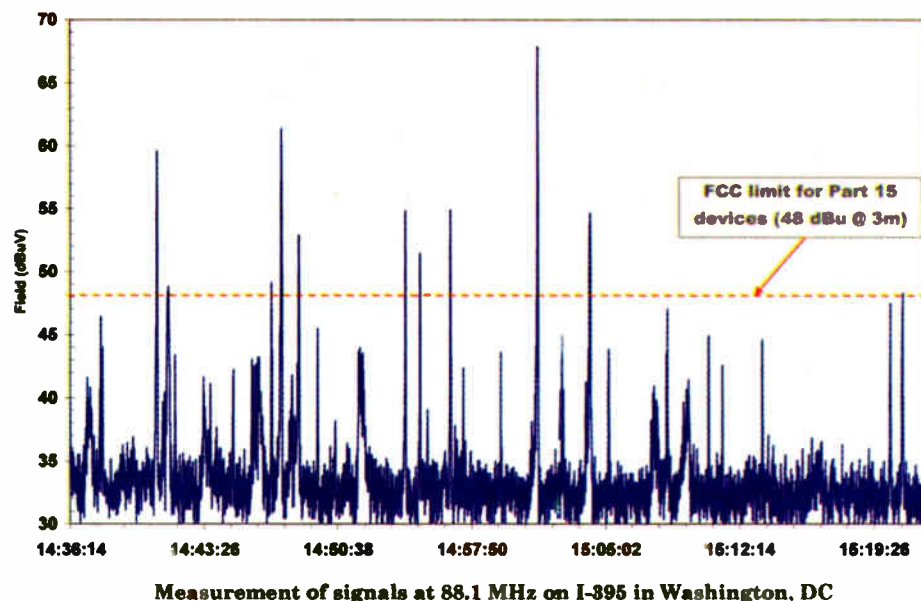
People place FM modulators in different places in the car — on the seat, on the dash or in the cigarette lighter — and that

placed on a support on the ground next to each measured road; it was shielded with a band-pass filter to remove strong out-of-band signals and connected to a spectrum analyzer controlled by software running on a laptop.

set up the antenna and take measurements a safe distance from the road. In most cases, they were 30 to 45 meters from the center lane, said Kean.

Interns counted cars that went by in each lane, and measurements were taken off the spectrum analyzer.

The first graph shows a 45-minute measurement sample collected alongside the



Measurement of signals at 88.1 MHz on I-395 in Washington, DC

Fig. 2

Measurement data of FM modulators from three sites

	Frequency (MHz)	Vehicles Per Hr.	Measurement Period (min)	Detected Modulators (#)	Vehicles with Modulators (%)	Non-Compliant Modulators (#)	Non-Compliant Modulators (%)
I-395, Washington DC	88.1	5520	49	35	0.77	10	0.22
	87.9	5610	53	7	0.14	4	0.08
					0.91		0.30
Branch Avenue, Clinton MD	88.1	5383	53	16	0.14	11	0.20
	87.9	6374	63	9	0.30	1	0.02
					0.44		0.22
US Route 50 Arlington VA	88.1	3497	58	18	0.51	7	0.20
	87.9	3769	58	14	0.37	7	0.19
					0.89		0.39

Source: NPR Labs

Fig. 1

signal levels in excess of FCC limits, potentially resulting in objectionable interference to broadcast services," states NPR Labs in the study.

It conducted the research on behalf of the North American Broadcasters Association, a member of the International Telecommunications Association; NPR donated the research work. It has sponsored a draft recommendation on FM-modulated devices through the ITU and NABA, hoping to influence worldwide manufacturers, as reported here earlier.

NPR initially wanted to review specific FM modulators and had already purchased some when NAB released its study (RW Aug. 2, page 1), said John Kean, head of Labs Measurements and Research for the Labs. So he switched tactics and developed a test to understand how many FM modulators are used and their emission levels.

Commercial market data on FM modulators is limited, NPR found. However, it quotes the Consumer Electronics Association as saying FM modulators and FM modulator/car chargers accounted for approximately 16 percent and 7 percent,

location can make a difference in the measurements, said Kean.

"You can have two of the same car and modulators but put the modulator in different places and get two different results," he said. "That's why it's best to take measurements of thousands of vehicles going by in order to get a big enough sampling to get average behavior."

NPR Labs measured the field strength of signals emitted from more than 28,500 vehicles. The tests were conducted on three highways in the Washington area representing varying amounts of traffic.

Measurements were taken on 88.1 and 87.9 MHz, which NPR said appear to be the two most commonly supplied frequencies for personal FM modulators. The results indicate that nearly 1 percent of vehicles were operating modulators on these two channels alone. Of these, approximately one-third were operating with emissions that exceed the regulatory limit, according to the study, which means it's likely "that a listener to 88.1 MHz or other FM channels will encounter objectionable interference in a matter of minutes of driving, or perhaps multiple occurrences per minute on high-traffic routes," states NPR.

NPR wanted to determine how many passing cars had FM modulators that were turned on — "radiating" — and the field strength of those modulators. Its personnel used a yagi antenna with a gain of 6 dBd,

Because Part 15 specifies a distance of 3 meters from the vehicle, NPR used mathematical formulas to normalize the measured field strength to the reference distance to determine compliance of the measured vehicles.

This was necessary so personnel could

northbound lanes of Interstate 395 at Potomac Park in Washington. The estimated field strength in dB μV at 3 meters is shown along the vertical axis and the local time in hours, minutes and seconds — HH:MM:SS — is shown at the bottom.

See INTERFERENCE, page 10

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XM, Sirius Work to Fix Problems as NAB Urges Recall

While NPR was busy working on its tests in July (see story, page 5), satellite radio companies had more to say on what they're doing about the products. The companies answered Wall Street analysts' questions as they released their respective second-quarter financial results.

As reported here earlier, XM received new equipment certifications in June for the Delphi XM SkyFi2 and Audiovox Xpress to reduce emissions and comply with occupied bandwidth regulations. But the FCC at that time also had 30 days to ask further questions or make a change. It

later did so, dismissing the certifications in July. XM said the certifications were for modified equipment configurations using in-vehicle compliance testing based on the FCC's recent procedure clarification.

XM wrote in an SEC filing that by dismissing, rather than denying, the certifications, the FCC allows them to be reinstated if the equipment is deemed compliant. The company is reviewing all of its FM-modulated products and asked manufacturers to suspend production or shipments in order for modifications that include changing operating or installation instructions, or software and hardware changes "such as small attachments that reduce emissions through the antenna or the cigarette lighter adapter."

XM told executives told analysts they're almost in daily contact with the FCC over the issue.

Hugh Panero — now chief executive officer after handing his president title to telecom executive and board member Nate Davis for the newly created position of president and chief operating officer — said, "We will navigate through these issues with the focus that helped us to lead the industry."

XM executives said the issue has resulted in work stoppages and the added expense of on-going redesign. XM reported \$5 million in subscriber acquisition costs related to addressing the FCC issues in the second quarter.

The company lost market share to Sirius in the quarter; company executives cited some shortages of the FM modulator products at retail. Company Chairman Gary Parsons said the company wants to ensure there's enough product for the fourth-quarter selling season once manu-

facturers can resume production, and that's in question for the low end of the product range.

While not all plug-and-plays use FM modulators, Parsons said the category makes up about 70 percent of XM's retail installations.

Asked by analysts about NAB's study of the FM-modulated products, Parsons said, "The NAB is an ally on certain fronts," referring to their joint opposition of the RIAA regarding increased music licensing for digital products, yet an "adversary on other fronts."

Also in July, Sirius said in an SEC filing it discovered in an internal review "certain Sirius personnel requested manufacturers to produce Sirius radios that were not consistent with the FCC's rules."

As a result, the company says it's taking "significant steps" to ensure this problem does not recur, including the adoption of a comprehensive compliance plan, approved by the Sirius board, to ensure that future products comply with FCC rules.

The satcaster said two of its manufacturers — one of which was S50 maker Directed Electronics, which made a separate filing — received letters from the commission inquiring about emissions and frequency compliance and Sirius itself received such a letter in June. It has "taken a series of actions to evaluate, mitigate and correct" the problems with the specific FM modulated products, Sirius stated.

"We directed manufacturers of Sirius radios with FM transmitters to suspend manufacture and shipment to retailers of non-compliant devices and to make the necessary changes in production to bring the radios into compliance."

The Sirius S50 was one of the wireless satellite radio devices tested by Meintel, Sgrignoli & Wallace for NAB. In the report, the engineering consulting firm said the S50 apparently violated the Part 15 limit of 48 dBuV/m with an average of 74.7 dBuV/m tested on three frequencies.

NAB Wants Recall

In the days between release of the financial information for XM and Sirius, NAB called for the recall of noncompliant products. In a letter to FCC Chairman Kevin Martin, association President/CEO David Rehr wrote that although "XM and Sirius have requested their manufacturers to suspend production of noncompliant devices, these actions do nothing to address noncompliant products already in consumers' hands or those already shipped to distributors and retailers."

Pressed about the recall letter later by analysts, Sirius President/CEO Mel Karmazin said NAB was lobbying the issue aggressively.

"We continue to see what their agenda is. NAB has been moving from an organization that used to play offense" to one that now plays defense and is "looking to muddy waters."

"We continue to believe the products we are manufacturing are all in compliance."

Lacking health or safety issues, there's no reason for a recall, Karmazin said, noting that there have been "few complaints" from consumers. Karmazin and other Sirius executives reminded analysts that other devices, such as iPods, use FM modulators as well.

Like XM, Sirius executives say they're in daily contact with the FCC over the issue. The company hopes to solve the problems quickly and is evaluating "cost-effective engineering solutions," he said.

— Leslie Stimson




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World Radio History

Grammer

► Continued from page 1
ing stations in Denver, Nashville, Tenn., and just outside Portland, Ore.

In addition, the company operates 26 translators and has permits to build about 75 others. WAY-FM Media also distributes the Christian Hit Radio Satellite Network, which has more than 70 affiliates.

"I've worked in both secular and non-secular broadcast groups, but this is a very unique group. It embraces new technology and keeps looking for ways to reach our typically younger demographic," said Grammer, who has worked full time in radio since 1996 and has moved quickly through the engineering ranks to a senior management position.

Younger demo

The mission of the religious broadcaster is "to encourage youth and young adults in their Christian lives and introduce non-believers to Christ." Meeting that mission as a noncom operator can be a challenge.

"Since our demographic is younger and doesn't have as much money to give in support, we have to typically try to do more with less. Yet, we are in some top 50 markets and so we have to sound as good as everyone else on the dial," Grammer said.

That usually means getting by without



Morgan Grammer

the latest Omnia processor or Harris transmitter, he said.

"We scrutinize where we are going and how we can get there by spending less on equipment. We need to improvise a bit at times, but once we get there we sound pretty good, I think. But we do have to look at some equipment manufacturers and vendors who may not be in the traditional broadcast supply marketplace," Grammer said, noting that was demo'ing an R.V.R. USA PTX-DDS dig-

ital exciter at WAY-FM's Denver station as he spoke. The company is a division of RVR Elettronica of Italy.

Grammer oversees WAY-FM Media's local engineers in areas of research, consulting and direction as technical issues arise. He directs the design and implementation of IT systems. Previously, Grammer served as the company's western regional corporate engineer.

WAY-FM Media is exploring IBOC implementation in Denver and West Palm Beach, Fla., specifically because of the high concentration of HD Radio stations already broadcasting in those markets, Grammer said.

"We are going through our options right now to get a good feel to see what rollout we want to pursue. We expect to convert our Denver station in the next 12 months. Cost is a major concern, but we know we'll have to keep moving forward to be competitive," Grammer said.

Mississippi River. He also set about designing and implementing a company-wide Internet streaming strategy, including setting up a Linux-based server at a co-location facility with high-bandwidth connections, encoder and software and utilization reporting.

"It's an MP3-based system based upon Icecast with custom player script for different players," Grammer explained. "We can provide them custom playlists that don't lock listeners into a specific player, they can use Winamp, Windows Media Player, I-Tunes or Real Player.

"We are looking at iTunes to have some things published there, and we're even looking at digital downloads, like ring tones and integrating a store," Grammer said.

The Christian Hit Radio Satellite Network, based in Nashville, offers 24/7 satellite delivered programming aimed at the 18-34 demo. Grammer has technical

'We do have to look at some equipment manufacturers and vendors who may not be in the traditional broadcast supply marketplace.'

That ambitious technology philosophy is evident throughout WAY-FM Media's latest initiatives. The company streams most of its stations — more than 10,000 streams daily — and is looking at streaming its signal to cell phones, as well as podcasting, and launching interactive Web sites with 3-D animation streaming. Plans also call for launching a second Christian music satellite network soon.

"We have a very young demographic that is quick to embrace new technology and wants to listen to music the way they want when they want. Part of my job is to look at ways to implement on-demand listening technologies," he said.

College radio

Grammer has moved forward in his career, too, quickly going from working at the college radio station at Southern Illinois University to his first full-time job as assistant engineer and on-air personality for Lyle Broadcasting at WCIL(AM/FM) in Carbondale, Ill., in 1996.

Just a year later, Grammer became assistant engineer and division manager of IT systems for Zimmer Radio Group at a cluster of six radio stations in Carterville, Ill. Zimmer Radio is now part of Mississippi River Radio Group. Grammer assisted in the design and construction of a multi-million dollar broadcast facility.

"I've been fortunate to work on some major projects, which is what I really enjoy doing. I like to build things and then see them through to completion," Grammer said.

Other career stops included a stint with a four-station group in Greensboro, N.C., which is now owned by Entercom Communications, but at the time was in the Sinclair Broadcast Group portfolio, and IBI Radio Ministries in Carlinville, Ill., south of Springfield, where Grammer was director of engineering and technology from 2000 until 2004.

Grammer then joined WAY-FM Media Group as its western region corporate engineer with responsibility for technical operations at O&O properties west of the

oversight of the CHRSN satellite network systems, which he helped conceive. "I designed the latest uplink on the air for the satellite network. I administer it from afar here in Colorado Springs," he said.

WAY-FM Media is in "expansion mode" and expects to add several more radio stations to the O&O group before the end of the year, Grammer said.

Private funders

President and CEO Bob Augsberg founded WAY-FM Media Group in 1987. The non-profit organization relies on partners and listeners to fund its non-commercial operations.

Besides knowing whom Christian music groups like Seventh Day Slumber and FM Static are, Grammer said there are benefits to working for a religious broadcaster.

"There is an understanding and respect for family time, as opposed to my experience with commercial broadcasters I worked for where they lacked an appreciation of family time. Obviously some things come with the territory, like if the station is off the air you drop everything and go. But if someone's printer is jammed at 7 p.m. or a production room CD player is skipping at 11 p.m. at night, those things should be a lower priority," he said.

Caring attitudes also seem to persist inside and outside the WAY-FM Media workplace, Grammer explained.

"The missions of commercial radio and Christian radio are different. Commercial radio seemed more like a rat race with everyone trying to come out on top (of the ratings). In Christian radio, we all share peaks and valleys and seem to work more toward the team benefits.

"I think I have pretty strong personal values and core beliefs. The company believes, as do I, that a relationship with Christ is a personal decision and a personal relationship. It's wonderful to work for a broadcaster whose goal it is to change lives and not just make money," Grammer added.

Grammer lives with his wife, Jennifer, and their two children, Michelle and Aaron, in Colorado Springs, Colo.

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WARN

► Continued from page 3
buildings better," said Kelly.

Billy Pitts, president for government affairs for the NTI Group, served on the FCC's panel that looked into the breakdown of communications during and after Katrina hit the Gulf Coast. The panel found "that for a variety of reasons, the existing EAS system was not up to the task," he said. Both the panel and the defunct Partnership for Public Warning have recommended using advanced technology to carry alerts to a wider population.

His company has developed a time-sensitive notification system that enables schools and others to alert people of an emergency quickly. His company is performing more than 12 million calls a month, including bilingual calls, he said.

NTI can record a message and deliver it over cell phones or landlines. "This is beyond the old auto-dialer systems. We can reach over 4,000 recipients in less than an hour," whereas a standard auto-dialer would take a day to reach the same number of people, Pitts said.

Sheriff Michael Jackson, representing the Maryland Sheriffs' Association, said, "This bill is only the first step in notifying the public." Jackson is also sheriff for Prince George's County, Md., near Washington. He stressed the need for local emergency managers to be able to input alerts into the new system.

Sara Allen, senior radio engineer for Ciara Enterprises, testified on behalf of the Prometheus Radio Project, which considers protection and expansion of LPFMs important to take part in the new EAS.

Redundancy

Several witnesses said redundancy is important. Guttman-McCabe said the idea of dropping a second chip into a cell phone — to integrate pagers into the phones — requires a new standard and the need to shield the built-in antenna from interference.

"It's sort of like inserting a NOAA chip, which we've looked at," said Guttman-McCabe. "We're willing to investigate all that."

Kelly agreed that while integrating pagers into cell phones is possible, there is a question of whether it makes business sense.

Rep. Greg Walden, R-Ore., a licensed ham operator and the owner of five stations, urged industry to consider amateur radio operators as a resource for the new digital EAS.

Pitts said ham radio operators were likely the first to get emergency messages out during Hurricane Katrina.

Walden noted that most broadcast stations remained on the air during 9/11, though the panel formed to look at communications warnings after that disaster, the Media Security and Reliability Council panel, found that in contrast, wired and wireless carriers had substantial outages.

Walden asked Knapp whether wireless carriers in particular could now handle the extra traffic during an emergency.

Knapp said technologies to beef up capacity are being rolled out, although "there is debate about how quickly that will happen."

Walden reminded hearing participants that radio is the "best" form of communication. "I had a BlackBerry in terms of communicating on 9/11 but it couldn't handle much traffic."

Guttman-McCabe said industry can respond and develop a new EAS, but first the government needs to decide what it wants, such as what system capabilities should be and what should be contained in an alert.

