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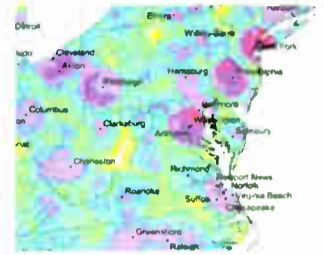
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**National FM Coverage Density**

Here's the FM landscape at a glance, in a map to clip and save.

See Page 17

# Radio World



The Newspaper for Radio Managers and Engineers

April 14, 1999

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**NEWS**

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## Lucent to Start IBOC Field Tests

*DAB Proponent Consolidates Research Team At New Headquarters in New Jersey*

by Leslie Stimson

**WARREN, N.J.** Lucent Digital Radio is preparing for on-air field testing at two FM stations, with the goal of beginning some of the tests before NAB99 this month.

LDR has chosen WPST(FM) in Trenton, owned by Nassau Broadcasting Partners, L.P., and non-commercial WBJB-FM, licensed to Brookdale Community College in Lincroft (RW, March 31) for its first station tests. These are the first IBOC DAB

field tests for LDR.

The news of Lucent's testing plans comes after LDR employees settled into new headquarters.

The two test sites have different equipment configurations and power levels. WPST broadcasts at 50 kW while WBJB-FM broadcasts at 11 kW.

**Interference conditions**

Both stations are near LDR's headquarters in Warren, N.J. The area receives many radio signals, not only

from New Jersey, but also the cities of New York and Philadelphia, creating a challenging environment to test for signal interference.

At both stations, LDR will insert its digital signal into the host analog signal.

See LUCENT, page 10 ▶

## CRL Will Shut Down Or Sell

by Randy Stine

**TEMPE, Ariz.** Barring a sale, audio processing manufacturer Circuit Research Labs plans to cease operations later this year after several years of losing money.

The company said it is curtailing production and selling its inventory.

CRL's board of directors has proposed dissolution of the company. Shareholders are expected to vote on the matter at the company's annual shareholders meeting the first week of May.

Shareholders also will consider any offers to buy the company at the meet-

See CRL, page 7 ▶



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# ◆ NEWSWATCH ◆

## Major Changes At Chancellor

**DALLAS** Chancellor Media Corp. has appointed Chairman Thomas Hicks as chief executive officer following the resignation of Jeffrey Marcus and changes in several top management positions. Observers said the company's shareholders wanted the changes to bolster Chancellor's stock price. Chancellor executives said the changes resulted from a strategic financial review of its units and that a sale, merger or consolidation of one or more of its operations has not

been ruled out as the company focuses on radio and outdoor.

Other management changes: James de Castro, currently president Chancellor Radio Group, is now president and CEO of Chancellor's new radio and outdoor group. R. Steven Hicks, president and CEO of Capstar Broadcasting, retains the same title with the newly created Chancellor Media Services Group, which will include a new Internet initiative. James McLaughlin continues as president of the outdoor unit and will report to de Castro, as will new Chancellor Radio Chief Operating Officer Ken O'Keefe. Stu Olds, president of Katz Radio Group, a subsidiary of Chancellor's Katz Media unit, will report to Steve Hicks.

De Castro and Steve Hicks join Chancellor Chairman Tom Hicks as vice chairmen in a new position, office of the chairman. Both Hicks brothers and de Castro will share responsibilities previously held by Marcus.

## TV Deal Dies

**DALLAS** Chancellor Media Corp. also decided to terminate the merger agreement with LIN Television Corp. because investors wanted the two companies to remain separate, said Chancellor Chairman Tom Hicks. Hicks is also chairman and chief executive officer of investment firm

Hicks, Muse, Tate and Furst, which will continue to own LIN TV, but operate it separately from Chancellor. Hicks Muse will invest up to an additional \$500 million in Chancellor, which will raise its holdings to 29 percent of Chancellor stock.

See NEWSWATCH, page 3 ►

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# EAS Leaders Set Priorities

*Improving 'Perfect Paul,' Settling Patent Dispute Are Priorities for EAS Leaders This Year*

by Lynn Meadows

Like it or not, broadcasters will enjoy at least another two years of Perfect Paul, the automated voice of the National Oceanic and Atmospheric Administration's Weather Radio which reads emergency alerts issued by local National Weather Service offices. There are no funds in the NWS budget to switch to an automation system that links together words until 2001.

But Emergency Alert System planners are promoting the idea that NOAA Weather Radio outlets may be able to improve their audio feeds which in turn

may make Perfect Paul sound better.

A group of California broadcasters held a meeting with John J. Kelly Jr., NWS assistant administrator for Weather Services, just before the EAS National Advisory Committee meeting at the end of February. The results were shared at the NAC meeting.

### New NWS consoles

The point of the NWS automated system was to get messages out instantaneously. In October 1997, the NWS began replacing its old consoles with new consoles. With the new consoles, a meteorologist can type in a warning, push a

button and, relay the message instantly to all nearby transmitters. The NWS argues much time is saved with the automated voice. Broadcasters argue the strangely accented voice is not believable to listeners and some complain the voice is not easily understood.

The NWS plans to put together public service announcements with the new voice to explain the purpose of Perfect Paul to the public. The agency is also looking at conducting transmitter maintenance as one way of making the voice sound better.

"There is general agreement that every NWR radio system needs to be evaluated," said Los Angeles Local Emergency Communications Committee Chairman Richard Rudman. Of the Oxnard, Calif., NWR, he said, "We found transmitters, antenna feed lines and antennas all need attention."

Rudman said he and several others involved in EAS issues are looking at alternative sources of funding to help the NWS make improvements sooner than 2001.

Bill Browning, president of the Heartland Partnership in Peoria, Ill., was elected chairman of the NAC for another year. He said the new information from the NWS on the improvements in equipment was good news. The goal for the coming year, he said, is to continue to build a good communications system between the agencies and the communities.



William Browning

"We have so far to go, but we are making progress," said Browning. He said 100 local area EAS plans have now been approved. That includes state and local area plans. Each state decides how many plans are needed.

### Quad patent dispute

At least one issue needs to be resolved for more progress to be made: the EAS patent dispute. Quad Dimension Inc., a Kansas-based company, sent out royalty requests in January to several hundred broadcasters. Quad owns a patent that it believes covers the entire EAS system.

See EAS, page 6 ▶

## NEWSWATCH

▶ NEWSWATCH, continued from page 2

The investment brings Hicks Muse's cash investments in Chancellor and Capstar Broadcasting Corp. to \$1.35 billion. Hicks said the previously announced merger between Chancellor and Capstar has been approved by the FCC and the Department of Justice and the deal should close by July.

tion, he *did* willfully violate commission regulations and "there is no support" to justify the FCC *not* enforcing the laws against unlicensed operations when the stations do not interfere with other stations.

The commission also said it is "commendable" if Fulling now wants to operate in a lawful manner, but that does not excuse him from the penalty.

### Pirate Fined \$8,000

**WASHINGTON** The FCC is standing firm on an \$8,000 fine levied against a Kansas man for operating an unlicensed station. In August, the commission investigated a complaint it received about an unlicensed station being run from a residence in Garden City, Kan. The owner of the station, Mark Fulling, admitted to an FCC field agent that he was operating an unlicensed 9 W station on 102.1 MHz and had expected such a visit. The FCC fined him \$8,000.

In his defense, Fulling's attorney said his client had not willfully violated FCC regulations; that the equipment used to operate the station did not exceed FCC specifications and the station did not interfere with other stations. He also said Fulling wished to apply for a Class A commercial FM station.

The FCC said that since Fulling admitted operating an unlicensed sta-

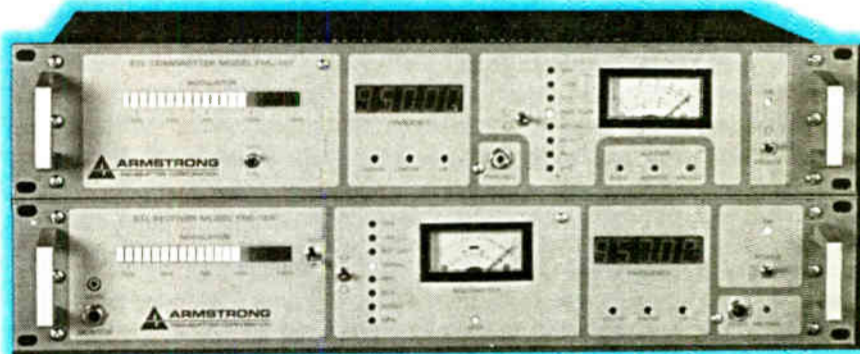
### FCC: 'No' to Net Rules

**WASHINGTON** FCC Chairman Bill Kennard has been flamed — in about 600 e-mails a day — sent by citizens worried the commission is about to regulate the Internet. His response? "Let me say this as clearly as I can: As long as I am chairman of the FCC, we will not regulate the Internet."

The torrent of e-mails was prompted by an FCC action on Feb. 25 that addressed how phone companies pay each other for connecting calls to the Internet. The FCC concluded that a computer user's dial-up calls to the Internet are interstate communications subject to federal jurisdiction. Internet dial-ups have been treated as local calls.

Kennard said the decision meant that the FCC, and the FCC alone, has jurisdiction over Internet traffic. "It means that no state can impose long-distance charges. And the FCC won't either."

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# Everybody Take a Deep Breath

*The Low-Power Radio Debate Is Shaping Up As 'Us Vs. Them.' That's a Shame*

Before I get to the topic at hand, please take a moment to notice that *Readers Forum* has moved. Our "Letters to the Editor" page, which was found on page 5 in the past, has moved to the last inside page of *Radio World*. Find it there in each issue.

★ ★ ★

*RW* has come under attack in some quarters for our qualified endorsement of a low-power radio system in the United States, as discussed on page 5 of the March 3 issue. In other camps, we were praised for our "courage" for taking this stance.

The powerful response on both sides demonstrates the volatility of the low-power debate. Expect a lot more hollering.

## Caveats

For the record, we wrote this: "Legitimate questions exist about how low-power radio will affect interference protection and the future of digital radio. The FCC must address them. But if a technical solution can be found that allows low-power radio stations to bloom, the commission should pursue it."

There are big caveats in that paragraph. Can such a solution be found? The answer is by no means clear, and these questions must be answered.

But should the authority charged with regulating spectrum use even be allowed to ask whether that spectrum is being used at maximum efficiency? I think the answer is yes.

I'm not surprised that some broadcasters feel differently. In a letter we printed last issue, John David, NAB executive vice president for radio and a man I respect, went so far as to call our editorial a frontal attack on thousands of U.S. radio stations providing a free, local communications medium.

I disagree with that assessment, for *RW* cares deeply about radio. But I'm more disappointed that NAB apparently decid-

ed early that *any* discussion of *any* low-power option would be anathema. All low-power radio is bad, NAB seems to say, and must be met with all possible force.

NAB has created an "Action Plan" for its members. The package includes FCC filing guidelines, pre-written editorials to send to newspapers, and "Congressional talking points."

Among its points are these: Low-power radio will cause massive interference. It could harm a future DAB system. It will burden the FCC. It will not accomplish ownership diversity nor create stations where they are most desirable.

The vigor of its response reinforces the perception that the association is against any new stations of any kind, anywhere. Unfortunately, that plays into the hands of those who wish to portray NAB as the association of the "haves" in the fight against the "have-not's." How much better to ask whether there isn't some room, somewhere, for a reasoned compromise on this issue?

In a letter to industry journalists, an NAB spokesman also accused low-power advocates of "utopian rhetoric." I agree with the criticism, but the rhetoric is not limited to the low-power side. The arguments against have also relied on worst-case, doomsday outcomes.

One trade publication even created a phony obituary of FCC Chairman Bill Kennard with the headline, "The Man Who Killed Radio." That kind of pseudo-journalism feeds the frenzy, but does not advance understanding.

## Like LPTV?

Comments to *RW* tend to support LPFM. Some are from unexpected sources.

For instance, a manager at an AM-FM combo wrote to support it. This broadcast facility also owns a low-power TV station.

"I know the value to a community of LPTV and have a good feel for what LPFM will do for rural and small towns

all across America," he wrote. "LPFM could serve their respective communities much like LPTV is capable of, only easier. Thanks for speaking your open mind."

I received one strongly negative response. This radio owner wrote angrily, "It's too bad there is not a Federal Publications Commission that would allow more small newspapers to publish stories for radio managers and engineers. Perhaps it would make you a better competitor."

Fortunately, our government does not license newspapers. But we don't need an FPC in order to "allow" more small newspapers to compete with *RW*. You could start one tomorrow. We could have 20 new competitors next week. Our publisher faces that possibility every day. That's how the open market works.

But radio is not an open market. And all arguments about low-power radio must start with that assumption.

This writer also accused *RW* of looking out for our equipment advertisers. I would never apologize for supporting our advertisers; nor should you as a broadcaster. And yet suppliers are by no means unanimous on the issue, either. And the issue is too important to decide based on the needs of just one constituency.

In any case the debate will be interesting. We have an FCC chairman who is "way out in front on this issue," in the words of one NAB executive; Kennard has turned low-power into a cause célèbre and has less room to negotiate a middle ground should he wish to do so.

We have one of the most effective lobbying organizations in America focused on LPFM and determined to squash it.

We have elected representatives on Capitol Hill who say they favor open competition, but who respect the political power of broadcasters and the public service they perform. Many of those politicians already are upset with what they view as an overly activist commission.

We have enthusiastic supporters of low-power. Some are schools and community groups that have longed for an opportunity for a slot on the dial; some are "reformed" pirates with no history of responsible behavior. Some are wildly

## From the Editor



**Paul J. McLane**

idealistic, others clear-eyed. Do any of them have the political clout to carry their fight beyond a sympathetic FCC?

Expect the NAB to put forth powerful technical arguments and bring its formidable lobbying weight to bear. Can low-power advocates respond in kind?

The NAB response to the issue tells me that its leaders understand LPFM could happen. The idea has simple appeal in a way that people can understand, in an era of Net access and multiplicity of voices.

And once things move into the political arena, anything can happen.

On page 17 of this issue, we print a Dataworld map, showing the concentration of FM signals in the United States. The map was created as part of a research project into digital audio broadcasting, but it demonstrates how complex any low-power solution will be.

Take a look, and ponder. Clearly, there is room in some parts of the country for more stations. Just as clearly, interference is a legitimate concern in areas where stations would be most in demand.

Advocates must be realistic. It is unlikely we would ever see new stations in New York or Boston. Schools and community groups in Idaho or Nevada might be able to put that big white space on the map to use. Will that suffice?

Make your feelings known to the commission, and to us. *RW* is committed to providing space to other voices for this debate. Send your comments via e-mail to [radioworld@imaspub.com](mailto:radioworld@imaspub.com) or to the address on page 78.

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## GUEST COMMENTARY

# Are FCC Proposals a Threat?

by Doug Vernier

No matter how you feel about the specifics, each of the FCC's far-reaching proposals to "streamline" the rules, create a new low-power FM micro-broadcasting service and move to all-electronic "spot-checked" filing systems will benefit some segments of our profession.

However, taken together, these proposals represent the greatest threat to a technically superior U.S. broadcast system since its inception.

Under MM Docket 98-93, "Streamlining of Technical Rules ..." the commission proposes to allow 2nd- and 3rd-adjacent contour overlaps for full-service FM stations as well as to allow engineers to submit showings using the undesired-to-desired (U/D) signal-strength ratio-analysis method.

Both of these actions will reduce the interference protections historically provided by the FCC to our FM stations. This is coupled with a proposed reduction of six kilometers in the minimum distance short-spacing distances provided in Section 73.215(e) and the declaration of all new construction permits as 73.215 (shortspace) proposals. While these pro-

posals will give broadcasters more flexibility in locating their transmitters, they will also increase the use of directional antennas and additional shortspacing that will elevate interference.

Each other. It questions whether the bandwidth or the spectral masks of such stations could be reduced to lessen the impact of interference. It asks whether LPFM stations need to protect existing translators.

## Low-power radio

Certainly, the idea has merit, but on what scale? The commission has concluded that unless these stations are allowed to operate under less stringent interference standards, only a handful of LPFM stations will be possible.

It therefore proposes to remove 2nd- and 3rd-adjacent spacing requirements between these stations and asks what impact will result from removing these spacings with regard to full-service stations.

It questions to what extent these new stations should be allowed to receive interference or cause interference to

each other. It questions whether the bandwidth or the spectral masks of such stations could be reduced to lessen the impact of interference. It asks whether LPFM stations need to protect existing translators.

With "in-band, on-channel" (IBOC) digital radio seemingly "just around the corner," the industry still remains without a standard.

In its filing before the commission, USA Digital Radio (USADR) has requested the initiation of a proceeding to develop a U.S. standard for digital broadcasting.

In its LPFM Notice of Proposed Rulemaking, the commission paraphrases USADR's statements that the impact of new 2nd- and 3rd-adjacent stations on its IBOC system will be "negligible." On the contrary, the NAB argues that since the IBOC system places the digital carrier at the edges of the analog carrier that interference from adjacent transmitters is more likely to have an impact.

The commission reports that, "Because no comprehensive operational test data is available for any form of IBOC system configuration, we do not know whether USADR or NAB is correct." It also remains unclear how the systems proposed by Lucent Digital Radio and Digital Radio Express will be affected since they have had no reason to argue one way or the other.

With all of this going on, the commission continues to function in a vacuum regarding the capability of modern receivers to reject interference. Their hunch is that receivers have improved over the years since the adjacent channel U/D ratios were estab-

Readers Forum has moved!  
Find reader letters on the  
last inside page.

service Americans get from their radios.

It is interesting to note that the commission rejects the notion that the AM band be used for low-power operation because of their efforts to "clean it up." Hopefully, the commission will have enough sense not to turn the FM band into the same mess AM has been in for the last 30 years.

■ ■ ■

Doug Vernier is a telecommunications consultant, president of V-Soft Communications and director of Broadcasting Services for the University of Northern Iowa.

RW welcomes other points of view.

## These proposals represent the greatest threat to a technically superior U.S. broadcast system since its inception.

posals will give broadcasters more flexibility in locating their transmitters, they will also increase the use of directional antennas and additional shortspacing that will elevate interference.

The commission raises the interference threshold further in its proposal of a new Point to Point (PTP) method for calculating the distance to interference contours.

The new method is designed to consider terrain that extends beyond the current two to ten miles. In theory, this allows interference calculations to consider hills and mountains that have a significant impact on signal.

A procedure that more accurately defines where interference will fall is welcome, however the FCC's PTP, as it stands now, has some serious flaws. When using the FCC's PTP computer model, we found several instances in which the interference signal contour actually traveled farther for a lower power than for a higher power with all other factors remaining constant.

## Streamlining proposals

We have seen where the predicted 70 dBu contour on occasion traveled further than the 60 dBu contour. Clearly, adoption of this procedure, without alteration of the method, poses yet another danger to interference-free FM broadcasting.

If any of the streamlining proposals are adopted, carefully prepared engineering showings will be required. The fact that the commission proposes to "only spot check" 10 percent of these applications under its newly proposed electronic filings system is frightening.

While this will reduce the burden of

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# Mackie Copycat Suit Lingers On

by Randy Stine

**WOODINVILLE, Wash.** The legal battle between Mackie Designs Inc. and German audio products maker Behringer GMBH and its American distributors has moved another step closer to a trial expected this fall.

Mackie sued Behringer, Samson Technologies of Syosset, N.Y., and New York-based music store chain Sam Ash Music Corp. in June of 1997, claiming the three defendants conspired to produce a copy of Mackie's 8-Bus Mixer line. The mixer board in question is Behringer's Eurodesk MX8000.

In the most recent ruling in U.S. District Court for the Western District of Washington, Judge Barbara Jacobs Rothstein granted Behringer's and Samson's motion for dismissal of Mackie's copyright claim, a Washington state unfair competition claim, and limited Mackie's trademark/trade dress infringement claim to just Behringer's Eurodesk MX8000 mixer. Mackie originally claimed that Behringer had incorporated similar designs into other mixer boards it produces. Behringer has stopped making the MX8000.

The November, 1998 ruling cut from six to four the number of claims remaining against the defendants in Washington state. They include trademark and trade dress infringement, and trademark dilution. The last claim refers to Mackie's contention that the defendants sought to dilute the value of Mackie's trademark.

Samson and Behringer are still subject to damage claims asked for by Mackie if found culpable during trial. Mackie originally had sought \$327 million in damages.

## A 'brief' history

Mackie first noticed what it thought were similarities in design between the Mackie 24-8 and Behringer's MX8000 mixer board in late 1996. By that time, Mackie had already filed for copyrights

on its schematics and circuit diagrams. Mackie also contended that Behringer, Samson, and Sam Ash Music violated copyright law by using Mackie's net lists,

which are computer-generated lists of the components and components' values, which are affixed to the printed circuit boards in the Mackie mixer.

## Samson and Behringer are still subject to claims sought by Mackie, if they are found culpable during trial.

which are computer-generated lists of the components and components' values, which are affixed to the printed circuit boards in the Mackie mixer.

In its latest ruling, the court concluded that "Mackie's copyright in the schematic drawings of the printed circuit boards

does not extend protection to the actual circuit boards themselves. Circuit boards are not protected by copyright because they are useful articles, designed and cre-

ated for a functional purpose." In the original lawsuit (Mackie had filed two other amended suits and a suit in New York state) Mackie claimed that Samson and Sam Ash Music conspired to hand over the 8-Bus Mixer to Behringer with intentions to copy it. In the November rul-

ing, Judge Jacobs Rothstein wrote, "There is no dispute that Behringer reverse-engineered printed circuit boards Mackie uses in its 8-Bus mixer and incorporated the reverse-engineered printed circuit boards into its Eurodesk MX8000 mixer."

## Dismissal

Sam Ash Music, Sam Ash Music Chief Executive Officer Richard Ash, and Samson Chief Executive Officer Scott Goodman were dismissed from the Washington state lawsuit in January 1998 after the judge ruled the defendants had never conducted business in the state (RW, Sept. 30, 1998). Summarily, all three have been sued by Mackie in U.S. District Court for the Eastern District of New York on similar claims of patent, copyright and trademark infringement.

"It remains to be seen whether or not Mackie will withdraw some or all of its claims in the New York state case. Or they may be forced to do so by the court,

See LAWSUIT, page 14 ►

# EAS Leaders to Evaluate NWS Systems

► EAS, continued from page 3

FCC Chairman Bill Kennard has sent NAB President and Chief Executive Officer Eddie Fritts a letter indicating that the patent office will be asked for a further opinion on the Quad Dimension patent. At press time, the NWS had not yet filed a request for re-examination with the patent office because its attorneys were still reviewing documents needed to justify a re-examination request.

Meanwhile, the largest of the cable systems are still being added to the Emergency Alert System. On Dec. 23, 1998, the commission released its third Report and Order on EAS in which it decided not to require cable systems to install selective channel override equipment. This means television stations that do not want their EAS messages overwritten by cable companies will have to work out an agreement with their local cable operators.

The deadline for those cable compa-

nies to be added to the EAS was Jan. 1. Some EAS manufacturers were overwhelmed by the demand, said Frank

## The NWS is looking at conducting transmitter maintenance as one way of making 'Perfect Paul' sound better.

Lucia, director, Emergency Communications for the FCC's Compliance and Information Bureau. He said the FCC understands that not all of the cable sys-

tems required to be on line are ready yet.

Lucia could not say when petitions from the SBE and the NWS will be addressed. The two separate petitions filed over a year ago addressed issues that arose during the first several months of the EAS. One SBE point, for example, was that the monthly tests with their 15-minute relay windows be changed to quarterly tests with 60-minute relay windows. In its petition, the SBE said quarterly tests would be frequent enough to verify the readiness of the relay system and the longer relay time would make it easier for broadcasters to insert the test into a less disruptive portion of their programming.

Lucia said the cable override issue had to be handled first because of the Jan. 1 deadline.

## EAS cable training tape

The Society of Cable Telecommunications Engineers, a counterpart to the SBE, has developed an EAS training tape for cable companies. There was a discussion at the NAC meeting of developing a similar training tape for broadcast stations to show how EAS should function when a message is received.

Some state's plans still have no primary entry point for receiving national messages. Lucia said one possible solution is to use an intermediate station to listen and relay the PEP alerts. NAC members discussed conducting a national-level EAS test. The White House will have to authorize that.

Rudman asked the FCC to clarify the revised FCC EAS Handbook to give individual stations a clearer understanding of how the national warning component of EAS will work.

The next NAC meeting is scheduled for Feb. 25, 2000. There are 22 members on the NAC, but they passed a motion at this year's meeting that any state chair who attends will also have a vote on any issue that develops. Lucia said that about 20 state chairs came to the meeting this year at their own expense.

Browning will serve as NAC chairman one more year. Richard Rudman was elected first vice chair so he will likely become chairman next year and Al Kenyon, vice president, engineering, Jacor Communications was elected second vice chair.

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# CRL Board Proposes Dissolution

► CRL, continued from page 1  
ing. CRL President and Chief Executive Officer Gary Clarkson said he was optimistic about finding someone to buy CRL.

Several bad financial years led to the board's decision. The company, based in Tempe, Ariz., has lost money five out of the last six years.

Though sales figures for 1998 were not available, according to CRL's filing with the Securities and Exchange Commission in 1997, the company lost a net \$262,296 on total sales of \$1,953,521. Sales were down that year 23 percent from 1996 levels.

**If we can't sell the company or some of our individual product lines, (ceasing operations) will be the last resort.**

— Gary Clarkson

The publicly held company is traded on the NASDAQ stock exchange under the symbol CRLI.

"I have a fiduciary and moral obligation to our 600 shareholders to maximize company profits and the returns on their investment," Clarkson said. "At this point the best way to do that is to sell the company or liquidate it."

### Loss of Jones

The decision comes just over a year after the death of co-founder Ronald R. Jones in January of 1998. He was the company's president, chief executive officer and biggest shareholder (RW, Feb. 4, 1998).

CRL repurchased Jones' stock from his wife following his death. The company also collected \$1 million in life insurance payments.

The 46-year-old Clarkson, who co-founded the company with Jones in 1974, said the loss of Jones plays a significant role in the latest developments.

"We lost our CEO and top sales person," Clarkson said of Jones. "Ron handled most of our Asian sales and was the company's driving force."

The cost of competing globally and sagging sales to Pacific Rim countries are reasons given by Clarkson for the company's downfall.

International sales typically accounted for nearly 60 percent of CRL's total yearly sales.

"The cost of marketing our products worldwide is a significant factor in our performance," Clarkson said. "Our high international selling budgets took away from our engineering and product development budgets."

Clarkson said the company has done little R&D in the past year.

He said CRL was working on several new projects in 1998, but has put all work on hold. That includes plans to exhibit at the NAB99 convention this month. Clarkson said the company does not plan to exhibit at the show, although some of its distributors would have CRL products in their booths.

Clarkson said production work was continuing only on the Amigo FM stereo

audio processing system.

"We are in the middle of a production run on that product and will finish it. But that will be it," Clarkson said.

CRL has sold its RDS Encoder line. The paging and auxiliary data service was sold to DataFM in Georgia in February.

In January, the company discontinued its PC-board manufacturing production line. CRL is leasing space in its building to Desert Assemblies to do the same work. Six CRL employees were laid off and went to work for the new company.

CRL currently has 15 employees.

Can a small company like CRL still compete in the broadcast manufacturing industry?

Clarkson said that it is getting harder in light of industry consolidation.

"The Harris's and BE's of the world have strengthened their grips on the marketplace and don't have many weaknesses to compete against. It's tough for us in this present condition. I'm sure others are having problems as well," he said.

But Clarkson said closing the doors to the company is the doomsday scenario.

"If we can't sell the company or some of our individual product lines, that will be the last resort," said Clarkson.

If the company does cease operations, plans are in place for Customer Service Manager Kevin Clayborn to continue servicing and repairing CRL equipment.



"No current customer should be out in the cold when it comes to tech support and repairs," Clarkson said.

"Ron (Jones) and I started this business as radio engineers, so I don't want to just walk away and leave our customers scratching their heads wondering what to do," Clarkson said.

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# NRB Show a Picture of Growth

by Bob Millard

**NASHVILLE, Tenn.** The four-day 56th annual convention of the National Religious Broadcasters was a story of growth and more growth.

There was growth in all directions, including regional attendance, reported number of new religious broadcasters and exhibitors.

The most dramatic percentage increases were seen in exhibit space. It was wall-to-wall booths and sales people in the cavernous Opryland Hotel exhibition halls. According to NRB, the 1999 floor space occupied by vendors and ministries, from Comrex Corp. to Friends of Israel, was 212,500 square feet. That was up 119 percent over last year's 97,000 square feet.

## More floor space

The increase in floor space was caused primarily by larger display booths. Vendors apparently felt the market for goods and services at the NRB is burgeoning. The actual number of exhibitors was 236, up 8 percent over the 1998 count.

Vendors were enthusiastic about the value of attending the NRB event.

"This is one of the best NRBs that we've been at," said Bunk Robinson, a regional sales manager at Custom Business Systems Inc. "The attendance is good and the traffic here at the exhibit is quite good."

Robinson was attracting attention with a new software product which CBSI unveiled at The NAB Radio Show this past fall.

"We're introducing our new Digital Universe System here," Robinson said.



There was increased floor space at the 1999 NRB show.

"This is the first time it has been at the NRB."

"It's one of the best (shows) of any kind that we've been to," said Ben Avery, broadcast sales manager for UPI Broadcast News. "You think of NRB as maybe a niche, but it's been better than some of the mainstream shows."

"The number of people who come up to the booth who are actively seeking

religious news and information and secular news and information is very strong this year; probably four- or five-fold over last year," Avery said.

UPI's presence at the show was seen by Avery as a function not only of religious broadcasting's raw increase in numbers and reach, but also of the industry's broadening reach to its audience.

"More and more religious broadcasters are moving into the news field, moving

There are indeed more stations airing Christian religious programming either some of the day, or full-time, defined by NRB as 15 hours or more, the group said.

The 1999 Directory of Religious Media, published by the NRB, reported regional increases in both Christian radio and television broadcasts.

Texas was the site of seven of the 51 new religious television outlets, which brought the NRB-reported total to 242 at the end of 1998.

Kentucky added 13 of the reported 28 new radio stations airing Christian con-



Opening the exhibit floor is (l-r) Brandt Gustavson, NRB president, David Clark, NRB chair and Mike Glenn, NRB vice president.

to fill a vacuum caused by consolidation closing newsrooms and because of their own special interests ... such as First Amendment issues, school prayer, abortions rights," Avery said.

## Numbers game

But essentially, Avery said, his NRB business spurt is simply a numbers game.

"More and more of the Christian-formatted stations are learning about (UPI), and there are more and more of them."

tent, but the radio growth was relatively small by comparison. The year-end total of 1,616 religious stations was only a 1.8 percent increase over the prior year.

"We see that primarily as a function of market saturation in a lot of areas," said NRB President Brandt Gustavson. "We're still growing; just not as fast as we once were."

Expansion of coverage area and upgrade efforts are next on the horizon for religious broadcasters, Gustavson said.

## Religious Broadcasters Converge in Nashville

by Bob Millard

**NASHVILLE, Tenn.** With an encompassing theme like "Bridging the Centuries," the recent National Religious Broadcasters convention in Nashville promised to be an interesting admixture of traditional faith messages and up-to-the-minute technology. It did not disappoint.

The history-steeped Southern gospel act, Vestal and The Happy Goodmans, delivered its homey, roof-raising music and witness at the first general session. They affected attendees in the back row, but were also linked live to the Internet via LightSource, "the spiritual channel" of Broadcast.com.

## Web sites

As with the rest of the business world, religious broadcasters are establishing a growing Web presence. This includes the Rev. Charles Stanley's "In Touch" ministries Web site, whose reported 2 million hits per week exceeds any other religious Web site.

Christian radio broadcasters, many of whom operate AM daytime-only stations, worry about getting their message



Alan Keyes

out. As the population shifts, religious stations that may once have floated on the outer fringe of an urban area find themselves landlocked into suburbia, their most-receptive listeners moved just out of optimal reception range.

While commercial stations might change format to reflect the new demographic within their signal pattern area, religious broadcasters cannot.

The "Meet the FCC" session showcased

See NRB, page 14 ▶

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# Lucent Proceeds With DAB Tests

► LUCENT, continued from page 1  
in the so-called "saddle bags," the upper and lower sideband of each station's analog channel.

This is a test of a "hybrid" system, in which a digital signal is broadcast along with the existing analog. In all of the IBOC systems proposed, a transitional or hybrid period of broadcasting would pre-

multiplexing). It's the same signal modulation scheme for each station," said LDR Vice President, Business Development, Nick Karter.

LDR is providing prototype equipment to emulate exciter functions to amplify and transmit the signal.

"We have to overcome the challenge of combining those signals efficiently and then

stations will have LDR prototype receivers to monitor the signal.

## The first tests

LDR was installing the equipment in March at WJJB-FM, where it will test an older, single-stream version of its technology. Pai said the LDR tests "will help us assess the best achievable performance of a single-stream system, which some of the other proponents are using. It will also help us project what we believe might be the performance we might be able to get out of a multi-stream system."

The testing was to begin in March for WJJB-FM, well before the station begins its April pledge drive. The National Public Radio member station airs talk and jazz programming.

"We will learn through this process. As a public broadcaster, I look at how we can use this stream of new information," said station General Manager Cheryl Cummings.

Cummings said LDR has access to her station for 18 months, although she expects most of the testing to be done in the first couple of months of the agreement. She said a number of the tests could be done simultaneously and many of them would be done at night.

LDR will conduct on-air tests of its newer, multi-streaming technology at WPST. Tony Gervasi, senior vice president engineering and technology for Nassau Broadcasting Partners, L.P., expected the tests to begin by mid-year and end within one year.

He said LDR would duplex its digital audio signal into WPST's signal and use the station's eight-bay Shively antenna, located on a 500-foot tower, to transmit.

WPST is part of a four-station combined complex in Princeton, N.J. Nassau owns or operates 19 stations, 15 of which are in New Jersey.

LDR said two other Nassau stations are candidates for testing: WHWH(AM), Princeton and WBBO(FM), Ocean Acres.

Gervasi is excited about the data transmission capabilities that all of the IBOC proponents say will be possible with their systems, but believes Lucent is "really focused" on datacasting.

"I think of it as high-definition radio. High-definition TV has revolutionized what a TV station is going to be able to do. Radio should have the same capabilities," Gervasi said.

In general, he said, radio managers must think about the transition to digital beyond audio quality and signal coverage, although those considerations are part of the Lucent tests.

"There's got to be more than just providing the customer with CD-quality radio. Radio has this huge bandwidth and we have huge signals. If the only thing we're going to do is take them from FM quality to CD quality, we're wasting our signal."

He believes radio should be offering CD-quality sound, as well as multicasting and datacasting.

WPST engineers will help LDR maintain the equipment used in the tests.

How will LDR handle WPST's signal processing? Gervasi said, "We've shown them what we use for signal processing — Frank Foti's box, the Omnia. We've allowed them to take an AES/EBU signal, the digital output of the Omnia, which they'll be able to assimilate into their computers."

An initial problem, he said, was how to handle the transcoding delay inherent in any digital encoding/decoding process for the on-air DJ, who normally is listening to the transmitter output or to a receiver.

"What becomes a problem is when the announcer has his headphones on and goes to open up a microphone and says 'Hello,' and four seconds later he hears 'Hello,'" said Gervasi. "That's the biggest problem, not what the consumer hears in the receiver."

Engineers could treat the delay as a problem in the studio, and have the announcers listen to console program output rather than the air monitor, a simple arrangement similar to that used with a profanity delay.

Neither station would comment on whether LDR had paid for access to their facilities, nor on what dayparts the testing would take place.

Lucent plans to complete most of its field tests by the end of 1999, and have a working AM and FM IBOC system ready in 2000.

Karter said broadcasters facing facility upgrades now should consider the possible timing of the digital transition.

"The system should be upgradable. If you're getting a digital STL it (should) support a certain bit-rate. The digital STLs that are being deployed now are of a sufficient capacity to support IBOC development," Karter said.



Photo: At Home Studios

Nassau's Tony Gervasi (left) With New Jersey Governor Christine Whitman

cede a move to all-digital broadcasting.

"On each side, of both carriers, the streams will be modulated with the coded OFDM (orthogonal frequency division

transmitting them on the same (existing) antenna," said LDR President Suren Pai.

LDR will use each station's existing directional antenna. Both LDR and the

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Photo: Paul J. McLean

Jiashu Chen With a Dummy Used for Acoustic Tests

## New headquarters

The team developing in-band, on-channel digital audio radio for Lucent Digital Radio has moved from Lucent Technologies' gargantuan facilities in Murray Hill into its own headquarters in nearby Warren, N.J.

About 40 people are working on Lucent IBOC technology at any one time, said LDR President Suren Pai. About 30 people are in the new Warren facility, while others work in Lucent labs in nearby Holmdel and Murray Hill.

Lucent is leasing the approximately 14,000-square-foot building from AT&T.

"Our initial developments were all being done in Murray Hill and Holmdel before we set up this facility," Pai said. Eventually, LDR will consolidate its employees in Warren.

Most of the employees working on IBOC technology are research and development-oriented, and organized in five

See LUJCEN, page 11 ►

► LUCENT, continued from page 10 subgroups focused on specific aspects of system design. The groups include systems engineering, FM development, AM development and validation and testing. The fifth group is tweaking Lucent's patented compression algorithm, the Perceptual Audio Coder, for different applications. LDR is licensing PAC as an audio codec.

**Pushing PAC development**

LDR has developed a team to push the research and development of PAC as it relates to all broadcast and wireless/wireline applications, Pai said.

Looking at an entire broadcast audio air chain, said Pai, "You have to look and see where audio coders could be employed throughout the system. We are essentially helping to enable the innovation in other parts of the chain as well, not just looking at the transmission link, which is IBOC."



LDR believes its PAC algorithm is the best at 96 kilobits-per-second. Lucent has said several times it is trying to lower the bit-rate to 64 kbps so that broadcasters can have more bandwidth capacity for data transmission when they begin broadcasting digitally. But getting the bit-rate to 64 kbps, Pai said, is not essential.

"We've already crossed the threshold of what we need for IBOC," he said. "Any further developments will only improve the system."

Bell Labs' Peter Kroon, of the acoustic and communication research department, echoed Pai's statement that Lucent is looking at tailoring PAC to different applications. In general, bit-rate reduction of digital audio causes a delay in the overall process. All three IBOC proponents are using a form of OFDM modulation with an interleaver, which introduces an additional time delay in the encoding and decoding process.

