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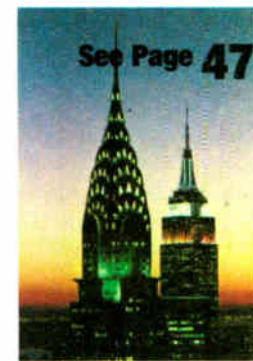
From Here to There

Buyer's Guide looks at STLs and RPUs.

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AES and Digital Radio

DAB is in the spotlight at the 107th AES in New York.



Radio World

The Newspaper for Radio Managers and Engineers

September 1, 1999

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▼ Dave Foxx has a dream job: production director for Z-100 in New York.

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Interference Wars Dominate LPFM

by Leslie Stimson

WASHINGTON The FCC proposal to relax interference protection standards in order to allow new low-power stations on the FM band has generated thousands of public comments.

As the filing deadline draws to a close on Sept. 2, broadcasters and would-be broadcasters seem diametrically opposed over the ability of the FM band to withstand more interference without intolerably degrading the audio quality.

LPFM supporters and opponents also disagree sharply on whether the com-

mission should delay LPFM channel allocations until a digital transmission standard is selected.

What next

The commission staff now will review the flood of comments and try to find a workable compromise that does not degrade the FM band nor threaten radio's digital transition.

Technical questions are at the heart of the debate. As a result, opponents and proponents submitted opposing technical studies about the possible effects of

See LPFM, page 8 ▶



Robert Hafer, Bill Elliott, Patrick Malley, Derrick Clerici and Keith Ege pose with USADR's "DAB Rover 2."

NEWS ANALYSIS

WW1 Wins In Metro Buyout

by Randy J. Stine

NEW YORK Most media analysts agree with Infinity Broadcasting Corp. Chairman and Chief Executive Officer Mel Karmazin's decision to buy Metro Networks to complement his Shadow Traffic division at Westwood One. In doing so, they say Karmazin purchased the industry leader and eliminated most of the competition.

The \$900 million deal announced in June gives WW1, managed by Infinity Broadcasting, nearly total domination of the outsourced traffic service business. CBS Corp. owns 25 percent of WW1. Infinity is the radio and outdoor arm of CBS.

The deal means that Metro's traffic and news operations will co-exist with Shadow's traffic and news

See TRAFFIC, page 5 ▶



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◆ NEWSWATCH ◆

FCC Allows Six Radio, Two TV

WASHINGTON For some time, the FCC technically prohibited radio/TV cross-ownership, but allowed it in practice by granting numerous waivers to the rules. Now the FCC has relaxed several TV broadcast ownership rules, including those pertaining to radio/TV cross-ownership. FCC Chairman Bill Kennard said he hoped the changes would bring certainty to the marketplace.

Now, a single entity can own two TV stations and six radio stations in a market

where at least 20 independent media voices (including newspapers and cable) would remain post-merger. A broadcaster may also own seven radio stations and one TV station instead, or just eight radio stations.

A combo of one TV and one radio outlet will be allowed in any market.

Groups that already had a waiver to own one TV and eight radio stations in a market, along with grants of waiver requests on file as of July 29, will be "grandfathered" in to the new rule. Those owners will be allowed to operate their combos for another five years, and then reviewed on a case-by-case basis.

In markets with 10-19 unaffiliated media voices, one entity can own four

radio and one or two TV outlets.

The FCC will allow waivers of the radio/TV cross-ownership rule in cases where one of the stations in a proposed deal is a failed station.

Stock Ownership Redefined

WASHINGTON The FCC also has revised broadcast ownership attribution rules, or how much stock an entity can own in a broadcaster before it "counts" as an owner for the purposes of multiple

ownership. Now, passive investors (such as bank trust departments, mutual funds and insurance companies) with a 20-percent interest in a station are counted as owners, up from 10 percent. The 5-percent stock benchmark for ownership attribution of active investors remains unchanged.

In the new "equity/debt plus" rule, any party becomes attributable if that party holds more than a 33 percent financial interest in a station, whether equity or

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GUEST COMMENTARY

USADR: A Total Systems Approach

by Glynn Walden and Rick Martinson

USA Digital Radio recently initiated the final phase of its In-Band On-Channel Digital Audio Broadcasting system test, broadcasting on prominent radio stations representing challenging interference conditions and a variety of transmission infrastructure configurations around the country.

This final system test is the culmination of almost a decade of research and development directed toward perfecting the technology that will seamlessly and efficiently transition AM and FM radio to the world of digital.

In that time, USADR has completed in-depth interference studies on the AM and FM bands, performed comprehensive channel characterizations, conducted countless simulations using real-world data and logged over 10,000 hours of over-the-air tests on numerous radio stations including the first ever IBOC DAB Transmission in 1992 on WILL-FM in Urbana, Ill.