No further action on the bill was slated as of early August.

On the Senate side, Sen. Ted Stevens' Commerce Committee reported out its



Appearing on the Hill: Julius Knapp, John Lawson, Christopher Guttman-McCabe and Vincent Kelly.

version of the WARN Act in July.

On his blog, one EAS expert praised the public television digital emergency broadcasts, saying that the larger bandwidth of the digital transmitters means the new EAS can provide more than a brief audio message and an on-screen crawl.

The proposed system is based on a Common Alerting Protocol, Art Botterell told Radio World.

He supports the proposed system with public digital TV stations as the backbone because it has "a standards-based design that allows interconnection with other technologies — not just glitzy ones like cell phones and digital radio, but even old standbys like sirens and weather radios and even analog EAS."

What might adoption of this system mean for broadcasters and the current EAS?

"Potentially, it takes the primary burden of emergency alerting off an industry that's carried it for the last 50 years. On balance I suspect many owners will be happy with an approach that allows them to continue to participate proudly, but on a secondary basis."

Still, he noted, the new technology may foster heightened demands on public officials and private-sector entities to issue precise and specific warnings in time to make a difference. 🌐

Interference

► Continued from page 5

For comparison, the FCC limit, converted from $\mu\text{V}/\text{m}$ to $\text{dB}\mu\text{V}$, is shown as a dashed red line. "It is readily apparent that at least nine of the 34 detected modulators exceed the FCC emission limit; some by 20 dB or more," states NPR in the study. "This includes the aperture loss introduced by signals escaping through the vehicle windows." Bigger windows allow more signal leakage, said Kean.

Measurements were collected at three sites, as detailed in Fig. 1. All measurements were conducted in midday, when traffic was not congested and flow was relatively constant.

As summarized in Fig. 2, the data indicate that up to 0.91 percent of vehicles were operating detectable modulators on only two FM channels.

**We have enough
data to give us
a pattern of usage.**

— John Kean

"Most significant is the proportion of modulators that were estimated to exceed the regulatory emission limit of $250 \mu\text{V}/\text{m}$ at 3 meters, ranging from 0.22 to 0.39 percent of vehicles or 30 percent to 50 percent of detected modulators," states NPR in the report.

While this doesn't seem like a lot, Kean said, 1 percent of 5,000 cars is a lot of vehicles. Even listening to a single channel, if 3,500 to 3,800 vehicles pass by in an hour, "you could pass dozens of modulators."

"And if you're listening to your favorite radio station on 88.1, that's probably interrupted numerous times," he said. "The complaints we hear the most are from those listeners who pulled up to a stoplight and an FM modulator takes over their signal for the entire length of time they're at the light. Their frustration of having interference is higher because it lasts longer," Kean said.

To hear what the interference caused by the FM modulators sounds like, Kean set up a receiver in Potomac Park and listened to modulators as they went by to make sure he designed the right system to detect them.

"You could hear noise, hiss, and all of a sudden, a comedy channel or rap music...depending on what people were listening to. It would do that time and time again."

Asked if NPR could identify the specific modulator models they were hearing, he said no, but "we have enough data to give us a pattern of usage."

"Between NAB's study and ours, we've answered key questions," he said, such as how many modulators are compliant in actual use.

The test results have been presented to NABA's technical committee.

NPR, acting as a NABA representative, planned to take its results to the ITU in August to present them as a draft recommendation; if approved they would be presented as a full recommendation in another ITU meeting in Korea in September, he said. 🌐

See related story, page 6.

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Workbench

Radio World, September 1, 2006

Past columns are archived at www.rwonline.com/reference-room

Got Gas? Try These Handy Aids

by John Bisset

When was the last time you checked your nitrogen regulator assembly? As we pointed out in the Aug. 2 *Workbench*, these assemblies can leak, depleting a nitrogen tank in no time.

Where should you shop for a replacement? If you haven't visited a welding supply or bottled gas store, pay a visit. Usually the company from which you rent the bottled nitrogen will have a retail store associated with it.

You'll be amazed at the assortment of gas-related accessories that can make your life easier and safer. What will you find? One is the regulator assembly shown in Fig. 1, submitted by Contract Engineer Bryan Hars of Hilltop Engineering.

Unlike traditional assemblies, this is designed to mount permanently on the wall, with a jacketed connecting hose running to the tank. There's less chance that the gauges could be dropped or damaged when removing a tank, because the gauges are secured. Only the flexible hose gets moved.

Pro Star manufactures the tank bracket assembly shown in Fig. 2. This bracket also mounts to the wall; webbed belts are used to secure the tanks.



Fig. 1: This type of regulator mounts your gauge assembly to the wall.

These accessories are affordable and will help you perform your job more efficiently.

★★★

Ask Nassau New Hampshire's Engineering Manager Dirk Nadon what he and his staff have been up to and he'll tell you "Studios!"

A view of a new air studio in Hooksett, N.H., is shown in Fig. 3. Note the flat-screen monitor for the hard-drive system, clear copy stand for host/co-host interaction and emergency lights up on the sound-proofed wall. There's also plenty of workspace for air staff.

Fig. 4 shows one of the many finishing touches: cables concealed by a flexible plastic jacket that reduces clutter and keeps the studio tabletop clean and neat. The jacket also makes cable identification easier should a monitor need to be replaced. Cost? Less than \$5 for a roll of plastic jacket found at electronic supply stores, even RadioShack.

★★★

Kevin Larke is market chief for four FMs that make



Fig. 2: Use a quick-release webbed belt to secure nitrogen tanks.

up the Holt, Mich., cluster of the Mid-Michigan Radio Group.

Recently, Kevin's 94.1 WVIC site lost power after a thunderstorm. It happened around 10 p.m., and the station continued on the air with the generator. Kevin reported the outage to the utility company, Consumers Energy, which gave an estimated restoration time of 6 a.m.

The next morning, Kevin noticed the station was still

See 911 SIGNS, page 14 ▶



Fig. 3: Desire for ample workspace drove the layout of this Nassau studio in New Hampshire.



Fig. 4: Black plastic jackets help organize a multitude of monitor cables.

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Okay, back to work now. (Consoles don't build themselves, you know.)



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WIRED FOR SOUND

Get Wise to the Ways of Plenum

by Steve Lampen

You know about plenum cables; in many installs, they are now required. But do you know what “plenum” means? Do you know what is done to a cable design, and in cable testing, to get there? Probably not, and I don’t blame you. The architect, fire marshal or director of engineering told you to use plenum cables, so you use plenum cables.



Belden 9451P and 9451DP are plenum audio cables.

Sure, these can be three or four times the cost of the non-plenum cables. But, as my friends in New York City say, it is what it is.

If you look up *plenum* in the dictionary, it will tell you, among other things, that a plenum is an “air bag,” a place where air is held at a different pressure than air outside. If you ever saw someone playing the bagpipes, that bag he’s squeezing to move the air is a “plenum.” But the “bag of air” we’re concerned with is in a drop ceiling or raised floor. Often, these are connected to the building return for the air conditioning. So anything that’s burning up there (or down there) will have the smoke and fumes sucked out and nicely distributed to the

rest of the building.

Awareness of the whole “plenum” thing got started after a number of nasty mishaps involving fire and plastic. Among them were a Bell System central office fire in New York in 1975 and the MGM Grand fire in Las Vegas in 1980. The latter was notable because “scrubbers” in the air conditioning, designed to handle dust and soot, reportedly removed the smoke but left

toxic fumes that were fed to the rest of the hotel.

For the Europeans, there was the rocket attack on HMS Sheffield, a British ship, during the Falklands War with Argentina in 1982. It was rumored in the general press that many of the deaths were attributed to burning cable and other plastics.

In the United States, such events led the National Fire Protection Association to modify its guidelines, the National Electrical Code, to require “plenum” cables in the United States. You can get a copy at any technical bookstore.

This is a voluntary organization. It is not a governmental body. There is a voluntary code, not a law.

However, if your local fire marshal, planning board or other AHJ — “authority having jurisdiction” — decides to adopt the NEC, as many have, then it is law. Some cities or counties (Las Vegas, Chicago, Los Angeles) have written their own codes. So if you’re doing an installation in a strange city, better find out what they require or they may make you tear it out.

There are many fire ratings for cables; the top grade is plenum. These cables are subjected to a special process called the Steiner Tunnel Test. This tests the cable for flame spread and smoke emissions, among other things. The test requires that the components of the cable resist burning, so many special compounds are used. The two most common are various versions of Teflon, a product made by DuPont, and special PVC versions that can be mixed to resist burning.

But someone noticed that you don’t install just one or two cables. Some places have *thousands* of cables. The “fire load” in a bundle of cables is different from that of the small amounts tested in a Steiner Tunnel. So data cables, and now video cables, are coming out with “LC” versions, for “limited combustibility.” These cables are entirely Teflon.

You will find, of course, that these cables are even more expensive than regular plenum cables. But the alternative is conduit, and that’s not cheap either.

In fact, in most installs, the cost of the wire and cable is 5 to 10 percent of the cost of the entire installation. So, put in perspective, even LC cables aren’t the budget-killer that you might expect. And, of course, the liability aspects of using lower fire ratings are another whole kettle of fish. Don’t ask me! Go talk to your lawyer!

Order a copy of the *National Electrical Code* by calling (800) 344-3555. More information about cable manufacture and hazards can be found online at sites such as www.cablingsolutions.dupont.com and www.cablefireresearch.com.

Steve Lampen’s latest book “*The Audio-Video Cable Installer’s Pocket Guide*” is published by McGraw-Hill. Reach him at shlampen@aol.com.

People News

Tell us about your job change or new hire. Send news and photos via e-mail to radioworld@imaspub.com.

Cumulus named Dennis Eversoll regional engineer for the markets of Kansas City, Columbia, Jefferson City and Stockton, Mo.; Topeka, Kan.; Faribault/Owatonna and Rochester, Minn.; and Sioux Falls, S.D. He had worked for Cumulus in a regional position based in Savannah, Ga., until 1999, when he left to join Computer Concepts.

Eversoll replaces Lloyd Collins, who is leaving to pursue other interests closer to his home.

Bill Clough, former news director for South Texas Public Radio in Corpus Christi, Texas, has joined the *Victoria Advocate* newspaper in Victoria, Texas as audio news director.

Kerry Richards joined the Cumulus Media engineering department as chief engineer. He had previously been chief engineer at WOR(AM) in New York.

Broadcast Electronics promoted Brent Whelan to senior customer service manager. He joined the company in 2001 as the manager of RF systems and test, with responsibility for system and sub-assembly level testing.

Envision Radio Networks appointed Michael Lichtstein director of programming for its New York office. He was senior producer, head write and talent booker for Carson Daly’s syndicated show “Most Requested” at Premiere Radio Networks.

The NAB promoted Chris Brown to executive vice president of conventions and business operations. He replaces Jack Knebel, who retired. Brown joined the organization in 1999 as senior vice president of conventions and expositions.

Cox Radio appointed Faith Perkins to vice president, human resources. She had been VP of human resources for Susquehanna Radio Corp.



Bill Clough



Brent Whelan

911 Signs

► Continued from page 12

on generator (he has the transfer switch wired to the Burk Remote Control status inputs to save him a trip to each of the sites). He drove to the site with 20 gallons of diesel fuel in 5-gallon cans to add to the tank.

At 10 a.m., a Consumers Energy truck passed slowly on the road and Kevin chased it down. It turns out the crew was still trying to find the station address. The utility had the power back on by 10:30.

The location is difficult, because the entrance is through someone’s yard. The Consumers foreman told Kevin that a truck had come by at 2:30 a.m. but couldn’t find the station driveway and left.

Kevin had given the customer service representative a description of the driveway and noted a 2-by-3-foot white sign

with the station call letters and tower registration number listed. Kevin had also provided his cell phone number and said they could call anytime. None of this was entered in the work order; the repair crew had only a street address. The utility foreman recommended putting up the address number by the homeowner’s driveway using standard 911 signage.

A good idea. Kevin bought a couple of the green reflective “911” address sign kits at a hardware store for \$18 each. The kit includes a 6-by-18-inch aluminum sign and a bunch of 3-inch white reflective numbers. All you supply are the mounting pole and hardware. If your hardware store doesn’t stock these signs, Kevin says kits are available on the Internet for \$20 plus shipping.

Kevin mounted these signs on 6-foot steel “T” posts that cost \$3.50 each. He knocked the posts into the ground with a



Fig. 5: For safety’s sake, install 911 address signs at your transmitter site.

big hammer. (Do this before bolting the signs on, Kevin says; you won’t want to miss and smash your spiffy new signs.)

The signs will make it easier for telephone and power companies to find his sites. Kevin’s assistant engineer, Drew Henderson, also had a good point: If the staff ever needs to call 911, the signage will make it easier for responders to find the transmitter locations. Twenty-five dollars is pretty cheap for a safety aid that could get you back on the air or even save your life.

Kevin Larke can be reached at kevlarke@yahoo.com.

John Bisset has worked as a chief engineer and contract engineer for 37 years. He is northeast regional sales manager for Broadcast Electronics. Reach him at (571) 217-9386 or jbisset@bdcast.com. Faxed submissions can be sent to (603) 472-4944. Submissions for this column are encouraged, and qualify for SBE recertification credit.

“Showcase studios take time, right? Not this time.”

“Challenging’ didn’t begin to cover it. Our **showcase studios** were to be located in the high-visibility West Edmonton Mall. With only six



weeks ‘til our on-air date, our challenge was finding a manufacturer we could trust to deliver on our timeline.

“We’d almost decided on one of the traditional console/router companies; working 25/7, we could *barely* make our deadline.



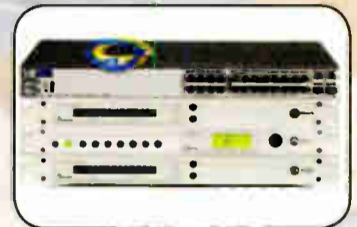
Then we found out about Axia IP-Audio networks.

“Axia gear goes together with RJ-45 connectors, so adding sources to the network takes almost no time. A few clicks and you’re done! That produces a **substantial cost reduction** in terms of wiring from room to room.



“And because the Axia system routes audio using **ordinary Ethernet** instead of expensive mainframes, the ease of adding to the network allows it to grow and change dynamically with our operations.

“When we decided to go with Axia, the router guys had a fit. They actually tried to tell us that the IP-Audio network would catch viruses! We laughed for days about that one.



“Our studios were finished **with time to spare**. The installation came together really well, and since going on the air we’ve been trouble-free.

“We’ve had several announcers tell us how much they **love working with the Axia surfaces** and how easy they are to operate. It’s great to be able to setup and **save multiple configurations** that can be **recalled at a moment’s notice**.



“Our experience with Axia has been all positive; we’ve had no audio glitches or dropouts whatsoever. I don’t know why we hadn’t gone this route earlier. Where we’re installing new equipment, **we’re onboard with Axia.**”



— Owen Martin, Director of Engineering,
Newcap Radio, Alberta, Canada



www.AxiaAudio.com

Get Back to Basics: Become a Rock Hound

Crystal Radios Offer Old-Time Simplicity and Provide Insight Into Factors Affecting Your Listeners

by Neil Lewbel

If you are ready to take a break from high-speed, complex digital systems, consider becoming a "rock hound" and constructing a crystal radio, one of the earliest forms of receivers.

For close to 100 years companies have been making and selling crystal radios. Many people in radio and other technical fields credit crystal radios for sparking their interest in electronics. Possible circuits and construction techniques range from extremely simple to quite complex.

With many advances in technology, such as ICs, computers and digital electronics, interest in these radios seemed to decline for many years. By connecting many people and companies, the Internet has spawned a revival of interest in crystal radios.

New and old crystal radios, in every price range, continue to appear on eBay. The use of 21st century tools has added a new spin — and additional insights — to one of the oldest receiver systems.

Resources

In the early days of radio, companies that operated stations and made transmitters often manufactured receivers. Many early crystal radios carried well-known names such as Marconi, Westinghouse and Radio Corporation of America.

Over the years, parts and complete sets were sold by small companies and industry leaders including Federal, Freed Eisemann, Grebe, General Electric and Steinite. Kit makers and toy manufacturers such as Heathkit and Remco offered simple crystal radio kits.

Philmore Manufacturing is the company most commonly associated with crystal radios. Located in the New York area for many years, it manufactured complete sets, parts and kits from the 1930s through the 1950s. The company no longer offers crystal sets but is still in business following a change in ownership and a move to Illinois.

If you are trying to restore a classic Philmore or other crystal radio, replacement parts sold by Antique Electronic Supply in Tempe, Ariz., may be helpful.

Today several companies still offer crystal radios, kits and parts. These range from children's toy to science project, from simple kits to expensive reproductions of classic, early radio masterpieces. In fact, there is one modern supplier of broadcast equipment that also sells crystal radios. Ramsey Electronics of Victor, N.Y., sells a variety of gear, such as transmitters, production audio systems and FM antennas, aimed at low-power broadcasters. They also offer their model CS2 Crystal Radio Kit for \$9.95, a wonderful (and economical) introduction to crystal radios.

If you are interested in building or learning about traditional crystal radios, try surfing to the Web site for Modern Radio Labs. The company offers a col-

leagues are popular in this application.

An interesting variation on the crystal radio, known as a foxhole radio, used a blued double-edge razor blade and a pencil lead in place of the crystal and cat's whisker. The name refers to the fact that GIs could build and operate these easily, using materials readily available to them in the field. This unlikely combination of a pencil and the razor's surface coating forms a semiconductor junction.

Join up

Progressing to more sophisticated crystal radios becomes challenging.

To appreciate the complexity of even the simplest radios, take a look at the Web site of Ben H. Tongue, a founder of Blonder-Tongue, a well-known provider of broadcast, cable and consumer communications equipment. Under the title "Crystal Radio Set Systems: Design, Measurement and Improvement" you will find many articles on theory and analysis. Some of the covered topics include:

- Improving sensitivity, distortion and selectivity.
- Determining the best diodes and audio transformers.
- Detector simulations using the SPICE computer program.
- A new diode detector equivalent circuit.
- Measuring sensitivity (insertion power loss), selectivity and input/output impedance.