For communications applications such as video conferencing, said Kroon, long delays cannot be tolerated. Therefore, Lucent is trying to develop the PAC codec with a high-quality compression ratio but without a long delay. He said in the broadcast use, the delay would be less than one second.

He said the PAC technology being used for IBOC is similar to the compression technology for the planned satellite-delivered DAB technology being developed by CD Radio. Lucent Technologies also is developing the integrated circuits or "chip-sets" for the CD Radio system.

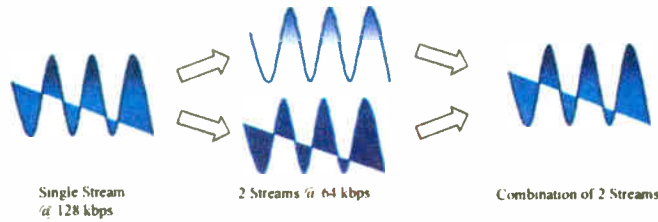
**Multi-streaming**

LDR has tailored Lucent's PAC and channel coding design for its patented multi-streaming technology (RW, March 31). A background paper to be released at NAB99 about the concept stated, "By breaking audio information into different streams, the information can be spread across time and frequency."

Multi-streaming, said Lucent, "enables high-quality digital reception of audio even when part of the signal is severely

**Demonstration 1: Multi-streaming of audio provides transparent, CD quality sound representation**

- Single stream 128 kbps sound through clean radio channel (no errors)
  - Compression of 11 to 1 with no loss of quality
  - LDR will employ same techniques at 96 kbps and below
- Multi-stream representation of audio through clear channel
  - 2 x 64 kbps streams, each stream carrying complementary high quality audio
  - Combination of streams yields audio quality equivalent to original



Lucent Digital Radio's Multi-Streaming System

interfered with, by recombining the remaining streams. Under fading channel conditions, part of the spectrum is impaired at a particular time. With multi-streaming, the system continues to operate smoothly by constantly switching to the highest-quality combination of streams available."

Each stream is protected by forward error protection codes and COFDM modulation. Lucent also said station acquisition time is minimized, because the receiver can begin the capturing process with only one stream.

In the new LDR lab, employees have computer simulations and development platforms set up to conduct experiments that can be changed rather quickly to incorporate new techniques or design changes. There are separate platforms for

See LUCENT, page 12 ►

4

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# Lucent Preps for Field Tests

► LUCENT, continued from page 11 the transmitter and receiver.

Of the receiver board experiments, Jim Lui, principal engineer for digital hardware development said, "The board allows us to do the design and download it via software, and via the LAN, depending on how much hardware we need. We can reconfigure modeling approaches to the baseband portion of the receiver design (that) allows us to have a smooth interface to the algorithmic development team."

Of the transmitter research, "In radio architecture, we're split between RF and baseband," said Greg Nease, principal engineer, LDR's system integration and verification. "The baseband is all-digital

and it's quite flexible ... to have a working platform for everything's that been simulated in the other rooms."

He cited the multi-streaming design as an improvement in Lucent's IBOC FM system and said the company would like to obtain more information about other technologies to improve performance, "especially in the face of things like micro radio."

Pai said it is too early to tell what the likely impact of allowing new low-power stations on the FM band would have in IBOC technology. "Yes, likely it creates a bigger challenge. Is it big enough to stop or impede the development of IBOC, I cannot answer now."

Several general-purpose directional and omni-directional FM antennas on the roof of the LDR facility allow LDR to capture signals off the air and use them in its computer simulations. Using signals that actually interfere with stations in the area allows LDR to work on certain algorithms that selectively cancel certain channels, Nease said. Nease's team is working on prototype receivers with a front end that is "flexible" in terms of filters and

multi-programmable for LDR's purposes. "Something that could be reduced to a small chip-set in a normal receiver," Nease said.

Getting the receiver to a reasonable cost point is a concern for all the IBOC proponents and receiver manufacturers. Pai said the biggest challenge facing IBOC development is, "How do you ensure sufficient value, created with this technology that the average consumer is willing to pay for. Ultimately, the consumer has to be willing to pay for these receivers and adopt this new technology."

"If that does not happen, everything else is a moot point."

Nease said LDR's FM IBOC system was "mature" in terms of simulations. Getting the AM system to that point is the biggest technical hurdle facing the company now, he said.

Lucent's Bell Labs also is conducting microphone and receiver design studies that support Lucent's phone technology and may be parlayed into LDR's digital development effort. In an anechoic chamber built in 1941, Lucent employees measure and calibrate microphones as part of their research efforts to develop hands-free acoustics for Lucent's wireless products and the consulting work Lucent does for receiver and PC manufacturers.

Among other things, Lucent is researching the use of automatic speech recognition for car phone users. Some of this research can be used to determine what an IBOC receiver would sound like

in a car, said spokesman Chris Pfaff.

James West, fellow, Bell Labs acoustics and speech research, said, "We do subjective acoustic studies because it's one of the few environments in which you can present information over loudspeakers and know precisely what that person is receiving in their ear. No reflections. So you know what you're transmitting is what the person is hearing."

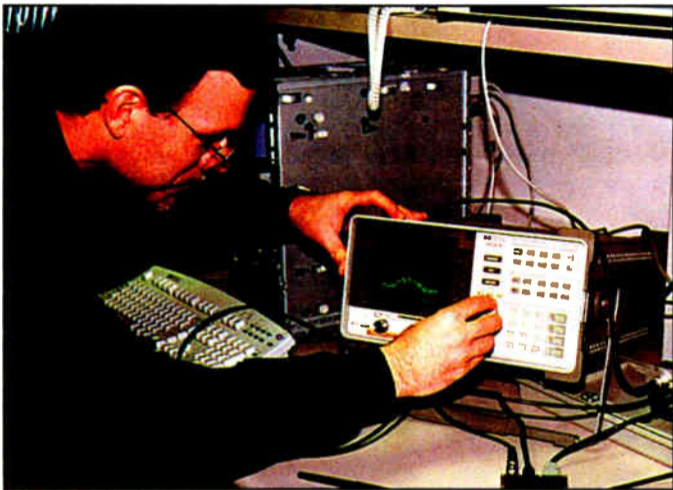
Lucent is also developing real-time acoustic modeling in an interactive, virtual environment.

"We synthesize a static source of sound and make it interactive with the listener," said Jiashu Chen, technical manager, Lucent Sound Systems. The computer program allows the listener to "fly" through a virtual environment and hear the sound as if he or she was really walking through that space.

Whatever Lucent develops from these acoustic tests could have future applications for IBOC.

Lucent competitors have also conducted or planned tests of their IBOC systems. USA Digital Radio has been preparing for field tests in several cities by outfitting new mobile test vehicles, and it recently hired a manager of field support (RW, March 31).

Digital Radio Express performed brief station field tests of its FM system on KSAN-FM in San Francisco last summer. Company officials have said there would be more FM tests, but have not elaborated where or when those would be. DRE expects to conduct field tests of its AM system this summer.



Greg Nease adjusts a spectrum analyzer.

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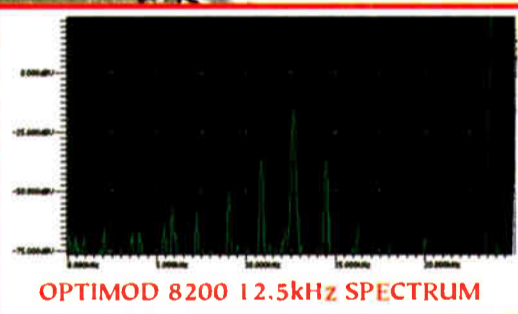
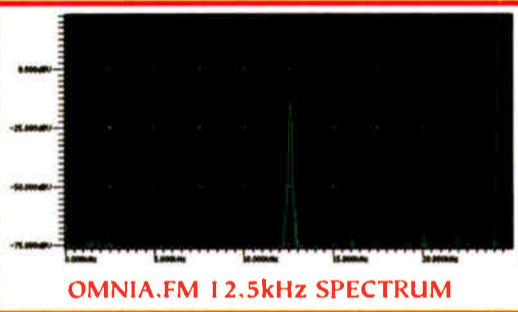
**W**hen you hear the Omnia.fm, you'll know why broadcasters the world over choose it: Sound that's as smooth and fluid as analog, with absolutely none of the digital grunge you hear in other digital processors.

So what's digital grunge? Artifacts caused by aliasing distortion in yesterday's processors that lack the Omnia's 48kHz sampling, 192kHz virtual upsampling and unique anti-aliasing final limiter. In the FFT analyses shown below, you can actually see the grunge as well as its absence in the Omnia.

To hear the difference for yourself, contact your Omnia dealer and get your risk-free, 60-day demo\*.

**Here's how:** The test results were obtained with a Hewlett-Packard Audio Test Set, Model 339A; the audio processor under test; and Rapid Systems R1200 Data Acquisition System for FFT analysis. The processors were set for 75µs pre-emphasis, and were carefully adjusted so the input levels were within the normal range of operation. The unit under test was fed a 12.5kHz test tone using the analog inputs. The discrete left channel analog output was connected to the FFT analyzer input. That's it. No tricks, no disclaimers about the test working only in our trade show booth or only in our lab, under the most arcane, non-real-world test conditions. In fact,

you can duplicate the test results yourself in your own shop. Don't have an FFT analyzer? No problem. Just use an oscillator and your ears—you can clearly hear the birdies in the old processor! Of course, this isn't about test tones; it's about music. And Fourier theory says that music—whether it's rap, oldies, urban, country, and yes, even grunge—can be represented as a combination of sine waves. Imagine what this kind of aliasing distortion can do to complex musical signals!



**Here's why:** The Omnia.fm utilizes 48kHz sampling for dynamics processing and virtual upsampling at 192kHz for the final limiter, which is a unique, anti-aliasing design. The test used version 1.02 software and the 'Cranked' preset, which is the Omnia's most aggressive stock setting. The Orban® Optimod® 8200 used for testing operates at 32kHz sampling for the dynamics processing and incorporates (4x)

128kHz upsampling for the clipping/low-pass filtering function. The test used version 3.0 software

and the 'Urban/Rap-Dense' preset, which is the Optimod's most aggressive stock setting. Aliasing will occur with input signals above 5kHz in 32kHz FM broadcast audio processors unless mechanisms that cause aliasing are eliminated.

For a complete technical report, call us for a copy of our paper entitled "Omnia.fm: An Engineering Study." Or visit our web site at: [www.nogrunge.com](http://www.nogrunge.com).



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\*Contact your dealer for details on this demo program. Demo requests must be accompanied by a purchase order so our dealers know you're really serious about some serious sound.

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World Radio History

# Fall Trial Expected in Mackie Suit

► **LAWSUIT**, continued from page 6 following what happened in Washington state," said Samson and Sam Ash attorney Kenneth George of Amster, Rothstein and Ebenstein.

If the court does not act, George said he planned to file for dismissal of the New York state charges.

Counter suits were filed on behalf of Samson and Sam Ash against Mackie in 1998. Samson alleges that Mackie tried to damage its reputation and business through false claims and is seeking \$10 million in damages. Sam Ash has asked for \$38.5 million from Mackie for allegedly publishing false information

about it on the Internet.

The two cases may come to trial in 1999.

## Who is winning

Both sides have claimed an advantage in the legal proceedings. Mackie, Samson, and Sam Ash Music have released printed statements that emphasize the positive and appear to gloss over any legal setbacks.

"We stand by our interpretation of the judges' rulings to this point," said Gregg Perry, director of advertising and public relations for Mackie.

In a December statement, Roy Wemyss, chief operating officer of Mackie, said that the company would

protect its intellectual property. "The issues here are simple; the defendants knocked off Mackie's products," he said.

The headline on a press release issued by Samson in the same time-frame read, "Court Closes Case on Mackie's Copyright and Joint Venture Claims." That much is true; however, the claims of trademark/trade dress infringement and trademark dilution remain. It is clear that the case is far from over.

"Yes, this has been a long process so far, but nothing out of the ordinary when you have two sides believing they are both right," said George. "In the end we will be victorious, and it will have been worth it."

# Religious Stations' Concerns

► **NRB**, continued from page 8

NRB concerns. One issue for religious broadcasters is gaining evening access to FM translators for daytime-only AM radio stations.

Roy Stewart, chief of the commission's Mass Media Bureau, told attendees he sees no immediate relief for the sunrise-to-sunset AMs.

"If you want that issue to receive more attention at the commission, you're going to have to get people to write letters and make phone calls and bring it to our attention that it's a concern," said Stewart.

The NRB convention took place as President Clinton's Senate impeachment trial was winding down. Attendees were well aware of it, and the phrase "decay of public morality" or some variant thereof cropped up as an undercurrent, if not the main subject, in nearly every speech and press conference during the four-day event.

The NRB, as the evangelical wing of Christianity, tends to move into alien cultures with a message viewed as confrontational by ruling parties in China, Russia and the Middle East. The NRB is concerned with freedom of religion issues abroad, as well as in areas of the United States where liberal politics and "homosexual intrusion," as the convention handbook put it, are viewed as threats to the evangelical agenda.

Still, the NRB members are not wholly homogenous in either theology or politics. A striking contrast between forgiveness and right-wing frustration was seen in major convention addresses by Bishop T.D. Jakes of the Potter's House, Dallas, and radio talk show host and former presidential hopeful Alan Keyes.

While Jakes preached the grace of God for all at the Saturday night opening session, Keyes unleashed a blistering, incendiary attack on Clinton, describing the President as "garbage we need to take out."

Keyes' speech was sponsored by the Campus Crusades for Christ at its Monday morning Public Policy Breakfast. As a measure of attendees' sentiment, Chesapeake A/V Communications Inc., sellers of session tapes, reported the Keyes speech outsold all others by a wide margin.

## New HQ

In its annual business meeting, NRB membership approved a \$1.5 million plan to build new permanent headquarters in Manassas, Va., where it is currently located in smaller space.

The new building is scheduled for completion in 2000. It will feature office space, studios and a religious broadcasting hall of fame.

Much of the construction budget comes from major contributors, including Cornerstone TeleVision, Christian Broadcasting Network and Total Living Network.

# The Best Digital Systems

It's a fact: *More* U.S. radio stations choose *Scott Studios'* than any other digital system! 2,025 U.S. stations use 4,600 Scott digital workstations. One reason is that the Scott System is the *easiest to use*. It's simple, straightforward, intuitive and powerful!

And Scott Studios' audio quality is the *very best!* You choose from new 32-bit PCI cards by Digigram, Audio Science or Antex. Scott Studios is famous for our *uncompressed* digital systems at a compressed price, but we also work well with MPEG. Scott software can record and play our audio files on a laptop and home PC.

Scott computers are industrial quality in 19" racks, but *not* proprietary: functional equivalents are available at most computer stores. You get 24x7 toll-free phone support. You also get new software features *free* for years from Scott's Internet site.

Scott Studios offers *three* different systems in *three* price ranges to suit *any* budget.



This is the user-friendly Scott 32 System, with 30 sets of 30 hot keys, phone editor and all songs and spots on line for instant play! It seamlessly mixes uncompressed and MPEG digital audio!

## Good Spot Box

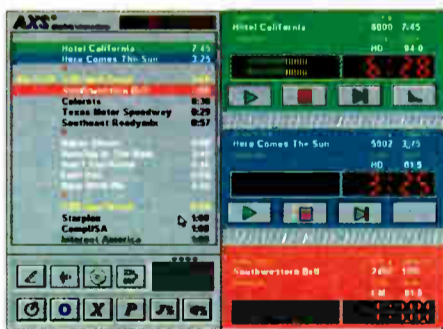


Scott's Spot Box delivers the *simplicity* of a triple-deck "cart" player plus *compact disc quality* digital sound.

Spot Box has only the one screen, so announcers always know what's playing. On the left of the screen, three digital players have clear labels on each spot. VU meter bars show levels. Buttons show countdown times and flash as each recording ends. At the right of the screen, "Cart Walls" let you pick and play any recording by name, number or category. Or, number keys at the bottom load spots quickly from your log.

Scott's Spot Box includes a recorder and costs as little as \$5,000. Options include log imports from traffic computers and music on hard drive.

## Better AXS 2000+



AXS<sup>®</sup> (pronounced ax'-cess) 2000+ is radio's premier digital audio system for automation and live assist. AXS<sup>®</sup> 2000+ is fully featured, with 99 sets of 28 instant play Hot Keys, log editing in the studio, live copy on-screen, big countdown timers and can include a production or phone recorder.

You also get auto-fill of network breaks to cover missing spots, a Real Time Scheduler, unattended net recording, timed updates, macros and optional time announce and WAVE file imports.

For stations with large CD music libraries, AXS<sup>®</sup> 2000+ can also control inexpensive consumer CD multi-pack and 300 CD juke box players.

See Scott Studios at NAB Booth L11890 in Las Vegas, April 19-22

## Best Scott 32 System

The Scott 32 System (pictured at the upper right) is the most powerful digital system in radio. Your log is on the left side of the screen. Everything plays at your touch. On the right, 30 sets of 30 Hot Keys play any spur-of-the-moment jingles, effects or comedy. You also get 10 "Cart Walls" with 1 or 2 second access to *any* recording. A built-in recorder quickly and easily edits phone calls, spots or pre-recorded Voice Trax.

Scott 32 options include recording Voice Trax while hearing surrounding songs and spots, time or temperature announce, *Invincible* seamless redundancy with self-healing fail-safes, newsrooms, 16-track editors and auto-transfer of spots and voice trax to distant stations via Internet.

Contact us to see how one of Scott Studios' three digital systems can be tailored to *your* needs and budget.

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**E**ventide's **BD500 Broadcast Delay** makes talk shows run smoother and sound better, for less. The BD500's multiple dump feature divides the delay time into several "slices" so you're still safely in delay even right after dumping an offensive remark. It's the hassle-free talk solution... even when air talent is working without a producer. No other delay offers Eventide's high quality patented catch-up technology for clean audio combined with fast catch-up. And it's the only delay with optional digital inputs and outputs for new all-digital studios. Yet the BD500 costs thousands less than our previous model. See how much easier talk shows can be with Eventide's 4th generation BD500 Broadcast Delay.

**W**ant to increase creativity without adding personnel? Add life to drive-time shows? Win new

advertisers with better station-produced spots? An **Eventide Ultra-Harmonizer**® brand effects processor really does all that. Designed specifically for radio and production, the new DSP4000B Ultra-Harmonizer features radio effects designed by production whiz Jay Rose. Hundreds of comic voices, sound effects, reverbs, pitch changers and more are instantly accessible at the touch of a button. Plus, the DSP4000B has superb Timesqueeze® time compression /expansion capability. Shorten a 60 second national spot to allow for a local tag. Squeeze or stretch a music bed to fit the spot. The DSP4000B has optional digital I/O to interface easily with digital editors and consoles. It's the radio effects box designed to bring stations more business and more listeners.

*The bottom line:* Eventide broadcast products are potent tools for today's radio. To learn more, talk to your broadcast distributor, call Eventide direct at 201-641-1200, or see our website, [www.eventide.com](http://www.eventide.com).

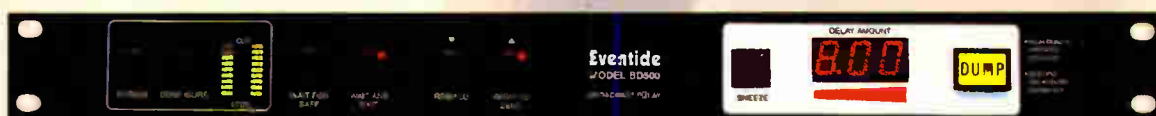
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# BOTTOM



# LINE

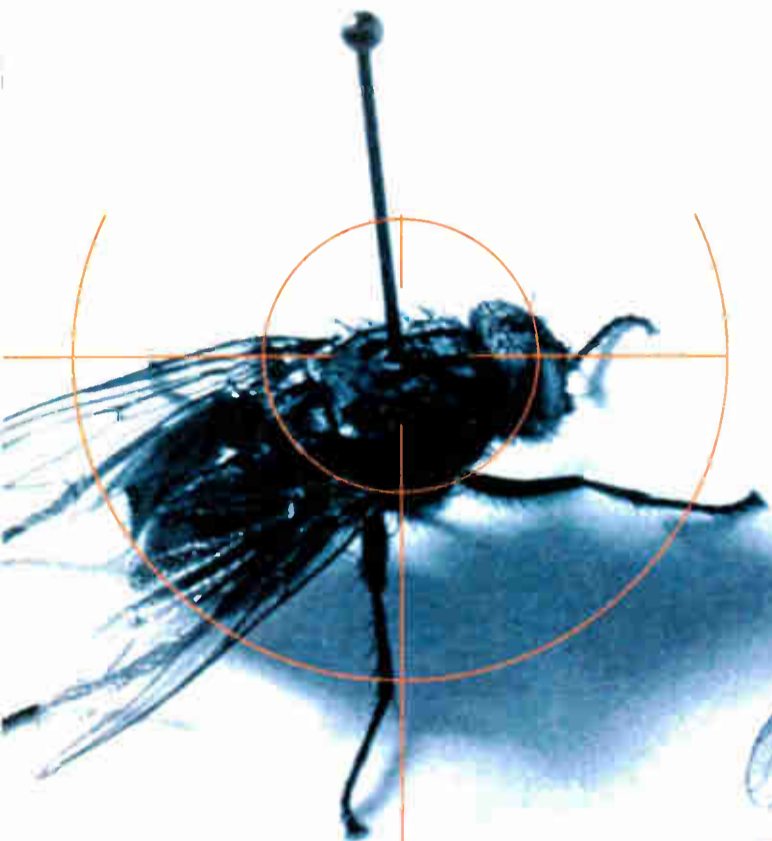


# BROADCASTING

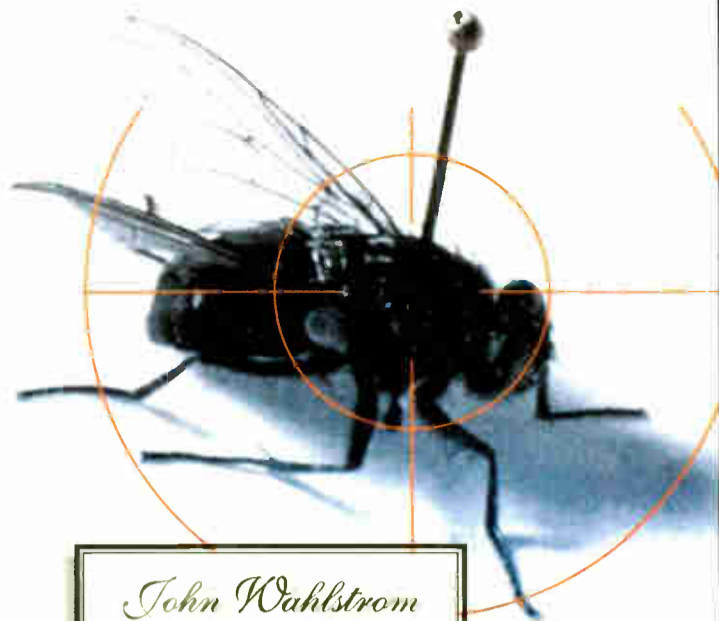


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radio yields  
better results.**

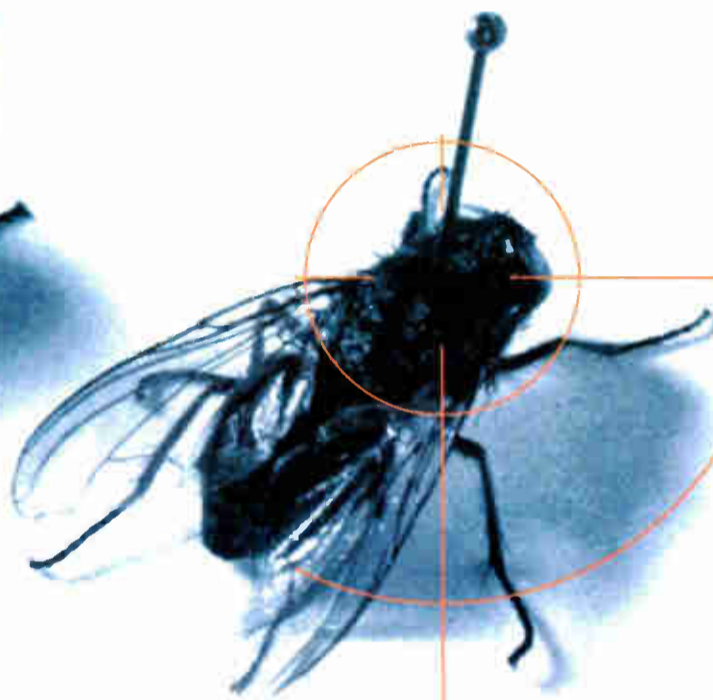
# Their biggest regret was not talking with Dalet...



*Bruce Wodder*  
General Manager 1998-99



*John Wahlstrom*  
Engineer 1996-97



*Steve McAllister*  
Program Director 1997-98

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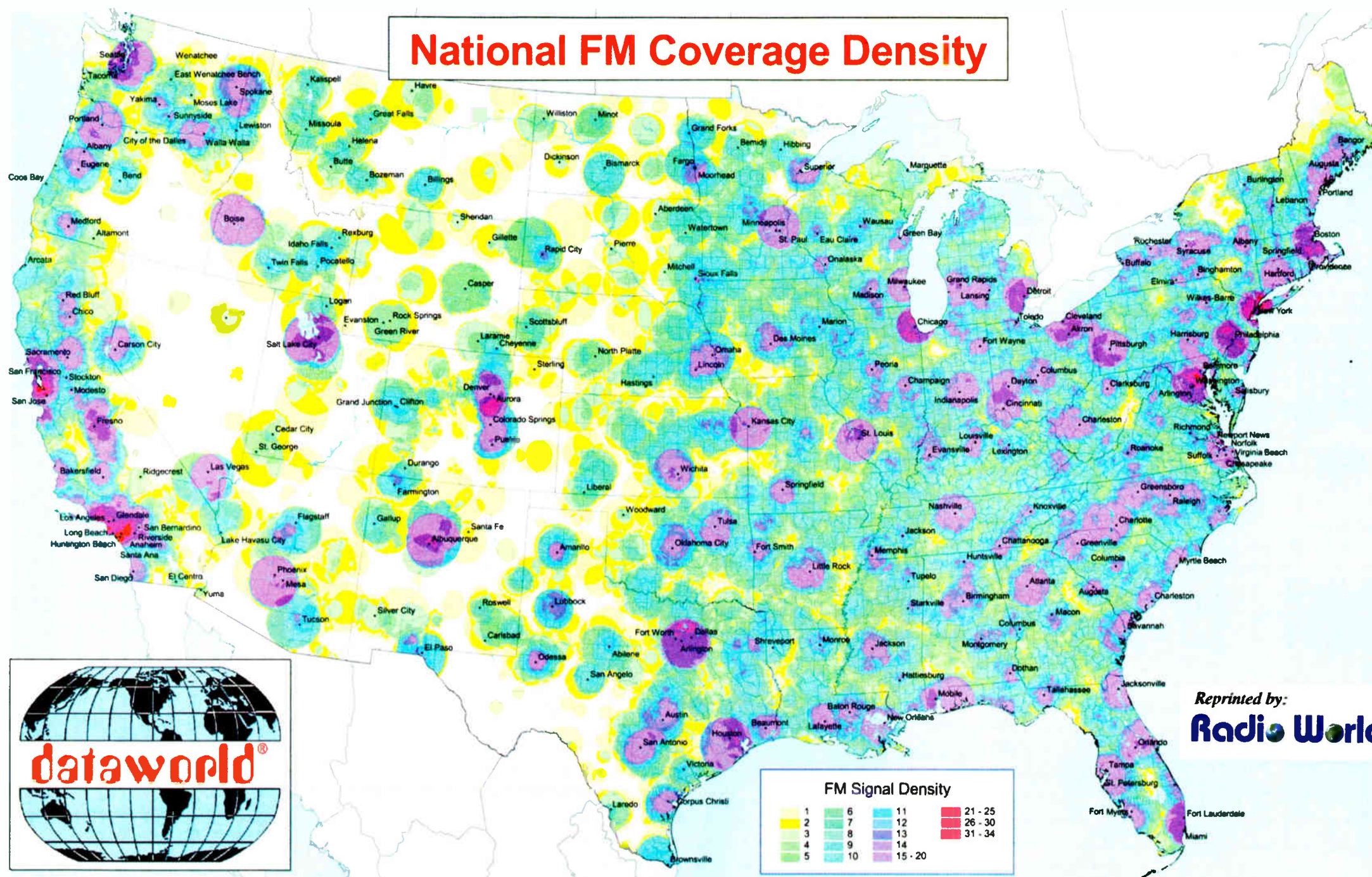


dalet



cut here

cut here



As part of a research study for a digital audio broadcasting company, Dataworld has produced what it calls the most thorough analysis of the broadcast FM band ever done. One result is this map, showing the density of FM coverage in the United States.

The supplier performed the work on behalf of USA Digital Radio, which has petitioned the FCC to allow in-band, on-channel digital radio. Dataworld produced a series of U.S. maps showing all FM stations on each channel, with predicted interference contours for each under a DAB system.

Dataworld Executive Vice President Hank Brandenburg said the project included coverage and interference calculations for more than 7,400 full-service FM stations, using FCC propagation curves to predict interference-

free coverage areas.

Among the patterns noted by Dataworld as the project proceeded:

- A number of time-shared stations are still in operation. Brandenburg said these were addressed on a case-by-case basis to correct the effect of "self-interference."
- There are many severe co-channel and adjacent-channel short-spaced operations. Although most were in the noncommercial educational reserved band, Brandenburg said, many exist in the commercial band as well. Some date to the early 1960s, before the FCC established required minimum spacing criteria.
- Many stations have interference-free coverage out to the 44 dBuV/m con-

tour and beyond. Even though stations are protected to the 60, 54 (Class B) or 57 (Class B1) dBuV/m contour, many stations in cities with no adjacent population centers have coverage well beyond their protected service areas.

• White and yellow areas on this map, showing low signal density, tend to occur where population density is very low. But there are exceptions. For example, coverage density may be lighter than expected in populated areas surrounding large urban centers, where FM stations could not easily be added without causing interference. Brandenburg also points out the Radio Quiet Zone surrounding the National Radio Astronomy Observatory in Green Bank, W.Va.

— Paul J. McLane

# NAB99 and the 'Oh Wow' Factor

Alan R. Peterson

Don't worry, it's okay to stare in Las Vegas.

You just may find yourself transfixed in front of a number of exhibits at NAB99 this month, amazed at the latest and greatest products to roll into town from your favorite equipment manufacturers.

This year, digital technology is bringing us powerful new processors, versatile workstations and transmitters that all but think for themselves. You will see consoles beyond your expectations and experience global reach beyond your dreams.



Check out the new Orville Harmonizer at the Eventide booth.

thanks to the Internet.

Be ready with the eye drops this year. You will be staring for a long time at some of these intriguing and engaging products.

Here are just a few that are likely to draw attention from attendees to the show during exhibit days April 19-22.

Get used to IBOC DAB as part of your criteria in purchasing new transmitters. Many manufacturers are letting you know their products are ready now, for when the time comes.

Nautel is showing IBOC DAB-compatible AM transmitters in 12 and 60 kW levels. The company says its "Interphase

Pulse Duration Modulation System" satisfies designated IBOC performance criteria.

Solid-state components and digital control make today's AM and FM transmitters reliable, energy efficient and extremely stable on-frequency.

This year, Harris brings a DX-10 digitally modulated solid-state AM transmitter to the exhibit floor, while Continental Electronics shows off the new 317D 50 kW all-solid-state digital AM transmitter.

Energy-Onix launches the Pulsar solid-state AM transmitter series in power levels from 250 W to 10 kW, while Omnitronix fronts a frequency-agile AM transmitter that can change and lock down frequency changes in one second.

Solid-state design also means it is possible to remove individual modules from an FM transmitter and remain on the air at only a slightly reduced signal. Broadcast Electronics is doing it with the FM-10S, while Nautel is preparing the FM20 for show.

Digital exciters are gathering momentum. Harris is putting the Digit CD digital FM exciter into its new Z10CD transmitter. CTE International is bringing its DEX30 digital exciter with internal modulator for built-in RDS. And Continental Electronics Corp. is introducing a 10 kW solid-state FM transmitter that incorporates a new-design digital FM exciter.

Unlicensed low-power radio fans may find favor with the AM-2000, FM-2500 and FM Advantage transmitters from LPB. All were designed to operate under FCC Part 15 rules regulating unlicensed broadcast. A nice, legal 1.5 mile coverage can be achieved with the AM unit and the FM rigs are good for 250  $\mu$ W at 3 meters.

## Consoles

For "wow" factor, you may wish to see the Klotz Spherion digital console, available in 12- and 20-fader versions. This was shown at the NAB Fall Radio Show last year, and makes its Vegas debut this year.

You can't help but smile at a console called "Sparky." Audioarts Engineering is rolling this one out. Sparky accepts analog and digital signals, and has 12 inputs, three stereo busses, multiple format A/D converters and digital mix-minus.

AEV and AEQ are both visiting Vegas with smart, simple and well-made consoles. If you don't need the big features, you may find yourself spending time with these. But if you want lots of buttons, the Studer On-Air 2000, Euphonix CS3100B and PR&E Integrity consoles will keep you busy.

## Recording

It is officially time to retire the old Uher reel deck you once slung over your shoulder for field audio. New recorders for radio are the best they have ever been.

Superscope Technologies made the Marantz PMD650 MiniDisc recorder look similar to the ENG cassette deck news reporters have used for ages. And ASC created a shoulder sling that places pro features (balanced XLRs, power supply) at your fingertips for your favorite DAT or MD recorder.

The Maycom Easycorder and the Sonifex Courier will appeal to the high-tech field reporter looking for digital quality, random-access editing and the ability to phone the report in via POTS or ISDN lines.

## Things you can say about our old fashioned meters



"2 or 4 VU meters"

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"Familiar"

"High impedance inputs"

"Lighted VU meters"

"XLR connectors"

"Priced right"

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# Workbench

Radio World, April 14, 1999

## A Clever Way to Dry Your Lines

John Bisset

Our *Workbench* story about resurrecting old Heliac transmission line inspired Hal Kneller to relate the following story.

Hal's company acquired an AM station the first of this year. The AM tower once had a FM antenna mounted on it, followed by a STL antenna. The transmission line was 1-5/8-inch Heliac, with an air dielectric. Since the line was on an AM tower, there was a quarter-wave stub with insulated hangers running down the tower and shorted to ground at the base.

For reasons unknown, a former engineer had disconnected the line and returned

bled and allowed to slow-leak as two more bottles of nitrogen are run through one each day. The electrical resistance at the building end of this 200-foot length of line went from 30 ohms to several megohms.

At the conclusion of the drying cycle, the connector was reassembled and attached to the tower line, the ATU was readjusted and the tower rebridged. The result has been a solid STL receive signal.

Although Hal doesn't recommend filling a line with water to test this method, he was able to save about \$6,000 worth of line. Unfortunately, the 30 psi maximum found on most nitrogen regulators is not

reminder, because many of these batteries are hidden behind panels or doors, but such a note can help ensure all these batteries are replaced on a regular basis, usually once a year.

While at the site, also check your fire extinguishers. If they have not been inspect-

**The 30 psi maximum found on most nitrogen regulators is not enough for the job.**



Figure 2: Keep a fire extinguisher by the door to your transmitter building ... and make sure it's charged!



Figure 1: Don't forget hidden batteries that keep memory alive when power fails.

ed or charged recently, see that the job is done. Some fire marshals write citations for inoperative extinguishers, and some local codes require them, especially where electric equipment is used.

\*\*\*

Fred Krock from KQED-FM in San Francisco wrote to say he has received a couple of requests for more information on the Space Guard high efficiency air filters that he discussed at the NAB Transmitter Workshop. Space Guard products are sold by heating and air conditioning contractors and are manufactured by

Research Products Corp., P.O. Box 1467, Madison, WI, 53701-1467.

■■■

John Bisset has worked as a chief engineer and contract engineer for more than 20 years. He is a district sales manager for Harris Corp. Reach him at (703) 323-8011.

Submissions for this column are encouraged, and qualify for SBE recertification credit. Fax your submission to (703) 323-8044, or via e-mail at jbis-set@harris.com

the base ATU matching network. There was an EIA connector at the base where the line was shorted to the ground.

When the line was disconnected, the end was left turned up so the gas-pass connector was pointing into the sunlight (and rain clouds). Every time it rained, the gas-pass holes funneled water into the 200 feet of line running from the base of the tower back up to the transmitter building. Hal was told the line had been this way for at least two years!

After Hal's group buys the station, the line needs to be used for an STL receive antenna. How does one remove gallons of water from 200 feet of buried line?

Enter retired consulting engineer Ralph Winquist of Lake Worth, Fla., with a brainstorm!

Ralph shows up at the site with his Oxy-Acetylene regulator with an adapter for a nitrogen tank. Hal orders four tanks of nitrogen.

The next step is to open up the Heliac connector at the tower end so the inside of the cable is exposed. At the transmitter building end, the nitrogen and oxyacetylene regulator is installed and the pressure is adjusted for 80 psi. Hal says the tower end resembles a fire hose as the water pours out. Several tanks are used, and after a while the line just spits water occasionally.

The connector at the tower is reassem-

bled and allowed to slow-leak as two more bottles of nitrogen are run through one each day. The electrical resistance at the building end of this 200-foot length of line went from 30 ohms to several megohms.

Another thing to keep in mind is that the line must be reasonably flat. A line running up a tower could not be dried this way; removing the connector and letting the water run out would be preferred to trying to blow the water out the top of the line.

Hal said the inside of the line was inspected when the connector was being reassembled, and it's pretty black inside. However, for a receive-STL, it's working fine holding 5 psi and is providing a strong signal on the receiver.

Hal Kneller is the chief engineer and owner of WKGF(AM)-WZZS(FM)-WZSP(FM) in Arcadia, Fla.

\*\*\*

As we begin the second quarter of the year, don't forget to do your quarterly tower inspections.

While you're at your transmitter site, take along some industrial 9V batteries to stick in transmitter controllers or remote controls that use these batteries to keep memory alive when power fails (see Figure 1). When I was doing contract work, I tried to make it a point to label the front of this equipment with a note stating when the batteries were last changed.

