BUYER'S GUIDE: AM TRANSMITTERS. See Page 55

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Cuban, Radio & Yahoo!

Net billionaire Mark Cuban on what the Yahoo! deal means for *broadcast.com*

See Page 39

'Cart Chunk' Detailed

An extension to the Broadcast WAVE format could help integrate production and on-air gear.

See Page 19

Radio World®

The Newspaper for Radio Managers and Engineers

May 12, 1999

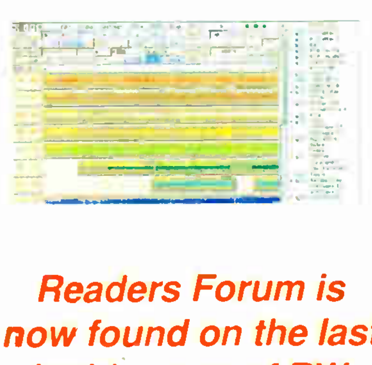
INSIDE

NEWS

ENGINEERING

GM JOURNAL

STUDIO SESSIONS



Readers Forum is now found on the last inside page of RW.

IBOC Alliance Called for at NAB99

by Leslie Stimson

LAS VEGAS As the proponents of in-band, on-channel digital audio broadcasting prepare to bring their technology out of the lab and into the field with real-world testing on radio stations, equipment manufacturers are beginning to become more visible in the development process, and one manufacturer has called for a "Grand Alliance" in order to rapidly implement IBOC.

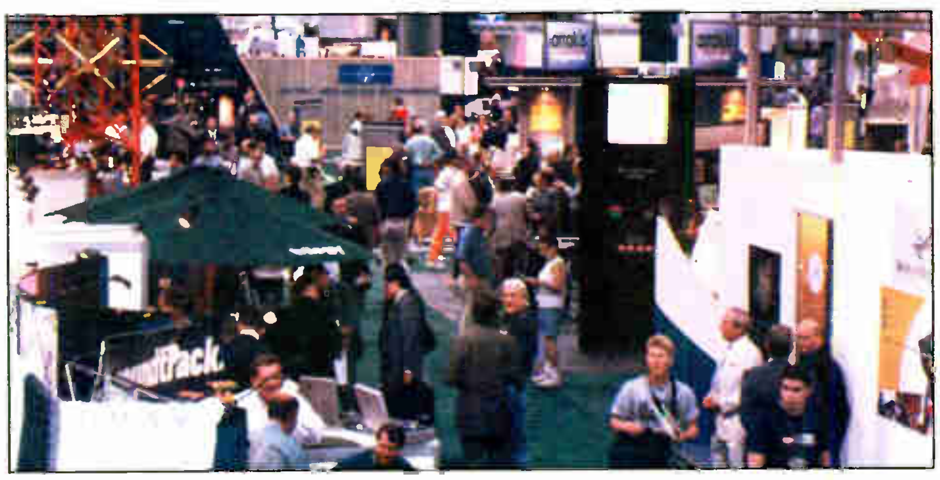
The proponents developing IBOC DAB systems and the National Radio Systems Committee and its DAB subcommittee have set a voluntary deadline of Dec. 15 of this year for the submission of all lab and field test data for both AM and FM systems. The group intends to evaluate how each system performs to an analog baseline standard. The group is not comparing systems to one another.

After evaluating the systems, the NRSC will issue a report on each of the three systems. Unclear is what happens next, as the NRSC has consistently said its goals at this point do not include selecting a single system.

However, with data submitted, the NRSC will be in a better position to decide whether the IBOC DAB systems being developed perform "significantly better" than current analog systems. The three proponents believe they can submit most of the data by the deadline.

All three proponents are poised to begin field tests. DRE planned to begin tests on an AM station in Palo Alto, Calif.,

See IBOC, page 8 ▶



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NAB99 attendance topped 105,000.

Digital and LPFM Top NAB Show

by Leslie Stimson

LAS VEGAS The convergence of new technologies and how broadcasting can best position itself to compete, or, in some cases, form alliances, with these technologies were top of mind for radio attendees at NAB99.

More than 105,000 broadcasters attended the show. NAB President and Chief Executive Officer Eddie Fritts said the numbers were especially good, considering how the economic problems in Asia are still affecting the broadcasting industry. He said exhibit space was well on its way to being sold out for NAB2000.

The steady progress to bring in-band,

See NAB99, page 12 ▶

Circle (1) On Reader Service Card

World Radio History

◆ NEWSWATCH ◆

Harris to Focus On Six Businesses

Harris Corp. is restructuring.

The communications company said it seeks to increase shareholder value and position itself for growth.

Harris plans to cut 300 to 400 positions as part of the restructuring efforts.

It also plans to spin off its Lanier Worldwide office equipment subsidiary to Harris shareholders by summer in a tax-free transaction.

None of those cuts would affect the broadcast area of the company, said Jim Woods, vice president of the Harris Broadcast Radio Systems Business Unit.

He said the plan should be viewed as "very positive and supportive of Broadcast," which he described as a big part of Harris' growth plans.

When the reorganization is complete, Harris will have six businesses, with a total workforce of about 12,000 employees.

It will provide communications equipment, systems and support services — concentrating on the broadcast, wireless, government systems and network support markets.

NPR Requests Satellite Funds

WASHINGTON The U.S. Senate and House have passed bills specifying different levels of funding for the Public Radio Satellite System in fiscal year 2000.

The money is to go toward satellite replacement.

Public radio has only one year left on its contract with PamAmSat. National Public Radio, which operates the PRSS, requested $60 million. The House approved $48 million, while the Senate approved $18 million, with a promise to

See NEWSWATCH, page 3 ▶

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Index

World Radio History

No Answers for Quad Queries

by Lynn Meadows

WASHINGTON The winner of the Emergency Alert System patent dispute that has broadcasters wedged between a federal mandate and a private company's royalty request appears to be broadcast lawyers.

With no clear directive from any of the federal agencies involved in the EAS patent issue, broadcast associations have not been able to provide advice to their members on whether or not to pay the royalties requested by Quad Dimension Inc.

Instead, the NAB and state associations such as the Texas Association of Broadcasters have told members who ask for advice about the royalty request to contact their legal counsel for help.

We are motivated by our concern that adoption of FCC's mandatory EAS system will be inhibited by QDI's assertion that use of the EAS requires a patent license from QDI.

— John Kelly Jr.

"As far as we know, nobody has paid," said a spokesperson for the Tennessee Association of Broadcasters. Quad Dimension Inc. asked for a license/royalty payment of $240 for calendar year 1999 with an annual royalty payment of $180 due in 2000 and every year afterwards for the life of the patent (**RW**, March 17).

Royalties

Daric Laughlin, one of the inventors of the patented system and one of the founders of Quad, did not say how many stations had paid the royalties.

He and his partners believe they own a patent covering the entire EAS. In January, Quad sent 1,500 broadcasters requests for royalties with a Feb. 24 deadline.

"We are still not at liberty to provide you with numbers of any sort," said Laughlin. "As far as what is the next thing to happen, there are discussions that are on-going with the DOC (Department of Commerce) and everybody, broadcasters included, recognizes that the DOC helped create this problem and should fix it.

SAFE

The commission also had information on the SAFE (Specific Alert For Emergency) patent back in 1992 and decided to ignore it when they created the Emergency Alert System standard, thereby causing the present situation," Laughlin said.

The Department of Commerce is the parent agency for both the National Weather Service and the U.S. Patent and Trademark Office. The FCC mandated that broadcasters buy, install and use EAS encoder/decoders beginning Jan. 1, 1997 to create the EAS.

In a statement issued Feb. 24, the payment deadline set by Quad, the NWS said that its patent attorneys were researching "issues of 'prior art'" as they related to the Quad patent. In this case, the prior art must show that the technology existed and was publicly available before Quad filed for its 1991 patent.

It said that the attorneys for the National Oceanic and Atmospheric Administration (NOAA) "do not expect to be ready to file for re-examination until mid-March." By mid-April, no request for re-examination had been filed.

Quad appealed to its U.S. Rep. Karen McCarthy, D-Mo., who wrote a letter on Quad's behalf to John J. Kelly Jr., assistant administrator for weather services.

Kelly replied, "Let me assure you the NWS is not involved in 'unfair treatment' of QDI nor are we attempting to 'satisfy the complaints of private industry.' Rather, we are motivated by our concern that adoption of FCC's mandatory Early Alert System will be inhibited by QDI's assertion that use of the EAS requires a patent license from QDI."

He also wrote, "Many of the features of the QDI patent are remarkably similar to those developed by the National Weather Service, coincidentally also in Kansas City."

Quad patented its SAFE system in 1992. The National Weather Service said it demonstrated its NOAA Weather Radio Specific Area Message Encoding in Jackson and Clay Counties, Mo., in 1985. Both systems use frequency shift keying to create alert codes that are sent specifically to the affected area.

If the National Weather Service does file for re-examination, it will be the second re-examination for the Quad patent, which was upheld in 1998. The NWS stated that a re-examination could take one year.

(Left to Right): QDI's Al Eckilson, Larry Ganzer, Daric Laughlin and Mike Fessler

◆ NEWSWATCH ◆

▶ NEWSWATCH, continued from page 2

give additional funding in the next year's appropriations process. Backers were expected to work out a compromise between the House and Senate versions.

PRSS had expected to transmit programming using PanAmSat's Galaxy IV through about 2003. But that satellite's directional controls malfunctioned and Galaxy IV had to be replaced last spring. NPR is negotiating with PanAmSat and other satellite providers for service.

Radio Beats CDs in Cars

ARLINGTON, Va. Although consumers enjoy listening to a variety of music for entertainment, more adults listen to the radio (96 percent) than CDs (75 percent) and cassettes (73 percent), according to a study conducted by the Consumer Electronics Manufacturers Association.

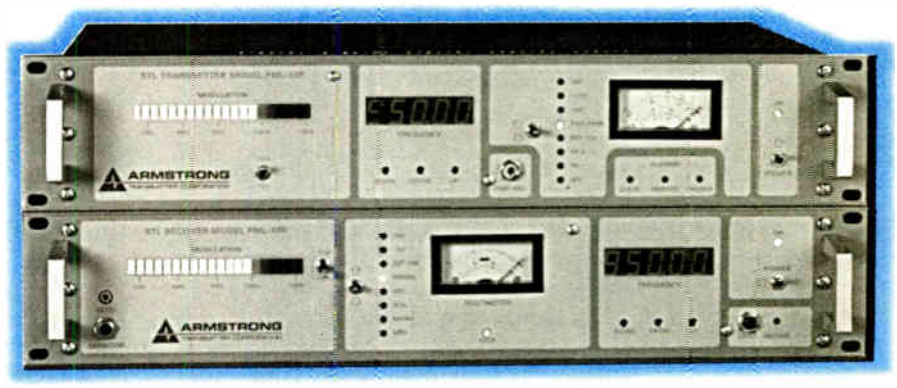
In a survey of 1,000 consumers, ranging in age from 18 to 65, seven out of 10 said radio is the medium they choose most often in the car.

In their homes, respondents said they listened to radio using these products: component stereo system (54 percent), portable boombox (47 percent), clock radio (42 percent), compact stereo system (37 percent), headset radio/cassette player (25 percent) and computer (17 percent).

Income also influences listening preferences, according to the research. While at home, households with incomes over $40,000 listen mostly to CDs (43 percent) compared to lower income households (26 percent).

Females and young adults ages 18-24 prefer cassettes. Those over age 64 listen the least in all formats.

Frequency Agile STL Systems



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World Radio History

NAB99 Hits a Homer for Radio

LAS VEGAS With the hubbub of NAB99 swirling around me, the scope of this broadcast and new media event is more impressive than ever.

There's a saying among those in the general print media that the process of putting out a daily newspaper is "a little daily miracle." Well, the process of putting on a show of this magnitude is a little yearly miracle.

Consider the number of people who crowd through those turnstyles at the baggage area of McCarran airport, onto those shuttle buses and through the doors of the Las Vegas Convention Center and the Sands.

Look at the headline speakers who show up, the Turners and Kennards and Cubans and Stringers. They recognize the reach not only of NAB, but of the people this show attracts.

Consider that virtually every *radio* supplier that cares about the industry uses this event, and no other, to make their most important product announcements. Even the fall Radio Show is not as popular for new product rollouts.

Consider how easy it is here to see every console, workstation or transmitter you might want to buy, to drag your boss over to see the latest codec, to hammer out your best deal with a manufacturer or dealer.

Come one and all

Industry groups, large and small, obviously agree, and they vote with their feet. Beyond all the official goings-on, an uncountable number of such groups use the NAB show as a gathering point.

Are you a gay or lesbian broadcaster? Are you a broker? Are you a Webcaster? Are you a member of an online chat group? Are you a public radio engineer?

Somewhere in Vegas, there's a meeting for you.

Some have said that the very size of this show, and the heavy presence of TV, multimedia and other new media, take away from radio. But I disagree. Its size is one of its biggest advantages.

The behind-the-scenes coordination is massive. But attendees benefit by having a unique opportunity to network, to see hardware and to learn about converging media. Exhibitors enjoy an unsurpassed pool of potential clients under one roof — more than would be possible if the show were broken into its component parts.

For attendees, registration costs are not out of line (although I wish more broadcast managers would pony up the bucks to send their staffs). And Las Vegas is an amicable place for visitors.

For exhibitors, the cost to display wares is not cheap, and it continues to creep up. But the benefit is substantial. It's reasonable for a small- or medium-size supplier to expect to go home with the names of 400, 500 or 600 prospective clients — just one of whom could conceivably order enough product to pay for the show. Big suppliers invest big money in their booths, knowing they can reap the rewards by standing out from the other guys.

Consider how easy it is to drag your boss over to see the latest codec, and hammer out your best deal with a supplier.

(The competition among exhibitors for booth space and to design the most interesting booths is one of the quieter but most satisfying angles of this show for me. If you want to see a marketing manager perk up at the show, compliment them on the design of his or her booth.)

Kudos

The NAB comes in for its share of knocks, as any effective association and lobbying entity will. I have differed with it in this space on certain policy issues.

But just as we should speak up when we differ, we should give praise where it's merited.

This is my 11th spring show, at least, and probably my 25th convention as an exhibitor or journalist. I have seen the show through many different guises. I must say that the NAB does a spectacular job of bringing together the people radio cares about.

Kudos to the folks at NAB who are responsible for the show.

In our next issue, we'll report in detail about the most interesting new products at NAB99, and unveil the winners of our much-sought-after **Radio World Cool Stuff Award**.

★ ★ ★

I should add by way of disclaimer that I was also a participant in the show, as a speaker.

Richard Farquhar of RAF Associates Inc. was kind enough to invite me to deliver the opening remarks at the all-day session on "Digital Audio for Broadcast Engineers," part of the Broadcast Engineering Conference.

Thanks, Rick, for allowing me to take part and to offer my thoughts on the importance of education and standardization as we forge our digital future.

Among the other participants, Farquhar also invited David Baden of Radio Free Asia to speak on the topic of building a digital station. I interviewed Baden in **RW** last year (see our Aug. 19 issue). Readers will recall the sophisticated planning and impressive size of the RFA facility buildout.

I was pleased that the article in **RW** helped lead to Baden's participation in the panel. He is an example of the kind of radio engineer who will succeed in the digital future — a hard-working man with an appreciation of the big picture, of the role of computer technology, staff development and careful planning.

Of course, he also has something many radio engineers could only hope for, an owner with the resources to back up its broadcast mission — namely, Uncle Sam.

From the Editor

Paul J. McLane

★ ★ ★

As always, we have plenty of interesting stories in this issue.

Orban has been working with several companies on a way to integrate production and on-air delivery systems through an extension of the Broadcast WAVE file standard. Read what Dick Pierce, the principle software developer for the Orban Audicy workstation, has to say on that topic.

Our Man of Steel, Troy Conner, recalls an FM antenna swap that involved a big tower, a big helicopter and big headaches, including a smashed foot for one worker.

And in *GM Journal*, Bill Mann talks to Mark Cuban to learn his plans in the wake of the acquisition of *broadcast.com* by Yahoo! Cuban works online but he speaks the language of radio, of average quarter hours and of targeting at-work listeners. Those are *your* listeners. Are you paying attention?

★ ★ ★

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World Radio History

Sine Systems Returns to Facility

by Randy Stine

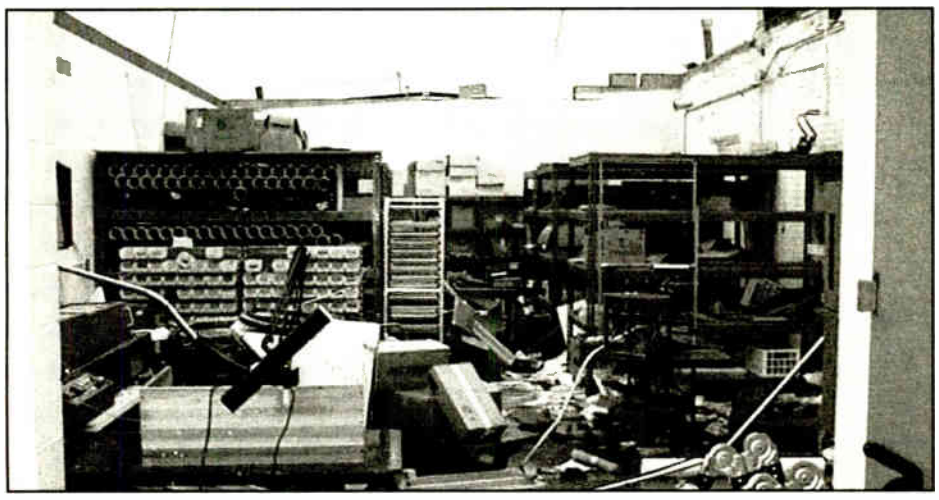
NASHVILLE, Tenn. Sine Systems has resumed operations at its headquarters following repairs to the building.

A year ago this month, a tornado tore the roof from the company's building and left more than two feet of water in the warehouse. No one in the building was injured.

In the interim, the broadcast remote-control equipment manufacturer, perhaps best known for the RFC-1 dial up, had been operating out of a temporary location near downtown.

"The building damage was put at $125,000," said Susan Ford, company co-owner. "That doesn't include contents like production equipment and the parts in the warehouse we lost."

Sine Systems has settled with its insurance company for building damage and is expected to file an insurance claim for equipment and inventory losses at a later date.



Damaged Warehouse

Along with the storm damage, the company had to overcome the death of owner John Pate. The 48-year-old Pate shot and killed himself in front of the company's building following the storm (**RW,** May 13, 1998).

Pate incorporated Sine Systems in 1984 and was the company's sole owner at the time of his death.

Pate left a note giving the assets of the company to Ford, the former office manager, and Mark Pezzolla, who had worked with Pate at Sine Systems for eight years. Ford and Pezzolla are currently co-owners of the company.

"It has been an incredible nine months around here," said Pezzolla. "We had to find a temporary home that was suitable for our needs and with John gone we were left very short-handed as well."

Pezzolla said that immediately after the storm everyone was overwhelmed by the situation. "I'm really proud of everyone here. They knew what they had to do and away we went."Sine Systems currently has six employees.

It took Ford and Pezzolla three weeks to find a temporary location for the business.

"We wound up about five miles from where we were. The biggest difficulty was finding a short-term lease. We knew pretty much right away we would repair our existing building," Pezzolla said.

The original 3,600-square-foot building required extensive repairs. A new roof was needed along with water damage repairs. Pezzolla said the water damage was the worst of it.

"It was just pouring in after we lost the roof. It ruined all of our office furniture and some computer equipment."

Tech support and repair service were also out of the question for several weeks following the storm. Sine Systems made its operating manuals available on-line for customers.

While the company's equipment development program was temporarily sidetracked following the storm, Pezzolla said Sine Systems has a new product to launch by early summer.

"It's an accessory for our remote control, really the mother of all accessories," he said.

The RAK-1 will complement the Sine Systems RFC-1 remote-facilities controller.

"You take the guts out of the RFC you have and drop it into this. It's a one-rack unit chassis with LED on the front and a printer port, built-in modem, battery back-up and some other extras. We call it the 'Intelligent Rack Adapter,'" Pezzolla said.

Upon moving back to the newly repaired headquarters in January, the company's shipping, order taking and production manufacturing has finally regained a sense of normalcy.

However, Pezzolla said several things were still missing from the building. "We need office furniture, and still miss John."

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

After Repair

Ten Crystal Award Winners

LAS VEGAS Ten Crystal Radio Award winners were honored at NAB99.

All 10 award winners followed through on a range of community public service programs and initiatives last year.

KUDL(FM) of Westwood, Kan., raised $2 million for local charities and provided 150 tons of food and supplies for victims of Hurricane Mitch.

KBHP(FM), Bemidji, Minn., conducted a 24-hour radiothon to end child abuse. The station also aired 13,000 PSAs.

KUEL(FM) of Fort Dodge, Iowa, headed a drunken driving and drug abuse campaign last year.

WGOH(AM), Grayson, Ky., airs "County Conversation," on which local officials discuss local issues, and also sponsored a record-breaking blood drive.

WYTZ(FM) and WZTY(FM) in Hartford, Mich., hosted "Stuff-A-Truck" in which it raised 99,600 pounds of food.

Richard Mecham, vice president and GM of Bonneville International, accepted awards for two stations: KSL(AM) in Salt Lake City and KZLA-FM in L.A.

KZLA-FM sponsored "The Sunday Show," where 200 community leaders raised money for community concerns. The station has also donated more than $3 million to local communities.

KLOS(FM), L.A. sponsored a blood drive.

The seven-member staff of winner KBHR(FM), Big Bear City, Calif., participated in 12 non-profit organizations in addition to their regular jobs.

WHUR-FM in Washington, D.C., participated in "Project Harvest" which raised $57,000 for Thanksgiving dinners, and "Project Hope" provided immunizations for disadvantaged children.

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World Radio History

Enco and Scott Embrace Linux OS

by Alan R. Peterson

"In spite of its rising popularity, it may be a long time before any radio-specific uses are created for Linux."

That quote is from a story that appeared in **RW** on Sept. 30 of 1998, titled "Is Radio Ready for Linux?"

Oh, the changes that can occur in only six months.

On March 18, Enco Systems announced that its DAD$_{PRO}$32 digital audio management system can now be configured using Linux as the network operating system (NOS).

And at NAB99, Scott Studios unveiled plans for a Linux-based studio storage and playback model, a work in progress slated for future commercial release.

The two companies are taking divergent approaches to implementing the OS in their products. The single-solution Scott Studios product is a self-contained, totally Linux-dependent workstation for the studio, while ENCO uses a Linux-based server, networked to "client" (studio) machines that run under Windows NT.

What it is

Linux is a freely available, UNIX-like operating system. It is drawing considerable attention from users seeking an alternative to Windows products.

Its raw performance and efficiency differentiate it from commercially available network software products that some claim are getting too bloated.

In spite of UNIX-style programming commands that make it less than intuitive to Windows users, Linux is efficient and crash-resistant, and boasts 7.5 million registered computers. Another 15 million unregistered machines may be running it.

Under a General Public License (GPL), the operating system is free on theNet to anyone who wishes to use it. Inexpensive commercial distributions and complete documentation are available from companies such as S.U.S.E. and Red Hat Software.

Addressing the reputation Linux has as not being a real-time, "I-need-it-now" OS, Dave Scott, president of Scott Studios, explained how his company makes Linux work.

"The on-air software is in full control," he said. "It handles all time slicing in one box. It offers a better Live Mode, more hotkeys and the preview cartwall."

The one-box solution also means there are none of the latency problems inherent in drawing audio from a server. The Scott system also checks other workstations in the network for any updated audio that must be uploaded.

Larry Lamoray, vice president of sales and marketing for Enco, offered his company's reasons for investigating Linux.

In a press release, Lamoray said, "The latest NOS releases from Novell and Microsoft have only significantly added to the overhead burden that makes them increasingly less attractive for broadcast applications and ceased support of some features that had historically made them attractive for broadcast applications."

Lamoray said Linux removes this overhead and permits the administrator to select only those operational components that are required for the system to run.

Enco began to re-examine Linux as an alternative to Novell and Microsoft software when the latter products began to "bulk up."

Using Linux, multimedia applications such as DAD$_{PRO}$32 can experience a four-fold improvement in benchmark performance over a Windows NT server and twice the performance of a Novell NetWare server.

Lamoray told **RW** his company once worked with disk-drive manufacturer Micropolis to create a video device. "We never told anyone then that it was running under Linux," he said.

How to play the music

The lack of Linux soundcard drivers for many high-end broadcast soundcards is a major issue. Windows drivers are available readily, but, with the exception of some translated Soundblaster drivers, there exists a scarcity of drivers written specifically for Linux.

Scott said he hired an outside programmer to create "true Linux" drivers for his system, and that the sound cards his company uses have plenty of capacity.

"We have 32 MB RAM on each card," he said. "That is about three minutes of uncompressed 44.1 kHz audio." Because much of the processing is done on the audio interface, the cards used in Scott products offer a degree of autonomy from the CPU as well.

Also at issue is the matter of redundant file servers — Linux does not currently include support for more than one server.

The Scott single-workstation system does not require such redundancy, while the Enco system employs an optional Gateway program utilizing two identical Linux servers.

The Scott Studios model will not be available immediately following the NAB show, but should be in the near future. Dave Scott said he wants to be sure the system is completely stable.

"I'm the first to admit there have been a couple of glitches," he said, "and I'm not promising a firm date."

Lamoray considers installation of Linux to be fast and easy. "CNE training and certification is not required," he said.

DIGITAL NEWS

CD Radio Inc. Deals, Seeks More Cash

NEW YORK Satellite-delivered digital audio broadcasting licensee CD Radio Inc. has signed agreements for the design and development of its receivers with Recoton Corp. and Delphi Delco Electronics Systems.

At the same time, the company has dismissed its outside auditor, Price Waterhouse, in favor of Arthur Anderson LLP, and needs to raise an additional $240 million to become operational.

Delco will design, market and sell a factory-installed three-band (AM/FM/CD Radio) receiver to vehicle manufacturers General Motors, Toyota, Ford, Volkswagen and DaimlerChrysler.

Recoton, which owns the Jensen, Advent AR/Acoustic Research and InterAct brands, would develop and market Jensen-brand aftermarket three-band receivers. Recoton will also design and develop an adapter that can be inserted into an existing receiver's cassette slot.

CD estimates the price of the aftermarket three-band receiver, including an antenna and installation, at about $150 more than existing receivers. Its estimate for the adapter is about $199.

Another planned product is an FM modulated receiver that would be mounted either in the vehicle's trunk, behind the dashboard or under a seat. It would contain a downlink processor that would interface with a car's existing FM radio through the antenna input. The estimated retail price, including antenna and installation, is about $299.

The prices could increase, CD warns, because of the requirement in its FCC license that its receivers be compatible with those produced by any competitors for the satellite-delivered DAB service.

"This interoperability requirement could delay the commercial introduction of these products or require that they be sold at higher prices," the company wrote in its recent filing to the SEC. CD said talks on this topic continue with competitor XM Satellite Radio, but it cannot guarantee receiver interoperability can be achieved.

CD Radio must raise more money in order to launch its services, now planned for late 2000 or later. Although CD Radio has raised about $900 million to fund its pay radio technology, it needs $240 million more.

CD Radio Executive Vice President and Chief Financial Officer Andrew Greenebaum said CD's switch to accounting firm Arthur Anderson was planned, and CD now plans to tap the high-yield public debt markets to raise the needed funds. The total projected cost to become operational is $1.14 billion.

— Leslie Stimson

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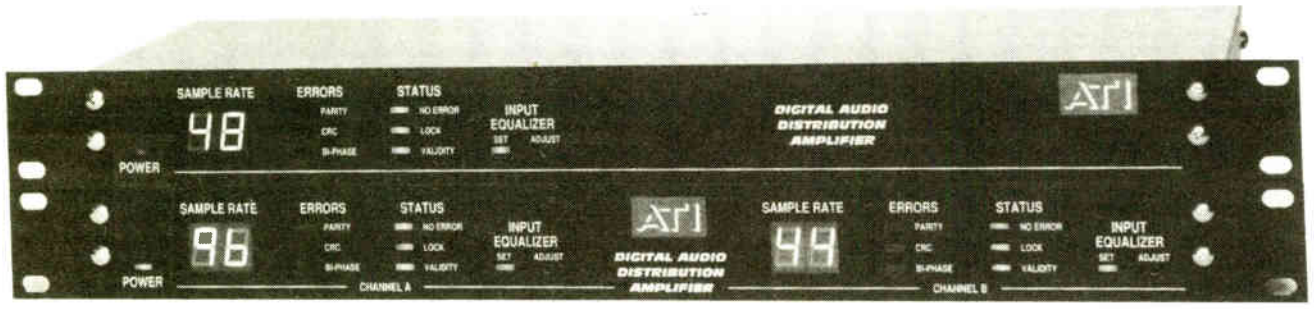
DDA212-BNC (Dual 1X12)



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World Radio History

'Engineer' Defined in Illinois

by Randy Stine

SPRINGFIELD, Ill. The state Supreme Court of Illinois has refused to hear an appeal of a lower court's decision regarding a debate over who can use the title "engineer" in that state.

The decision allows Novell Computer to continue to call graduates of its certification program "Certified Network Engineers." Novell has more than 120,000 CNEs employed worldwide.

The decision also settles whether the Society of Broadcast Engineers can continue its certification program in Illinois, and retain the right of radio station engineers to be called engineers.

The case originated in 1996 when the Illinois State Department of Professional Regulation received a complaint claiming that Novell Computer was offering certified engineering training as part of its certification program.

Cease and desist

A cease-and-desist order was issued later that year by the regulation department preventing Novell from using "engineer." The department thought Novell's use of the term would confuse the public.

The regulation department wanted to reserve the use of the term "engineer" only for professional engineers who were registered in Illinois. It recommended that Novell use "technician" instead.

Novell went to court and in July, 1997 the Cook County Circuit Court sided with Novell and reversed the regulation department decision. The court found that by Novell using the term "engineer" it did not harm the public in any way.

The decision was upheld in the Appellate Court of Illinois First Judicial District in August, 1998.

The State Attorney General's Office then appealed to the state Supreme Court. On Dec. 2, 1998 the state's top court denied the appeal.

"We have no further plans to pursue the case," said Brian Barov, assistant attorney general for the state of Illinois. "It's dead as far as we're concerned."

SBE vs. NSPE

The legal challenge pitted the National Society of Professional Engineers and the Society of Broadcast Engineers on opposing sides.

The SBE sided with Novell and its effort to retain the legal right to use the term "engineer." SBE saw the case as a threat to people working as radio station engineers, and their legal right to be called engineers. "We took the Novell case as a test as to whether or not SBE could continue its certification in Illinois," said SBE attorney Chris Imlay.

> **Our interest** ... is in protecting the status ... of professional engineers who are required to get an accredited engineering degree.
>
> — Arthur Schwartz

The SBE filed a "friend of the court" filing on behalf of Novell. "If the state and NSPE had its way, it would be a short step from preventing software engineers from using the term, to saying that SBE members couldn't call themselves certified broadcast engineers since they are not registered in-state," said Imlay.

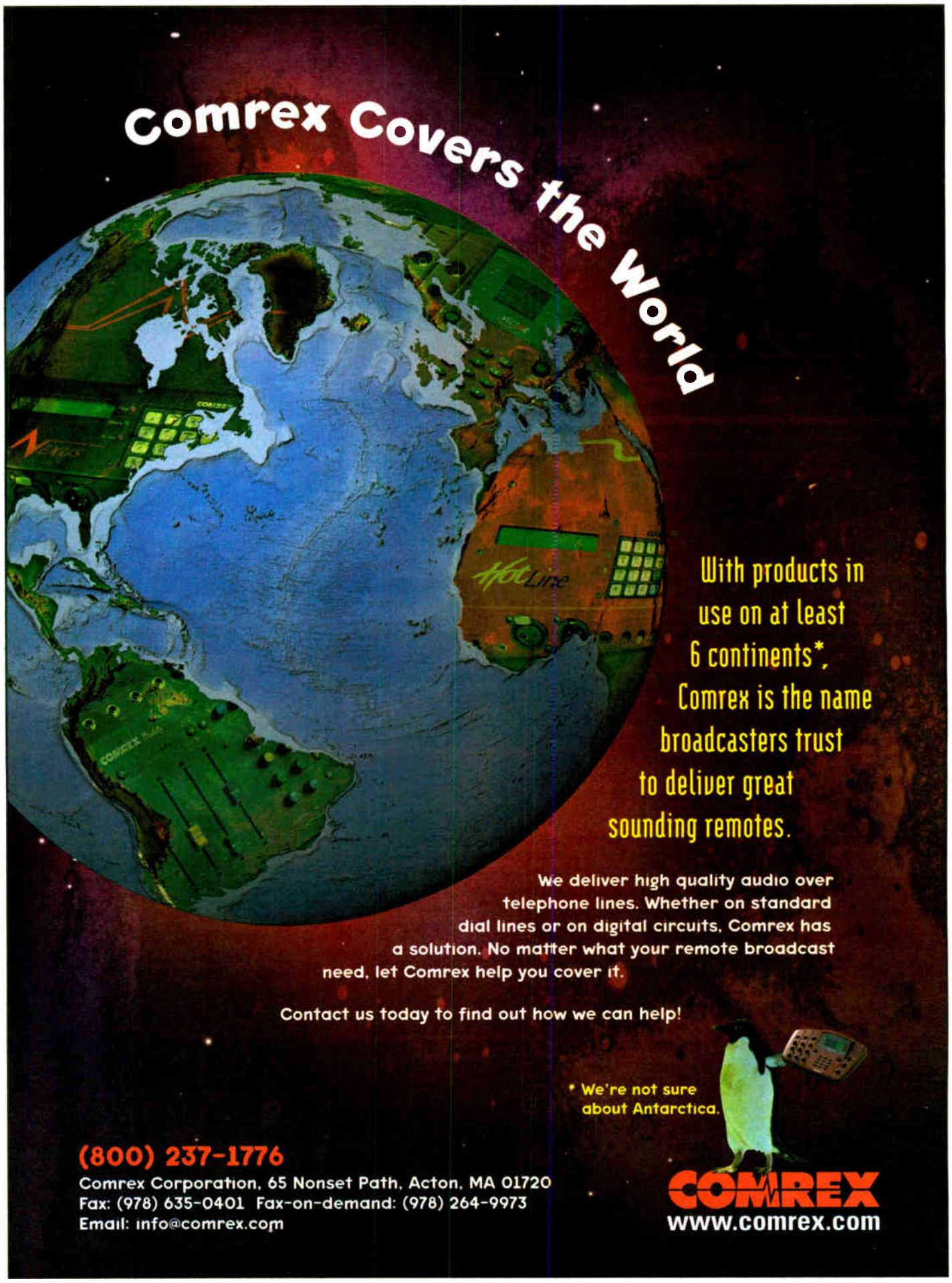
"The rationale of the appellate court was that it is OK to use the term engineer without being a registered professional engineer; you just cannot imply such," said Imlay.