A different perspective on building crystal radios is offered by Ramsey.

"I think the people who are in radio as a passion, rather than a simple profession to make money, are more prone to be involved in crystal radios. It is just the fascination of being able to whip something together with so few parts. I just want to see what I can do with the barest minimum" of parts.

If you want to understand radio or just return to a simpler time and technology, try building and operating a crystal radio.

Former broadcaster Neil Lewbel is a consultant focused on developing new companies and products in the technology and communications fields. Reach him via e-mail to neillew@aol.com.



Ramsey Electronics offers a basic kit for \$9.95.

lection of crystal radio books and claims to be "America's Oldest Radio Manufacturer & Publisher," in business since 1932.

By a whisker

In its most simple form, a crystal radio consists of a diode, tuning circuit and audio transducer.

Possible diodes range from simple home-made open detectors to the latest high-frequency semiconductors. Open detectors consist of a crystal and a contact wire.

The crystal typically is some type of mineral (acting as a semiconductor) mounted or held in a metal frame. Early radio builders embedded a piece of "ore" in a small cylinder of solder or lead, which was then held by clips or screws. The mineral "ore" was usually galena or pyrite. Today most stores that sell rocks and minerals will have a variety of acceptable crystal materials.

A spring-like wire called a cat's whisker contacts the mineral material. Only the point or end of the wire actually contacts the mineral. (If you have ever seen a diagram of early "point contact" diodes, it is obvious they are just miniaturized versions of the open crystal detector.) Moving the cat's whisker over the mineral's surface to find the best spot requires a little patience and skill. Different contact positions can change signal strength, selectivity, distortion and other factors.

Today's crystal radio builders have a choice of using the classic open detector or a diode. Open detectors can be purchased or built from scratch. Electronics parts distributors offer a broad selection of diodes. Discussions and articles compare types of diodes, based on their construction, frequency rating or operating voltage. Builders opting for the diode generally have started with a type 1N34 or similar germanium diode. Other popular choices include Schottky and microwave diodes.

Some builders experiment with different wire gauges and alloys for the cat's whisker. There must be a small amount of pressure to maintain proper contact with the crystal. Normal copper wire is too soft for an effective cat's whisker. Bronze



The Xtal Set Society is a source of books and online info.

In this realm, you may develop new or additional understanding of radio technology. The crystal radio Web sites and newsgroups can challenge your knowledge of transmission, antennas, modulation, detectors and receivers.

A quick Web search for "crystal radio" produces many organizations and sources of information. A leading provider of construction and other information is the Xtal Set Society or XSS. They publish a newsletter and books on crystal set construction. XSS also sponsors "Rap 'n Tap," an online, crystal radio discussion/newsgroup. These postings reveal a broad range subjects that will also interest radio professionals.

The online discussions can get quite technical, involving various theories about tuned circuits, detectors, antennas, interference, ground systems and signal strength. Reading these discussions and attempting the proposed circuits may give you new insights into factors that affect what your listeners hear.

John Ramsey, founder of Ramsey Electronics, suggests looking at the crystal set as "a big matching circuit that matches the EM wave to the earpiece. You want to maximize it for maximum power transfer and along the way you want to get some selectivity too."

Web Resources for Crystal Radios

Ramsey Electronics, following in the steps of many classic transmitter companies, offers broadcast equipment and crystal radios. www.ramseyelectronics.com

The Xtal Set Society is a leading source of books on crystal set construction. The site is a valuable source of information. They also sponsor Rap 'n Tap, a Web site and a newsgroup. www.midnightscience.com

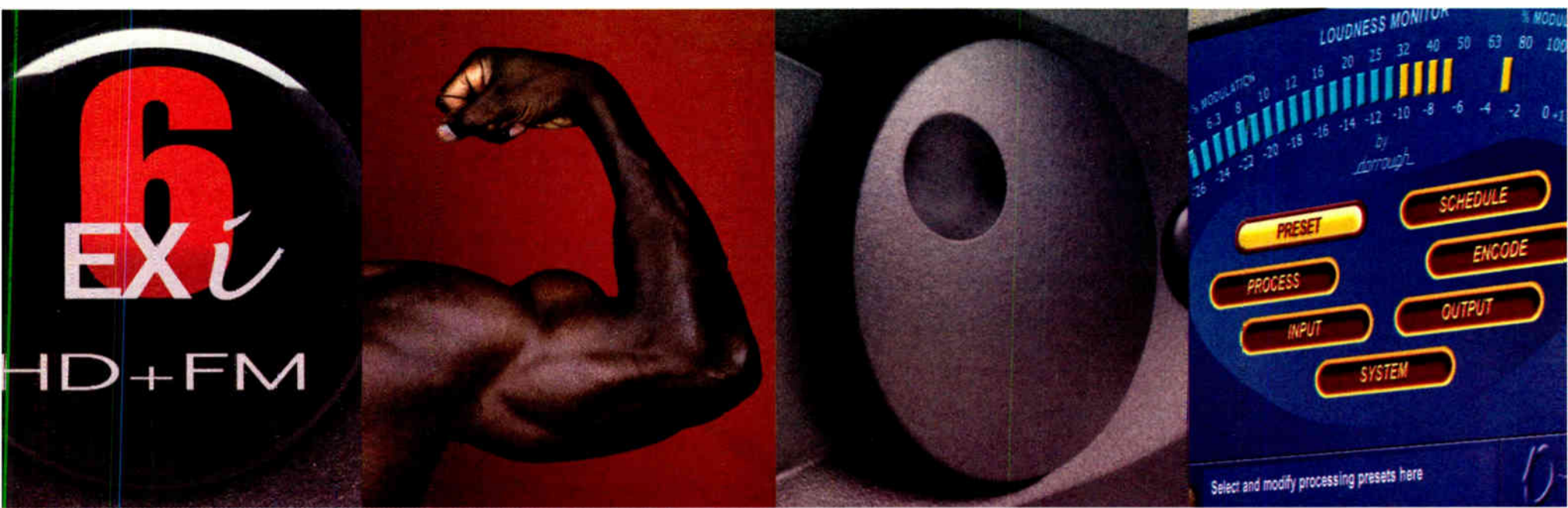
To appreciate the underlying sophistication of crystal radios, look at the site of Ben H. Tongue, a founder of Blonder-Tongue. www.bentongue.com

Although they no longer offer crystal radios, Philmore Manufacturing Co., which is now part of L.K.G. Industries Inc., offers a range of parts, cables, kits and tools for professionals and hobbyists. www.philmore-data.com

Modern Radio Labs offers a variety of traditional crystal radio parts and books. www.modernradiolabs.com

Known as a source for tubes, Antique Electronic Supply also offers a small assortment of crystal radio repair parts, as well as several books on the subject. www.tubesandmore.com

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Which is why the new Omnia-6-EXi makes perfect sense. With integral **HD Radio Diversity Delay** that helps digital broadcasters eliminate analog connections to the HD exciter, ensuring independent analog and digital program streams. And the exclusive new **LoIMD Clipper** that actually **suppresses intermodulation distortion** to deliver audio that's cleaner, clearer and more detailed than ever — no matter how aggressive your processing. (If you already own an Omnia-6, don't worry — there's a low-cost upgrade to give your processor full-fledged Omnia-6EXi power.)

A lot of muscle? You bet. No wonder the competition is running scared.



FIRST PERSON

It Was More Than Just a Movie

Audio Duties Bring the Author Up Close With Families of United 93 Victims

by Gary Palamara

This year, as the fifth anniversary of Sept. 11, 2001 approached, the motion picture industry offered up its first serious attempts to chronicle part of the story.

Written and directed by Paul Greengrass and produced by Universal Studios, the full-length motion picture "United 93," which debuted in spring, depicted the heroic efforts of 40 passengers and crew to thwart the hijacking of a United Airlines transcontinental jet.

In August, Paramount Pictures released the Oliver Stone movie "World Trade Center," which documents the successful rescue of two Port Authority policemen amidst the rubble of New York's Twin Towers.

My role for both films was to provide engineering services and audio equipment to facilitate the radio and television interviews used for the film's promotion. For the United 93 film, however, I also had a unique front-row seat to view an historic invitation-only event.

Screenings

Almost immediately upon announcement of the "United 93" film, questions about the project arose. The controversy revolved largely around the timing of the release and also the showing of the film's trailer to unsuspecting moviegoers.

Was it too soon to revisit the memories of that September morning? For many it was, but for others, it is a story that needs to be told again and again.

Throughout the "United 93" project, Universal Studios worked with the victims' families. Greengrass secured the approval of the families of those killed aboard the plane before beginning the project. Even so, as the film approached completion, the family's reaction to the first screening would be a critical component to help shape the last-minute details and to

promote the movie. To that end, Universal arranged private screenings of the yet-to-be-finished film for the families.

One screening took place near Flight 93's origin, Newark Liberty Airport in New Jersey, on Saturday, April 8. The next day a second screening took place near the plane's destination point, in the San Francisco Bay area of California. Other

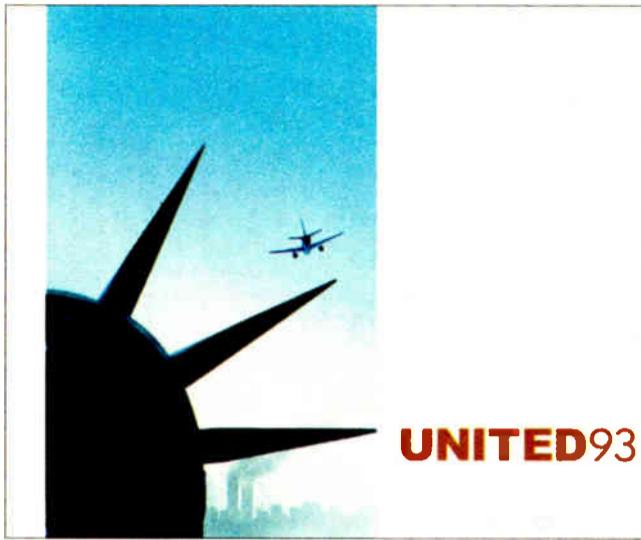
screenings were arranged for those who could not attend either theater.

At both screenings, Greengrass spoke to the families via a two-way satellite hook-up from London, where he was mixing the final sound track and putting the finishing touches on the film. My job was to handle the audio communications for the Newark-to-London satellite hookup.

Group effort

It was clear from the outset that the pain was still immediate for many loved ones. After viewing the film there was a 10- or 15-minute break while the families collected themselves. That gave me a chance to make last-minute audio and video checks with the London location. In Newark, a portable satellite truck, video cameras, wireless microphones, plasma TV monitors and a separate house sound system were preset prior to the film's viewing.

Once the two-way audio/video conference began, Greengrass asked the group via satellite if anyone thought that it was too soon to tell the 93 story. None of the approximately 75 family members at my location said yes. In fact, their reaction was the opposite.



'United 93' Movie Poster

To a person, those who spoke up appreciated what they referred to as a horrifically accurate portrayal of the events as we know them. All seemed grateful that their loved ones' sacrifice finally was to be visualized through the medium of film.

Many thanked Greengrass for the ensemble manner in which the victims' stories were told. "It was a group effort" aboard the plane, the director replied.

One of the most poignant comments came from a family member who spoke about being swept away by the film's storyline.

Perhaps one of the most poignant comments came from a family member who spoke about being swept away by the film's storyline. She told of being detached from reality at times while watching the events unfold on screen. In a surreal moment, she found herself wondering if the passengers would ever get to the cockpit in time to save the plane. Seconds later, she remembered the terrible truth.

Colleagues who worked on the West Coast screening told me the families in San Francisco overwhelmingly supported the film.

Promoting the film

When a movie company wants to promote a film, it typically assembles the key players in one location and makes them available for press interviews. Such was the case with "United 93," although the atmosphere surrounding this film's promotion took on an almost reverent tone.

Along with the director, an FAA flight controller and three actors, several family members took part in the interviews. Among those were the parents of Todd Beamer, the brother of Edward Felt and the sister of Linda Gronlund, all of whom died on the flight.

The radio, print and television interviews took place in New York City on April 18-19. The radio interviews took the form of roundtable discussions. In this format, several reporters interview one of the principles from the film in a mini "press

conference"-type format. Each interview typically runs 20 to 30 minutes. All reporters have access to the same questions and answers via an audio press mult and the engineering services I provide. In addition, these interviews are recorded digitally and sometimes dubbed onto CD for future distribution by the movie studios.

After several recording sessions, reporters normally walk away with several hours of unedited interviews.

Over the grueling two-day promotion schedule, none of the family members with whom I came in contact had a negative word about the project. Asked about viewing the film, Beamer's father David responded, "Yea, it's tough to see, because it's a real story about real people, a real event and a real war. But my first reaction was one of relief, because they got it right. They got it right."

"It was incredibly painful and gut-wrenching," said Felt's brother Gordon. "But it's a story that needs to be painful, it needs to shock, because it's so important that we don't forget these events."

The memorial

In 2004 I visited the Flight 93 crash site. At the time, volunteers told me that nearly 5,000 people a month were making the pilgrimage to the barren Pennsylvania field. In 2002, Congress had passed the Flight 93 National Memorial Act, which would purchase land and prepare the area for long-term

use by the National Park Service. But funding to erect a proper memorial has been held up by bureaucratic red tape in Congress.

By September 2005, a final memorial design was announced and a \$30 million effort to generate private funding begun. Encompassing approximately 2,200 acres, the Flight 93 memorial will be large. Included is an area of approximately 1,355 acres that contains the crash site, the debris field and the area where human remains were found.

The estimated completion date for the memorial is now Sept. 11, 2011, the 10th anniversary. To help further the project, Universal Studios is donating 10 percent of the film's first weekend gross to the memorial fund.

After several months in the theaters, "United 93" is available for home viewing. Universal Home Video set a release date for the DVD in September. The disc version includes audio commentary from the director and has a family section that takes a look at the real-life stories of the passengers and crew.

To download audio excerpts of the "United 93" radio roundtable interviews, go to http://garypalamara.com/Audio_Download.htm.

From 1968-'72, the author worked with the Armed Forces Radio & Television Service while serving with the United States Air Force. He is a freelance broadcast engineer and owner of Morningstar Sound.

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To Ride the Radio Comet

Where We Consider How Chris Anderson's 'The Long Tail' Might Apply to the Radio Business

Chris Anderson's seminal article "The Long Tail" in the October 2004 issue of *Wired* magazine has stimulated an inordinate amount of discussion in the media world. A new book by the same name and author is now on many media professionals' late-summer reading list.

To recap the basic premise, the long tail idea starts by stipulating that for any media type, there is a "head" of top-selling titles comprised by a small number of the whole (say, less than one of every 10) published offerings. No surprise there, and it's probably always been so; not every player is an all-star.

But the concept continues with the critical premise that if all titles were equally available, the less popular 90+ percent of titles — the "tail" — would account for about half of the media form's total sales in aggregate. This is where the concept has particular resonance to today's online media world, given its armchair access to all the world's catalogs of content.

In other words, when all published content of a given form is "in stock" at a

The immediacy of radio is its 'head,' and its collected archive of content is its 'tail.'

given retail venue, about half of all its sales will be made up by the bestsellers, with the other half going to all the other titles. In a world of physical inventory, this is a difficult algorithm for any vendor to satisfy fully. But in the virtual world of digital media, where every title need be stocked essentially just once in a "master file" form that can be copied as requested by each customer, the long tail concept rules.

For this idea to deliver its full value to any business model, however, both the head and the tail must be respected. Like a comet, the tail cannot exist without the head, and vice versa.

Radio's role

Given such analysis, many have asked in the interim how it applies to radio.

Traditionally, radio has played a part in the music industry's long tail, by amplifying, and perhaps effectively creating, its head. The bestsellers of music are continuously promoted by radio, with few or none of the industry's tail occupants appearing on air. Thus radio is a tool in the retailing of music content, acting as simply a single component in a larger machine.

But what of radio's own long tail? Is radio condemned to forever remain a foot soldier for the record labels, or can the medium leverage this concept to its own advantage in the digital age?

In engineering terms, given that radio

plies its wares not in the physical but in the time domain, how might the long tail apply if a transform were applied? A number of possibilities emerge when the concept is viewed along the time axis, in which radio's own head and tail become visible.

Let's assume first that the archetypal radio service we consider here adds some unique value by creating some of its own broadcast content, and is not a complete shill for the music industry by spinning discs full time. I sincerely hope — and still believe — that this is gener-

ally the case.

(If nothing else, local advertising fulfills this function at the most rudimentary level, but let's take the premise that at least some local assets such as news, sports, weather or other valuable program material are also created and broadcast by this station.)

With this in mind, it can be argued that the *immediacy* of radio is its "head," and its collected archive of local content is its "tail." In other words, in an age where it is possible for broadcasters to easily provide access to at least some of their content beyond its ephemeral, real-time broadcast lifespan, a station's Web site becomes valuable as a widely accessible repository of low-demand material,

The Big Picture



Photo: Gary Hoyer, BBC

by Skip Pizzi

while its on-air service remains its ubiquitous, high-volume site. If every visitor to the Web site seeking such archival content is considered, its aggregated

See COMET, page 20 ►



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Comet

► Continued from page 19
audience could become a non-negligible addition to the whole.

Market issues

By this thinking, today radio's head far outweighs its tail, but this need not always be so. In fact, current trends would argue that the differential is waning.

Consider NPR's recent redesign of its Web site, and its frequent on-air encouragements to listeners to check its site for more on a particular story. A visitor to that story's page may find (besides the story as it aired, presented in streaming media forms) some photos taken by the reporter, extended interview excerpts or

other audio material that did not appear on the air, plus links to other stories about the subject, other pieces by the same reporter, etc. — like a library's (or Amazon's) cross references.