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# Products & Services Showcase

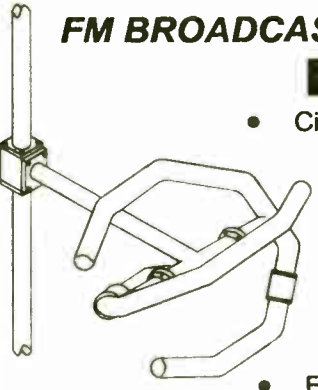
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MA-210 Stereo Monitor Power Amplifier  
MP-2 Dual Microphone Preamplifier  
MX-6 6 Channel Line Level Audio Mixer  
SC-2 Stereo Corrector  
VP-2 Dual Extended Range VU/PPM Meter  
VP-2D AES/EBU Digital Audio Meter

**Distribution Amplifiers**  
ADA-204A Dual 1x4 Audio Distribution Amplifier  
CDA-104 1x4 Composite FM Distribution Amplifier  
DDA-104 1x4 AES/EBU Digital Audio Dist. Amplifier  
TCR-1 Time Code Reshaper/Distribution Amplifier  
VDA-108 1x8 Video Distribution Amplifier  
VDA-204 Dual 1x4 Video Distribution Amplifier  
VDA-SDI 1x8 SDI Video Distribution Amplifier  
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RS-41A 4x1 Stereo Audio Router  
RS-41D 4x1 RS-422/Time Code Data Router  
RS-41DA 4x1 AES/EBU Digital Audio Router  
RS-41S 4x1 SVHS Video Router  
RS-41V 4x1 Video Router  
RS-44V 4x4 Video Router  
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**See Videoquip at NAB '99, Booth L12433.**

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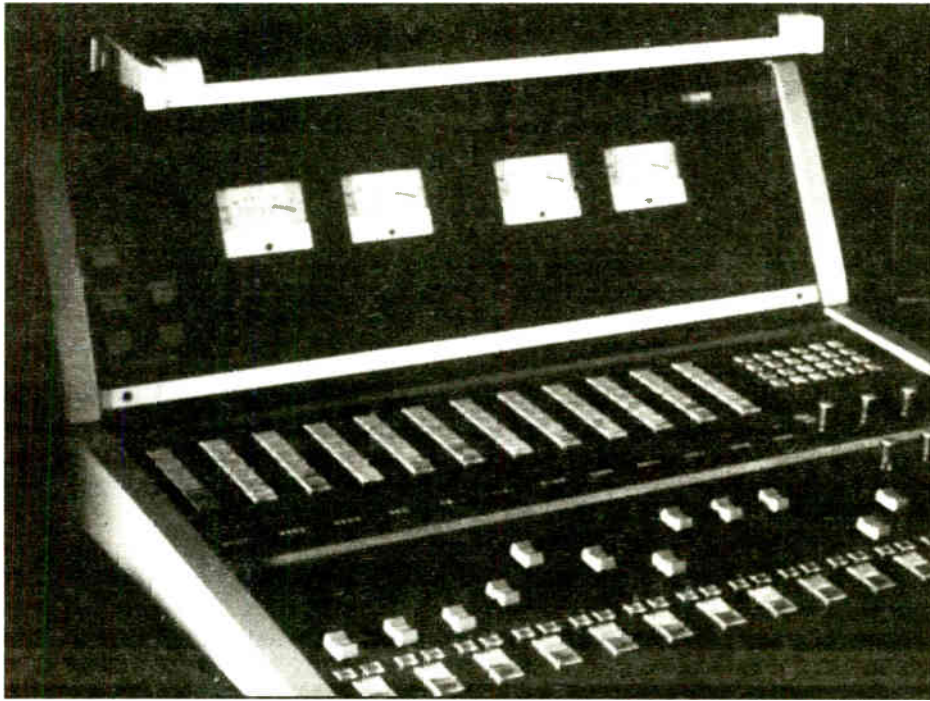
READER SERVICE NO. 103

# NAB99 Radio Realm

► PRODUCTS, continued from page 18

Radio is getting into recordable CD, so expect considerable interest over products from MediaFORM, Microboards

Radio Computing Services (RCS) rolls out SelectorNET, with graphics, artist data and music-related links sent to the user's computer. RealNetworks and Telos



The Klotz Spherion digital console makes its Vegas debut at NAB99.

Technology, Sonic Solutions, HHB, Cedar Technologies and Roland.

360 Systems finally responded to customers asking, "You know the Short/cut? How about a self-contained multitrack version?" You will meet the TCR4 and TCR8 multitrack recorder/editors at NAB99.

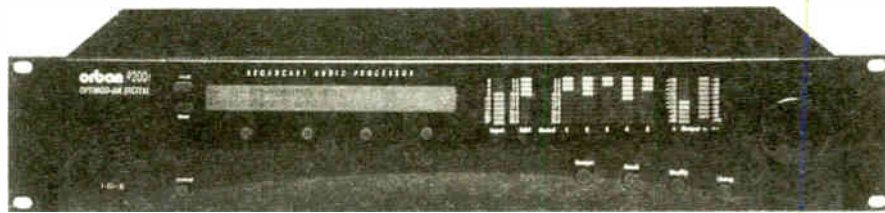
Eventide gave its new multichannel effects processor — based on advanced Harmonizer technology — a playful new name. You will see "Orville," the newest effect box in the long line of Eventide products.

### The Net

This is the year to put your station on the World Wide Web, with help from some new and familiar names.

Systems present ways to deliver your audio to a global audience over the Internet.

This also is the year to do your show from home or from practically anywhere.



Orban will present new software for its Optimod-AM 9200 processor.

Both Scott Systems and RCS are presenting voice-tracking systems that allow on-air talent to voice an entire shift from anyplace in minutes by using MPEG



The Maycom Easycorder provides digital quality for field reporting.

audio and laptop computers.

Internet broadcasting is possible with WaveStation software from BSI, the Trinity GlobeCaster from Play, the all-digital Omnia.net audio processor from Cutting Edge Technologies or the Orban Optimod-DAB 6200.

### Processors

Speaking of processing, there will be plenty to see and hear in that arena.

Orban is discontinuing the Optimod-8100 analog processor, but is gearing up for Las Vegas with new software for the Optimod-AM 9200 and v.3.0 software for the Optimod-FM 8200.

Aphex Systems Ltd. is bringing the FM Pro 2020 hybrid analog/digital FM processor, and Cutting Edge will roll out the Omnia.am, as well as version 1.6 soft-

pany, IDT — Impact Développement — thinks so. The company is introducing 24-bit/96 kHz digital broadcast sound processors and presenting the Sound Design five- and seven-band AM and FM processors, and the Sound Style four-band broadcast audio processor.

Sennheiser combined digital microphone technology with wireless transmitter/receiver technology to come up with the Digital 1000, a wireless microphone system operating in the 900 MHz band. Two independent diversity and audio sections eliminate companding and its related audio degradation.

Beyerdynamic launches a new, large-diaphragm announcer's microphone: the M99.

CAD Professional Microphone also loves the radio announcer. The company is showing the VSM-1 cardioid condenser microphone, which merges VX2 tube topology with Equitek servo technology; and the VX2 twin-tube studio microphone.

Shure Brothers is showing its new KSM32 side-address studio mic and SM7A studio mic.

For advance information on new products at the show, see RW's comprehensive booth listings in our March 31 issue. In May, look for our detailed reports from the floor about the many new products on display.

## RFC-1/B

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See Us at NAB Booth # L13878

# The RW Guide to Fun in Sin City

We all know that the biggest show in Las Vegas during April 17-22 will be the NAB99 convention, but you know what they say about "all work and no play."

## HEADLINERS:

Stars are what make Las Vegas shine, and here are the hottest tickets:

- DESERT INN, Crystal Showroom** April 22-25/Don Rickles (733-4444)
- CAESARS PALACE**, April 16-18/Steve Lawrence & Eydie Gorme (731-7110)
- LAS VEGAS HILTON**, Hilton Theater April 22-25/Alan Jackson (732-51 11)
- MGM GRAND**, Grand Garden arena, April 17/N Sync (891-1111)
- THE ORLEANS**, Orleans Showroom, April 19-May 12/The Righteous Brothers (365-7111)

When you really want to get away from it all perhaps a tour will provide the proper escape.

## GROUND TOURS

- Gray Line Tours of Southern Nevada** (702) 384-1234
- Guaranteed Tours** (702) 369-1000
- Interstate Tours** (702) 293-2268
- Las Vegas Adventure Tours** (702) 564-5452 1 (800)-553-5452
- Ray & Ross Transport, Inc.** (702) 646-4661
- Superior Tours** (702) 798-7311
- Valen Tours** 1 (800) 487-2252

## BIKING/HIKING TOURS

- City Streets Bike Tourist Rentals** (702) 596-2953
- Downhill Bicycle Tours Inc.** (702) 897-8287
- Happy Hikers-Wilderness Experiences** (702) 873-6962

Looking for entertainment that is more of an experience than a performance? Take in one of the city's more happening events:

## ATTRACTIONS

### THE ADVENTUREDOME AT CIRCUS CIRCUS

The Adventuredome at Circus Circus (formerly known as Grand Slam Canyon) is a five-acre theme park at Circus Circus, 2880 Las Vegas Blvd. South. The theme park features water rides, a roller coaster, laser tag, animated dinosaurs, an arcade, gift shop and restaurant. Hours vary. Ride tickets range from \$2 to \$5. (794-3939).

### BUCCANEER

Every 90 minutes each evening, cannon and musket fire are exchanged in a dramatic pyrotechnic battle between the pirate ship *Hispaniola* and the British frigate *HMS Britannia* in the middle of Buccaneer Bay. Hotel: Treasure Island (894-7111). Pricing: free. Visit the Web site at [www.treasureislandlasvegas.com/](http://www.treasureislandlasvegas.com/)

### CAESARS MAGICAL EMPIRE

Caesars Magical Empire at Caesars Palace, 3570 Las Vegas Blvd. South, offers free displays of its fiery Lumineria show 10:45 a.m.-3:45 p.m. Fri. through Tue. Guests can explore the catacombs en route to a 70-foot-tall central rotunda, where whirlwind flames and high-tech special effects are featured. Caesars Palace (731-7333).

### DOLPHIN HABITAT

This 2.5 million gallon Dolphin Habitat is home to a family of Atlantic bottle-nose dolphins. Its purpose is to provide a healthy and nurturing environment for dolphins, as well as to educate the public about marine mammals and their environment — including their role in the ecosystem. Hotel: Mirage (791-7111). Pricing: free.

### FREMONT STREET EXPERIENCE

The Fremont Street Experience, a pedestrian promenade in downtown Las Vegas, features a misting system, retail carts, kiosks, free entertainment and one-of-a-kind light and sound shows, with more than 2 million lights and 540,000 watts of sound. Shows include "Odyssey," "Las Vegas Legends" and "Country Western Nights." On Fremont Street between Main Street and Las Vegas Boulevard (678-5777 or (800) 249-3559).

### M&M'S WORLD

M&M's World at the Showcase Mall, 3785 Las Vegas Blvd. South, features Ethel M's flagship store on the first floor; an 8,500-square-foot retail store on the second floor featuring a see-through wall filled with M&Ms and more than 3,000 M&M's logo items. Hours are 10 a.m.-midnight (until 1 a.m. Fri.-Sat.). Admission is free (736-7611).

### MASQUERADE SHOW IN THE SKY

The "Masquerade Show in the Sky," an indoor entertainment experience featuring a cast of 36 performers, five floats, elaborate costumes and four different themed parades, is presented on the hour every other hour from 2 p.m.-midnight daily, except Wednesdays, at the Rio, 3700 W. Flamingo Road. Performances are free. Guests may participate in the sky parade for \$9.95 (252-7776).

### MOTION MACHINES

Merlin's Magic Motion Machines, inside the Excalibur, 3850 Las Vegas Blvd. South, combine 70mm film, five-channel Dolby stereo sound and specially designed seats that move in-sync with the on-screen action. Hours are 9 a.m.-midnight Sun., 10 a.m.-midnight Mon.-Fri. and 9 a.m.-1 a.m. Sat. Cost is \$3 per ride (597-7777).

### RACE FOR ATLANTIS

The first giant-screen Imax 3D motion simulator ride, is open 10 a.m.-11 p.m. daily (until midnight Fri.-Sat.) at The Forum Shops at Caesars, 3500 Las Vegas Blvd. South. General admission is \$9.50; \$8.50 for senior citizens; and \$6.75 for children ages 12 and under. Discount for local residents. Must be at least 42 inches tall to enter (733-9000).

### THE SECRET GARDEN OF SIEGFRIED & ROY AND DOLPHIN HABITAT

The Secret Garden of Siegfried & Roy at The Mirage, 3400 Las Vegas Blvd. South, features some of the world's rarest and most exotic animals, including the Royal White Tigers of Nevada and the White Lions of Timbavati. Hours are 11 a.m.-5:30 p.m. daily, except Wednesdays. General admission is \$10; free for children ages 10 and under. Price includes admission to The Mirage Dolphin Habitat. (791-7111).

### STAR TREK: THE EXPERIENCE

Star Trek: The Experience at the Las Vegas Hilton, 3000 Paradise Road, includes a complete re-creation of the promenade from "Star Trek: Deep Space Nine;" and The Voyage Through Space, an interactive ride where visitors are "beamed" through time and space aboard the USS Enterprise. Hours are 11 a.m.-11 p.m. daily. Cost is \$14.95 general admission for The Voyage Through Space (732-5111).

### THE TOMB AND MUSEUM OF KING TUTANKHAMUN

The Luxor, 3900 Las Vegas Blvd. South, features a full-scale replication of King Tut's Tomb, as found by Howard Carter in 1922, and a museum. Hours are 9 a.m.-11 p.m. daily (until 11:30 p.m. Fri.-Sat.). Tickets are \$4 general admission (262-4555).

### WORLD OF COCA-COLA LAS VEGAS

The 28,000-square-foot World of Coca-Cola Las Vegas at the Showcase Mall, 3785 Las Vegas Blvd. South, features an interactive storytelling theater, a multisensory "fantastic fountain" and the world's largest Coke bottle. Hours are 10 a.m.-11 p.m. daily (until midnight Fri.-Sat.). General admission is \$2, free for children ages 3 and under (270-5965).

## TIPPING

A gratuity, tip (or "toke," as they say in Las Vegas) is the way to show appreciation for courteous service. Here's a guide to the going rates:

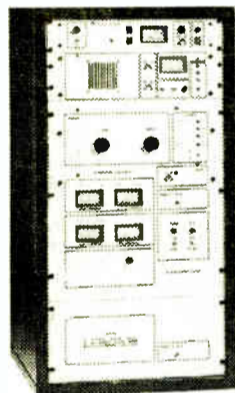
- Bartenders:** \$1 per round for parties of two to four; more for larger groups.
- Bellmen:** \$2-\$5, depending on whether you will need services or advice during your stay.
- Change Clerks:** If a machine fills up your paper cup, remember who gave you the lucky coins, please.
- Cocktail waitresses:** \$1 a round for parties of two; more for larger groups.
- Dealers:** Tips either can be given directly to the dealer between hands, throws of dice or spins of wheel, or small "side bets" are permitted. These can range from \$1 to, generally, half of your bet.
- Guest room attendants:** About \$1 per day, usually left at the end of your stay.
- Restaurant waiters:** The standard 15-20 percent rule applies.
- Room service waiters:** The standard 15-20 percent rule applies.
- Skycaps:** 50 cents to \$1 per bag, depending on size and weight.
- Taxicab drivers:** Approximately 15 percent of the total fare, but not less than \$1.

— compiled by Jay Ankeney and Dan Dennis

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High Performance Solid State Exciter  
Solid State IPA Amplifier  
One Year Limited Warranty  
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10,000 watt .....	\$24,990.00
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### 20 Watt Solid State Exciter - \$995.00

### Solid State FM Transmitters with Digital Exciter

120 watt .....	\$2,800.00	2,000 watt .....	\$12,900.00
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1,000 watt .....	\$7,990.00	5,000 watt .....	\$29,990.00

<b>FM AMPLIFIERS</b>	<b>FM STL Both Transmitter and Receiver</b>
100 watt..... \$995.00	<b>\$3,500.00</b>
300 watt..... \$1,790.00	
500 watt..... \$2,990.00	

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All Power Levels 500 watts to 20,000 watts per bay

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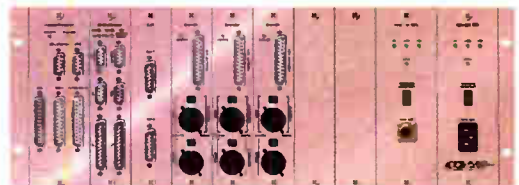
Studio FONE  
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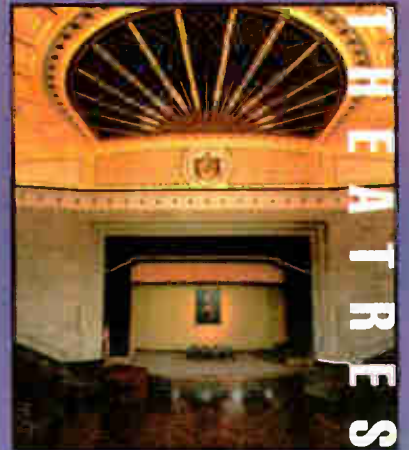
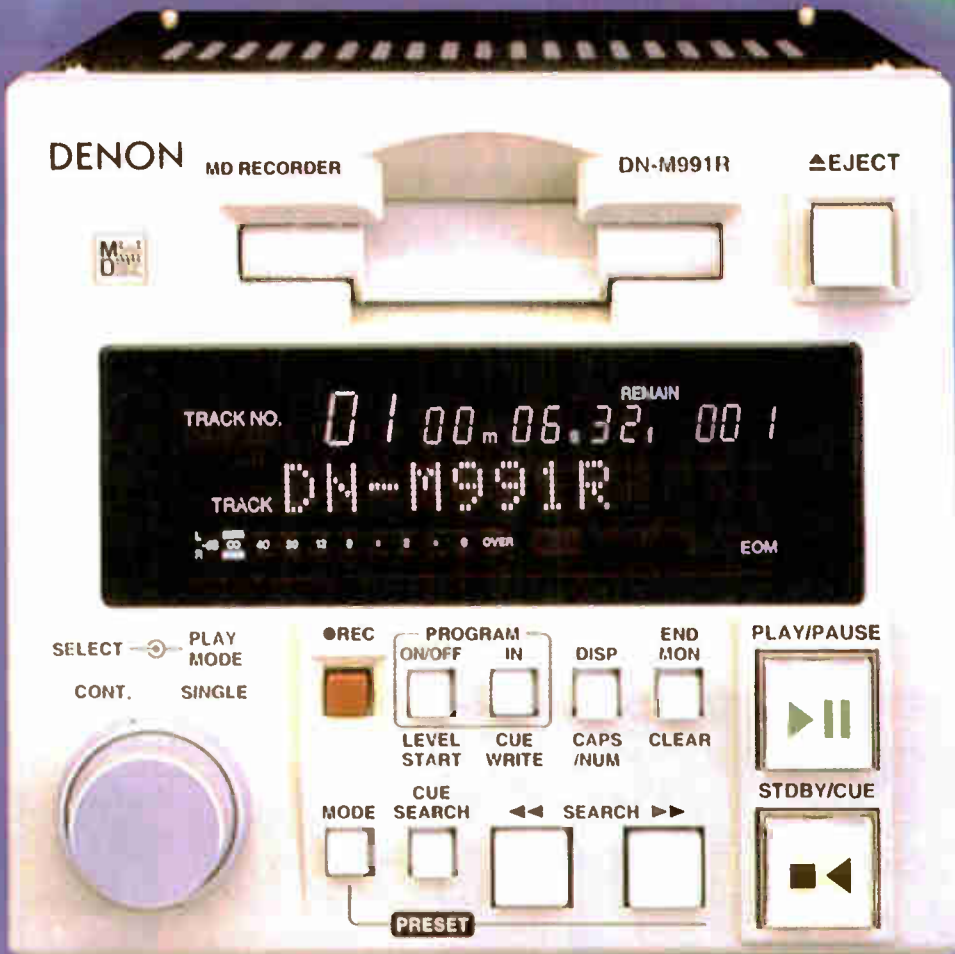
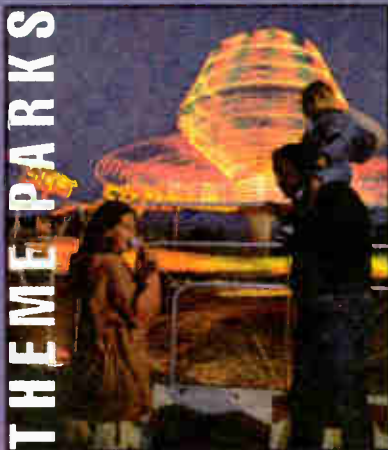
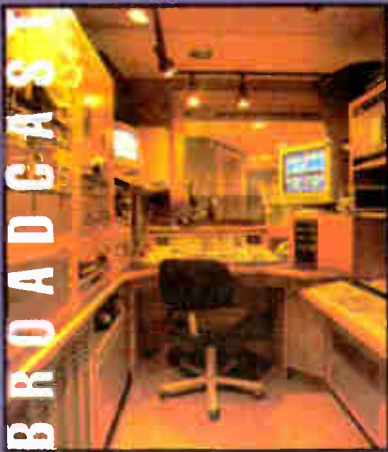


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Introducing the new Denon DN-M991R MiniDisc recorder/player. MiniDisc is the most versatile media available for archiving program material for playback in a variety of applications including broadcast, theme parks, theatres and shopping malls, among others. The DN-M991R offers all the features and functions that



engineers have asked for, such as a large and easy-to-read florescent tube display with multiple readouts, Hot Start, keyboard entry, seamless Sleep mode, front-panel Program Play and a variety of control terminals including RS-232C, RS-422A, D-Sub 25 pin and PC-compatible Mini Din keyboard connector. For additional information, contact our broadcast products specialist at



(973) 396-7492.

■ 10 Hot Starts

■ Instant Start

■ Auto Cue

■ Multiple Display

■ Seamless Sleep Mode

■ +/- 8% Playback Speed Control

■ Program Up To 25 Tracks

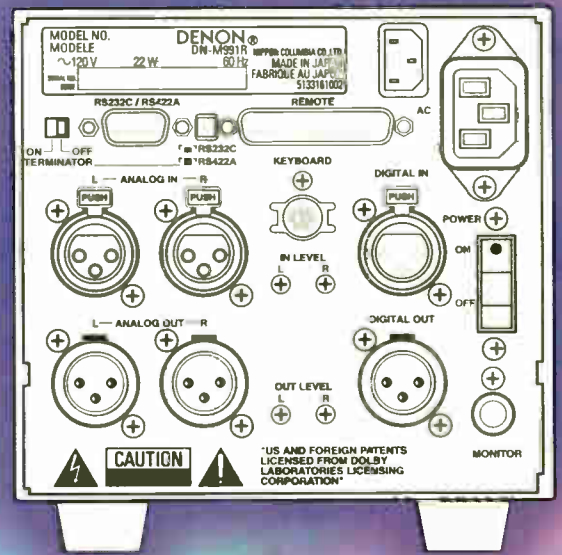
■ Multiple Editing Functions

■ Rotary Track Selector

■ Relay Recording

■ Auto Level Rec Start

■ Optional Wired Remote RC-650



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# DENON

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# SynchroCast Puts GPS to Work

*Harris Intraplex Uses Synchronized Transmitters For Extended Coverage in FM Broadcast*

**Bill Gould and Jai Eu**

This is an abbreviated version of a paper to be presented during NAB99. The authors are employees of Harris Communications Intraplex Transmission Solutions.

Simulcasting is not normally a topic one would associate with radio's transition to digital, the topic of this column in RW. But the use of digital as described below demonstrates how various technologies can converge to offer new solutions to radio managers.

The full paper and additional graphics are available at [www.rwonline.com](http://www.rwonline.com)

Simulcasting is the use of multiple, overlapping transmitters, operating on the same frequency, in a market. Through simulcasting, radio broadcasters can ring a metropolitan area with low-powered suburban stations and cover the entire market.

Simulcast transmitters placed in a line can cover the length of a major highway, population corridor or rating service survey area. On-frequency boosters can fill in important coverage gaps.

those associated with a single major-market station transmitter. Station acquisition costs are far less, and the resale value of the combined system can be many times the price of its individual component stations.

Also, rating services use dial positions to score survey responses. Realistically, the only way to keep people listening is to allow them to move transparently between coverage areas on the same frequency.

Broadcasting from two nearby transmitters on the same frequency can lead to serious reception problems in the overlap areas. SynchroCast technology makes

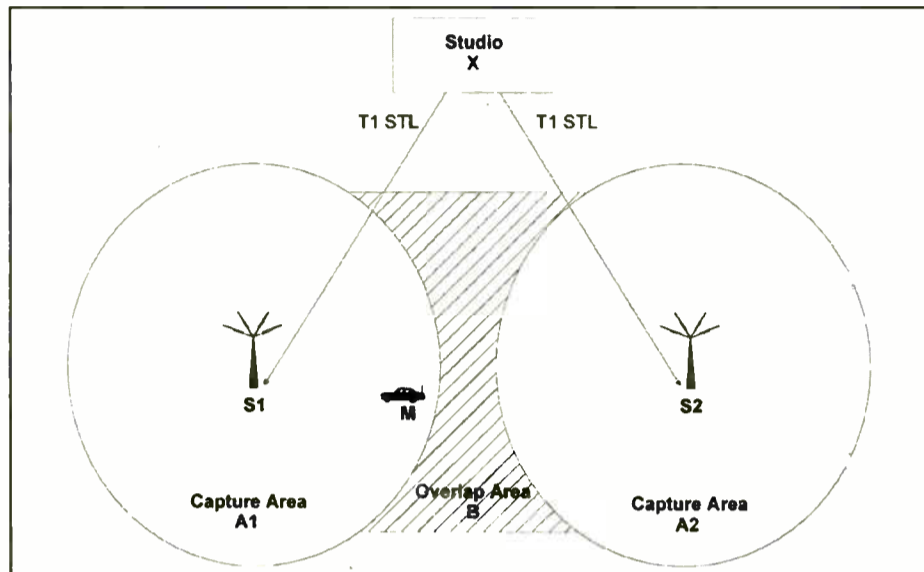


Figure 1: Impairment Compared to Relative Delay and Protection Ratio

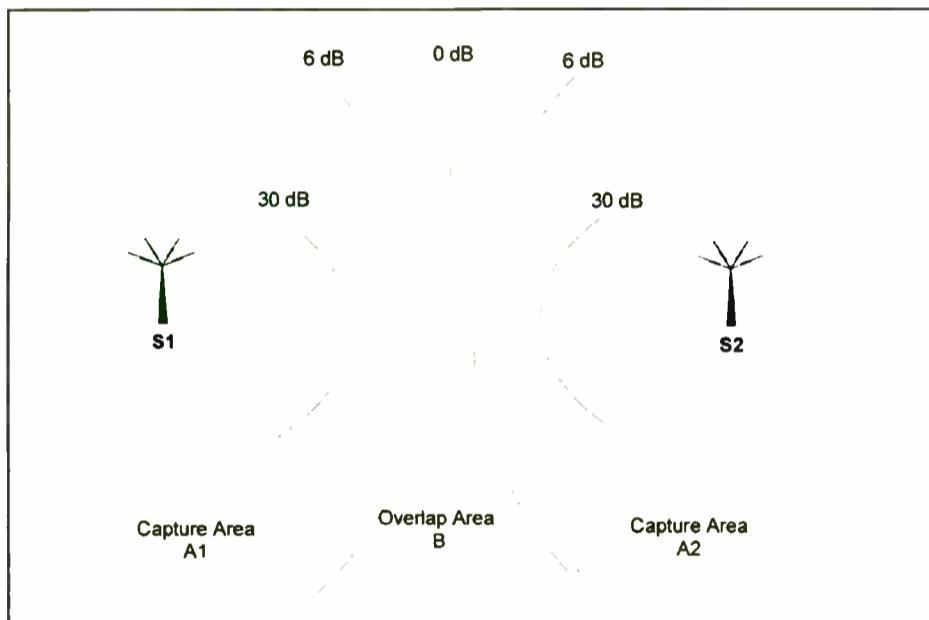


Figure 2: Overlap and Capture Areas

Simulcasting can provide dramatically increased coverage. Smaller stations can be combined to create expanded coverage maps that are larger than a metro powerhouse. Operating costs of smaller transmitting facilities are a fraction of

Simultaneous transmission of programming on multiple frequencies has yielded marginal results. Promoting multiple dial positions is expensive and confusing to listeners who often don't remember to retune their radios.

this type of broadcasting possible by integrating state-of-the-art technologies, GPS satellite receivers and precision digital delay management. It can be applied to multiplexed digital studio-transmitter links (STLs), across leased T1/E1 circuits, microwave radio links or fiber optic links.

Carrier frequency and program audio timing at all transmitters are locked to the GPS timing standard, reducing or eliminating unwanted artifacts at the listener's receiver.

**SynchroCast and STL Plus**

Harris' simulcasting technology, SynchroCast, operates in conjunction with the Intraplex STL Plus digital studio transmitter link, which can be used on leased T1/E1 circuits, microwave radio links or fiber optic links. The Intraplex STL Plus multiplexing system provides bidirectional transmission paths for program audio STL/TSL, data for remote control and LAN interconnect, and voice channels for off-premise extensions and intercoms, all on a single digital circuit.

The Intraplex STL Plus supplies the transmission capability for the STL and SynchroCast. Program audio is delivered



to the transmitter by a 15 kHz stereo linear uncompressed digital system. Inputs and outputs can be either analog or AES/EBU. SynchroCast timing signals accompany the program audio in the out-bound direction.

An optional TSL package provides a 15 kHz stereo linear uncompressed return audio path, well-suited for off-air audio from the modulation monitor. Since one or more of the transmitters in the simulcast system will be out of over-the-air reception range, this provides a convenient means of monitoring the actual air sound of the transmitters.

Two bidirectional voice-grade audio paths are also provided. One accommodates transmitter remote control and return telemetry. The second may be used for backhauling audio from an EAS receiver or RPU gear at the remote transmitter site.

The system requirements for a simulcast application are for one Intraplex STL Plus system for each studio to transmitter link; one GPS receiver for the studio and one for each transmitter in the system; and one SynchroCast simulcasting package, which includes all GPS modules, timing transmission modules, and digital delay modules needed for the studio and two transmitter sites.

Let us consider the application in more detail.

**GPS and simulcasting**

For simulcasting to work effectively, the broadcast signal from each transmitter must arrive at the receiver at a precisely controlled time. A signal leaving the studio will be subject to two delay factors: uncontrolled studio transmitter

See DIGITAL, page 27 ▶



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# Audio Preparations for AM Radio

Ed Montgomery

*This is one in a series of articles about the fundamentals of AM radio. The previous part appeared March 17.*

Audio is a variable: It constantly changes and creates the power levels in sidebands. Because noise is an amplitude function, it is important to create a power level that gives the best signal-to-noise ratio that can possibly be attained.

Audio can come from any number of digital or analog sources. It must be delivered to the transmitter at a level that will give the maximum sideband power possible without adding distortion or

reducing dynamic range to an intolerable level. Overdriving the signal at the studio console can cause clipping distortion. Once distortion is introduced into the system, it cannot be removed.

After the signal leaves the studio, it travels either across the building to the transmitter or through a studio-transmitter link (STL), telephone line or microwave feed to the transmitter location.

The audio is prepared for the transmitter by using compressors or limiters to prevent distortion and overmodulation. Often it is wise to use a limiter on telephone lines or microwave STLs to prevent distortion. Unlimited instantaneous

peaks can cause undesirable affects.

All transmission systems have a specific operating level, usually related in decibels, which should not be exceeded. The amount of protection necessary is dictated by the type of format being used. Conversations with the engineers in charge of the station can assist you on arriving at a level that is appropriate for your station. If your station does not sound as good as others in your market, assume something is wrong.

## Masking noise

Audio processing developed rapidly in the 1950s. After television took away many radio audiences, broadcasters

adopted the DJ format, becoming music or news stations. To hold onto listeners, they made the station appear loud. Limiters and compressors were introduced to increase loudness at the expense of some dynamic range, which reduced the appearance of noise within the system.

Another technique to increase loudness and coverage area was the introduction of reverberation. Many stations put these devices at their transmitter sites, adding an echo effect to the broadcast signal. This gave the DJ a louder and more commanding voice. One might say everything sounded like it was happening in a large bathroom, but it worked. Music performers — such as Phil Spector — began to add echo to their songs. Spector's "wall of sound" recordings were made with the AM band in mind.

The sound of an AM broadcasting station is dependent upon everything from the quality of the studio console to the condition of the antenna system. AM is frequency-sensitive; sideband power is directly related to the audio frequency creating the modulation.

The most powerful sidebands are closest to the carrier. Check the frequency response of the audio line, telephone line or STL. Don't assume everything is okay. There was a time when the FCC required this in the form of the audio proof-of-performance. A flat frequency response in the audio line can translate into a louder audio signal in the receiver.

Format plays an important part when considering the amount of audio processing being used. You also have to consider what type of receiver people will be listening on. AM listening takes place in cars probably more than any other place. It is important to prepare a signal that will be able to compete with all of the other sounds around the vehicle.

## Chemistry set

Processing must not be to the point where "listener fatigue" is reached. Compressors and limiters can be set so the modulation meter almost constantly remains at 100 percent. While this will produce an audio signal almost void of noise, it will also annoy the listener. It usually takes some experimenting with an audio system to get it precisely where you want.

Classical music, which contains many audio levels and variations, requires little audio processing. For that reason, classical music is difficult to carry on AM in this age. At times, the classical station listener might think the station is off the air. Popular music is different and can be processed at a more aggressive level, as its dynamic range is much smaller.

For talk radio, audio should be set somewhere between what is best only for voice and music. Commercial material may include jingles and short music pieces, and they must sound right when broadcast. The "attack time" of the compressor/limiter should not be set to increase the audio output level at the instant someone stops talking. It is important to read the manuals on proper setup of these units to achieve the sound you and your listeners want.

The compressor/limiter has become quite a sophisticated piece of equipment over the years with features that include audio compression, expansion, limiting, clipping and gating. Many models are multiband, permitting specific processing

See AM, page 32 ▶

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# Timing Is Established With GPS

► DIGITAL, continued from page 25  
link path delay and the "flight time" in the air from the transmitter to the receiver, over two different paths.

The arrival time of each signal at the receiver can differ significantly, causing distortion, echoes and other artifacts. In addition, each transmitter's local oscillator frequency will be slightly different, causing phase errors between carrier frequencies in the overlap area.

The advent of Global Positioning System satellites has created a truly effective method for synchronizing transmitters.

A GPS receiver delivers a precise timing reference to the studio and to each transmitter site. At the studio, a timing signal is sent along with the program audio over the studio's transmitter link, to each transmitter site. At the transmitter, SynchroCast technology compares the timing reference received from the studio to the local timing signals, to determine the actual path delay.

Once this delay is established, digital delay modules calculate and introduce a precisely controllable delay, causing exact alignment of the transmitted audio signals. In addition, the GPS receivers at all transmitter sites provide the same 10 MHz reference signal to each transmitter exciter, locking all of their carrier frequencies to the same satellite-delivered timing reference.

Effects of multiple transmitters, each broadcasting a locally generated 19 kHz stereo pilot in a simulcast system, must be considered. Proper decoding of the stereo L-R signal depends on the accurate reception of the stereo pilot. Just as the transmitter carrier frequencies in a simulcast system must be locked to a GPS-delivered reference, the stereo pilot should be locked to a master reference as well.

The system operates automatically once the initial installation and alignment is complete. It continually monitors the timing of each link, keeping the total delay to each transmitter constant, even if the actual path delay changes. This can occur, for example, if a T1 circuit gets rerouted to an alternate path due to network interruptions.

## Good reception criteria

When a receiver is in range of more than one transmitter, the criteria for good reception include *relative signal strength* and *total transmission delay*.

Relative signal strength describes the relationship of two or more transmitted signals, based on the location of the receiver. In the case of two overlapping transmitters, within the capture area of the transmitters the signal level of one transmitter is stronger than that of the other.

Total transmission delay is the elapsed time interval calculated from when the signal leaves the studio to when it reaches the receiver. This delay can differ from one transmitter to another, based on the signal path of the specific studio-transmitter link.

Figure 1 illustrates the relationship between delay and relative signal strength. The figure shows a broadcast system in which the same audio program is simultaneously transported from Studio X over T1 or E1 STLs to two transmitter sites (S1 and S2).

In this example, both sites have equal transmission power. The total transmission delay between the studio and each transmitter is different, based on audio processing time and path delay.

When the FM receiver "M" is located in capture area A1, the receiver will lock in the program transmission from site S1. This is because the signal from S1 is much stronger in capture area A1 than the signal from S2. In this case, the signal from S2 can be considered an interfering signal. When the receiver is located in capture area A2, the reverse occurs.

When the receiver is located in the overlap area "B," however, it receives signals of almost equal strength from

both transmitter sites. These signals interfere with each other.

Figure 2 depicts the contours of relative signal strength from both sites. In the overlap area, the relative power levels differ by less than 6 dB.

Because the studio distributes the same FM audio program over STLs using T1 or E1 circuits in the public-switched telephone network, different time delays will occur between the studio and the receiver in the overlap area, based on their location. Factors affecting the total transmission delay time can include audio processing delay at the studio and/or transmission sites, T1 or E1 network path delay and air path delay.

In the overlap area between two adjacent transmission sites, equalization of the time delay and phase alignment of the audio base band are required for good reception.

Now, consider the relationship between the air path delay from the two transmitter sites. Regardless of the signal power strength of the transmitter, the contours of the air path propagation delay are determined by the distance between the receiver and the transmitter.

If each transmission site transmits the same signal at exactly the same time, there is a line of equal delay that lies exactly halfway between them, perpendicular to a line connecting them. A receiver located anywhere on this line will receive exactly the same signal at exactly the same time from both trans-

See DIGITAL, page 28 ►

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World Radio History

# The Power of Simulcasting

► DIGITAL, continued from page 27  
mitters. This is because the speed-of-light delay from each transmitter is exactly the same for all points located on this line.

Other lines can also be defined along which a receiver will receive the signal from one transmitter at a constant specified interval before the other. These lines are in the shape of mathematical hyperbolas, with one transmitter or the other at the focal point. (If you have difficulty picturing this, see the graphics accompanying the full paper at [www.rwonline.com](http://www.rwonline.com))

For example, a time-delay difference of 5.364  $\mu$ s corresponds to a corridor about 1.0 mile (1.6 km) wide, crossing directly between the two transmitters, because the FM receiver gets the signal from the closer transmitter 2.682  $\mu$ s (0.5 miles) earlier and 2.682  $\mu$ s later from the farthest transmitter, for a total difference of 5.364  $\mu$ s.

The width of these corridors, at their narrowest, is independent of the actual distance between the transmitters; only the shape of the curves to either side changes.