The SBE has its own certification process for broadcast engineers. To earn certification, engineers must study suggested material and take tests.

"We have a very extensive and complex training program," said Terry Baun, vice-president of engineering for Cumulus Broadcasting and SBE director of certification.

"We think the court's decision supports our contention that the terms 'radio engineer' or 'Novell engineer' are not confusing or misleading to anyone," said John Poray, executive director of the

See ENGINEER, page 16 ▶



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World Radio History

NRSC Sets Dec. 15 IBOC Test Goal

▶ IBOC, continued from page 1

the week after the show, while Lucent was moving equipment into two previously announced New Jersey FMs. USADR told **RW** it intends to conduct initial tests on about 10 stations.

Our industry is going to compete with alternative services that will siphon off the radio audience.

— Jim Woods

As the technology development moves forward, so too does the process of proponents reaching out to end-users and equipment manufacturers. Some manufacturers have publicly announced alliances with at least one IBOC proponent. Harris Corp., which is testing the USADR system on its AM transmitters, has called for the United States to adopt a single standard for in-band, on-channel digital radio and to implement it rapidly.

Jim Woods, vice president of Harris Broadcast Communications' Radio Systems Business, said a lack of cohesive effort by proponents to develop a single nationwide standard could slow, and perhaps even derail, implementation of IBOC.

The three companies developing IBOC technology — USA Digital Radio, Lucent Digital Radio and Digital Radio Express — are working separately.

Woods said radio should emulate the approach of the television industry, which adopted the ATSC "Grand Alliance" DTV transmission standard.

"Our industry is going to compete with alternative services that will siphon off the radio audience," Woods said.

IBOC proponents agreed in principle to the idea, but differed on approach and exactly what an alliance would entail.

Derek Kumar, vice president, engineering, Digital Radio Express, said, "We support anything that brings IBOC to a conclusion faster. If that's a contribution on behalf of all the proponents through a single melting pot ... if that makes the reality that everybody can sign up for as opposed to one segment of the industry, or somebody in a market-leading position, then I think it's a good thing."

Lucent Digital Radio President Suren Pai said that Harris' call for a single standard is consistent with what LDR and the other proponents are looking for. However, there are "multiple ways of approaching a standard," he said.

"A standard essentially means there's going to be one technology that you will adopt. ... I would not jump to the conclusion that this necessarily means a grand alliance. That's one possible way to go about it," Pai said. But, "There's several different alternatives that you could look at."

USADR President and CEO Robert Struble said that USADR has long supported a coalition approach.

"We have a coalition of broadcasters who have invested in USADR. We've announced transmitter deals. We'll announce more. We're working hard with receiver guys, with chip guys. We are building a coalition," Struble said.

If the other IBOC proponents want to join the coalition, Struble said, "They've all got my phone number."

Part of USADR's "coalition" is transmitter manufacturer Nautel Limited. USADR and Nautel have formed a technology and marketing agreement in which both companies will cooperate to develop, test, and promote IBOC compatible transmitters. The companies will work together to define a certification process for Nautel transmitter equipment and develop coordinating strategies to launch IBOC technology and associated Nautel products.

Struble said the alliance was, in part, the result of calls received from broadcasters looking for future IBOC-compatible products.

Nautel Limited President and Chief Executive Officer David Grace said Nautel "brings tremendous international depth to USADR's team." Nautel claims customers in more than 160 countries.

USADR has other public relationships with equipment manufacturers. USA Digital Radio said five transmitter companies have successfully passed AM and FM USADR's IBOC DAB waveforms through their transmission equipment.

"While there is still additional IBOC testing ahead to meet the power and modulation levels required by radio stations, we are extremely pleased by the initial results and look forward to continued development and test efforts with these transmitter manufacturers," said Glynn Walden, USADR vice president of broadcast engineering.

Three FM high-power amplifiers for Energy Onix Broadcast Equipment Co., QEI Corp. and Broadcast Electronics were tested at USADR in Columbia, Md. The FM HPA models successfully tested were: BE FM 500C1, Energy Onix SSA-1000C and QEI SS-MOD.

Three AM transmitters passed USADR's IBOC waveform: Harris Gates 1, a 1 kW transmitter, Harris DX10, a 10 kW transmitter and Nautel XL-12, a 12 kW transmitter.

The Harris Gates 1 and the Nautel XL-12 had live demonstrations passing USADR's IBOC waveform at their booths.

"We demodulated one of the carriers to look at the signal-to-noise ratio and linearity through the transmitter," said Salemi of the AM demonstrations. The demonstrations showed the waveform passing through the AM transmitter, and the waveform could be seen on a vector signal analyzer.

At the USADR booth, attendees saw a video of its IBOC AM and FM waveforms being passed through AM transmitters and the high-powered amplifier modules mentioned above, as well as audio comparisons of AM analog to AM digital and FM analog to FM digital.

Early adopter program

To connect manufacturers with end-users of the IBOC technology — radio stations — USADR has also unveiled a so-called Early Adopter Station Enhancement program, in which USADR will provide stations with free assessments of what equipment they need to convert to digital, and early access to transmitter manufacturers under agreement with USADR.

For its show demonstrations, LDR showed a simulation demonstrating FM audio quality at the end of a station's coverage area.

We are pleased by the initial results and look forward to continued development and test efforts with these transmitter manufacturers.

— Glynn Walden

Listeners were able to compare analog FM to a single stream IBOC FM system and then to Lucent's FM multi-streaming IBOC system.

LDR has also announced the availability of new audio coders, based on the Lucent-patented Perceptual Audio Coder (PAC). The new PAC coders offer a range of bit rates from 16 to 128 kilobits per second. The new PAC coders include PAC version 1.0, which delivers digital audio transport on unimpaired channels and PAC version 2.0, which incorporates LDR's patented multi-streaming technology for broadcast applications over impaired channels.

LDR Vice President, Business Development, Nick Karter said Internet radio can use PAC technology to improve its audio quality, and the PAC audio coding can improve the quality of streaming audio as well.

Representatives of each company developing IBOC technology stated how their systems differed from each other, and why each believes their system is superior in a spirited discussion during NAB99.

The most critical difference between all three systems is what happens when digital reception reaches the point of failure.

USADR's Rick Martinson said USADR's blend-to-analog system during the hybrid phase extends seamless useful coverage to the existing analog limit. Lucent and DRE are not using the blend mechanism, preferring to keep the received signal in the all-digital mode.

Other differences lie in how each company uses the resources in the digital bitstream, including audio quality, data services, and performance robustness.

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World Radio History

DINFOS Consolidates Programs

by Randy Stine

FORT MEADE, Md. Educators and students are enjoying the relatively new 232,000-square-foot home of the United States military Defense Information School at Fort Meade, Md.

The $30 million state-of-the-art DINFOS building facility consolidates operations of three military schools — the Defense Visual Information School, the Defense Photography School and DINFOS — into a single location. The old DINFOS had been lodged in a temporary modular building at Fort Meade since moving from Fort Benjamin Harrison, Ind., in late 1995. Groundbreaking for the new school took place in July of 1995.

The DINFOS trains about 4,000 students each year. Entry-level and advanced instruction will be given in public affairs, broadcasting, radio system maintenance, journalism, visual information, photography and related fields.

Located about a half-hour outside of Washington, the school was built with funding appropriated by Congress under the Base Realignment and Closure Package. The school's annual budget is $3.5 million. Due to the consolidation of the three schools, the military is saving an estimated $5.3 million a year on operating costs.

The Defense Information School at Ft. Meade, Md.

DINFOS provides training to officers and enlisted personnel from the four branches of the military. The Coast Guard, which falls under the auspices of the Department of Treasury except in times of war, also sends personnel to DINFOS for training.

A soldier works at the controls inside one of the DINFOS radio studios.

Class in session

Most DINFOS graduates will serve in Armed Forces Television and Radio Services overseas. Others will be assigned to public affairs positions within their branch of the military, both in the United States and at bases abroad.

The new school is state of the art. "We have over $17.5 million worth of broadcasting and computer equipment in the building," said Colonel Larry Icenogle, commandant of DINFOS. "The feedback we have received from people who have visited the new building has been positive."

DINFOS has a training and support staff of 335 people. That includes 297 military and 38 civilian employees.

The basic broadcast course at the school takes 12 weeks to finish. Class size averages 24 students with nine graduating classes a year. Students learn news writing, commercial writing, voice and diction, and disc jockey skills. Icenogle said lectures are kept to a minimum — hands-on training is preferred. Students train in six broadcast studios, three production studios and one master control studio.

See DINFOS, page 11 ▶

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World Radio History

▶ DINFOS, continued from page 10

Officer training at DINFOS includes a three-week broadcast manager's course. Several government agencies also send civilians to Fort Meade for broadcast and public affairs courses.

'Radio maintainers'

Broadcast systems maintenance training is longer, usually requiring eight months to complete. The course teaches both radio and television maintenance. Students begin with a basic electronics course and then enter specialized blocks of training. "Radio maintainers," as they are called by the military, have several studios in which to train.

Thanks to the new facility, more students receive hands-on training. "We needed this new school for several reasons," said Col. Icenogle. "First, we had orders to consolidate the three schools. Next, we needed more room to better train these people. And most importantly, the students needed better equipment to learn on."

Colonel Larry Icenogle

Up until just a few years ago, students worked with record turntables, cart machines and reel-to-reel machines at the old training center at Fort Benjamin Harrison. DINFOS had been there since 1966. The school originally was located at Fort Slocum, N.Y.

The updated equipment at the new school includes digital audio systems.

"There isn't much in this new building that isn't connected to a computer," said Sergeant Major James Gilbert, senior enlisted advisor at the school. "DINFOS had to really come up to speed within the realm of technology. If we are going to educate broadcasters and engineers, it had better be on equipment that is accurate to what is happening outside the military as well," he said.

We have over $17.5 million worth of broadcasting and computer equipment in the building.

— Colonel Larry Icenogle

In addition to the new building, Fort Meade also has a field training site to simulate what it is like to set up for broadcasting from the field.

"It's a scenario played out like a Bosnia situation," said Gilbert. "It's very realistic and presents a formidable challenge. The radio people must be able to put up a small transmitter and satellite dish and do a broadcast. This is quite different from setting up a remote at your local 7-11 store," he said.

Students who attend DINFOS are not just sitting around in broadcast studios. Remember, this is the military.

"The enlisted men and women still have a military lifestyle. The Army folks get up at 4:40 a.m. to do physical training," Gilbert said. Formation training and lots of cleaning chores are scheduled daily.

After enlisted personnel have fulfilled their military obligations, some will take their radio experience and apply it to commercial radio.

"We have had many success stories throughout the years of life after the military," said Gilbert. Famous DINFOS grads include Pat Sajak, John Chancellor, Casey Kasem and Jim McKay. Gilbert said the students who make it through the technical training are in demand after leaving the military.

Fort Meade also is home to a number of other tenant units. They include the United States Army Field Band, military intelligence units training and the NSA.

DINFOS is accredited by the American Council on Education. You can take a virtual tour of the building at *www.dinfos.osd.mil*

DINFOS RADIO STUDIOS

Equipment	Model
Audio Console	Auditronics 212
Power Supply	Auditronics PS-60
Audio Amplifier	Crown D-75
CD 'Cart' Player	Denon 951A
Digital Audio Recorder	360 Systems DigiCart/II Plus
Digital Audio Systems	BE AudioVault 100
Monitor	MIDI
Cassette Deck	Tascam MK102
Distribution Amplifier	Radio Systems
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Microphone	Shure SM58
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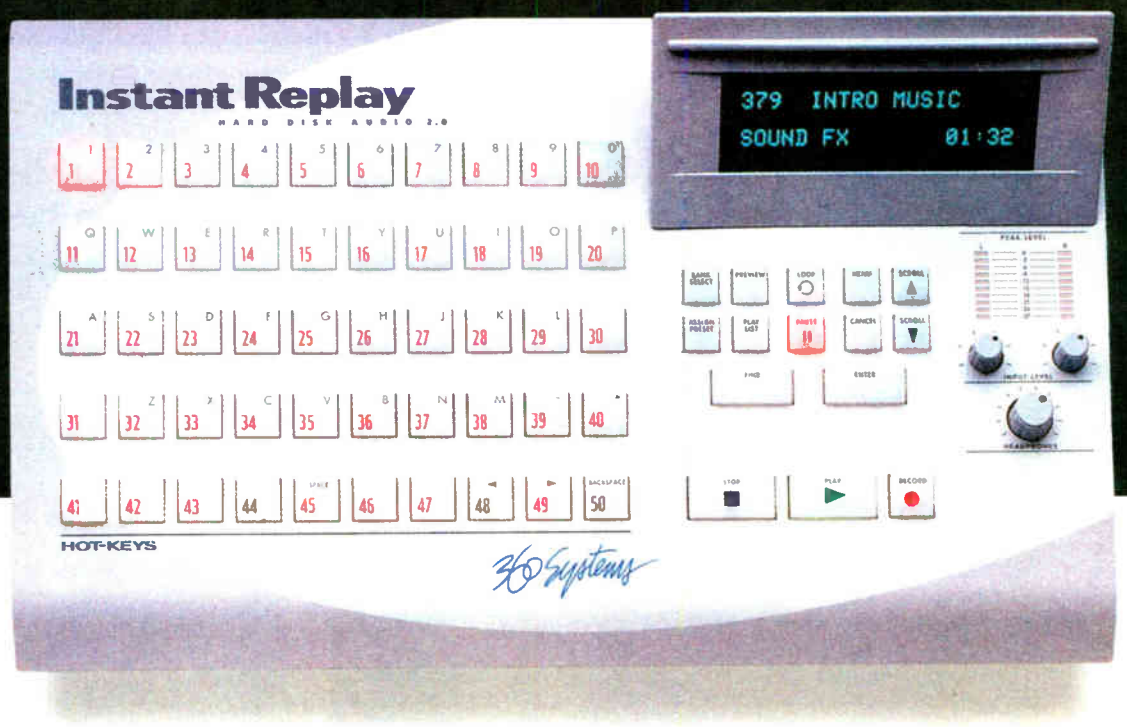

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World Radio History

Radio Positions Itself for 2000

▶ NAB99, continued from page 1

on-channel digital audio broadcasting technology to market, and how the creation of a new class of low-power FMs could affect that progress remain sensitive issues for broadcasters, federal regulators and the IBOC developers and equipment manufacturers. Those concerns were expressed several times over the course of the show, sometimes heatedly.

LPFM still hot

FCC Chairman Bill Kennard let broadcasters know he is not backing down from trying to develop LPFM. He took broadcasters to task for their LPFM concerns.

"Frankly, it is not helpful to hear only rhetoric that 'the sky is falling' even before the (June 1) rulemaking comments have been filed."

In response, NAB Joint Board Chairman Dick Ferguson said, "He's asked us to work with him and we've been doing that at the (FCC) staff level. But we are concerned. Take digital as an example, we think it's backwards. If you want to have digital radio you need to go in and lay the foundation of that first technically and then see if low power can fit in after the fact. ... If you listen to public radio, the part of the (FM) band between 88 and 92 MHz has lots of radio stations squeezed and shoehorned in. ... That's the kind of interference that we're afraid will happen up in our part of the band.

"We're looking for ways the chairman's goals can be achieved without taking the FM band with it."

NAB Joint Board Chairman Dick Ferguson

We've cleansed ourselves. We have a very clean balance sheet at the moment.

— Don Naab
PR&E

Several attendees said LPFM would result in the "swiss-cheesing" of the FM band. They said that the commission's reasons for supporting LPFM — to promote ownership diversity and opportunity — were the same reasons given when the commission passed Docket 80-90, in which several hundred FM stations were dropped into the band.

Those drop-ins, broadcasters argue, were the reason radio pressed for relaxation of the ownership limits in the 1996 Telecommunications Act. Passage of the legislation spurred record station trading.

How the FCC does its job and its role in the future in the face of convergence were discussed. Commissioners Susan Ness and Michael Powell agreed that increasing the efficiency of the FCC is at the top of their agendas.

We're looking for ways the chairman's goals can be achieved without taking the FM band with it.

— Dick Ferguson

Among the proposed changes, said Ness, is the establishment of an enforcement bureau that would, for example, be responsible for closing pirate radio stations.

Kennard also said pending ownership proceedings have been languishing at the commission for too long and challenged broadcasters to work with him in crafting "common-sense ownership relief."

He said that while it's too soon to completely de-regulate broadcast ownership rules, something needs to be done to bring more certainty to the marketplace.

While broadcasters wrestle with large regulatory issues, they are not forgetting their public service.

Public service campaigns

Ad Council Chairman Emeritus Robert Wehling, global marketing director for Proctor & Gamble, said broadcasters donated the bulk of about $1.2 billion in advertising time and space for public service campaigns in 1998, representing a 21-percent increase from the $995.8 million received in 1997.

Radio remains the Ad Council's largest supporter, contributing more than $714 million, or 59 percent of the total donated media. Television support in 1998 was $230.7 million, up 78 percent over the year before.

The other kinds of ads, the kind that bring in revenue, are doing well, but broadcasters should not become complacent, said Radio Advertising Bureau President and Chief Executive Officer Gary Fries.

He cited a 12-percent increase in advertising sales in 1998 from all parts of the country and a 16-percent increase for the first quarter of 1999.

Fries said, "I would predict to you that over the next five years we will probably evolve to a degree that is probably equal to the last 50 years. We are going to change, and the leaders of this business are going to have to change with it."

Of new technology partnerships, Fries said, "A whole new platform on prices will occur and a whole new demand on radio will occur. We need to position ourselves to be ready and capable of moving forward at that time."

Equipment manufacturer Pacific Research & Engineering also reported good sales figures.

The company reported a profit in the first quarter, with $4.2 million in sales, and earnings per share of four cents.

Significant results

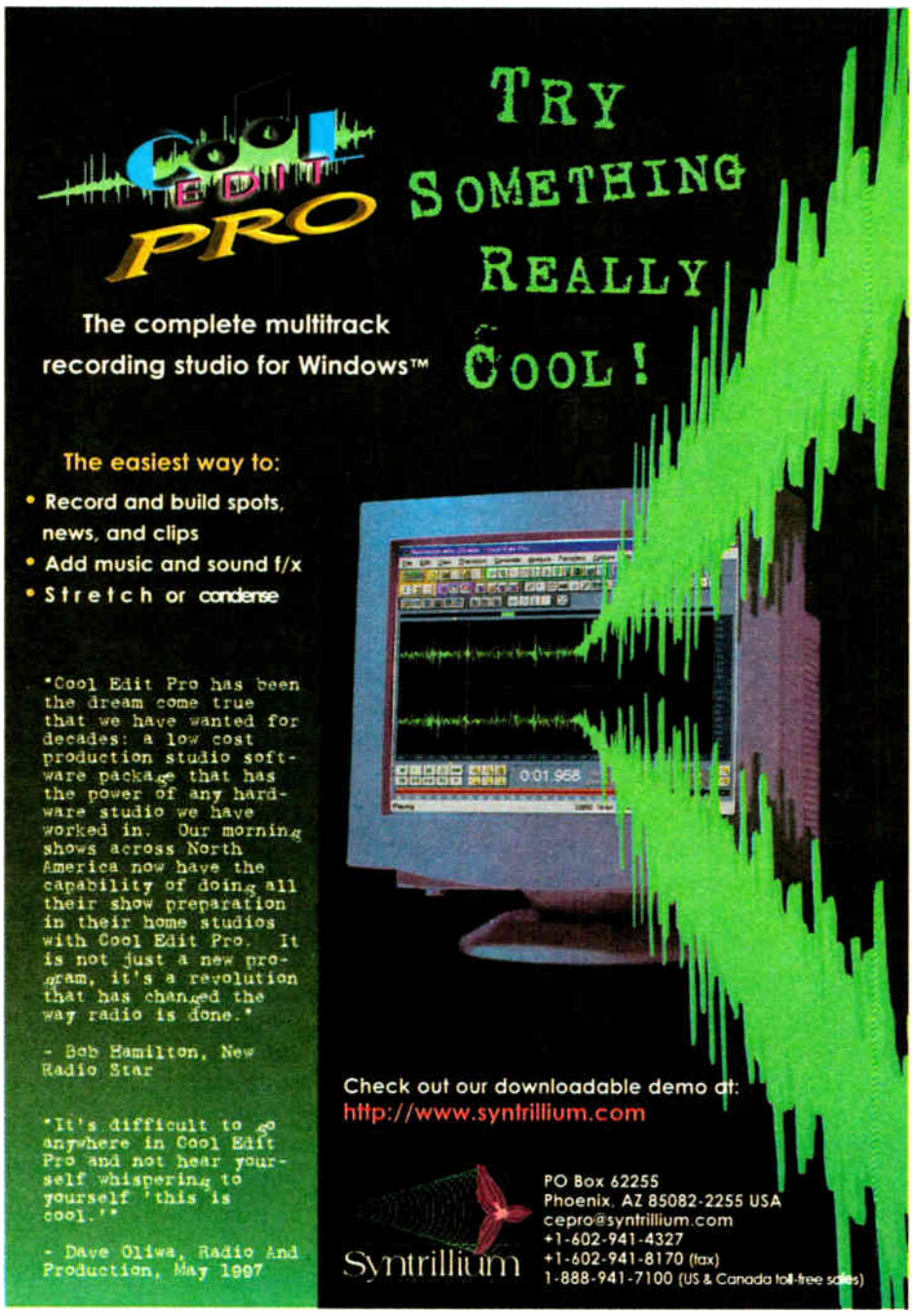
At a press conference at NAB99, the publicly held broadcast supplier said it had net income of $90,000 in the quarter.

Earlier this year, the company had reported a net loss of $4 million for 1998 (**RW**, April 28). It said then it had fallen below the listing guidelines for the American Stock Exchange, although it continues to trade on the exchange, and said it would restate financial results from earlier years to show losses.

PR&E blamed several factors for those results, including an error in how it had capitalized software development costs.

President and Chief Operating Officer Don Naab called the results "very significant," in light of losses at PR&E over the past three years.

"We've cleansed ourselves," Naab said, referring to the changes at the company over the past several months. "We have a very clean balance sheet at the moment," he said.



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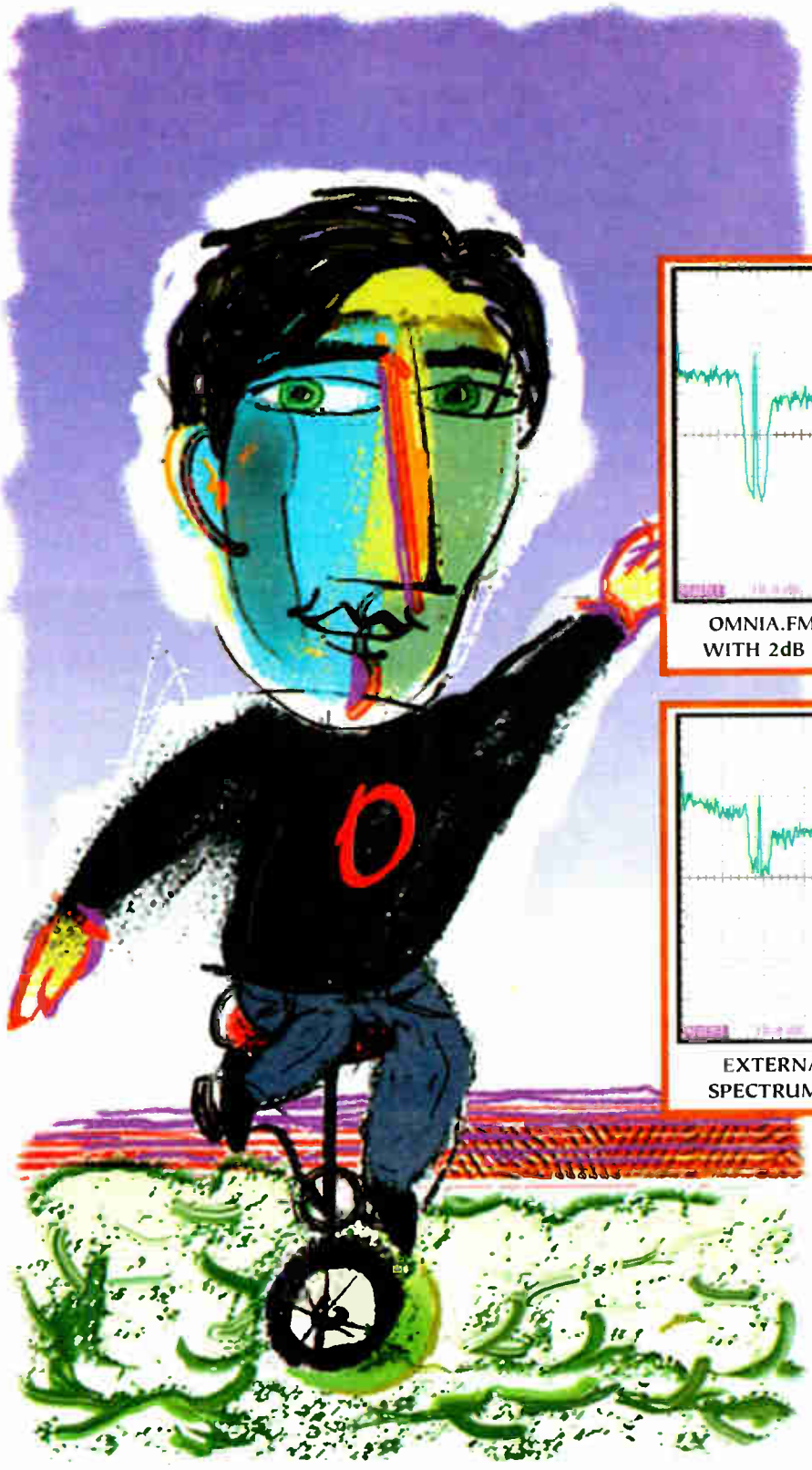

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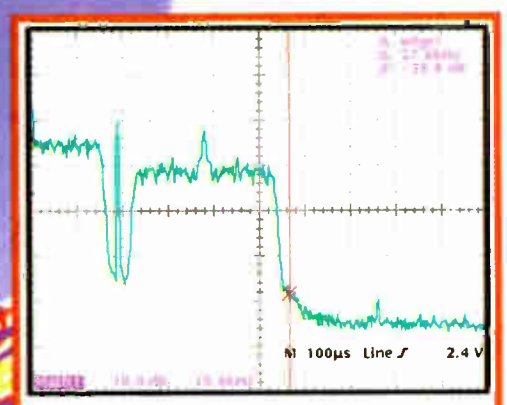

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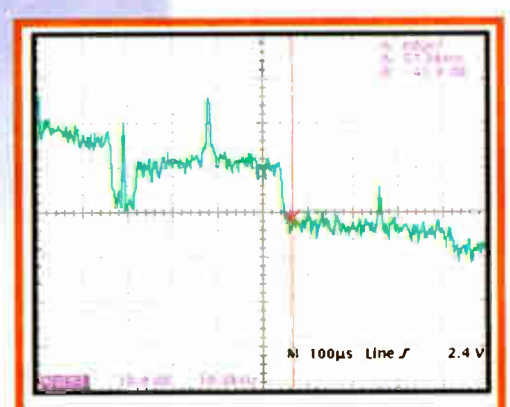

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Here's how: *The test signals were generated by a Delta Electronics SNG-1 (Stereo Noise Generator); spectrum analysis was performed with a Tektronix TDS-744A Digital Scope in the FFT mode. The top graph shows the spectrum out to 100kHz of the Omnia.fm with its built-in, all-digital composite clipper and composite low-pass filter. The bottom graph shows a different processor combined with an external composite clipper. Both composite clippers were set for 2dB of clipping. Notice in the bottom graph the significant harmonic energy in the SCA region as a result of composite clipping.*

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.

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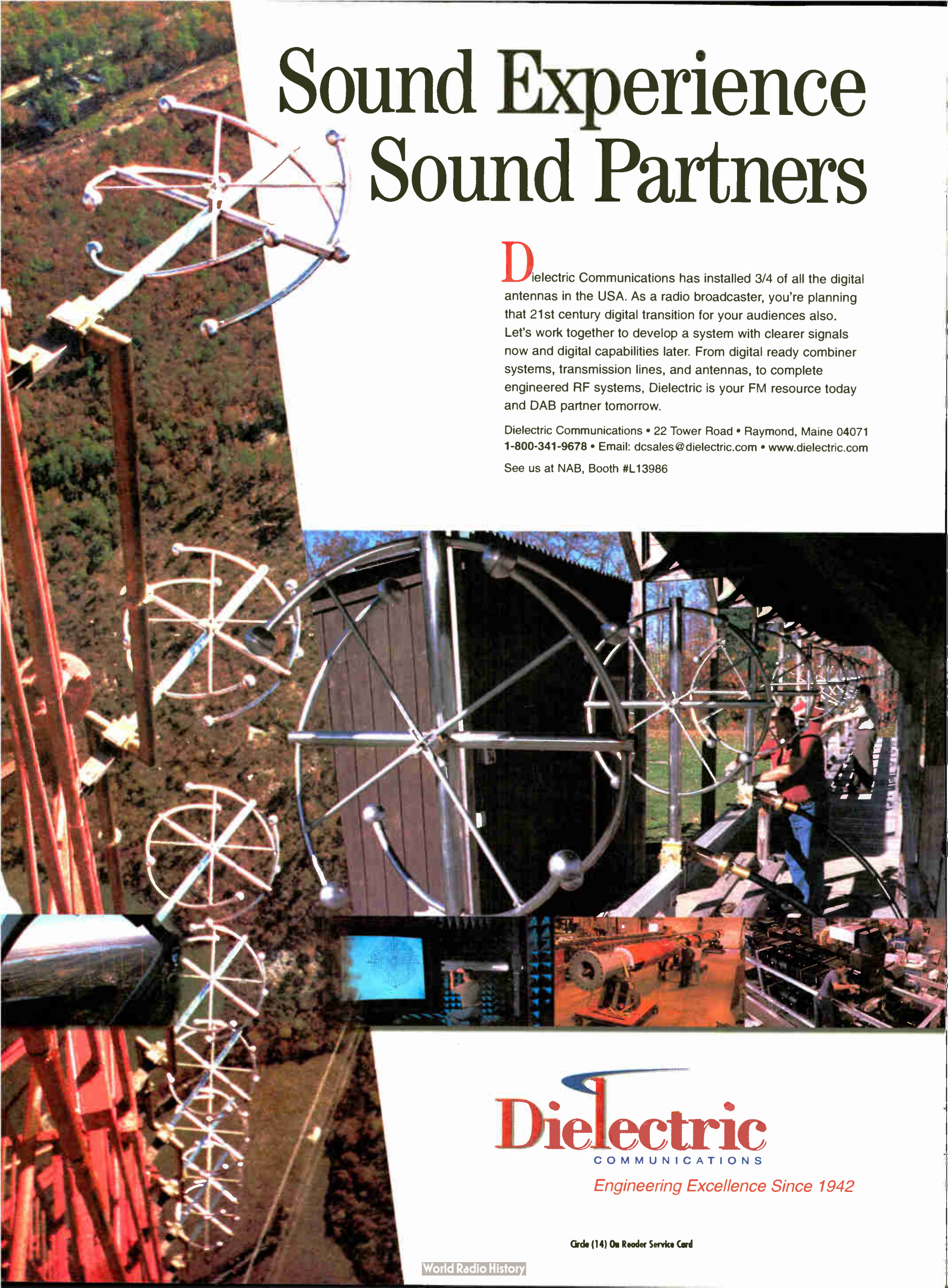

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ARMA Seeks New Membership

ATLANTIC CITY, N.J. ARMA is reaching out. The American Radio Manufacturers Association, an organization created last year to give radio and audio equipment makers a stronger industry voice, is reaching out to companies with a membership drive.

The group also is inviting clients to the Broadcasters Summit and Mid Atlantic Expo in Atlantic City, N.J., in conjunction with the New Jersey, Delaware, Maryland and D.C. Broadcasters Associations.

ARMA will provide the technical sessions at the June 7-8 convention and coordinate the exhibit hall.

"We will be able to draw 40 or 50 companies to the exhibit hall," said Vince Fiola, president of Studio Technology and a member of the ARMA steering committee. "This show has upwards of 1,000 people attending under regular circumstances — and that's without a good exhibit hall."

Registration is free for engineers.

"The New Jersey broadcaster's show is always well-attended, and the fact that we've teamed up this year means that we'll have good, solid attendance from programming management and technical people," said Elaine Jones of Davicom, another ARMA organizer.

Author and advertising guru Roy Williams is a featured guest speaker.