In other words, the long web tail is thus appended to the on-air head. This is simply the latest incarnation of Nicholas Negroponte's and the MIT Media Lab's "tell me more" vision of the 1970s, now quantified with a new conceptual model.

Ultimately, IBOC multicasting may play a role here, as well, by which broadcasters on their main ("head") channels can reference and cross-promote longer-form or special-interest "tail" content on their supplemental channels.

Moving away from radio's home-grown content, and returning to the other traditional radio function of music

discovery, similar features could apply. For example, many radio stations already leverage their computer-based playout systems' metadata to feed RBDS, PAD and online "now playing" displays. On the latter, a few stations now include links to music download services where listeners can purchase a copy of the song currently airing. Some stations also include retrospective program guides online, so listeners can explore and purchase songs broadcast earlier — and the stations announce this feature's availability on the air.

Here again, a real-time head is attached to a historical tail. Listeners tune in for the "now" experience, but may come away with a permanent purchase of a particularly favored musical experience. (Put another way, this is the "rent-to-buy" audio business.) Appropriately,

radio stations may receive a "finder's fee" for this discovery or content-referencing service, as some of the radio stations working in this area have arranged.

Such a two-tiered approach to content delivery — one providing a few high-demand offerings on-air, and the other including many low-demand units online — can be a helpful model to broadcasters as they learn to manage their and emerging services. A proper balance of heads and tails will keep radio vital and relevant in the modern media world.

Skip Pizzi is contributing editor of Radio World.



Suppliers and equipment buyers, send news of recent purchases to radio.world@imaspub.com.

NextMedia picked Prophet Systems' NexGen for its stations in Aurora, Crystal Lake, Waukegan and Joliet Ill., as well as Pleasant Prairie, Wis. ...

Jampro Antenna/RF Systems shipped an RCHA-323-10HD FM High-Power Combiner to the Mass Communications Organization of Thailand to support the country's inaugural HD radio transmission. MCOT was granted a special license to broadcast HD Radio and will transmit programming to the greater Bangkok public transportation systems.

Separately, Jampro was awarded the contract to supply Kent State University's WKSU(FM) with two low-power JLLP antennas to expand the station's repeater and translator system.

And Millcreek Broadcasting developed a new antenna site in Utah's Bountiful State Park, hiring Jampro to handle site design and installation. The project called for a low-profile system that could handle eight FM frequencies with room for expansion while minimizing downward RF levels. Millcreek owns FM stations KHTB, KUDD and KUUV in the Salt Lake area. ...

Broadcast Electronics said orders for Messagecasting products from The Radio Experience have tripled in the first six months of 2006 compared to the same period last year. A BE official said one reason is the product line's capabilities in the area of "interleaving," being able to interleave dayparted promotional and sponsored messages with song title and artist text. BE Messagecasting is available by the module or as a package.

Separately, BE deployed studio and transmission equipment to Ethiopia in a project valued at \$1.5 million. The equipment is for six new FMs to be operated by South Nations, Nationalities and Peoples Regional State Mass Media Organization, a government broadcast organization in the southern region of Ethiopia.

Included in the contract were AudioVault digital media systems, FM 1 kW transmitters, STLs, towers, generators and turnkey installation and training. BE partner Zami Public Connection recruited and trained local staff that will run the operation. Equipment installation for the six stations was expected to start in August. BE and its partner earlier built a turnkey FM station, Radio Voice of South (Ravos), broadcasting in the regional capital of Awassa.

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lucid



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230 List \$799.00

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APHEX

Neumann TLM49 Studio Mic

We don't start these rumors – we just spread 'em. But we think that there may be some truth to this one... For starters, we understand that those who have heard the TLM49 think they are listening to a warm, smooth, creamy-yet-crisp U 47. Then, there's the way it looks. Neumann doesn't acknowledge the U 47 comparisons, but says that it has a Tube Emulation circuit that gives it this special sound. Whatever they are doing, they seem to be doing it right. Grab a few of these and open up your own Abbey Road. Comes with the cool shockmount pictured!

TLM49 List \$1,699.99

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Oscar Brand Sets Longevity Record

by Ken R.

No one ever told Oscar Brand he officially had the job of show host on WNYC(AM) in New York. Not on Dec. 9, 1945; nor the next week, when he showed up again; nor the week after that.

But after more than 60 years on that same radio station, it's unlikely he'll be fired.

Brand's is the longest-running show with the same host still on the air, according to The Guinness Book of World Records. WNYC, heard on 850 kHz and 93.9 MHz, calls itself New York's flagship public radio stations.

Navigators

A Canadian immigrant, Brand had completed college and a stint in the army by the end of World War II and didn't know what he wanted to do for the rest of his life.

"I loved radio," he said. "It had funny shows, dramas and offered remarkable, fantastic worlds which people believed in. I started writing plays and satires, which I submitted to several NYC stations with no luck."

Eventually, however, WNEW(AM) and WNBC(AM) responded, and Brand performed on a couple of occasions for those outlets; but nothing further came of it.

"Then I sent notes and Hermann Neuman, station manager at WNYC, told me to come down the next Sunday,"



Brand at the taping of 'Celebrating Oscar,' a special saluting his 60th anniversary at WNYC.

Brand said.

"He was a fine man who was noted in Europe as a composer and made classical fans of many people in this country, too. I went in and he took me down to Studio B, which is still there."

Brand was amazed to witness a full-blown radio show created live on the air. Shortly thereafter the station produced a drama that young Brand had written. In those days radio plays required between

30 and 40 people including on-air talent, boom operators, sound effects men and engineers. And programs didn't always begin and end at exactly the right time.

"If it started at 6:04 instead of 6:00, who cared?" said Brand. "In the early days I wrote and directed these shows and there wasn't much stress. We didn't have to worry about government censorship and we certainly didn't have much of a budget.

We were out there as navigators on an uncharted ocean and it was an exciting time."

The lure of radio

Neuman kept asking Brand to return, week after week; and Brand loved it. "People were listening," he said. "Hundreds and thousands of them."

Noted guests like Lauren Bacall, Eleanor Roosevelt and many others dropped in. Entire Broadway casts visited the station to perform without pay to promote their shows. Caesar Petrillo, president of the American Federation of Musicians, had to grant special permission for that.

Brand loved music, especially folk music. He featured pioneer performing and recording artists in that genre on his shows long before they found mainstream success. One station photo, taken around 1950, shows Woody Guthrie, Jean Ritchie, Fred Hellerman and Pete Seeger.

In his spare time, Brand taught guitar to earn extra money, though he was not a trained musician.

"My course was called, 'How to Play the Guitar Better Than Me,'" he said. "I taught the ability to create chords, and many people still use my system."

Brand was also a writer of prose, known for his storytelling abilities.

"I wrote scripts about strange places

and made sounds part of the fabric of these shows," he said. "I ended up as a narrator for CBS radio and in fact had a 90-minute program every night called 'Oscar Brand's Little World of Music.' Then I went to NBC and did a series of children's shows and became director of music for children's programs on that network."

All this while Brand continued his shows on WNYC.

Records of note

As if Oscar Brand didn't have enough to do, he embarked on a recording career, creating dozens of albums with titles like "The Best of Bawdy Songs," "For Doctors Only," "The Best of the Worst" and "Songs for Tadpoles" — to say the least, an eclectic catalogue of music.

Brand also was involved with helping PBS plan "Sesame Street," and the producers allegedly named a popular character after him: Oscar the Grouch.

"Oscar Brand's Folksong Festival" is still on the air. The octogenarian host keeps going and going, like an audio



'American Music Festival' host Oscar Brand, center, with blues singer Josh White, left, and Lord Burgess, 'the father of modern calypso.'

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GUEST COMMENTARY

A Look at 'Truthiness' In HD-R

Mixed Press About HD Radio and What It Really Means

by Mark Ramsey

A year ago, the author wrote in this space about what he saw as poor marketing of HD Radio. Here he updates his observations.

It's becoming a trend: Articles in major newspapers express the industry's HD Radio hopes besides the writer's natural skepticism. In this case, that skepticism is best expressed in the title of a July 3 piece in the Boston Herald: "Listen up: HD Radio struggling to be heard."

There are a number of emerging themes or "talking points" in these articles, which are obviously the product of the HD Radio PR machine (and there's nothing wrong with that, by the way).

Those themes are:

- HD Radio is hugely important to the radio industry.
- Why aren't people listening to it?
- When receiver prices drop, demand will explode.
- The industry is investing 200 million bucks to get the word out.

Let's consider each point in turn.

Yes, HD Radio is presented as being hugely important to the industry. But how important is it really?

See HD-R SELL, page 26 ▶

Ibiquity Changes FM IBOC Emission Mask

Ibiquity Digital has eased slightly its emission mask specifications for FM IBOC.

In a Notice of Ex Parte Filing with the FCC, Ibiquity stated that these "minor adjustments" are "based on additional analysis and real-world experience."

The 250–600 kHz offset changes from near –80 dB to –74.4 dB, plus average weighting changes.

Specifically, Ibiquity states:

"For hybrid transmissions, measurements of the combined analog and digital signals shall be made by averaging the power spectral density of the signal in a 1 kHz bandwidth over a minimum time span of 30-seconds and a minimum of 100 sweeps. Compliance will be determined by measuring the composite power spectral density of the analog and digital waveforms. 0 dBc is defined as the total power of the analog FM carrier.

"Under normal operation with analog modulation present," it continued, "the following requirements shall be met at all times. Noise and spuriously generated signals from all sources, including phase noise and intermodulation products, shall conform to the limits as described in the following paragraph and shown in the chart."

- The measured power spectral density of the Hybrid analog and digital signals at frequencies removed from the center of the channel between 100 kHz and 200 kHz shall not exceed –40 dBc/kHz.

- The measured power spectral density of the Hybrid analog and digital signals at frequencies removed from the center of the channel by 200–250 kHz shall not exceed $[-61.4 - ((\text{frequency in kHz}) - 200 \text{ kHz}) \cdot 0.260]$ dBc/kHz.

- The measured power spectral density of the Hybrid analog and digital signals at frequencies removed from the center of the channel between 250 kHz and 540 kHz shall not

Figure 1 HD Radio FM Hybrid Waveform Noise and Emissions Limits

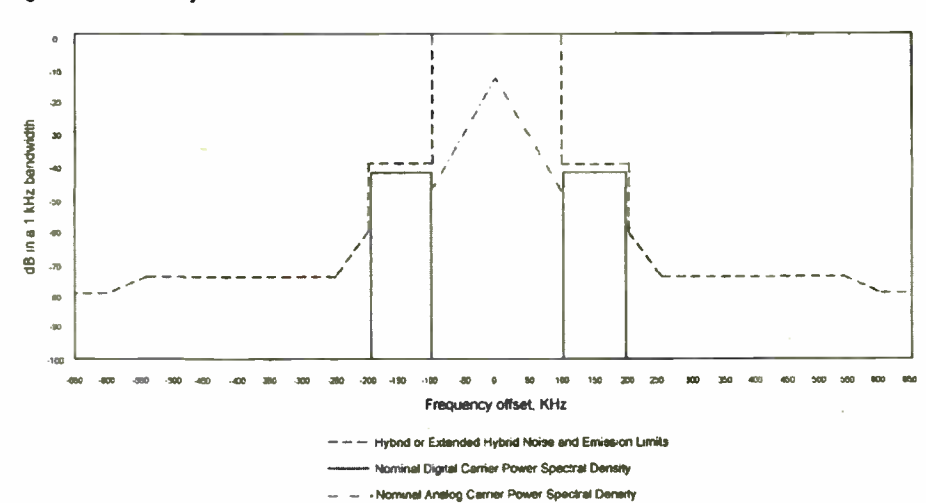


Table 1 HD Radio FM Hybrid Waveform Noise and Emissions Limits*

Frequency Offset Relative to Carrier	Level, dBc/kHz
100-200 kHz offset	-40
200-250 kHz offset	$[-61.4 - ((\text{frequency in kHz}) - 200 \text{ kHz}) \cdot 0.260]$
250-540 kHz offset	-74.4
540-600 kHz offset	$[-74.4 - ((\text{frequency in kHz}) - 540 \text{ kHz}) \cdot 0.093]$
>600 kHz offset	-80

* The requirements for noise and spurious emission limits defined in this subsection reflect acceptable performance criteria. In certain circumstances, additional measures (filtering, active emissions suppression, etc.) may be needed to reduce the spectral emissions below the limits given in this subsection in order to reduce mutual interference between broadcast stations.

exceed –74.4 dBc/kHz.

- The measured power spectral density at frequencies removed from the center of the channel by more than 540–600 kHz shall not exceed $[-74.4 - ((\text{frequency in kHz}) - 540 \text{ kHz}) \cdot 0.093]$ dBc/kHz.

- The measured power spectral density at frequencies greater than 600 kHz from the center of the channel shall not exceed –80 dBc/kHz.

Overall, the changes "will allow the introduction of a more efficient digital emission mask facilitating the successful introduction of HD Radio," states the company in the July 5 filing.

Unclear was whether the agency would incorporate the new figures into its final authorization IBOC, according to a company source.

— Leslie Stimson

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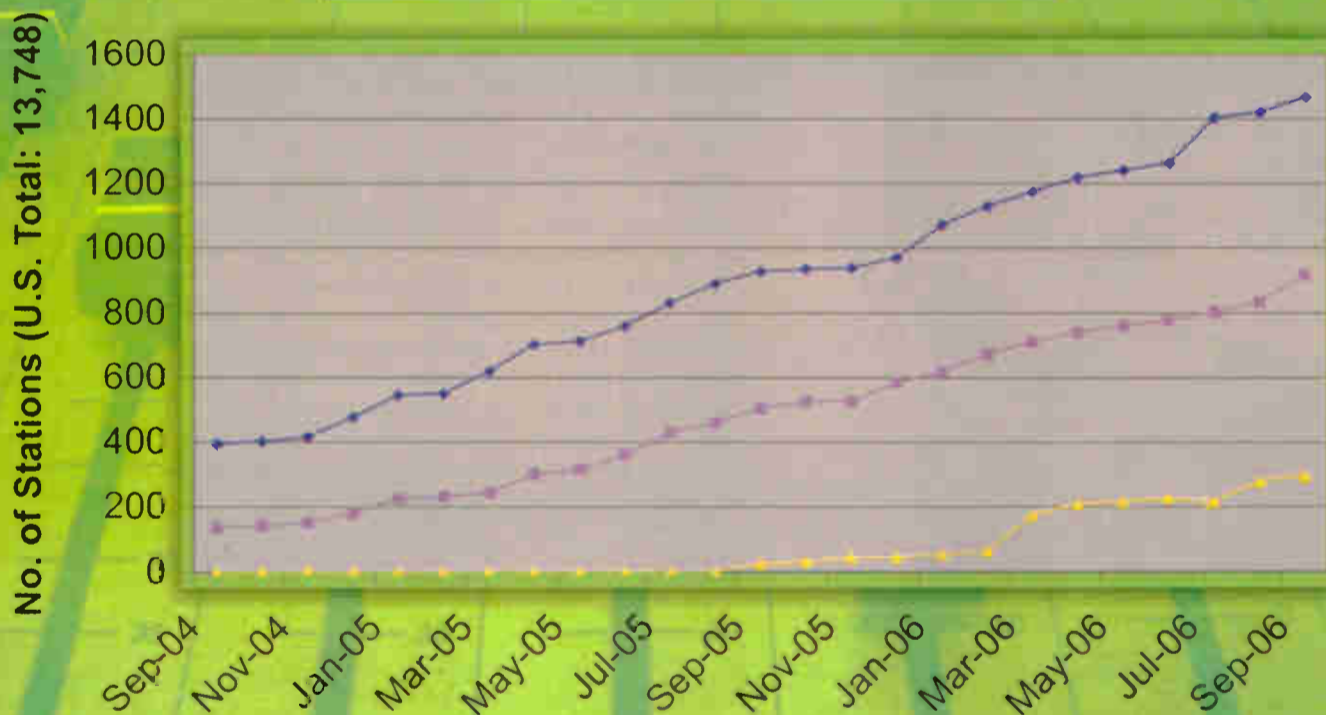
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Radio World's HD Radio™ Scoreboard

The HD Radio Scoreboard is compiled by Radio World using information supplied by iBiquity Digital Corp. and other sources. The data shown reflect best information as of July 27. This page is sponsored by Broadcast Electronics. HD Radio is a trademark of iBiquity Digital Corp.

Two Years in HD Radio

— Licensed — On the Air — Multicasting



The HD Radio Bottom Line
Total Licensed On the Air

1,469 917

Last Month
Total Licensed On the Air

1,420 834

Market Penetration
United States

13,748 AM & FM Stations
(excludes LPFMs)

Number of
FM Stations
Multicasting:



294

■ Licensed by iBiquity and on the air
■ Licensed by iBiquity and not on the air

HD-R Sell

► Continued from page 24

I was on a panel in late June for the Interep Bear Stearns Symposium and, of course, the topic of HD Radio came up. One panelist reported the non-trivial revenues HD-R was expected to bring in by 2007, if I remember correctly.

Two other panelists — both of whom work in sales-related capacities — indicated that they have no clue how the industry will earn that revenue. How important is a movement where the key to unlocking its revenue is misplaced somewhere around the house?

It seems to me — especially when one presents before an audience of buyers and investors — that one should have a

clearly devised revenue strategy, or at least the remotest sign of one.

Could it be that the prospect of a smattering of radios in every market is, in the truest sense of the term, a “hard sell”?

Also at this session I got to see a presentation from Ibiqity Digital about the exciting trends in HD Radio. If you read between the lines of this presentation, however, much of the promise of HD-R is strictly what the tech industry calls “vaporware,” benefits and features that don’t exist yet but will soon.

For example, the ability to rewind and replay songs you like on HD Radios. Not here yet, but will be soon.