A similar set of curves can be drawn that represent the relative signal strength that a receiver obtains from each transmitter.

Mathematically, these curves are sections of ellipses, not hyperbolas (because of the inverse-square law). As a result, their basic shapes resemble, but do not correspond perfectly to the delay curves. Furthermore, signal-strength curves are distorted by the antenna patterns, multipath

and terrain conditions. If the transmitter ERP levels are not equally matched, the center of the equal-signal corridor is offset

lated areas such as mountaintops or over bodies of water.

At the speed of light, a signal traverses

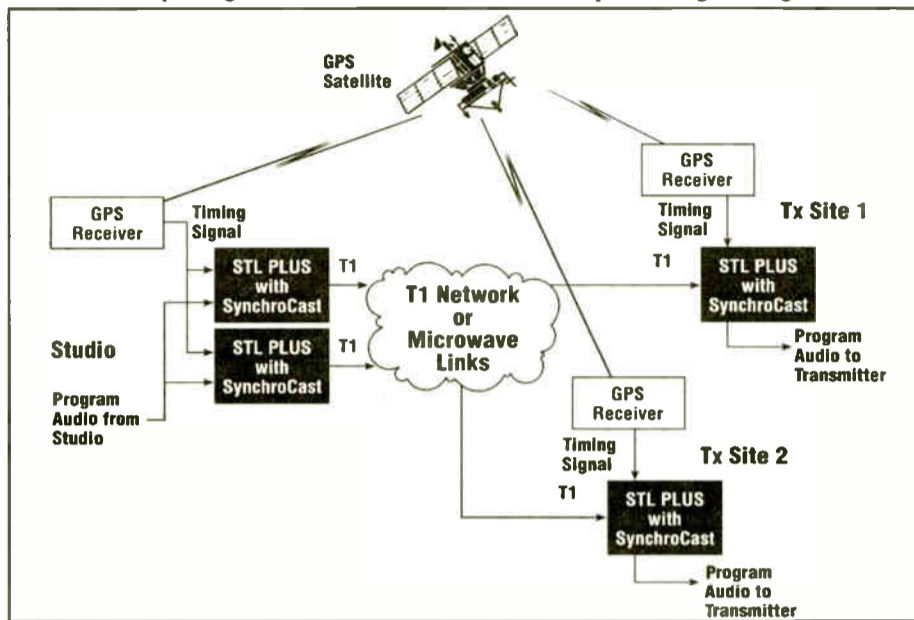


Figure 3: Block Diagram of System Configuration

toward the weaker transmitter.

In cases of unequal transmitter power balance, where the point of equal field strength is not located at the equal distance point, signal delay at one of the transmitters must be intentionally and precisely altered. This alters the position of the delay curves relative to the signal level curves, eliminating problem areas or allowing them to be shifted to unpopu-

lated areas such as mountaintops or over bodies of water. about 981 feet (300 meters) in one microsecond ( $\mu$ s). If the time that a signal leaves a transmitter varies by  $\pm 4 \mu$ s, the location of the equal-delay curves will shift by about a third of a mile (0.6 km) to either side.

This delay-curve change is equal to half of the transmitter signal propagation delay change. To maintain this degree of control, the delay of every element in the signal

path, from the studio to each antenna, must be controlled to this level of precision. This becomes problematic when sending the signal through a public or private distribution network whose characteristics do not allow this degree of control.

Use of digital T1 (1.544 Mbps) or E1 (2.048 Mbps) circuits in the public-switched telephone network have become an increasingly popular way to distribute high-quality audio signals between studios and transmitters. These circuits tend to have fairly stable delay characteristics, typically in the 3-8 ms range.

Public networks, however, are subject to rerouting, which cause a sudden and dramatic change in the overall circuit delay, and can happen as often as several times each day, without warning. STLs using private networks or microwave links can also be subject to variable delays on the order of tens of microseconds, as a result of data buffering in modems or other equipment.

Long microwave links can have unequal amounts of delay shift due to path differences. Clearly, some sort of mechanism for compensating for these unpredictable delay variations is required for successful transmitter synchronization.

### Automatic adjustment

The Harris Intraplex simulcasting system solves these problems by automatically adjusting for any differences and variability in the STL path delay, and by providing a GPS-locked frequency reference to the transmitting equipment to eliminate carrier frequency drift.

See DIGITAL, page 29 ►



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► DIGITAL, continued from page 28

The system, shown in Figure 3, addresses these problems with a three-pronged approach. First, the program is distributed as a discrete-channel digital audio signal, which facilitates amplitude and frequency response matching. Second, GPS receivers at all sites in the network provide extremely precise frequency and time references—to one part in  $10^{13}$  in frequency and to less than 1  $\mu$ s in time.

The GPS frequency reference is used to calibrate the transmitter frequency directly, while, the time reference is used to adjust a variable time delay mechanism that automatically compensates for delay changes in the distribution network.

The timing comparator receives a local timing reference from a GPS receiver located at the transmitter site. Its other input is the master timing reference that arrives over the STL, with exactly the same network delay as the audio signal it accompanies.

The comparator measures the time offset between these two inputs and sends commands to a precision digital delay line to create the overall delay required to compensate for any variations in the network delay.

Overall, the system can control the path delay from point A at the studio to point B at each transmitter to within  $\pm 2 \mu$ s. The individual path delays can be offset in steps of 0.1  $\mu$ s to optimize the performance of the system in the overlap regions. It is also possible to configure the system to absorb path delay variations of up to 84 ms.

It is important to note that the audio and other multiplexed signals are not interrupted or perturbed in any way, even when delay adjustments are made. This is called "hitless" operation, and a patent covering the mechanism that accomplishes this has been applied for.

The system also delivers the signals to the inputs of the exciters with the desired degree of precision. It is important that the signal chain from that point, to the antenna at each transmitter, maintain the same fixed delay, or at least delays that track each other. This is most easily accomplished by using identical processing and amplifying equipment at each transmitter site.

**Planning a system**

The first step in planning a simulcast system is identifying an appropriate opportunity, such as those detailed earlier in this article. The second step in a feasibility study would involve investigation of existing transmitter facilities and possible future improvements that could enhance these systems.

Directional antennas can be used to concentrate signals in desired areas while protecting them from exceeding strength limitations in other directions. A frequency search of the fundamental, as well as the first and second adjacent frequencies, can help identify future expansion possibilities as well as any "short spacing" that might exist.

The next step is to design the signal distribution network. The key requirements for synchronization of multiple transmitters are ensuring that the carrier frequencies are locked together, and aligning the modulation in both amplitude and phase.

Figure 4 shows an overall distribution network schematic. One link is required

from the studio to each transmitter site. In addition to the 15 kHz stereo linear uncompressed channels for transmission

support provides a 15 kHz inbound stereo channel for an air monitor and a bi-directional path for remote transmitter control.

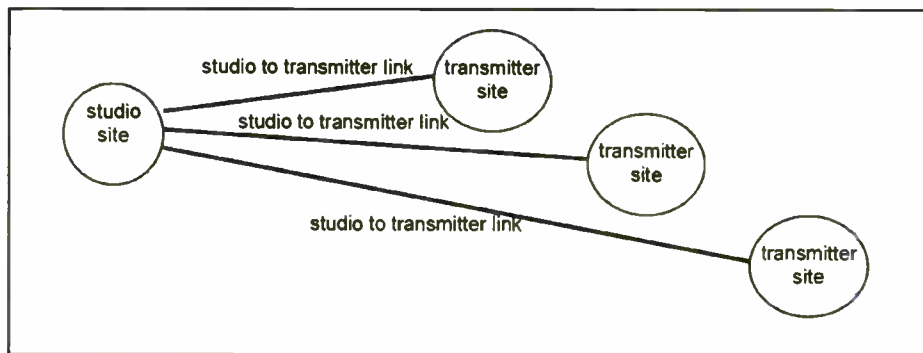


Figure 4: Block Diagram of Distribution Network

of program audio to the transmitter, SynchroCast timing information is sent in the outbound direction. The optional TSL

An additional voice grade circuit is available for carrying Emergency Alerting System (EAS) audio, remote pick-up, etc.

Each link requires the equipment previously listed. The studio site requires one multiplexer shelf for each link, but a single GPS receiver can be shared for timing reference. Each transmitter site requires one multiplexer shelf and a GPS receiver to generate its local timing and frequency references. Each additional transmitter site added to the system requires a multiplexer shelf at each end of the link and a GPS receiver at the transmitter site.

The full paper, available at [www.rwon-line.com](http://www.rwon-line.com), includes a discussion of audio processing and implementation considerations, including tips for verifying performance.



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PRODUCT EVALUATION

# JK Audio Goes Inline

**Jerry Arnold**

The telephone hybrid certainly is nothing new, having been used in its analog form basically since there has been phone audio put on a radio station.

In recent years, the trend has been toward digital technology, phone hybrids included. A positive selling point of a digital version is its deep nulls of send-vs.-receive audio and automatic, or at least semi-automatic, nulling. But these features come with a hefty price tag, usually at the additional downfall of an unusually large enclosure.

So it was a slight surprise to see JK Audio introduce its Inline Patch analog hybrid.

## Nice size

The package is small enough to be tucked into any remote broadcast bag, but not so small as to be hard to use or read. Connections are quite conventional, and universally used — a male XLR is required for the “Send To Phone Line” connection, although a 1/8-inch mono plug can also be used.

A female XLR is needed for the “From Phone Line” output, but again provisions



The author, at right, joins announcer Doug Breneman at ringside.

are made for two additional unbalanced outputs using 1/8-inch phone plugs: one

is a mixed mono output, and the other is a 1/8-inch stereo jack where the left channel represents the “Line” and the right channel represents the “Phone Line.” Simultaneous use of the balanced and unbalanced inputs and outputs is permitted.

Telephone and phone line connections are made via standard RJ-11 jacks. The unit is powered by an included

**The package is small enough to be tucked into any remote broadcast bag, but not so small as to be hard to use.**

“wall-charger” type of transformer that supplies 16 VAC to the unit. Controls are straightforward and well-labeled. A toggle switch allows capture of the phone line without coming off-hook with the attached telephone, if you desire.

### In the left corner...

We put the Inline Patch to the test, broadcasting live coverage of a World Championship WBF Boxing match.

Our setup was quite conventional: Two boom mic headsets were plugged into a venerable Shure 267 mic mixer, with the output of the mixer fed to the Inline Patch input. The Patch's output was split and fed to the left headphone of both boom mic headsets so we could hear instructions from the studio. We also used one of the unbalanced outputs to drive a cassette recorder.

The user guide that comes with the Inline Patch recommends a -10 dBm nominal balanced input, which is not exactly line-level. Many consumer-grade audio components do use -10 dBm as “line-level”; this caused a slight problem when driven from the 267 mic mixer, which has a nominal +4 dBm output at “zero VU.”

We had to turn the level of the mic mixer down quite a bit so we didn't overdrive the Patch. Doing so made the mixer's VU meter useless, not to mention the

See INLINE, page 32 ▶

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# Choose Your Processor Carefully

► AM, continued from page 26 at prescribed frequencies.

When choosing an audio processing system, know that all systems do not interface favorably with each other. A certain manufacturer may say its processor will improve your audio with documented evidence from other broadcasters. While this may be true, you still need to test a unit in your audio chain. Install a demonstrator unit according to the manufacturer's instructions and listen to it under differing conditions: in a car, on a Walkman, at home, etc. Make sure it is performing to your expectations.

An equalizer may be used to enhance

certain frequencies, but this device really "unequalizes" your signal by lowering the output of some frequencies while increasing others. Some broadcasters attempt to use an equalizer to improve the frequency response of an AM station that has a deteriorating antenna system. This is not recommended. The equalizer is best used in the production studio to improve the sound of poorly recorded audio, perhaps to remove unwanted hum from a remote feed. It is not recommended as a part of the studio to transmitter audio chain.

I am probably the last person in America to say this, but I will: AM stereo

is a way to improve the sound of AM. I recently researched AM formats and found that more than 75 percent of national AM stations program a substantial amount of music. AM is not the news/talk world that seems to dominate the major markets. AM stereo is worth the investment.

■ ■ ■

*Ed Montgomery is the video technology and communications lab director at Thomas Jefferson High School for Science and Technology, Fairfax County, Va.*

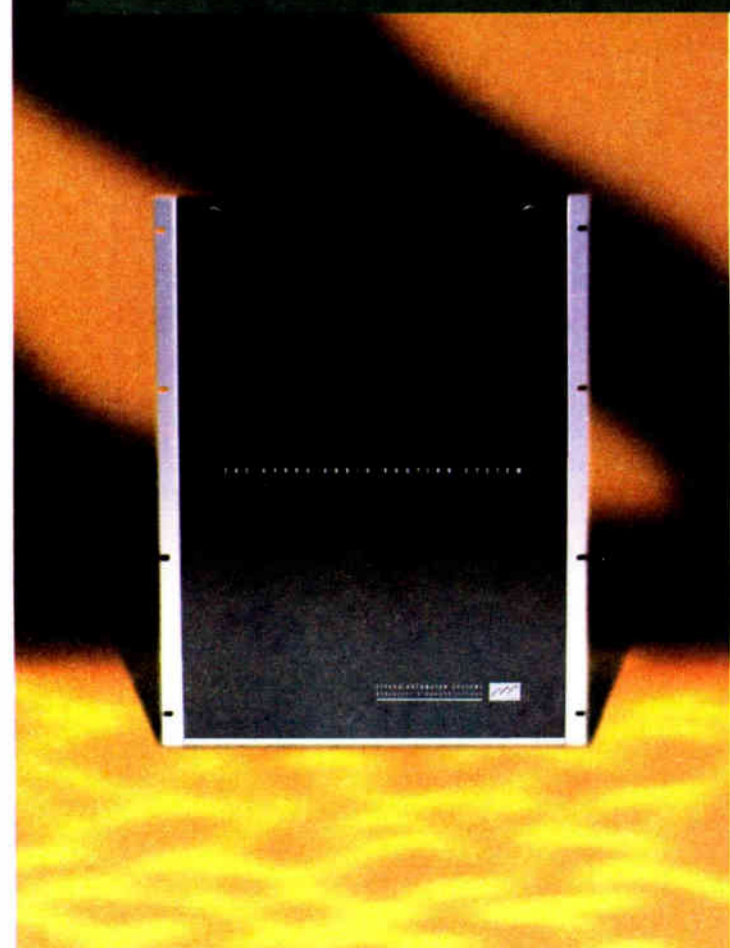
*He has worked as a broadcast engineer and college-level instructor. Reach him at emontgom@lan.tjhsst.edu*

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## Patch Your Broadcast With Inline

► INLINE, continued from page 30 degradation of the signal-to-noise ratio. Driving the patch's input at +4 dBm caused noticeable distortion on the phone line. The user guide claims a null depth of 20 dB. While I made no actual measurement of the null, I was quite impressed by it.

### Positive vibration

The unit also has a jack on the rear panel which is a remote control point for the Off Hook switch. For most broadcast applications this will have no value, since at a remote event the front-panel switch will be employed. I would have sooner had the same space used for an output jack of a small internal headphone amplifier.

My overall reaction to the unit was positive, especially in light of its low cost: \$270 at retail. And its performance as a hybrid was everything it claimed to be.



The JK Audio Inline Patch

For a supposed obsolete technology, the hybrid does a surprisingly good job. Having used other brands, both digital and analog, I found the Inline Patch nearly equal to any analog unit, even rivaling the operation of lower-end digital units.

■ ■ ■

*Jerry Arnold is vice president of engineering at WTHC(FM) in Terre Haute, Ind.*

### Product Capsule:

#### JK Audio Inline Patch



#### Thumbs Up

- ✓ Small size - perfect for remote broadcast
- ✓ Easy to use and set up, using standard audio connectors
- ✓ Flexible balanced/unbalanced I/O
- ✓ Low cost



#### Thumbs Down

- ✓ Professional line-level audio input causes distortion
- ✓ RJ-11 jacks on the front panel where lines get in the way
- ✓ No provision for battery operation

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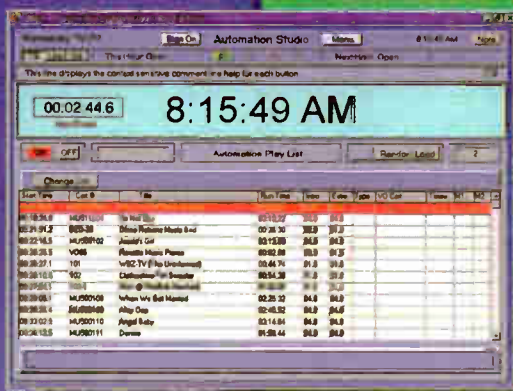
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Circle 1134 On Reader Service Card

FIRST PERSON

# KXRK's Annual Invasion of Europe

Mario Hieb

Why would a Salt Lake City alternative radio station travel across the Atlantic and broadcast its morning show from three European cities in five days?

For several years in a row, a motley entourage of DJs, engineers, contest winners and "tag-alongs" fly across the pond for a unique station promotion.

The KXRK(FM) X96 "Radio From Hell — Invasion of Europe" broadcast had us in London Monday through Wednesday, in Amsterdam Thursday and in Paris for Friday's show. My job: schlep a case of remote gear through airports, train stations, subways and streets.

We travel on taxis, ships, trains, planes, and buses, and on foot. Once we reach our destination, I set up a studio

examine your equipment and will stamp the carnet. Each time you enter or leave a country, your carnet will be processed. The idea is that you don't leave or bring back high-tech equipment without paying the proper duties.

Show prep

It's Wednesday and we're in London! It's 10 a.m. here, 3 a.m. in Salt Lake City.

While Kerry and Bill are out on the town with the DAT recorder gathering material for the morning show, I'm setting up the equipment in the hotel suite; this takes me about half an hour. I have four mics, one each for Kerry and Bill and two for guests. The mics feed the HotLine with a tiny, five-channel custom mono mixer built from a Radio Design Labs RU-MX5. I can mix four mics and a line-level auxiliary source.



The Louvre

that serves as the home for the "Radio From Hell" morning show featuring Bill Allred and Kerry Jackson.

Before we go

We travel light and fast, which is why I chose the Comrex HotLine for our trip. At four pounds, this little wonder-box is the heart of our remote studio.

Other items include a custom mixer, microphones, collapsible desk mic stands, Walkman-style headphones, a telephone extension reel, a power strip, a Sony TCD-D7 DAT recorder and perhaps the heaviest item in the package, the 220-110 V step-down transformer.

Also, I bring along a Gentner Microtel in case I can't make a connection with the Comrex. The weight is 60 pounds.

There's one thing that makes or breaks the broadcast: the phone line. Prior to the broadcast, we request that the hotel provide us with a "dedicated" telephone line, one compatible with a fax machine or computer modem and that doesn't get routed through the hotel switchboard.

The HotLine seems to work best when the line is sent directly from the telephone central office. Otherwise, the connection can be tenuous, with low data rates and even disconnection.

Along with the remote studio package, I bring an assortment of telephone line and power plug adapters. Spare fuses are a good idea.

Just as you need a passport to get into a foreign country, you should have a carnet for your equipment. To do this, you need to fill out papers listing the equipment you plan to take on your trip. You then post a bond with a carnet representative such as the United States Council for International Business.

Before you leave the country, U.S. Customs will stamp your carnet. Upon arrival, the local customs official may

The line-level output of the HotLine feeds a four-output headphone amp built from two RDL ST-STH1 modules. Everything is plugged into a step-down transformer. Last time, my surge protector blew up. I forgot European power is 50 Hz and dislikes 60 Hz filters.

It's 12:15 p.m. in London, 5:15 a.m. in Salt Lake City. Kerry and Bill arrive with the DAT tape from their morning foray. Bill has several local newspapers for the morning "newscast"; British tabloids make for great comedy. Kerry brings some interesting snack food ... more comedy? We check microphone levels.

12:25 p.m. London, 5:25 a.m. Salt Lake City. The HotLine rings and answers; it's Gina the producer, beginning the morning show. The HotLine will not store enough digits to dial the local long distance provider, enter the credit card number and dial the other HotLine at the studio. Dialing from the radio station to the remote studio requires fewer digits. To save on long distance charges, we often disconnect the line from the studio end and reconnect from the studio end just before a break.

2 p.m. London, 7 a.m. Salt Lake City. The show is going well. Kerry and Bill are taking phone calls from listeners back in Salt Lake. Even though there is an audio delay due to distance, careful mix and monitor level setting minimizes the effect. Listeners find it hard to believe that the show is originated from London. The audio quality is almost as good as my 7.5 kHz Marti system, even from Europe. I have an occasional glitch, but considering that I'm in a foreign country, I find the connections quite robust.

3p.m. London, 8 a.m. Salt Lake City. Bill is reading the news. Our special guest, Andy Fletcher of Depeche Mode, arrives. Many of the artists played on X96 are based in London and they often stop by to promote their records and chat. Callers in Salt Lake can talk directly to Andy.

Listeners in Salt Lake are now beginning to believe we're in London.

4 p.m. London, 9 a.m. Salt Lake City:



Amid munchies, cables and a HotLine, Bill Allred, left, interviews Andy Fletcher of Depeche Mode in London.

I play back some of the recorded bits. These were recorded Sunday at Preachers Corner, an open-air forum where street preachers literally stand on soapboxes.

Who needs an air studio? We can do a broadcast from anywhere.

Our plane for Amsterdam leaves soon. Comrex HotLine is protected by a Pelican case; it and everything else fit in an Eagle Creek SwitchBack case.

Both the Amsterdam and Paris broadcasts go off without a hitch. Planning,

good phone lines, and traveling light are the key, along with the attitude that while in these cities, why not have some fun?

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# A challenge from the greatest critic of the OPTIMOD-FM 8200 - the guy who invented it.

**ON AIR**



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**BOB ORBAN** is known for his critical ears. In the seven years since we introduced OPTIMOD-FM 8200, perhaps no one has logged more hours listening to the best and worst in digital audio processing. Even critics have called his knack for creating louder, punchier, artifact-free sound "a gift." But make no mistake. With 30 years of experience in audio, it's Bob Orban's expertise that is written into every layer of the new Version 3.0 software. It gives you a level of audio technology that no other processor in existence can match.

## **NOTHING IS NEWER.**

Version 3.0 software adds five new features to OPTIMOD 8200's proven digital platform. With thousands of users and millions of on-air hours to draw on, Orban's team knew exactly how to take your station's audio to the next level. 21 new presets dramatically expand your options to create a superior competitive sound. Sonic "color" controls now allow you to fine-tune tonal balance to precisely target your desired audience. Tweak the band output mix controls to add sizzle, bring vocals up front, or mellow out instrumentals. Raise the bass clipper threshold to create a more solid bass punch for urban and dance formats. Toggle Phase Rotation on/off to minimize distortion or improve music transparency. Open up the highs to effectively remove any hint of what has erroneously been called "digital grunge."

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Cut to cut, spot to spot, announcer after announcer, nothing delivers a more consistent sound than the new Version 3.0 software. Which means that hour after hour your station's signature sound remains true to your audience's preference. The dynamic, musical presentation never fatigues listeners. Every minute you're on the air, you achieve a unique sound that brands your station with a distinct presence in the market. Loud. Clean. Clear and Punchy. Side by

side, no other processor delivers higher quality sound or requires fewer hassles to achieve it.

## **DIGITAL PROCESSING DONE RIGHT.**

After seven years of listening, tweaking and non-stop critiquing, we've confirmed what you've known all along: the biggest news in FM digital processing is still OPTIMOD-FM 8200. OPTIMOD integrates perfectly into any industry-standard STL and transmitter environment—no exciter modifications or non-standard connections are



necessary. It achieves tight peak control without composite clipping that trashes subcarriers. In short, it delivers elegant, professional engineering—not junk science or marketing spin. In the words of one of the most critical ears in radio, "don't believe everything you hear." Listen for yourself.

## **UPGRADE NOW.**

In a matter of minutes you can upgrade the 8200 to the newest, best-sounding, best-performing audio processor in radio. Call your Orban dealer for details. Visit our website for more information. And e-mail Bob to let him know what you think.





## NAB Honors the Cox Family

Laurie Cebula

Sixty-five years ago in Dayton, Ohio, James M. Cox, a newspaperman, established WHIO, the first radio station in Ohio's Miami Valley. In 1934, at the gates of a new media age, Cox decided to invest in the new medium of radio rather than compete with it for the attention of his newspaper readers.

Radio proved a solid investment. Five years later, Cox established WSB(AM) in Atlanta, now known as "the South's first radio station." Cox later introduced Atlanta's first television station, WSB-TV, which celebrated its 50th anniversary last year.

James Cox Jr. carried on the family business as chairman when his father died in 1957. A brother-in-law, Garner Anthony, succeeded James Cox Jr. in 1974. Today the Cox family business is headed by James Kennedy, grandson of the founder and the son of Barbara Cox Anthony.

Kennedy is the only family member actively involved in the management of the



James M. Cox, center, son James Jr. and grandson James Kennedy attend the dedication of the Dayton Daily News building in 1957.

This award is reserved for those whose contributions to American broadcasting are significant and lasting.

NAB President and CEO Eddie Fritts

Media, Manheim Auctions and Val-Pak Direct Mail Marketing.

The company, through its combined subsidiaries, owns 12 television stations, 58 radio stations and 75 percent of publicly traded Cox Communications. It publishes 16 daily newspapers including its flagship publication, The Atlanta Constitution.

Cox Enterprises also is involved in book publishing, spot sales, television production and research, cable distribution, programming broadband communications and Internet networking.

Headquartered in Atlanta, Cox has nearly 51,000 employees.

### Radio leaders

Cox Radio Inc. is ranked among the top 10 owners in both revenue and number of stations, according to BIA Research.

The company owns 58 radio stations clustered in 13 markets. The group has a presence in major markets like Los

See COX, page 50 ▶

said, "The Cox family's dedication to the business of broadcasting has endured through generations. They have been, and continue to be, pioneers in the industry, and NAB is pleased to award the Coxes with this high honor."

Cox Enterprises Inc. is a media conglomerate that includes Cox Newspapers Inc., Cox Broadcasting Inc., Cox Communications Inc., Cox Interactive

**A new medium is competition for our existing businesses, whether we're a player or not. We'd rather be a player.**

— James Kennedy

company. Barbara Cox Anthony and Anne Cox Chambers, daughters of the founder, serve on the company's board of directors.

### Trailblazing

The NAB has selected the Cox Family to receive its Distinguished Service Award. The presentation will be made during the opening session of the NAB99 convention in Las Vegas on Monday, April 19.

### NEWS MAKER

## New VP at Chancellor, Steve Smith

Bill Mann

Steve Smith, Chancellor's new senior vice president of programming, is joining the big company at a time of big change and uncertainty.

Just before the 39-year-old former Emmis programming executive took over his new post, it was announced that both Chancellor's

**Chancellor**

MEDIA CORPORATION

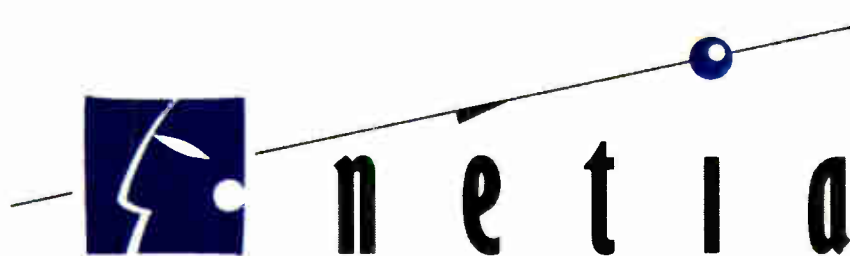
CEO, Jeff Marcus, and its recently-appointed CFO, Thomas McMillin, were resigning. Chancellor Chairman Tom Hicks assumed the CEO position.

Two months earlier, on Jan. 20, Chancellor, which will control more than 465 radio stations including pending deals, had stunned Wall Street by considering the possibility of selling, amid concerns that its stock was trading at a discount to its radio peers. It was said on Wall Street that Clear Channel Communications, a frequent subject of such rumors, was a candidate to buy Chancellor.

Veteran radio executive James

See SMITH, page 46 ▶

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# Ten Tips to Radio Sales Success

Winning Radio Professionals Talk About What Makes an Effective Sales Person

## Bob Rusk

The radio industry is in the midst of a record-setting revenue run, having shattered the \$15 billion mark in advertising sales last year. The industry experienced an overall 12 percent jump in earnings in 1998, pushing ad revenue to \$15.4 billion, according to the Radio Advertising Bureau. Local ad sales were up 11 percent, while national spot dollars increased 15 percent.

"An increasingly sophisticated, committed sales force, coupled with a widening array of opportunities, has positioned our industry for unprecedented success in the future," said Gary Fries, RAB president and CEO.

How is radio doing it?

What strategies are stations using to attain this enviable success? What techniques are smaller group owners using to compete with the bigger owners?

To find the answers to these questions, **RW** called on sales managers at some of the top-billing stations throughout the country. While the way specific sales strategies are planned and executed may differ from market to market, many of the ideas that lead to success are similar.

### No. 1

**Winning Attitude** — "Wanting to win" is the most important trait of a successful sales person, said Ervin Clarke, general sales manager of Sinclair Communications stations WCDX(FM), WPLZ-FM and WJRV(FM) in Richmond, Va.

"That's not just from a financial standpoint, but also from a sense of feeling that you have completed something that may have been difficult. The competitiveness of having an idea and selling it drives me," Clarke said.

John Leathers, local sales manager at Chancellor Media station KYLD(FM) in

San Francisco, said numerous elements that lead to winning, including "persistence, creativity, commitment and a passion for what you do."

Expanding on that philosophy, Susan Hoffman, director of sales at the five Sandusky Radio stations in Seattle, said enthusiasm is the key.

"That hasn't changed from 15 years ago, when I started (in radio)," she said. "If somebody is enthusiastic about their product, it's contagious for the advertiser. (The best sales people) are really into their product and like what they're selling. There's an exuberance that shows and advertisers like those kinds of sales people to call on them."

### No. 2

**Communicate the Benefit of the Buy** — "Educating clients on how your stations can help them reach the goal of selling their products or services is extremely important," said Clarke, of Sinclair Communications. The most common roadblock to a client not saying yes to an ad campaign is the sales person's inability to communicate the benefit of the buy, he said.

"The sales person has to find out what it is that is not being expressed or is not understood by the client," Clarke said. "You have to get beyond that point and create the value to the client. Until they understand the value, there really isn't a reason for them to buy."

Maria Llansa, general sales manager at the highly-rated Spanish Broadcasting System outlets WSKQ-FM and WPAT-FM in the New York area, said her staff sells the stations "one client at a time."

"We go in with the attitude that we have a superb audience and big numbers," Llansa said. "The Hispanic market has billions of dollars to spend. We talk to the client, the agency, all levels."

"We're well aware that we have to edu-

cate the market about the (Hispanic) consumer. It is a very viable, solid middle-class consumer. We spend a lot of time going into agencies and educating them on the size of the audience, the age group and how significant it is, and the growth pattern."

Using this strategy, Llansa said, WSKQ-FM and WPAT-FM have doubled



Susan Hoffman

their billings in just two years. "We've made tremendous progress," she said, "but we still have a long way to go."

### No. 3

**Untangle the Statistics** — High ratings, however, don't automatically translate into sales.

"Statistics and research can be highly manipulated," Llansa said. "You can't go in and just expect that things are going to happen. Advertisers and agencies will find every little excuse not to buy time."

"You may get an advertiser, for example, who will use ZIP Code runs to show the Hispanic population is not heavy in a particular area — but the advertiser may have locations in other areas where the Hispanic population is heavy. The Hispanic population lives all over the tri-state area (of New York, New Jersey, and Connecticut)."

Llansa said, "The success that we have

had is a result of focusing on the accounts that buy the most time on radio in this market."

As an example she pointed to Bell Atlantic, a major East Coast advertiser that did not buy time on the Spanish Broadcasting System stations until last year.

"That is one of the accounts that we went through a long and hard fought battle with," she said. "They finally saw the light."

On another statistical note, Clarke said that when sales people talk to clients about ratings, "being number one or number two in a specific demographic isn't always relative."

"Radio stations have listeners, listeners are consumers," he said. "Many stations have large audiences. If you can target a client's good product or service to match the listeners that you do have, listeners should respond to the advertising."

"The demographic ranking should not be the total reason for success or failure. How you match the advertiser to your audience is much more important than your ranking."

### No. 4

**Develop Long-Term Relationships** — "In every industry there are companies that are into cash flow. Sometimes the goals that are achieved through cash flow are not the goals that a client benefits from," said Tom Nelson, general sales manager at locally-owned KZST(FM) and KJZY(FM) in Santa Rosa, Calif.

"One of the things that we're most concerned with — and I wish more people in radio were — is how what we do today will benefit our clients five years from now. A lot of stations will look at next quarter and maybe even the end of the year, but very few people will look ahead five years."

"A lot of them would laugh at me knowing that they may have four owners in five years," Nelson said. "If our industry was more inclined toward accepting and applauding long-term thinking, rather than short-term turnaround, it would be better off."

Susan Hoffman of Sandusky Seattle said, "As a privately-owned company, we don't have to be concerned with what a lot of other stations are going through. For some of them, their biggest concern is the stock market and Wall Street."

"For us, the number one priority is delivering a good product to our listeners and a valuable investment for our advertisers. That makes us a little bit different than what is going on with groups such as CBS and the owners who are being squeezed by Wall Street. That's apparent by them just adding more and more (commercial) avails."

"When you have a music station running 15, 16, 17 avails (per hour), that's a lot for the listener to put up with," she said. "They are risking long-term success for short-term gain."

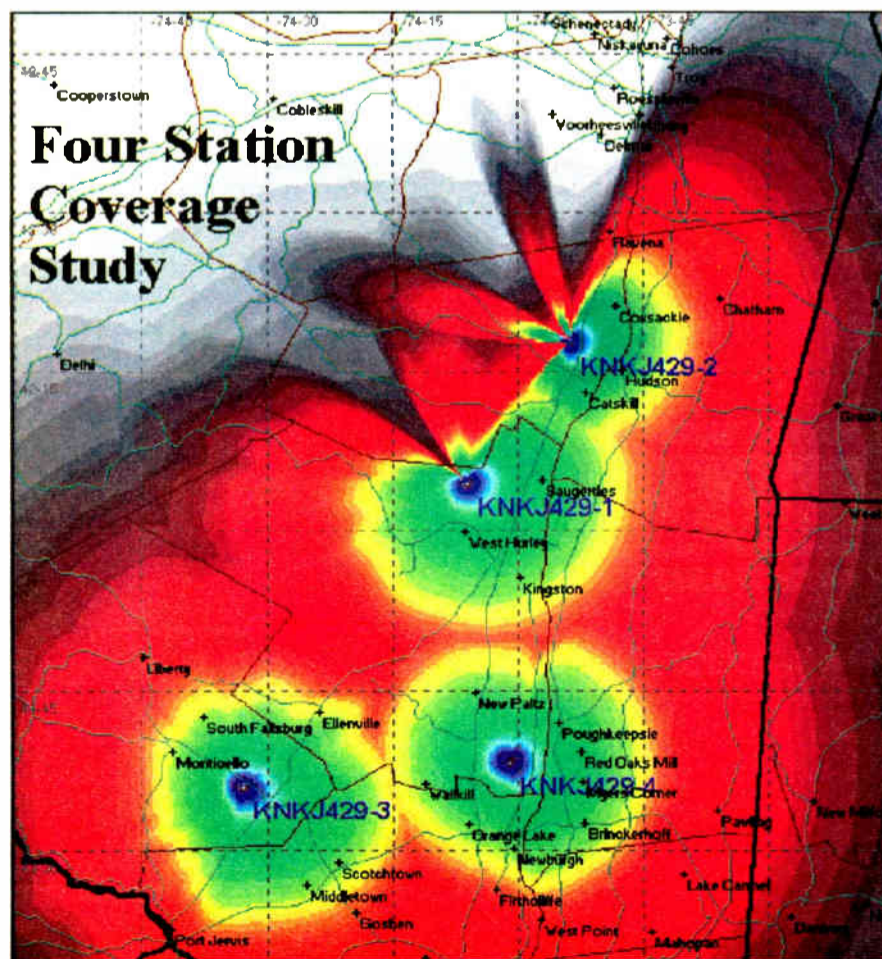
### No. 5

**Encourage an Advertising Mix** — "I am very proud to say that we've had clients who've described to us what their challenge was and we helped them achieve that goal without using our stations," said Tom Nelson.

"We didn't make a nickel on the deal in the short-term, but we made money for our clients. We gave them our ideas, guidance and marketing plans and knew that our stations weren't the best choices — so we encouraged them to use other radio stations and newspapers to achieve their goal."

Nelson said this strategy creates a level

See AD SALES, page 44 ▶



## RadioSoft Announces the release of the NEW Version 2.0 of ComStudy for Windows

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# Industry Leaders Speak at NAB99

**Laurie Cebula**

Can streaming audio revitalize your radio station or will the Internet cause the end of traditional radio broadcasting as we know it?

The apprehension surrounding radio on the Net can be defined by the question: How much money can this new media make for my station?

The topics, sessions and special seminars at NAB99 are designed to address those concerns most challenging to broadcasters. The lineup includes testimonials and advice from the pioneers in streaming audio; those who can be considered experts as their services and products have grown to be standard necessities in the business of streaming media and of successful marketing through Web sites.

From content providers to product manufacturers, NAB99 will address technical tricks and requirements of new media Webcasting, ways to develop or access quality programming for Web sites, Internet marketing and advertising solutions for streaming media providers, e-commerce stats and new research that sheds a little light on this rapidly advancing media.

## Content is paramount

Industry experts seem to agree that a key factor behind the success of most radio shows is the same essential ingredient for successful Web sites. The trick, according to many of the speakers at the convention, is to keep Web site content interesting, deliver what your audience craves and keep it fresh. Radio broadcasters wouldn't dream of airing the same broadcast day after day. Furthermore, audiences wouldn't stay tuned if the same broadcast, the same playlist and the same information was given each morning, noon and night.

Why should an online listener or computer user, therefore, return to a radio station Web site if it hasn't changed since last month? Dave Casper, vice president, Communications at RAB, said radio should adapt a more forward-thinking approach and have a strategy or gimmick for their Web sites that makes visitors want to return.

The message from NAB99 is: Don't just do it — do it with a purpose. "You

need to cultivate your audience online," Casper said. "Just like the programming model, you need to give people reasons to come back. You need to build time and time spent listening (on the air) and the same thing applies to the Internet."