As we cross this milestone, USADR feels it is important to share with the broadcast community some key aspects of our system, and why we consider it to be the only viable approach for a digital radio service.

The objectives of IBOC DAB are to bring the tremendous benefits of superior digital audio quality, enhanced data services and improved signal coverage to broadcasters and their listeners.

Digital Coding Techniques			
Design Feature	Benefit	USADR System	Multiple Audio Stream System
Redundant sidebands	Digital Audio quality transmitted twice unimpaired reception in presence of adjacent channel interference	✓	
First Adjacent Cancellation (FAC)	Essential to handle adjacent channel interference	✓	
Code Combining	Error correction for drop-out free reception	✓	
Power Combining	Delivers twice as much DAB power	✓	
Long Interleaver	Enhances error correction accuracy and reduces audio interruptions	✓	
Instant Tuning	Instantly acquires with analog	✓	
Blend	Insures fast tuning and continuity of service at edge of coverage	✓	
Time and Frequency Diversity	Improves performance in multipath noise and interference	✓	✓
Audio Error Concealment	Reduces audio impairments in presence of multipath, noise and interference	✓	✓

Our research, development and testing efforts conclude that IBOC must be able to survive the severe multipath, noise and interference conditions present in both the AM and FM bands. Our system is therefore designed to meet these objectives in this challenging environment by employing multiple digital signaling techniques including:

- Redundancy of Digital Information
- First Adjacent Station Cancellation
- Code and Power Combining
- Long Interleavers

- Instant Tuning
- Blend

The combination of these techniques and coding algorithms used exclusively in the USADR system deliver the highest performing, most robust digital radio service as part of our total systems approach to IBOC as described below (see Figure 1).

IBOC DAB systems must deliver new digital services simultaneously with the existing analog broadcast. The DAB sig-

nals are transmitted at low levels on each side or sideband of the "host" analog signal to prevent interference to the host and stations on adjacent channels.

If the sidebands are not redundant — as is the case with a system that employs multiple unique audio "streams" contained in each sideband — digital audio quality is sacrificed due to the presence of an adjacent interfering station. USADR has found this interference occurs on over half of all radio stations. Therefore, our system employs redundant audio information placed in the upper and lower sidebands to ensure that the system works across the country on all radio stations.

Our system further combats interference through our unique First Adjacent Canceller technology. FAC cancels the effects of a strong analog first adjacent channel station, which can easily wipe out a digital sideband. This patent-pending technology greatly increases the chances of a sideband surviving — and when combined with our redundant sideband implementation, provides robust digital reception under all interference conditions.

Our system overcomes multipath and noise through the use of proprietary coding and power combining techniques. The USADR system uses proprietary error correction techniques that apply complementary coding to the upper and lower sidebands.

The use of these complementary codes allows for a more powerful error correction algorithm by code-combining the sidebands, ensuring near dropout-free digital reception. The sidebands are also power-combined in

See USADR, page 6 ▶

NEWSWATCH

► NEWSWATCH, continued from page 2
debt or a combination of those, and supplies more than 15 percent of a station's weekly programming or has other media interests in the market. All stock, whether common or preferred, voting or nonvoting, will be counted toward the 33 percent threshold.

Tax Certificate Comeback?

WASHINGTON U.S. Senate Commerce Committee Chairman John McCain (R-Ariz.) and Telecom Subcommittee Chairman Conrad Burns (R-Mont.) have prepared a bill that is a new version of the defunct minority tax certificate program.

Congress killed the program in 1995 because of complaints of abuse. The new bill would allow a taxpayer to defer the tax realized on capital gains realized from the sale of a station if that sale is to a minority or if the gain is invested in a minority-owned station. The new bill, which McCain intends to introduce this fall, would include all telecommunications companies.

In the House, Reps. Charles Rangel (D-N.Y.) and Eliot Engel (D-N.Y.) said they plan to offer companion legislation.

NAB President and CEO Eddie Fritts said NAB supports several tax certificate proposals in the works.

FCC Chairman Bill Kennard praised the proposals and said he was confident the FCC could work with Congress to establish a new tax certificate program.

WHAT COMES AFTER DIGITAL?

In the beginning, there were stone axes. Then came fire, the wheel, and the steam engine. Then came analog audio and then digital audio. What comes next?