What the presenter neglected to mention, of course, is that this technology can be applied right now today — to the same analog radio you listened to this morning. Any benefit of HD-R which is

also a benefit of the 800 million radios currently in circulation isn’t much of a selling point, is it?

Why aren't people listening to it?

Does it bother anyone else that every article written in any neutral publication, meaning a wide circulation newspaper as opposed to an industry trade, can never seem to reconcile the puffery with the usage or lack thereof? Is it good PR for potential listeners to be reminded that most people still aren’t listening?

The industry dearly needs better answers to this question because of the inadequacies of the following answer.

When receiver prices drop, demand will explode.

This is a tremendous myth. The Herald article quotes: “A recent Arbitron/Edison



Mark Ramsey

Media Research study found that more than one-third of Americans are interested in HD Radio, but nearly half said they would only purchase an HD Radio if it cost \$100 or less.”

This survey is hopelessly vague and worded with “deniability” in mind. For example, what does “interested” mean? And when I have a dollar to spend, which of the things I’m “interested” in will I spend it on?

HD Radio exists in anything but a vacuum. Further, the statistic that “nearly half said they would purchase an HD Radio if it costs \$100 or less” is absolutely, positively *dead wrong*. Of course, from a “deniability” standpoint, “would purchase” and “will purchase” are not the same.

Such is the level of “truthiness” in the world of HD Radio.

The industry is investing 200 million bucks to get the word out.

This is presented as an expression of an industry’s commitment. But think about it, how many times have you seen the commitment promoted better than the product being committed to?

Perhaps Apple spends \$200 million to promote the iPod, although I doubt it, but they don’t go on and on about how much they’re spending to promote the iPod.

The iPod is what they’re selling, not the selling of the iPod! The natural momentum of a product in the marketplace, not the promotional budget, is its best selling tool.

For HD Radio, we’re selling the selling hard. Since listeners buy benefits and don’t buy “selling,” whom is this selling for? Could the answer be “Wall Street”?

Now truly, many stations are doing a huge job of getting the word out about HD-R and they deserve credit. But “getting the word out” never has been and never will be the problem.

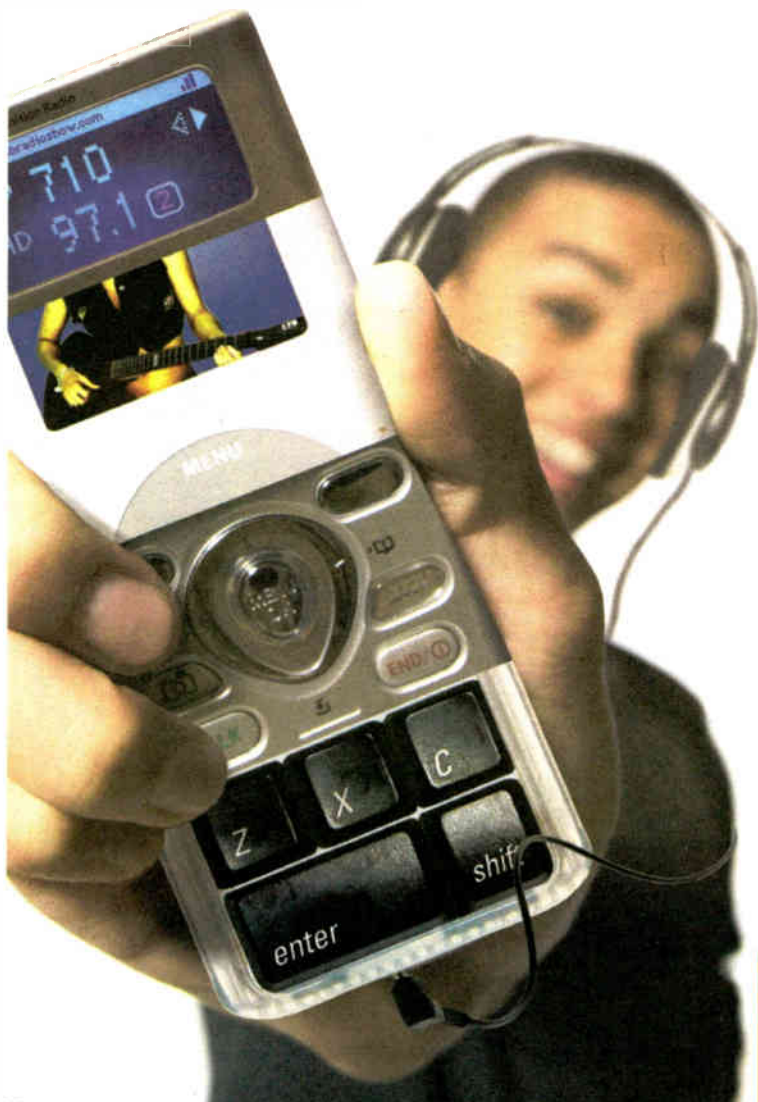
It’s really about time the powers-that-be in our industry faced up to that.

By the way, we keep hearing the “200 million” figure, but we’re many months into this effort. How much of that “200 million” has been spent already? Half?

Ramsey is president of Mercury Radio Research in San Diego. This article was adapted from his blog at www.radiomarketingnexus.com.

RW welcomes other points of view. ●

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FIRST PERSON

Receivers in Buffalo; But Is Anyone Buying?

by Brian Cunningham

The author is chief engineer for Crawford Broadcasting in western New York.

BUFFALO, N.Y. The HD evolution has begun here.

With RadioShack and other major electronics retailers announcing they will be stocking HD Radio products, and with increased advertisements in major car and audio enthusiast's magazines, the general public is beginning to realize the importance and benefits of this new technology.

I have noticed in my retailer visits over the past few months that receivers have recently dropped in price, some as much as 50 percent from the cost of the first-generation units. Most if not all are now



Brian Cunningham

multicast-capable, with the HD-R tuner built into the head unit, eliminating the additional costly purchase of the extra digital tuner.

With the drop in pricing and the ready availability of HD Radio receivers, many regular listeners of terrestrial radio are beginning to purchase HD Radio-capable receivers to check out what the buzz is all about. We have received several phone calls and e-mails here in Buffalo from regular WDCX listeners asking where they can purchase the radios and what advantages we have to offer on our HD-R channels.

To date, I know of only a handful of people outside the broadcast community who have purchased HD-R receivers for either their home or car, but I suspect that within the next six months or so, that number will have grown significantly.

The information is out there. I recently checked the Yahoo search engine for HD Radio and it returned 20.6 million results. Google returned an astounding 54.5 million results for HD Radio. The public is starting to take notice of digital terrestrial radio's existence and the benefits that accompany converting to multicast digital reception of their favorite stations.

But all is not favorable in HD Radio land. Many people nationwide have been fed incorrect information on how HD Radio works and what is required to receive it. A quick check is to go to YahooAnswers.com and enter "HD

Radio." You will be surprised, amused and a little bit angry at what some people's perception of today's radio has become. Until we can expel all the myths and predetermined perceptions of what HD Radio is not, our job is not complete.

Cunningham is based at WDCX(FM), which began broadcasting an HD2 channel in May. His comments are adapted from *The Local Oscillator*, Crawford's engineering newsletter, and are used with permission.

How are HD Radio receivers managing in stores in your area? Write to us at radioworld@imaspub.com.

HD RADIO BRIEFS

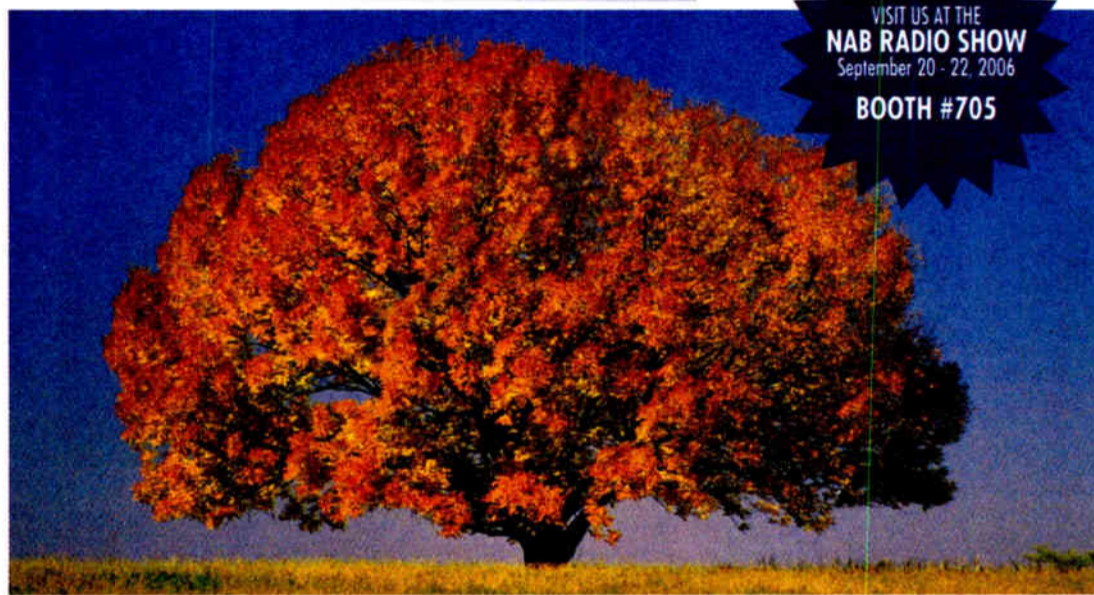
KAGAN RESEARCH doesn't expect HD technology to have an immediate impact on broadcast revenue, but in a summary of its latest Radio Financial Databook, the company said the investment in digital would have a long-term positive impact.

Kagan expects IBOC to generate \$1.6 billion in annual revenue by 2011, with the bulk of that coming from ad sales on secondary channels, which are now commercial-free.

MEMBER STATIONS of the HD Digital Radio Alliance are running a new flight of ads, part of a marketing/branding campaign named "Discover It!" This supplants the earlier "Are You Def Yet?" campaign. The campaign invites consumers to discover new, free, digital programming and multicasts. It launched in 50 markets including 22 new ones; the alliance said spots would be heard in 43 of the top 50 markets.

Using a portion of the combined \$200 million in unused ad inventory committed in December by alliance members, the alliance says it will become the largest or second-largest radio advertiser in each of 50 markets. More than 90 spots are running.

Amazon joins retail partners RadioShack, Tweeter and Crutchfield as the latest major retailer to carry HD-R radios.



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September 1, 2006

We'd Be Happy to Give You a Tour

Zandar Technologies, On Location Visuals Help XM Satellite Radio Stop Visitors in Their Tracks

by Mark Greenhouse

A corporation like XM Satellite Radio depends on its image as a cutting-edge home for the arts to attract performers, investors, directors and potential employees. It's a given that broadcast equipment must be pristine and appear high-tech.

In today's world of revolving-door technology, the extra "wow" factor is essential for such a company to make an impression with visitors to its facilities.

Transparent screens float in front of the two XM engineers' consoles at the JAZZ station in Lincoln Center in Manhattan, allowing the technicians to interactively select any item desired on their display while taking up zero topographical real estate. The screens hang in mid-air. The result is a futuristic, somewhat holographic display, with clear, sharp full-color images seeming to appear out of thin air.

XM Satellite Radio has On Location Visuals and Zandar Technologies to thank for this element of its "wow" factor.

In a project designed, installed and managed by systems integrator On Location Visuals, Zandar FusionPro+ MultiViewers are employed at several XM locations to render multiple sources to high-resolution displays.

Two systems are installed in front of DJ booths at the JAZZ station at Lincoln Center in New York; another unit drives the display in the lobby of XM's Washington headquarters, with a further system scheduled for installation in the control room area.

Take out the seams

The Zandar FusionPro+ MultiViewer permits multisource images to be projected onto suspended translucent screens provided by On Location Visuals. Capable of four processing cards and supporting up to eight scalable windows at up to 1080p resolution, the FusionPro+ MultiViewer, according to Zandar, uses a combination of 10-bit outputs, an advanced video processing engine and dynamic phase adjustment (in this application) for accurate pixel mapping to feed a Canon Realis SX50 projector at its native 1,400 x 1,050 resolution.

FusionPro+ is built on modular architecture consisting of a choice of plug-in processing cards and associated I/O, enabling users to combine formats — analog, video, SDI, HD-SDI, RGBHV computer sources, DVI sources and audio — in one system.

At the Washington headquarters of XM Satellite Radio, I met with Terry Carr, manager of broadcast applications, who showed me several functioning Zandar displays. Four Zandar FusionPro+ 1 RU

MultiViewers are employed at numerous locations to provide digital signage or full-color graphic images of the inner workings of the facility that include a mix of live and prerecorded video, audio and computer signals, as well as impress



Zandar's FusionPro+ projects a musical performance onto a transparent screen from On Location Visuals in the XM Satellite Radio lobby in Washington.

guests brought in to the facility.

The images were engaging; while at times there were as many as four activities taking place on the single screen, they were not separated by the familiar black lines used to frame each one, as with the familiar "picture-in-picture" technology. They maintained their own spaces and were separated seamlessly.

Then Carr took me into the "ECC," XM's version of Master Control. In the rear of the room was a curved wall filled with six 32-inch (diagonal) CRT television screens across by two 32-inch TVs high, all told measuring 200 inches wide by 68 inches high. Carr said Zandar has additional equipment for FusionPro+ to project images onto a single screen built to that size, which not only looks unique, as there is a seamless picture, but provides substantially more coherent visual information.

It also reduces the demands on air conditioning in the room, as the heat given off by the CRT electronics will disappear. Zandar Technologies has named this optional facility ZdH Zandar Dual Head Display, and says it provides cost savings to users worldwide.

On the big screen

MultiViewers permit diverse inputs for display on a single large screen, replacing the traditional monitor stack with a virtual monitor wall. Available as an option on FusionPro+ MultiViewer models, ZdH-enabled MultiViewers combine support for multiple inputs, of any format and in any combination, with the ability to drive two

displays on one monitor wall, seamlessly connected and simple to control with Z-Configurator software. Any of the inputs (up to 26 on the FusionPro+ 3 RU model), can be viewed on either display, including horizontally spanning the displays.

Additionally, ZdH provides device redundancy. In the event of failure of one display projector, the operator instantly can reroute channels to the remaining

after post-production effects.

Another value is apparent when one considers, for example, a 40-inch LCD typically costs more than six times a 20-inch LCD. Zandar's ZdH technology allows one to quarter a portrait display and then project it seamlessly onto four 20-inch panels, accomplishing the desired large image while reducing capital equipment cost.

The range of resolutions supported using ZdH includes the popular plasma, LCD and projection system resolutions.



XM Manager of Broadcast Applications Terry Carr

active display by recalling a pre-loaded recovery configuration.

This product is for mission-critical applications in Master Control rooms and Network Operation Centers.

With the Zandar MultiViewers, a director can sit in front of a monitor on the studio floor and simultaneously see the output of three sources as well as the program output of the mixer. The unit outputs a quad split-type display with each quadrant displaying the key images desired. This also allows for accurate side-by-side comparisons of before and

ZdH is enabled via software license with the FusionPro+ MultiViewer systems, and can be factory installed or provided as a field upgrade.

The Zandar Remote Panel is a desktop control pad that provides push-button control of one or more Zandar MultiViewers. The panel controls up to 100 serially attached units, including FusionPro+, Predator HD, DX and MX Series MultiViewers.

For more information, visit www.zandar.com.

Mark Greenhouse is a broadcast/recording engineer with NPR. Reach him at mark@markgreenhouse.com.

PRODUCT GUIDE

Audix Offers VX-5 Vocal Condenser

The VX-5 handheld vocal condenser microphone from Audix handles various live, studio and broadcast applications. It has a frequency response of 40 Hz – 16.5 kHz +/- 3 dB, and features a 14 mm gold vapor diaphragm, a supercardioid polar pattern and a -10 dB pad and bass roll-off filter.

Additionally, the VX-5 has a steel mesh grill screen and a satin black finish.

The mic handles sound pressure levels of 144 dB (in the pad and roll-off position) without distortion and also will provide more than 20 dB of ambient noise rejection for feedback control on live stages. It is suitable to capture acoustic instruments such as guitar, woodwinds and percussion, as well.

The VX-5 is available from Audix dealers and retails for \$299. It comes with a mic stand adapter, carrying pouch and one-year warranty.

Audix says the wireless version of VX-5 will be offered with the RAD360 wireless system, and will be available by the beginning of 2007.

For more information, contact Audix in Oregon at (800) 966-8261 or visit www.audixusa.com.



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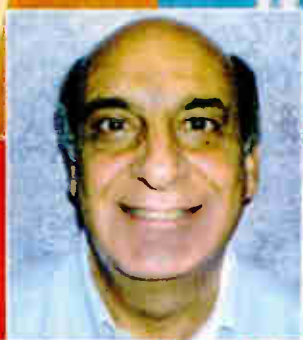
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CLASSIC GEAR

BE Spotmaster 500 Faces Extinction

Cart Machine Served Its Era Well, But Dwindling Replacement Parts Confirm Its Place in Antiquity

by Tom Vernon

No piece of equipment in the broadcast studio of the 1960s and '70s was more used and abused than the cart machine. It was subjected to an endless barrage of carts with commercials, jingles and news actualities by heavy-handed DJs. The endless-loop tape cartridge machine, with its ability to play short audio clips, was part of what made the top 40 and all-news formats possible.

From its inception in 1959, the Broadcast Electronics Spotmaster 500 was synonymous with the term cart machine. Automatic Tape Control Inc. (ATC) of Bloomington, Ill., and Tapecaster TCM Inc., located in Rockville, Md., were among early competitors, but Spotmasters seemed to be everywhere. A few are still in use, providing service to small-market and college broadcasters over 30 years after they were built.

Keeping it clean

Although a giant in the radio industry today, Broadcast Electronics had humble origins. Founded in 1959 by engineers at WWDC(AM) in Silver Spring, Md., the original manufacturing facilities were located in a garage next to the station.