Rob Glaser, President, RealNetworks

Casper hosts the session "How Radio Stations Are Making \$\$\$ with the Internet," with President, Intervox Communications and founding Chairman of the International Webcasting Association, Peggy Miles.

## Blending media

Miles said the radio industry is showing signs of acceptance and belief in the Internet and in the future opportunities created from the blending of the two media. As other media, particularly newspapers and magazines, begin to partner up with Internet companies and services, Miles said, the radio industry members see their competition adding value to their product. She said radio people realize that same value can be incorporated into broadcasting operations and produce profitable results.

Still, the profits are not great in terms of cash flow. Most radio stations on the Web are not making huge or even impressive gains in revenue as a direct result of their Web sites. In addition, there are costs involved in maintaining the content, the actual service fees to stream audio and initial expense of site design.

Miles said broadcasters want to know why they should invest huge efforts in a medium they don't fully understand for what amounts to making only a little bit of money right now. "It's kind of a catch-22," she said. Miles, author and expert on Webcasting will host part of the super session, "Webcasting and IP Multicasting: Competition or New Revenue Generators."

This session can provide valuable information on the technical requirements of multicasting and Webcasting. The session features leading industry members and manufacturers of products and services related to Webcasting.

Opening remarks will be given by Chairman and CEO of RealNetworks, Rob Glaser. Glaser is former vice president of multimedia and consumer systems for Microsoft Corp.

## E-commerce and radio

The rapid advancement of technology and the increasing evidence of an electronic media age in America is often cause for alarm in retail sales and other traditional marketing circles. Advertisers,



The Arbitron/Edison Media Research study "E-commerce and Radio," released in February, will be presented with further calculations and analysis during the session "The Impact of the Internet on Radio."

The study speaks highly of the future of the Internet and, for the most part, is positive about the relationship between radio and the Net. Onliners spend more money in cyberspace, it seems, every time a new study is published. Half of those online want to see coupons they can print out and use at their local supermarket and nearly 40 percent expressed interest in buying advertiser's products from a radio sta-

## The message at NAB99 is, 'Don't just do it — do it with a purpose.'

for example, are spending more and more on Internet-related campaigns whether it's to promote their company Web sites or by placing banner ads on business-related Internet pages that reach millions of online users daily.

A new study from Arbitron/Edison Media Research indicates a dramatic rise in the number of people who are online.

It's called e-commerce and it's all about electronic merchandising, retail sites and the clever use of a URL address. Like the continuing growth of radio advertising revenue, online ad revenue has climbed to nearly \$500 million for third quarter revenue in 1998, an increase of more than 115 percent compared to the third quarter, 1997. According to the Internet Advertising Bureau, revenue totals for 1998 are approaching the \$2 billion mark, the first time ever for Net ad sales to exceed \$1 billion.

tion Web site and/or linking to advertiser's Web sites to learn more about the product.





## Latest trends

Gary Fries, RAB's president, predicts the country will create malls and shopping centers online and that our next revolution — the electronic revolution — will change the way we do business in America. He said radio is the voice of the new media age. Radio is going to point the way for consumers to find information and become the directory messenger or road map to the Internet.

Radio spots devoted to announcing company Web sites are increasingly common already. As Fries put it, the information super-highway will use radio to get the directions out. "And it's going to have a 'dot-com' address."

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# Russian Radio Fights the Gloom

**Gleb Vesnin**

The financial crisis that hit Russia in mid-September last year rocked the commercial radio sector, which had been flourishing.

But despite the current gloom, some station managers here see hope.

During the first half of 1998, the radio market showed signs of improving health. Several new commercial stations went on the air in a climate of optimism and enterprise.

The financial crisis that exploded in September threatened disaster for the entire sector, with potential advertisers — fearful of the catastrophe in the Russian banking sphere — freezing

expenditure and with several major clients halting their usual activities.

## Drastic change

In November 1998, difficulties eased somewhat because of the usual growth in pre-Christmas sales.

Companies using radio advertising reacted to the crisis in one of two ways: they either slowly stopped their advertising activity, or they continued advertising but changed their policy.

The main reason cited for the changes was the repeated weakening of the Russian ruble against the U.S. dollar. Shop prices rose sharply because most goods were imported from abroad or pro-

duced from imported materials.

Salaries remained unchanged, thus greatly reducing purchasing power, and sales in almost every sector plummeted.

Advertisers and radio industry specialists have reacted to the situation in various ways.

Denis Perederin of Matsushita Electronics, distributor of Panasonic and Technics equipment in St. Petersburg, said the company would not leave the market but would put emphasis not only on advertising but also on helping its dealers.

Olga Masalova, general sales manager of Eldorado of St. Petersburg, said she thought it would be difficult for the TV advertising market to survive

because a lot of international brands have seen their profits in Russia slide and are likely to withdraw.

## Looking ahead

This situation, Masalova said, will benefit radio advertising because radio is more flexible in pricing, more operative and more dynamic. She also believes that many advertisers will come directly to radio without the involvement of ad agencies, saving time and money.

One of the biggest dealers in consumer electronics in St. Petersburg, Victor Gordeychuk, said his company's situation is better than that of some competitors.

"The conditions of our agreements with our producers are really favorable for us. Even if sales drop sharply, we have the ability to survive, because a lot of our competitors will have to close down and our share of consumers on the market will grow," he said.

Views like this are typical — but, some observers say, they could also be dangerous. A reduction in the number of competitors could lead toward a reduction in competition and in the need to advertise, they argue. Why would a business need to inform people about a shop when there are only a few such shops left in the city?

With every station having lost at least half of its usual revenue, it is not easy to be optimistic. Lena Danilova, in charge of sales at Radio Maximum, said its usual clientele has changed.

"We have lost lots of mobile phone and computer dealers whose products are of no immediate necessity these days, while food companies are currently flourishing, which is why they have stopped advertising on our station," she said.

## Local companies

In addition, several Moscow-based stations that broadcast in St. Petersburg and enjoy advertising from both cities have lost a great deal of money because of their greater reliance on revenue from international brand advertising, a source that has dried up as a result of the turmoil.

However, in Moscow and St. Petersburg, many advertisers are local companies. This has favored local St. Petersburg stations, which are less dependent than their Moscow counterparts on big international clients.

Despite the generalized despondency, some radio managers have tried to find positive aspects of the situation. The manager of St. Petersburg station Radio HIT, Maxim Vasilenko, said the situation will make the station stronger.

"We are not complaining about living in such an unpredictable country. We have found the ability to become even more flexible and creative in the effort to survive," Vasilenko said.

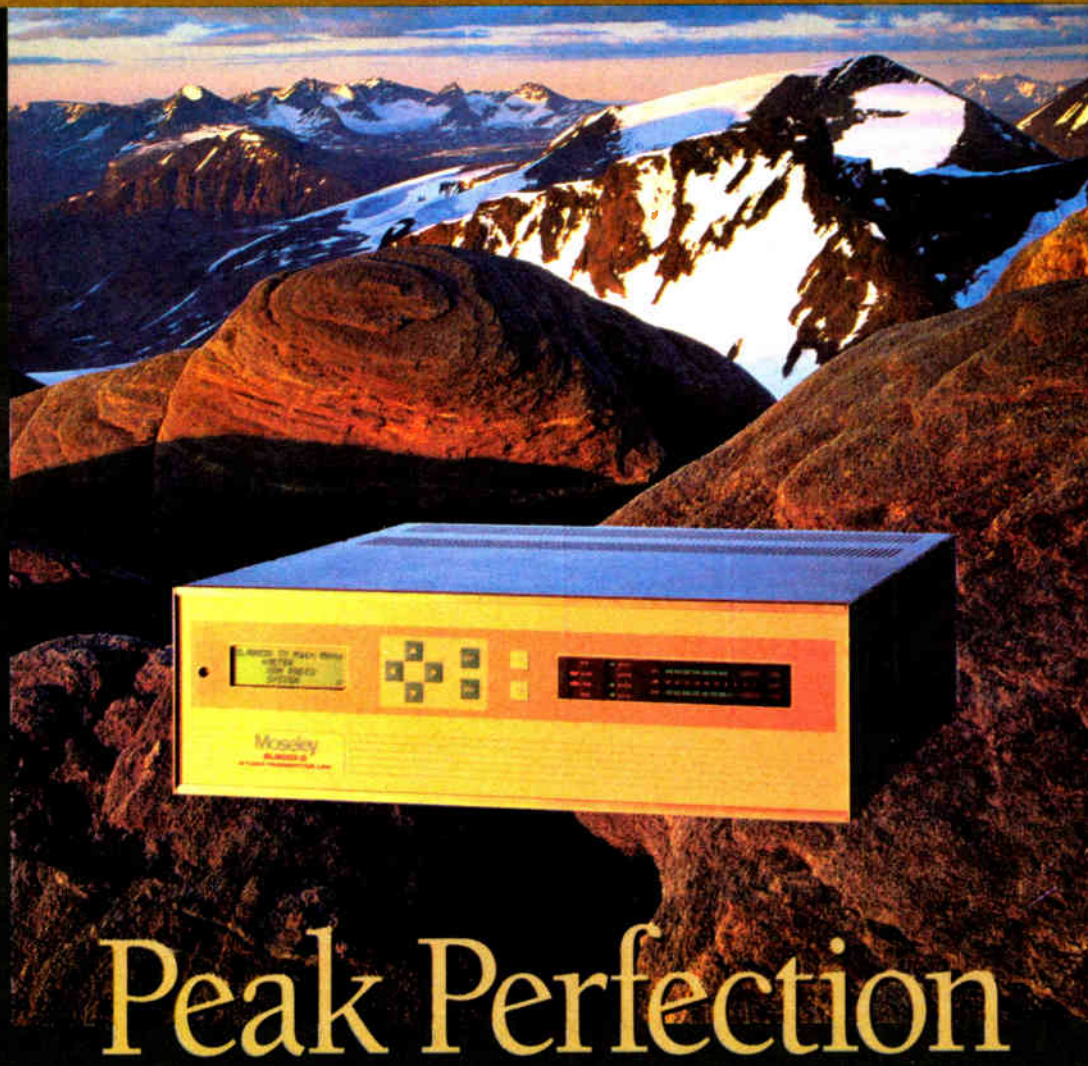
Other station managers are convinced that such a huge market created before the onset of the present crisis is almost impossible to ruin.

Russian companies must now be given the opportunity to develop. For five years the country has been consuming mostly foreign goods and its domestic industry was slowly dying.

It is therefore necessary to view the crisis not as a total disaster, these observers say, but as a chance to change the economic situation in the country. The conditions for this are favorable.

■ ■ ■

Gleb Vesnin reports for *Radio World* from St. Petersburg, Russia.



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### AP Provides News for Cumulus

Cumulus Broadcasting has entered an agreement with the Associated Press to use the news organization as the primary provider of news and information to the company's radio stations.

AP will supply local, national and international news, sports, business news, weather and show prep to the 220 Cumulus stations.

Cumulus Broadcasting operates stations in 42 markets, pending FCC approval of announced acquisitions. The majority of its stations are in the Midwest, South and Northeast.

The general manager of the AP radio division, Corinne Baldassano, said, "These are exciting times at AP. We're proud to be a major partner with Cumulus, one of today's fastest growing radio groups."

Cumulus Media is ranked third in the nation in the number of stations owned, according to BIA, and 12th in revenue among group owners.

The company went public in 1998 and trades on NASDAQ with ticker symbol CMLS.

The Associated Press Broadcast Center serves more than 4,000 radio and television stations and offers broadcast wires, audio, video, graphics, software and multimedia services.

— Laurie Cebula



Susan Spaulding, director of sales for AP Radio, and John Dickey, vice president and director of programming at Cumulus Broadcast, sign agreement.

### Davicom Appoints Dealer




Davicom Technologies has announced the appointment of Broadcast Supply Worldwide as a distributor for its products. BSW will sell the company's remote control and signal monitoring lines, along with selected RF products.

Davicom also appointed Armstrong-Boyce Marketing as its representative for the Pacific Northwest. Armstrong-Boyce will represent the company's products in the contracting and broadcast industries to customers in Alaska, Washington, Oregon, Hawaii, northern Idaho and western Montana.



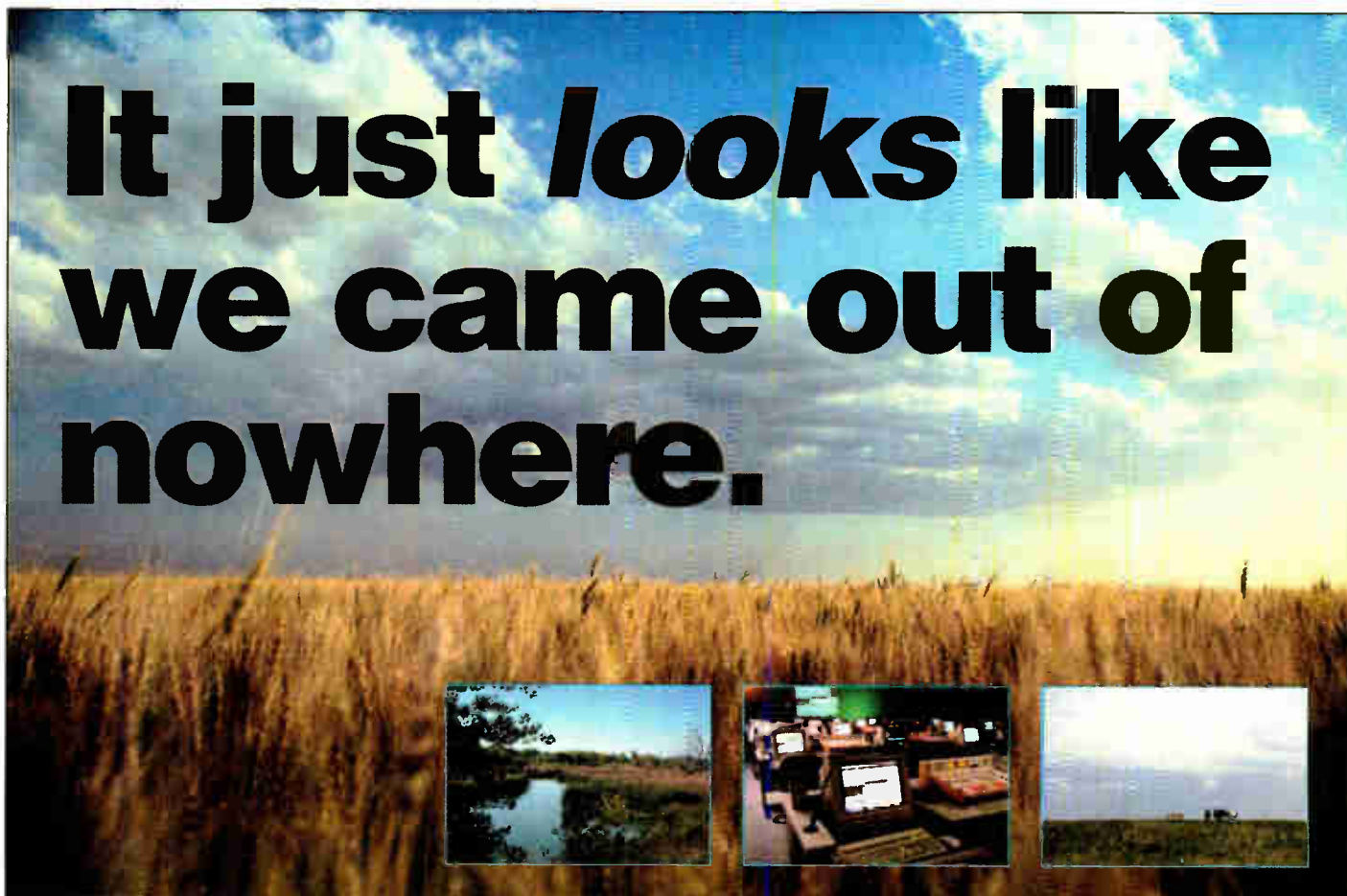
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# Web Site Building 101: By Example

Alan Haber

Here's a revelation for you: No amount of book learning will teach you anything.

Now, before you start that e-mail writing campaign, let me explain. The printed word can certainly enlighten, point out, edify, describe and clue you in on things you may not already know, but it cannot *teach* you anything.

Only *you* can teach you anything ... given the right base of information, of course. Never fancied yourself a teacher? Well, this is as good a time as any to start. Grab a shiny apple and get ready to educate!

Putting together a Web site isn't as easy as some people might think.

If it were *that* easy, everybody would be designing and maintaining top-flight cyber showcases and there would be so many awards coming their way they would fast run out of places to display them.

Building a successful Web site takes a heap of maxi-moxie, provided you have the basic tools with which to build said site. You can get great information from

books and there are plenty of them out there, certainly. There are also great resources on the Web.

But you can learn a lot more by example. So here are a bunch of examples to check out — some great opportunities for you to see what works and, by direct contrast, what doesn't.

## Web site crimes

We'll get to what works in a moment. But first, let's take a look at things that *don't*. You can learn a lot more from other people's



Vincent Flanders'  
**WebPagesThatSuck.com**

mistakes and, besides, it's more fun.

The Web Pages that Suck site ([www.Webpagesthatsuck.com](http://www.Webpagesthatsuck.com)) offers you the chance to do the honorable thing: laugh and cringe at other people's creations toward a better understanding of how not to make the same mistakes on your site.

You can buy the book "Web Pages that Suck: Learn Good Design by Looking at Bad Design" and/or you can learn directly by viewing some Webbish high crimes

and misdemeanors.

Take the tour on this site and learn, among other things, why loud and gross backgrounds don't cut the mustard; why too much text is simply too much; why text improperly presented is a strain on common sense; and why Java is sometimes not a good cup of coffee.

A great feature of this site is "The Daily Sucker." Every day you get a site that sucks.

There were two on the day I visited, the second of which takes the art of centering text to new lows.

The Daily Sucker site is normally available to link to for only 24 hours, so who knows what you will find when you visit? Probably something pretty darned instructive.

## Learn from sites

You can learn a lot from what doesn't work on Web sites. You can also learn a lot from Web sites that do things right.

I featured one of those last installment — the Radio 10 site, which has a slam-bang home page that practically sings.

Here's another: Christian Pirate Radio ([www.mycpr.com](http://www.mycpr.com)).

The home page is a colorful bonanza of information that puts the most important factoid right before your eyes first chance it gets — right beneath the eye-catching logo is the answer to the musical question "What is Christian Pirate Radio?"

On a lot of radio station Web sites you have to go to another page (or two) to get such an answer.

It looks like the station has worked a bit of e-commerce into its cyber-mix. On its top 40 page, you can see a list of the top 40 songs played throughout the world.

**Learn by these examples. Tune up your site to operate at peak efficiency.**

You can listen via the Windows Media Player. There are thumbnails of the top 10 albums that house the top 10 songs on its site. By clicking on the appropriate link you have a chance to purchase them.

## Familiar breed

There is more to savor here, but perhaps the most important thing is to study the overall site design. Notice that there is a very particular scheme at work; all of the pages follow a similar column-oriented design.

There is a nice use of color throughout. And there is a sense of uniformity that breeds familiarity on the part of the site visitor, which in turn breeds a sense of comfort.

This site looks nice and gets the job done.

Another site that gets the job done, and in high style, is the one operated by the Nebraska Rural Radio Association,



on behalf of KNEB-AM-FM, KRVN(AM) and KTIC(AM).

## Enough information

I just love this site, and you will too, I imagine.

If you're looking for farm-related nuggets, this is the place to come — and you can listen to KRVN while you surf through its pages. While not graphics-heavy, it is information-heavy.

I bet Jack Webb would have loved this site — all you get is just the facts, and plenty of 'em.

You get: plenty of agriculture info, everything you've ever wanted to know



about livestock and other types of auctions, agriculture products and services, an extremely helpful (for radio folks, anyway) page of ratings info for the three stations, and a cool history of KRVN — all presented in a clean, text-based format.

No muss, no fuss here. I'll bet nobody visits this site and complains there's a lack of information on display.

And, of course, you don't want that anyway — your goal should be to go eons before anybody asks why you don't have enough information on your station's site (well, you'll probably hope *never* to get that question asked).

Or why the information that is presented is arranged in a confusing, not-so-cool-to-look-at manner.

There is a lot of good work being done by radio stations on the Net. If you learn anything it will be to learn by their examples and tune up your site to operate at peak efficiency.

Come to think of it, it's been a long time since I recognized the best of the best, so I will do that next time around by presenting my list of top 10 radio station Web sites.

See you then.

Alan Haber's column "Cyber House" appears regularly in *Radio World*.

Reach him via e-mail at [zoogang@earthlink.net](mailto:zoogang@earthlink.net)

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# Top 10 Sales Tips

► AD SALES, continued from page 38

of trust that will bring the client back to advertise on his stations down the line.

"There is an understanding that, first and foremost, we are there to help make money for them," said Nelson. "Our goal (to sell ad time) will be achieved if the client makes their money first."

At legendary WGN(AM) in Chicago, a unique relationship exists between the station, WGN-TV and the Chicago Tribune, which are all owned by the Tribune Company.

WGN(AM) Local Sales Manager Tom Michon said the sales staffs at all three outlets have synergized their efforts to create their own "advertising conglomerate."

Michon said, "We also own the Chicago Cubs, so we bring that to the table. We have always believed that you don't go after just one other media. Everybody else seems to be battling other radio, other TV, other newspaper.

"We're out there blazing our own trail, getting new clients who have never advertised before. There are a lot of clients like that who advertise only on one radio station. The most one-station radio buys in the Chicago market are on WGN."

## No. 6

**Advertisers Like Consistent Staff** — "Sales staffs come and go," said Michon. "There are just a handful of people who have been at the same station as long as I've

been in Chicago radio. That's important.

"Advertisers like to hear that people have been with a station for a long while and know what will work and not work on the station."

Michon, who has been at WGN for 16 years, said the average length of time a sales person has been at WGN is about eight years.

Nelson, who has been with his current stations for nine years, agrees.

"Our sales people stay here a long, long time," he said. "One of the most innovative things we do that helps our sales success is that we offer a profit sharing program.

"After you have been here two years, you are 100 percent vested in a 401(k) profit sharing program. Generally speaking, between 8 percent to 12 percent of a sales person's previous year's income will be contributed to the 401(k). You don't have to match it. All you have to do is come to work and you're going to make money in the 401(k) program. We have people with very nice nest eggs for retirement."

## No. 7

**Develop Ongoing Training** — "We brought somebody aboard a year-and-a-half ago who had worked for us, went to San Francisco, and came back because of the lifestyle that exists here," Nelson said.

"We brought her back primarily as a trainer. She is a sales person who has

accounts, but she also brings an added measure of expertise to our veterans and takes new sales people and gives them an enormous amount of hands-on training," he said.

"That's not only basic training, but training in areas such as non-traditional revenue — as well as an area that we are passionate about that doesn't exist much in our business: an understanding in the application of marketing principles. Not advertising, but marketing. A key to our success is our ability to take a client by the hand and share with them how they can create a synergy between all of the advertising media that they may use, along with what happens in their store — whether it be sales meetings, buttons for their sales people, signage, logo design or even a name change that better fits the client's image."

Hoffman oversees about 22 account executives at five stations — KLSY-FM,

staff is much like a basketball team, and each person plays a different position.

"I don't look for the same qualities in every person," said Leathers. "If you believe in the notion of soaring with your strengths, some people are particularly good at certain elements of sales, while some are strong in other areas. Some people are extremely good at digging up new business. Obviously you want that in everybody, but some people are better at that than others.

"The best description I heard is that some sales people are hunters, some are skimmers, and some are both hunters and skimmers," he said. "Hunters would be the people who can dig up the new business, skimmers would be the people who are good at servicing and upselling the business, and a combination hunter and skinner would be somebody who could do it all. You want a staff with a good mix of those traits."

## No. 9

**Heritage Counts** — A station with a rich history of serving its community and that also has consistently high ratings is tough to beat. A prime example is 50 kW full-service powerhouse WGN in Chicago, which has been broadcasting in the Windy City since 1924.

"The station has always been a classy place for advertisers and they get results," said Local Sales Manager Tom Michon. "What makes it classy is that anybody can listen to the station at any time and not be embarrassed (by offensive programming). WGN offers a lot to its advertisers and listeners. We are what Chicago is all about. We are the pulse of the city."

With the strength of its 75-year heritage and consistent ranking as a top-billing, top-rated station, WGN does not worry about concentrating on the coveted 18-34 demographic.

"If we get that demo, fine," said Michon. "But our key demo is 35-54 and 35-64. That's where the money is. That's where the bulk of the baby boomers are. That's where America is going now."

## No. 10

**Like the People You Work With** — In this era of consolidation, with sales people putting in longer days to sell multiple stations and multiple formats, the company you work for and the people you work with can make a huge difference.

"We have five radio stations and like working with each other," said Hoffman at Sandusky Seattle. "We like the owner, the manager, and we have a lot of enthusiasm because of the attitude of those people. We feel that they have an interest in us."

In February of this year, all of the stations moved into one building in suburban Bellevue, which Hoffman said is important.

"Since I'm just one person, I now have much more time for the account executives. Previously I was going to three different locations, which spreads you pretty thin," Hoffman said. "You find yourself saying 'Hi, what can I help you with?' and then you're off to the next station."

At his stations in California, Tom Nelson said, "an enormous amount of our profit is funneled back into our facilities, as opposed to going to stockholders or corporate expansion. The owner is a visionary and is making sure that we're prepared for the next decade."

■ ■ ■

*What do you think makes a successful radio sales person? Tell us via e-mail to radioworld@imaspub.com*

*Bob Rusk is a regular contributor to RW and operates the Web site www.CallingHollywood.com*



Radio Advertising Bureau's  
Monthly Sales Tool.

KIXI(AM), KWJZ(FM), KRWM(FM) and KSRB(AM). An important part of her job is accompanying the account executives on sales calls and offering ideas and suggestions to motivate them.

"I do a lot of training within the radio stations and prepare meetings that we have," she said. "We are looking at bringing local media people in as guest speakers, from advertising agencies and clients such as car dealers.

"With the Internet becoming so huge, we want to bring a key person in to speak to the staff. That should be somewhat easy here in Seattle," Hoffman said, pointing out that the city is home to Web giants Microsoft and Amazon.com.

Clarke at Sinclair Communications said he observes his sales people at the station as they work the phone.

"If we're dealing with a client who is based in Dallas, phone skills become extremely important," he said. "To a certain extent, the sales people also preview their presentations with me to discuss things such as possible objections and how to overcome them."

Leathers at CHR-formatted KYLD-FM said the key to training is finding "the magic button" that motivates each sales person.

"Doing that is like a sales call on its own," he said. "You have to constantly evaluate your sales staff, ask questions, watch them and try to find out what motivates them, what drives them. You have to do that on a daily or weekly basis."

Clarke stressed the importance of participating in training sessions offered by the Radio Advertising Bureau.

"The RAB fosters growth in radio, and from that standpoint I can learn and then train my sales people to be better at marketing and consulting with our clients," he said.

## No. 8

**Be Versatile** — Leathers said a sales

## Radio's Most Wanted

### PROFILE: Jeff Littlejohn

Vice President of Engineering, Chancellor Media Corporation  
Cincinnati, Ohio  
Radio World reader for 15 years

Hometown: Gary, Indiana  
School: ITT Technical Institute (Bachelor's Degree)  
Favorite radio format: Chancellor's Jammin' Oldies  
Favorite place to listen to the radio: In the car  
Favorite color: Green  
Favorite piece of equipment: Neutrik A2 test set  
Hobbies: Spending time with my wife, Tina; my dogs, and flyfishing  
Coffee: Black  
Proudest moment: Any time a major studio or transmitter project goes "on-the-air."  
Favorite Section in Radio World: Workbench  
Best thing about your job: Working with the best engineers in the world!  
Reads RW because: Radio World is the ONLY publication that focuses on the things I need to know about radio.



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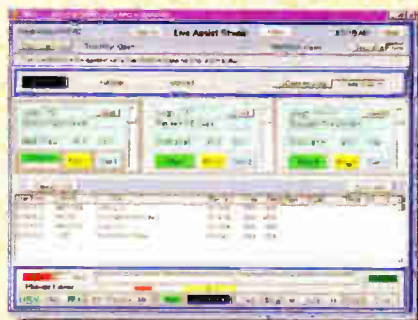
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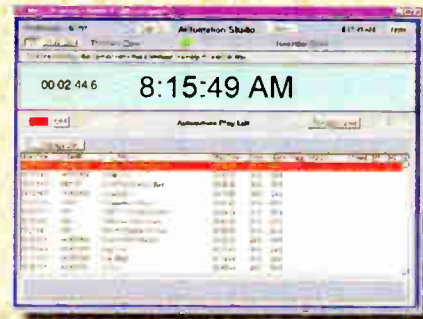
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# Jammin' Programming for Smith

► SMITH, continued from page 39

de Castro announced Smith's appointment. When Marcus resigned, de Castro, who had been head of Chancellor Media's Radio Group, was named a vice chairman of Chancellor Media and president and CEO of the newly created Chancellor Radio and Outdoor Group (see story, page 2).

The same day Marcus left, it was also announced that Chancellor had decided not to proceed with a multibillion-dollar purchase of LIN Television and that it would concentrate on its radio and outdoor operations.

Chancellor had planned on using LIN's eight network-affiliated TV stations as part of a multimedia platform, with radio and outdoor properties, that could be packaged to advertisers.

Steve Smith, who was until recently VP of programming for Emmis, was more concerned with Chancellor music programming than its corporate turmoil when RW caught up with him at his L.A. home.

At the time, he was packing to go on his second business trip that week.

**RW:** How long were you with Emmis?

**Smith:** Five years.

**RW:** What were the most important contributions you made when you were running Emmis' New York stations prior to

becoming that company's top programmer? And afterwards?

**Smith:** We had two of our stations become number one at various times in New York, HOT97 (WQHT(FM)) and KISS-FM (WRKS-FM).

And at Emmis, we made WTLC-FM the top station in Indianapolis.

I flew to L.A. often to help establish Power-106 (KPWR(FM)) as the number-one English-speaking there, too, last fall. We had some notable successes at Emmis.

## Strange feel

**RW:** How does it feel to be working for the "other guys" in the same markets you served with Emmis?

**Smith:** It's going to feel strange.

Emmis was great to me, and leaving that company was the most difficult decision I've ever had to make in my professional life.

But this is a tremendous opportunity for me, and it's a chance to work with more stations than I dealt with at Emmis.

**RW:** What will you miss the most about Emmis?

**Smith:** No question, the people. Jeff Smulyan, of course, and many more of my colleagues.

People like Val Maki (general manager of Power-106), Judy Ellis (VP and GM of

Emmis' New York stations) and Rich Cummings (Emmis executive VP).

**RW:** As vice president of programming at Emmis, what important contributions did you make to the radio group?

**Smith:** We perfected the new hip-hop format at HOT97, and we developed the smooth R&B format at some of our other stations.

**RW:** How does your new position at Chancellor employ those talents and strengths you honed at Emmis?

**Smith:** I'll be concentrating on CHR, urban and on the Jammin' Oldies formats — the latter at our stations like WUBT(FM) in Chicago, KTXQ(FM) in Dallas and WBIX(FM) in New York.

## Jammin' Oldies

**RW:** What appealed to you the most about this new job?

**Smith:** Mostly, the chance of working with new formats like Jammin' Oldies. And, of course, the opportunities to work with more stations in the group.

**RW:** In these three formats, what specifically will you do now?

**Smith:** (Laughs) I haven't even gotten my feet wet yet!

The first thing I plan to do is to get to know the markets, and to meet every GM and PD. It's really too early to say anything about new strategies.

One of the first things I want to do is familiarize myself with Jammin' Oldies. It's critically important that those J.O. stations have three things: solid morning shows, great presentation and good personnel.

**RW:** What kind of working relationships will you have with individual general managers and program directors?

**Smith:** General managers, of course, will continue to have lots of other people to deal with besides me.

I want to focus my efforts on our PDs. I want to have a close relationship with all of them, and I'll get to know them all.

## Steering stations

**RW:** What are the most important contributions local GMs and PDs can make to the company?

**Smith:** They're crucial. These are the people on the front lines. They make the big contributions, and they steer the ship. I foresee my role mostly as giving them suggestions to help steer their stations.

**RW:** What are some of your immediate goals?

**Smith:** First of all, I want to set up a networking plan where I can brainstorm with all my PDs. I'd like to set up weekly conference calls, among other networking strategies.

**RW:** Can you reveal any new formats Chancellor has under consideration?

**Smith:** (Laughing) I'm new here. I can't get into any of that yet!

**RW:** Where is Chancellor's greatest strength in formats?

**Smith:** Jammin' Oldies. No doubt about it. That's the star of this company right now.

That format has tremendous potential.

# Jammin' Oldies

Here's how a Chancellor spokesperson defines the Jammin' Oldies format: "Rhythmic hits and great party songs from the '60s through the '80s."

The target audience is 35-54. Among the artists featured in the format are Aretha Franklin, Prince, Marvin Gaye and the Temptations."

Joel Salkowitz, WBIX program director, says, "This is not your father's oldies station. Jammin' Oldies puts the rhythm back in rhythm and blues and offers a fresh, fun and contemporary alternative to the traditional oldies format that uses '50s doo-wop."

It's doing very well in Chicago, New York and Dallas out of the box.

**RW:** Did you like the promotional idea they used in Chicago of allowing listeners to name the Jammin' Oldies station and participate in choosing the music selections to be included in the format?

**Smith:** Absolutely. That was very creative, and I like the idea a lot. It gets your audience immediately involved with the station.

## Target demos

**RW:** What are the marketing strengths of the three formats you'll be responsible for at Chancellor?

**Smith:** There are several strengths in each, and that's something I want to be actively involved in, because I handled a lot of the marketing responsibilities for my stations at Emmis.

**RW:** What kind of demographics are we looking at in Jammin' Oldies?

**Smith:** 25-54, with the core audience around 35.

**RW:** How about CHR and urban?

**Smith:** With CHR, it's 12-30 now.

With urban, it depends on which urban you mean. With urban-AC, for example, you're stronger in 25-plus, of course.

You have to tailor your marketing strategies to each specific demographic; we're all becoming even more demographic-targeted. You have no choice.

**RW:** The company's new AM/FM Interactive division rolled out six branded Web sites at its Philadelphia stations in March.

Are there new-media strategies you foresee at Chancellor in the way of partnerships or programming content for station Web sites?

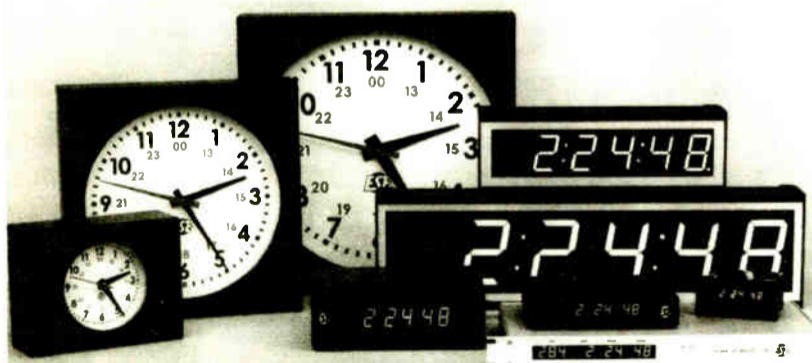
**Smith:** That's not really my area of expertise, although I know we've had some positive feedback from listeners who have visited these new sites.

Bill Mann is based in San Francisco, where he has covered radio as a media columnist for two daily newspapers.

"Remember that time is money."

— Benjamin Franklin

## When you must, must have precision timing



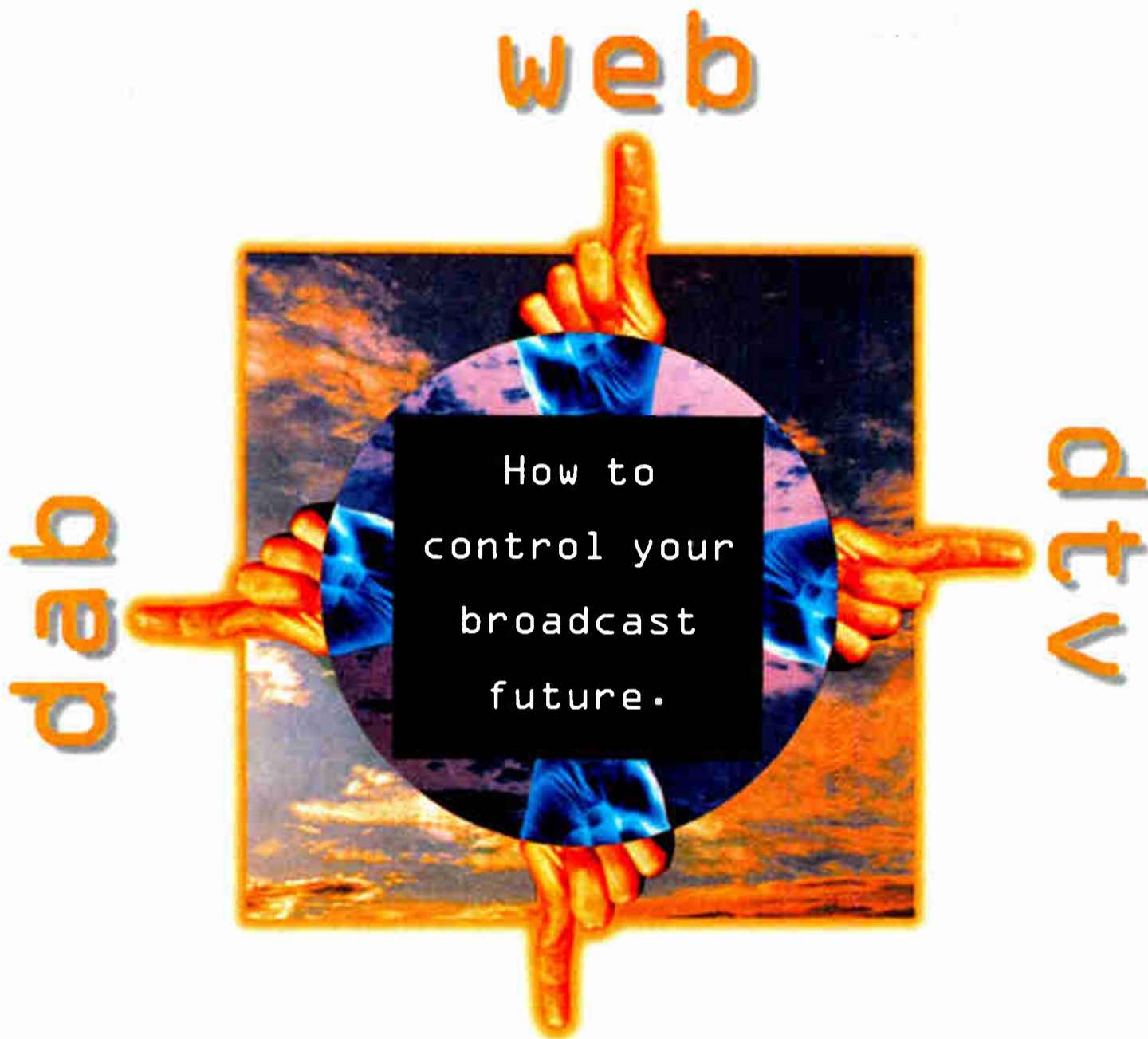
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## PROMO POWER

# Forge New Relationships With Promoters

**Mark Lapidus**

Perhaps you're not surprised that concert hotshots share tall tales about how they've wangled enormous free exposure from our industry. Everyone knows it's a win-win situation, right?