Jones said ARMA organizers are pleased with their membership efforts so far.

"We've had a good response from our membership drive and a good response to the N.J. Broadcasters show. Exhibit booths are filling up, and we've gotten some interesting papers and seminars," she said. "But we are still looking for people who are interested in presenting a topic at the show."

Vince Fiola

Jones said she is optimistic about ARMA's future."We're still small," she said. "We'll be small for quite a while, but everybody's got to start somewhere."

— Linda Sultan

For information about the Broadcasters Summit and Mid Atlantic Expo, visit the Web site www.njba.com or *call (888) 652-2366.*

For more information about ARMA, contact Donna Detweiler via telephone at (609) 653-6130.

FCC Plans Auctions For Competing Apps

LAS VEGAS The FCC "tentatively" plans to begin auctions in cases where there are competing applicants for the same license this fall, although Linda Blair, chief of the FCC Audio Services Division of the Mass Media Bureau, calls that timetable optimistic.

Blair spoke in a session at NAB99.

The auctions are among several moves the FCC has made to streamline its broadcast rules.

The FCC plans to issue a public notice detailing the auction procedures shortly, Blair said. The auctions would affect a backlog of pending applications that have been frozen since July 1, 1997.

The commission previously adopted an order implementing legislation requiring auctions to solve most competing applications for stations. Blair said competing applications for FM translators would be subject to auctions as well. Congress required the auctions in the Balanced Budget Act of 1997.

The commission reaffirmed the adoption of new entrant bidding credits in its recent auction decision. Applicants with interests in no other mass media facilities would receive a 35-percent bidding credit, while those with interests in "a few" media outlets would receive a 25-percent bidding credit.

In a couple of months, Blair said, the FCC hopes to finalize the technical streamlining rules not covered under its recent Report and Order.

Left undone are the more controversial aspects of the FM technical changes, including negotiated interference agreements in limited circumstances and dividing the existing FM Class C into two subclasses, Class C and Class C0 (or C zero). Generally, every FM station is protected from interference to its maximum height and power classification. FCC officials have said this policy permits some broadcasters to warehouse spectrum, when they have no interest in increasing their power.

Now, Class Cs operate with a maximum antenna height above average terrain of between 300 to 600 meters. The FCC would give affected stations three years to meet a new Class C minimum antenna HAAT of 450 meters. Of the approximately 1,000 Class C stations, about 600 would be reclassified to Class C0 if they do not apply for a change.

Gregg Skall of Pepper & Corazzini said he heard gasps from engineers afraid of the so-called "AMization of the FM band" when they heard the proposal, but he called it "worthwhile." The FCC has proposed allowing stations to negotiate their own interference agreements in some cases allowing a contour overlap in limited circumstances.

Also part of the technical streamlining that remains undone is a proposal to replace the contour predictor method with one the FCC says is more accurate.

Non-controversial technical streamlining approved by the FCC include: extending first come/first served processing to applications for minor changes to AM, non-commercial FM and FM translators, expanding the definition of "minor" modification to conform more closely to the commercial FM definition (which includes all changes except community of license and certain frequencies), and permitting one owner to file up to four related minor station change CPs at once.

The actions mean that most proposed changes in power, antenna height and/or antenna location would be classified as minor, and generally processed faster than major changes. The expanded minor change definition will provide relief from the current/new commercial application freeze for many applications formerly classified as major changes, the FCC said.

The FCC also has expanded the period a construction permit is viable to three years, from the previous 18 months. Jerold Jacobs, Rosenman & Colin, said that because of the change, the FCC is serious about cracking down on CP extension requests.

—Leslie Stimson

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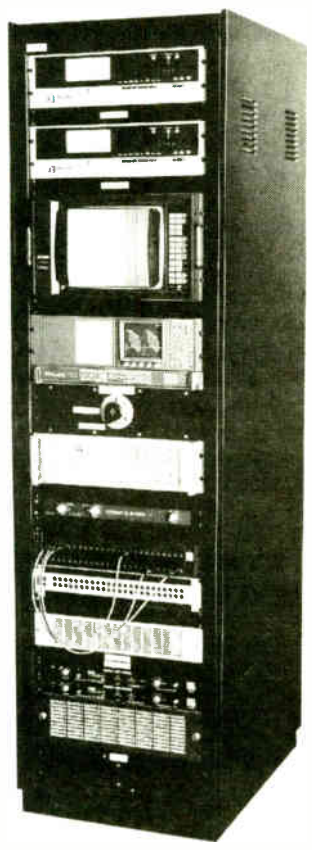

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World Radio History

'Engineers' Safe in Illinois

▶ ENGINEER, continued from page 7

SBE. "This appears to have been borne out by the latest ruling."

The NSPE supported the regulation department's contention that by using the term "engineer," Novell was implying professional status.

"Our interest was and still is in protecting the status and reputations of professional engineers who are required to get an accredited engineering degree," said Arthur Schwartz, NPSE attorney.

For now, Novell can continue to call its training school graduates Certified Novell Engineers. "This settles the matter to that specific claim, but it doesn't prevent someone else from coming along and starting the whole process over again," said Craig Christensen, associate general counsel for Novell.

The court's decision supports our contention that the terms 'radio engineer' or 'Novell engineer' are not confusing or misleading to anyone.

— John Poray

"But we are confident that with the guidelines handed down by the courts, we can avoid this kind of litigation in the future," said Christensen. "No one has ever presented any evidence that shows CNE has ever confused any person."

Novell is currently faced with a similar case in Nevada, pitting it against the Nevada Board of Professional Engineers and Land Surveyors.

"The case remains active. We are seeking ways to settle our differences out of court," said Christensen.

The NSPE will remain vigilant in its watchdog role. "We will look at every situation on a case-by-case basis and continue to work closely with our state groups making sure the public is not misled," said Schwartz.

Novell appreciated the support it received from the SBE. "We thank them for their interest in the case. We think SBE can see where someday they may be faced with the exact same dilemma," said Christensen.

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Kosovo's Pain, Wolf's Award

LAS VEGAS Although the war in Kosovo kept Senate Commerce Committee Chairman John McCain (R-Ariz.), from attending NAB99, his taped comments were riveting during the radio luncheon.

The widow of Wolfman Jack, Lou Lamb Smith, accepted Wolfman's induction into the 1999 NAB Broadcasting Hall Of Fame at the luncheon on her late husband's behalf.

Sen. McCain said he hopes that the Kosovo conflict is nearing an end.

"I think it is safe to assume that no one, including me, anticipated the speed with which Serbia would defeat our objectives in Kosovo," said McCain. "NATO can and probably will prevail in this conflict with what is, after all, a considerably inferior adversary."

McCain said he planned to introduce a resolution that authorizes President Clinton to use "whatever force necessary to end the conflict."

McCain spoke of challenges facing broadcasters, particularly digital and low-power issues as well as ownership diversity.

"As an industry, broadcasters are being challenged today as they never have before," said McCain. "The need to stay competitive in a digital world is propelling broadcasters into the unpredictable future of digital radio and TV."

McCain ended by addressing his stance on creating ownership diversity. According to McCain, he planned to hold hearings on the matter within the month of April. He said he planned to introduce legislation that will feature a revised (minority) tax certificate program within a package of diversity-enhancing initiatives.

Later in the program, as Lou Lamb Smith accepted the 1999 NAB Broadcasting Hall of Fame Award on behalf of her husband, the late Wolfman Jack, Smith said that she believes Wolfman is still commanding the airwaves in the afterlife. "I'm sure Wolf is doing radio ratings in heaven."

— Brian Galante

World Radio History

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'Cart Chunk' May Enhance Broadcast WAVE

An Extension to Broadcast WAVE Could Help Create Integrated Production/Delivery Networks

Dick Pierce

Orban has been working with several other companies on a way to fully integrate their production and on-air delivery systems via "cart" WAVE files.

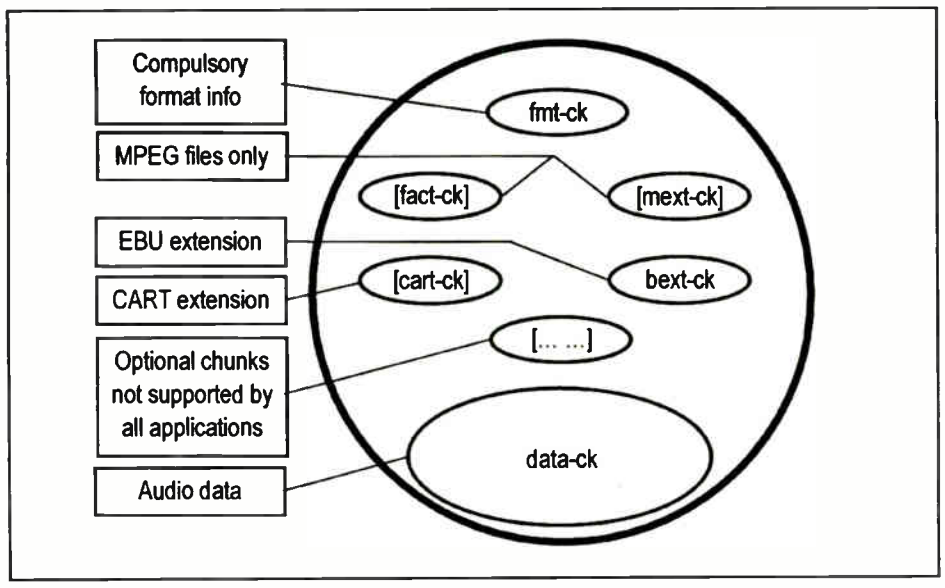


Figure 1: Broadcast WAVE File With 'Cart' Extension

Printed here is a presentation on the extension of the B-WAVE standard as written by Dick Pierce, principle software developer for the Orban Audicy digital audio workstation.

"Cart/Audio Delivery Extension to the EBU Broadcast WAVE Format" was part of the Digital Radio Production workshop at NAB99 and is reprinted with permission.

This paper proposes a new RIFF WAVE data type specifically for use by broadcast audio production and on air delivery systems. Its purpose is to allow the export of audio data in the form of WAVE files along with needed scheduling, traffic or continuity information from one system to another.

Our intent is to allow systems from disparate manufacturers to participate in an integrated production/delivery network, greatly benefiting the broadcast user by preserving their product choices, and simplifying the task of integrating their systems. ("Traffic" in the context of this proposal is intended to mean radio station traffic management, as in play scheduling, and not "road traffic" information.)

This proposed extension is based on the well-established EBU Broadcast Extension WAVE file format (BEXT), the MPEG extension, and supporting documentation.

1. The industry's need for the "cart" extension — Different on-air delivery and production systems use incompatible databases, audio file types and access methods, yet the scheduling, continuity or traffic information they use share many common attributes.

As broadcasters leverage technology, audio becomes increasingly file-based, and the WAVE file has become a de facto standard interchange format.

(In many ways, WAVE files have come to represent the same sort of "universal audio media" that two-track, quarter-inch tape was until recently. The computer revolution in audio has further emancipated audio by severing the once inexorable link between physical media and format representation. WAVE files can easily be stored and transmitted over nearly any media with no loss in fidelity.)

But the WAVE file is somewhat brain-dead, in that it lacks the critical "label" information which readily identifies it for broadcast use.

The WAVE file is somewhat brain-dead, in that it lacks the critical 'label' information that readily identifies it for broadcast use.

'Cart' label

To simplify the integration of different systems, in this case, audio production and on-air delivery systems, a "digital cart label" for representation of continuity/traffic information, attached to and transmitted with an audio data file, will greatly benefit broadcasters using systems from multiple manufacturers.

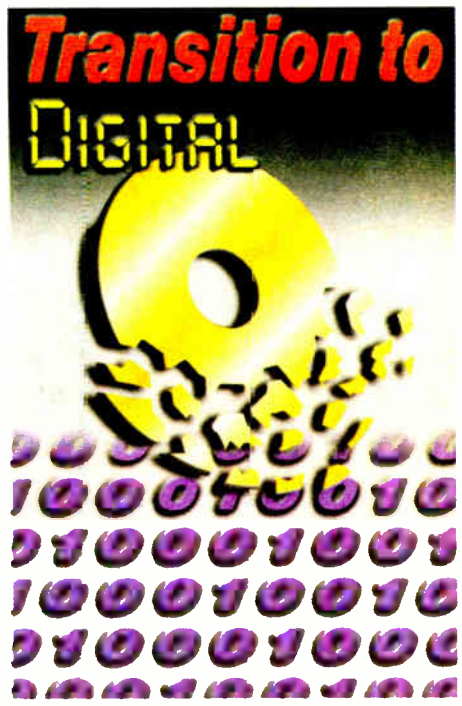
Efficiencies will be gained as users of one system export audio files and continuity data faster than real-time from one system to another using industry standard networking topologies.

The RIFF WAVE format has emerged as a dominant audio representation, and supports a wide variety of audio formats (linear PCM, MPEG and others), samples rates, and bit rates.

The RIFF conventions allow the arbitrary addition of other data without impacting the ability of diverse RIFF-compliant applications from reading and interpreting needed data. Thus, adding an extension to a WAVE file allows inclusion of needed continuity/traffic data to a widely accepted standard representation.

(The RIFF specification requires all readers to be able to read all compliant RIFF files. When such an application encounters data that it is not prepared to handle, it can simply ignore the data and move on.

There, indeed, exist some RIFF WAVE consumer applications that are intolerant of new and unknown chunks.



For this reason alone, these applications are not RIFF-compliant. They may be front-ended by so-called "chunk stripper" utilities, the combination of which are, then, RIFF-compliant.)

By utilizing a standard audio file format (WAVE and EBU/BEXT) and incorporating the common "cart" information into a specialized chunk within the file itself, the burden of linking multiple systems is reduced to producer applications writing a single file, and the consumer applications reading it.

Simple link

The destination application can extract the needed information and insert it into the native database application as needed.

Communication between a production/delivery system is thus reduced to a simple, purely passive link that allows the production application to write the properly formatted WAVE file in a standard "drop box" location, where the delivery system, periodically polling the drop-box for new additions, finds the file, opens it, and uses its own native access methods for adding this information to its database.

The result is that both production/editing systems and on-air delivery systems can communicate readily without the need for implementation-specific intelligence or design.

See B-WAVE, page 30 ▶

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World Radio History

Workbench

Radio World, May 12, 1999

Mystery of Damaged Ground Wires

John Bisset

John Stortz, chief engineer at WKES(FM) in Lakeland, Fla., writes that a recently acquired station had vines growing up the guy wires much worse than our photo in the Dec. 23, 1998, **RW**.

As he was removing the vegetation, one of the first things he noted was that all of the guy cable grounds were broken off — some at the ground, some at the guy clamp. In a lightning-prone state like Florida, this is bad news!

At first, John thought it might have been the farmer who kept the field mowed, so he carefully restored the connections, painted the cables red and tied flags on the cables to make them visible to the mower operator. Within a couple of months, the grounds were broken again!

The next speculation was that the cattle that grazed in the field may have damaged the ground wires. Cattle enjoy scratching their backs on guy cables. One of John's assistants saw a cow using the side door mirror on a telco truck to "scratch that itch." She rubbed so hard that the mirror broke off the side of the truck.

Cattle enjoy scratching their backs on guy cables.

Because the tower was being replaced, they put up with the frequent broken grounds until the new tower was completed. Chain-link fencing was then placed around each guy anchor to keep the cattle away. In less than a year, fractures were still found in the ground wires, exonerating both the farmer and the cattle!

Don't forget transmitter air filters. Dirty filters tax blower motors and reduce cooling efficiency.

John noticed the site experienced some wind nearly every day. When watched closely, the ground cables appeared to be in constant motion as the guys moved. Unlike most metals, copper becomes hard and brittle when bent back and forth. As it hardens, it breaks more easily.

To retard the movement, John and his staff installed a length of small-diameter PVC pipe along the path of the ground wire, fastening the wire to the PVC "support" using black (UV-resistant) wire-ties. This prevents much of the bending in the wind.

The work was completed only a few months ago, so it's too early to claim success, but so far, so good.

John noted one other thing while repairing his ground wires: The tower installer used "U" bolts to clamp the ground wire to the guy cable. John and his staff believe that split-bolts would work better because the clamping force is distributed over a larger surface area. Additionally, the point of bending becomes distributed over a larger part of the copper ground wire.

★★★

Have you experienced intermittent audio from your Sony MiniDisc recorder? If so, check your mini-plug!

From a recent online discussion on *broadcast.net*, it appears that the dimensions of the oft-used Radio Shack mini-phone plug don't quite match up to the jack used in the MiniDisc.

In fact, comments were made that these plugs perform less than satisfactory on Motorola handie-talkies and even camcorders.

Although the dimensions on the pack seem to be the same, these plugs don't fit as snugly at the exact replacement. Ron Foo of Jacor in San Diego has had good luck with the one-eighth-inch stereo connectors made by Canare. They aren't cheap, but are well-made. Ron uses Belden 9252 to wire the plugs.

Ray Vaughn has had good luck with Switchcraft, which are available through Digikey or Mouser, or your local electronics parts house.

Things aren't always what they seem, so the suggestion of going with the "brand" name connectors is a smart one, especially if the connection needs to be reliable and permanent. The worn-out phrase "you get what you pay for" has real meaning in broadcast engineering!

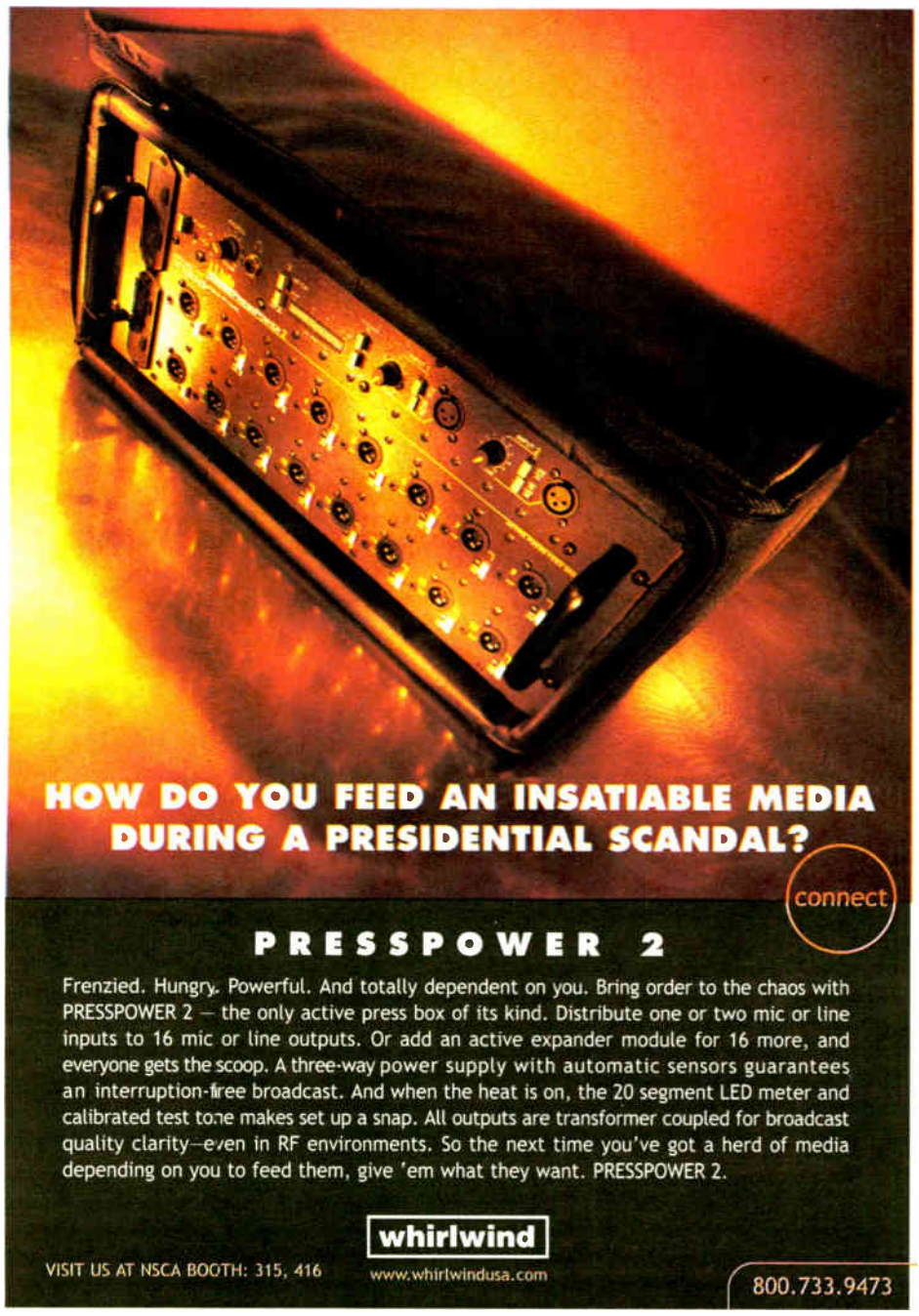
About 15 years ago, Otari used a cinch connector for the remote starts on a reel-to-reel it manufactured. Otari supplied a plug to be used, but of course, in time the plug was cut off, lost, whatever, and a replacement was needed.

The pin numbering on the plug that Otari provided was different from the pin numbers on the Radio Shack equivalent. Not having the original plug to go by, we just had the pin numbers in the manual.

You guessed it: The pin number discrepancy effectively grounded the supply voltage when the remote start switch was depressed.

Not only did it take a day just trying

See WORKBENCH, page 29 ▶



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World Radio History

AM Uses Ground Waves

Ed Montgomery

This is one in a series of articles about the basics of AM radio. The previous part appeared April 14.

The AM broadcast band grew out of a few frequencies established by the Department of Commerce in 1921. The interest and demand for broadcasting prompted the Federal Radio Act of 1927 that lead to the Federal Communications Commission in 1934.

The concept of broadcasting was conceived by David Sarnoff while general manager for RCA. Rather than use wireless communications as a telephone service - the transfer of information between two locations - a one-way system of sending information from a transmitter to many receivers would be employed. There would be no need for the listener to respond.

In addition to the institution of broadcasting, Sarnoff developed the network concept with the creation of the National Broadcasting Company. Radio broadcasting was on its way.

Ground conductivity

The AM band was established in the medium frequency spectrum. As radio frequencies increase, propagation changes. The medium frequency band created a ground wave that travels along the earth and into the sky. The ground wave permitted reliable reception.

Land that contains copper has good conductivity, while mountainous terrain filled with iron ore will absorb electro-magnetic signal.

The consistency of the ground can either promote or inhibit the propagation of the radio wave. For instance, sea water provides the least attenuation of the AM band signal. Land that contains copper has good conductivity, while mountainous terrain filled with iron ore will absorb the electro-magnetic signal.

Usually, the broadcasting station is designed with this in mind. In some areas of the country, an AM station will provide a vast area of coverage with half the power of a station in a different area but with the same frequency and classification. Ground conductivity plays an important role in AM.

Man-made structures can also affect the broadcasting signal. Since the radio wave is electro-magnetic, ferro-magnetic materials can absorb it.

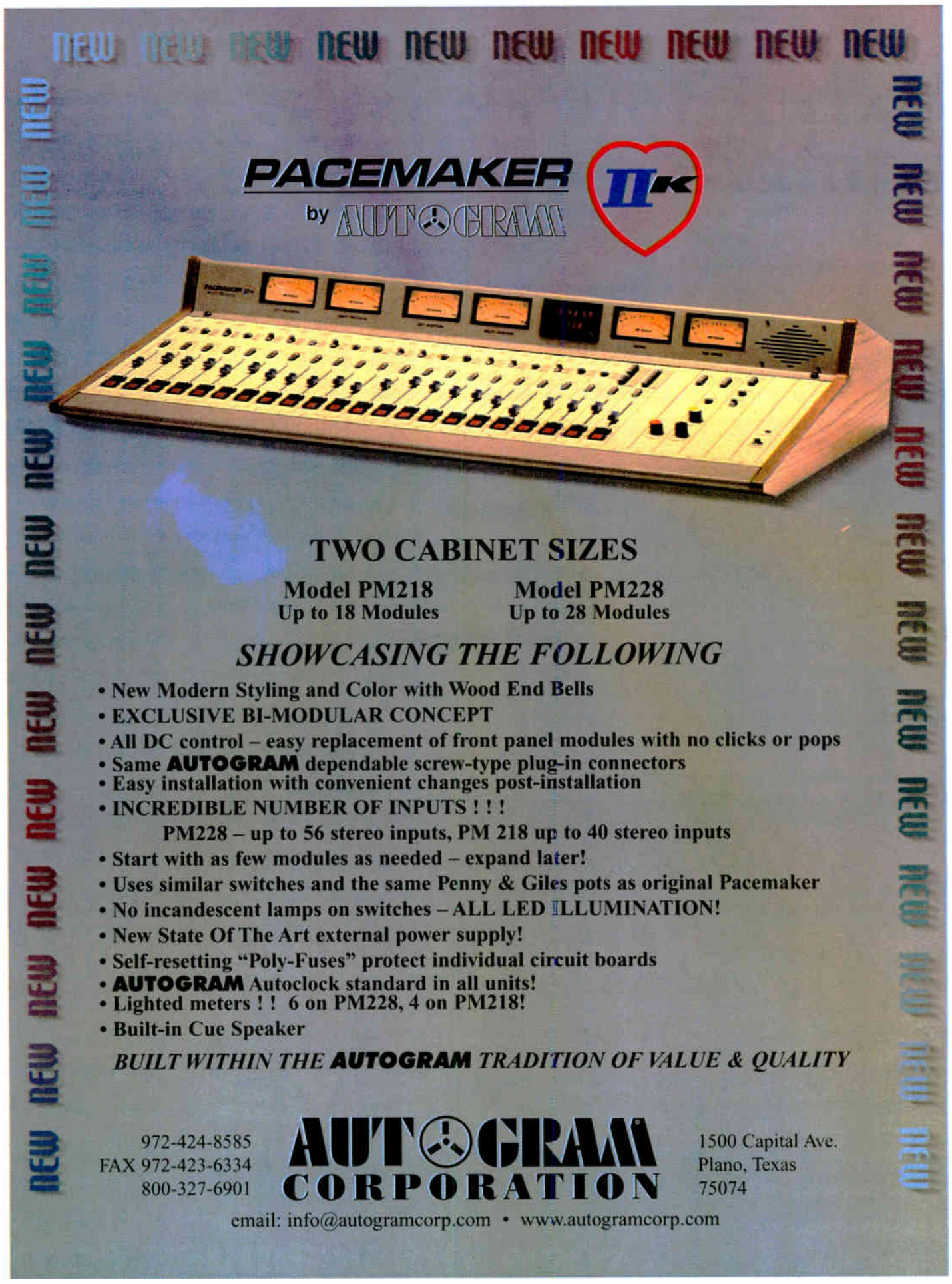
AM frequencies, because of their wavelength, are affected by large structures. Since the 1930s, transmitter sites have been located in remote areas with little population. An AM station built 50 years ago with an adequate coverage area may not provide that same service today. If the area surrounding the transmitter has been filled with industry, large buildings and/or tall electrical transmission towers, much of the radiated signal may be absorbed before it reaches its original licensed coverage area. Along with added radio-frequency interference from computers, telephones, etc., the signal may be unusable.

Serious issue

This is a serious issue that does not have a cheap solution. FM suffers from interference as well, but from smaller objects. The VHF frequency for FM is about nine meters long. Smaller objects can cause signal cancellation,

See AM, page 23 ▶

Directional antennas require multiple towers, which are complemented by the radials just below the surface.



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World Radio History

AM Radio Basics

▶ AM, continued from page 21

which causes receiver fades and brief interruptions to it when you are listening. Walking across a room can cause an FM signal to briefly cancel out.

The wavelengths at AM frequencies are quite long. An AM station operating at 1,000 kHz, in the middle of the band, has a wave length of 300 meters; that's over 900 feet in length.

It would not be practical to make an antenna that long. As AM developed, it was discovered that an antenna as short as one-half or even one-quarter wavelength could be used, as it still created an antenna of significant size.

The AM transmitter site requires ample space. In its simplest form, the antenna consists of two parts: the vertical tower, which is the driven element; and the counterpoise, or ground plane.

Power distribution was greatly improved by supplying an artificial ground; the same was discovered in radio transmission.

Electric current flows through the vertical tower at the carrier and sideband frequencies. If the carrier is operating at 730 kHz, the current is flowing up and down the tower 730,000 times a second.

The counterpoise consists of 120 evenly-spaced wires, known as radials, a few inches below the ground and extending about one-quarter wavelength. At the base of the tower is a ground screen above the earth. This array of wire in the ground provides a consistent electrical ground for the transmitter, regardless of the moisture in the soil, temperature or seasonal temperature.

Artificial ground

When electricity was first explored, the earth was found to be a good return. A wire carrying the electricity could be established and a reasonably good delivery of power could be achieved if the generator ground was connected to a long rod driven into the earth. Power could be used on the receiving end by grounding that device in a similar manner.

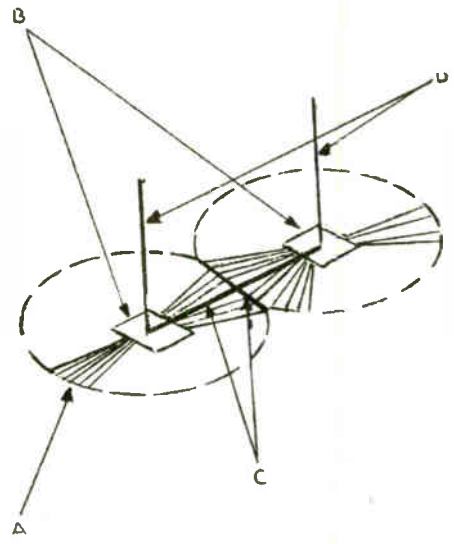
Power distribution was greatly improved by supplying an artificial ground; the same was discovered in radio transmission. While an artificial ground can not be established in wireless transmission, a constant ground made up of radials did much to improve the system. Even today, grounding the receiver can improve the received radio signal.

Directional antennas require multiple towers to control just where the radio signal will go. Each tower requires ground radials; where the ground radials intersect, they are soldered together before covered with dirt. The area encompassing the ground system should be void of trees, and grass should be only a few inches high. See the accompanying illustration and explanation.

■ ■ ■

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

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



(To the left is an sketch of a two-tower AM antenna site. For simplicity, the antenna tuning units, transmission lines and feed method have been omitted.)

A - Ground radials. 120 spaced three degrees apart about four to six inches underground.
B - Ground screen. Placed above ground and framed with a copper band. Ground radials are soldered to this screen.
C - Copper strap connecting the bases and antenna tuning units of both towers. Another strap is placed where the radials from each tower intersect. All radials are soldered to this strap.
D - Towers, radiating the carrier and sideband frequencies.

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World Radio History

Swap on a Chopper Lift

Troy Conner

Some years ago, while working for a tower firm in McLean, Va., I was involved in an FM antenna swap performed by helicopter.

We had been contracted to perform the antenna exchange and a subsequent re-plumbing of the transmission line system. A number of factors ultimately resulted in the decision to use a helicopter to perform the lift.

There was a limited space around the tower site, just north of the District of Columbia. This alone would have made it considerably more difficult to rig the tower. We would have had to rig our winch and tag lines across a street, which realistically would have meant closing that section of road for a week, at least.

Also, because the tower is a self-supporting structure more than 740 feet tall, and because it is topped by a three-pointed candelabra, rigging the gin pole and tagging the load (keeping the antenna away from the tower) would have been more complicated.

The lift was further constrained by the fact that there were two FM stations on a single antenna mast; both operations wanted to be off the air for the shortest time possible. Also, the other candelabra arms supported two additional broadcast antennas and they, too, would have to power down.

It was decided that a helicopter lift was the best solution. The pre-eminent Erickson Air-Crane out of Central Point, Ore. was chosen to perform the lift.

Just that summer, Erickson had been contracted to lift the statue of Freedom from the dome atop the U.S. Capitol, and were scheduled to relift it after it had been buffed and polished. In the rarefied air where Air-Crane companies work, the name Erickson is nearly synonymous with helicopter lifts.

The new antenna mast itself was 48.5 feet tall, and weighed just 20 pounds shy of five tons. As dual-frequency antennas go, it could be considered a relatively light lift. The old antenna was similarly sized, so both were well within the helicopter's 25,000-pound capacity.

Man of Steel

Perhaps the most critical issues regarding the use of a helicopter were the logistics of its use within FAA-controlled airspace. The tower sits just within the northern flight path of Reagan National Airport. The planes were spaced a couple of minutes apart and they literally circled the tower about a mile off in their 180-degree turn to final.

Once the FAA permits had been obtained, the work was scheduled within a two-day window. We had one day to do the work and one "weather

The Erickson Air-Crane Co. was elected to perform the lift.

day" if conditions on the first day did not permit a safe lift.

The lift was scheduled over a weekend for several reasons. First, we could cordon off the streets briefly without interfering with regular weekday business traffic, as we needed a safe zone to perform the lift.

Second, because it was a weekend, we were able to obtain the use of a federal parking lot immediately adjacent to the tower site.

This parking lot served as a launch/landing point for the two antennas. My bosses devised a pair of gigantic steel hinges; these were firmly attached to the asphalt to facilitate pivoting the two antennas from horizontal to vertical and vice versa.

This job essentially involved a staggering amount of planning to perform a limited amount of work. In the abstract, it might be described as loosening and retightening less than 100 bolts to replace object "A" with object "B," atop object "C." The reality was a bit more complex, physically more strenuous and inherently dangerous.

The morning of the job, we woke up to a persistent drizzle and a nasty fog. After breakfast we drove to the parking lot we had reserved and waited. We pictured a wet tower, wind gusts and imagined a wildly swinging antenna.