For many years the company had only one product, cart machines. In 1977, BE left the Washington area for the rolling hills of Quincy, Ill., where it expanded and diversified its offerings. Broadcast Electronics entered the RF transmission business in 1979 with the introduction of the FX30 exciter.

The "Spotmaster 500" name was used for several models in the early years, leading to some confusion when it came time to order parts. The first 500s can be identified by a rounded cabinet and the spring-loaded start switch on the right side of the machine. The earliest record decks were hybrids, with transistorized playback and cue amps, and vacuum tubes on the record amp PC board. A rack-mount version of the machine also was available.

Next-generation 500s had the familiar square cabinet with Start and Stop pushbuttons on the front, and all solid-state electronics.

Inputs and outputs on the early Spotmasters were unbalanced, with connections via 1/4-inch phone jacks. Remote start, stop and record preset were made through an octal socket.

Throughout most of its life, the transport mechanism for Spotmasters was manufactured by Viking. The Broadcast Electronics deck was virtually identical to the transports that Viking provided to Tapecaster for their cart machines.

Although ruggedly constructed, Spotmasters required frequent visits to the shop to maintain good operating condition. Despite installation instructions to the contrary, many cart machines were located on top of vacuum tube consoles. The resultant heat made short order of electrolytic caps and dried-out lubricants. Moving parts simply wore out.

Regular maintenance duties included vacuuming out dust and debris, replacing belts, cleaning pulleys and lubricating the motor. A rhythmic thumping sound when the machine was in play indicated the flywheel was past its prime and ready to be replaced. Regular disassembly of the Papst or Hurst drive motors and lubrication with Wynn's Friction Proofing Oil kept them running smoothly.

Mechanical alignment of the deck included a screwdriver adjustment to set the striking angle of the pinch roller, positioning the head bracket, setting the pressure of the pinch roller and clearance of the flywheel thrust bearing. Head alignment on the early machines involved inserting a special flat wrench behind the head and slowly rocking it while playing an alignment cart. The process could best be described as slow torture.

Later BE introduced a head bracket with Allen wrench adjustments for height and azimuth, making head alignment a more scientific procedure.

The first-generation Spotmasters had no

adjustments on the playback and cue amps, and only bias level and frequency on the record amps. Later machines had the expected assortment of trimpots and tweakers.

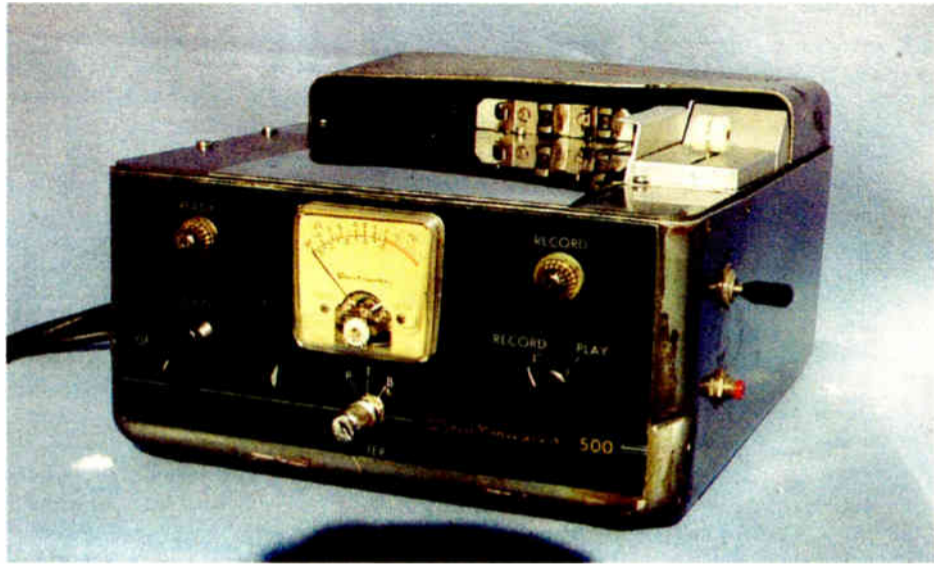
The basic 500 record and playback machines are best remembered, but the company also made limited runs of other

along with a host of other models.

In 1990 BE released the AudioVault line of hard-disk storage systems. The company ceased production of cart machines in 1995.

The Spotmaster 500 was manufactured from 1959 through the early 1980s. Neil Glassman, vice president of strategic marketing for BE, notes that full support for the product was provided for approximately 15 years after it was discontinued.

While a few of the Spotmaster machines



Later production runs of the first-generation Spotmasters had the more familiar black anodized front panel and a spring-loaded lever switch on the side to start the machine.



The earliest Spotmaster cart machines were manufactured with wooden cases. This one is from the collection of Tim Bealor at Broadcast Electronics.

machines in the series. In the early '60s, the 500 DA was introduced. It had a front-panel speaker and headphone jack, and was used to audition carts without tying up a production room. An even rarer item was the variable speed 500, which also featured a fast-forward function.

Beginning of the end

The Spotmaster 500 series was in production for many years, but advancing technology and changing times eventually took their toll. Direct drive cart machines were introduced, eliminating the troublesome belts and flywheel, and giving better performance in the process. Stations started putting music on carts, and a stereo cartridge standard was introduced.

BE responded with the release of the Ten/70 family of machines, with advanced features such as automatic fast forward, self-cancelling record pre-set and solid-state logic switching. At the same time, the 303C and 305C multicartridge decks were introduced. These machines were followed by the Series 2000 and 3000,

live on, their days may be numbered. Broadcast Electronics continues to sell the replacement parts they have on hand, but stock on some items has been exhausted.

"Nearly all of the parts that we at one time supplied for the 500 series cart machines have been discontinued by our suppliers, including the motors, the heads, the belts and especially many of the ICs," said Tim Bealor, vice president of RF systems and a long-time executive for the manufacturer.

"We still are able to supply pressure rollers, but not much more than that. As far as I know, there are no after market parts suppliers, unless someone was to go online and search for ... old-time broadcast distributors who used to keep stock of some of those items. We are no longer able to access them.

"We will continue to answer technical questions concerning the products, and we do keep documentation on hand, but supplying parts has gotten to be more and more difficult. I'm not sure we will be able to do that in any capacity much longer."

Tom Vernon is a frequent contributor to Radio World.

PRODUCT GUIDE

Califone Is Handy For Remotes

Lead Remote Engineer Mark Smith of Radio One in Cleveland checks the air signal on the Califone 2455AV-02 Performer Plus at a recent remote.

The cluster's Chief Engineer and IT Director Ric "Rocco" Bennett, tired of replacing boomboxes for remotes, selected the unit for its conventional features such as AM/FM tuner and cassette and CD player, as well as unconventional ones such as a stereo power amp rated at 7 watts per channel and six headphone jacks five of which are 1/4-inch.

The Califone Performer Plus has an internal electret microphone and an external mic input with independent level control that mixes with the selected line source. Bennett says operators like the stereo line input and output jacks. Smith finds the 1/4-inch jacks valuable at the remote site.

The Califone Performer Plus retails for \$325 and is available from authorized dealers such as HCI Pro Audio in Westlake, Ohio. Contact HCI Pro Audio at (440) 686-0180.





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GUEST COMMENTARY

Young Broadcasters, Take It Seriously

by Brian DeNicola

Legendary radio personality Bruce Morrow, known as Cousin Brucie and now heard by a national audience on Sirius Satellite Radio, feels somewhat dubious about how future broadcasters will carry the radio medium into a new era.

"The next generations have to take the lead and continue the great legacy we have set up over all these years," said Morrow. "My kind of radio is in a little bit of trouble because there are not too many people left around to teach and pass the baton.

"There is a lack of respect and responsibility today in this medium, and that concerns me," he said. "People with a work ethic, with great respect and responsibility, are rare; but we need them in order to survive."

I have to agree with Mr. Morrow. A young person who is a radio fanatic, with a passion to work in the business in a meticulous fashion, is an anomaly, but the breed is not extinct.

I consider myself part of an elite group of young broadcasters. I'm a 21-year-old college student working in the top radio market in the nation. I recently noticed I'm not alone.

Talk is the niche of radio in which I began working unsupervised at age 16. My first official gig was as a board operator and call screener for a program on WMCA(AM) 570.

Square peg

I knew the profound history of the station and its legacy in New York radio. The fear and trepidation I felt on that first day behind the controls were enough to make me want to vomit; but I didn't. The show went seamlessly, and throughout the experience I thought about one of my radio idols, for whom I now happen to work: Bruce Morrow.

Growing up I was addicted to the radio, especially WCBS(FM) Oldies 101.1. Everybody else my age was listening to WHTZ(FM) Z-100, the local top 40 station in the New York area. I was an oldies buff, which caused me to be a bit of an outcast when it came to popular music in middle school. But in a few years I'd be able to use my oldies knowledge to work as Cousin Brucie's co-producer on his Sirius Satellite Radio music shows.

As time passed and I became comfortable working in a stressful and sometimes belligerent behind-the-scenes radio environment, I established valuable relationships.

But there was something missing in my work to date: people my age interested in the business. I was surrounded by middle-aged people. At times it was intimidating; and in almost every conversation I felt as if I were being talked down to.

My kind of radio is in a little bit of trouble because there are not too many people left around to teach and pass the baton.

— 'Cousin Brucie'
Morrow

All of that changed when I entered the vivacious atmosphere of WABC. At age 19, I was offered an engineering board job at News Talk Radio 770 WABC(AM). I was overwhelmed at the opportunity and I jumped on it without hesitation.

Making the grade

Working for WABC opened my eyes. The first thing I noticed was the people who work there. Many were college-age, like me, working alongside professionals such as Sean Hannity and Mark Levin. Former CKLW and WCBS(FM) Disc Jockey Max Kinkel suggests that talk radio is "a great place to find a platoon of talent these days, because music radio has become fragmented in a way that cuts off the younger generation from hearing inspiring radio talent."

Michael Gunzelman was plucked from this platoon of talent. Gunzelman, 20, is a full-time junior at Fordham University. I met him shortly after I began working for WABC. He is co-producer of "The Mark Levin Show" and also works from time to time with Hannity. He screens calls while I run the board for the "Brian Whitman Show" on Sunday evenings.

Gunzelman said young broadcasters must be "prepared and dedicated" if they want to work in radio, and must perform as professionals. "If you don't, you're not going to be working in New York radio too long," he said.

When it comes to radio Gunzelman does everything in a scrupulous manner. He is so dedicated to his work at WABC that he admittedly lets his grades slide

See SERIOUS, page 33 ▶

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Serious

► Continued from page 32 and social life be disrupted.

"I sacrificed my school and social life to an extent, but the benefits are that I'm learning a lot from hands-on experience, and I can relate to topics we discuss at WABC in class discussions," he said. "I'm hoping someday all this hard work will pay off."

Gunzelman hopes to become a radio talk show host and continue to study political science at Fordham University as well as immerse himself in the business he lives and breathes. "My goal is to become an on-air personality someday. Whether it's talk or music, I'm unsure," he said.

As a junior at Rutgers University majoring in journalism and media studies, I too am unsure of my choice of medium. So I'm giving each a try. I've been dealt a lucky hand of cards; and one of the most fortuitous things to happen to me has been working for Sirius Satellite



Bruce Morrow and Brian DeNicola

Radio, where I got the opportunity to work with some of the most dignified people in the business. Bruce Morrow is one of those people.

The experience of working with Morrow and his staff at Sirius has been a dream turned into reality. I've been working with him for less than a year and he's taught me valuable lessons. One is that the most important element of a successful radio show is a staff that is competent and affable to everyone who makes the show possible.

A message to young broadcasters: Take radio seriously and learn respect for the medium if you wish to succeed. And never be afraid to speak up, because you just might be recognized.

Brian DeNicola is co-producer of Bruce Morrow's Sirius Satellite Radio show.

PRODUCT GUIDE

Orban Has Stereo Audio Processor for HD, Netcasts

Orban/CRL debuted the Orban Optimod-DAB 6300, a multipurpose stereo audio processor for digital radio, netcasts, STL protection, audio production and digital mastering. The company says it succeeds the Optimod-DAB 6200 and offers improved processing algorithms and flexibility.

The Optimod-DAB 6300 has 20 kHz audio bandwidth and 48 kHz internal sampling rate. It contains a stereo enhancer, AGC, equalizer, phase-linear multiband compressor/limiter with either two or five bands, and two independent stereo look-ahead peak limiters. The company says peak limiting can be "flat" or pre-emphasis-aware at 50 or 70 microseconds, allowing the 6300 to protect pre-emphasized analog STLs.

The 6300 incorporates Orban's PreCode technology, which pre-processes audio to minimize audible artifacts in low-bit-rate codecs such as the Ibiqity HDC codec used in HD Radio. Several of the 6300's presets use this technology to provide plug-and-play processing at low bit rates.

The processor can be used as a combined studio AGC, digital radio/netcast processor and low-delay talent headphone processor.

Any of its three outputs (one stereo analog, two AES2 digital) emit the output of any of the following processing chains: stereo enhancement, equalization and AGC without look-ahead peak limiting; the same, but with look-ahead peak limiting; stereo enhancement, equalization and multiband processing (two-band or five-band, including AGC) without peak limiting; and the same with peak limiting.

For more information, contact Orban/CRL in Arizona at (480) 403-8300 or visit www.orban.com.



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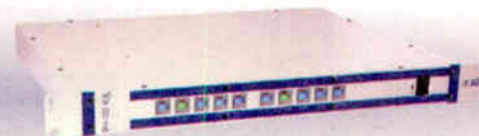
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Tech Updates



Inside

Radio World

Studio Furniture and Design

September 1, 2006

USER REPORT

Cluster Picks Smoothline for 43 Studios

Clear Channel L.A. Selects Customizable Harris Furniture for Multistation Facility With Limited Space

by **Terry Grieger**
Director of Engineering
Clear Channel Los Angeles

LOS ANGELES Intelligent workflow is an essential ingredient to the operational success of any consolidated radio broadcast facility. Clear Channel Los Angeles, with eight stations (five FMs and three AMs) and 43 studios spread over three floors, is a shining example of how planning and design have a lasting positive effect in multi-station facilities.

Press feature articles focused on the studio generally zero in on the production, on-air and routing equipment, while too often overlooking ancillary systems and products critical to the overall operation. Studio furniture is amongst these overlooked items.

One may argue that furniture isn't critical to the on-air product, but it is certainly important to both the look and feel of the studio. Perhaps more important, studio furniture is responsible for securely housing the equipment and providing a com-

fortable atmosphere for the personalities that bring life to the on-air broadcast. For these reasons, we opted for Harris Smoothline furniture in all 43 studios.

Clean lines

Clear Channel Los Angeles has been operational in its current state since mid-2004. The initial design phase of a consolidated radio facility this size is crucial for understanding exactly how much room is allotted for each studio. Upon receiving studio dimensions for the entire facility, we traveled to the Harris Pacific Design Center in Vista, Calif., to discuss our furniture requirements with Dave Schlegel and Paul Alsing from Harris.

Between their expertise and AutoCAD program, they were able to anticipate wiring, space and other ergonomic requirements we missed in our initial planning. One example relates to our lack of raised floors.

Harris offered design suggestions that would ease wiring and cabling complexity for equipment connections instead of

running the wiring underneath the floors. Each cabinet comes with multiple cable access holes for wiring consoles, automation systems, players/recorders and other studio components. These cable entry points are in close proximity to access points in the walls

dios, the facility also features two talk studios. These studios are designed more for comfort: Each one includes a horseshoe-shaped counter top, with room for up to six participants. The main host area also features a turret with clocks, on/off switches, headphone controls and a microphone.

Several voice-tracking rooms round out the Smoothline furniture installations, and feature a basic countertop



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to facilitate wiring and inter-facility connections.

Smoothline furniture is customizable, which is important when working with limited space. The modern radio studio environment generally offers less space than in the past, and requires a compact furniture footprint. Most of the furniture designs are similar for each on-air and production studio, all of which support Harris BMXdigital consoles and VistaMax frames for inter-facility routing and source sharing, plus Prophet automation stations.

This design not only addresses our space limitations but also reduces construction costs, which would be more expensive if we had opted for varied Smoothline designs throughout the facility.

The biggest difference between the on-air and production counter tops is in the integration: The on-air counter tops are designed to be stand-up in height, while the production tops are adjusted for traditional seating. Harris also specifically designed "pull-out" racks for our smallest studios. This allows us to store our systems against the wall when not in use.

The vinyl T-molding on the edge of the counter tops also is color-coded to match specific chairs in each studio. Chairs that go missing are easily identified through this color-coding.

While each on-air station is supplemented by two or three production stu-

diplomats, these counter tops support a Harris StereoMixer digital console with a Prophet automation station and microphone.

Harris also assisted with integration, sending a team of five to six engineers to build out the studios. The documentation delivered with the furniture allowed the team to build out each studio within a couple of days. Our in-house engineering team applied anti-static tile to the floors for the comfort of operators. The wiring contractor pulled the wiring between the studios and central server room, also employing wiring harnesses built out at Harris' Mason, Ohio facility.

The Smoothline furniture also eases maintenance procedures in each studio, thanks to the clear wiring and cabling connections afforded through the design and integration.

My suggestion for engineers building out new studios would be to view photos of other recently designed facilities, paying special attention to the furniture design. It is truly an essential component of every studio. I also would suggest talking to the people at Harris, which has done excellent work in furniture design for stations and facilities of all sizes throughout the country.

For more information, including pricing, contact Harris Radio Broadcast Systems in Ohio at (513) 459-3597 or visit www.broadcast.harris.com.

E-mail **Claudia Van Veen** at cvanveen@imaspub.com or call **1-703-998-7600 x 154** to reserve your space.