After many years of playing ball, I'm not so certain anymore. I've fought the good fight about being the station that gets to say "presents" so many times that it feels like a comedy routine and I'm the punch line.

A pal of mine recently returned from a large convention of concert promoters with stories that reminded me of typical broadcasting bashes. The one seminar that piqued my interest was on the topic: How concert promoters can improve their ability to obtain free promotion from radio stations. It was one of the best-attended workshops.

**Not long ago, concert updates on radio were exciting. Now, fans know about tour dates before stations do.**

### Serious doubts

It has long been considered fact that it's vital for music radio stations to "own" the concert image. This image has been elevated so high that station perceptual studies frequently test how a station rates against competitors when it comes to scoring as "the concert station." Could it be that things have changed or am I just becoming cynical? Maybe it's both.

I believe that listeners now expect radio stations to say that they either "present" or "welcome" core artists to town, give away concert tickets and have a presence at shows.

When we do these things, all we are accomplishing is meeting expectations.

My intention here is not to advocate the abandonment of concerts by radio. I simply feel that the time has arrived for us to ask more consistently: What's in it for us?

The argument I've heard against change is that concerts are of vital lifestyle interest to core listeners to certain formats. I don't question this assumption. I do question how that translates into either come or TSL, particularly when massive contesting isn't involved.

Not long ago, concert updates on radio were exciting. Now, fans know about tour dates before stations do. They find out via fan club mailing lists, Web sites and music television channels. By the time radio stations air concert updates, they're nearly irrelevant for those who care the most.

### Lifestyle radio

Back to the lifestyle assertion for a second. There are plenty of other

aspects of entertainment that are vital to lifestyle interest and yet we don't give away tens of thousands of dollars of free airtime to promote them.

Television shows, sporting events and movies are of equal or greater interest to the masses than many concerts, but do we run hundreds of promos for them without asking, "Why?"

### Shared revenue

Even in major markets, annual concert advertising revenue is a joke compared to what they receive for free as one of our "partners." There's a good reason why big acts purchase pricey full-page ads in

daily newspapers and run a few thousand dollars of radio spots.

They do it because they can. When was the last time you saw a newspaper jump through hoops to get what they deserve?

Perhaps I'm being shallow but in some places regular free admission, V.I.P. parking, backstage passes and easy artist access offer mid-level radio managers and disc jockeys incentive to keep the status quo. When your internal review of how you deal with this issue comes up, it's important to face this head-on without threatening or accusing.

If we are to be true partners in promot-

ing shows, we must forge new relationships with concert promoters. This new relationship may include sharing revenue. It may mean bringing in third-party sponsors that add non-traditional revenue to the bottom line.

Or, it may mean saying we're happy to give away the tickets but we're cutting back the rest of the promotion. This time around we'll concentrate on other listener lifestyle interest activities ... maybe somebody in television, sports or the movies would like to be a real partner instead of a sponge.

■ ■ ■

*Mark Lapidus is president, Lapidus Media and works in programming, public relations and marketing consultation. Reach him via e-mail at lapidus@erols.com*

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# Internet Audio Sessions at NAB99

► **WEBCAST**, continued from page 39  
 vitamins, supplements and other healthy items, recently announced an \$8 million advertising campaign to be conducted primarily on radio, print, outdoor and transit advertising.

The campaign seeks to drive people to the company location which exists virtually, online only.

## Net shopping

According to the Arbitron/Edison study, Internet shopping will rapidly increase as consumers become more comfortable with security issues of online purchases. Mothernature.com demonstrates the virtual-retail merchandising that consumers are asking for, according to the study and Fries' predictions.

The radio spots, featuring actress Blythe Dana, use eerie and then sunny music to highlight the advantages of shopping online, company executives said. They said they are committed to creating innovative radio commercials to drive traffic to their Web site business.



Other steaming-related sessions include "Broadcasting in the 21st Century: Players, Partners and Opportunities," with EchoStar Communications President Charlie

Ergen and TCI President Leo Hindrey, "Where is Wall Street Finding Value? Broadcasting, Multimedia and Satellite/Telecommunications," with Mark Cuban. Broadcast.com, Cuban's multicasting service, currently accommodates more than 400 radio stations with streaming media capabilities. His company, a pioneer in streaming media and a leader in introducing new technology, recently experienced a soaring value in its stocks when they announced their initial public offering late last year.



Alan Haber and Laurie Cebula contributed to this story. For more information about Internet and business sessions at NAB99, see the on-site convention program guide.

# Father and Son Talk at KRLA (AM)

Here's an update to a story we told you about in our Feb. 17 issue. KRLA(AM) in Los Angeles, which last November dropped its longtime oldies rock format and switched to talk, has added more local hosts to its lineup.

Ken Minyard, who was at crosstown talker KABC(AM) for about 30 years and had been a fixture there in morning drive, now holds down afternoon drive at KRLA, sharing hosting duties with his son, Rick Minyard. Teaming them was "an opportunity to have two unique personalities who are both radio veterans and just happen to be father and son," said Bob Moore, KRLA vice president and general manager. "It lends an interesting perspective."

To make room for the Minyards, the nationally syndicated G. Gordon Liddy was moved to 7 to 11 p.m. Ira Fistell (who worked at KABC from 1977-95) follows in the 11 p.m. to 3 a.m. weeknight slot at KRLA.

"Ira is a walking encyclopedia of information," said Moore. "He is versatile enough to talk about almost anything."

CBS-owned KRLA began bringing KABC talent on board with the hiring of British-accented Michael Jackson. He had been relegated to a weekend-only shift at KABC, after three decades in the 9 a.m. to noon slot (RW, Feb. 17). More than half of the weekday hosts now at KRLA formerly worked at KABC, which also includes the syndicated Dr. Toni Grant.

While it is too early to tell how KRLA will do in the ratings as a talk outlet, Moore is pleased with the lineup. "We're doing some exciting programming and are having a great time with it," he said. "Everything is going wonderfully."

— Bob Rusk

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# Cox to Be Honored

► COX, continued from page 37

Angeles, Atlanta and Miami, and owns clusters in San Antonio, Texas; Tampa and Orlando, Fla.; and Birmingham, Ala.

A recent acquisition strengthens its clusters in Tampa and Louisville, Ky. In an exchange with Jacor and Clear Channel, Cox swapped six radio stations in Syracuse, N.Y., for three stations each in Louisville and Tampa. Cox executives said the move is in line with their growth strategy to strengthen its clusters in those markets.

## Cox Interactive

"We welcome the opportunity to expand our revenue and cash flow in these two high-growth markets," said Robert Neil, president and CEO at Cox Radio. He said the move "demonstrates our ability to strengthen our portfolio through prudent strategic acquisitions."

In some ways, the challenges facing Cox Enterprises President James Kennedy are not unlike those that faced his grandfather 65 years ago. Cox was working with a new medium. The risks of competing in evolving, unknown territory presented challenges to conventional business strategies.

In the era of the new millennium, Kennedy is pursuing innovations through Cox Interactive Media ([www.CIMedia.com](http://www.CIMedia.com)), a provider of local content on the Internet.

Established in 1996, the network includes 25 city sites and two specialty-programmed sites, *FASTBALL.com* and *GreatOutdoors.com*

According to Media Metrix, CIMedia hosts the most pages viewed by consumers of any local site network. CIMedia is involved in delivering services to develop content programming for the Internet and *AccessAtlanta.com*, the company's flagship Web site.

## A Cox Family Century

**1898:** Twenty-eight-year-old James M. Cox founds the company by acquiring the Dayton Evening News, later renamed the Dayton Daily News. (The company still publishes the newspaper today.) James Cox was a former country schoolteacher and later a reporter for the Cincinnati Enquirer.

**1957:** James M. Cox dies. His son James Jr. succeeds his father as chairman.

**1974:** James Jr. dies; Garner Anthony succeeds his brother-in-law as chairman. Anthony is the husband of Barbara Cox Anthony, one of the two owners, and the stepfather of Jim Kennedy.

**1988:** Anthony is succeeded by Jim Kennedy.

**1999:** Jim Kennedy is the only family member actively involved in the management of the company. Barbara Cox Anthony and Anne Cox Chambers, daughters of the founder, serve on the board of directors.

# Kennedy Continues the Tradition

James Kennedy spoke to RW about the award to the Cox family.

**RW:** How does it feel to receive the Distinguished Service Award from NAB?

**Kennedy:** There's nothing we'd rather be honored for more than service.

In 1935, when my grandfather dedicated his first radio station — WHIO in Dayton — he said he hoped the station would always be "an instrument of service."

Nearly 65 years later, the Cox family still is committed to that principle. However, thousands of employees throughout the years have enabled us to provide service, not just talk about it. They all share in the honor.

**RW:** Synergy is a word from the latter part of this century, but over the years Cox really has blended media companies in print, television, radio and Internet.

**Kennedy:** We've always focused on the opportunities new technology brings, by giving customers choices. A new medium is competition for our existing businesses, whether we're a player or not.

We'd rather be a player, and we have a long history of winning by competing with ourselves.

My grandfather was a newspaper publisher, but when radio came along, the family said, "This is something new, and we ought to be in it because we're in the communications business."

At least, those were the actions

**Welcoming  
new technology ...  
is one of the  
traditions I value  
the most.**

they took. So the company has progressed logically from newspapers to radio to television to cable television to broadband and full-service telecommunications, and, now, to



James Kennedy

the Internet.

Every era has had its challenges and risks, as well as rewards. James M. Cox, my grandfather, had to scrape together \$26,000 to buy the Dayton Daily News; bankers in 1898 considered a newspaper too "risky" for a loan.

His bookkeeper once told him that, if they had no news and every column was filled with advertising, they'd still lose \$500 a week.

**RW:** Technology has changed so much over the years.

**Kennedy:** My uncle, Jim Cox Jr., was fascinated with new technology and he was given the job of getting WHIO in Dayton on the air in 1935.

"A giant structure of steel and wires and insulators and all the magic devices of this scientific age," his father said of his first radio station.

Our family put WSB-TV, the South's first television station, on the air in 1948. During the station's 50th anniversary, WSB-TV was the first station in Georgia and among a handful in the nation to sign-on digital television.

Welcoming new technology, rather than fighting it, is one of the traditions I value the most in our company. The company doesn't wait for others to prove new ideas and technology work. Now we're a leader in online information, news and entertainment via the Internet, through Cox Interactive Media.

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# Studio Sessions

Trying Out the  
Ensoniq PARIS



See Page 52

Radio World

Resource for Radio Production and Recording

April 14, 1999

## Improvising During Impeachment

Rich Rarey

One of the personal benefits of the recent impeachment process was the opportunity to re-examine the way we view remotes at NPR.

In one instance, our within-the-box thinking made our impeachment coverage needlessly complicated and messy, which will be described in a moment.

For five weeks in January and February, until the Feb. 12 acquittal of President Clinton, we were camped out in the Russell Senate Office Building across the street from the U.S. Capitol in Washington, D.C. National Public Radio events coverage of the Senate trial was located here, along with a handful of



near the events coverage, the equipment had already been set up and tested by other NPR engineers, and their design proved to be most flexible for the tasks NPR news staffers had in mind.

Busy day

The NPR coverage usually began each day at 1 p.m. ET, and lasted from one to six hours.

Many NPR member stations preempted afternoon programming to broadcast our coverage, ably anchored by NPR host Neal Conan with support from NPR Legal Affairs Correspondent Nina Totenberg, NPR Senior News Analyst Daniel Schorr, and an occasional expert or conservative pundit. We had never participated in a remote that lasted days, let alone weeks, so it was a learning experience.

The physical space we had for the broadcast was eked from the Russell Building rotunda, or more accurately, the third floor hallway circling the rotunda. With all hard marble surfaces and the semi-spherical rotunda cap, the whole area reverberated with the acoustics

of a gymnasium.

Clearly, this was not an omni-directional-mic friendly place.



Inside the Russell Senate Office Building in Washington, D.C., author Rarey (upper left, with hand to throat) motions to Nina Totenberg, right, to adjust headset microphone. Host Neal Conan looks on.

hastily erected local and network television filing posts.

When we arrived in January to engi-

The decision had been made to use Crown 312-AHS headset mics, the type designed to mate to a pair of Sony V6 headphones. Conan, who does minor league baseball color commentary in the summers for fun, easily transitioned to this headset mic.

The other anchors, however, were used to decades of fixed-position table mics.

In Schorr's case, this meant more than 50 years of working a microphone. Most had difficulty shepherding the mic element to the best spot for their voice.

We frequently saw the mic pointed at noses, throats, and all points between. Repeated, patient coaching eventually brought the desired results.

Mix time

A Mackie 1402-VLZ mixer was selected because of its 10-input, two-Aux See IMPEACHMENT, page 54 ▶

## Audix Stakes Its Claim In Condenser Arena

Tom Vernon

Just the mention of the words "condenser mic" conjures up images of the legendary Neumann U 87. It has become the benchmark for transparency and wide-frequency response.

It is also known as being too pricey for all but the largest broadcasters and recording studios. The rest of us have been forced to settle for something else.

The recent growth of project studios and smaller operations, however, has given manufacturers the incentive to make condenser mics available in the less-than-\$1,000 price range.

Audix, a manufacturer of high-quality microphones and speakers, stakes its claim with the large-diaphragm CX-101 and CX-111 condenser mics.

Our evaluation suggests that the company has done itself proud with these premiere entries into this market.

The CX-101 has a gold-sputtered 1-inch diaphragm with a cardioid pattern. Frequency response is 20 Hz to 20 kHz. Maximum sound pressure level (SPL) is 135 dB and the dynamic range is 109 dB.

Floor noise is specified as 17 dBA. Phantom power of 48 to 52 V is required.

The black satin CX-101 has an overall length of 7.7 inches, a maximum diameter of 1.99 inches, and weighs in at 17 ounces. It comes with a bulldog-clip style shock-mount and rugged lockable aluminum flight case.

A windscreen and two-channel phantom power supply are available as options.

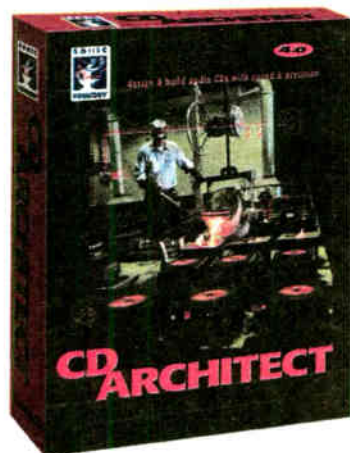
The CX-111 is a close cousin to the CX-101, and

is the microphone we used in the World Café evaluations. Basically the same microphone as the 101, the CX-111 features the addition of a bass rolloff switch and 10 dB pad, allowing

See AUDIX, page 61 ▶



Audix CX-111 Mic



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## PRODUCT EVALUATION

# Make It PARIS in the Springtime

## Part I of II

Alan R. Peterson

Eleven years ago at WHEN(AM), Syracuse, N.Y., I got my first taste of Ensoniq Digital Systems audio products when the station bought a Mirage DSK sampling keyboard for the production room.

In retrospect, it wasn't much of a sampler. It offered only about two seconds of gritty sample time and had a cryptic hexadecimal display that made editing and overall control a headache. But I stuck with the company just the same, waiting to see where it would end up.

Today, Ensoniq makes more keyboards, a few high-quality audio processors and a neat hip-hop sample box. The company also now shares a letterhead with E-mu, another company well known for samplers (the Emulator and E-Max lines).

## Debut of PARIS

Prior to this collaboration, Ensoniq released PARIS — Professional Audio Recording Integrated System — an immensely powerful digital audio editor for PC and Macintosh computers.

The PARIS contains many features that make it appropriate for broadcast audio production — so much so that it caught the attention of Harris, which has



The Ensoniq PARIS, shown with two-screen Windows 98 option (see text).

since become a distributor of the product ("Harris PARIS?"). The production staff at urban powerhouse WPGC-FM, Washington, D.C., have made it their DAW of choice.

In this two-part review, you will read about the basics of the PARIS and its features. Next time, installation on a typical PC and an actual hands-on review.

To call this the "PARIS System" would be redundant, as the "S" already stands for that term. All my references will simply be to "the PARIS."

The PARIS consists of software, a PCI card for either Mac or PC machines, a

rackmount audio interface that couples to the PCI card, and a component that is seriously lacking in many DAW packages these days: a hardware fader board.

The inclusion of the Control 16 surface nicely bridges the chasm radio people endure between high-end editors such as the Orban Audicy and simple software editors such as Cool Edit. Put simply, it is the difference between drawing volume "rubber bands" directly to waveforms and experiencing the feel of real faders under the fingers.

A number of software editor manufacturers are now understanding the importance of a separate mixer interface for radio production. For example, in 1998, Digigram adapted its XTrack software bundle to work with a JC Cooper controller.

My experience has been that jocks can handle both manual mixing and automated rubber banding quite effectively. But if presented with a choice, many still want to do the Fingertip Fandango on a mixer. It feels familiar and allows creative decisions that take too long to draw on a screen and try out.

## Easy to find

As is the case with many current digital audio products, the PARIS takes advantage of readily available and inexpensive standard computer system cables. When somebody else does all the design work to establish the cable standard, several things happen: cost is kept to a minimum, the need for proprietary cables is eliminated, and replacement parts can be had at a local office superstore.

A similar example of this philosophy is found in the Fostex FD-4 and FD-8 digital editors. These forego internal disk drives and utilize simple Syquest removable drives, available practically anywhere.

The PCI interface includes an interesting design feature that one would almost miss: small insulating bumpers maintain a set distance between adjacent PCI cards inside the computer. This avoids accidental contact with other cards that could cause spotty operation or actual damage.

The rackmount interface box includes four quarter-inch TRS analog inputs and outputs, coaxial word clock connectors and RCA-style S/PDIF connectors. A case could be made for inclusion of AES/EBU XLR-style connectors, but most radio studios have no problem with one or the other.

Besides, that would mean the Ensoniq team would almost be obligated to include XLR audio connectors as well, which would cause the loss of a desirable feature: the ability to plug in balanced or unbalanced audio on one jack without having to create custom cables.

## Standard method

If Windows and Mac operating systems have done nothing else, at least they have standardized the way humans move data in to and out of computers. Conventional Open, Close, Save, Save As and Quit commands make project management in the PARIS as simple as running any other project on any kind of program.

When the PARIS is running, one of two screens takes center stage: either the Editor Window or the Mixer Window. The Editor Window comes in two flavors called "Constrained Mode" and "Free Form." In the former, the PARIS is configured much like a multitrack tape recorder, with each track directly corresponding to a single fader on the Control 16 hardware fader board.

This is the mode most of us would feel familiar with. Recording, mixing and overdubbing are done in an environment we have known since our earliest days wrestling with the huge four-track Ampex machine.

In Free Form, up to 999 "FlexTracks" are available. This uses a priority play system to determine what track will be played while recording multiple passes of a part. This mode is probably more useful to musicians using a PARIS editor to create album tracks or audio for film/video.

Ensoniq calls individual audio elements audio "Objects" and the workspace the "Playing Field." The sports analogy is amusing and I will admit to having smiled a bit when I read about it.

The fact is, there are little word-plays all over PARIS. For example, there is a small icon bar in the upper-left-hand corner that click Command Bars on and off as needed. It is called the *Standard User Show/Hide Indicator Bar*, or, for short, the *SUSHI Bar*. Gotta like that.

As on most DAWs, PARIS audio events have associated waveform overviews that assist in editing. The overview is calculated in the background, which means you may continue to play back or record more material into PARIS while the process goes on.

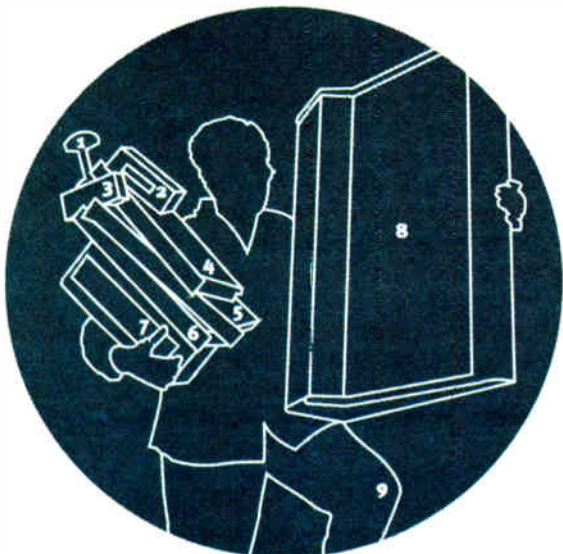
Marking and editing points along the wave are dropped in by clicking a Marker icon on the lower left of the screen. Sequential markers can be mouse-clicked on the fly while recording or playing, or by clicking a position on the time line when stopped.

Other audio programs allow you to drop markers by poking the "M" key on the computer keyboard. If mousing all day is not your idea of fun and you would rather hit a button, use the Set New Marker button on the Control 16 hardware controller.

The Control 16 could well be the departure you have been waiting for from endless mousing. Besides full transport control (Play, Stop *et al*), the surface allows arming tracks for recording, altering EQ, assigning Aux sends and performing actual editing; the jog/shuttle wheel under the right hand position will drag and relocate audio elements anywhere within the playing field.

The free-spinning wheel is metal with a silky spin and heft, without the "clickiness"

See PARIS, page 54 ▶



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PRODUCT EVALUATION

# Editor Fits Tape Rack

Thomas Caldwell

The best ideas are often the simplest. Take for example, the Otari PD-20B.

Otari has taken a state-of-the-art digital editing system and mounted it in the same frame used for its classic MTR reel-to-reel tape machines.

It is a move that could prove to be one of the cleverest made by the company.

The story of the PD-20B began about two years ago with the introduction of the Otari PD-20 Magneto-Optical digital recording system (RW, May 13, 1998). Although the PD-20 was well-regarded from a technical point of view, it did not sell very well in overseas markets.

Customers complained that the unit was awkward and not easy for production people to use.

The bulk of the PD-20 was mounted in a rack. A small control panel was connected to the main unit by a cable and sat on a table or ledge. The setup proved unproductive and impractical.

### The great idea

Then a large and loyal customer made a rather unusual request.

Technicians at Japanese public broadcaster Nippon Hoso Kyokai (NHK) asked Otari engineers if they could mount a PD-20 inside a frame normally designed to hold the old MTR or BTR-10 reel-to-reel tape deck.

NHK liked the technical quality of the PD-20 system, but the engineers did not want to overhaul the layout of their studios.

Six months later, NHK was shown the results — the PD-20B. The reaction was beyond expectations.

"The NHK people went crazy when they saw what we did," said Kunihiko Maeda of the Otari International Sales Division. "They just loved it."

Like most large, traditional organizations, NHK spends a great deal of resources training its personnel. Although among the first to use the latest in broadcast technology, the public broadcaster always looks at the time and cost in training its people before making any sizable purchase.

Technicians who had spent time cutting tape on an Otari reel deck had very little trouble using a PD-20B. The controls were virtually the same as the old analog system, except for the typical advancements one would expect from a digital machine.

First, there is a plug for a PS/2 computer keyboard. This is used for titling sound clips, creating electronic session notes and other library management functions. The keyboard does not have to be plugged into the system when it is switched on, and it can be plugged and unplugged at will.

The PD-20B has a built-in "virtual" keyboard operated by the editing keys. Although it might sound clumsy, it is very easy to use.

Audio levels are controlled from the front panel, while all editing functions are on top. The Stop, Play, Pause and Record buttons are well laid out and are virtually identical to those of a conventional tape recorder, right down to the mechanical "click."

VU meters and cue speakers are all where they would be expect to be. The only thing notability missing are two

reels of tape.

Cut-and-paste editing, referred to by Otari as "cut and insert," is accomplished using a keypad. A jog/shuttle wheel, similar to those used on many other editors, is used to locate edit points. There are also fade-in/fade-out and track mixing functions.

This may not be as elaborate a list of features as is found on high-end workstations, but is fine for most broadcast requirements.

Users can zoom in and see 1.62 seconds of waveform data using a conventional 15-inch SVGA monitor. Larger SVGA monitors can be used if needed. Time is clearly displayed, as are other technical details.

Unlike most digital editing systems I have used, the screen on the PD-20B has very little in the way of clutter or distractions.

Screen colors can also be mixed and matched to come up with a combination the user finds most pleasing to work with.

The PD-20B boasts a highly sophisticated library system, capable of storing up to 999 separate sound items, any of which can be loaded up with a few keystrokes.

An additional feature called "instant playback" allows an operator to quickly locate a section of audio among the multitude stored on disk.

I found this feature most attractive, as it could save precious seconds when a major story has got to be put together and on the air in an instant, or when a spot has to air ASAP.

### More space to spare

Below knee level is a storage drawer along with an additional 3 RU of space for mounting other equipment. It is a suitable place to mount a minidisk deck, cassette tape recorder or even an ISDN codec.

One of the major attractions for studios trading up to the PD-20B is the ease with which it can replace its analog ancestor. The back panel is in the exact same location as and almost identical to the old tape recorder, eliminating the need for any massive studio rewiring. Just roll the PD-20B in, connect it up and you are in business.

Instead of an internal hard disk, the PD-20B uses standard removable 640 MB magneto-optical (MO) disks for storage. For backup, the unit can be connected to any SCSI-2 device, including conventional hard disks or Zip and Jaz drives.

The PD-20B features 20-bit A/D/D-A converters, AES/EBU digital interfaces and two-channel analog I/O.

Five sampling rates are available: 32 kHz, 44.056 kHz, 44.1 kHz, 47.952 kHz and 48 kHz. At 44.1 kHz, 60 minutes of audio can be stored to a disk.

### Proprietary format

Unlike most other digital editing systems, the PD-20B records and plays only its own proprietary format.

According to the designers, this was because the WAV format and other popular computer-relevant formats were not capable of the versatility they wanted to build into the system. The operating system is chip-based and is also proprietary.

This is not a major concern because dubs can easily be made by connecting

the unit to another recording device. It is also fully compatible with the Otari PD-80 eight-channel MO disk recorder/editor.

Editing functions on the unit include off-line processing and  $\pm 12.5$  percent pitch shift. It also includes time code synchronization and chase capabilities.

Otari is offering two models: the PD-20B-E with the CB-170 edit controller for editing suites and the PD-20B-P with the simplified CB-172 edit controller for on-air studios.

The PD-20B had its birth in Japan, and was very well received there. It is available in the U.S. on special order.



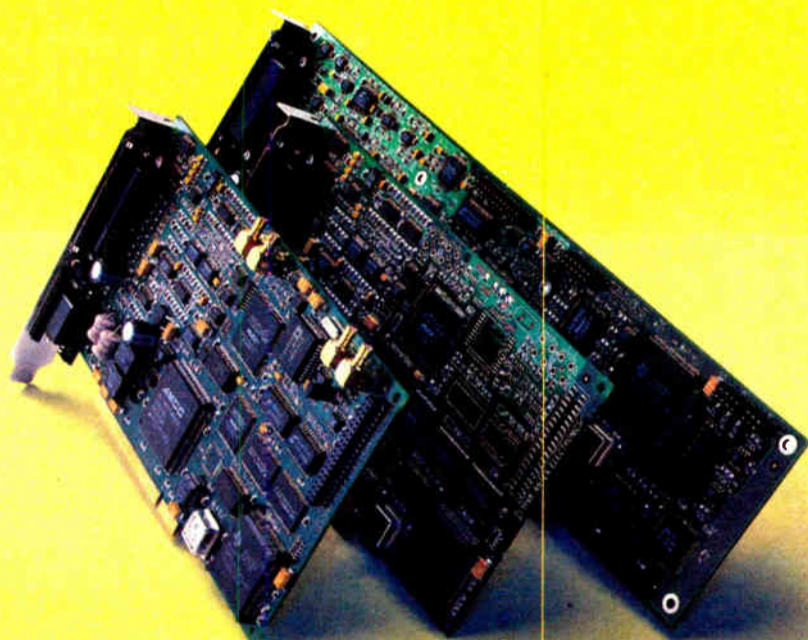
Thomas Caldwell is a free-lance print and radio reporter based in Tokyo. Contact him via e-mail at [caldwell@gol.com](mailto:caldwell@gol.com)



A PD-20B in a Rollaround Cabinet.

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# Rethinking Remote Simplicity

► IMPEACHMENT, continued from page 51  
send capabilities and internal power supply with no line-lump or wall-wart transformer to trip over.

It also had a small footprint — our table area was perhaps 10 feet deep, and we still had to provide clearance for other media workers to pass behind our anchors. In all respects, smaller was better.

The anchor table faced the open atrium of the rotunda, while our table faced the opposite wall, two feet to the anchors' right. In this way, eye contact could be maintained with minimum strain.

The anchors' headphones were fed the right channel output from the Mackie mixer; the left channel was sent to a MUSICAM USA Prima 120 codec.

The 120 was sending our broadcast back to NPR for satellite transmission at 128 kbps MUSICAM MPEG Layer II, and receiving dual mono at 64 kbps Layer II.

Audio from the Senate floor was picked up at NPR headquarters via the Washington Area News Distribution (WAND) audio service and shipped to us on the right channel. Stakeout audio on the WAND, typically at the Ohio Clock (a large grandfather clock donated by that state), was sent to us on the left channel.

Both Prima decoder outputs were fed into the Mackie, which made for easy duck-and-under maneuvers during the tri-

al. Conan chose to do minimal voice-over narrative, especially when the Senate voted on any of its resolutions; listeners had sent e-mails asking to hear the voting in the clear, so as to hear how their senators voted.

## Up to the gallery

One of the mixer's Aux busses was configured as a mix-minus to feed a Telos One hybrid, for easily adding a telephone guest.

The other Aux bus was configured as a mix-minus to a Prima 110 for feeding audio to the Senate Radio-TV gallery mezzanine: a site equipped with a MUSICAM USA RoadRunner codec and designed for grabbing senators for quick live interviews with our anchors.

The Prima 110 output appeared on the Mackie, and was easily auditioned in Solo mode, to set the senators' levels prior to the interview.

We provided funding credit playback and station breaks from a Sony D-10 DAT recorder.

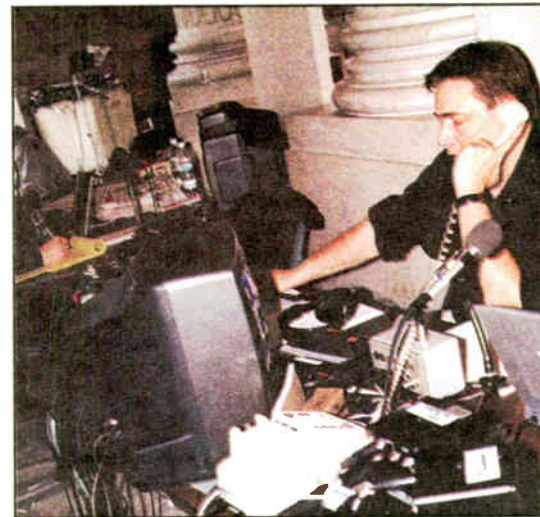
In all, five ISDN lines had been ordered for the event: two for our broadcast, one for the Senate radio-TV mezzanine, one for the "All Things Considered" broadcast position 30 feet away, and one for linking to the NPR computer systems.

A router using CAT 5 cable linked four laptop computers and an HP laserjet printer into the NPR data network. With this

setup, we could write and edit scripts, view newswires, perform Internet searches and handle other informational needs.

While this arrangement of devices and equipment worked beautifully for broadcasting the "routine" parts of the trial, our thinking bogged down when the Senate would have an extended recess to collect their thoughts.

NPR News management wanted to have a call-in segment from NPR Studio



No remote is complete without an impossible tangle of cables.

3A, hosted by Ray Suarez. We had to be able to allow the Russell building site to join the conversation, then break away when the Senate returned to conduct its business.

Initially, our thought had been to send the Russell site audio to the satellite, then dial NPR Master Control on the second Prima prior to the recess, and have our audio switched to Studio 3A with a backfeed return.

At an appropriate moment, the NPR satellite feed would be switched to Studio 3A, and the Russell building would become a remote site until the recess ended.

Because Russell was feeding two

sources, and the scheme was conceptually complex, NPR engineer Michael Cullen reported that on his watch one Saturday, a giant satellite feedback loop occurred in the transition from Russell-as-studio to Russell-as-remote site.

Later in the week, the same tasks were assigned to us. An old radio maxim came to mind: "If it seems too complex, it probably is."

It then became apparent to us that, if we kept the Russell site a "studio" feeding the network, we could use our second ISDN to receive NPR Studio 3A as a "remote site." Additional sources could be switched into Studio 3A, and mixed into the feed coming to the Russell site.

Readers may shake their heads at this simplicity, and wonder why it took us so long to see the obvious. It was simply years of thinking of a studio *always as a studio* and a remote site *always as a remote site* and never as a network feeding studio.

Duh!

This out-of-box thinking had made our lives — and this broadcast — much better. Now the Russell site could include Studio 3A as appropriate, even when Studio 3A was live on another satellite channel with "Talk of the Nation," and the Russell site could break away cleanly when needed.

Again, I will stress that the solution was simple, but the process that took us there was not direct, especially for those of us with years of broadcast experience.

There may be a time in your work where you encounter such tasks, and — with your out-of-box thinking coming up with such elegant, simple solutions — your colleagues will wonder why it wasn't obvious from the beginning.

Until next time, I remain,

Your ob'd't eng'r.

■ ■ ■

Rich Rarey is managing editor of EUOnline, the on-line NPR engineering resource. Reach him at [rrarey@npr.org](mailto:rrarey@npr.org)

## PARIS DAW Comes With Its Own Mixer

► PARIS, continued from page 52

noted in plastic encoders on less-expensive controllers. It almost has the feel of a video controller.

When the Mixer Window is opened, you are treated to a genuine mixer layout and not simply a handful of virtual faders.

Each fader has a virtual LED bargraph VU indicator, EQ and Pan windows, Aux Send and a set of icons for Record Enable, Mute, Solo, Automation and Automation Edit. Aux master and Main master sections are shown to the far right.

EQ choices are high-pass, low shelf, band-pass parametric, high shelf and low-pass. The control range is +18 to -18 dB. If you don't know how to apply effective EQ — whether analog or digital — it will be easy to make a recording sound very bad. Work with this feature to get it to sound good.

Aux Sends route audio through sets of Ensoniq plug-ins. Factory

effects include mono and stereo compression, chorusing, delay and reverb. Others are available.

Response is very quick to fader adjustments. The on-screen sliders follow those on the Control 16 when moved.

The mixer can be resized as well. If you are dealing with a smaller display (say 832x624), an alternate mini-mixer can be clicked open that displays all 16 tracks at once. EQ and Aux sections can be hidden if desired. And Windows 98 allows the use of two monitors at once (with appropriate hardware), so both the Mixer Window and Editor can be displayed simultaneously.

In the next installment, the PARIS finds a home inside a 300 MHz Pentium II and goes to work on some radio production projects.

■ ■ ■

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PRODUCT EVALUATION

# The '70s Live in Apple CD Reissue

Sallie Schneider Sauber

None of us ever wished for the day disco would make a comeback.

However, '70s nostalgia is all the rage right now, in the way some people dress, the music we listen to (hip-hop artists using classic disco and rock samples), and the movies we go to see, such as "Boogie Nights" and the return of "Star Wars."

The '70s live on in television commercials for Old Navy, Miller Light Beer, Volkswagen, and even Macintosh Computers. Cable channels "Nick At Nite" and "TV Land" pull out all the stops and routinely rerun 25-year-old shows. Then there is the TV program that unabashedly calls itself "That '70s Show."

Now they tell us

With this newfound interest in everything '70s, it may be likely that production directors everywhere are cursing themselves today for throwing out their cheesy vinyl music libraries during the mid-'80s, believing wholeheartedly, "We'll never use this music again!"

Never fear, because O'Connor Creative Services is back to save the day with the Apple Digital Library, available once again through Dave Dworkin's "Ghostwriters."

Ghostwriters has been knocking

around for about 13 years, starting out with written radio comedy material. Since then, Dworkin has been on a mission to locate and sell creative radio products to radio stations, TV stations, audio-video producers and cable operators.

Among his other product lines, the Valentino music and effects libraries, Sound Ideas libraries, the Halland Broadcast Services "Eighties Plus" music collection and Dork-A-Pellas.

The Apple library is all original material from the '70s. Hence, the horns, the strings, the drums are the real thing. So realistic, in fact, that you can hear an out-of-tune horn in a couple of places, most notably on the series of workparts that sound a whole lot like the Beatles song, "Magical Mystery Tour."

This collection is something. It is "Kojak," "Charlie's Angels," "Baretta" and "Love American Style" colliding at a four-way intersection. It is Tom Jones at the Sahara and Don Rickles at the Palace. It is "Streets of San Francisco" meets "Get Christy Love."

This is not your father's production library. Then again, maybe it is.

What is unique about this library, as opposed to the '70s-style cheese being written today in the '90s, is that the Apple collection is the real McCoy. The people at O'Connor were serious when they wrote this stuff some 25 years ago.

They were actually competing with other companies for this very sound.

The unmistakable tonality of analog Moog and ARP synthesizers are everywhere. The guitar tracks are filled with the "whacka-chacka" sounds made popular in "Shaft." The trumpet and string stabs speak for themselves.

This collection is so full of goopy wholesome goodness, Bert Kaempfert himself — the king of '70s elevator versions of all your favorite rock tunes — would have been jealous.

In use

I used one of the Apple music beds for a radio commercial about insurance companies that leave you stuck on hold with annoying music for ten minutes, only to disconnect you suddenly just before you get to speak to your representative.

The music was perfect with my singsongy, smiley, sarcastic, "I'm sorry, all representatives are currently busy, please hold."

One of the workparts sounds just like music from one of my favorite cartoons, "Superfriends" — the one with super heroes like Wonder Woman and the Wonder Twins — when the big booming voice would say, "Meanwhile, back at the Hall of Justice ... " and the picture would swirl into the next scene.