As the helicopter landed, it buffeted us with its downdraft, forcing us to lean heartily into the wind. At this

See MAN OF STEEL, page 28 ▶

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VTVI includes Scott Studios' exclusive Voice/Music Synchronizer. Whenever the announcer mentions song title or artist, he or she turns on the link so the back sell or intro plays ***only*** with the correct song.

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Here's Scott Studios' Voice Trax Via Internet (VTVI) software, shown with the optional Segue Editor. VTVI allows a distant announcer to pre-record a 4 hour show in about 15-20 minutes with nothing more than a Windows computer with an ordinary sound card, an Internet connection and a good microphone.

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When the announcer is done, a click on the VTVI Auto-Send button dials the Internet over a standard phone line and uploads the entire show to your Scott Studios digital audio system automatically. Transfer does take a long time, but your announcer can be answering e-mail, writing copy or creating promos on the VTVI computer while the show transfers.

VTVI isn't limited to music announcements. It gives high quality audio to recorded spots, remotes, weather, stock reports, news and election returns.

Your station will sound great with Scott VTVI! The only thing you need is an Internet connection on each end, a $29 a month FTP transfer site and the Scott NT System with Remote Recording Router.

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3 VTVI Models: Good, Better, Best

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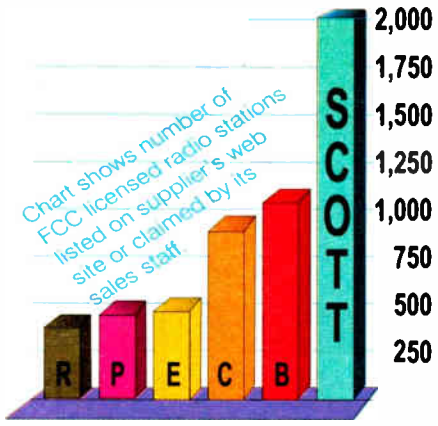

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World Radio History

FIRST PERSON

Bright Future for Dark AM Site

A Chicago Engineer Puts Lessons to Work in Rebuilding a Dark and Long-Neglected AM Site

Michael G. McCarthy

You are working on a project with a consultant. While in town, the consultant needs to inspect an AM transmitter site up the street for a client who may buy it out of receivership.

Having inspected the station some time ago, you share some of the untidy secrets hidden underground. The consultant invites you to join him because you know its location and site.

The site is the worst you have seen. Towers are snake-bowed and guy lines rusted to the point that if you tug them, they may snap. Tower base piers are heaved some 15 degrees thanks to poor installation and 40 years of freeze and thaw.

For good measure, a drain swale, a low-lying wet stretch of land, has carved a path along the row of towers and aided in the pier heaving. The existing transmitter building seems to have sunk (!) some two feet, which puts the entrance door header nearly even with your chin. The interior is littered with ...

The author is shown at the base of tower No. 6.

Well, you get the picture.

The story is real; the protagonist is me. And the site that confronts me is beyond resuscitation. It is DOA.

Back to the air

Fast forward three months and the journey begins in earnest. The buyer (my new client) has agreed to acquire the station. The station has been off the air for some 10-1/2 months, so we must move swiftly. We must return a nightmare station to the air in that remaining month, or lose the license to the FCC's automatic license sunset.

First, a request with the FAA is filed seeking to modify the tower marking requirements from painted/red beacons to strobe. The towers have no paint, nor any sign of paint from before. The beacon is lit, but not flashing. Painting towers in February is out of the question. One tower's lighting system is missing completely, wire and all.

Next comes the STA to operate at one-quarter power omnidirectional on the one tower that is remotely safe to plumb and to install the strobe. The FAA request is granted without delay and the FCC STA is filed.

We scour the area for an international shipping container to use as a temporary transmitter shelter. The containers are robust, relatively cheap, watertight, almost airtight, RF proof and, most important, rodent-tight.

Upon location of a container, we back the caddy trailer with the container into the dock of WNIB(FM), Chicago, for a couple days. (WNIB is another story!) In goes the new Nautel AMFet transmitter, rack of new gear, alarm system and the AC power panel. It's cold outside, so heat is not an immediate concern. HVAC is a matter for later; I need to get the station on the air in 10 days.

Next, we drop the container at the TX site, hook up AC to an open breaker in the old building, connect RF to the only good tower through the phasor's tower J-plug, wire and adjust the audio, and a station is born. We make it on the air with five days to spare, and for less than $50,000, new processing and transmitter included.

A pat on the back, a brat and a beer — end of the first quarter. Go Bulls!

Reconstructive surgery

The consultant and I agree the site requires complete reconstruction. Towers, ground system, transmitter building, phasor, ATUs ... everything. Nothing is salvageable. Forty years of neglect finally caught up to the station.

We also examine the possibility of modifying the patterns and power to better serve the growing southern suburbs of Chicago, especially with a possible third metro airport being built only 10 miles away. Much to our dismay, the new FCC rules requiring interference reduction would cost us a 25-percent power hit and instill deeper

See FIRST PERSON, page 32 ▶

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World Radio History

Fastest Swap in the Mid-Atlantic

▶ MAN OF STEEL, continued from page 24

point, we became even more apprehensive, concerned about even being able to stand up on the top of a tower while this beast hovered overhead. It was painted bright orange and adorned with the name "Bubba" on its nose.

The tower and helicopter crews met the morning of the lift when the helicopter landed in the parking lot. The Soviet-made Sikorski "Sky Crane" is an enormous machine, more than 100 feet from rotor tip to rotor tip. It can land over a small semi-truck-sized box and carry it off. One of the features of this rotary wing craft is the bubble on the stern of the cockpit, allowing the pilot to fly the chopper while facing backwards. Oriented in this fashion, the pilot can look directly out and down upon the load.

The pilot explained to us the differences between a helicopter lift and the hoist-type lifts we routinely performed. First, he allayed some of our collective fears. He explained that being on an elevated lattice structure, we would not experience the tremendous buffeting from the down-draft, as we had when he landed in the parking lot.

We then discussed the emergency load-release methods, including as a last resort, a series of explosive bolts which forcibly detach the hoist — and any attached load — from the helicopter. The pilot's worst imaginable scenario would be to lift a load, have it be bolted down and then be unable to release the load line.

Finally, the pilot briefed us on the serious business of static electricity. During even a brief helicopter flight, the whirling rotor blades generate a significant amount of static electricity, enough of a charge that a set of automotive jumper cables are required to discharge it to ground.

After our briefing with the pilot and his spotter, we gathered our tools, strapped on our belts and rode the lift line to the top of the tower. First, we got the spotter squared away and in a good location to direct the load. We then got in position to remove the final bolts holding the old antenna mast to the tower proper.

The weather was not looking good as rain alternated between a heavy mist and a light drizzle. The real problem was the fog — too much and the pilot would have to abort the lift, which was exactly what happened.

The next morning the weather looked a tad more cooperative. The light rain persisted, but the fog was lower and was breaking up. We gathered our gear and began the ascent up the 750-foot tower.

Once we re-established our positions, the foreman gave the signal to begin. Minutes later, we heard the turbine begin to whine, and eventually, the blades begin to turn. It seemed to take forever, looking down on the action from our nervous perspective.

Finally, the big bird took to the air, and just a few moments later, it hovered overhead. We were thankful that the pilot hadn't lied and it was indeed like being in the eye of the storm; the powerful down-draft all but eliminated the rain.

Shown is an on-the-ground, inside-the-tower view of Erickson on the job.

The man at the top of the old antenna mast, with one end of his jumper cable firmly grounded, used the other end to reach out for the slowly swinging hook. Once the static electricity had been discharged, he clipped the helicopter's hook onto the lifting sling before quickly scrambling down the mast.

At this point, the helicopter was literally "tied" to the ground, so we had to work fast. One man beneath the antenna plate held the bolt heads, while one man on either side of the top plate loosened the final nuts holding the antenna in place. After that, it was up and gone.

Having done the "easier" of the two lifts, we let out a small cheer and watched the helicopter descend toward the parking lot with the old antenna. From our perspective it took a while, but we were more concerned with thinking through the lift ahead.

I found out later while watching a video-tape shot from the ground why the process seemed to take so long. Unlike our position on the tower top, the ground crew had to contend with the tremendous down-draft and the swirling rain it created. It took four or five of them to tackle and literally wrestle the antenna onto the steel hinge staked into the parking lot. Once the antenna was bolted down, the helicopter quickly swiveled the antenna from vertical to horizontal. After disconnecting the old antenna, the new antenna was raised to vertical, unbolted from its hinge and sent skyward to its new home.

Somehow, removing the antenna was a lot easier psychologically than installing the new one, even though it can be said that it should be the same, the only difference being the reversal of steps.

The next thing we knew there was an antenna hovering overhead. Ever so slowly, the pilot and spotter coordinated the load toward its destination. The static, once again, had to be discharged. This time we all got a good look at the series of sparks that were about one-half-inch thick and arced about eight inches.

The antenna was swinging gently about a foot above the plate when a gust of wind must have blown the helicopter and BAM! — the lower plate of the antenna slammed down on the right man's foot, bounced up and rotated slightly. It caught the small railing and bent it upward.The spotter and pilot were superb and had the load under control in minutes. The man with the squashed foot and his partner on the top plate quickly stabbed their spud wrenches into a couple of holes, followed by a rapid series of bolts. Then it was over: The pilot released the hook and we all breathed a sigh of relief.

After we found out we had an injured man, we helped him down, hooked him in and we piled onto the winch line, headed toward ground.

The actual antenna swap took less than half an hour. After dispatching our wounded worker to the hospital, the remainder of the crew went back up the tower, plumbed the pair of antennas and had both stations back on the air in less than an hour. With rigging and de-rigging included, the tower crew was only on site for about a week.

It was undoubtedly the quickest antenna swap I have been involved with.

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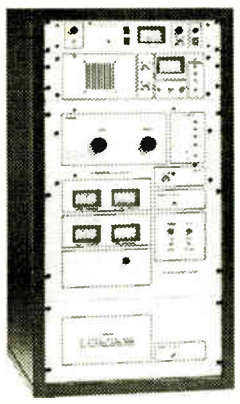

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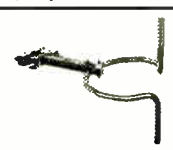

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World Radio History

ROOTS OF RADIO

Wire Recording: A Failed Promise

Bill Ryan

Long before audio tape recording was available to Americans, voices, music and actualities from World War II were being stored on wire hardly as thick as a hair.

Wire recording, once considered a technological breakthrough with wide use foreseen in industry and education in the post-war world, failed to materialize fully.

In May of 1943, Time magazine noted that Army and Navy technicians had given the nod to a highly portable little gadget called the Magnetic Wire Sound Recorder, an instrument about the size of a portable typewriter. It could record the human voice and other sounds within an earshot.

The supply spool held 10,000 feet of carbon steel wire for 60 minutes of recording. On its way to the take-up spool, the wire received and stored the signal as it passed through a magnetic zone. The wire could be erased and used hundreds of times. If it broke, it was fixed by simply tying a knot in the wire.

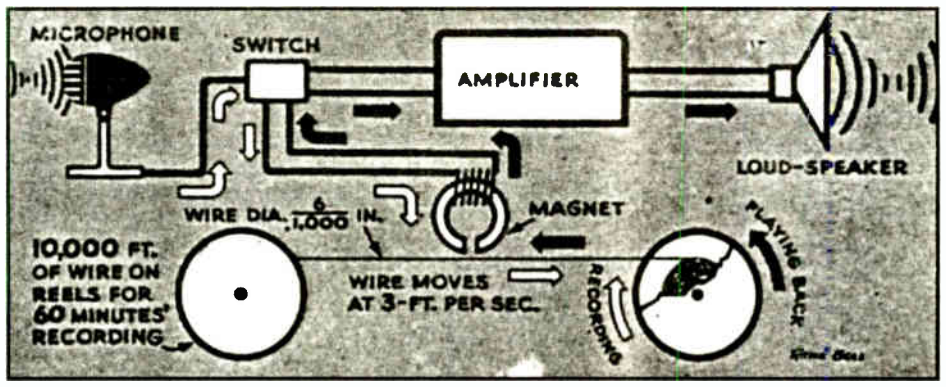
Although a Danish physicist in the early 1900s had suggested that magnetized wire could carry sound, the device was perfected by Marvin Camras, a young scientist at the Armour Research Foundation in Chicago. General Electric was contracted to produce the machines.

Military uses

As GE entered production, wire recorders were distributed to key military personnel for pilots in combat or on reconnaissance flights as well as other strategic uses. The pilot of the Enola Gay, the plane that dropped the atomic bomb on Hiroshima in 1945, said some of his crew members were given wire recorders before the flight to describe what they witnessed for scientists to study.

Some newsmen also used the recorders. One of the great battle actualities of the D-Day invasion of 1944 was a shipboard wire report given by George Hicks of the Blue Network.

Early field units used two 6V wet cell car batteries. Later models operated on two flashlight batteries and had playback facility.



Shown is a diagram from Popular Science in January 1946 on wire recording and playback.

The future looked bright for wire recorders. Fifteen makers of electronic equipment met in early 1945 to discuss standardization for civilian use in the postwar world.

The recorders were expected to compete with office dictating machines and home phonographs.

Sears was the first manufacturer to offer a living room console radio-phonograph combined with a wire recorder.

Selling at $169.50, the Silvertone unit came with one 3-1/2-inch spool of stainless steel wire, good for one hour of recording. Additional spools cost about $3.98.

Veteran ABC-TV audio man Gene Larson said he remembers seeing one of these Silvertone units. According to Larson, the take-up reel was attached to the same shaft as the phonograph turntable, running at 78 rpm.

Other manufacturers who planned to include wire recorders in their larger units were Stromber-Carlson and Scott Radio.

Business Week magazine of March 15, 1947, said, "Wire recorder owners will be able to borrow expensive record albums and re-record them at low cost. This prospect has been giving disc makers the chills for months."

But Larson said the wire recorders could not compete with commercial records or with the soon-to-appear tape recorders due to a lack of fidelity, and stereo would be out of the question.

Incidentally, the first mention of tape recorders appeared four months after the war. A brief note in Science News Letter for Dec. 22, 1945, states:

"A new German magnetic tape recording machine, to make records of code or voice messages, obtained by the Army in Germany, has been on public display recently in the Department of Commerce, (in Washington's) Office of the Publication Board. The signal from the receiver passes through an amplifier to (a) recording head, which magnetizes the coating on the tape. The exact composition of the tape is not known, but it appears to be a plastic composition coated with material having high magnetic qualities."

This and similar tape machines brought back from Europe revolutionized the broadcast and recording industries. Other than home use, wire recording never had a chance.

■■■

Bill Ryan worked as a broadcast editor for United Press International and an assistant professor of journalism at Idaho State University.

He also served as that institution's first full-time alumni director.

He is retired.

Let's Talk About Plugs

▶ WORKBENCH, continued from page 20

to figure out what was wrong — all the wires looked right — but then the back had to be pulled off the machine to get to the blown fuses!

Live and learn ... and spend the extra couple of bucks.

★★★

Have you looked at your transmitter filters lately? After the Transmitter Workshop at the NAB Radio Show last fall, I participated in a discussion about the use of these high-efficiency air filters, as shown in Figure 1.

To see is certainly to believe. These filters came from a closed, air conditioned site, and represented about six months' worth of dirt. Can you imagine the grunge inside the transmitter if the cheap fiberglass "furnace filters" were used instead?

By the way, don't neglect the filters on the back of your FM exciters! These metal or plastic filters need to be vacuumed occasionally, to keep the dust down.

While I'm nagging, do you have a spare muffin fan for your exciter? Minimize your down time and keep one on the shelf!

■■■

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.

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World Radio History

Enhanced B-WAVE Proposal

▶ B-WAVE, continued from page 19

We certainly don't intend to suggest that the contents we describe here represent the only relevant data for all cart systems. Rather, we surveyed a variety of systems from several manufacturers and found that a large subset of the data is common to all. We thus based the design on this common set of fields.

As to the audio contents, the recommendation has been made elsewhere of the importance on standardizing on a common exchange format, and WAVE, especially in the form of the EBU Broadcast Extension standard. We endorse this recommendation, though this does not necessarily require the use of EBU/BEXT files as each system's native format.

2. Broadcast WAVE with "cart" extension — The relation of the new "cart" chunk to other WAVE file components is illustrated schematically in Figure 1 on page 18.

(The ordering of chunks within a WAVE file is somewhat arbitrary. However, the prevailing opinion is that the "fmt" format chunk should always be first and the "data" chunk should always be last in the file with no chunks following. This avoids the inclusion of so-called "end chunks" which some applications can't handle. Within these constraints, though, the ordering could be arbitrary. We feel these conventions are prudent.)

3.1 Contents of proposed BEXT with "cart" extension — We are proposing using the standard EBU/BEXT wave format file with the addition of a new optional chunk type. Such a file would have, at a minimum, the chunks shown in Figure 2.

Any additional chunk types that are present in the file are considered private. Applications are not required to interpret or make use of these chunks. Figure 3 shows the layout of the proposed "cart" chunk at a C/C++ structure.

The following are fields with descriptions of each:

Title — A 64-character long ASCII string for the title of the cut. This differs in use from the EBU BEXT <description> field. The title is normally viewable on the cart or delivery applications and can be used as an entry into a table of contents or a key in an indexing or search system. (It is probably reasonable, though, to use the BEXT Description field for more detail about the cart.) If the title occupies less than 64 characters, the last valid character is followed by a NULL byte '\0'. Some applications may not support a 64-character title and may truncate it as needed.

Artist — A 64-character long ASCII string holding the artist or creator name. This is different than the <originator> field in the EBU BEXT chunk in that it can be used to describe the original artist of a song, for example, while the <originator> field would be more appropriate as the producer of the specific audio file. If the string is less than 64 characters, it is terminated with a NULL byte.

Figure 2

```
<WAVE-form> ->
 RIFF('WAVE')
   <fmt-ck>                 // mandatory for WAVE files
   [<fact-ck>]              // required for MPEG files
   <bext-ck>                // BEXT information
   [<mpeg-ck>]              // required for MPEG files
   [<CART-ck>]              // optional cart information
   <data-ck>                // audio data
```

Figure 3

```
typedef struct CARTchunk_tag
{
DWORD ckID;                          // chunk ID: "cart"
DWORD ckLen;                         // chunk data length
 BYTE ckData[ckLen];                 // chunk data
}

typedef struct cart_extension_tag {
CHAR Title[64];                      // ASCII cart sequence title
CHAR Artist[64];                     // ASCII artist, creator name
CHAR CutNum[8];                      // ASCII 8 digit cut number
CHAR Category[16];                   // ASCII Category ID
CHAR OutCue[64];                     // ASCII out cue text
CHAR StartDate[10];                  // ASCII yyyy/mm/dd
CHAR StartTime[8];                   // ASCII hh:mm:ss
CHAR EndDate[10];                    // ASCII yyyy/mm/dd
CHAR EndTime[8];                     // ASCII hh:mm:ss
DWORD dwTimers[4];                   // four time markers after head
CHAR UserDef[64];                    // User defined text
DWORD dw0level;                      // Sample value for 0 dB
WORD Version                         // Version of the cart
CHAR Reserved[718];                  // Reserved for future expansion
CHAR TagText[ ];                     // Free form tag text
}CART_EXTENSION;
```

CutNum — A decimal number string made up of ASCII digits '0'-'9', ranging in number from 1 to 99999999, representing the cut number, or unique cut key. The string should be left justified and terminated, if less than 8 digits long, by a NULL byte. Using a cut number of 0 signals the destination delivery system to auto-assign a cut number.

Category — This holds a category name up to 16 characters long. The category name is somewhat application dependent. It's advisable, though, to use common or standard category names, such as "PSA" or "NEWS", etc. (A list of category names might be appropriate for standardization.)

OutCue — A 64-character ASCII string holding the optional outcue phrase to be displayed when the cut is being played. This is a user readable cue string. If less than 64 characters in length, it's terminated with a NULL byte.

StartDate — An ASCII date string of the form yyyy/mm/dd, such as 1998/12/25, holding the start date. Any valid date can be used. To signify an immediate start date, use a date and time significantly earlier than the present, for example 1900/01/01

Year is defined as 0000 to 9999.

Month is defined as 1 to 12 (or 01 to 12).

Day is defined as 1 (or 01) to 28, 29 30 or 31, as applicable.

Separator between fields is normally "/", but can be any of "-", "_", ":" " " (space) or ".".

StartTime — An ASCII time string of the form hh:mm:ss, such as 12:31:45, representing the 24 hour time-of-day for the start time on the assigned <StartDate>. There is no default for this field.

Hour is defined as 0 (or 00) to 23.

Minutes and seconds are defined as 0 (or 00) to 59.

Separator between fields is normally ":", but can be any of "-", "_":" " (space) or ".".

EndDate — As above in start date and time, but indicating the end date. (Often referred as the "kill" date. The term "end" date is to be preferred because of the confusion with the concept of "killing" the entry altogether, purging it from the system, as opposed to simply deactivating it.) This the final air date after which the sequence will no longer be active. If the sequence is to run forever, use an impossible date such as 9999/12/31. There is no default for this field.

EndTime — Indicates the time of day on the appointed end date. There is no default for this field.

DwTimers — Four 32-bit integers representing a time mark offset from the start of the cut. Time units are in sample periods at the cut's current sample rate. (The timer range is 232 or 4,294,967,295 sample periods. This allows timer ranges at a sample rate of 48 kHz, for example,

See B-WAVE, page 34 ▶

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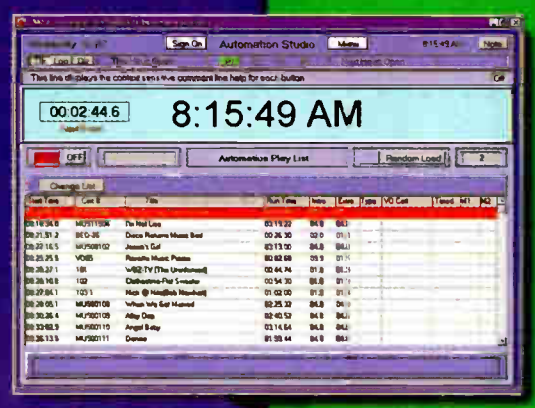

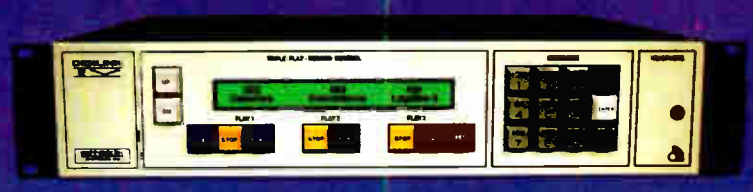

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World Radio History

Many Zoning Issues to Consider

▶ FIRST PERSON, continued from page 27

nulls where they are already rather deep. We would lose more than one-half million listeners in our 0.5mV contour going that route.

After some debate, the station owner decides to reconstruct as licensed, though it would cost more. One should always examine alternatives, regardless of how costly or absurd the results may seem, before proceeding. Without knowing the options, one may pass up the possibility of going from 1 kW to 50 kW. In this case, we are satisfied all possible avenues to increase coverage were examined and weighed.

Aside from developing the master budget and plan, the foundation of any successful construction project of this nature is the retention of a qualified and licensed surveyor to map the property as well as the topographic features. The latter is necessary in this case, thanks to a terrain delta of more than 20 feet as well as the aforementioned creek swale across the property. Those two facts alone will prove integral to our new site design and how it is handled within various government agencies.

While the terrain deviation may not be of importance to a station on flat land, it does matter to stations on any sort of hill where the tower bases will not be at an even elevation. The higher the frequency, the greater the importance of terrain differential.

Remember, RF radiates in all three dimensions. Typical algebraic calculations used for pattern design generally factor in Z plane (sky wave) radiation, but do not factor in Z plane radiator geometry differentials, only X and Y plane relationships. Our goal is to keep the base elevation differential within four degrees of the wavelength.

There are volumes recorded about the various codes issues and flooding mitigation for any project of this type.

If you find yourself in this situation and are simply rebuilding, retain the services of a competent property or zoning attorney to determine if your construction would fall under grandfathered zoning or more recent and more restrictive zoning. The $1,000 spent on their services will save you many times that amount if you should develop plans that are unacceptable to the local zoning or building agency, not to mention keeping the "Nimbys" at bay if the station was not a good neighbor in the past.

If you are zoned A-1 (Agricultural-Rural here in Illinois), determine what, if any, issues would apply to be able to hold on to that zoning designation. I know of a station that elected to build a one-acre pen and import three cows to keep its A-1 zoning. Otherwise that station's property taxes would have tripled. Property taxes are but one issue; others may include landscaping, trash removal at an unmanned site, etc.

If you propose material or layout changes to the site, the local zoning agency may force you to a commercial zoning class.

Much to our dismay, the new FCC rules requiring interference reduction would have cost us a 25-percent power hit.

This is a nightmarish situation if the station is only a marginal performer already. Legal help becomes mandatory at this point; sometimes, lawyers *are* worth their fees.

Ask the land surveyor to recommend a good civil engineer and environmental surveyor/consultant (preferably local) to develop the site plan, determine what changes in drainage would affect adjacent properties and aid in filing the plans with the appropriate jurisdictions.

Also, the consultant will develop EPA, Army Corps of Engineers and related applications for wetlands designation and mitigation.

This is definitely not a job for an amateur or station owner wanting to save a buck or two. You will lose.

Fortunately, our surveyor has its own planning department and is well known in the county for its thorough plans.

Thus, the flooding, grading and site plan are acceptable on the first try to the county, U.S. Army Corps and the state flooding and environmental protection agencies, any of which could have killed or stalled the project.

We now have approval from start to finish, including possession of building permits cards, in 11 months. It is amazing how fast things go when done by the books and dollars are committed to enlightened execution.

Planning is 90 percent of a successful project. The construction part is mechanical and requires many skills unto itself. Without a good plan and support from the owner, the project is doomed from the start.

Next up: Finding contractors in an area that knows all about this station's storied past, dropping towers and dodging rain drops while pouring concrete.

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World Radio History

B-WAVE Proposal

▶ B-WAVE, continued from page 30

to extend beyond 24 hours (24:51:18).) These timers can be thought of as secondary or tertiary markers or "trip tones", used to activate events in the cart system. If a timer is not used (unset), it's value is set to 0xFFFFFFFF.

UserDef — A 64-character ASCII string whose use and contents are defined by the user of the system. If the user text is less than 32 characters long it is terminated with a NULL byte.

dw0Level — A 32-bit signed (two's complement) integer word holding the sample value of the 0 dB reference level for the originating system. This is to facilitate scaling and metering consistency across disparate systems. As an example, a 16 bit linear PCM system that has its meters calibrated as 0 corresponding to maximum signed digital value will have the value set to 32768 (0x00080000). A similar system with the peak value set to +6 dB will have this value set to 16384 (0x0004000), since the 0 dB meter reference level is 6 dB below, or 1/2 have the value of, saturation.

Version — An unsigned binary number giving the version of the "cart," particularly the contents and usage of the Reserved area.

Reserved — Area reserved for future expansion of the standard.

TagText — Non restricted ASCII characters containing a collection of strings each terminated by CR/LF. This text can be system or even user defined descriptive text for the sound, such as script information, instructions, notes on an artist, or a live tag for a commercial. (An alternative use for this area is discussed later.)

3.2 Other Relevant Information — All the other information regarding WAVE audio characteristics can be found in the mandatory "fmt" chunk. This includes sample rate, number of tracks, sample width and sample format. For other than PCM format, the "fact" chunk and the EBU "mpeg" chunk will contain further information. Refer to the relevant documentation for information on these data. Information regarding the exact format of the audio data representation is also to be found in the reference documentation.

"BEXT" chunk usage suggestions — The BEXT chunk already has fields that could be of use in a cart application without violating the intentions of the BEXT standard. Some of them are described here with some suggestions for usage in a cart/delivery system context. Refer to EBU 3285 for more specifics on the "official" usage of these fields.

Fields and their descriptions:

Description — A 256-character ASCII field that can hold a free form descriptive text for the program. Several "cart"/delivery systems utilize a long description field, and this could be used for such a purpose.

Originator — A 32-character ASCII field holding the originator or creator of the sound.

OriginatorReference — A 32-character ASCII field holding, as EBU 3285 describes, "a non-ambiguous reference allocated by the originating organization."

OriginationDate — A 10-character ASCII for date of creation.

OriginationTime — An 8-character ASCII for time of creation.

TimeReference — A 64-bit time code of sound sequence.

Version — Unsigned short integer version number.

Reserved — A 254-byte reserved area for future expansion.

CodingHistory — Non-restricted ASCII characters containing a history the sound's coding process.

3.3 Application-Specific Info — It is certain that some radio scheduling applications can make use of or require data not included above. The RIFF chunk file format allows addition of arbitrary new chunks in which such information could be placed for private exchange between applications that can understand the information.

Such chunks, however, will fall under the category of "private" chunks and can be ignored by applications conforming to the standard definitions. As such, they are beyond the scope of this document.

Some correspondents have raised objections to the fixed-field layout of the cart chunk, preferring instead a free-format keyword-oriented approach. The latter, while providing a high degree of flexibility and expandability, suffers from a great increase in complexity. A fixed field format has the advantage of not requiring parsing and interpretation. Further, it runs a serious risk of violating the very notion of a standard by allowing essentially indeterminate content to be added to the chunk.

One must remember that the objective here is to provide a commonly agreed upon means of communicating known and well-characterized data between diverse applications. The goal is to allow as many such diverse applications to connect as possible. It's also to be noted that none of the other relevant chunks (fmt, fact, bext, mext, etc.) employ such

See B-WAVE, page 35 ▶

World Radio History

▶ B-WAVE continued from page 34

a free-format layout.

The proposed standard addresses these issues in two ways. First, as in the EBU BWF standard, an area has been set aside for future standardization. This area would continue expansion of fixed size fields in a manner as currently done. Secondly, the area at the end of the chunk (currently designated as the TagText member) is available for arbitrary expansion. If desired, this area could be used for such keyword-oriented data.

Assuming the latter path is chosen, it is the recommendation of the authors that a tagged format, essentially the same as the basic RIFF chunk format, be used in this area. This retains the advantage of keyword-orientation while also retaining the full backwards and forwards compatibility of the basic tagged methods. Diverse applications can easily navigate this area without the requirement of understanding all possible members. It is further recommended that such an approach be subject to the standardization process.

And, ultimately, there is a third approach, as mentioned above: further chunks can be defined as seen necessary.

Not to belabor the point, but again the goal is to provide a common means of communicating specific information for a reasonably well defined and constrained application. This standard makes no attempts to get it 100 percent correct, such is impossible. The user base is far better off with 90 percent correct now, instead of 100 percent correct never.

4. Real-world use — This standard concerns itself with the contents of the proposed "cart" chunk. It does not specify how it is to be used or how it is to be communicated between systems. These are implementation-specific issues beyond the scope of this and, for that matter, most any standards process. However, we can envision a number of different uses that have a high degree of universal applicability.

Imagine, for example, a network connecting several audio production systems integrated with an on-air system. The network provides a blind "drop box" directory or folder. As a user finishes a production, a WAVE file containing a filled-out "cart" chunk is created in this blind drop box.

On a periodic basis (once a minute or so), the on air system looks in this folder. If it finds a WAVE file, it opens the file, reads the cart data and uses it to set up a new entry in its database, and moves the WAVE file to its own playlist directory.

Another possibility is for the traffic manager to create empty WAVE "cart" files with the basic "cart" information (cut ID, title, etc.) filled out. In addition, the "fmt" chunk could be provided with the stations audio defaults already filled in. There is, however, no audio. A user on a production system picks up the WAVE file (again, from some standard network location) as a "work order," fills in the finished audio, then delivers it (as above) to the on-air system.

The "cart" extension is no pie-in-the-sky vaporware. A version of the Orban Audicy system that fully implements networked cart file production has been developed and is now in being tested.

We have been working closely with several manufacturing partners on fully integrating our systems with theirs via "cart" WAVE files. Among these partners are Enco, Prophet Systems, David GMBH, Studer and Scott. Discussion is now underway with several more manufacturers. Most importantly, users have responded enthusiastically to the idea of the "cart" WAVE file and the resulting ease of integration of their Orban editors and other manufacturers' on-air systems.

5. Conclusion — No single manufacturer can claim to address the needs and budgets of all possible users with workable integrated production and on-air delivery systems. Simple resource limitations dictate that any such system can never be everything to everyone.

Moreover, broadcasters want choice in terms of what solutions they buy. Manufacturers need to hear what our market is saying, in short, "make it work together." To provide the maximum utility to the broadcast market as a whole, it makes sense to design interchange standards that allow the users to select production systems and delivery systems that suit their unique needs, integrating them with minimum effort. Our proposed "cart" standard is intended for just that purpose, and we are hoping that its adoption will provide significant operating benefit to all parties.

6. Acknowledgments — Geoff Steadman, product manager for the Orban Audicy workstation, can justifiably take credit as being the father of the "cart chunk" idea. It was through his discussions with many Audicy users that he came to develop the basic germ of the idea and pushed the original formulation ahead.

I would also like to acknowledge the support of Dr. Barry Blesser, Barry Demchak and others at Orban, who helped develop the idea into a viable, concrete concept. I would also like to recognize our many industry partners who are helping to make the idea of integrating all these systems a reality for the users.