USER REPORT

Lightner Makes Beeline for A-Line

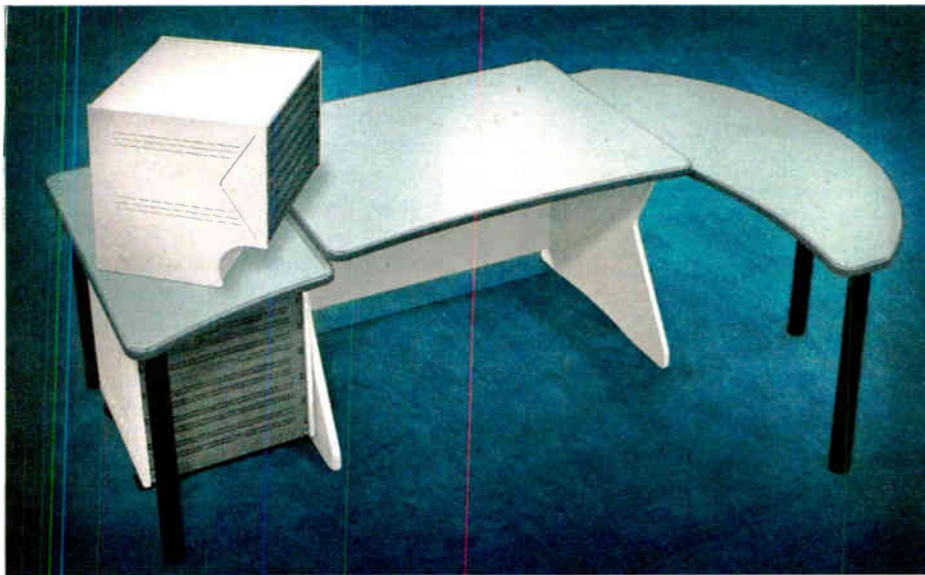
Company Appreciates Modularity, Precision, Easy Installation of Wheatstone's Furniture

by **Matt Lightner**
President
Lightner Electronics

CLAYSBURG, Pa. Lightner Electronics was contacted to do an integration project for First Media Radio in Lexington, Va. Due to some complications, the stations had to move quickly, as the lease was expiring in their former studio building. So we needed cost-effective

Assembly of the other modules went quickly. The complete set of furniture was finished in about three hours.

While this furniture is cost-effective, Wheatstone did not leave out important features. The center desk has a metal-vented wire tray/shelf underneath that is versatile. We used the shelf to hold the multiple KVM extender boxes, and the other areas to route the cables going from the counter-turret and underneath the cabinet to



Wheatstone's A-Line Furniture

studio furniture fast. We chose Wheatstone's A-Line furniture.

The first step in the design process was to have the program director and station manager go to the Wheatstone Web site and pick the configuration they wanted for the studio. The site has pictures and list prices of the basic configurations, as well as modules. The A-Line furniture is completely modular so whatever pieces you pick integrate into a working system.

Two weeks after the order, FedEx arrived with the furniture. It came shipped flat in approximately nine boxes for our configuration. Every box was clearly marked with what module it contained, and whether or not it was part of multiple boxes for that module.

First assembly

The first task was to assemble the desk support base. At first I thought this is going to take awhile, as there were many wood screws required to hold everything together. I was wrong. I grabbed my handy electric screwdriver, a must for assembling this furniture, and it went quickly. Each hole was predrilled with precision. I've never assembled furniture where every hole lined up.

In about 20 minutes the base was assembled, and then we attached the countertop. Wheatstone decided to assemble the modules using wood screws for added strength. I'm glad they did. I left for lunch, and when I returned the 250-pound electrical contractor was standing on top of the desk assembling the track lighting in the studio. I was a little unhappy but decided to calm down and ask him how sturdy the furniture was. He said it did not move at all.

the punch blocks. The wire tray/shelf has holes cut in the shelf that let us run the cables down onto the modesty panel where we mounted the Krone blocks.

For more information, including pricing, contact Wheatstone in North Carolina at (252) 638-7000 or visit www.wheatstone.com.

TECH UPDATES

E-Rack Manages Dense Cables, Wires

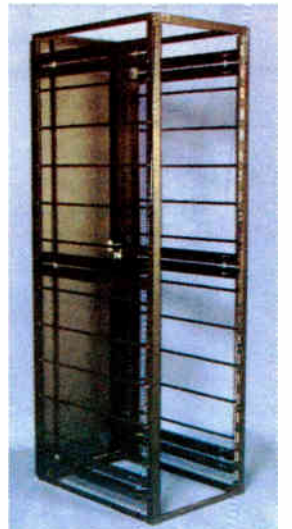
APWMayville offers the Stantron E-Rack broadcast rack, a 22-inch-wide system with horizontal lacing brackets. These, it says, ease management of cables by spreading them from front to back. The integrator can tie cables in strategic areas to accommodate a narrower space.

Features include a powder-coat finish; thin profile strips for space savings in high-density wiring applications; a variety of cooling fans and devices; and filler panels to plug open spaces.

The company offers other broadcast studio furnishings such as the Frontier series of sloped consoles, which are designed with a 19-degree sloped front to ease viewing of monitors; and the Pioneer enclosure cabinet, which is available in pre-configured and "Configure Your Own" versions. The company says both versions of Pioneer are suitable for multibay applications with potential for growth.

APWMayville has an audio-video rack available in several heights and depths; and various studio accessories such as doors, shelves, drawers side panels, instrument cabinets and modular writing desks to allow customization of the enclosures and consoles to varying specs.

For more information, including pricing, contact APWMayville in Wisconsin at (800) 558-7297 or visit www.stantronracks.com.



Middle Atlantic Accessories Ease Power-Strip Installation

Middle Atlantic Products has cord kit accessories for its PDT Series of configurable thin power strips. They attach to a PDT power strip J-box and facilitate a change from a hard-wired to a corded power strip.

The company says the accessories ease ordering and installation of UL-listed PDT Series strips in broadcast enclosures, as well as extend an installer's level of customization.

PDT Series power strips are field-configurable for the installer's choice of single or dual circuits, and isolated or non-isolated ground. They are available in 15- and 20-amp models, and provide additional power distribution choices inside enclosure systems.

Outlets are positioned to accommodate plug-in power supplies. The company says the J-box eases hardwiring and alternating outlet colors to denote separate circuit sources when configured for dual circuits.

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

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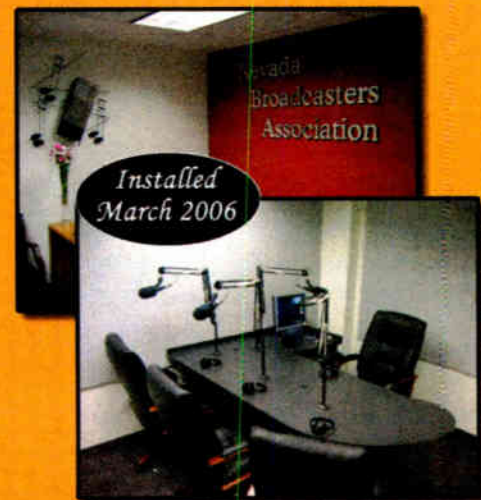
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USER REPORT

WWBA, WHBO Take Penthouse Suite

Tapped to 'Establish In-House Image,' Balsys Outfits Studios Overlooking Bay

by **Bobby Gray**
Chief Engineer
Genesis Communications

TAMPA, Fla. This has been an exciting year for WWBA and WHBO, two AM stations owned by Genesis Communications in Tampa. We expanded our programming and made several notable additions to our air and management

staffs. We also had the opportunity to relocate from what had increasingly become cramped quarters to new penthouse suite studios in a modern high-rise building with stunning views of Tampa Bay.

There are always what seem to be a million details involved in such a move. One of the early decisions we made regarded studio furniture, as its look and functionality would establish the in-house



The furniture in WHBO's talk studio was designed to match the room's unusual geometry.

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WZBA Baltimore, MD KYSL Frisco, CO
WRBZ / WDNC Raleigh, NC
KNEW (Clear Channel) San Francisco, CA
Metro Networks Jacksonville, FL
Univision Radio Houston, TX
KPAM Portland, OR (in process)
KCWU Ellensburg, WA (upcoming)

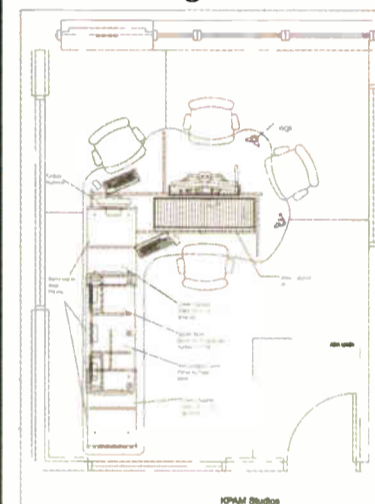
"I'm blown away" - Dave Williams, Director of Engineering, Clear Channel San Francisco

"High quality, heavy duty furniture. Great workmanship and finish. Most importantly, it was packaged so well that we had no shipping damage. Design services were excellent. We got an effective, attractive, user friendly design."

- Jon Banks, Jon Banks LLC, Technical Consultant to Krystal 93 Radio, KYSL, Frisco, CO

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CAD drawing



CAD rendering



image as well as provide an atmosphere to stimulate the talent. We performed substantial due diligence on this subject, contacted several other stations that had recently built new studios, researched a number of furniture fabricators and finally decided to turn the project over to Balsys Wood Arts in Orlando.

Natural oak construction

By the time we brought Balsys on board, we had a general floor plan from our architect, but little other detail regarding the final construction details. Balsys provided a few iterations of suggested studio layouts — which was challenging due to unusual shapes and sizes of a few of the rooms — as well as restrictions regarding wiring paths from TOC.

The company concentrated on our desire to have the furniture in the control rooms built "wall to wall" to provide as much work space as practical. It even made some suggestions regarding changes to studio sizes, door locations and ADA issues that were incorporated into the final design.

When final designs were approved, Balsys worked with our general contractor and electrical contractor to assure the rooms were built to specification so the furniture would fit as designed, including site visits to template spaces after walls had been erected.

The final furniture design incorporated natural oak construction with laminate tops per color choice, as selected by our interior decorator. General construction is of high quality and rugged, with solid oak edges to withstand the years of use we foresee in these studios.

Balsys also included vertical cable chases to house the wiring between rooms. Internal wiring within the furniture spans all areas with wide access doors for internal terminal box and rack areas. Slide-out racks are included where the furniture is placed against walls, providing quick and easy access for wiring and maintenance.

One of the most pleasing aspects of working with Balsys was their attention to detail. It supervised the moving of furniture into the new spaces, assembly and leveling, and then cut holes for consoles, headphone panels and wiring access with interactive on-site input from our staff as they mimicked daily operations to evaluate the ergonomic impact of the placement of each item.

For more information, including pricing, contact Balsys Wood Arts Inc. in Florida at (407) 654-7611 or visit www.balsys.com.

TECH UPDATES

Studio in a Box Uses ProFoam to Control Reflections

Acoustical Solutions offers RPG Diffusor Systems' Studio in a Box treatment packages, which contain image tools to control comb-filtering that can arise from strong reflections, spatial tools to increase the diffusion in small rooms and bass tools to minimize low frequency room modes and speaker boundary interference distortion.

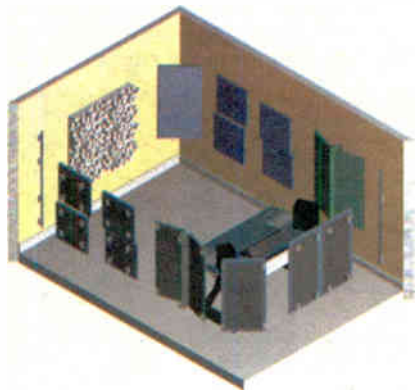


Image from the data sheet for RPG's Studio in a Box.

The company says it designs the kits with RPG, the manufacturer, and each treats a 14 x 10 x 8-foot room. Add-on materials are available for larger spaces.

The Studio in a Box Silver Package features ProFoam nestable foam for controlling first-order reflections. RPG says a Variable Depth Air Cavity offers enhanced absorption compared to a flat panel; absorption efficiency increases as ProFoam is stacked.

Tiles are mounted in a 1 x 1-foot checkerboard pattern to provide a variable impedance surface, offering moderate passive surround sound. The design attenuates and disperses spatial reflections. The checkerboard pattern offers useful scattering above 1000 MHz compared to a flat wall.

The ProCorner increases low-frequency absorption by increasing acoustical foam thickness in the corner, while visually extending and integrating with the ProFoam wall design. The absorption of a ProCorner extends down to 125 Hz.

Studio in a Box installation entails applying construction adhesive to the foam ridges that contact the mounting surface. Panels are to be mounted 2 to 3 feet above the floor so they provide reflection control in the seated and standing positions; they are available in white, white fleck and gray fleck Class A Melaflex, as well as charcoal gray, blue and purple Class B/C Polyflex.

RPG's Studio in a Box starts at a retail price of \$735.

For more information, contact Acoustical Solutions in Virginia at (804) 346-8350 or visit www.acousticalsolutions.com.

Coming up in Buyer's Guide

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Efron Provides Vegas Studio

The Nevada Broadcasters Association selected Efron Computerized Studios' ECS Studio for its Las Vegas headquarters' radio studio.

The design is essentially an office desk with a return, built to house the electronics components necessary for the functioning of the studio. It includes rack-mount space and a cabinet for the computer tower, with rear access to components.

Ventilation is achieved by air passing under the baseboard, up through slotted cutouts in the cabinet bottoms and out through side vents at the top of the cabinets.

The units are constructed of 3/4-inch plywood with a lacquer finish on the cabinets, and a laminate on the desktop. Sides are finished, allowing for placement against or away from a wall. Casters are mounted on the frame to allow the unit to be rolled without disassembly.

Contact Efron Computerized Studios in Las Vegas at (702) 938-0475 or visit www.efronstudios.com.



Laura Mir
Chief Broadcast Engineer
Radio Free Europe/Radio Liberty
Washington, DC

photo credit: Carol J. Farman Photography

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USER REPORT

Mager Helps KIFM Keep Valley View

by **Bill Eisenhamer**
Staff Engineer
KSON(FM)/KIFM(FM)/
KBZT(FM)/KSOQ(FM)
Lincoln Financial Media Co.

SAN DIEGO A couple of years back we decided it was time to upgrade our facilities, much of which is 10 years old or older. Through many unavoidable delays such as weather, a partial tower collapse and change in personnel, we managed to remodel our country station, KSON(FM), last year. The beginning of this year called for the remodel of our smooth jazz station, KIFM(FM). As with all studio projects, budget, function and feel are the main focus points. With such goals in mind, Mager Systems is my choice when it comes to furniture.

The design of the air room got off to a rocky start, as I had a difficult time finding a way to arrange the room so the air

kept observations, which resulted in minor changes before construction began. We have a unique freight elevator situation for a 10-story office building, so I forwarded dimensions of the elevator car, the doors and the hallways through which we had to carry the furniture.

He created a mock elevator car in his shop to make sure the largest section of the countertop would be delivered without any field modifications. On delivery day we had four inches to spare with the largest countertop section.

Mager personally installed our furniture with care. I like the level countertop, made of Avonite with a subsurface of 26-ply Finland birch. No pens are rolling on this surface.

The Avonite is only a half-inch thick, so Mager builds the edges of the countertop with layers to achieve the two inches necessary to "hide" the subsurface. Kizziah and I discussed adding detail to the edge,



Mike Vasquez, program director, and Kelly Cole, music director and afternoon drive talent, in the KIFM studio.

talent continued to have the seventh floor view of Mission Valley and would not have to have their backs to the door as in the original layout. In addition I had to work with the original prefabricated enclosures, which did not allow for moving the existing cable and power access.

After much consultation with the PD Mike Vasquez and Chief Engineer Eric Schecter, I created a CAD drawing with the layout and elevations for distribution. I forwarded the drawings to two manufacturers, one of which was Mager Kizziah. As our budget was tight, we had little "wiggle" room for changes and unknown surprises. As it turned out, Mager, with his quality materials, came in with a comparable price to the second vendor including delivery. The choice was easy.

Mager is a professional cabinet-maker. He took my drawings and made some

and we added a different color of Avonite. We named the detail "the racing stripe." Everyone liked this detail. Grommet holes and on/off/cough panel holes were field cut. Mager even made custom Avonite end-bells, which match the countertop, for our new SAS Rubicon console.

The cabinets, made of 13-ply Finland birch and engineered lumber, fit as planned. Using the same color as the stripe, I took things a bit further and asked Mager to create end caps on the narrow countertop support that houses the wiring blocks. This too was a hit among the air staff.

Cabinets have enough space to add D-rings for wiring and to mount AC power strips. I asked Mager to create a removable panel with smoked Plexiglas to cover the front of the SAS RioLinks and Radio Systems patch panel. I received a panel that looks good, is functional and is quite sturdy.

The KIFM staff feels comfortable in their new studio, and that reflects upon their on-air performance. For more information, including pricing, contact Mager Systems in Phoenix at (623) 780-0045 or visit www.magersystems.com.

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USER REPORT

Omnirax on Tour With Westwood One

Syndicator Selects Furniture for Builds in New York, Los Angeles and Houston

by **Conrad Trautmann**
SVP Engineering & Technology
Westwood One Inc.

NEW YORK At Westwood One, we were introduced to David Holland and Omnirax by our good friends at Sierra Automated Systems. We had a studio

the new studio design to Holland. With that, along with information on what equipment we planned to mount in the furniture and whether it was above the tabletop (like effects processors or CD players) or below the tabletop (such as monitor amplifiers or power supplies), he was able to make suggestions on the



Control Room One in Westwood One's Culver City facility.

renovation project to do in New York and needed to get competitive bids. SAS suggested we speak to David, as they had worked with them on other projects with great results.

We sent the project to bid and Holland was the only vendor who followed up and asked the anticipated questions. The other vendors required multiple calls to get the followup we needed; one just outright didn't return our calls.