I would swear this library even had a piece that sounds like "Brady Bunch"



The O'Connor Apple Digital Library: A peachy collection of '70 production music.

transition cue music; the tune that played just before or after a commercial break, accompanying the visual of the house exterior.

The motif was always reminiscent of the original theme music, but in a different style or tempo, depending on the mood of the episode or scene — ominous, when Jan lost the precious locket; eerie, when those pesky boys fashioned the flying saucer; and the tender moment when poor Cindy was forced to endure Buddy Hinton's teasing.

There is even a drippy, lounge-style version of "Happy Birthday," complete with ambient party chatter in the beginning. This cut is perfect for those anniversary sale ads that every single

See APPLE, page 56 ▶

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## TECHNOLOGY UPDATE

# Pentium: The Next Generation

*The Newest Intel Processor to Hit the Market Is Ready, But No Need to Replace Current Gear Yet*

**Read G. Burgan**

Intel has once again raised the CPU stakes with the introduction of its new Pentium III processor.

Does this mean you should rush to refit or replace your production computer, your traffic and billing system or even your audio storage and playback computer with a new Pentium III-based machine?

Maybe. Maybe not.

For the most part, recent processor improvements have been incremental. And if you include the Celeron, one might even argue that some have been incremental in a negative direction.

When Intel introduced MMX technology a couple of years ago, it was touted as the greatest advance since permanent-press slacks.

But most users quickly found out they experienced little or no improvement in performance with the software they were using.

been optimized for the Pentium III processor.

How much difference are you likely to see in the performance of an actual application? That remains to be seen. But my previous experience suggests it could be substantial.

## Next step

I decided to upgrade my 486 computer a couple of years ago. I initially decided to go with a Cyrix 686 processor.

I was disappointed in its performance. Under Windows NT 4.0, some incompatibilities caused software that was normally stable to crash.

After exchanging the chip several times, I replaced it with a Pentium with the same clock speed (166). The difference in performance was impressive. For example, digital audio processing in Sound Forge that had taken 24 minutes using the Cyrix processor now took only seven minutes.

The motherboard and RAM remained



Do you need one yet?

Ironically, one of the Pentium III's most touted features is one that provides no performance increase and is also its most controversial: the processor serial number. Each Pentium III processor has a unique 92-bit serial number electronically embedded in silicon.

Allegedly the purpose for this innovation is to provide protection and confidentiality for those engaging in electronic commerce on the Internet. But potential users see it as another tool for Big Brother to use in tracking the Internet activities of John Q. Public.

So should you rush out and be the first on your block with a new Pentium III?

Before you do, first check with your software provider — whether its for the workstation, for music rotation or for running the audio server — to see if the company's software has been optimized to take advantage of Pentium III features.

If it has, will you have to upgrade the software? And if so, at what price? Then ask yourself if the increase in performance is worth the price of a new computer and software.

If you are still using an early Pentium processor, you might find that moving up to a Pentium II will provide you with all the performance gain you need while letting you take advantage of the recent drop in Pentium II prices.

## Pricing

I have found that the street prices for the Pentium III processors average in the mid-\$500 range for the 450 version and in the mid-\$700 range for the 500 MHz version. There are also a handful of motherboards out there that currently claim the ability to handle a Pentium III, and those start in the low \$100 price range.

Unless you absolutely have to be on the cutting edge, there is a lot to be said for staying one generation behind in the computer processor wars. Your station can continue to enjoy substantial increases in performance at a fraction of the price that would have been paid for being the first in line to buy the latest product.

■■■

*Read Burgan is a free-lance writer and a former public radio station manager. He can be reached at (906) 296-0652 or through e-mail at rbg@up.net*

**Unless you absolutely have to be on the cutting edge, there is a lot to be said for staying one generation behind.**

In order to benefit from MMX technology, software had to be written to specifically take advantage of its features. For a long time, few software packages did.

## What's in the block

The Pentium III processor, like its predecessor the Pentium II, uses P6 Micro architecture, a 512 K level 2 cache, a single-edge 242-contact cartridge and initially will be available in 450 and 500 MHz clock speeds.

Like the current Pentium II generation processors, it has a 100 MHz system bus and is designed to be used with the 440BX chipset. To take advantage of the higher bus speed, one must have peripherals that are designed to run at that speed.

The Pentium III incorporates technology that gives it the potential to substantially increase the speed of some applications. The chip will have a set of 70 new instructions called SIMD (Single Instruction Multiple Data).

Probably the single most important feature will be its claimed ability to deal with four floating-point units at one time. Current Pentium processors can execute only one floating-point computation at a time.

In addition, because of architectural alterations, the processor is expected to stream both audio and video more efficiently.

Again, as with the initial MMX technology, you are unlikely to see substantial improvement in performance unless your specific software application has

the same. Only the processors were different. Key to that difference was the floating point performance of each processor.

However, performance enhancement depends upon function. When I run a specific Sound Forge plug-in on my Pentium 166 and again on one of my Pentium-II-300s, the total processing time is within a few milliseconds. In that application, I gained little or nothing by upgrading to a Pentium II.

But when I preview the results of the same plug-ins *in real time*, the Pentium falls far short of the Pentium II. And if I attempt to chain together several plug-ins and listen to the final result in real time, the Pentium II is able to preview many more plug-ins than the old processor.

## Down by the old data stream

Similarly, it is likely that the Pentium III will exhibit the greatest advantage in tasks that require real-time streaming of audio and video. Under these circumstances, it likely will provide stellar performance. Those that provide such services are enthused.

"We are pleased to announce our support for Intel's Pentium III processor," said Len Jordan, senior vice president of media systems, RealNetworks, Inc.

"We look forward to continuing to work with Intel to further accelerate the rapid adoption of streaming media on the Web. The superior performance of the Pentium III processor coupled with RealSystem G2 will deliver a unique and even more compelling streaming media experience," he said.

## Oh, Those Fabulous '70s

► APPLE, continued from page 55

client insists on at least twice a year.

Alas, many of the weird synth sounds took me back some years to a class in college about a style of music that never really caught on: *musique concrète*.

I had to memorize the names of a bunch of composers I never had heard of, as well as their compositions.

One such piece was a recording of a drip of water a hundred times into itself, creating a torturous feedback loop worse than a genuine water torture.

My instructor fancied himself a composer of *musique concrète*, scratching dinner forks across the strings of a grand piano and such. He called it music. But mostly it was screechy, scratchy noise, appropriate for eerie sound effects or a Star Trek soundtrack.

Four months ago, I put together a Christmas music show with over 200 songs — classic stuff like Bing Crosby and the Ray Coniff Singers — sprinkled with some contemporary material. More than 40 hours of effort were spent creating this project from scratch and nobody else in the market had anything like it.

I would have loved to have had some of these workparts to use to

introduce the show just before we aired it. I suppose there is always room for a formal introduction for this year's holiday project.

Thanks in part to aging baby boomers and cable TV reruns of "Adam 12," the Apple Digital Library actually has a place again.

Jocks would have fun with this collection. Morning show bits involving time warps back to an earlier era are a natural for this library. A clever jock can invent "'70s Man," an Austin Powers-wannabe stuck in another decade.

With the '70s officially long over, the Apple Digital Library would not be one's first choice for a conventional, contemporary library. But there are certainly plenty of uses for the workparts and the music certainly does fire the imagination.

The Apple Digital Library is available from Ghostwriters for \$495, but Dworkin is offering it for \$395 if you mention RW when ordering.

■■■

*For information on the Apple Digital Library, call Dave Dworkin's Ghostwriters in Minnesota at (612) 522-6256; visit www.radio-mall.com or circle Reader Service 217.*

*Sallie Schneider Sauber is production director for WATH(AM) and WXTQ(FM), Athens, Ohio, and a contributor to RW.*



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# Choosing the right audio Codec.



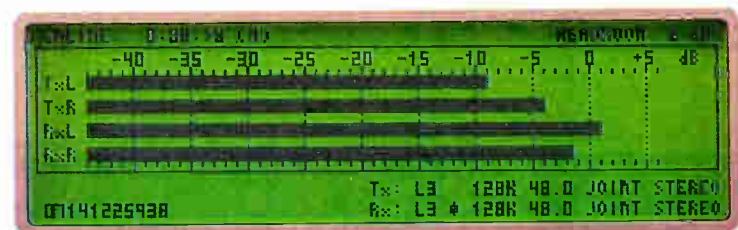
The Dialog4 MusicTAXI range is one of the most comprehensive codec packages on the market today. It contains all the standard ISO/MPEG audio coding algorithms in common use today such as Layer 2 and Layer 3, as well as CCITT G.722 for high grade voice bandwidth connections, and G.711 so it can talk to a plain old analogue telephone line, too. Connectivity features include up to three ISDN terminal adapters and X.21 port, for operation up to 384kbps. Dialing is quick and easy using the 96 entry directory.



The range of network protocols included means that it can be taken to virtually any part of the world. In the studio the audio i/o can be analogue or digital (AES/EBU & S/PDIF interfaces are both provided). The aux data channel enables embedded control data to be sent alongside the audio, and the unit can be controlled remotely from a PC or the external Remote Panel if desired. Most importantly automatic sensing of the codec at the other end of the call means that it sets itself up to communicate with the most commonly used systems in use today, i.e. Telos Zephyr, CDQPRIMA, Glensound and



others without complicated manual programming. Operationally the buttons are large and straightforward to use, while the illuminated LCD display gives a clear indication of what is going on at all times. No noisy internal cooling fan to worry about in quiet studio conditions. The Remote Panel can control a MusicTAXI from over 1500 feet away via the RS422 interface. The online menu indicates online time, send-level, receive-level, adjusted headroom, Rx and Tx audio configuration, SYNC flag of MusicTAXI at the other end.



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# Top Floor and on Top of the World

**Ken R.**

In the days right after World War II, the top floor of the Hutzel Building in downtown Ann Arbor, Mich., was converted into one of the first UHF TV stations. Within a year the owners discovered that almost no one could receive UHF TV signals. Oops.

By the time I arrived at that station in the late '60s, the sound stage, control room and dressing rooms had been converted into the radio studios of WPAG(AM) and WPAG-FM, the site of my first paying job.

The Hutzel Building had become badly run-down. The stairs creaked, the carpet was threadbare and there was a faint musty odor everywhere. But at \$2.39 per hour, I thought I had finally made it.

Fringe benefits included the occasional Edie Gorme single and gift certificates to Arby's when I behaved myself. But even though there was no money, benefits or prestige, I told myself it was great experience. Besides, I could work on my college homework while the tunes were spinning.

## With a moo-moo here ...

There was a noon show called "The Farm and Home Hour," in which every commercial was voiced by the host, and each one began "Attention Mr. Farmer ..."

The show open — a rousing, out-of-phase Sousa march with voice-over dubbed to an ancient cart — declared, "Attention, Mr. Farmer, it's time for the Farm and Home Hour with Howard Heath and Frank Gegler."

I later found out Mr. Gegler had died in 1965, but no one bothered to change the cart. Perhaps people wondered why they never heard Mr. Gegler. Perhaps they did not.

During this one-hour sold-out agricultural soiree, Howard Heath introduced each taped actuality by saying something like, "Now, live and direct from the Chicago Board of Trade, here are the livestock prices for today." You would then clearly hear the cart wow as it came up to speed in the wheezing Gates machines.

Everything was "live and direct," regardless of when it had been previously recorded. A time-warping and mind-altering experience.

## Bow your heads

Many of the taped programs on WPAG, such as the Sunday morning religious shows, ran on an old rack-mounted Ampex reel machine dating back to the '50s.

One morning I was down the hall, ripping the news from the AP machine. It was located down a flight of steps from the studio, which felt a quarter-mile from the control room. I was absently listening to the air monitor while I ripped the news, marveling at how distorted the audio was from the Bethel Baptist Church service in progress. Then the choir went silent.

I dropped the news copy and ran down the hall back to the studio. As I started up the flight of steps to the control room, a reel of tape bounced down the steps and passed me heading the other way.

Of course I could see the feed reel still spinning wildly on the Ampex. It was the take-up reel which had jumped ship and was headed out of Dodge City.



Ken R.

Ever the quick thinker, I ad-libbed, "one moment please," threw in a PSA about shoe safety and retrieved the peripatetic tape reel from down the stairs. "We now continue with the Bethel Baptist Church of the Air, already in progress."

The tape wowed back to life and listeners could then ostensibly continue to enjoy that fine music.

A few weeks later the program director instructed me to send a letter to all the suppliers of our Sunday morning religious shows.

"Dave," he said (my name is Ken), "tell those shysters we're doubling our rates. They can pay up or get out. Maybe we can get rid of those clowns once and for all!"

The letters went out and with lightning speed, larger checks began flying in the door. No one canceled. Bethel Baptist Church of the Air continued unabated on WPAG for many years.

## That homespun sound

For a time I handled the evening air shift. My mandate from the program director was clear: "Play folk music, sweep up the place. lock up when you leave." After getting bored with the several dozen Joni Mitchell, Bob Dylan and Judy Collins albums on hand, I started branching out.

Iron Butterfly, Blood Sweat and Tears and occasionally Cream issued forth over the airwaves. This went on for several months and no one complained.

One night around 8 p.m., the program director stopped by the station to show a lady friend around. Upon entering, he heard "I'm a Man" by Chicago blasting out of the speakers and headed to the control room to have a word with me.

"Dave," he inquired, "what exactly are you playing?" I mumbled that my definition of folk music was rather elastic and he let it go.

I guess he had other plans in mind, and besides, no one was listening.

## Museum ware

At the end of one of the hallways of WPAG was a large metal fire door which opened with a huge clang. Behind it was a cavernous, unheated room lit by three small bulbs with pull strings. Those allergic to dust entered at their own risk.

This enormous room, laughingly referred to as the "Announcer's Lounge," housed no less than the history of local radio.

Stacks of electrical transcriptions — giant 16-inch disks containing commer-

cials — old TV props, vintage microphones, on-air signs and discarded control boards were stacked in random piles. Old 78, 45 and 33 rpm recordings lined the walls in milk crates. Photos in glass frames from the salad days of the station were stacked in corners.

I only had a faint notion that any of this was valuable at the time, and asked the program director if I could have some of that stuff. He said, "Sure, Dave. Take whatever you like. Who cares about that junk?"

By this time I was getting used to him not knowing my name.

One day I showed up for my show and

the Announcer's Lounge had been emptied to the walls. Everything had been carted off to the dumpster.

I have very few regrets in my life, but I regret not saving more of that stuff. I think I ended up with a transcription disk for the 1959 Edsel and not much else.

I think about WPAG now. Like many other stations, it has undergone multiple ownership and call letter changes. All the characters I worked with have now moved on or passed away. The world has changed and so have I. But like many radio veterans, I have fond memories of an easier time.

Back in the days when, like it or not, my name was "Dave."

■ ■ ■

Ken R. produces radio jingles in Toledo, Ohio, and contributes to RW. E-mail him at kenr5367@aol.com

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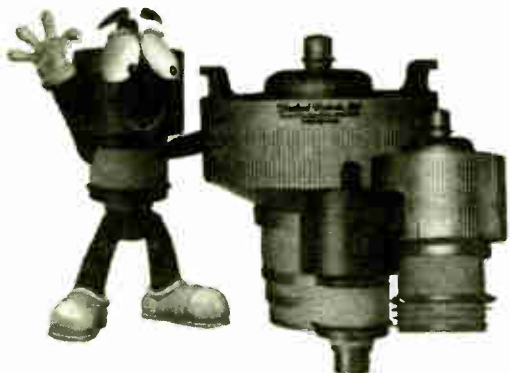
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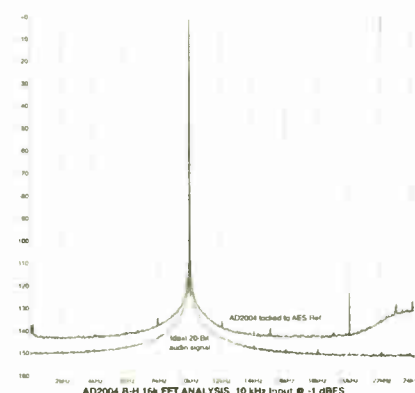
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READER SERVICE NO. 127

# Audix a 'Big, Full' Performer

► AUDIX, continued from page 51  
it to handle sound pressure levels up to 145 dB.

Our evaluations were made with acoustic guitar and vocals. The CX-111 has a big, full sound with plenty of clarity at both ends of the spectrum.

This is not something that you can take for granted with lower-priced condenser mics. Some try to imitate the full low end of the Neumann, but do so at the expense of high-end clarity. That definitely was not the case here.

## Music recording

In acoustic guitar sessions, even the sounds of finger screech (fingers sliding on strings) was faithfully captured — something that I can usually hear only while sitting in the studio next to the musician.

The amount of high-end detail was surprising. Presumably with its switchable 10 dB pad, the CX-111 would be equally at home in front of a speaker cabinet or a guitar amplifier, although we did not have the opportunity to experiment with that application.

**The company has done itself proud with these premiere entries into the condenser market.**

Vocal recordings with the CX-111 were also rewarding. Especially pleasing were female vocals, where this mic was able to make a thin-sounding voice appear fuller without sounding artificial or processed.

## What's this?

While our response to the CX-111 was overwhelmingly positive, there were a few minor annoyances.

The slide switches for bass rolloff and 10 dB attenuation are well-camouflaged on the body of the microphone, making them hard to find and adjust in low-light environments.

We found the finish and assembly of this mic to be wanting in some ways. The

paint finish on our mic was uneven. In areas where paint was applied too thick, it scuffed easily. The shockmount construction is somewhat flimsy, and the screws quickly loosened.

The CX-101 is an incredible bargain for \$499. The CX-111 is equally so for \$599. Both have opened up the world of condenser mics to those who may have considered such instruments to be out of reach. Sound quality is on par with condenser mics that cost considerably more.

Incidentally, Audix has recently taken a plunge into consumer education with the release of a microphone application guide and CD-ROM. Both feature well-

known recording engineers and musicians demonstrating different applications of Audix microphones.

Volume I, which covers basic instruments, was recently released. The soon-to-be-released Volume II will cover vocal applications of Audix products.

For more information on the application guides, the CX microphone line and other Audix gear, check out the company Web site at [www.audixusa.com](http://www.audixusa.com)

Tom Vernon is a multimedia consultant working in Philadelphia. Reach him at [TLVernon@blazenet.net](mailto:TLVernon@blazenet.net) or call (717) 367-5595.

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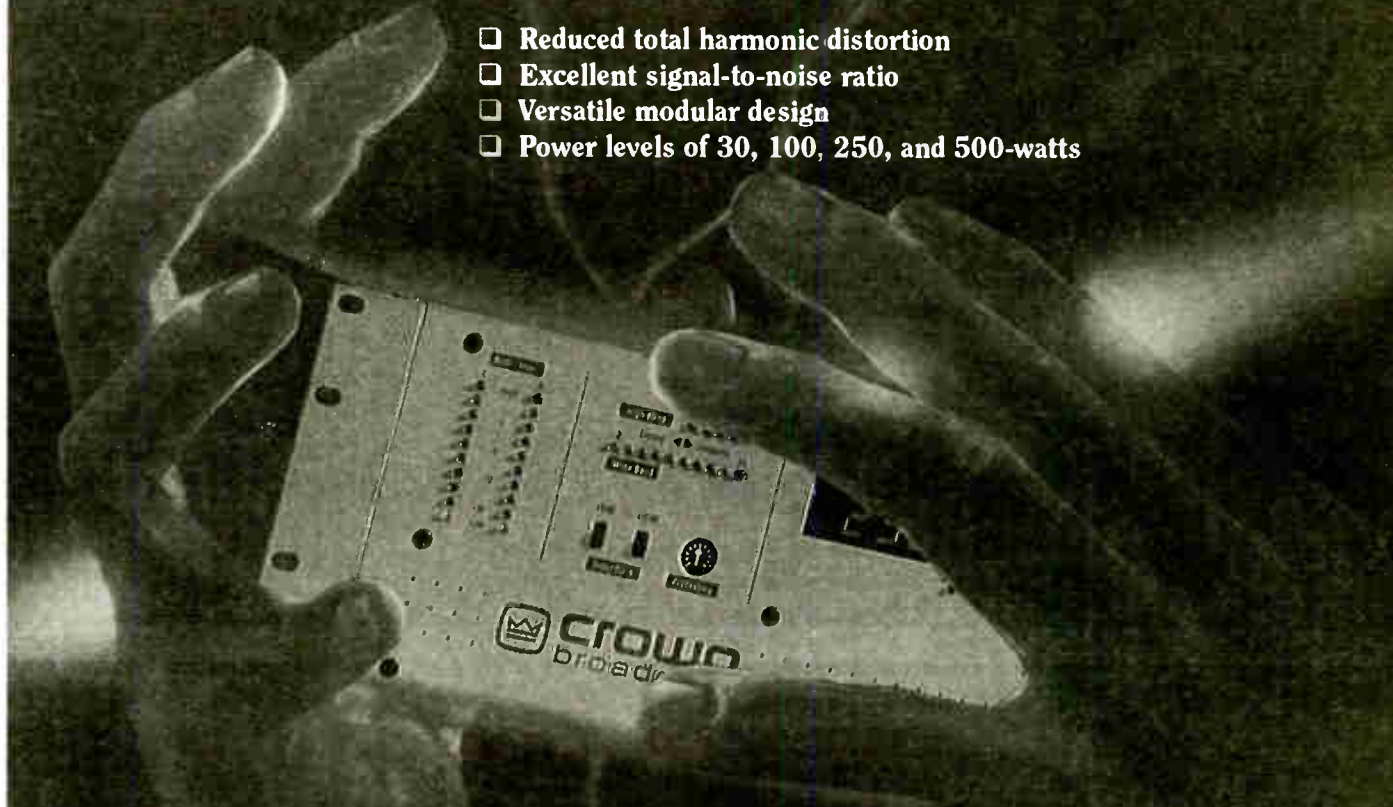
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**Product Capsule:**  
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- ✓ Price

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- ✓ Paint finish

For more information contact Audix Corp. in Oregon at (503) 682-6933 or circle Reader Service 108.

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The TeleRadio even has a DTMF selectable external audio connection so it can be used as a standard telephone coupler too. An optional call progress decoder is available for using the TeleRadio on PBX analog lines and in areas that don't support CPC.

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# Buyer's Guide

The Remote  
World of the  
WBUR Group  
Page 66

Radio World

Remote Audio Recording and Mixing

April 14, 1999

SPECIAL REPORT

## Build a Remote Box the Right Way

Allen J. Singer

Spring is here, and in radio, this means remote season is in full swing.

While the promotions department worries about event planning, it's the engineering department's job to worry about the live broadcast. If you design and build the remote box effectively, you will have much less to worry about.

The key to building a remote box is to keep it simple. It needs to perform well enough for the promotions department to operate it without engineering supervision.

Though sometimes an engineer's presence is required at a remote broadcast, simpler remotes can run without the engineer. What many of us ideally desire is to set up the box, hang around for the first break and take off when the broadcast appears as though it will work fine without our presence. After all, this is why we carry pagers.

### The recipe

A remote box must contain the following: the transmitter device (whether it's a Telos Zephyr for ISDN, a Marti, etc.) and a mixer. If you wish to expand your equipment to improve efficiency, you can add wireless mics and a receiver, and maybe a wireless headphone system. Wireless mics and headphones make a world of difference since the talent does not have to be attached to the equipment via long wires on the ground. Plus, they make cleanup easier.

Versatility is an important aspect for your remote box. If your station(s) is (are) remote intensive, it would be helpful to have more than one box ready to go. Depending on your budget, you can make as many boxes as you want.

Max Turner, engineering manager for the Susquehanna stations in Indianapolis, has four boxes, or road kits, since the stations are remote-intensive with as many as 20 over one weekend. Three boxes have Telos Zephyrs and ElectroVoice mixers. One box contains a Mackie mixer for concert events.

If you can't afford multiple sets of equipment, then you may find it necessary to swap out a portable Marti or Comrex HotLine or Zephyr. We do this at WRRM(FM) in Cincinnati. Depending on the remote, the box might have a Zephyr or HotLine in it. Since we don't constantly do remote broadcasts, we don't need more than one box.

Kevin Surgeon, chief engineer for WRRM and WVAE(FM) in Cincinnati recommends multiple boxes for multiple functions. At his former job in Columbus, he built several.

"We'd prefer separate cargo cases: three for the PA, one for IFB (talkback), one for ISDN, and one for wireless

mics," said Surgeon. "This way, we only had to take the equipment (that was) needed."

### Decision time

Choosing the right mixer for your box depends on budget and need. We use a Shure mixer in our box; it offers VU meters and compression and we like it a lot. Rolls also makes a good mixer, but it lacks extra features in lieu of a more economical price tag. Shure mixers cost \$2,000-vs.-\$200 for the Rolls unit.

In a pinch, you can even do without a mixer. Surgeon suggests plugging mics into the back of the Zephyr.

"We used to plug the mic receiver outputs into the Zephyr to avoid using a mixer," he said. "The wireless receiver had mic adjustments for levels."

Wireless mics and wireless headphones aren't necessarily a priority, but they make walkin' and talkin' easier for the talent. Wireless units add much more distance for the jock to move around in, especially during a busy event with many people. Pack mics, cords and wired headphones for backup as they can pick up other signals, such as at a live concert. Headphones can receive wireless messages from stage personnel and may cause confusion to your personnel. Always keep backups on hand.

So how does the remote site hear the station? Obviously the simplest solution is a PA box with a tuner and speakers. But if the jock needs to interact with the on-air board op, you'll need something more.

The studio console will need a mix-minus to feed the remote. If the console lacks a mix-minus, you can fake it by instructing the board-op to put all channels into audition as well as program. You can then send the audition feed to the remote.

The basic problem to overcome is delay. ISDN has nearly a quarter-second delay, and a Marti shot will have a slight echo. Since Marti doesn't offer a talkback from the studio, the best choice is to use simple Walkmans or an SCA transmitter and receiver — typically operating on 67 kHz — at the remote site for a talkback solution.

### The distance

An ISDN unit, such as the Telos Zephyr, has a return feed for talkback. Connect an XLR to the output, run it into your Shure mixer and run the output into the wireless headphone transmitter. This way, the person wearing the headphones will hear the station, the board-op, himself and all of his cues.

The same setup will work for a Comrex HotLine, which offers a return as well. The output of the mixer can also be run through a Crown D-75 amp to a

small JBL speaker so remote personnel can hear the broadcast and talkback.

A simple equalized phone loop will also do the trick for talkback. If you order two phone lines, you can use one for send, and the other for receive. It's a useful, inexpensive alternative.

Physically, the remote box should be the only the size you need, nothing too gargantuan. If you don't have any kind of

ing around the rear where the connections hide.

Surgeon also recommends to install a pull-out drawer for the box in which you can store mics, headsets and cords. If you install an AC plug into the side of the case, you can tie-wrap the back of the case shut so the promotions department never needs to open it. This operation can greatly extend the life of your equipment, especially when you eliminate the need to store mics and cables in the back of the box.

A "power distribution system" is a nice investment for your box also. This is



The Shure UHF Wireless System could provide a boost to your remote box.

wireless system, Surgeon recommends that you build a panel for the front of the box that contains ins and outs for the box. In other words, a promotions person should simply be able to plug the mics into the front of the box rather than pok-

a unit that all of your equipment will plug into for power. Not only do you benefit from not having to use a power strip, but the unit keeps the voltage at a constant level avoiding power fluctuations. This is

See SINGER, page 64 ▶

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## SPECIAL REPORT

# MD, RemoteMix 3 As a Road Team

*Combining Sony MiniDisc Recorder and JK Audio RemoteMix 3 Telephone Box Makes Reporting Easier*

**Paul Kaminski**

I cover major-league auto racing and am sometimes asked to contribute reports, features and actualities to other broadcast outlets.

input mixer into a box that will fit comfortably into a soft-sided briefcase.

It is simple to use. With the 3.m edition, you get a mixer that will let you feed 80 Hz to 15 kHz audio from the XLR jack. That will sound fine on an

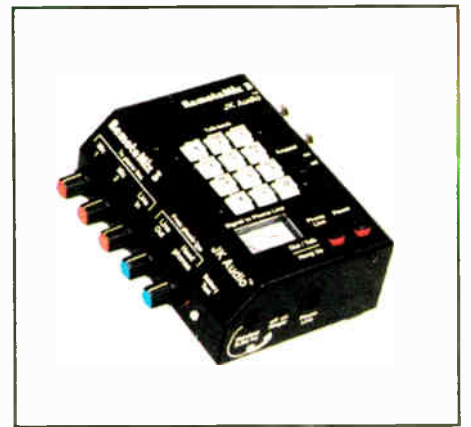
stumbled onto a solution by wiring the tip and ring connectors to the XLR Pin 2 lead, and the XLR Pins 1 and 3 to the sleeve. I have used both my Shure mics and an AKG D-3800 dynamic with good results.

The MZR-30 has a mic sensitivity control for the Auto Level feature. I leave the switch in the high sensitivity position and get good quality audio with an omni mic; in this case, a Shure SM-63.

Battery life has not been a great concern. With lithium-ion batteries and rechargeable Ray-O-Vac alkaline Renewal AA cells, I can record for two weekends before recharging both sets of batteries on the MZR-30.

### As we go up

The only problems I have experienced with the MZR-30 are the Pause button working intermittently (a warranty prob-



The JK Audio RemoteMix 3



The Sony MZR-30 simplifies sending wraparound reports and actualities.

Most of them accept submissions through the easiest and most readily available medium: the plain old dial-up telephone system.

In 1998, I added two new tools to the arsenal: the JK Audio RemoteMix 3 and Sony MZR-30 MiniDisc recorder/player.

The RemoteMix 3 is a road warrior's dream. It replaces the telephone and plugs into any analog RJ-11 jack. Though it has only tone dialing capability, the RemoteMix 3 can connect to those rare pulse dial lines with a parallel jack and inexpensive tone-pulse phone.

If you are in a situation where the only line available is a digital PBX line, the RemoteMix 3 allows you to connect to the line through the handset on the telephone. If you have a cell phone with the ability to accept an RJ-11 device, you can also connect.

This JK Audio box has a three-input mixer, two stereo headphone outputs and two line outputs. The RemoteMix 3 has RCA and XLR output plugs for a mix of the telephone Send and Receive audio, which lets you record interviews in the field. The base model RemoteMix 3 has solid telephone quality audio.

### On the road again

We used it literally from coast to coast, hooking up to telephone lines in press rooms, hotel rooms and any RJ-11 jack we could use. Hooked to those jacks, we had fewer complaints about lines than usual. One set of two 9-volt batteries lasted most of the season. That probably happened because we used regular AC wall-wart power most of the time.

The line input had more than enough gain and headroom to accept the line output of a Marantz PMD222 and Sony MZR-30 MiniDisc recorder. With our Shure SM-77 mic connected to one channel, the feeding of wraparound reports, voice reports and actuality were no problem.

The price tag of \$895 is reasonable, when you consider that JK President Joe Klinger combined an FCC-registered telephone, handset interface and three-

ISDN, RPU or POTS codec, and lets you use a dial-up line as a hot backup. This is a serious tool for broadcast newspeople — the real deal.

I couldn't find a minus with the RemoteMix 3, because the 3.m edition solves the only note on that wish list.

### The fun begins

The addition of the MZR-30 MiniDisc recorder made sending wraparound reports and actualities even easier. It also added field editing and recording capabilities that were once only available to me in the studio.

Here is what the fidelity, flexibility, and portability of the MiniDisc format mean for the field reporter and studio producer in a news or sports situation: Simple wraps don't need to be done live with the MZR-30. Once a clip of actuality is found, and marked as a separate track, the fun begins.

The countdown and introduction can be done as a separate track, the end and lockout can be done as another. Once you are satisfied with both, you can move the clip of actuality between the narration and end. Place the unit in pause, call the studio, and when they are ready, the MZR-30 plays back the tracks seamlessly with no further editing. This will endear you to the producer or editor at the studio end.

Sending cuts of actuality back to the studio is no problem. Once you find the right cuts, you separate them into tracks, make a note of the track number and out-cues, and then call the studio. You can access the cuts with the MZR-30 thumbwheel.

Example: If you want to play Cuts 1, 20 and 5 in that order, you can turn the thumbwheel to Cut 20, while Cut 1 is playing. Once you stop at the end of Cut 1, hit Play and Cut 20 will play. While Cut 20 is playing, you can dial up Cut 5, and it will play in the same manner. This too will endear you to the producer or editor back at the studio.

Connecting a mono microphone will require using a 1/8-inch TRS plug. I

## An Efficient Remote Box Goes a Long Way

► SINGER, continued from page 63  
handy for overseas remotes.

A word about solder connections: I believe it is necessary to overdo the solder connections on mic cables. I realize that we engineers prefer simple

If your remote box system is efficient and user-friendly, your station's remote broadcasts should run smooth. Obviously, you need to look ahead for unplanned problems, but with proper foresight, the remote should go with-



The Telos Zephyr is a vital component to the WRRM remote box.

connections, but for a remote box, I think you should use more solder than necessary on the mic XLRs because the cables tend to get banged around a

out a hitch.

"Organization is the key," said Surgeon. "If you're organized and you plan ahead, and know where all the Radio Shacks are, everything should go fine."

Keep in mind that your work, the remote box, is a reflection of you. If it looks good and is simple to operate, then your work will be appreciated.

### Organization is the key.

— Kevin Surgeon

Allen Singer is assistant engineer for WRRM and WVAE. E-mail him at [asinger@cincyradio.com](mailto:asinger@cincyradio.com)

lot by the promotions personnel. A weak solder point will break easily, meaning you will have to dig out your portable soldering iron at a remote broadcast to repair a connection that shouldn't have happened in the first place. Also, if cables and other equipment is stored in the rear of the box, then you should over-solder your connections on the equipment installed in the box.

Keep the remote equipment together under lock and key. Indianapolis keeps its equipment in a warehouse; we keep ours in engineering. The worst place to store remote equipment is in promotions, but that goes without saying.

### WRRM-WVAE Remote Box:

SKB case (or equivalent)  
Shure M267 mixer  
Shure UHF wireless mic receiver  
Shure U2-UA wireless mics  
Telex Soundmate AAT-2 wireless headphones  
Telex AAR-10 wireless headphone receiver  
Audiometrix PLM power distribution system  
Crown D-75 amp  
JBL speaker  
Telos Zephyr  
Marti RPU System  
Comrex HotLine



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## SPECIAL REPORT

# Field Sound Vital at WBUR Group

Michael LeClair

Field recorded sound is an important part of the news operation at the WBUR Group. Our news department has between 15 to 20 full-time reporters and producers who use portable equipment on a regular basis.

Besides recording material for long-form news stories, we also routinely capture "vox populi" segments, lectures, press conferences, and documentary-style sound material. As part of our field recording operation we maintain a variety of equipment for these different applications.

For many years, our mainstay recorder has been the Marantz PMD430 cassette. The PMD430 has a host of professional features, such as three heads to allow confidence monitoring, rugged input connectors, varispeed, and long-life operation on standard D batteries. Additionally, the PMD430 has dBx processing which we feel provides the best sound available on cassette.

Our standard news kit includes a Marantz cassette deck, a pair of Koss TDS60 headphones, an Audio Technica AT813A microphone, a small microphone stand and the necessary cables and adapters to allow a wide range of connections to be made in the field.

We chose the Koss headphones for its bright sound and low cost. These headphones are not intended to be reference monitors, but rather to reveal the worst

problems in a particular recording. Due to its high efficiency and emphasis of the upper mid-range frequencies, the Koss TDS60 headphones help identify distracting background noises, such as loud air conditioning systems, that are common in office environments.

The Audio Technica microphone was also chosen for low cost but the electret condenser design provides a clean and accurate sound. Unlike most microphones designed for news gathering, the AT813A is cardioid and does not have special shock mounting or low-frequency roll off. It takes extra care to use them properly but the results are worth the extra effort.

## Field-vs.-studio

In regular listening, it can be difficult to distinguish good field sound from that which was recorded in the studio. Also available when needed is a Sennheiser ME80 mid-length shotgun that can help in crowd situations or to capture sound effects in the field. While I generally prefer condenser microphones, due to the difficulty of supplying phantom power we tend to use only battery-powered models like this for field recording.

The above equipment comes protected in a quality camera bag. We use the Tamrac model 606, which is amazingly durable (I have three or four still in the field with over 10 years use). The camera bag is essential to make sure equipment survives the rough handling of the news staff as they rush to meet deadlines.

Operationally, we take simple precautions to make sure that the quality of the sound remains high.

First, to eliminate head azimuth errors, cassette recordings are dubbed for production using the same cassette deck they were recorded on, often straight into a digital workstation.

Second, each deck should have a basic alignment performed once every 12 to 18 months. This allows the bias and record levels to be adjusted to compensate for head wear. We also provide reporters with a house standard chrome cassette for consistent results. With this schedule of maintenance and minor repairs, we get an average of five or six years of usable life from the cassette decks and microphones.

More recently we have been experimenting with the inexpensive Sony MiniDisc recorders. For the last seven months we have had six new kits operating with the MZR-B30 and B50 models. Reporters like them because they are small. Other important benefits are non-linear access and accurate time stamping. These last two features translate into lots of saved time when pulling 120 seconds of sound nuggets from a 60-minute field interview.

## MiniDisc woes

I have to admit that I was pleasantly surprised at only losing one of these MD recorders to rough handling so far, given the small size and consumer construction. That said, there are a lot of problems with these decks.

The input and output connectors use a special Japanese 3.5 mm mini-plug that is too delicate and the record level can't be changed during recording. Additionally, the headphone output level is inadequate for proper monitoring in the field and there is no way to make sure that the MiniDisc is actually being recorded.

To compare the audio performance of the MZR-B50 with cassettes I measured

it with our Amber 3501 test set. Leaving similar headroom, the MiniDisc has a noise floor about 10 dB better than chrome cassettes without any processing (such as dBx or Dolby). The noise characteristic of the MiniDisc recording is quite pleasant and unobtrusive. Frequency response was down 1 dB around 13-14 kHz and fell off rapidly above that point. Oddly, the low-frequency response also rolled off below around 50 Hz, perhaps due to a less-than-optimal input stage.

In listening tests, the results compared favorably to standard cassette but were not as good as cassette recordings with dBx. The MiniDisc colored the high-frequency sound on voice using our standard AT813A microphone as a source. There seems to be phasing distortion caused by the ATRAC data compression and the brick wall anti-aliasing filters.