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• Microsoft Software Developers Kit Multimedia Standards Update, rev 3.0 15 April 1994

• "Specification of the Broadcast WAVE Format," EBU Tech. Doc. 3285, EBU Publications, Ancienne Route 17A, CH-1218 Grand Saconnex (Geneva) Switzerland, July 1997

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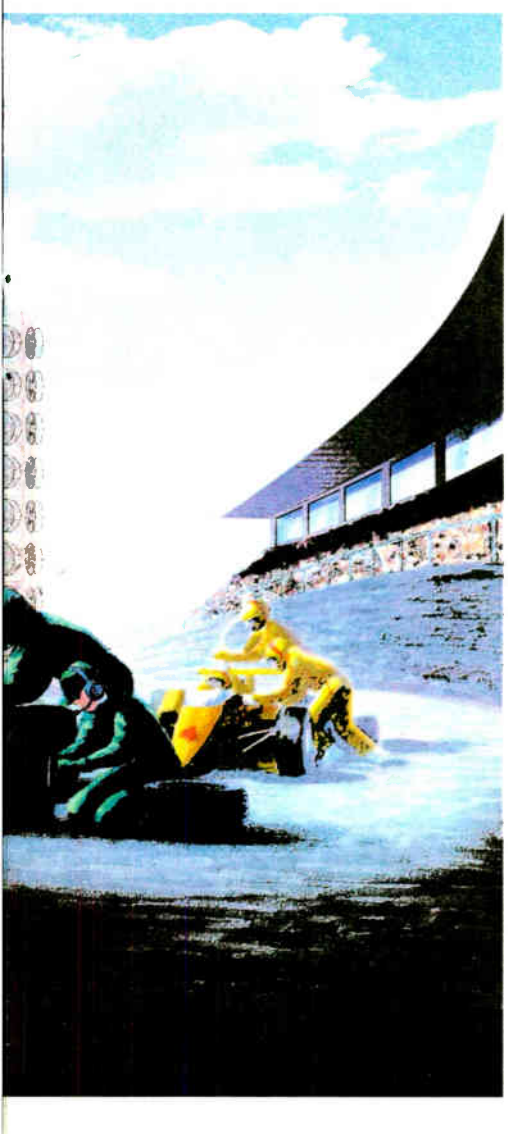

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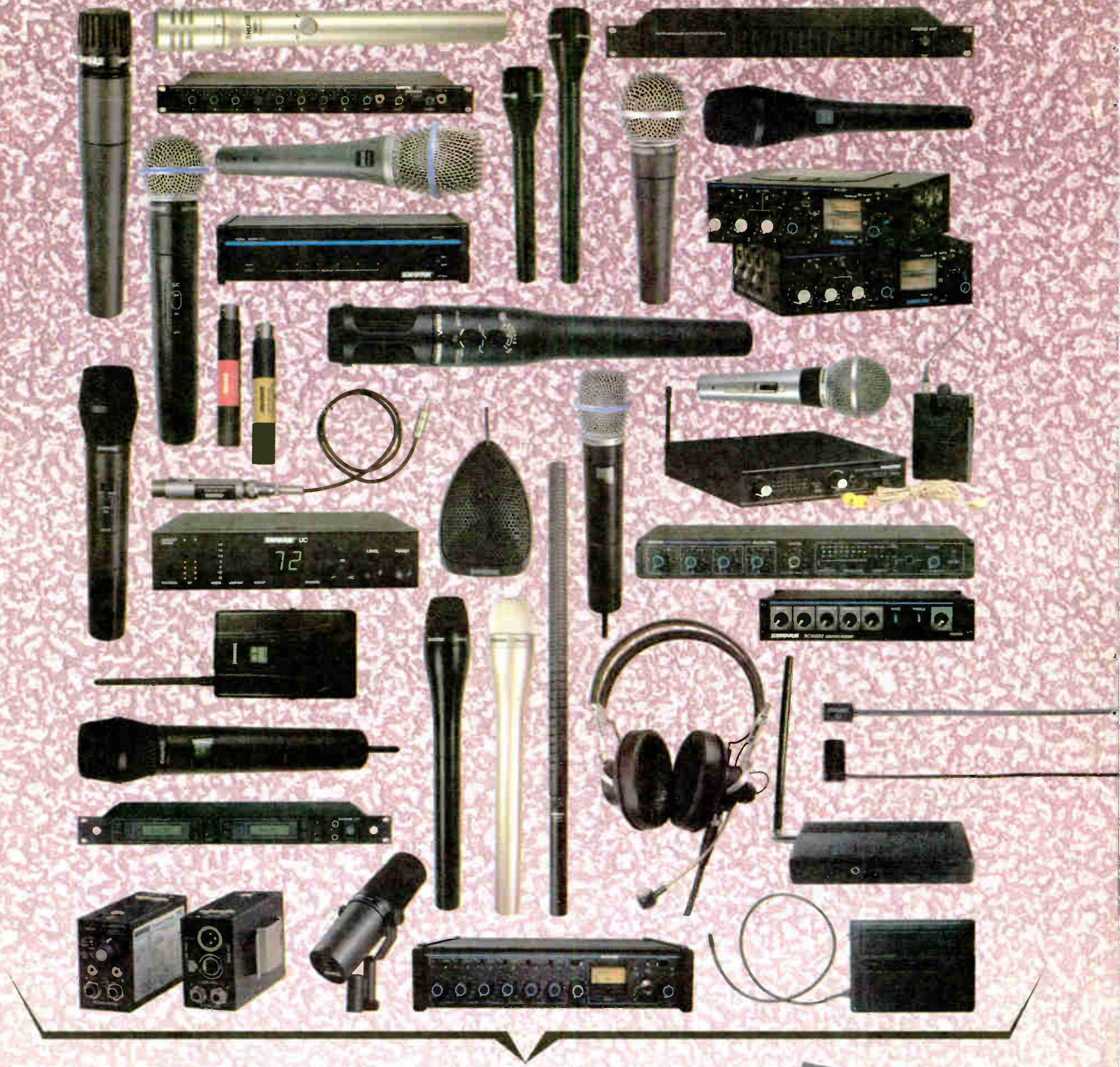

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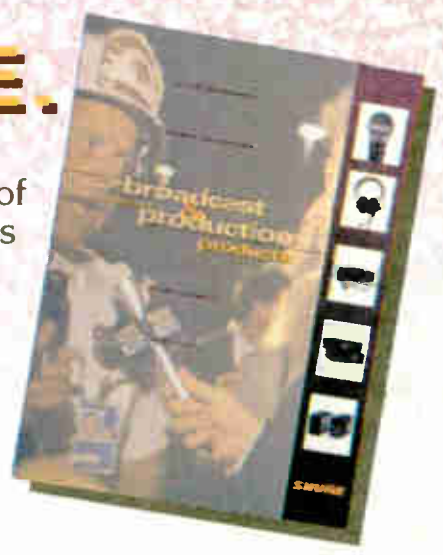

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GM Journal

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Radio World | Resource for Business, Programming & Sales | May 12, 1999

MARKET WATCH

Groups Invest in Providence Radio

Gail Hulbert

Were the country's No. 32 radio market to adopt a slogan, it would perhaps be as unoriginal as this: The more things change, the more they stay the same.

A feeling of sameness stems from listening habits here, which appear not to have changed amid shifts in ownership.

That's not to say there's been a dearth of activity in the Providence-Warwick-Pawtucket metropolitan area. On the contrary, this radio market has been riding the same wave of consolidation as the rest of the country since the government eased ownership limitations.

Not 'booming'

One industry-watcher declared the radio market in Providence as "not a booming market by any means."

Robert Maccini, director of Media Service Group Inc., a local broker of radio and television stations, should know. He has assisted in four Providence station sales in about as many years.

According to Maccini, half of Rhode Island's 26 commercial AM and FM stations have sold since 1996. Almost all of those — 11 to be exact — were acquired by three out-of-state giants: Clear Channel Communications, Citadel Communications and Atlantic Star Communications, a subsidiary of Capstar Broadcasting.

Relaxed ownership rules, beginning with duopoly in 1992, have affected the radio market.

"A lot of the mom-and-pop operations have gone away," Maccini said of the Rhode Island radioscape.

The fairly recent entry of Citadel in Rhode Island and, for that matter, the entire East Coast, illustrates the trend.

A series of acquisition announcements that began in spring 1997 concluded in November of that year, when Citadel closed on the last of six Rhode Island deals for a total of about $125.5 million, as reported by The Providence Journal.

In one package, the company bought two FM stations and an Internet provider owned by Philip Urso, whose family started in radio in 1964.

Robert Ames is shown on the air at WRNI(AM), Rhode Island's first public radio station. WRNI has been operating since spring 1998.

At the time, the properties operated as separate businesses. Bear Broadcasting owned WDGF(FM), Major Urso Broadcasting owned WDGE(FM) and Bear Broadcasting, LLC owned Edgenet.

The sale of four stations owned by Tele-Media Broadcasting of Bellefonte, Pa., added WPRO-AM-FM, WWLI(FM) and WLKW(AM) to Citadel's mid-size empire. WLKW became WSKO(AM) 790 The Score, replacing nostalgia with all-sports programming.

Urso, who became president of Citadel's Internet division (renamed eFortress), said he decided to sell based on Citadel's reputation and "the writing on the wall."

"I was watching rapid consolidation happen in the market and I sort of envisioned that things were going like a game of musical chairs," Urso said. "Things would eventually slow down and there'd be only so many buyers left."

With competition from clusters of group-owned stations, he said, small, independent stations "would face increasing challenges against groups of five or six stations."

Urso expected Citadel to achieve greater operating efficiencies and selling power and to keep a local profile. So far, he hasn't been disappointed.

"As far as anything really dramatic to the programming, Citadel hasn't done anything except improve it," Urso said. Under Citadel, WDGE(FM), or 99.7 The Edge, became WXEX(FM) but kept an alternative rock format.

Meanwhile, disco station WDGF(FM) was renamed WHKK(FM) The Hawk and assumed a new identity as a rock and roll oldies station.

Then The Edge began simulcasting The Hawk in January of this year.

There have also been shifts in on-air personalities. "They all stemmed from

See MARKETWATCH, page 38 ▶

Country Radio's Lost Listeners

Bob Millard

Country radio, still reeling from a disastrous Fall 1998 Arbitron book, is trying to figure out where its audience went and — more important — how to get it back.

At the 30th Annual Country Radio Seminar, held recently in Nashville, a presentation led by Larry Rosin, president of Edison Media Research, revealed possible reasons for the decline of listeners of country-formatted radio stations.

Mark Chesnutt, MCA Nashville, rocked radio executives at the 30th annual Country Radio Seminar.

If comments from broadcasters during the session "The Research Project: A Little Good News" represent the

See CRS, page 43 ▶

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Circle (138) On Reader Service Card

World Radio History

Rocking the Radio Boat

▶ MARKETWATCH, continued from page 37

(Citadel President) Larry Wilson's belief in local programming," said Andrea Scott, general manager of Citadel's Rhode Island operations.

"I also believe in local programming. I think people feel better hearing from someone who lives and breathes in their city and knows the issues," she said.

When veteran talk show host Mary Ann Sorrentino's long-standing contract with WPRO(AM) expired last summer, the station chose not to renew. Myrna Lamb, a local psychologist, columnist and radio personality, assumed the 10 a.m. to noon spot.

Around the same time, popular shock-jock Carolyn Fox joined the late afternoon lineup, following a career hiatus from No. 2-rated WHJY-FM.

Save for Rush Limbaugh, who follows Lamb, Citadel has steered clear of syndicated programming, Scott said.

Urso imagines that suits Rhode Islanders just fine.

In a state where the population grows at between zero and 3 percent a year, people "aren't looking for something new," Urso said. "People who listened to 'PRO when they were younger are still listening to it. If their parents like Lite 105 they assume they'll grow up and listen to it."

Citadel's don't-rock-the-boat approach appears to be working, or at least not causing any damage.

Hot 106 hosts 'Club Nights' in the city.

Revenues have grown, according to Scott. BIA estimates revenues in excess of $14 million for all six Citadel stations last year and ratings are more or less where they were when Citadel took over.

Citadel CHR station WPRO-FM and WWLI(FM), an adult contemporary-formatted station, are second and third. Citadel's other stations rank 6th, 11th, 12th and 16th in market revenue.

BIA estimated the total radio market revenue of Providence-Warwick-Pawtucket at $41.7 million in 1997 and $44.2 million in 1998. BIA estimates ad revenues will grow by 7 percent annually through 2002, a figure slightly higher than in recent years.

Scott said Citadel's advertising mix is status quo, with car dealers, furniture stores and general retail leading the pack. And she insisted little packaging occurs.

"We have a dedicated sales staff for each station," Scott said. "When an advertiser calls, the rep goes to all the other reps in the building and says 'What's the best use of their money,'" Scott said.

"Our goal is to maximize advertisers' results. It can't be competitive within the same building," she said, "What goes around comes around."

It's what could be around the corner that has small operators like John Maguire, president and chief operating officer of Back Bay Broadcasting, bracing for the future.

"I've seen a lot of packaging (of sales) out there," Maguire said. And, while it hasn't happened yet, "it could force the smaller operators to lower their rates."

Of course, Citadel isn't the only one Maguire worries about.

Clear Channel Communications bought oldies station WWBB(FM) of Providence and WWRX-FM, a classic rock station in Westerly, R.I., in December 1996.

Atlantic Star acquired Providence stations WHJY(FM), an AOR station and the revenue leader in the market, and news/talk station WHJJ-FM last May, as well as Taunton, Mass., station WSNE(FM), an

See MARKETWATCH, page 40 ▶

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Circle (38) On Reader Service Card

World Radio History

Radio and broadcast.com Go Yahoo!

Bill Mann

To broadcast analysts and stock traders, the March 31 deal in which giant Internet portal Yahoo! bought *broadcast.com* is a great match.

Yahoo! shares, which were already getting stratospheric, climbed another 30 percent in the two days after the deal was announced, and *broadcast.com* stock also climbed.

The $6.08 billion deal combines the Web's most prominent broadcaster of streaming audio and video programming with one of the world's leading Web networks serving more than 50 million people a month. The deal will be completed in the third quarter of this year, according to the companies.

"More people are getting their arms around this deal," said one analyst following the announcement of the deal. Andrea Williams at Volpe, Brown, Whelan & Co. still rated Yahoo! a "buy" after the deal was announced.

"*Broadcast.com* further strengthens Yahoo! and introduces a new revenue stream. In every way, it's strategic," she said.

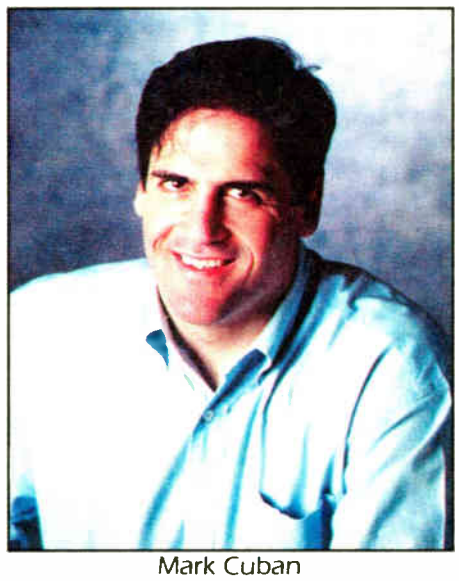
The audio and video services of *broadcast.com* work best on the kind of high-speed Internet-access services that will soon become common.

The new deal sets the latest remarkable chapter in the fast-moving career of Mark Cuban, the young entrepreneur who founded the Dallas-based company in 1995 and has seen the company's stock skyrocket since it went public last year. (The stock went up so fast, in fact, that NASDAQ briefly suspended trading in *broadcast.com*)

Cuban, who was profiled in our Nov. 11 issue, agreed to speak to **RW** again a few days after the deal was announced, to comment on what this deal means for his company and its radio clients.

***RW:** What will happen to the radio stations on* broadcast.com*? Who will be in contact with stations and group owners who have dealt with* broadcast.com*?*
Cuban: Nothing will change except that our station partners will get the benefit of having access to Yahoo!'s 60 million monthly visitors. Just think if just 10 percent go to our sites. We have over 410 radio stations and networks now. We have 49 television stations and networks.

***RW:** What will your role become?*
Cuban: Again, no change. Our companies complement each other so well, Todd Wagner and I will continue to run *broadcast.com* as we always have.



Mark Cuban

***RW:** Why is this sale a good thing for* broadcast.com*?*
Cuban: We are awesome at streaming media. Combine that with Yahoo!'s audience, and Yahoo!'s skills in so many other categories, like personalization, auctions, calendars, classifieds, and you will see us be able to offer new and unique services to our stations that *broadcast.com* alone would have taken awhile to get to.

Things will happen a lot faster and bigger for our partner stations.

***RW:** How does your partner Todd Wagner feel about the deal?*
Cuban: We both are very, very, very, very, very happy about it. Did I say we were very happy about it? (laughs)

***RW:** Where will you employ your entrepreneurial spirit next?*
Cuban: There is no next. Yahoo! and *broadcast.com* together will create new opportunities.

My next goal is to focus on helping our stations achieve greater 9 a.m. to 4 p.m. AQH (average quarter-hour) over *broadcast.com* than they get over the air, and I think we can get there with quite a few of them.

Then we will help our stations introduce new technologies from personalized ads to video and who knows what else.

***RW:** Why did you start the company? How did you deal with the rapid development of technology?*
Cuban: It's been a long, short time. Todd and I have loved this business and will continue to do so.

When we started this with KLIF in the second bedroom of my house, we knew we had the chance to create something special, that the Net was, and is, a new broadcast medium, and that there was a chance for us to become the lead.

That is why we did it. Somebody had to be the Ted Turners and Mel Karmazins of the Internet age, and we wanted it to be us.

How do I deal with the technology?

I love it. I'm the guy with six computers in that second bedroom and I will install and use every piece of software I can.

New streaming media server from Microsoft or RealNetworks? I install it and try it. New codec from Intel, same.

My bedtime and dinner reading is either trade mags, like **Radio World**, or printouts of manuals I download

See YAHOO!, page 43 ▶

Yahoo! Aims for Leader of The Internet Pack in Y2K

The *broadcast.com* deal is the second big one for Yahoo! this year.

In January, the Santa Clara, Calif., company bought Web service GeoCities Inc.

Internet industry watchers indicate that most of the leading Web companies are looking for strategic acquisitions like *broadcast.com* that reflect the convergence of computer, broadcast and telephone services with commerce, information and entertainment.

Todd Wagner, *broadcast.com* chief executive officer, said the possibilities have become a reality much more quickly than any of the industry techies, himself included, anticipated.

Wagner likened the quality of audio on the Net just a few years ago to that of an AM radio.

In comparison, the advancements. Wagner characterized audio on the Net today as "nearly CD quality."

Yahoo!, which earned $25.6 million on revenue of $203.3 million in 1998, is buying a company (*broadcast.com*) that had a loss of $16.4 million last year on revenue of $22.4 million.

In the wake of the deal, many analysts and investors are speculating that the purchase of *broadcast.com* will help differentiate Yahoo! from rivals Excite and Lycos.

Jeff Mallet, president of Yahoo!, said in a public statement following the announcement of the *broadcast.com* deal, there will be three companies emerging from the pack at the end of the year 2000.

Mallet predicted Yahoo!, Microsoft Network and America Online will become the top Internet companies in the country.

He said the three are "clearly starting to separate themselves from the pack."

Chief Executive Officer of Yahoo! Tim Koogle stated, "The acquisition of *broadcast.com* is a natural extension of our strategy to deliver the ultimate experience to Web users and a powerful advertising and distribution platform for both companies' content, advertising and business service providers."

— Bill Mann

Circle (105) On Reader Service Card

World Radio History

Rhode Island Public Radio Debut

▶ MARKETWATCH, continued from page 38

adult contemporary station ranked fourth in revenue in the market.

Nonetheless, Maguire considers this an exciting time to be in radio.

Back Bay Broadcasters, owned by Maguire and the Peter Ottmar family, is an example of what Maccini called "a hold-out" that is growing.

Its flagship station, WWKX(FM) of Pawtucket, has found success with a rhythmic top 40 format and the addition of Howard Stern to the morning drive.

Back Bay increased its market for Kix 106 in April 1997 when it acquired WPJP(FM) from Full Power Radio of Narragansett Inc., renamed it WAKX(FM) and began broadcasting the same format.

Back Bay also owns WLKW(AM) in Pawtucket, an easy-listening station patterned after the old WLKW-FM.

The station, with its small but loyal audience of mostly older listeners, ranked in the No. 9 spot in listeners.

To keep from being priced out of the market, Back Bay Broadcasting hopes to do some buying of its own, Maguire said, but probably not close to home.

"In this particular marketplace the players are so big that it's not like we're going to step up and buy two Clear Channel stations," Maguire said. "We're looking to other markets to grow."

And if Back Bay were approached to sell before that?

"The truth of the matter is we're having a lot of fun now and we're not ready to sell," Maguire said. "It would have to be something ridiculous."

Not all the movement has been in commercial radio. Last spring, Rhode Island shed its insular reputation as the only state without a National Public Radio presence.

That's when Boston University, owner of Boston's highly successful WBUR-FM, paid Neto Communications $2 million for WRCP(AM), a 5 kW station broadcasting Spanish-language programming.

Renamed WRNI(AM), the station began broadcasting its noncommercial format on May 1. (WRNI ranks 26th in listeners, according to BIA.)

In January, the university anted up another $300,000 for a 1 kW repeater station, WERI(AM), on the state's southernmost tip. It was renamed WXNI.

In the absence of ratings, it's difficult to gauge WRNI's impact on commercial radio. However, Maccini guessed "it's been very minimal."

Public radio stations "tend to appeal to a certain demographic that is better educated and more affluent" than the average listener, Maccini said. It's also harder for a newcomer to the AM band.

If WRNI were on FM, "it would have a much greater impact in terms of taking away listeners and being able to compete for sponsorships," he said.

While large radio corporations have devoured the strongest Rhode Island stations, Maccini expects limited buying and selling to continue.

There remain some owners before whom carrots will be dangled, he said.

Peter J. Ottmar

Providence-Warwick-Pawtucket Radio Snapshot

Market Rank: 32
Revenue Rank: 52
Number of FMs: 16
Number of AMs: 21

Estimated Revenue:
1995: $36.3 million
1996: $37.5 million
1997: $39.0 million
1998: $41.7 million
1999: $44.2 million

Revenue Growth:
'92 - '97: 6.9%
'98 - '02: 7.0% (est.)

Local Revenue: 75%
National Revenue: 25%

1997 Population:	1,502,000
Per Capita Income:	$16,500
Median Income:	$35,300
Average Household Income:	$43,742
EBI (effective buying income):	$24,244

BIA RESEARCH

Source: BIA's MEDIA Access Pro

Providence-Warwick-Pawtucket, R.I.
Radio Market Overview

Stations	Owner	BIA's 1998 Est. Station Revenue (in $mil.)	Format	Winter 1998 12+
WWLI(FM)	Citadel	5.0	AC	9.2
WPRO-FM	Citadel	3.8	CHR	7.3
WHJY(FM)	Atlantic Star	6.6	AOR	6.5
WWBB(FM)	Clear Channel	4.1	Oldies	5.9
WCTK(FM)	Hall Communications	2.5	Country	5.1
WSNE(FM)	Atlantic Star	4.7	AC	4.9
WLKW(AM)	Back Bay Broadcasters	0.5	Easy	4.9
WPRO(AM)	Citadel	3.1	Nws/Tk/Spts	4.4
WWKX(FM)	Back Bay Broadcasters	1.8	Urban	4.2
WHJJ(AM)	Atlantic Star	1.0	News/Talk	4.2
WBRU(FM)	Brown Broadcasting	1.9	Alternative	3.3
WWRX-FM	Clear Channel	3.2	Clsc Rock	3.1
WHKK(FM)	Citadel	0.8	70s/Oldies	1.9
WXEX(FM)	Citadel	0.6	Alternative	1.3
WNRI(AM)	Willow Farm Inc.	0.4	Talk/Nostlg	0.6
WADK(AM)	Westerly Broadcasting	0.3	News/Talk	0.5
WARV(AM)	Blount Communications	NA	Religion	0.4
WSKO(AM)	Citadel	1.0	Sports	0.3
WAKX(FM)	Back Bay Broadcasters	NA	Urban	0.2
WPMZ(AM)	Video Mundo	0.4	Spanish	0.0

BIA RESEARCH

Stations are ranked in order of Arbitron Winter '98 12+ share. Copyright 1999 The Arbitron Company. May not be quoted or reproduced without the prior written permission of Arbitron. Other information provided by BIA Research through its MEDIA Access Pro Radio Analyzer Database software.

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World Radio History

PROMO POWER

Why Joe Radio Has No Character

Mark Lapidus

Caution all disc jockeys: The following message may severely injure your ego!

And your reaction to it can help determine your success. Here goes: Even though you may say your name a dozen times an hour, most of your listeners have no idea who you are or what you represent.

If this doesn't bother you, then that's okay. You may fit in just fine with the format in which you have chosen to work.

Being a plain old Joe Radio also allows you to move with greater ease from station to station, because you meet the listener expectation that you sound like a radio announcer.

Connect with fans

But if being unknown for anything does rub your ego the wrong way (and I hope it does), you can change your future if you're willing to challenge yourself.

Ask yourself this question: How is it that character actors can appear in just a few movies and become known to the general public?

This challenge to emote becomes complicated because it's different for every person.

Well, of course being able to see the actor helps but I believe that the answer is in the word "character."

Characters have quirky, easily recognizable personalities. This doesn't mean that they talk a lot or even appear in most of a two-hour movie. What it does mean is that they've connected emotionally with the audience in a memorable way.

This challenge to emote becomes complicated because it's different for every person. There are a few threads among the most attention-grabbing personalities.

1. Strong opinions that are continually repeated are attention-grabbing.

2. Proactive character development, when the disc jockey develops his or her own schtick without waiting for every move to be approved by someone else is a good way to grab attention. However, this involves taking risks.

3. Learning and then staying on top of topics that are important to the target audience you're attempting to entertain is worthy of listeners attention.

4. Having a unique voice or at least being able to use your voice uniquely will grab the attention of listeners.

5. Imagining that at some point, a move will be made out of music radio and into talk radio. Moving into talk radio certainly doesn't have to be a goal, but striving to be entertaining enough to do that format is important.

Character coaching

There are few natural talents in radio. Most of us have to learn the hard way to be concise, speak extemporaneously, lose obvious signs of nervousness and operate equipment seamlessly.

Once this behavior is internalized, we become professionals and hopefully move to larger positions. Sadly, this is when the growth stops for most and routine delivery becomes the rule.

Fear sets in and rather than ask the program director for character development coaching, we simply try to do the format by the textbook and wait for the pat on the back for hitting a post or flawlessly promoting an event.

All of us have aspects of our personalities that can be pushed toward becoming a little more interesting. This often requires exaggeration and experimentation.

The universal mantra

It sometimes means being known for or linked to something important to a particular city. Sometimes it also means switching to a format more suited to our natural lifestyle or age. "Let's develop talent in the small markets" has been a universal mantra in the industry for as long as I can remember.

While I respect this sentiment, I don't understand why we don't spend more time encouraging talent that already have the basics down cold to push to the next level.

Can DJs emulate actors rather than other disc jockeys?

The best can. The rest will have to learn to be happy as Joe Radio.

■■■

Mark Lapidus is president, Lapidus Media.

Reach him via email at lapidus@erols.com *for programming and marketing consultation.*

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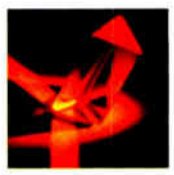
profit goals set before you? How

can you compete with the duopoly across town? It is a given that virtual radio must be part of your arsenal if you are to compete. How do you choose which digital automation system to depend upon? What if we assure you of no off-air time?

Let us give you a system that can accommodate growth from one or two



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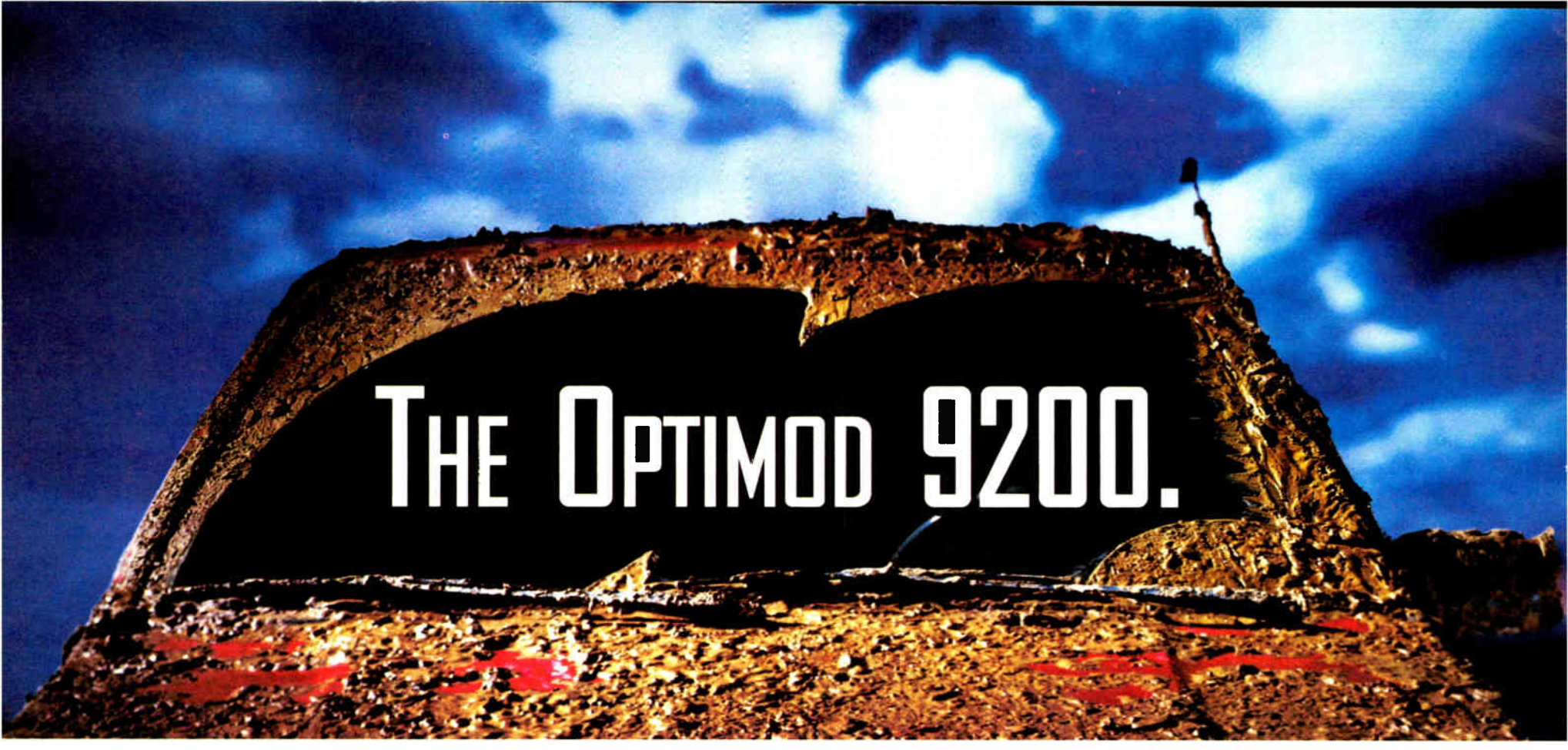

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World Radio History

A New Audience for Country Radio?

▶ CRS, continued from page 37

indtry's comprehension of the slump, country radio is not yet grappling with the reality of the decline, much less its probable cause.

Nationally, the fall ratings for country music are being interpreted as a wake-up call for a format that has been in steady decline for the past five years.

Where did they go?

It now appears that country radio's 12.8 percent share of all listening among those aged 12 years and older in 1994 represented the zenith of the format.

The format would have to enjoy a 33-percent jump in listenership to get back there, as Arbitron ratings indicate by the 9.6 percent share in listeners 12+ that country formats delivered last fall.

Rosin was session leader and statistics distributor for the session, probably the most controversial of the CRS week at Nashville's downtown convention center.

The study looked at six markets and found losses of listeners all across the board.

Rosin said CRB paid for the research but didn't provide enough money to conduct what he referred to as "a true national survey." He said the six-market study was the next-best thing.

First, Rosin summarized Arbitron ratings over the past five years for country radio. Demographics start this story. Between the winter 1994 Arbitron ratings and the Fall 1998 book, country radio nationally lost 26 percent of its men 18 and over.

The strongest group in the demographic radio universe, women, was down 20 percent.

And the kicker was in teenage listeners, down more than half.

Overall, every commonly measured age group has dropped, regardless of gender bias, according to Rosin. Listening among the 18-24 age group dropped 32 percent, which he described as a very significant drop.

The 25-54 demo group declined 25 percent. "This is the group that a lot of country stations focus on," he said.

The 35-44s were down 23 percent, the 45-54 segment took "a 34 percent drop if you look at it nationally," Rosin said.

Declining demos

"The three demos that have declined the least are women, targeting women 25-44 more narrowly, and that's who they've held onto most," Rosin said.

Still, he reminded broadcasters that one out of five former listeners have stopped listening to country radio.

Rosin presented his own research findings and interpretations of the six-market study.

His survey markets were Houston, Phoenix, Greenville, S.C., Charlotte, N.C., Dayton, Ohio, and Rochester, N.Y.

His presentation was built upon comparing and contrasting the methodology of programmers, the chart behavior of "hit" records, the number of chart toppers and the corresponding listenership gains and losses among country, and adult contemporary and hard rock formats.

Findings

One of his findings was echoed by programmers at CRS '99: country listeners were moving toward adult contemporary and hard rock formats — if indeed they were going anywhere on the broadcast dial. In-dash CD players, some felt, have also drawn off former radio listeners.

Most disturbing to Rosin was the geographic locations of the worst retrenchments: country music's traditional heartland.

There were dramatic drops in audience share in the South Central region of the country, with a top station in Houston losing 50 percent of its audience.

The loss in Houston is part of a regional drop in audience share of 30 percent overall.