Because of the limited space we had and the specific use of the studio, it needed to be a custom design. Holland worked closely with us to satisfy our needs and delivered exactly what we needed. The furniture looked good, was designed to work with the SAS consoles we installed and was easy to assemble.

On the move

Having had a good experience with Omnirax on our New York studio project, we asked David for help on our Jacksonville, Fla., studio move.

Westwood One operates Metro and Shadow Traffic nationwide. We recently moved our Jacksonville studios, and the vendor we had been using was getting more difficult to work with for various reasons. Holland stepped up and designed a workstation for our traffic reporters that he was able to put together quickly.

Next came our Los Angeles studio move. In L.A., we moved our West Coast network operation from one building to another in Culver City. Once again, working with SAS, Holland simply asked what model consoles we were going to use and already had the specifications for the exact sizes.

Our architect sent CAD drawings of

best type of furniture. David worked with us so equipment was easy to reach and sight lines were maintained.

Omnirax helped with color selection and met our timeline for delivery and installation. The furniture went together easily and looks great. It has a modern look and feel, is sturdy and supports the equipment we needed to mount.

On top of all this, Omnirax was competitively priced.

Now that we have three great experiences with Omnirax behind us, our confidence in working with David is strong. Our next project is a new Data Monitoring Center at our Houston office. This new project comprises a dual-computer workstation desk with the ability to view eight 40-inch flat screen monitors.

Holland designed something that enables the operators sitting at these positions to see their own dual-screen flat screen monitors, as well as easily glancing up at any of the 40-inch monitors. In order for us to get a good feel for the way it would look, Holland provided three-dimensional renderings of the furniture in our room. We had a view from various angles including above, front and back and the sides.

This information made it easy for us to decide what we wanted. Ease of installation is important and we got that with Omnirax. Customer service was superior to almost any other vendor we deal with. David Holland stayed on top of the details and was persistent in getting the information he needed to stay on schedule, even when it might not have been top of mind for us.

For more information, including pricing, contact Omnirax in California at (800) 332-3392 or visit www.omnirax.com.

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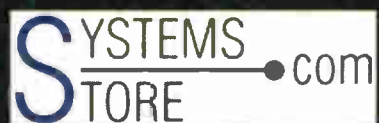
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USER REPORT

Salem Outfits Studio With Modulux

by Anthony Ochoa
Corporate Projects
Engineering & Design
Salem Communications Corp.

CHARLOTTE, N.C. In my years of work in the broadcast industry, primarily radio, I've seen that a better-than-adequate work surface area is of paramount concern. And I've seen them all — from the infamous dark walnut wood veneer to the stylish fluorescent purple, from shapes as square as Lego building blocks to round pods that look like they drifted out from the lake in the public park.



Talk Studio of the Christian Research Institute's 'Bible Answer Man'

Whether it's a corner nook for producers and call screeners or a center island for hard-to-please talk show hosts, Arrakis designers and wood craftsmen consistently come up with a plan to suit the needs of our studio.

Form-fitting

We chose Arrakis' Modulux furniture for our summer 2005 build-out of The Christian Research Institute's "Bible Answer Man" broadcast studios in Charlotte, N.C. The Modulux line has solid oak trim and high-pressure laminate table surfaces, as well as a laminate finish inside and out of the cabinets and racks. Panels are laminated on both sides to prevent warping and absorption of moisture.

The furniture can be assembled left- or right-handed, stand-up and sit-down, as well as in configurations such as "Short L," "Long L," "Unbalanced U" and "Long U." Pedestal returns have front equipment racks and rear access doors. The table pedestals also have options for inside and outside access doors.

My favorite design is the five-sided 45-degree tabletop turret, which faces the equipment toward the console operator; and allows the engineer to open a specific side of the turret and access the backside of user-end equipment, giving him plenty of room to work in. I am able to hang D-rings from both the turret's top undercarriage and the stationary backside of the turret, which allows for clutter-free routing and ganging of cabling.

Interview tables can be added to tabletop configurations. Copy stands, mic risers, earphone and turret control placement, media storage cabinets round out the options.

If you've ever had to crawl underneath cabinets and desks to get to your central wire blocks or hub connectivity, you'll appreciate the punchblock cabinets that lie upright against the closest wall to the furniture cluster, making it easy to funnel your wiring mass into your lower equipment racks. Or end cabinets with overbridges can be designed to house your connectivity systems.

How does a station keep from building computer screen towers all over its table surfaces, greatly impeding visual contact with guests? Enter the Master Interview/Talk Table. Rod Graham, Arrakis' vice president of broadcast sales, came up with its design to conquer this problem.

By building what we dubbed "flat-screen easels," the island was given a great look, which complimented the personality of the Talk Table by matching the wood stock of the table trim to the full wrap of the flat-screen easels. And for the "Master" Talk Show Host, we embedded his screen directly into the Table's surface.

Arrakis' craft is not limited to radio. During our build-out, Graham and I went visual. We put out heads together and came up with a dual video workstation surface. With the introduction of TiVo and programmable DV-R systems, I needed to come up with a design where video bits and streams can be recorded automatically throughout the night, and be ready for slicing and dicing by the editor in the morning. We developed two side-by-side video edit bays, with audio control as well, and a central "Final-Cut" corner monitoring cabinet that is accessible by both operators.

Arrakis says the typical Modulux studio retails for \$4,995 complete.

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

TECH UPDATES

WXPN Chooses Studio Technology

This production studio is one of six rooms of custom furniture that Studio Technology designed and installed for the new WXPN(FM) facility in Philadelphia.

A seventh studio has been constructed and will help with a new Web-based addition to its format called "eXPoNential on demand."



Studio Technology was founded in August of 1991. It provides studio furniture from out of an 8,400-square-foot cabinet shop in the western suburbs of Philadelphia and a 5,000-square-foot facility in Reno, Nev.

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

KYS Installs Sonora Panels

Acoustics First Corp. recently supplied sound control materials to Professional Broadcast Supply in Caracas, Venezuela for its installation of on-air studios for KYS 101.5. This photo shows the on-air studio during live operation, with the company's Sonora panels installed on the walls.



Sonora fabric-covered fiberglass acoustical panels absorb reverb and prevent comb filtering of the sound within the room. They are available in 48 colors and in sizes ranging from 2 feet by 2 feet up to 4 feet by 10 feet. Several choices of edge design and mounting options are available, as well.

Additionally, Art Diffusers were added to the standard T-bar ceiling above the talent for depth and clarity in the broadcast performance area. Acoustics First says the diffusers redistribute sound uniformly, rather than absorbing it, to maintain sonic warmth while lowering sound intensity.

For more information, contact Acoustics First in Virginia at (888) 765-2900 or visit www.acousticsfirst.com.

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◆ READER'S FORUM ◆

'Old School' Methods Work Best

The writer of "Time to Rethink Tower Lighting and Marking" (*Reader's Forum*, July 19) has, perhaps understandably, fallen victim to the belief that technology will provide every answer.

My personal opinion, based on years as a Coast Guard helicopter pilot, is that a warning system for every tower won't work in the aviation environment, except perhaps in extremely wide open, rural areas. There are so many towers today, and electronics simply cannot provide the instantaneous judgment necessary to properly alert a pilot. "See & avoid" is the only sound method.

An electronic warning system would have to take input on the aircraft's heading and speed, discern a "closest point of approach" and issue a warning. How will it do that in a suburban, let alone an urban, environment "rich" in towers — and tall buildings, wires, power lines, etc.?

One of my frustrations has been the hazy color of cell towers with one white strobe. Dusk, snow and fog all are gray and white. This makes for extremely hazardous operations.

— Jim Seeman

I have not yet encountered an avionics system capable of that fine a discernment of the situation at hand. Combine that with traffic alert systems, radios and internal communications within the aircraft, and we have "electronic sensory overload." An overabundance of warning horns and automated voices produces not more safety, but too much sound, leading to complacency about warning tones.

The problem is even worse for helicopters. I've flown rescue helicopters for 20 years, in pretty challenging weather. One of my big frustrations has been the hazy gray color of cell towers with one white strobe. Let's think it through: dusk, snow and fog all are gray and white. This makes for extremely hazardous operations.

A warning tone barking at me would not tell me where the tower was with any accuracy; and it would give course corrections that would not necessarily comport with terrain, wires and buildings. And of course, the warning tone does not obviate the need to get to the rescue scene.

While perhaps "old school," the red and white markings for towers work extremely well for daytime. They're low tech; they're reliable; they're all-weather. Same for flashing red lights; very visible

under night vision goggles. And white strobes in certain cases.

Simple, rugged and reliable. Not a bad approach.

*Lt. Commander Jim Seeman
U.S. Coast Guard
Elizabeth City, N.C.*

The editorial in the July 19 issue asks why aircraft radios still use AM, rather than the "more reliable" TDMA or CDMA systems. There is a very good reason for using AM (SSB on HF bands).

Under weak signal conditions, an AM or SSB station can still be heard. If two stations are transmitting at the same time, the pilot or air traffic controller can still hear the weaker station under the stronger one. FM is not suitable due to the capture effect, which would completely block the weaker signal.

Digital systems such as TDMA or CDMA would be out of the question due to the "cliff effect." A signal that is right at the threshold would be unintelligible due to a "skipping CD" effect in the received audio. If the signal drops below that threshold, one would hear nothing.

Digital techniques are not a cure-all and a digital system is not necessarily a better one. Just ask any police department that has had trouble communicating on its new, whiz-bang digital radio system.

*Philip E. Galasso, K2PG
Shickshinny, Pa.*

The Show Must Go On

HD Radio has a few problems: adjacent-channel noise and operation limited to daytime for AMs, and the expense of producing compelling programming for secondary channels for FM. Not to mention, if the HD signal fades the FM HD2 channel mutes.

Here's an idea: Many AMs own FM, and vice versa. They could put the AM programming on a secondary or HD2 channel of their FM digital. If you don't have an FM, others may rent you their unused HD2 channel.

The AMs could use AMSS (AM Signaling System) to help HD Radios locate the HD2 programming. Blending could be used to avoid HD2 channel muting.

The AMs would forget about AM IBOC, and would continue with AM at 5 or 10 kHz or whatever audio; just no digital hash.

AMSS also could direct a future AM/digital "radio" to some other wireless technology for AM programming at higher quality.

Great AM stations could be heard in enhanced quality, and legacy analog radios would be useful for years to come.

To Ibiqity: The expense of HD Radio is a showstopper for many smaller broadcasters. Many AMs, especially daytimers, would like the nighttime capability that this HD2 idea offers, and everyone wants to improve their audio quality. But after equipment is purchased, the fees you require are too great a burden. Promoting HD Radio with spots that will help sell radios should be enough.

*Larry Ray
Springfield, Ill.*

Radio World
The Newspaper for Radio Managers and Engineers

Our readers have something to say

"Thank you for a great, informative, entertaining paper I have enjoyed for many years."

Robert Polhamus, KF6OZU
Silver Star Electronics
Owner/Operator
Los Angeles



Shown: Heil PR 30. Large-Diameter Dynamic With Hum-Bucking Coil and Built-in Shock Mount

Virtual Multicast Routing

I present an open letter to broadcast radio regarding a subject I believe will catch many large networks and radio stations by surprise as the reality of Virtual Multicast Routing (VMR) comes into public light.

As you know, the Internet is not really regulated yet, and the issues brought out in this letter will meet with opposition from those using and promoting the technology. I guess you could call it "enlightened self-interest." They may try to justify their decision to use this technology by stating there is notice given before the player download is executed, but people don't read those notices and even if they do, they do not know their employer and ISPs prohibit them from granting the permissions asked for in the player ULA.

We are talking about the largest media companies using this technology along with higher bandwidth using major-market radio stations, and it is getting worse as higher bandwidth streams become the norm. Plus, ISPs have further widened the customer's ability to transmit even higher and higher upload bandwidth — some even up to 30 Mbps.

We believe these factors will bring this technology under public fire. Our radio broadcast friends, who I believe are somewhat ignorant of the implications of the technology, will be caught with their hand in the pockets of their listeners. I really don't want that to happen.

I also don't like seeing one company being able to control the streaming media market with patented technology designed to commandeer the bandwidth of the station's unsuspecting listeners. Bandwidth is not free; someone will pay.

Paul Gathard
President
Barnabas Road Media
Indianapolis

Local-Channel Call to Action

The demand by some expanded-band broadcasters ("Expanded-Band Sunset Rule Appealed," June 21) to retain their new band location and keep their old frequency with the right to sell that for private gain — under the guise of promoting diversity — is nonsense. It is a classic example of someone wanting to have their cake and eat yours too.

These broadcasters knew and agreed to the rules when they accepted their expanded-band frequency. The purpose

of expanding the band was to reduce and eliminate interference on the AM dial. Keeping these stations on the air defeats that purpose while enriching these owners with a gift from the public coffers.

There were plenty of broadcasters who were not considered for expanded-band slots. In particular, local channel broadcasters were not given any consideration at all. So why should these fortunate but ungrateful expanded-band broadcasters get preferential treatment again?

You cannot talk diversity without first talking about justice, equality and respect. If removing interference was the principal motivation for expanding the band, then no group has "anything" on local-channel broadcasters. In fact, it states on our license that *we must accept interference*.

I strongly recommend the FCC devise a frequency allocation plan based on seniority and the minimizing of adjacent and co-channel interference. Further, the FCC should provide some relief to local-channel broadcasters by offering expanded-band frequencies and/or low-power FM frequencies, which might include the use of translators, that could give comparable daytime coverage.

If you are a local channel broadcaster on 1230, 1240, 1340, 1400, 1450 or 1490, you must speak out. I am proposing an organization of local-channel broadcasters. If you are interested and agree with my stated position, please call me at (205) 942-1776 or e-mail me at rambo2@bellsouth.net.

It's time for local-channel broadcasters to sit at the table, because if we don't we will continue to be the meal.

Gary R. Richardson, CPBE, CBNT
Owner/GM
WJLD(AM) 1400
Birmingham, Ala.

McCarty's Brush with History

I just read the article on Fessenden and the first broadcast of voice and music on Christmas Eve 1906 ("Was Fessenden's 1906 Broadcast Accidental?", June 21). Like any such historic accomplishment, there are always others who were at the same point, approaching the same goal. May I offer, for example, Francis J. McCarthy?

The following excerpt can be found at www.digitaldeliftp.com/LookAround/look_around_networks.html.

"Francis J. McCarty, while almost unheard of in the history of early radio, was a teenaged, self-educated engineering prodigy in San Francisco, who by 1903, developed a spark-telephone that had

Green and Off the Grid

Every time we dig into our wallets at the gas pump or write a check for the electric bill, we're reminded of the rising price of energy. These costs also are taking a bigger bite out of your broadcast operating budget. Maybe it's time to do something about it.

Renewable energy sources such as wind turbines and solar panels are now said to be the world's fastest-growing, with capacity expanding at double-digit rates every year over a decade. A few path-finding stations have made the switch to solar, wind or hydro power for some or all of their energy needs.

In some instances, wind and/or solar power make feasible transmitter or translator sites far from the power grid. In other cases, going "off the grid" can enable stations to generate cleaner and more reliable electricity than can be purchased commercially. In some locations, organizations can sell surplus power back to the utility company to offset operating expenses.

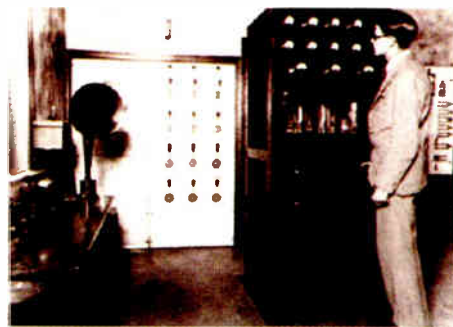
Startup costs for renewable energy can be high, so some states have created tax breaks, grants and other incentives to make the switch. In New York, for example, the Long Island Power Authority has launched the Solar Pioneers Program, offering rebates to commercial and residential customers that are approximately 50 percent of the costs of a PV system. LIPA's rebates are adjusted to reflect current PV costs. Current rebates for PV system installations are \$3.75 per watt (DC).

What can you do?

- Reassess your energy budget and see if renewables can work for your station.
- Investigate state and local energy subsidies in your community. If there are none, write your elected officials.
- Purchase blocks of "green" power from your local utility.
- Use your airwaves to advocate for renewable energy sources via PSAs, public affairs and news programs.

While renewable energy sources can improve your image as a responsible member of the community, they also benefit your bottom line, and if for that reason alone you should investigate them.

— RW



Courtesy of The Digital Deli Online

Radio transmitter room of KPO in Hale's Department Store, c. 1925

"By the spring of 1906, the future of The McCarty Wireless Telephone Company couldn't have seemed brighter. This optimism was shattered the morning of April 18, 1906, as San Francisco endured the most catastrophic earthquake in America's history. The public's focus on the aftermath of the Great Earthquake and its accompanying conflagration eclipsed McCarty's historic accomplishments. Interest in his revolutionary technology all but vanished."

Steve Lampen
Multimedia Technology Manager
Belden CDT
Richmond, Ind.

already transmitted an audible voice transmission over two miles. By 1904, following significant improvements in his invention, he successfully transmitted a clear voice transmission seven miles over water.

"Following another successful demonstration of his technology in 1905 — this time for The Press — McCarty's technology was deemed worthy of commercial interest, and The McCarty Wireless Telephone Company was formed, issuing 200,000 shares of stock at a dollar a share, with McCarty retaining 105,000 and a controlling interest. Shortly after his successful public demonstration, Hale's Department Store in San Francisco installed an experimental transmitting station.

AM IBOC Bandwidth

Barry McLaron's otherwise informative article ("AM IBOC Power Levels = Mystery," July 19) states AM IBOC "occupies a bandwidth of 20 kHz."

AM IBOC has sidebands extending nearly 15 kHz on both sides, which totals nearly a 30 kHz bandwidth.

Bob Radil
Northford, Conn.

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