There is another negative aspect to the use of substantial data compression. If source audio undergoes several generations of data compression in the course of post-production and distribution, watch out! As NPR affiliates, much of our sound is transferred to network headquarters via ISDN and then distributed nationwide via satellite, both of which links use data compression. Due to the potential problems, we use MiniDisc primarily for local production work.

## Keep the mix diverse

While waiting for advances in the MiniDisc format, we will continue to use a mix of different recorders. For some reporters, the size and time saved with MiniDisc outweighs other considerations. Others continue to like the familiarity of cassettes.

According to Marantz, there is a professional grade MiniDisc recorder in its production pipeline (see PMD650 Tech Update, p. 68). Adding professional features to the convenience benefits of the MiniDisc format would erase many of my reservations about its general use for radio production.

To handle long field recordings, such as lectures or documentary production, we

See LECLAIR, page 67 ▶

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## MiniDisc Recorders Get a Racing Workout

▶ KAMINSKI, continued from page 64

through the RemoteMix 3. Even when the mic sensitivity on the MZR-30 was set to low, the RemoteMix 3 had enough gain to send a clear and loud signal.

I also like the light weight and small size of the MZR-30. It slips easily into a pocket.

The MZR-30 is now an older model; at press time, the MZR-50 was the most recent model from Sony.

### Wish upon a jack

As for my wish list for the MiniDisc field recorder/player:

Instead of the mini-jack, I would like to see a tiny Switchcraft-type XLR connector used as the mic jack. But if you can find a hank of thin lavalier cord, and make your connections that way with the 1/8-inch TRS mini-plug, it won't put as much strain on the mini-jack.

The MZR-50 has the Pause button

on the top of the machine. Not the side, as does the MZR-30, which makes pausing easier and answers one of my wishes.

More and more broadcast reporters are using MiniDiscs. At the Indy Racing League season opener at Walt Disney World Speedway near Orlando in January, there were more Sony MiniDisc units connected to the multi-box than regular cassette machines.

It only makes sense to send the best quality signal you can through a bandwidth limited medium such as a dial-up POTS phone line. The Sony MiniDisc and JK Audio RemoteMix 3 help me do this quickly and easily.

■■■

*Paul Kaminski is the news director for the Motor Sports Radio Network, host of "Race-Talk" and "Radio Road Test" programs. Reach him via e-mail at [motorsportsradio@compuserve.com](mailto:motorsportsradio@compuserve.com)*

USER REPORT

# Wheatstone Assists Remote Truck

by Emilio A. Murro  
Vice President of Engineering  
Remote Possibilities

**LAS VEGAS** Understandably, when one considers a *remote radio mixer*, the normal assumption is a small, portable unit designed for the rigors of bad weather or other such environmental conditions.

But we had a project come in which required us to be inventive in a combined broadcast and promotional vehicle, intended to promote a beer brand rather than a station. Different, right?

NAB was in Las Vegas, and because Rick lives in Vegas, he went to the show to look for a console.

Rick ran into Jay Tyler from Audioarts, a division of Wheatstone. Tyler had an R-60 console at the show. Rick called me right away and I told him to have Tyler call me. I was promised that the console would hold up on the road and if it didn't, Tyler would take it back.

The only problem was that we needed the console right away and Tyler could not provide one until about two weeks after the show. I worked it out to have the

ment, it was time to turn everything on, the first being the transmission system. We picked a frequency that was far away from any commercial station in town and fired it up. The audio quality was as good as any station in town.

The P.A. System was next. Mick scratched his head and said, "It's as good as any system on tour." The R-60 console is at the heart of this system and performed perfectly.

**Learning curve**

The next task was to teach someone with no broadcast studio experience to operate this rolling studio.



The Wheatstone R-60 Console

On the last day of the project, Corey Troyer from G.M.R. Marketing was assigned the duty of taking this truck around the country and assisting local DJs with this studio. Corey has never been in a broadcast studio but took to the equipment like an old pro.

See WHEATSTONE, page 69 ▶



Inside this thirst-inducing beer truck is a mobile remote radio station.

So when Brian Buske and Mark Smathers from G.M.R. Marketing in New Berlin, Wis., called me along with Rick Carr, president of Remote Possibilities with a project to build a transportable, legal low-power radio station in a beer truck for Miller Beer, we jumped at the chance.

The problem was finding equipment to fill the need within two weeks.

As some broadcast equipment is not off-the-shelf, I wanted to have the best quality with the reliability of road-type equipment. I knew that a sound reinforcement console would hold up on the road, but would not provide the broadcast-type atmosphere that was required for this project.

The search went on for a console. After having all the other equipment ordered and shipped I still could not find what I wanted in a console. At this time,

console shipped from the show at a very good price.

**Perfect size**

When I arrived in St. Louis to build the studio, I was surprised that the console was compact and complete. With space being at a premium for the project, the size was perfect.

Remote Possibilities' live sound reinforcement provides the quality for the P.A. System he designed. The studio was connected to an FCC-legal Part 15 limited-range transmitter. The idea of the truck was for Miller Beer to use it at various sports and entertainment events around the country.

You have probably seen the FM truck at the events — it plays music to the public or broadcasts license-free on an open frequency on the FM band.

After testing and tuning the equip-

## Out in the Field With a Mission to Produce

▶ LeCLAIR, continued from page 66

also maintain a couple of portable DAT recorder kits. There are a number of drawbacks to this format that prevent its more general use for news production.


While the sound quality of DAT is excellent, portable DAT machines are too delicate and require a dedicated sound engineer for best results. The battery life is also poor, good for about 90 minutes without replacement. I have known reporters that went out and bought small portable DAT recorders only to trade them back in for cassette decks after six months of use. When using DAT in the field, we

often make a cassette copy as a backup in case the main recording fails.


At the WBUR Group, we are out in the field every day to gather sound for our local production. The different needs determine the best equipment to use for a particular news story or recording. By maintaining a range of equipment, we find that we can handle most situations while maintaining good audio quality and convenience.




Michael LeClair is chief engineer of the WBUR Group, a noncommercial group of four stations serving Massachusetts and Rhode Island.




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## USER REPORT

# Solution to Remote Mix-Minus Issue

by Jeremy R. Burnham  
Project Engineer  
Jacor/Los Angeles

**BURBANK, Calif.** Double ISDN remote broadcasts have become commonplace at KXTA(AM), X-TRA Sports 1150 in Los Angeles. Typically, this would involve one personality at a major event while another announcer sets up at a sports bar or sporting goods store.

Initially, this necessitated combining two studios involving numerous patch cords to develop the four necessary mix-minuses. The PR&E console in the air studio handled the master remote mix-minus



The ISIS Group Fred MKII Switcher for Remote Applications

on its audition channel as well as the telephone mix-minus on the utility bus.

Meanwhile, in a production studio, we used a PR&E Productionmixer console to develop two submix-minuses, allowing

broadcast equipment should be quickly and easily understood by any operator on duty without the need of a computer.

Buried in the television portion of the convention, I found the ISIS Group

## The IFB is a combination of the air console and ISDN outputs from other remote locations.

each remote to hear the other one and the main air studio while taking phone calls from listeners, all without hearing any echo.

This was a nightmare of patching and a waste of production studio access time as well.

I had a plan in mind to avoid using the second studio that would involve rack-mounting a four-channel mixer in Master Control. This, unfortunately, would be cumbersome to use and would need someone to set levels and do an extensive check-out prior to each double remote.

Another possibility was to find something at the 1998 NAB show to solve the problem. The only device I encountered in the radio exhibits of the Las Vegas Convention Center was large, very expensive and needed a computer plugged into its serial port to program it. I steer clear of such contraptions as I feel

booth. Although its equipment was aimed at the video market, there were some audio-only units. I liked what I saw.

### Easy street

Our simultaneous remotes became easy with the purchase of the ISIS Group Fred MKII switcher. This is a single RU stand-alone, 4x4 active routing switcher with one very important difference: Each of the four outputs can select any combination of the four inputs simultaneously.

In our case, we feed the air studio console supplying the local announcer commercials and telephone calls to the first input while feeding the outputs of ISDN units to the second, third and fourth. The IFB going out to a remote is simply a combination of the air console and the ISDN outputs from other remote locations. We can just as easily do three

remotes at the same time.

The front panel of the Fred MKII uses push-button switches that light when engaged, making a visual check of the configuration easy. The ISIS switcher is a unity gain device and remains a switcher as additional sources are added, by dropping each input in proportion to the number of sources selected.

The input attenuation is set at the factory for 3 dB-per-added-input. This works well with "normal" program material. We have never had any reason to do additional gain adjustments. The unit can be easily calibrated to another standard if necessary.

### Meat and potatoes

The rear of the unit uses standard XLR plugs for the inputs and outputs, which is my preferred method of connecting audio in our air chain. The user may consider either pin 2 or pin 3 as "hot." Fred does not care.

A D-connector is also on the back allowing for remote control. The front panel may be removed and located up to two hundred feet away if remote control is desired. A blank front panel is available for the rack unit.

The input impedance is 24 kohms balanced or 12 kohms unbalanced. Internally, the ISIS uses a 16 x 16 switch matrix controlled by the push-button logic. The selected outputs go to LF347 quad JFET summing amplifiers, followed by variable gain stages and finally through buffers to the outputs. The output impedance is 54.8 ohms balanced or 27.4 ohms unbalanced, which will easily drive 600 ohms with a minimal 0.3dB drop.

The Fred may be mounted anywhere with no special cooling required, although it is recommended that it not set directly on top of something hot. We try to leave a space between each piece of rack mounted equipment anyway; everything runs much cooler that way.

Labeling the switches made use of the Fred MKII so intuitively obvious to our operation people that virtually no additional instructions were necessary to air single, double or triple remotes.

*The author has been involved in every conceivable type of remote broadcast — including microwave, telco loop, RPU band, Switched-56, flyaway satellite and ISDN — for the past 35 years.*

For more information contact ISIS Group in California at (888) 622-4747 or circle Reader Service 208.

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## TECHNOLOGY UPDATE

### Superscope Technologies

Superscope Technologies is offering the Marantz PMD650 professional portable MiniDisc recorder for remote use. The PMD650 incorporates many of the features found in Marantz portable cassette recorders.

The MiniDisc standard-play mode of 74 minutes stereo and long-play mode of 148 minutes mono are both supported by the PMD650. When recording in long play, only one channel is recorded; when two are connected, the left and right signals are summed. Also included is a 20-second stereo recording (40-second mono recording) buffer.

A variety of analog and digital Ins and Outs suit numerous applications. The coaxial digital input with sample rate converter can be used to record from digital sources with sample frequencies of 32 kHz, 44.1 kHz or 48 kHz. An XLR digital output (S/PDIF) offers the flexibility to transfer the recorded digital data to other equipment.

All edit and playback functions are located on top of the PMD650 for easy table playback and editing. The editing functions allow the user to compile a program from recorded material and also divide, combine, move, erase or title a track to create virtually any type of compilation.



For more information contact Superscope Technologies in Illinois at (630) 820-4800, fax (630) 820-8103 or circle Reader Service 12.

# R-60 Assists in Remotes

► WHEATSTONE, continued from page 67  
The ease of operation with this console and associated equipment made his job easier as he promoted the Miller FM truck.

After Korey was on the road for about a month, I started receiving calls from engineers around the country about the truck. Most comments were, "This studio is better than the one I have at the radio station."

My concern when the truck hit the road was the durability of all the equipment. Some of the equipment needed minor repair, but the Audioarts console has been going strong after 200,000 miles. I had one bad Line module after about a year and Audioarts replaced it promptly. Since then I have had to make

no service calls on this console — not even a light bulb.

The console has held up under abnormal circumstances. Most of my installation jobs have had many console problems due to price limits. The R-60 is priced right and can stand just about anything. Needless to say, the console did not go back and is still on the road.

A few things I would like to see: The Line Select for extended inputs should be put on a drop-in card instead of across the meter bridge.

And I still do not like Molex connectors. For more information contact Wheatstone in North Carolina at (252) 638-7000, fax (252) 637-1285 or circle Reader Service 117.

## TECHNOLOGY UPDATE

### Yamaha

The Yamaha O3D is a mixer suited for a variety of broadcast purposes, including on-site use at a remote.

A total of 26 inputs plus four bus outputs, four auxiliary effect sends, a main stereo bus and a solo bus make up a flexible configuration of analog and digital inputs and outputs.

Coaxial and AES/EBU stereo digital I/O connectors allow direct connection to DAT recorders and other compatible digital devices. The stereo digital input signals can be routed to the stereo bus for submixing or to the stereo input channel for mixing and processing. The number of inputs can



be increased by digitally cascading two O3D units together, with both sharing bus, aux, stereo and solo busses.

The optional YGDAI slot provides eight digital inputs and eight digital outputs for direct digital connection to many modular digital multi-track recorders, disk-based recording systems and AES/EBU and Yamaha format systems. The YGDAI outputs can be configured as bus outs, aux sends, direct outs or stereo outs to achieve eight-track simultaneous recording.

For more information, contact Yamaha in California at (714) 522-9011; fax (714) 522-9522 or circle Reader Service 200.

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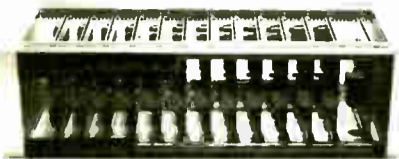
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6X1G

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3X2B

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### Sonifex

Sonifex offers the Courier portable hard disk recorder for audio retrieval in a variety of field recording environments.

With a weight of three pounds, the Courier digitally records to a PCMCIA hard disk, has graphical scrub-wheel editing and will transfer audio via mobile telephone, modem and ISDN.

The Courier is designed to record, edit and transfer audio in a quick and efficient manner. The PCMCIA cards can operate in severe conditions and may be used while on the move, making the recorder suitable for radio journalists.

A graphical display details the recording level and time count-up, remaining disk space and battery power. Standard camcorder batteries are used and can be changed without interrupting a recording.

A jog/shuttle wheel assists in creating accurate edits. Audio can be ported into any suitably equipped digital audio workstation for instant editing. Recorded files are compatible with DOS and Windows audio software and playback systems.

For more information contact Independent Audio in Maine at (207) 773-2424, fax (207) 773-2422, visit the Sonifex Web site at [www.sonifex.co.uk](http://www.sonifex.co.uk) or circle Reader Service 181.



### Nagra

The Ares-C portable digital recorder from Nagra is a shock-resistant digital recorder that offers continuous, solid-state recording, several editing features and ISDN and analog transmission.

The recorder dispenses with moving-part tape transports, disk drives or other electromagnetic components for virtually silent operation. Almost no service backup is necessary since the unit is software-driven.

At slightly more than six pounds, the Ares-C is suitable for use as an over-the-shoulder recorder. Low power consumption is a beneficial feature; up to five continuous hours of operation can be expected from a four-D cell pack, and up to 15 hours is possible from an eight-cell pack.

The control layout is designed for clarity and simplified use. A tactile function selector switches between Play, Record and Edit/Standby modes; additional "transport" keys provide cue and review functions.

The Ares-C uses the PCMCIA flash RAM card to enable uninterrupted recording and automatic seamless switching to the next card when the one in use is full.

For more information contact Nagra in Tennessee at (615) 726-5191, fax (615) 726-5189 or circle Reader Service 207.



### ATI

The MX101 mono field mixer from ATI is the latest addition to the company's NanoAmp series of studio and field mixers.

The MX101 combines three low-noise mic/line inputs with phantom power, switchable low-cut filters, a limiter and a headphone cue with a slate mic and tone generator, and a three-color LED meter. The unit feeds a +22 dBm XLR output.

This is contained in a 1.25-pound package, with several rechargeable battery modules that are easy to replace.

The company offers several other portable mixers in its NanoAmp series, including the MXS100 with three XLR switchable mic/line low-noise balanced inputs. The unit also features phantom power, pan pots, stereo Tape In and Tape Out jacks and a test tone oscillator that drives stereo, metered, low-distortion servo XLR balanced switchable mic/line outputs with switchable peak limiting.

For more information contact ATI in Pennsylvania at (215) 443-0330; fax (215) 443-0394 or circle Reader Service 180.



### Maycom

The Easycorder from Maycom is the company's second-generation digital solid-state recorder, featuring on-board graphical editing and use of both internal memory and removable PC cards.

All settings and actions performed by the user are visible on an illuminated liquid crystal display. Several presets enable the user to define combinations of compression algorithms and audio modes and to activate them with the press of a button.

All analog switches, such as those that operate the limiter, phantom power, line/mic and rumble filter, can be set independently for each channel.

Time Shift Recording enables the Easycorder to begin recording before the Record button is actually pushed. This is done by means of a looping mode, which constantly stores the last 20 seconds up to one minute in RAM.

The Easycorder provides extended playing time by cutting power consumption. A "smart" battery system is employed to monitor individual battery statistics and provide a precise indication of remaining capacity.

For more information contact Maycom in the Netherlands at +31-481-377740, fax +31-481-377380, visit its Web site at [www.maycom.nl](http://www.maycom.nl) or circle Reader Service 155.



### Intelix

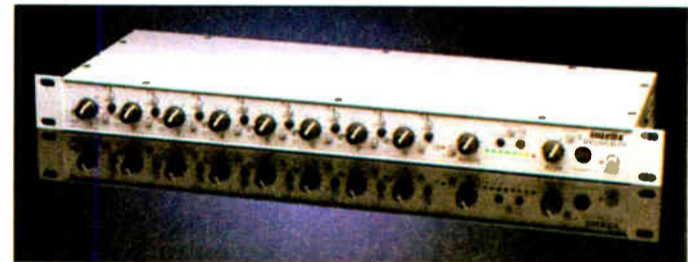
The 8002MCB-FP from Intelix is an eight-channel, dual-bus unit to assist field production of remote radio broadcasts.

The mixer is the same as the 8002MCB, except the company has placed the line pads and trim controls on the front panel for easy access at remote applications. This is particularly beneficial when installed in fixed remote racks like those in remote broadcast trucks.

The front-panel bus switches allow for quick reconfiguration at a remote; mix-minus and cueing are possible. The dual-bus structure also allows the mixer to be configured as two independent mixers in one chassis. The auxiliary bus can be routed to the headphone output.

The inclusive compressor/limiter can be set for a threshold of -40 to +20 dB. The compression ratio is adjustable from 0 to 100 percent; the compressor/limiter is engaged and adjusted using a front-panel button and screw controls.

For more information contact Intelix in Wisconsin at (608) 831-0880, fax (608) 831-1833 or circle Reader Service 182.



### Digigram

Digigram offers the PCXpocket and PCXpocketAD PCMCIA-style audio interfaces with the processing power of the company's full-sized PCX digital audio boards.

These are intended for professional sound recording and editing applications on laptop computers and are suitable for remote recording and editing use. When used with editing software, either card adds a digital audio workstation to the other capabilities of the laptop.

In addition to analog inputs and outputs, the PCXpocketAD interface includes a timecode input to expedite synchronization for post production. It also offers a S/PDIF digital audio input for direct digital dubbing from DAT, MD or other digital recording devices.

Both models feature two balanced mic/line inputs and two unbalanced outputs at line or headphone level. They operate in both PCM-linear and MPEG audio compressed modes for coding, processing and decoding in real time.

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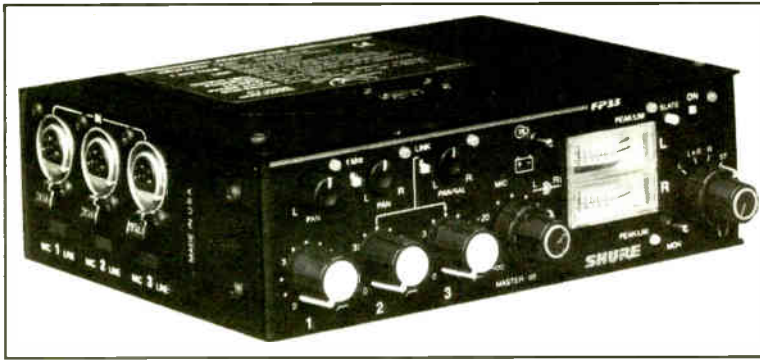
For more information contact Digigram in Virginia at (703) 875-9100; fax (703) 875-9161 or circle Reader Service 156.



### Shure

The FP33 from Shure is a portable mixer designed for remote audio recording, electronic news gathering and electronic field production.

With sealed, conductive plastic input potentiometers, an improved battery-



switching circuit, internal headphone level adjustments and durable 1/8-inch jacks, the FP33 is the next step above the FP32A field mixer. Light in weight and small in size, the FP33 will operate for approximately eight hours on two 9 V alkaline batteries. It can also be powered by any 12 to 30 VDC power supply.

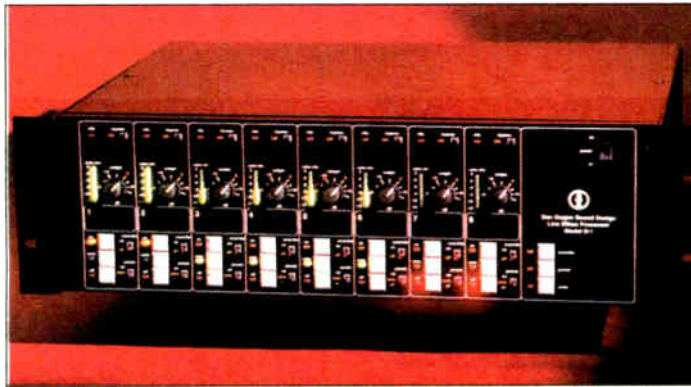
Its low self-noise and a dynamic range of more than 100 dB make the FP33 suitable for use with DAT and other digital recording media. Other features include pop-up pan pots, LED indicators of input levels, output peaks and limiter action and a mix bus to connect an additional FP33 or FP32A.

For more information contact Shure in Illinois at (847) 866-2200, fax (847) 866-2585 or circle Reader Service 206.

### Dan Dugan Sound Design

The Model D-1 Live Mikes Processor from Dan Dugan Sound Design is ideal for remote broadcast applications, specifically broadcast news and talk formats for radio.

Conference reinforcement and recording is possible and multiple wireless mics may be used as well — up to 96 live mics can be handled through linking the units. Up to eight VCA channels can patch into any mixer's input.



The multi-mic live sound system

performance can be improved through use of the Model D-1, and the unit reduces ambient noise pickup as well as feedback. Cueing errors are eliminated. Remote control capabilities are possible as an optional feature.

For more information contact Dan Dugan Sound Design in California at (415) 821-9776, fax (415) 826-7699 or circle Reader Service 54.

### Yorkville Sound

The DJM806 from Yorkville Sound is a mixer suitable for disc jockeys during live remote broadcasts.

The mixer features an equalizer, digital effects and a high-power, fan-cooled stereo amplifier. The amplifier delivers 800 watts of stereo power, appropriate for mobile situations.

The DJM806 has a heavy-gauge metal chassis and a toroidal power supply. The Silentfan feature provides fan cooling. Self-contained, the mixer minimizes setup and tear-down time.

Other specifications include balanced XLR and quarter-inch jacks, switchable phono/line stereo outputs, a cue switch on every LED channel, 60 mm long-throw faders, an effects unit with 255 presets and a peak/hold VU meter with 12 LEDs per channel.

For more information contact Yorkville Sound in New York at (716) 297-2920, fax (716) 297-3689 or circle Reader Service 154.



### Soundcraft

Soundcraft offers the GPI, a portable and rugged on-location mixer for remote production and live broadcast.

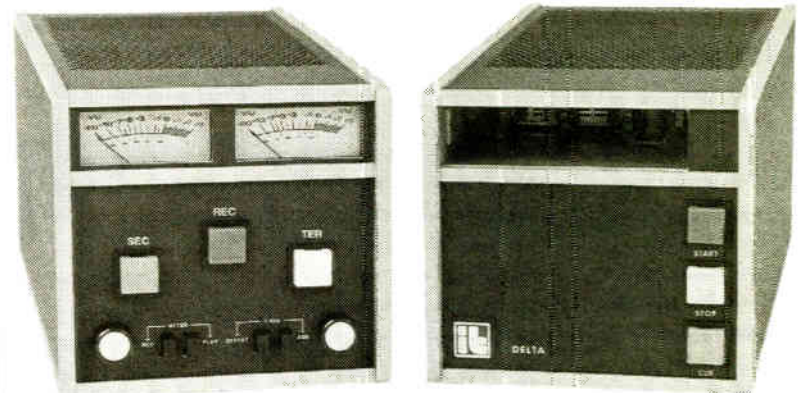
Available in 6, 8 and 12 channel versions, the GPI has a range of input and output modules for custom configuration to meet user requirements. The unit accepts power from internal batteries, an external DC source ranging from 8 to 30 V, or by using the provided power supply and charger.

The maximum input level for the microphone input is +16 dBu; for the line input, the maximum level is +40 dBu.

For more information contact Soundcraft in Tennessee at (615) 360-0471, fax (615) 360-0273 or circle Reader Service 152.



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Valley Audio MAXI-O, like new, \$400. A Polhemus, 212-302-9010.

BE AudioVault AV100 air system & AudioVault production, in excel cond, complete w/manuals & diskettes, \$18000/BO. M Bohach, 740-653-4373.

Sono-Mag 350 Carousel parts (2), BO; Electric Works Digital DJ (2) automation systems, computer snd card, no switcher, BO. J Parman, 606-236-2711.

SMC 350 Carousels (numerous) in as is cond, \$50 ea; 1970 SMC brain to control up to 6 Carousels, \$100. R Miller, 217-824-3395.

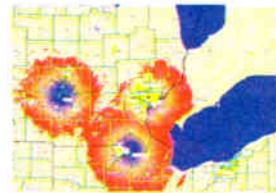
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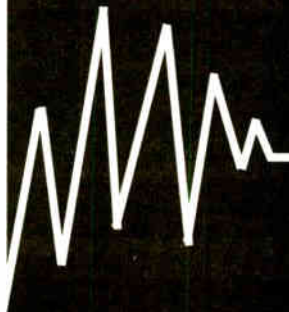
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Gates/ATC cart machines for parts, BO. J Parman, 606-236-2711.

Technics 1200 SLPII (2) CD players, gd cond, \$350 ea/BO. M Mathis, 501-305-2255.

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 K. Syndicators/Radio Station Service Providers
 G. Audio For Video (TV Station/Teleprod Facility)
 H. Consultant/Ind Engineer
 I. Mfg. Distributor, or Dealer
 J. Other

4 Equipment/Services Purchases in the Next 12 Months

- A. Transmission, STL/RPU
 B. Antennas, Towers, Cable
 C. Audio Procession Delays
 D. Telco, Codex, Remote, Field, Audio
 E. RDS/RBDS & Subcarrier Equipment
 F. Delivery Systems & Satellite Equipment
 G. Digital Editing & Production
 H. Live Assist, Automation
 J. Consoles, Mixers, Cabinetry
 K. Headphones
 L. Microphones
 M. Monitors/Speakers
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 O. Syndicated Programming
 P. Test, Monitoring & Remote Control

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- A. Authorize/Make Final Decision
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 C. No Purchasing Authority

5 Equipment Budget For Next 12 Months

- A. Less than \$25,000
 B. \$ 25,000 - 99,999
 C. \$100,000 - 249,999
 D. \$ 250,000 - \$499,999
 E. Over \$500,000

Table with columns for Reader Service numbers (N25, April 14, 1999 Issue, Use Until July 14, 1999) and corresponding page numbers for various categories.

ADVERTISER INDEX

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Table listing advertisers and their corresponding page numbers in the index.

Table listing production and circulation staff members and their roles.

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For Immediate Response, Fax to: 703-820-3310

## ◆ READERS FORUM ◆

Letters received are the property of RW, and may be edited for space considerations.

### IBOC DAB questions

Dear RW,  
 After reading about IBOC DAB in RW, I feel compelled to reply.  
 Is there really an IBOC DAB proposal to the FCC to phase out analog AM and FM, or are my reading glasses failing me? Do the IBOC DAB manufacturers and broadcasting proponents really believe that listeners are going to rush out and buy an IBOC receiver to replace every Walkman, boombox, car receiver and clock radio? Have they ever taken the time to poll the average listener to see if they care about audio quality? That answer is obvious to me, as I listen to commercial FM broadcasting in the Cincinnati area.  
 Several stations (especially rock) cause headaches due to the ridiculous amount of processing used, yet these same stations pull high shares in the market. The alleged "benefit" touted as "CD-quality audio" is a joke. How long do you think a station's full dynamic range audio will be preserved when the competitor across town installs a digital processor?  
 "Wait a minute here, those guys are louder than us! Get on the phone and get me a digital Omniblaster deluxe."

### Write to Us

RADIO WORLD  
 READERS FORUM  
 P.O. Box 1214  
 Falls Church, VA 22041  
 radioworld@imaspub.com

Within weeks, the same loudness wars and 3 dB dynamic range that are the standard for so many analog FM stations today will be with us again, except we now get 20 Hz to 20 kHz of garbage, instead of the current 20 Hz to 15 kHz.  
 So, who benefits from this? Why, the IBOC DAB patent holders and the manufacturers of broadcast transmitting equipment and receivers. Who loses? Radio station owners and their listeners.

Jack Giehl  
 Design Engineer  
 Cincinnati

### Sharp point

Dear RW,  
 I must take issue with one point in Carl Lindemann's review of the Sharp MD-MS702 (RW, March 17).  
 As a 702 owner, I am disappointed with a key point missed. Mr. Lindemann talks about the "static on microphone recording." Apparently the cause escapes him.  
 Had he investigated the technology a bit, or read the owner's manual, he would have discovered that the MD-MS702, like other portable MD recorders, supplies a bias voltage ("phantom power") at the mic jack for condenser microphones. It is possible to construct a circuit to keep this voltage from reaching a dynamic mic (like Mr. Lindemann's Electro-Voice) if one insists on using one, but the best results will be realized by using a condenser mic such as the miniature models offered by Sound Professionals, Core Sound, Sony, etc.  
 This is what was intended to be plugged into the mic input on portable MD units.

With my Sound Professionals "modular binaural microphones," I get incredible stereo sound. The mics are tiny, and cheap too, about \$70. These mics can be used for conventional stereo, binaural or "dual mono" in which interviewer and interviewee each clip on one mic in the stereo pair, each being recorded onto its own track. These may be mixed down to real mono later if desired.

Though I found the article interesting, I felt Mr. Lindemann missed the boat as regards the microphone input. DC from the "phantom power" is why he got static, not because of the use of 1/8-inch jacks.

Mike Walker  
 Owner/Operator,  
 The Production Room  
 Air Personality, WXRC(FM)  
 Boomer and Charlotte, N.C.

Carl Lindemann responds:  
 Mr. Walker is correct. The article failed to mention how my testing did compensate for using a dynamic mic with the powered jack. Even so, he points to an important clarification — the problem with the MS702 isn't the 1/8-inch jacks per se.  
 But I stand by my point that the real culprit is the way they are engineered into it. As it happens, Sharp's modified 702, the 722, changes this by reconfiguring the jack to make for a more robust design.

## The FCC's Future

What should the FCC be? Recent hearings on Capitol Hill show how much of a political football the agency has become.  
 Much of this debate will die down when Congress turns to campaigning for the 2000 elections. But as long as Democrats hold the White House and Republicans the Hill, the FCC will sit on a political fault line.  
 Expect even more posturing. Will anything come

of it? We think it's unlikely.

Rep. John Dingell, D-Mich., ranking Democrat on the Commerce Committee, is frustrated with FCC efforts to implement the Telecommunications Act. In particular he cited what he sees as FCC failings in regulation of the phone industry.

Rep. Mike Oxley, R-Ohio, said the FCC should focus on restructuring, and that neither the commission nor lawmakers should become distracted by arguments over re-opening the Telecommunications Act.

The commission has come under fire from some on the Hill for its inquiry into free ad time for political candidates, its initiatives on low-power radio and other issues.

Dingell and other lawmakers said the FCC is overreaching and taking on responsibilities at a time when it is supposed to be reducing them. He criticized Chairman Bill Kennard, saying, "The Chairman knows full well that the commission's implementation of the Telecom Act has been inconsistent with our intent."

Dingell's criticisms are all the more notable because he is a Democrat, and Kennard is a Clinton appointee.

Subcommittee Chairman Rep. Billy Tauzin, R-La., wants to streamline the FCC further, and plans hearings to explore activities the agency could eliminate or privatize.

FCC defenders argue that Congress wrote the Act but passed on the politically unpopular decisions to the FCC. Further, Kennard said, the commission is already streamlining and will be "dramatically transformed" in the next five years. But, he said, "We do not need chaos."

Barring a foolish change in course by the FCC toward regulating the Internet, don't expect too much to change after this tempest dies down. Political winds blow, but it will take more than these to blow the FCC away. Like it or not, it will be with us for a while.

— RW

### Message on the money

Dear RW,  
 I just wanted to say that Mark Lapidus' article "What Message Is Driving Your Radio Station?" (RW, March 3) was right on the money.

I'm the Production Poohbah at Jacor/Cincinnati, which puts me in charge of the production departments of eight radio stations.

Your article is exactly the attitude I try to use to keep my situation running smoothly and it works great. I hope more folks pick up on it.

Mark (Ranger Bob) Erickson  
 Executive Production Coordinator  
 Jacor/Cincinnati  
 Cincinnati

### Imitation vs. innovation

Dear RW,  
 If you were listening to the radio in Miami and then in Bangor, Maine, you probably wouldn't hear much difference. Voices, playlists, liners, promotions and

highly compressed audio would be pretty much the same. In fact, if it were not for weather and traffic, you wouldn't know whether you were in Miami or Bangor.

Imitation is in and innovation is out. However, I see a faint light at the end of this tunnel of banality. And it's not coming from the radio conglomerates, but rather from the inevitable development of LPFM, direct satellite-DAB and mobile access to the Internet.

This will force the terrestrial broadcasters to return to what they do best, serving the needs of the communities they cover.

As competition lowered our long-distance phone rates, it will hopefully bring us local innovative programming, opening the doors for people who love radio, and creating many new job opportunities locally.

Hurray for competition!  
 Bruce Burger  
 Producer, Host  
 The Radio Sojourner  
 Cleveland

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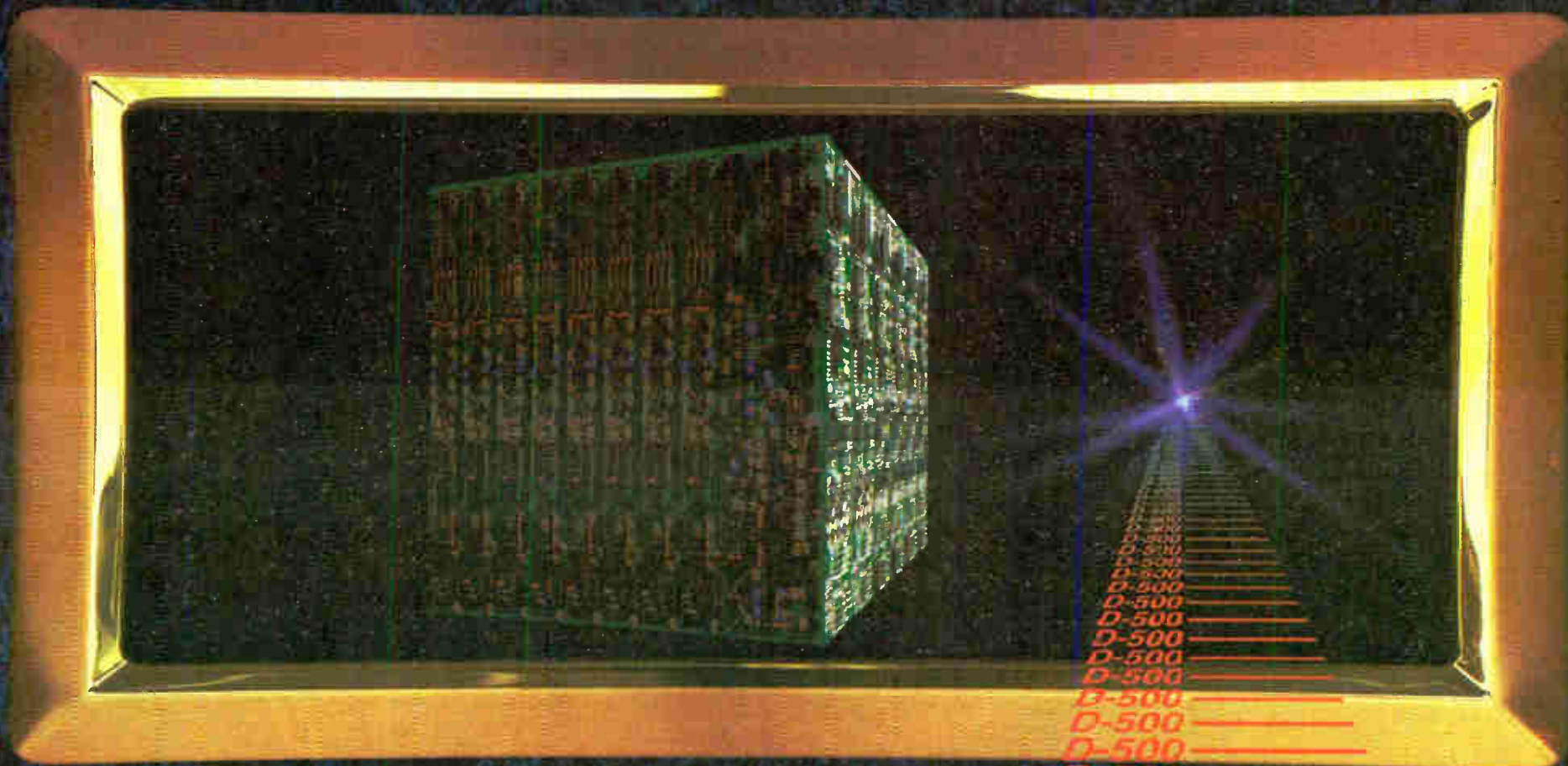
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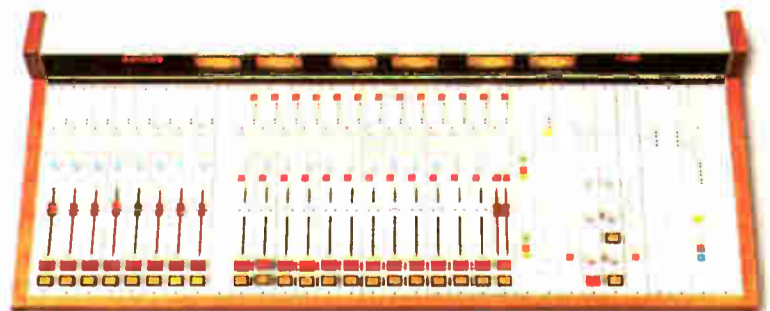


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