KYNG(FM) in Dallas lost 36 percent in its 12+ audience share.

Photo credit: Shelker Photography

Larry Rosin, president of Edison Research, addressed the crowd at CRS30.

In sharing these objective findings and comparisons, Rosin rhetorically took country radio to task for an incestuous relationship with record labels that worked to no one's benefit.

Rosin said even as country radio managers complained that the quality of songs from artists had declined, they reported 44 No. 1 hits to trade charts last year, compared to 11 for hard rock and 12 for adult contemporary.

"If it is true that the records are not as good, I think this has huge implications

See CRS, page 44 ▶

Cuban Eyes World Of Wider Bandwidth

▶ YAHOO!, continued from page 39

from the Net.

If I can't sleep, I read the software license agreements. I can recite to you the melodrama of plug-ins from the RealNetwork servers to the excitement of event triggers in the Windows Media Technologies encoders.

I sometimes actually get a little concerned about my sanity because I find myself getting really excited about new features in software. It's sad, but it's my life and I like it.

broadcast.com

***RW:** Tell us about your IPO. What was contingent on this move? Would Yahoo! have been as interested if you hadn't gone public?*

Cuban: The IPO was exciting. It was the biggest in history to date, and it was an amazing experience. I remember watching the stock open and thinking 'Oh my God, look at how high it is,' then thinking 'Oh my God, I don't have time to celebrate, I have to go to work and earn this valuation.'

The IPO gave us the chance to speed up our focus on becoming the leading Internet broadcaster.

***RW:** When RW spoke with you last year, you discussed streaming. You said that, once technology is up to speed and we can hear audio without buffering or Net interference, the average person being able to watch* video *almost goes hand-in-hand.*

Cuban: We are in a digital world now. As the amount of bandwidth to homes and businesses gets bigger, you can do more things. It's like a PC, the faster it is, the more things you can do. So, as cable modems and ADSL become more prevalent, people will be able to experience very high quality video.

Remember, the video of today is the worse it will ever be. It can only get better.

***RW:** Will radio become an interactive medium and gain an entirely new audience? How far away is all this?*

Cuban: We did research that says only 32 percent of white collar office workers even have radios at work, while more than 95 percent have PCs with Internet access. That's 68 percent of workers who will be available to radio that didn't used to be. This means there is a big audience at work waiting to be captured by *broadcast.com* stations.

As more and more people use Internet radio at work, they will expect better experiences and this is where personalization will come in. It's not years away, probably 18 months away.

— Bill Mann

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Bob's credentials for capturing the attention of young adults is impressive:

- Nominated five times as Lecturer of the Year by Campus Activity Today... Bob has appeared on stage at over 250 college campuses.
- Widely published newspaper and magazine columnist including Mother Jones On Line, The Funny Times, Z and National Lampoon.

Want more? - Bob is a five-time *Jeopardy* champion, author of "Cramming 101" and has received accolades like these: "wickedly observant" - (Chicago Tribune), "One of the most talented political comics performing today" - (Cleveland Plain Dealer)

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World Radio History

Country Lacks Call-Out Depth

▶ CRS, continued from page 43

for how you guys run your radio stations," Rosin said.

He asked the crowd, "If this is your excuse, if this is what you are blaming, why are so many records good enough to make it to No. 1 every single year?"

He further challenged the turnover in the top 15. In 1998, he said, 118 songs by only 50 artists made the top 15 in country music stations, compared to contemporary hit rock stations which offered 73 songs by 58 different artists in their top song charts.

Several programmers said they ditch new artists sooner because record company promotion executives tell them to.

Programming clues

Rosin struck a nerve in the crowd when he suggested that country radio is eating its young because hits by new artists are consistently under-identified and mediocre songs by name acts given preference because of radio's loyalty to its "stars."

Programmers rose with defensive questions and observations. Several said they ditch new artists sooner because record company promotion executives tell them to.

"I don't understand that argument," Rosin said. "Do they come in with guns and say you must drop this record now or it's over?"

Rosin said he saw a paucity of call-out research by country radio, while hard rock and adult contemporary rely heavily on that for programming clues.

Robert K. Oermann, a columnist and music reviewer, has been known to criticize big artists for poor songs and berate programmers for ignoring fresh, unknown artists.

He was blunt in his assessment of country radio programmers' use of call-out research.

Rosin summed up with positive suggestions. Country radio, he said, must program their stations based on call-out surveys, and based on songs rather than artist names.

It should widen its focus from females in drive time to more categories of radio listeners, including the growing legions of at-work radio listeners.

Perhaps typical of broadcasters' and programmers' attitudes was the response of one man who stood up near the end of the session to suggest country radio could be stronger if more artists visited their stations.

"We're so loyal to them, then why aren't they loyal to us? When was the last time anyone in here had the Dixie Chicks at their radio station?"

■■■

Bob Millard is a free-lance reporter based in Nashville.

He covered the National Religious Broadcasters Conference for ***RW*** *earlier this year.*

NEWS ANALYSIS

Execs and Artists Deal With Country's Decline

Bob Millard

The mood at the 30th annual Country Radio Seminar in Nashville was ambivalent at best.

Participants hunkered down in survival mode and many program directors and station managers reeled from disastrous Fall Arbitron books, as the country format seemed to continue a five-year slide.

The radio format's decline was further evidenced by lower registered attendance.

Fewer exhibitors showed up to sell

See NEWS ANALYSIS, page 45 ▶

Dick Clark gets help from country radio broadcasters and recording artists at CRS30 in Nashville.

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Circle (181) On Reader Service Card

World Radio History

▶ NEWS ANALYSIS, continued from page 44

goods and services to the broadcasters.

Registration totaled 2,180, representing a 6 percent decline from last year. Radio-related attendance was up 1 percent.

Lackluster

Showcases and "meet 'n' greets" by new artists seemed lackluster. Fearing country radio's infamous backlash against any perceived slight, some artists showed up to perform when they should have been in the hospital.

Billy Ray Cyrus, who is attempting a comeback in radio, made a brave but naturally subdued appearance only hours after the death of the stepfather who had reared him.

Radio personnel for the first time in memory left many tables empty at the normally hot-ticket New Faces Show and Dinner. Of those who came, approximately half walked out well before the end.

We all ran around ... buying up stations and saying, 'We'll figure out what to do with them later.' Well, welcome to later.

— Bill Figenshu

The New Faces talent was by and large retreads, songwriters taking an artist flyer, limited vocal ranges and other curiosities. One band misfired the tempo of its opening number; another seemed better suited to the college alternative rock circuit.

Chad Brock of Warner Bros. was the only New Face with a top 10 record. The most audience-stirring talent was Shane Stockton, temporarily without a label due to Decca Records' closing earlier this year.

How to beat buyouts

Sponsor Country Radio Broadcasters served up several educational sessions focused on the continuing trend toward industry consolidation, including "The Indispensable Manager," giving station managers tips on keeping their jobs in a downsizing buyout.

On the more broadly-focused Group Executives' Panel were Carl Gardner, new president of Radio Journal Broadcast Group; Larry Wilson of Citadel Communications; Dick Ferguson of Cox; and Bill Figenshu of CBS.

Panelists agreed that broadcast giants such as Infinity and Clear Channel were likely to continue acquisitions and become bigger group owners. Consolidation is a trend in all of corporate America, but the country slump is forcing acquirers to go hands-on with their newly acquired country properties where necessary.

"What we're going through is what all America is going through," said Figenshu. "We all ran around the country buying up stations and saying 'We'll figure out what to do with them later.' Well, welcome to later."

Two issues that relate to new group ownership involved sales and handling sales accounts. With general business consolidation, salespeople for individual stations need connections with national reps from parent companies.

Selling the big accounts for a family of stations offers a certain economy of scale, but there are more hurdles to leap to get it done.

"Ad buyers are no longer small businessmen on Main Street," said Ferguson. "We have to sell big corporate guys who are insulated (from us) by ad agencies."

Hurdles to leap

While the group execs said consolidation bore no blame for the decline of country cume, Figenshu recognized that stations that are flipped as often as thrice a year are understandably off-balance.

"Consolidation has distracted the (general and program) managers at some of these stations," Figenshu said. "But you also have had changes in demographics in major markets, ethnic changes, and that has had a big impact on a format that is essentially white and middle class."

Looking forward, Citadel's Larry Wilson said he was betting a lot of money on a country comeback. AC and CHR formats are simply playing better music and building new stars better than country radio has done in recent years, he said.

He suggested that radio and labels should probably make some mutually beneficial arrangement for developing "baby acts," a thrust his panel mates failed to second.

But all agreed that it wasn't consolidation, as a business practice, that hurt ratings.

"Listeners are not caught up in consolidation," Wilson said. "They just want to hear music that moves them. The customer is always right. If AC and CHR are cherry-picking country's top artists, maybe country should bring some AC and CHR hits over their way."

No apparent consensus on curing the format slump was reached at the show. Publicly, the industry put on a face of general optimism, as if cycles of boom and bust were predictable laws of physics, rather than the result of losing touch with listeners.

■■■

Free-lance reporter Bob Millard is a long-time attendee at the Country Radio Broadcasters annual seminar.

***RW** welcomes other points of view.*

Photo credit: Shelker Photography

Citadel's Larry Wilson was part of the session 'Right on the Money.'

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World Radio History

A Few of My Favorite Things

Alan Haber

We live in an age of lists. You probably make a few of them yourself: a list to take to the grocery store, a list to remind you to do a bunch of things you probably won't have time to do, a list to remind your next door neighbor to feed the cat and water the plants while you're on vacation, a list to remind you to remind your neighbor to feed the cat and water the plants while you're on vacation.

We critical types ... well, we like to make lists, too. All kinds. We like to show off how much we know and how much you don't. Or is it the other way around? That depends on how good our lists are, I guess.

So here's mine — a list of favorite radio station Web sites and streams.

Now, if you ask me if I would make the same list, say, tomorrow, I probably would.

Or wouldn't, depending on my mood. Lists are subjective, and subjectively speaking I'd be a liar if I said this was an engraved-in-stone kind of deal.

I mean, ask me tomorrow and I might have by that time found another site that I simply love, darling, that would bounce No. 6 off the list.

Or maybe No. 5. Doesn't matter. Here are 10 of my favorite sites and streams. In no particular order, just in case one or two of them slide off the scale for whatever reason.

Radio 10

I featured this station's site in this column not too long ago and I could feature it every month without flinching.

What a great-looking compendium of Web pages. And, if I translate my Netherlands-speak correctly, it's ABBA month on Radio 10!

A simply stunning design and one of the best-sounding audio streams around make this site a frequent stop on my radio-related Net travels.

Radio 10's Web site is located at *www.radio10.nl* on the Internet.

CTSNET

No real design-o-rama here — just a great sounding '50s, '60s and '70s oldies channel that frequently eschews the hits for bubbling-under and album-cut types.

You can also listen to popular and dance music channels, and you might if you are so inclined, but the good old days are what turn me on.

Find CTSNET at *www.on-air.com*

KING-FM

Pardon the pun, but this is truly the king of classical radio on the Net. Long one of my favorite stations *period*, KING-FM is a classical music-lover's paradise.

The site offers enough information to satisfy even the most voracious among you, and you know who you are.

And the station's live stream is crystal clear and extremely satisfying.

KING-FM is located on the Net at *www.king.org*

Eldoradio

I stumbled upon this site and I'm so very glad I did. This station, Webcasting from the Czech Republic, offers only one English page on its site, but so what?

With its mix of American and Czech country and western and folk and bluegrass, you won't need to look at your screen.

Just listen and marvel at the wonderful sounds coming out of your speakers. Absolutely essential — especially for the more adventurous among you.

The Web site address for Eldoradio is *http://live.eldoradio.cz/index_us.html*

WFMU(FM)

Lots of playlists and info and it's neatly designed, but you come here for the live stream for one of the most interesting radio stations operating today.

And it's freeform, no less. In this age of consolidation and tight formats? *Oy vey.*

WFMU's live stream, is located at *www.radio.broadcast.com/radio/public/wfmu/* and the Web site address is *www.WFMU.org*

Billboard Hot 100 on Billboard Radio.

This is plain and simple pretty cool fun — a rundown of some of the biggest hits from the current week's Billboard Hot 100 chart, hosted by none other than former **Radio Worlder** Chuck Taylor. The next Casey Kasem in the making? Check you on the flip side, Chuck!

Visit Chuck on the Web at *www.broadcast.com/music/billboard/100.html*

Boom Box Radio/Remember When

Part of the Nordic Online Radio group, which offers a variety of different music channels, this is another cool oldies outlet.

The Webcast is in glorious 16.1 kbps mono, the music mix is eclectic, and it sounds great. Couldn't ask for more, really.

Find Boom Box Radio at *http://radio.network.nordicdms.com/site/NEW/station/REMW*

Yesterday USA

There's nothing like radio drama to remind you of how old you are. And the power of radio — how radio can immerse you in the simple act of imagination. Yesterday USA does it like they mean it.

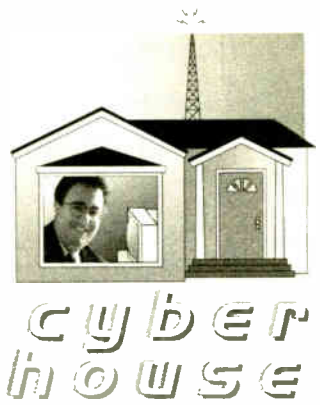
The Web site address for Yesterday USA is *www.broadcast.com/radio/oldtime/yesterday/*

WLNG-FM

Truly a station, like the proverbial fish, out of water. Plenty of echo (even on the commercials), re-sung PAMS jingles, great music, and such tried-and-true old programming stalwarts as Swap and Shop.

A great from-Long-Island listening experience. Hey, is it 1965 or *what?*

Find WLNG-FM on the Web at *www.wlng.com*



KPIG(FM)

The site address for KPIG on the Web is *www.kpig.com*

So there you go. Ten very satisfying stops along radio's big ol' corner of the cyber-highway. Go on and listen and look. Make your own list. Enjoy. And while you do, I'll be making another list of things I'm going to discuss next month. A bunch of things, to be exact.

See you then.

COMING SOON

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GM Journal

- Global Media and Its Big Plans for Radio
- Microsoft Media Player — A Review
- Special Focus on Traffic and Billing Services

Only in

Radio World

Circle (46) On Reader Service Card

Telos Systems/Cutting Edge Appoints Sacks

Telos Systems and Cutting Edge announced the appointment of Marty Sacks as national sales director.

Sacks began his career in broadcast engineering in 1976 in Washington, D.C. He comes to Telos/Cutting Edge from Pacific Research & Engineering.

Telos Systems is a manufacturer of ISDN, digital network and telephone interface products. Cutting Edge is a manufacturer of digital audio processing equipment for radio and television broadcasting. Both are headquartered in Cleveland.

Backus Joins Enco

Don Backus has joined Enco Systems Inc. as sales manager.

In his new job, Backus will be responsible for interfacing with customers and Enco's distribution network, as well as participating in the definition of new features and functionality for the DAD product line.

Backus previously served as digital systems manager at Audio Broadcast Group.

Harris Promotes Maines

Harris Corp. has promoted Chuck Maines to the position of radio district sales manager. Maines will service Alabama, Louisiana, Mississippi, Tennessee and the northern panhandle of Florida.

Maines is a 20-year broadcast industry veteran. He began his career with Allied Broadcast in 1978 when he joined broadcast sales. In 1987 he was promoted to the senior sales staff of Harris-Allied. Maines has also served in used equipment sales and as the first radio group sales manager.

World Radio History

Studio Sessions

Radio World — Resource for Radio Production and Recording — May 12, 1999

Laptop Tracking

See Page 49

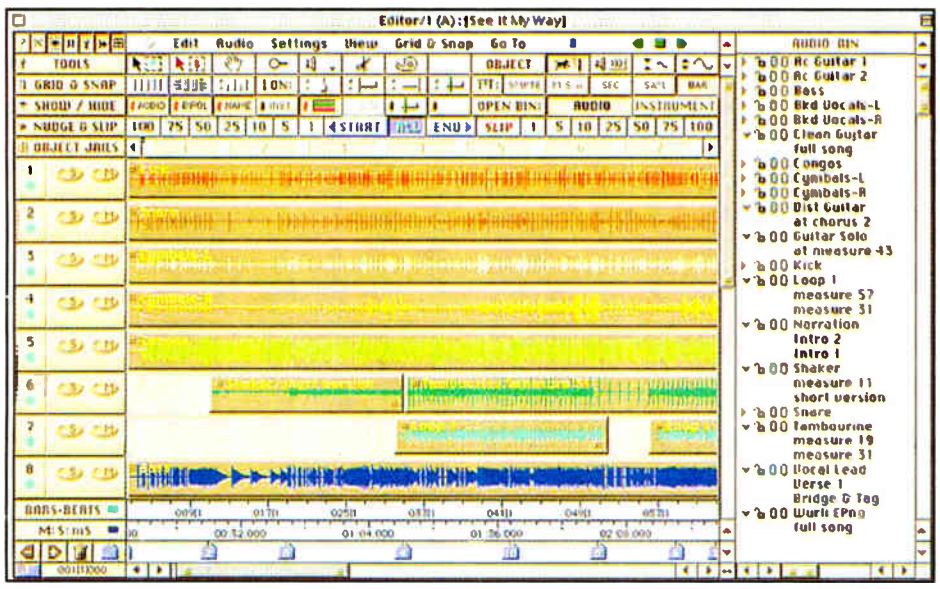
PRODUCT EVALUATION

PARIS Champ Performer in Studio

Alan R. Peterson

Part II of II

In Part I of the Ensoniq PARIS review, we went over the basics of the system and discussed the hardware controller. Here in the second look-see, PARIS is installed in a typical PC and is brought up to speed.



A Screen Shot of the Paris Playing Field

Several times in this article, I will be drawing comparisons to SAW from Innovative Quality Software and the Orban Audicy, only because these appear to be two of the more widely used PC-based products in radio production rooms. Apologies to all Mac aficionados.

For folks that like to know every last wrinkle of their computer as an editing tool (and then some), the PARIS may be the ultimate puzzle. Compared to other digital audio editors favored for radio production, there is a lot you must do to get it running.

Consider the Audicy, an out-of-the-box DAW that comes to life almost right after plugging it in. Or SAW, which loads and runs within minutes on a plain vanilla PC. Both are simple to set up and run. The PARIS EDS-1000 PCI hardware card must be installed into a computer, connected to its optional external interface and then set up. Frankly, you had better know what you are doing inside one of these babies.

Fortunately, if Windows or the MAC OS is doing its job, installation need not be a headache. An EDS-1000 audio card will fit only into a PCI slot, so there is no mistaking where it goes inside your machine.

Windows 95 or 98 should auto-detect the card after powering back up (you *did* turn the PC off to put the interface inside, right?). You will be prompted by Windows to locate and install the driver disk, then do a few keystrokes to launch the PARIS installer. A few diskettes later, reboot, and you are off to the races.

Mac users have it a little easier, according to the manual. Insert the floppy, double-click the PARIS Installer icon, and, with the exception of the computer asking for additional floppies, you may as well go out for coffee until it finishes.

I actually found installation to be quite effortless on a Pentium II-333. This is in contrast to postings I see on Internet newsgroups, asking for assistance on their equipment because of *Config* or *.Ini* problems. Either I am very lucky or a better computer technician than I thought.

When PARIS is started, a CD-ROM demonstration disc is inserted. Up comes a demo file called "See It My Way." It exists in two different iterations: one with automated mix and one without, so you may affect your own mix decisions on the piece and get familiar with the system.

PARIS stores an audio project with a *.ppj* extension. It would be nice if there were some standardized cross-platform means of sending a multitrack project from, say, a PARIS into a SAW or a Digigram Xtrack, and have all data and parameters understood. As it is, each manufacturer has its own way of naming a project. For example, the Quartz workstation from Canam Computers creates a *.qap* extension, while the aforementioned Xtrack amusingly labels working projects with *.tit* (for *title*).

On the field

Once I got PARIS set up and running, I dove first into a project consisting simply of pulling Objects (WAV files) out of earlier projects and tacking them together in the Playing Field — remember from last time that this is the multitrack window where edit and mix decisions are made. My second pass was with all original recorded material from CD, mic and effects processing.

Viewing numerous tracks can get confusing, especially when some of the tracks are scrolled beyond the bottom or top of the screen. In the case of SAW, pressing one of the Function keys clicks open a predetermined view of the workspace. In PARIS, "local views" are accessed by the View Mode button on the Control 16 hardware mixer surface. Up to 99 different local views can be memorized and clicked open when desired.

The simplicity of editing and cloning tracks in PARIS is, in my opinion, without equal in terms of a PC- or Mac-based editor. A constant-running timeline Ruler

See PARIS, page 51 ▶

PRODUCT EVALUATION

FX Collection Is 'Larger Than Life'

Sallie Schneider Sauber

With a lot of sound effects collections, you will likely spend more time trying to decipher the source than you will spend being moved by how true to life the sound is.

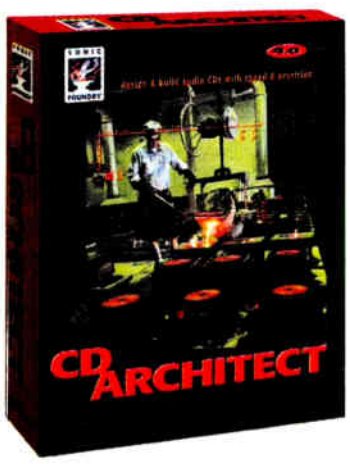
The problem is when a sound stands alone without a visual image to guide us along — as in a radio commercial — we can be misled if the effect is not a good representation of its intended sound.

Sound Dogs, Inc.™

With television and in movies, we can actually see what we are supposed to hear, even if the corresponding sound effect isn't produced very well. Radio, too, can be a *visual* medium when done right, but when the dishwasher sound effect sounds more like a toilet flushing, the commercial loses its power of persuasion as it loses the listener.

I have found that even the simplest of sound effects usually needs a boost of low end or a lot of reverb to really make an impact in radio commercials. For example, I produced a hard-sell ad for a bargain furniture store whereby the word "blowout" was

See SOUND DOGS, page 53 ▶



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CD Architect is the professional mastering software that's accessible to untrained users. It verifies Red Book standard audio before burning, fully supports PQ code editing, and lets you prepare the material in its own editor with multi-level undo.

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World Radio History

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$11,010. Now there's a string of binary code anyone can understand. So if you're budgeting to go digital—and running tight on budget—take a close look at a 12 or 20 input Airwave Digital on-air console. Its familiar layout flattens the digital learning curve. And with 3 program busses, talent can be playing Madonna, time shifting a Dr. Laura feed, and laying down voice tracks—all at the same time. So you can squeeze more production out of your payroll.

Airwave's flexible, too. One or two telco modules and B-side logic are among a host of available options. And unlike some digital consoles, you can reconfigure input modules from analog to digital—or vice versa—at your studio, just by changing a card.

Best of all, Airwave Digital comes with that "no-need-to-rationalize-to-anyone" PR&E quality. Want to know more? Call 760-438-3911, visit www.pre.com or email sales@pre.com.

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*12 input mainframe, standard clock/timer, monitor and output modules, standard 5-mic preamp module, 3 analog inputs, 4 digital inputs and one telephone input/output module.

Circle (48) On Reader Service Card

World Radio History

Configure Portable PC for Field

Carl Lindemann

The process of gathering broadcast audio outside the studio runs into a bottleneck when it comes time to load it into the DAW.

Whether your field recorder of choice uses DAT, cassettes or MiniDiscs, the raw audio has to be played back in real time. Most everyone facing this has developed a strategy to cut some of the wait time.

These methods usually involve some way of indexing the recording — marking where the relevant soundbites are to quickly locate them again under time constraints.

I polished my own technique while out on the campaign trail during the last New Hampshire Presidential Primary. A typical task was recording candidate speeches through a multibox (a breakout box with multiple jacks to provide isolated hum-free audio feeds to reporters).

Tick-tick-tick

I would start my stopwatch when I began recording on a Sony Pro Walkman Cassette. In my notes, I would mark the absolute time when quotables popped up. Once back in the studio, I would play the raw sound into the DAW while I hashed out the stories surrounding the soundbites.

The idea was that by the time the stories were written, the speech would be re-recorded digitally. I could look along the soundfile time scale and reference my notes.

Say there were useable cuts at 11 minutes, 17 minutes, and 27 minutes into the tape. I would click to them on the DAW, cut and paste them, then cart them up for airplay with the stories.

That real-time reload adds a layer that becomes unbearable with breaking stories. The solution? Instead of bringing sound in from the field to the DAW, bring the DAW into the field to gather sound.

The latest generation of laptop computers can handle all but the most challenging audio production tasks, in a size and for a price comparable to a pro DAT field unit.

Too fragile?

Obviously, laptops are not suited to every field-recording situation. They are fragile components, better suited for use in airplane seats and office suites. But when outfitted with the proper components and peripherals, they can significantly collapse that "real-time" re-recording bottleneck in many common scenarios.

I selected the Digital HiNote 735 (now Compaq) because it was the first laptop to feature all the elements for a portable DAW, including audio capability. That, plus a terrific reputation for being resilient enough to withstand some roughhousing, makes this a production Road Warrior.

The unit's Pentium 233MMX "Tillamook" processor with 512 kB Level-2 cache is not the fastest, but it does have the latest low-power chip design for good battery life — better than three hours on a charge.

More critical is that it includes the first IBM portable UDMA IDE hard drive, the DTCA-24090. This tiny drive turns in some impressive speeds for a portable unit. Using IQ Soft's Hard Disk Speed Test, it scored 3,351 kB/sec on the reading test — enough to play back eight simultaneous tracks. The write score of 3,391 kB/sec is enough to produce glitch-free recordings.

Not like the big dogs

Admittedly, this is not in the same league as my studio system. The at-home setup with a Seagate SCSI drive coupled to an Adaptec 2940 PCI adapter card hits scores better than twice this. Still, how many tracks do you really need in the field? The laptop is not a complete DAW replacement, at least not yet for high-end (12+ track) users.

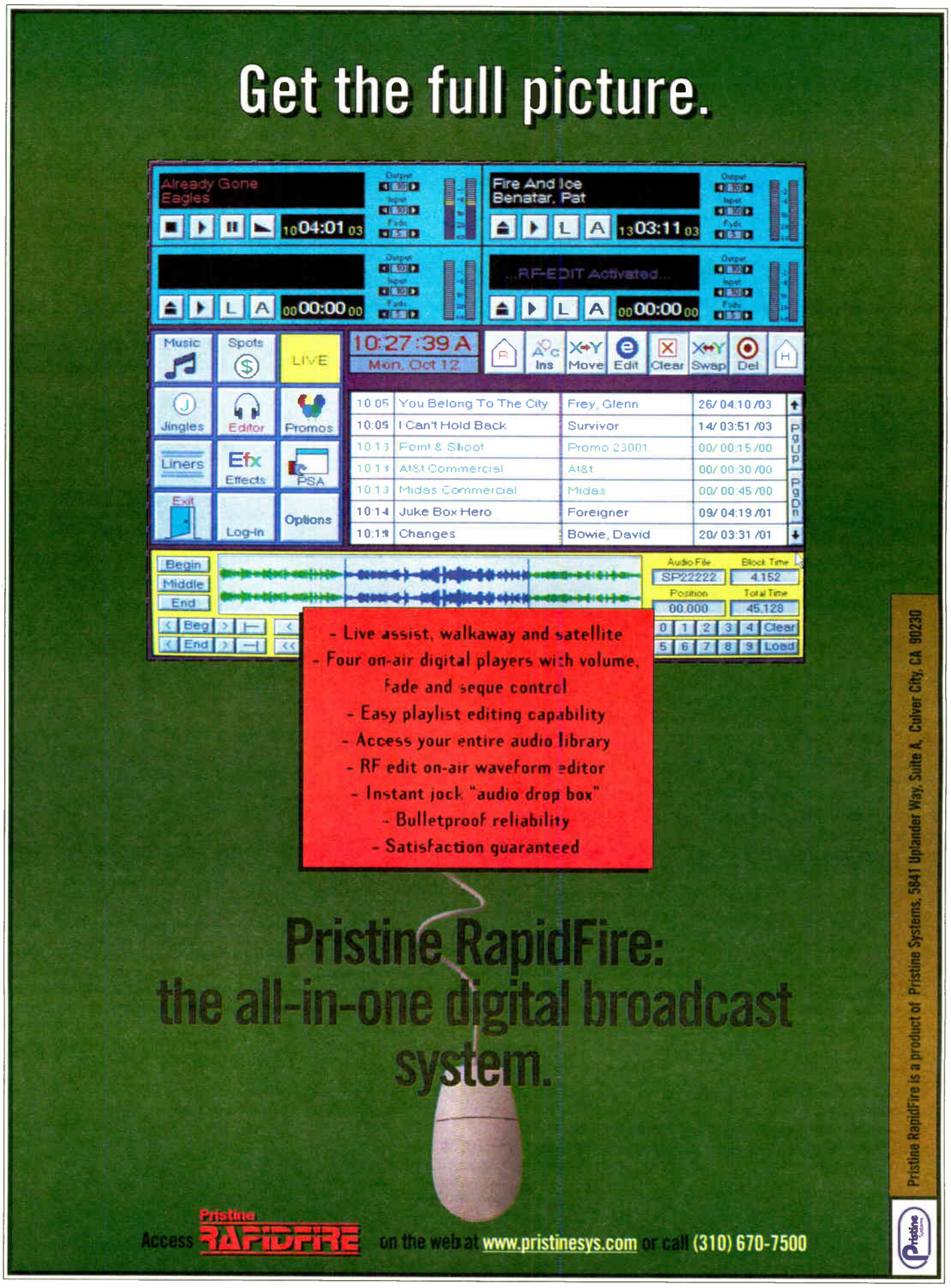
Running SAWPlus software on a laptop computer, an entire recording and editing session can be done in the field.

Another key element in the latest laptop crop is the adoption of SDRAM memory. High-speed SDRAM is a significant jump over the previous EDO RAM. EDO typically has an access time of 60 ms. SDRAM brings it down to 10 ms.

The HiNote 735 can be loaded with a maximum of 144 MB RAM. Perhaps not enough to qualify it as a full-blown, high-end DAW, but it does give plenty of speed to do fieldwork. Putting in the needed additional proprietary laptop memory can add significantly to costs.

Before buying the manufacturer's brand, find out if third-party memory is available. SDRAM I obtained from Viking Components performed

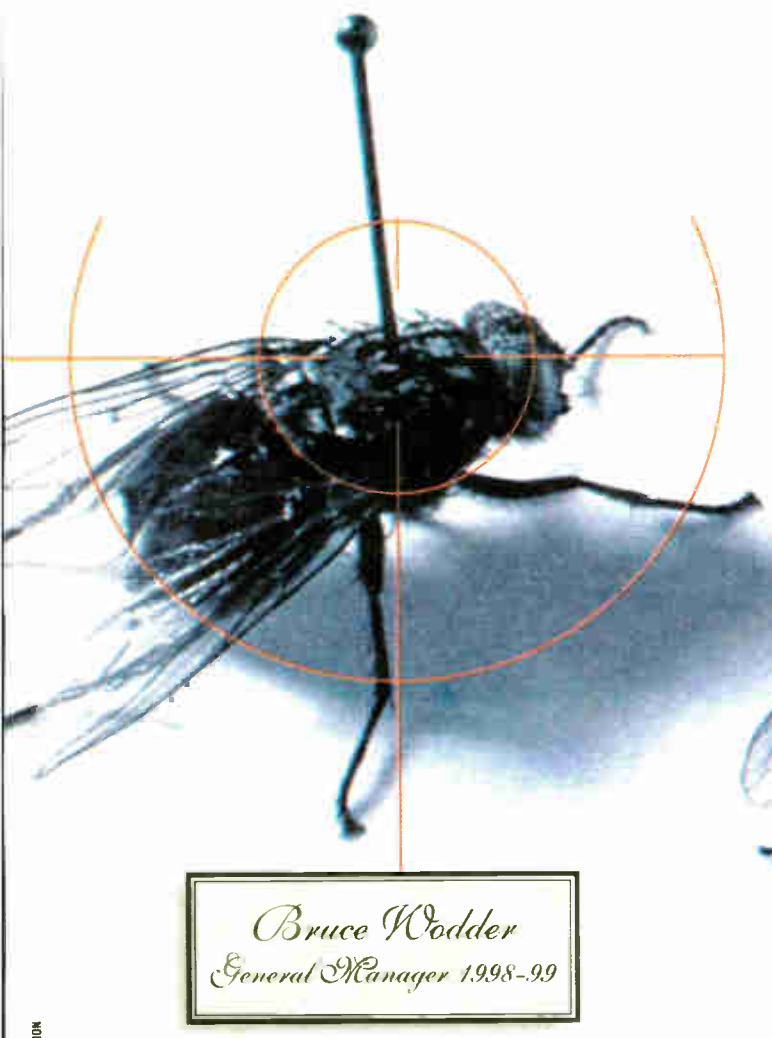
See FIELD WORK, page 52 ▶



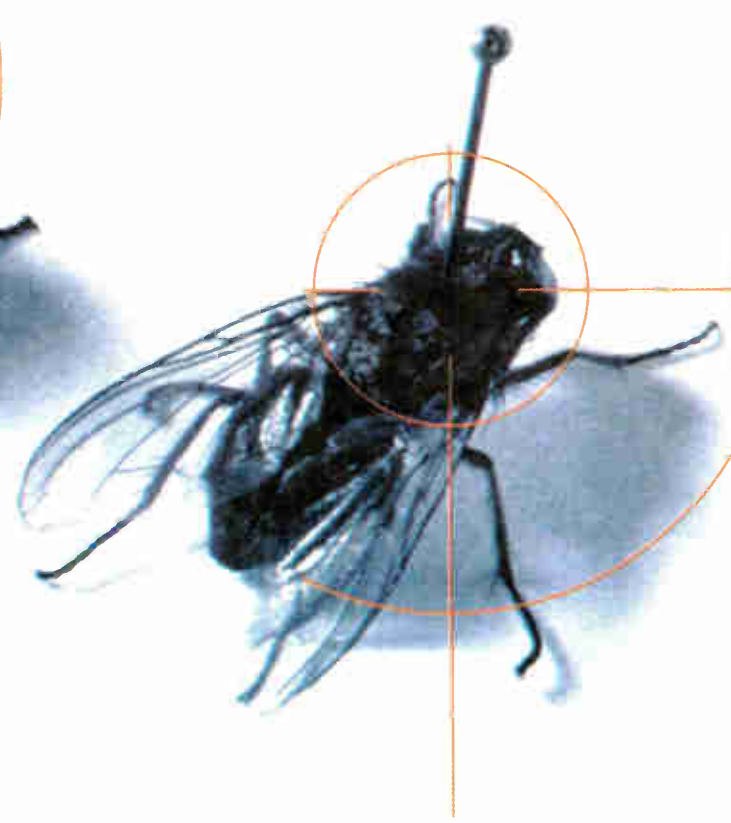
Circle (149) On Reader Service Card

World Radio History

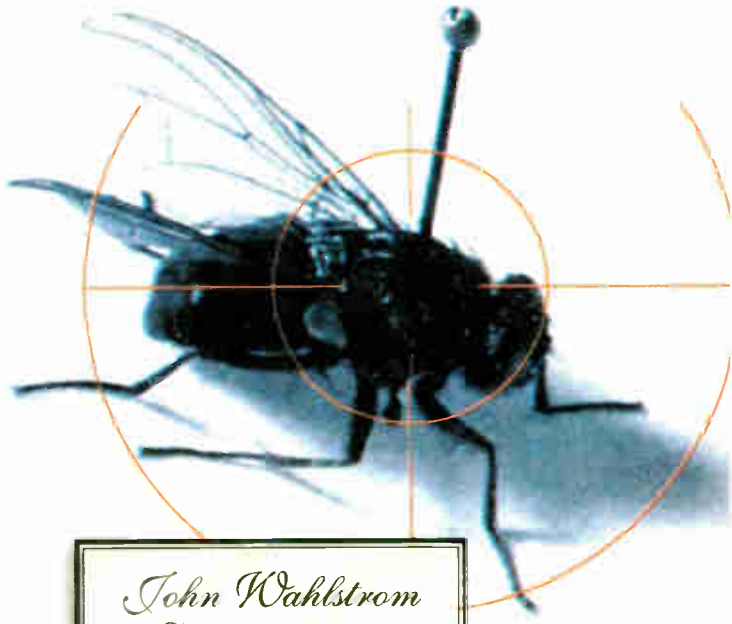
Their biggest regret was not talking with Dalet...



Bruce Wodder
General Manager 1998-99



Steve McAllister
Program Director 1997-98



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Circle (50) On Reader Service Card

World Radio History

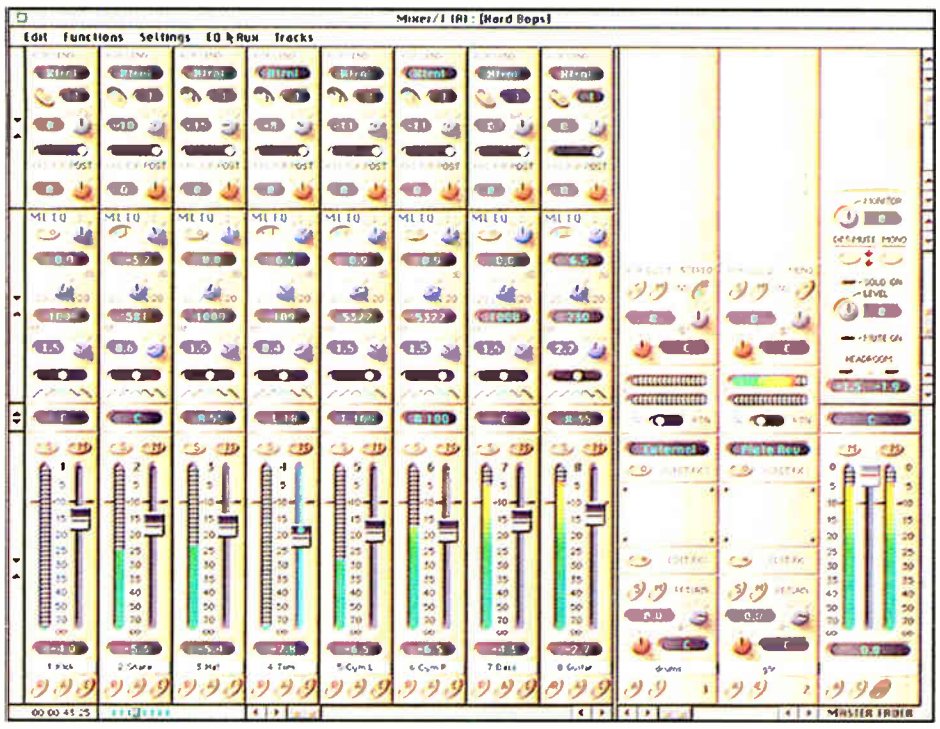
Producing on PARIS

▶ PARIS, continued from page 47

at the bottom of the Playing Field shows where in the project you are.

The Tool Bar contains icons that navigate you through editing and positioning of Objects. Clicking the Selector icon allows you to begin moving your work around.

To select and grab a small portion of an Object, use the mouse to draw a "marquee" around the selected segment. From there, the selected segment can be clicked and dragged to anywhere on the Playing Field.



Massaging Eight Tracks in the Mixer Window

I like the simplicity of this method very much. In SAW, depending on the direction you wish to move an edit, it is necessary to Shift-Click or Control-Click to accomplish horizontal or vertical motion. In PARIS, grab it and go. The only time you Shift-Click is when it becomes necessary to move multiple segments simultaneously.

Be ready for a couple of surprises. First of all, if you click the Snap function, your edit segment will align itself to the closest Grid line and not to the point where you desire. Second, if you click another Selector icon called the "Time Locked Selector," you can drag up or down to other tracks, but you cannot shift your edit forward or backward in time. My advice: *Watcheth Where Thou Clicketh.*

Go directly to jail

When it comes time to cut, copy and paste audio tracks, PARIS lets you do so with the Object Jails — another playful name the Ensoniq folks came up with, this one for "Clipboard." There are 32 Jail locations for storing audio segments. Drop several segments here for later recovery.

Placing reference Markers into the project is similar to most other editors. In programs such as Sound Forge, you would tap the M key on the computer keyboard to drop one. In PARIS, you click a Marker icon in the Editor window when the cursor arrives at the proper position, or hit the "Set New Marker" button on the Control 16, just above the transport controls.

Also along similar lines is the rollback method of trimming start and end points. I have always liked the ability to grab the edge of a waveform and "curl under" the portion I did not want, only to bring it back later if I had changed my mind. In PARIS, this can be a temporary or permanent decision; by dragging the edited Object in to the Object Bin, a copy of the new Object is created with your trim decision.

A few words here about the Selector tool. It is context-sensitive, and changes shape and function depending on where it is on the screen. If brought near the front edge of an Object, it changes to the Trim cursor. When brought to the center, it becomes a four-way Move cursor. When moved close to a Crossfade handle — the small icon inside an Object that determines the overall level and volume curve — the cursor changes to a Fade Tool, offering you the ability to alter the level of a track.

Open the Mixer window and design in as many faders as you wish to use, click open an Aux section and a Master fade section, and pick between a full-window version or a mini-mixer that loads all 16 channels at once.

As discussed in the first part of the review, there are five different types of EQ, all offering ±18 dB control. Aux Sends dial up eight busses of high-quality effects and are switchable between pre- and post-fader, just as on any professional-caliber mixing console. Effect plug-ins include plate and room reverb, stereo compression and limiting, gates and delays. All sound fantastic and others are now becoming available.

Also present on the Mixer as well as on the Playing Field are Mute, Solo and Record icons, extremely necessary for isolating one or more tracks to massage.

For those among us not ready to give up our precious faders, the Control 16 surface is just the ticket for a sweet mix. After noodling my way in the past through less-than-impressive plastic, cheap-feeling MIDI-type control surfaces, I came to appreciate the steel construction of the Control 16. I did not expect it to feel like a $100k console, but it had the right "feel" for doing both radio production and music mixing.

During my evaluation, I felt myself going to the mouse fewer and fewer times, depending more on the Control 16 for mix decisions, jogging and shuttling on the Wheel of Steel and doing my EQ tweaks in the Channel Controls section.

The PARIS has got to be one of the best DAWs to come down the road in a long time. On the PC, it screams and is easy to use. My Mac pals have called it, "The Common Man's ProTools." There is a reason Harris has been distributing it for months and an even stronger reason that a prominent D.C. urban station made it the DAW of choice: PARIS is serious competition.

The only way I can see anything threatening PARIS at this point is if the Audicy were suddenly priced at $3,000 tomorrow morning, or if Innovative Quality Software finally added a hardware controller to SAW; two not-likely scenarios, although Digigram recently added a JL Cooper controller to XTrack, so the interest is there.

Ensoniq built the PARIS for performance and priced it where anybody can get one. The PARIS1 base package consists of software, controller and PCI card ($2,898); the PARIS2 package adds the rackmount interface ($3,395); and the PARIS3 package includes a large 5RU interface with nine expansion slots and multiple I/O sync options for $3,895.

With the analog and digital I/O found on the higher-priced units, the PARIS will grow with your room. With new plug-ins coming, it will sound even better.

I suggest you use the Windows 98 option of dual monitors: Playing Field on one screen, Mixer on the other. No switching and no complaining. If you go the Mac route, be ready for a good time and a work environment you have long been familiar with.

■■■

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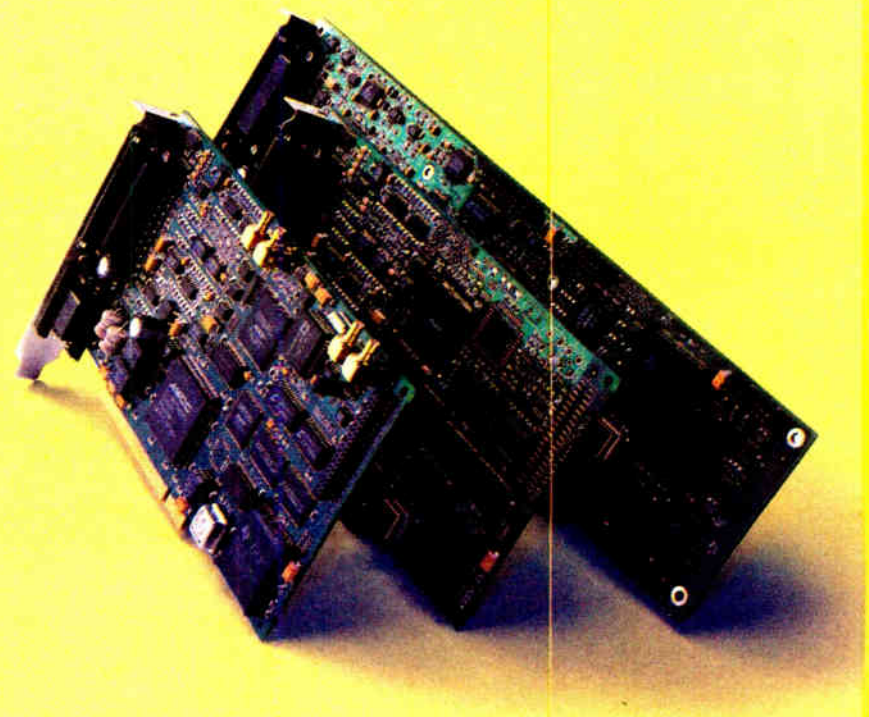

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Circle (151) On Reader Service Card

World Radio History

Bring It Back on a Laptop

▶ FIELD WORK, continued from page 49

flawlessly the price of the comparable DEC factory part.

The final key aspect of the latest laptop infrastructure is the addition of CardBus PC Card slots. This next-generation standard is a leap in performance over the original PCMCIA cards. The CardBus standard offers a bandwidth increase similar to the jump from ISA to PCI.

The 32-bit CardBus can triple the data transfer speeds of the 16-bit PCMCIA. CardBus slots are backward compatible, and can still use "legacy" PCMCIA cards. But the newer CardBus cards won't work in older PCMCIA-only laptops.

So what does CardBus add here? One of the traditional drawbacks to laptops has been connectivity. Getting data in and out has been problematic, primarily through the painfully slow parallel port. PCMCIA improved this, opening up the equivalent of ISA slots for expansion.

CardBus has taken it to the next level. The HiNote's two integrated slots, plus an additional one in an optional docking station, open the potential for full desktop performance. If the internal UDMA hard drive is not fast enough back in the studio, hook up an external SCSI.

It is equally as easy to attach a CD-R/RW recorder or to make a fast Ethernet connection. Using the right peripherals with the 32-bit CardBus can make it a match for most any deskbound DAW.

The author, Carl Lindemann, is shown cutting voice tracks for his radio featuure, 'CyberScene.'

Perhaps the biggest question mark for the laptop-as-field recorder/DAW concept is the monitor. Screen size is a two-edged sword. Having a big TFT (Thin Film Transistor) active matrix display is critical if you intend to do much actual editing. Undersized or passive matrix screens will not be suitable for extended use. The eyestrain quickly becomes unbearable.

DAW LAPTOP CHECKLIST:

- UDMA Hard drive
- SDRAM Memory (with at least 64 MB expansion capacity)
- 233MMX or faster CPU
- CardBus Slot(s)
- Active Matrix (TFT) Screen
- Docking Station w/CardBus Capabilities

The flip side is that large TFT screens are susceptible to breaking and at $1,000 or better, are quite expensive to replace.

The problem is that the "form factor" of the notebook PC puts an upper limit to screen size. The larger the screen, the less material there is in the case to protect it. The outermost limits seem to be 14.1 inches, reaching almost to the edge of the box. I opted for the sufficiently spacious 13.3-inch XGA size. The 1024x768 pixel display has just enough frame around it to give some peace of mind.

Still, if you expect to spend a lot of time in harm's way, you are probably smart to buy an insurance policy. Most major manufacturers offer such coverage as an option.

For all the advances in laptops, integrated sound systems are still only so-so. The HiNote's eighth-inch jacks for Line and Mic In, plus Line Out is fine for playback, but leave a lot to be desired for sound gathering.

The "Crystal Audio System" recordings sound muddy, as if made on a cassette recorder badly in need of degaussing. So the first item to add is a good audio PC card.

In Part Two, we will look at this and other peripherals you need to make for an effective field recording/DAW laptop. I will also tell how to use this rig to achieve "Road Warrior" status.

■■■

Carl Lindemann produces "CyberScene: The Socially Significant Cyberspace," based in Maine. He can be reached at www.cyberscene.com

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Circle (22) On Reader Service Card

World Radio History

Big-Sounding Planes, Bombs, Cars

▶ SOUND DOGS, continued from page 47

used in conjunction with a big explosion.

The explosion sound effect I used was some sort of mortar being fired. Because it was recorded far away from the actual event, it possessed a rather tinny quality. I gave it a lot of low end, removed some of the midrange and added reverb to bring it back to life.

It is as if radio sound effects have to be over-exaggerated to have any effect at all. And in my experience, many sound effects libraries just don't have what it takes for radio commercials.

One exception, however, truly is larger than life, literally. Sound Ideas has proven it with Sound Dog's "Larger Than Life" SFX Library.

Amazingly enough, this little five-CD collection was created from preexisting motion picture sounds and not necessarily for radio. I have never heard a more live winter storm or more painful body punch than the sound effects chronicled in the Larger Than Life library.

For the first time ever, I heard a sound effect so real that it actually gave me chills. On Disc One, Track Three, there is an airplane crash from the movie "Turbulence" that left me wondering how they got so close to the event without being knocked off the runway by flying debris.

I have never seen, much less heard, a passenger jet crash, but there is no doubt in my mind that what is on the CD is what one sounds like.

"The sound of the film was awesome but the film itself didn't do so well," said Rob Nokes, recording engineer for Sound Dogs.

Nokes is particularly partial to the sound effect of a Dodge Viper thundering by, as he did the recording himself.

Getting the recording certainly was not as simple as holding a microphone up to a passing vehicle. The location for the recording session was a secluded farm road an hour north of Toronto at midnight. The temperature was a nippy 15 degrees below zero.

So why so late and why so cold? Because sound travels better and more clearly in colder temperatures. The Viper V12 came within a foot and a half of Nokes and his Neumann stereo recording microphone, with some of the passes clocked at more than 100 miles an hour!

Back in the studio, the left and right channels were offset by two SMPTE frames to throw the engine out of phase for a more dynamic sound as the car approached. Multiple-generation loops were added to the muffler for an even fuller rumble during the pass-by.

And yes, you have heard this sound effect before. It was used in the movie "The Santa Clause" every time Santa's sleigh passed by.

Underwater submarines and ship motors (things with propellers) were created with a paint spinner attached to an electric drill, running in water, in oil and in water with ice. The drill motor was muffled with a bath towel so that the sound of the paint spinner stood out. Then with Doppler processing and equalization the effect of a pass-by is achieved.

For the first time ever, I heard a sound effect so real that it actually gave me the chills.

For the other airplane sound effects used in the movie "Turbulence," the Sound Dogs crew hung out in the desert for several hours at Georges Air Force Base in Los Angeles, recording DC9s, DC10s and C5s.

During certain takeoffs, the crew was 75 feet from the nose of the plane as the thrusters kicked in. Those standing were actually knocked to the ground from the force of the wind and rocks being thrown in their direction. To keep from ruining their equipment as well as their eyesight, the crew turned off-axis from the jet in anticipation of the jet blast.

According to Nokes, the crew didn't actually know the "right" way to get a good jet sound effect until they were all done for the day. Sometimes the learning comes with experimentation on the job.

According to Nokes, "We record everywhere and almost get killed sometimes, but unless you get a good recording to start with, no amount of studio processing or manipulation is going to help."

The company's movie credits include "Frost," "Very Bad Things," "Mumford," "The American President," "Ghosts of Mississippi," "The Cable Guy," "Turbulence," "Wyatt Earp," "The Santa Clause" and "Robin Hood: Prince of Thieves."

Sound Dogs is one of those visionary companies placing its effects on the Internet for users to audition and purchase immediately over the Web. Visit the Sound Dogs Sound Effects Library on the Internet at *www.sounddogs.com* to choose from thousands of effects to download directly from the site ready for use on your computer.

■ ■ ■

For information contact Sound Ideas in Ontario at (905) 886-5000 or circle ***Reader Service 144.***

Sallie Schneider Sauber is production director at WATH(AM)-WXTQ(FM), Athens, Ohio, and frequently reviews production music libraries and sound-effects collections for ***RW.***

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World Radio History

USER REPORT

BE: Big Sound, Small Market

by Bruce Anderson
Chief Engineer
Four Corners Broadcasting
KIQX(FM), KIUP(AM), KRSJ(FM)

DURANGO, Colo. Durango, Colo., recently grew up. We still have our century-old narrow gauge steam train, but we finally got a Wal-Mart.

Unfortunately, the prime real estate for the store was our 13.5-acre studio, office and AM transmitter site. Since the Super Center folks don't care for 5 kW of medium-wave RF emanating from the kids department, we had to move. The AM-5 from **Broadcast Electronics** certainly helped.

It was a piece of cake to find a new studio and office location compared to finding a new transmitter site. To keep from paying a prohibitively inflated price for fresh land, we ended up paying half-price for what we needed: Our company bought half the land, tower and building from the other AM in town. We also agreed to absorb the cost of improvements, the biggest of which was running three-phase power to the site for our 23 year old transmitter.

That was the big problem. No way were we going to give the local utility the satisfaction of ripping us off to the tune of $23,000 for a half mile of wire and a new transformer. Single-phasing the old unit became a discarded plan, and we buried the idea of a phase converter along with the necessary new ground radials.

The most logical and economic solution was a new transmitter. The AM-5 was a perfect choice.

The people in Quincy were easy to work with, from sales to financing to manufacturing. Within two weeks of the initial steps, our new unit was at the station doorstep. Now it was our turn.

Winter wonderland

We had been operating temporarily with a 1 kW standby unit. This gave us a chance to work any bugs out of the new transmission line and combining unit. We had also installed a new Unipole antenna.

Besides being remarkably broadband to accommodate both stations, the Unipole is manufactured less than an hour's drive from us. Also, the whole manifest of parts fit in the back of a sedan.

Once the utility somewhat begrudgingly plumbed and upgraded single-phase to the building (at their expense), an electrician, my assistant and I took a day to run everything as far as we could: AC, audio, remote control and RF. Then the fun began.

The author works at the AM-5.

The day before the move, it snowed. We ended up with 16 inches of powder

See AM-5, page 57 ▶

USER REPORT

Harris Saves WSB From a Fried Site

by John Talbert
Director of Technical Operations
WSB Radio Group

ATLANTA WSB Radio purchased its first **Harris** DX 50 AM transmitter in 1991. At the time, the station was using a tube-type transmitter as a primary and a Continental 317B as a standby.

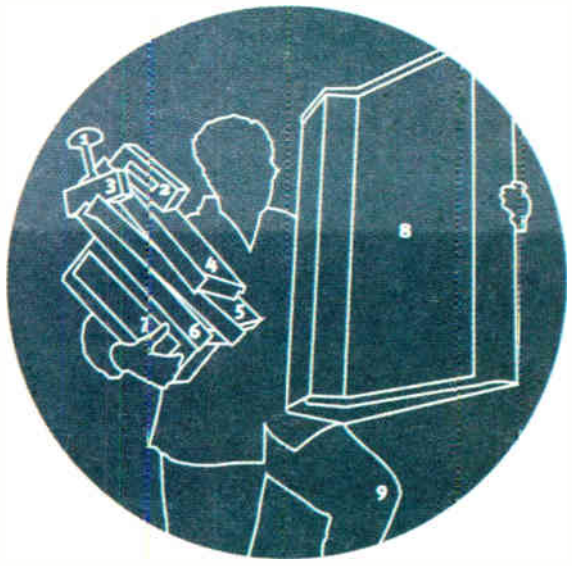
Since our transmitter site is situated in the middle of a shopping center parking lot, I was beginning to wonder if it wasn't actually one of the surrounding businesses that was on fire. I had our news room call the fire department while I left for the site.

"There are reports of a fire at the tower," our afternoon news anchor said, bursting into my office. I reached for the air monitor to find the station was on the air and everything appeared normal. A check of the remote control verified the DX 50 was working fine.


Senior engineer David Jones (left) and Walt Taylor, a WSB engineer, work at the DX 50.

The station was looking for a reliable transmitter that was easy to maintain and inexpensive to operate. At the time, the DX 50 spoke for itself on those two matters, but lacked a time-proven track record. That track record was the impetus for selecting a second DX 50 when the sudden need arose for an additional transmitter for the "Voice of the South."

See DX 50, page 63 ▶



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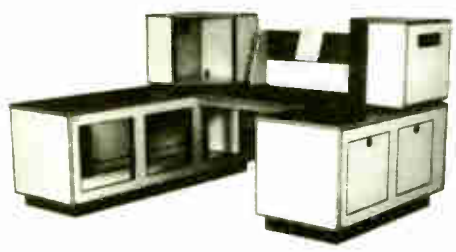

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World Radio History

AM-5: Simple, Clean and Powerful

▶ AM-5, continued from page 55

on top of slush. The AM site became known forever more in the wintertime as the "frozen swamp."

The front bucket of a backhoe gently lifted the crated AM-5 onto a pickup truck. Eight miles through city streets, no problem. We skidded the transmitter back into the backhoe and set out for the final mile: a dirt road buried in snow and nothing but two tire tracks the backhoe operator made to mash down the white.

With precautions, everything worked. An hour later, the AM-5 had been uncrated and muscled into place in the "building," an old insulated truck trailer. What we thought was going to be a day-long wiring nightmare turned out to be nothing more than a two-hour plug-in session.

The other radio engineer in this market had helped immensely in planning this project, so we gave him the honor of throwing the breaker. The AM-5 has refreshingly few controls on the front. AC energizes the blower fans and the control circuitry.

Jim threw the lever; the breaker went *ka-lunk*, the transmitter, *ka-blam!*

"I don't think it was supposed to do that," I said. Jim immediately killed the juice.

After poking around inside the box, we found nothing amiss — not even a scorch mark. According to the factory, a hair of a wire had floated to where it shouldn't have during shipment (probably over our snow-road). No fuses were blown and everything checked out, so we tried again. There was another *ka-lunk*, but no *ka-blam*. Good so far.

Talking boxes

The AM-5 has five factory-set (but user-adjustable) power settings. Both of us being astute engineers and not knowing what the unit was going to do, we started on the lowest one.

The unit has an LED fault map; everything looked okay. I hit the 100 W button. The power meter came right up to where it was supposed to. The next button, and we had 250 W. Let it burn in. One kilowatt, some minor retuning, then the biggie: 2,500 W.

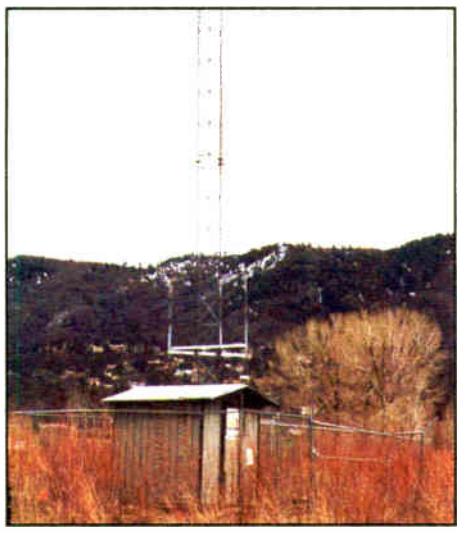
At that point, we both noticed the transmitter "talking." At a full 5 kW, it really spoke up. No amount of tuning could get rid of the sound of the program coming from inside the box, sort of like a monitor speaker with extremely narrow frequency response. Or, perhaps the plate transformer of a '30s vintage RCA high-power rig.

According to the factory, that was OK. It all depends on how the transformers and reactors in the power modules are wound. It is not a problem, but it is more noticeable on program material from vinyl LPs than from CD, computer or live announcer sources. Apparently, the old discs really like to rattle components.

And yes, we still play an occasional wax record here in the Rocky Mountains.

The failure of one side of a power module will reduce power output of the transmitter a bit. The death of an entire module will cost 700 W or so at high power. A power supply going south knocks your station down to 75 percent power. But, the AM-5 keeps the station on the air.

Even though power modules and power supplies are hot-pluggable, I'm too chicken to try it. To my way of thinking, there is too much of a chance that an errant chunk of static will go somewhere it shouldn't in our dry atmosphere.



The KIUP (AM) transmitter 'trailer' building is in scenic Durango, Colo.

The AM-5 is a lesson in simplicity. The only two variable controls on the front of the box are for tuning and loading. The two meters show forward and reflected power, with high and low selectable scales. There are fault lights galore, including one for almost every fuse in the box. One sensing unit tells you if you have experienced a lightning problem.

Troubleshooting is a breeze, especially with the well-written technical book. A reset button clears most faults, but once in a while you may have to kill power to the transmitter to undo a power supply glitch.

In two years, we have had only one bad power module replaced under warranty. I have replaced a couple of fuses that went down during power hiccups.

So far, the thing that has had the most use out of the spare parts kit has been the little adjustment tool, and that was to tweak stuff not even in the transmitter.

I did get into a discussion with BE about the cooling flow. Room air enters the bottom rear of the cabinet through a filter. Two major-duty fans send it over the power supplies, then up through the power modules and finally through the control and monitor card cage and out the top.

BE said they bake everything for several days before sending a unit out. My belief is that 100+ degree dry air constantly blowing over cards will reduce component life, especially at our dry 6,500-foot elevation.

Hot air

I let the exhaust hot air take its course, but I also left the front card cage door open and added a muffin fan. All components seem happy.

We have a stereo card, ready to plug in. Someday, when we get a stereo STL path built, we will.

The AM-5 is capable of better than 125 percent positive modulation. Nonetheless, we have a diode clipper on the output of the STL receiver.

Its sound is phenomenal. Listeners have compared it to FM signals. It is the only AM station my assistant will listen to, and not just because we are his paycheck. He claimed other stations hurt his ears.

Unfortunately, the AM-5 out in the frozen swamp is so trouble-free I have to remind myself to do routine maintenance: interior vacuuming, changing the air filter and a new 9 V battery once a year to keep the control microprocessor alive.

Next time you find yourself in southern Colorado, take a listen. If you ride our little steam train, you will pass right by our transmitter site. It's only 300 yards away, but a century apart in technology.

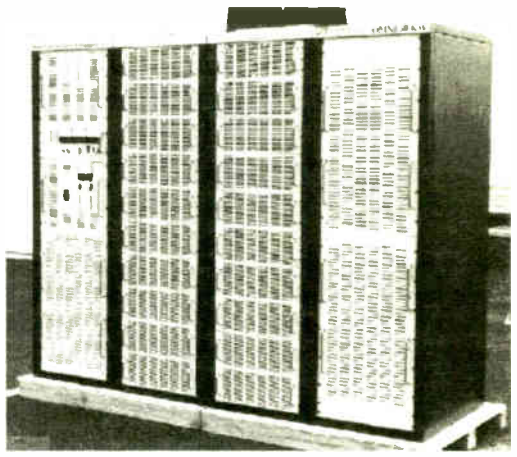
For information contact Broadcast Electronics in Illinois at (217) 224-9600 or circle ***Reader Service 79.***

Bruce Anderson was recently named Broadcast Citizen of the Year at the Colorado Broadcasters Association banquet in Denver.

TECHNOLOGY UPDATE

Omnitronix

Omnitronix offers several lines of solid-state AM transmitters, including extensive families of medium wave and shortwave models.

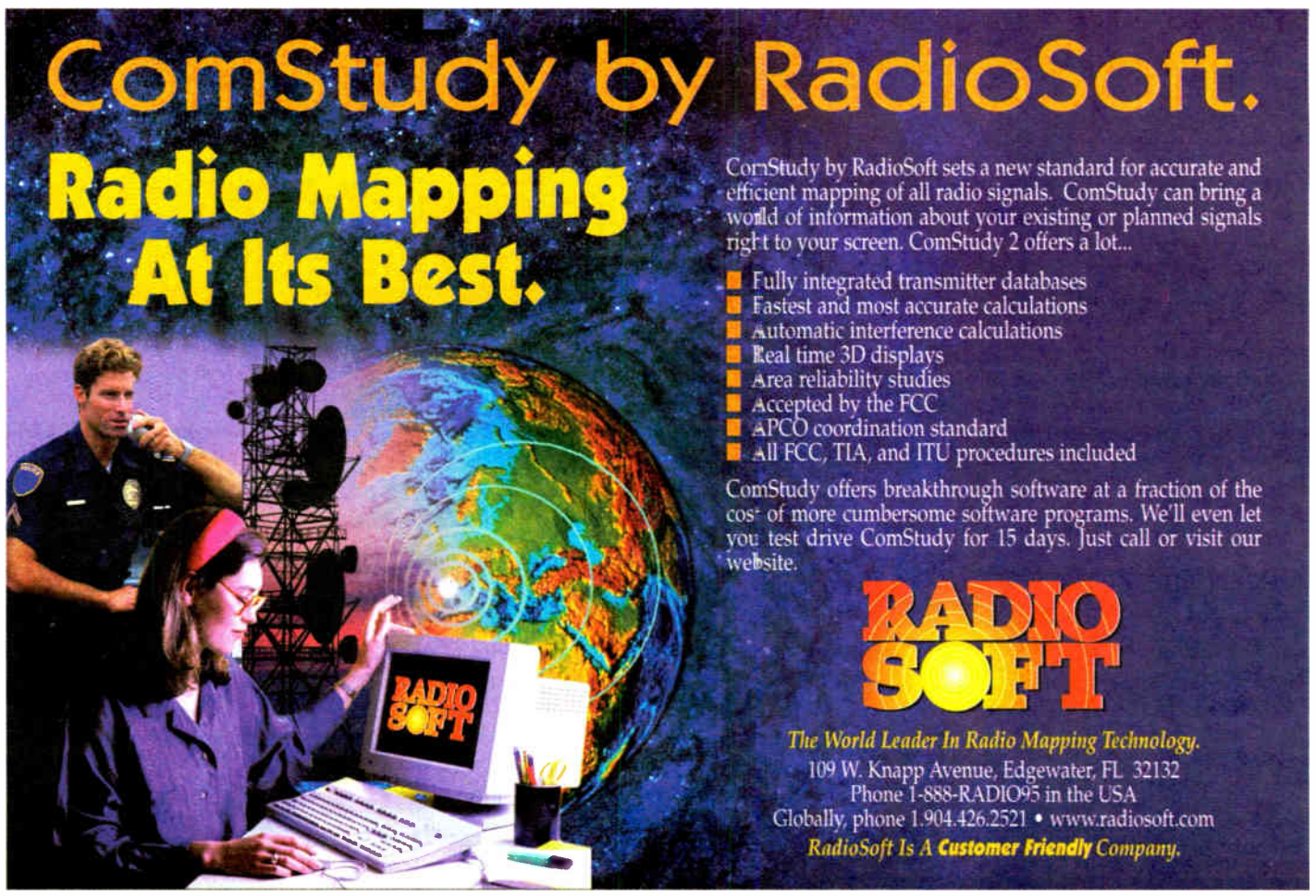


The Omni-50kW 50,000 AM broadcast transmitter is the most powerful in the company's line of medium wave transmitters. Adjustable from 10 to 100 percent of rated output, its modular design allows front-panel access to all plug-in power amplifier and control modules.

Troubleshooting is simplified through the use of meters and numerous LED status and alarm indicators. All remote controls have optically isolated inputs, power cutback levels of one through five, an alarm reset and a transmitter on/off feature. Teflon-insulated wiring allows extended life and reliability.

The company also offers solid-state shortwave transmitters of power levels as low as 1 kW up to 10 kW. A tropical band transmitter, the 10 kW unit features an RF frequency range of 3 to 6 MHz and a modulation capability of 100 percent positive peak at 100 percent of rated output.

For more information contact Omnitronix in Pennsylvania at (800) 446-6648, fax (215) 699-2323 or circle ***Reader Service 13.***



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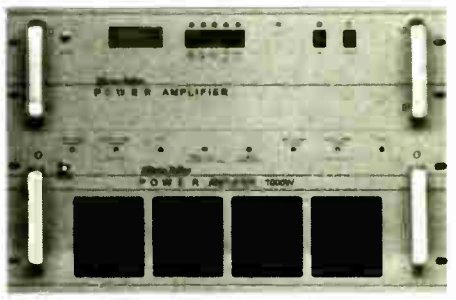

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READER SERVICE NO. 154

World Radio History

USER REPORT

Reliability Leads Back to Nautel

by Randy Finch
Staff Engineer
KSL (AM)

The author's son Lance holds small transistor modules that plug into the XL60 power module.

SALT LAKE CITY One of the desired features we wanted while searching for a new transmitter for KSL was solid-state design. This turned out to be our main reason for choosing a Nautel transmitter — no tubes to replace, no routine tuning or adjustments.

Tube transmitters require constant attention, where our **Nautel** XL60 AM 60 kW transmitter requires none. It does not change with age. It runs forever with the same specifications providing excellent audio clarity.

Reliability

Another benefit of its solid-state design is reliability. We already had first-hand experience with Nautel reliability through our Ampfet 50 solid-state 50 kW AM transmitter, purchased in 1986. We felt confident the XL60 would provide the same level of dependability.

Easy on-air service and maintenance is also a plus. With our Ampfet 50, we were able to remove modules for service while the transmitter was on the air. It was a huge benefit to remain on the air without switching to the backup tube transmitter, with audio quality described as "horrible" by the program director.

Like the Ampfet, the modular design of the XL60 is also on-air serviceable. Output from the 80 amplifiers in 10 power modules are combined to yield 66 kW capability. Should an amplifier fail, operation continues at a slightly reduced power level with no stress on the remaining modules. Additionally, a second built-in exciter switches in automatically if the main exciter fails.

The overall efficiency rating of the XL60 is 84 percent at our operating frequency. The net result is cool, continuous operation — an improvement over older transmitters.

Experiences

Although according to my legal department I am not at liberty to endorse this or any product for that matter, I can relate my personal experiences.

What I especially like about the XL60 is its new control panel design, which supplies meters for measurements of critical parameters such as forward and reflective power and power supply voltages.

The transmitter isolates faults quickly and easily identifies the problem on a front-panel block diagram with LED alarms. These alarms are stored in memory, so you can see the fault after you get to the transmitter site, even if the source of the problem has cleared.

Our XL60 transmitter meters just about everything there is to monitor and supplies status lines and linear meter outputs for these measurement points. Feeding this to our remote control system allows the studio to keep track of the transmitter more closely. Our computerized remote control system takes log readings in 10-minute intervals. Facilities are also provided to remotely switch the RF power on or off, select exciter A or B and a choice of six RF power selections. (The output power is incremented or decremented in 0.1 percent steps.)

The XL60 supplies an excellent isolated grounding system to prevent ground loops between AC power supply and transmitter electronics. I have not seen this feature in other transmitters.

Nautel also knows we engineers never have our tuning tools when we need them. There is a thoughtfully mounted standard tuning tool just behind the front door where the exciter board is.

Our history of customer support from Nautel has always been top-notch. Since our Ampfet 50 and XL60 were one of the first models of each transmitter to come from the factory, we expected some problems. The responsiveness from the staff has been excellent with both models.

Bug report

A few of the bugs we had to work out were random transmitter cutoffs and transmitter cooling due to the way air moves through our transmitter building. Since random transmitter cutoffs are serious, the field service tech immediately put me in touch with the transmitter project engineer.

While checking the circuitry they suggested, we discovered the problem. As we were one of the first stations to connect all of the remote metering options available, the transmitter status lines were coupling energy into the command lines in the common cable running from the transmitter to the remote control system.

This was randomly triggering transmitter control functions. Particularly noticeable by our program director was the Transmitter RF Off command.

To fix the problem, we thought of putting a resistor on the circuit board to lower the command line input impedance. However, Nautel insisted they should be responsible for the modification. The next morning, the company delivered a nicely modified circuit board straight from the factory.

Problem solved.

Another minor bug was power resistor failure on resistors used for charging capacitors in the power supply. Nautel provided a field service upgrade and an engineer who fixed the problem.

We would suggest one enhancement for our cooling problem, one that other similar radio stations with transmitter locations in extremely hot or dusty environments may find helpful.

Our transmitter environment is on the Salt Flats by the Great Salt Lake in Utah. Every time there is a dust storm (a regular occurrence), we pick up lots of very fine salt dust.

The original transmitter filters — as well as the filters for our building air handlers — were not adequate to filter out the dust.

We made a modification to the intake filter area by increasing the surface area and replacing the filter with a heavy-duty filter, able to filter out the fine salt dust.

We use a plenum exhaust fan above the transmitter for cooling as well as a fan applying positive pressure behind the transmitter. This was necessary for the original tube transmitter as well as the older Nautel Ampfet 50.

When ventilation to the XL60 is configured this way, some air flow is allowed to bypass necessary cooling points in the transmitter.

I must mention this is not a problem for the more common transmitter installation where heated air from the transmitter is exhausted directly into the transmitter room.

Installation was easy with well-documented instructions. A common transmitter installation difficulty is placing large power supply transformers into the transmitter. Nautel solves this problem by supplying a ramp to slide the transformer up into the power supply cabinet.

My overall experience with both the XL60 transmitter and Nautel has assured me that I would be comfortable choosing a Nautel transmitter again.

For more information contact Nautel in Maine at (207) 947-8200, fax (207) 947-3693 or circle ***Reader Service 15.***

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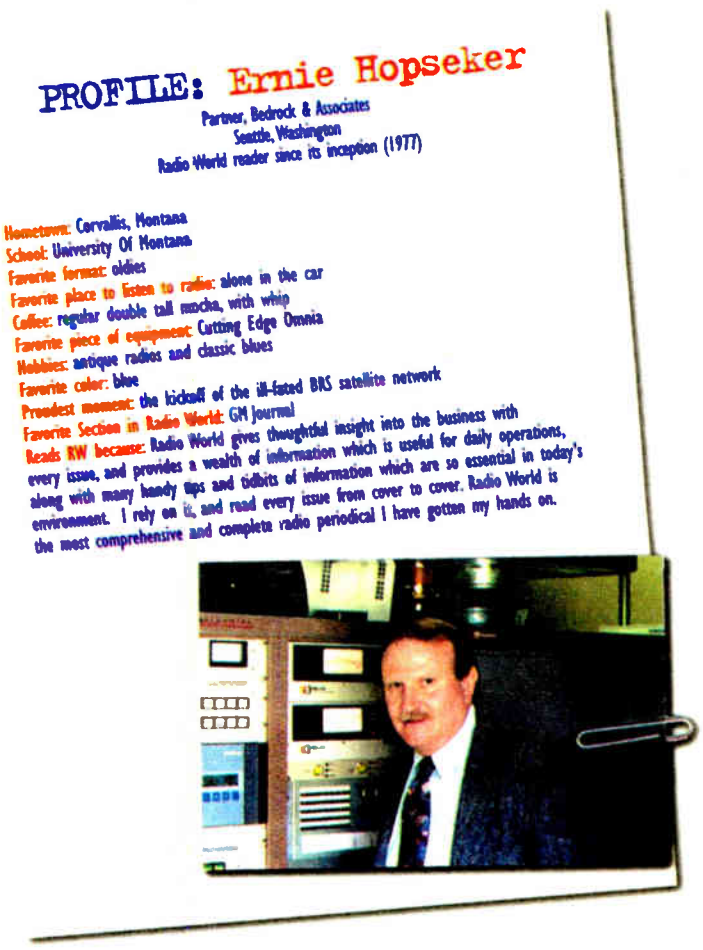

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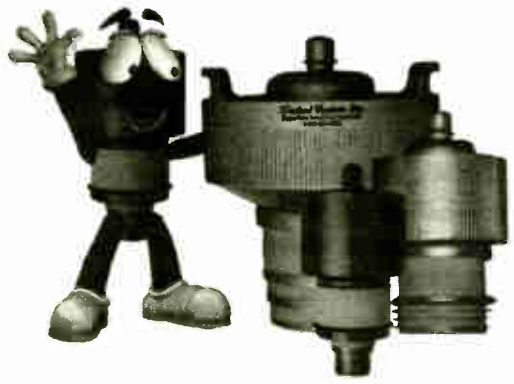

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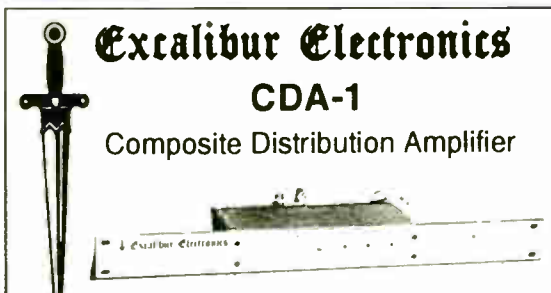

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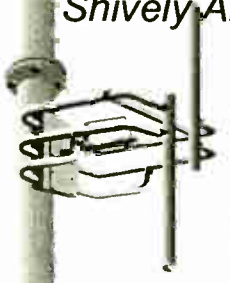

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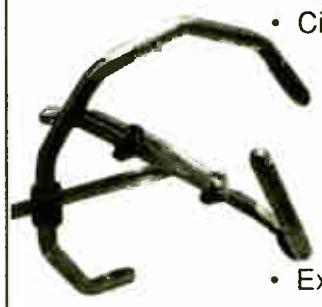

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READER SERVICE NO. 112

World Radio History

USER REPORT

Radio Icing Atop a Complex Cake

by Ralph Beaver
President and CEO
Media Alert Inc.

ST. PETERSBURG, Fla. The mandate from station management was simple: Provide a radio signal inside the St. Petersburg Thunderdome so hockey fans could enjoy the play-by-play calls of the Tampa Bay Lightning.

Sure! We can do that! But after months of careful study of the building layout and the interfacing of an ice hockey rink and temporary bleachers in a structure designed for baseball, I asked, "How are we going to do that?"

Part of the unique style of this beautiful facility in this semi-tropical region is the fabric roof. Any radio signals emitted within the building do not stay in the building.

Fabric proof

Local broadcasters simply mount antennas in the upper grid and microwave right through the fabric roof. It makes a great radome.

LPB was the natural choice. The company had a great track record (over 80 stadiums use LPB units.) They had a good price point (less than $1,000 for the basic package).

Additionally, they had great customer support, something I felt was necessary in this potentially hostile environment.

We chose the 30 W unit with a "lossy transmission line-" type of radiation. LPB sent about a zillion feet of wire on spools — half a zillion on one spool, another half on the second — with the proper end terminators and balun. This line had to be put in place for hockey games, removed for basketball games, then reinstalled for hockey games.

Cable ties were used every few feet to strap the cable directly to the safety railing along the upper level of seats. This provided the 100-foot minimum distance required to reach most seats. A season's worth of ice hockey radio required seven such set-up/tear-downs. The permanent cable spools sent by LPB held up nicely, and their clever design eased the pain of these multiple installations.

Just when it seemed safe to strap on the skates and have some fun, the Tampa Bay Lightning decided to move the team's home to a newly constructed building in downtown Tampa: the Ice Palace. This venue is very different from the St. Petersburg Thunderdome, particularly its steel roof. The radio flagship station changed. There was still the need for a radio station inside the building. Again, LPB was my choice.

Inside the building

This time, we were able to use an actual AM antenna inside the building. This LPB-supplied device was mounted inverted to get the radiated pattern out of the field of building steel.

The contractor promised CAD-welded connections. This became standard screw-type ground clamps on top of a painted surface. Normal AM technical rules were followed, and the LPB unit works like a charm.

You may ask, "Can we skate now?"

The permanent cable spools sent by LPB held up nicely, and their clever design eased the pain of these multiple installations.

No. As business goes, the flagship radio station changed again. We had to retune from the bottom end of the AM band to the top end. LPB retuned the transmitter and ATU, and a new antenna was put in place. Tuning was a snap, and the transition was made with a minimum of effort.

Today, hockey fans in the Ice Palace in Tampa enjoy the play-by-play calls on portable AM radios.

It was a genuine pleasure to navigate through these interesting situations with the experts at LPB. They have my vote for "low power broadcast transmitter supplier" for my next project ... but that's for another day. It's time to skate now.

For information contact LPB in Pennsylvania at (610) 644-1123 or circle ***Reader Service 209****.*

Ralph has been in broadcasting more than 30 years and has built radio stations in North Carolina, Virginia, Texas and Florida.

Today, he runs a news and information service in Florida, but enjoys playing with radio sports networks "for fun." E-mail him at bevo@media-alert.com

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World Radio History

Simple, Clean and Powerful

▶ DX 50, continued from page 55

Moments later, the car phone rang with confirmation of the bad news: Several fire trucks were on route to our site and smoke was billowing out of the transmitter building.

Still, there was no sign of trouble on the air. Twenty long minutes later, I arrived to find seven fire trucks, the power company and several police officers surrounding the entire transmitter building.

While stepping through what was the front door, I realized the venerable old primary was looking more like a barbecue grill than a transmitter. As the smoke cleared, I made the appropriate calls to station management and then to Harris Corp.

It was late in the evening ...

It was a late April evening, the Atlanta Braves broadcast was sold out, NewsTalk 750 WSB(AM) was the No. 1 station in the city and I suddenly had no stand-by transmitter. The spring storms were coming, the spring ratings book was underway and I needed a backup plan.

Harris responded immediately by renting us a Gates Five transmitter, which arrived five days later. The temporary transmitter was connected to AC power and a makeshift feed line. Our safety net was restored.

Twenty days later, we took delivery on our second DX 50 transmitter. Only 48 hours afterwards, the transmitter was on the air for testing. Ralph Wegman with Harris' field service conducted a field check-out and proof of performance, and "DX 2" was on the air, ready to play ball. The Gates Five was only on the air for 30 minutes to tune and test in the middle of the night.

Reliability breeds contempt

The solid reliability of the DX 50 comes with one downside: the transmitter can be easy to neglect.

In a multistation operation where there are many "squeaky wheels" (both mechanical and biological), it is easy to overlook even the most important components when they have a reputation of flawless performance.

Such is the case with the DX 50. In nearly five years with the station, I know of only two transmitter-related failures. The extensive metering and diagnostic indicators on the front of the transmitter combined with a generous remote control interface means you are not opening the doors and poking around the transmitter on a regular basis.

In the rare occasion where there is a problem requiring in-depth troubleshooting, you will likely find yourself disoriented at first. The extensive DX 50 technical manual and diagrams, in conjunction with the helpful telephone support from Harris, can usually get things cleared up fast. When the trouble goes beyond phone support, Harris responds with great on-site support.

The development and refinement of the DX 50 line continues, which is impressive for a transmitter that is 10 years old. Harris supports the transmitter with service bulletins and modification kits to further increase the reliability factor and preserve the integrity of the transmitter.

Behind the plain exterior lies the most complicated piece of electronic equipment at the station.

The DX 50 does not look complicated from the outside. Its monolithic exterior with large, lighted buttons and scattered green lights lead most visitors to mistake it for a computer (and I guess they are partially correct).

For those of us who brace for the traditional big clunk and floor-shaking rumble when the High Power button is pressed, the DX 50 can be a little disappointing. The array of direct drive fans in the transmitter softly whir at the same level, regardless of power output, as it switches from low power to high power without a sound. It takes some getting used to.

Behind the bland exterior lies the most complicated piece of electronic equipment at the station. The DX 50 is not for those who cringe at the site of a couple hundred ICs on a circuit board the size of a wall poster. The exclusive digital modulation scheme is a paradigm shift, which can be intimidating to RF engineers more comfortable with PDM, Dougherty or plate modulated designs.

Troubleshooting the transmitter always follows the same procedure, which can sometimes be unsettling. The first words out of the field support technician are typically, "Are all the connections tight?" After spending a few hours testing and tracing, it is not the first thing you want to hear but it is most often the fix.

The DX 50 uses high current (in excess of 250 A) at relatively low voltage (compared to more conventional transmitters). This fact, combined with the hundreds of connectors used to link the digital bit stream, remote control, monitoring and combining circuits, make good connections a high priority and a logical first place to check when something is wrong.

Component level repair of the DX 50 is not recommended. Repairing the complex digital and RF circuits of the transmitter is much like repairing a computer. Problems are traced to the circuit board level and the board is replaced. Most station lack the equipment and trained personnel to make component level repairs without a factory service bulletin.

Times are still uncertain for AM broadcasters; the popularity of talk radio has given many AM stations a new lease on life. Many stations are finding it to be a good business decision to make a long-term investment in transmission facilities to prepare for whatever is next.

Efficiency, cost-cutting, improved reliability and lower cost of ownership never go out of style.

Still, efficiency, cost-cutting, improved reliability and lower cost of ownership never go out of style, and that is where the DX 50 speaks for itself. When a station considers the benefits of a solid-state transmitter, particularly at this power level, the return on the investment is obvious.

In-band on-channel (IBOC) AM broadcasting may yet be the white knight for AM broadcasters; it is too early to tell. One thing is certain about currently proposed AM IBOC systems: it may not be compatible with many AM transmitters.

It appears that the Harris DX series is one of the few AM transmitter line prepared for this digital possibility.

For information contact Harris Corp. in Indiana at (800) 622-0022 or circle ***Reader Service 123.***

John Talbert has been director of technical operations for the Atlanta cluster of Cox Radio Stations since 1997. He joined the WSB engineering staff in 1995.

TECHNOLOGY UPDATE

Continental Electronics

New from **Continental Electronics** is the PowerStar digital AM transmitter, which, according to the company, is the first AM transmitter to accept and generate digital broadcasts.

With the PowerStar A50 50 kW transmitter, AM stations can share the benefits of the FM market, particularly in clarity in broadcast control.

The unit accepts and builds on the AES3 digital audio path standard.

According to Dan Dickey, vice president of engineering, PowerStar users will have more control over the sounds of their stations.

"All-digital paths reduce noise and prevent signal degradation as opposed to analog components that age and drift over time," said Dickey. "It's now much easier to customize and maintain a consistent sound over an indefinite period of time."

A solid-state transmitter, the unit uses less power than older tube transmitters and its digital modulator requires less power than PWM or PDM transmitters.

The unit's amplifiers maintain full power output with no signal degradation should one or more of the 48 amplifiers fail.

For more information contact Continental Electronics at (214) 443-9901, fax (214) 443-0002 or circle ***Reader Service 4.***

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World Radio History

TECHNOLOGY UPDATES

Radio Systems

Radio Systems is a manufacturer of low-power AM transmitters, from 10 to 30 W for non-licensed educational stations, licensed traveler's information stations, and pre- and post-sunrise commercial applications. New from the company is the TR-6000, a redesigned transmitter featuring a 30 W power output, frequency-synthesized tuning, and Class D design.

The Class D operation is of particular benefit in many outdoor and portable installations that must rely on solar power. Due to the Class D amplification, it runs cool even at full power. The digitally-synthesized TR-6000 has an internal audio limiter and detector circuitry. Because the frequency is digitally synthesized, a user can change the operating frequency in the field.

New features include remote-control capability, an audio VU meter and front-panel power meter, headphone monitor and a flat-pack design for simple rack-mounting.

For more information contact Radio Systems in New Jersey at (609) 467-8000, fax (609) 467-3044 or circle ***Reader Service 9.***

Thomcast

Thomcast offers several shortwave transmitters, including the TSW 2100 — a 100 kW transmitter, that transmit audio over AM frequencies. The TSW 2100 is fitted with one small driver tube and a final-stage tube, while the TSM modulator is designed with semiconductors throughout. All preliminary stages are fitted with semiconductors and are wide-band design. A high-stability programmable synthesizer serves as a radio-frequency source.

The TSW 2100 is equipped with TSM, a solid-state modulator. Exclusive use of semiconductors combined with the prevention of high switching transients provide the energy required by the transmitter.The TSM comprises 32 power modules, each one representing an individual voltage source which can be independently switched on or off from each other. The automatic tuning system of the TSW 2100 has a capacity of 230 preset values available for distribution between 3.2 and 26.1 MHz. Operators may store 100 additional states as operator presets.

For more information contact Thomcast in France at +33-1-34-90-31-00, fax +33-1-34-90-30-00, visit its Web site at www.thomcast.fr *or circle* ***Reader Service 21.***

Energy-Onix

The Pulsar line of AM transmitters from **Energy-Onix** will soon be available in 250 and 500 W models, as well as in 1, 2.5, 5, 10, 25, 50 and 100 kW configurations.

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This allows a standardized spare complement located in one flagship station to support multiple transmitters.

For more information contact Energy-Onix in New York at (518) 758-1690, fax (518) 758-1476 or circle ***Reader Service 99.***

Don't Forget ...

Readers Forum is now on page 70.

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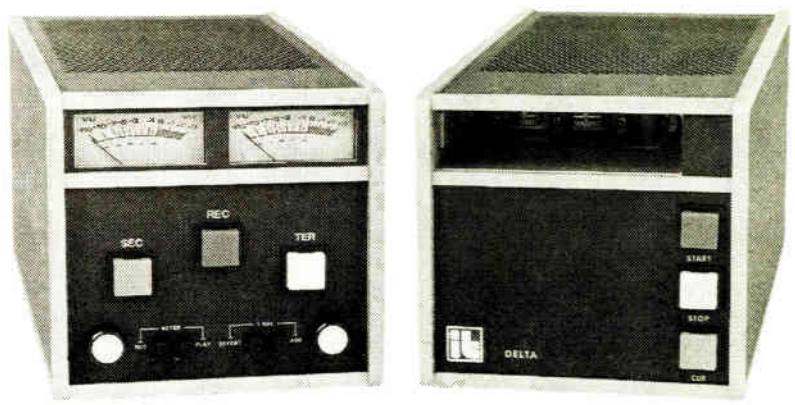

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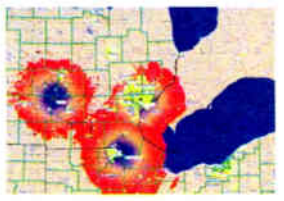

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Harris Medalist 10-pot slide board w/pwr supply, just removed from srvs, one mic module not working, $750. R Miller, 217-824-3395.

LPB Signature C 10-5, 10 mixer dual chnl Citation model, excel cond, 5 VU meter w/digital clock counter, nice, BO. R Osborne, 304-273-2544.

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Schafer 8000 w/complete pwr supply & 10 working modules +EQ module, gd working, complete w/manuals, 15 yrs old, BO. M Sedota, 843-249-3441.

Tascam MM1 kybd/line mxr FS; Tascam MM1 20 line input stereo mxr, MIDI mute, rack mount, treble/bass, effect sends, $600. M Hugh, 301-962-6823.

Logitek 12 stereo mixer. Mike, 800-588-7411.

MCI/Sony 618, 24x24, $6.5K; Quantum 24x24, $4.5K; Soundcraft 600, 32x16, $5.5K, like new; Model 30, $295; 512, $950; 520, $1450. W Gunn, POB 2902, Palm Springs CA 92263. 760-320-0728.

LIMITERS

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Orban 8000 stereo compressor/limiter w/manual, clean, $1000/BO. R Plessing, 850-670-8450.

Power-Pak SCD-40, composite to 2 chnl demodulator, $150. R Lankton, 941-377-1488.

CBS Labs Audiomax stereo level controller, $175. L Houck, 830-537-5494.

CRL AM System, APP-400, SEP400A, PMC 300A w/Radio Design Labs NRSC system, complete system in excel cond, BO. R Miller, 808-572-5534.

Modulation Sciences CP-803 composite processor, excel cond, rack mount, $600. K Tuckerman, 217-826-2813.

Orban 8100 A/ST Optimod-FM, excel cond, BO. C Marker, 906-249-1423.

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Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

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Neumann M-147 tube condenser mic, new, w/elastic shock mount & flight case w/pwr supply, $1595; Lawson L-47 tube condenser mic w/pwr supply & flight case, superb voice over mic, $1100. J Laurence, 828-524-9602.

Sennheisser headphone mike, Electret Boomset HME 45CA, brand new in box (2 pairs), $260 ea. M Hugh, 301-962-6823.

Neumann U47, $3900; U67, $3300; U87, $1800; KM83 or 84 pairs, $1400; KM88s, $950 ea; RCA 77DX, $1200; BK5, $700; BK1A, $300. W Gunn, POB 2902, Palm Springs CA 92263. 760-320-0728.

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Belar RFA-1 FM amp, gd cond, $200/BO. K Tuckerman, 217-826-2813.

Sparta A-10B board, 4 pots, 1960's vintage, $75; RCA 5' metal equip rack, heavy duty, doors front & back, 200 lbs, must pick up, $50; Tapecaster X-700 cart machine, works, $75; Harris 1960's vintage cart machine in gd cond. C Marker, 906-249-1423.

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Sony TC-355 7.5" solid state, $75. C Masker, 906-249-1423.

Tascam 32 2 trk r-r, 10" reels, $125. M Trumble, 201-392-0049.

TEAC X2000R 10.5" stereo R/P, $400. J Lalino, 315-891-3110.

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*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

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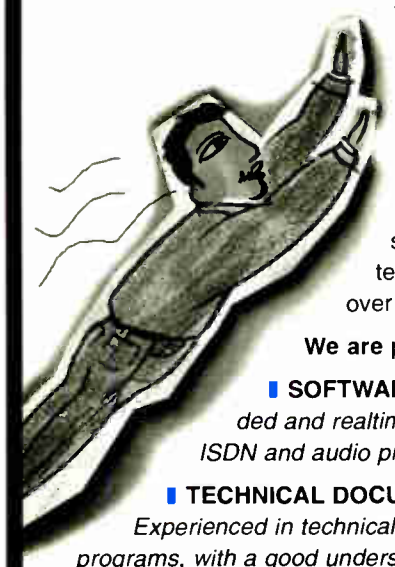

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World Radio History

◆ READERS FORUM ◆

Texas tragedy

Dear **RW**,

After reading the article "EAS Still Battles Alert Flubs" (**RW**, Nov. 25, 1998), I felt compelled to share our experience with EAS during flooding in Texas.

In our home county, Guadalupe, 3,100 homes were either damaged or destroyed. During the storms, the National Weather Service provided via EAS the normal storm and flooding alerts. The station we monitor in San Antonio provided via EAS the normal storm and flooding alerts.

In our local area, we provided round-the-clock coverage that is credited with saving lives and property without activating EAS.

Why? Because no other radio station monitors us, and no one in our audience has devices to respond to our EAS system. No home radios, car radios or TV receivers are activated by EAS warnings.

The true promise of EAS will only be realized when there are receivers out there to hear the tones and equipped to turn themselves on — change to channels broadcasting warnings, etc. I abhor more government regulation, but the only way "e-chips" or any other device will become standard equipment in *all* receivers will be by government mandate.

If the FCC, FEMA and NWS are serious about making EAS a real warning system, they must go to Congress and make mandatory activation equipment in all receivers the law of the land.

Hal Widsten
Co-Owner/General Manager
KWED(AM)
Seguin, Texas

Digital article disappointment

Dear **RW**,

I almost always appreciate the articles that are written in **Radio World**. They are almost always informative and helpful. Unfortunately, I was quite disappointed with the article "What Do We Do Until Digital Arrives?" (**RW**, Oct. 28, 1998).

I was especially alarmed by the paragraph in which the author simply said that he visited a large FM site in one western U.S. market. A summary of this paragraph was that the station engineer shelved his digital exciter. And the reason was the DJs were hearing the delay in their headphones and it was "messing them up."

If I were writing the article, I would have commented that this is simply a lack of understanding of the new way to deal with digital air chains.

At WUNH we have a simple solution. The on-air speakers output audio directly from an FM receiver. The on-air headphones are fed by our Optimod's analog outputs. This gives the DJ almost the exact sensation of listening to air without the annoyance of the ~14 ms delay that is generally present in an all-digital air chain.

I would never write that the engineer at that station was "out of touch," but he was. My air chain is Orban Optimod to Harris CD-Link to Digit Exciter to Z5 transmitter. The sound is incredible. And yes, there is a delay, but the approach that we took is more than acceptable.

Let's face the fact that most live radio has a digital delay anyway.

Next time you do an article like that, please do more research. And please use better real-life situations.

Peter P. Geremia
Chief Engineer
WUNH-FM
Durham, N.H.

Missed opportunities

Dear **RW**,

I have been reading with great interest the letters regarding the disappearing engineers. Once again the real opportunities are being missed. For years people harvested whales and then discovered, much to their amazement, that there weren't many left. Now instead of hunting them we send people to look at them.

If you work at a station that still has a full-time engineer, maybe you should consider a glass case and then sell tickets to other broadcasters who would like to see one in its natural environment.

I am one of the fortunate few. After a broadcast career that placed me in every job from jock to GM to owner, I settled in to a communications college where I engineer the television and radio studios as well as college computer networks. I am appreciated and paid reasonably for my services.

I have preached for years that someday the broadcasting business would be very sorry that it stopped employing full-time engineers, or at least treated contract engineers as if they had a brain.

Radio in particular has become a self-destructive medium. The general feeling seems to be make money at all costs and to hell with the employees, and perhaps worse, to hell with the listeners.

Nearsighted thinking years ago is now starting to bite GMs in the butt. If we think the engineering issue is bad, just wait for what happens down the road a few years when all of the automated (except in morning drive) stations go out hunting to replace their retiring morning jocks.

Since there are few entry-level jobs left (remember the live overnight jock?), radio is no longer training the people to move up into those positions. I think mass ownership and computerized radio have destroyed this business.

Old Will said, "First we kill all the lawyers." If radio is ever going to be what it was intended to be again, we need to add to that list all the accountants that have been turned into corporate managers, all the GMs who think like accountants instead of broadcasters, and anyone else short-sighted enough to believe that equipment doesn't need to be maintained, people who work in radio don't deserve any respect or pay and that programming can be properly done without human intervention.

Dave MacLaughlin
Facilities Manager, Chief Engineer
New England School of Communications
Bangor, Me.

Good Grief, Linux!

Six months ago, **RW** reported that the Linux operating system probably not be practicable in broadcast products for a while to come. To everyone's surprise, it arrived in style last month in Vegas.

The software with the penguin mascot attracted the attention of radio product manufacturers Enco and Scott Studios, as each exhibited Linux products at the NAB show. At press time, On Air Digital USA announced its own Linux-based system.

It does not end there. Audio software such as Cool Edit and Sound Forge XP prove viable under WINE, a Windows emulator for Linux. RealNetworks released a Linux RealAudio player, and amateur programmers have created up to a dozen audio editors and multitrack workstations.

Linux is attractive because it works on common inexpensive hardware, engineers can tweak it to do what they want it to, and it is on millions of registered and unregistered machines, possibly including your Web server.

However, Linux also is an evolving work-in-progress that can be just as quirky as it can be bulletproof. Considerable hacking and compiling are necessary to achieve a desired end, with no guarantee the program will work under a different "distribution" of the OS.

Historically, radio automation and live-assist products other than DOS- or Windows-based units have fared in less than spectacular fashion. The scarcity of Mac-based audio storage and playback products, and the ups-and-downs of Apple itself, made radio buyers leery of purchasing on-air Macs.

Witness the Airtime system, based in QNX, which was unable to win wide market support despite accolades for its intelligent engineering approach. The Australian-made D-CART, which runs under OS-9, is known in the United States but to a few.

We feel Linux is a viable alternative for computerized radio products and operations, but also recognize the work needed to make it so. More soundcards need stable drivers. Station engineers and factory support technicians must learn arcane UNIX commands. A user-friendly studio interface is mandatory. Much needs to be done.

The ultimate irony: Linux runs some of the new automobile MP3 players on the market — products that threaten in-car radio listenership.

The penguin is looking for a radio job. The time is right for manufacturers and station owners to offer it one.

— RW

Write to Us

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BUT DON'T STOP HERE: optional DSP equipped modules allow programmable ducking with gain reduction and master/slave selection, digital input attenuation, pan/balance, 4-band sweep EQ (plus sweep high pass), and compressor/limiter with threshold, ratio, attack, release and makeup gain—all on *each* input!

A meterbridge **router controller panel** can run our new Wheatstone rackmount switcher for hundreds of additional inputs. The totally modular hot-swap design accepts both analog *and* digital inputs. Dual metering is simultaneous VU and full scale digital peak. Add a PC based **setup program** for quick configuration of all displays, mutes, tallies, machine starts and mix-minus assigns (once set the PC is removed for console stand-alone operation) and you begin to see the *power* that lies behind this intuitively simple control surface.

SOUND LIKE SOMETHING YOU'RE LOOKING FOR? Give us a call here at **Wheatstone** and ask about the brand new **D-600 DIGITAL AUDIO CONSOLE**—our sales engineers would love to tell you more!

Wheatstone Corporation

600 Industrial Drive, New Bern, North Carolina 28562 (tel 252-638-7000/fax 252-637-1285/email: sales@wheatstone.com)

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The perfect balance between high technology and control features, Audioarts offers Wheatstone strength and quality with cost-effectiveness through clever engineering.

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