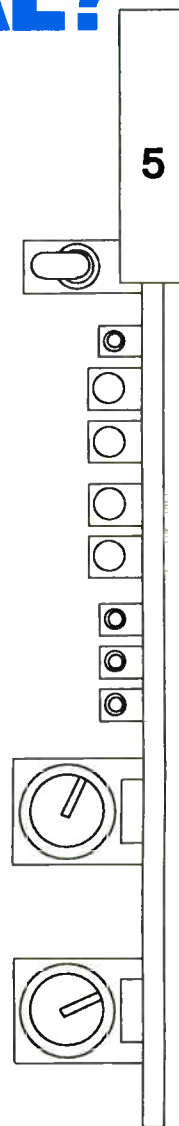
Certainly the stone wheel must have looked to the caveman to be the greatest discovery that ever could be. And to the simple farmer of the 1800's, the steam engine was the most modern contrivance that his mind could imagine. But neither was a terminal technology. Both have been replaced as time marches on.

Digital audio is also not a terminal technology. It is simply where we are now.

Want to know what comes after digital? Call (724) 772-2310 and ask for our white paper "Artificial Intelligence, It's What Comes After Digital". While you're at it, you could also ask for a no-obligation, 10-day demo of COBALT BLUE™, the world's first Neural Network audio processor.



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Many Words, Little Consensus

We need no proof that the low-power issue is the biggest thing to come down the radio pike at the FCC in recent years.

But if we did need proof, here it is. As Leslie Stimson reports on the front page of this issue, the commission has been flooded with thousands of comments about LPFM.

The NAB alone turned in what President Eddie Fritts called one of the most exhaustive filings ever submitted by the association, the result of a seven-month study into the possible effects of a new low-power service.

The biggest concern, and the most potent argument for broadcasters, is the interference issue. You'll find details on page 7.

NAB, CEMA and other interested parties have raised very serious concerns about interference. But how much is acceptable seems to depend in part on where the observer stands on the general desirability of more stations. The mountain of comments sent to the FCC and to us at *RW* — and the technical studies, which draw very diverse conclusions — reflect that.

In the end, a decision on LPFM is likely to come down to politics; and in the current environment in Washington, low-power stands a good chance of happening. But the NAB and its allies on the Hill are strong, and they could well delay the idea, hoping for a new chairman after the next presidential elections.

★ ★ ★

Clippings and comments from around the world of radio ...

Yes, the Internet is a real threat to your advertising revenue, according to one source.

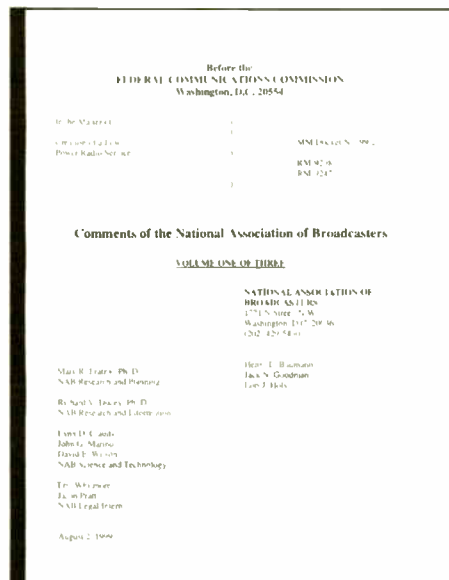
A recent study from a technology research firm predicts Internet advertising will more than triple in the next four years.

According to the Wall Street Journal, Forrester Research estimates Net advertising will make up more than 8 percent

of advertisers' total marketing efforts by 2004, accounting for about \$22 billion in spending in the United States.

Does that 8 percent figure sound familiar? It should — radio has been trying to get up to that share of ad spending for years, moving off its well-known 7 percent mark.

And the advertising community is watching. The headline of the online *WSJ* story went right to the point: "Net Is



NAB's technical filing on low-power radio runs to more than 500 pages.

Expected to Rival Radio in Ad Spending by 2004."

The Internet, it stated, will rival radio as the fourth-largest ad medium in the country at that point — better than magazines and Yellow Pages, and behind only TV, newspapers and direct mail.

But you already knew that. You heard the warning bells two years ago, and you took our advice and mapped out an Internet strategy for your station or group. By now, those NTR dollars are just quietly flowing in.

★ ★ ★

Did you ever notice how people keep comparing other media success stories to

radio?

There was another interesting story recently that used radio as a comparison point, this one in the *Chicago Tribune* not long ago.

In an article titled "TV as Background Noise," the *Trib* wrote: "In many households, TV is becoming the medium of choice in the morning — serving the same purpose radio has had for years. Instead of sitting down to watch the tube, people are using TV just like radio — listening to the audio portion while they move about preparing for the day."

The paper quoted the head of a local TV station as saying, "I think people are going to bed earlier, and getting up earlier. I think they are also more health conscious and working out."

He said TV has become part of their morning workouts, and that people are using the medium as a local source of traffic and weather information.

Another TV executive in the same market said, "We purposefully have copied the radio model because radio figured out that if you put traffic and weather on at a particular time, people might be (doing) something else, but they'll come over to get it."

The *Trib* concludes that TV's pursuit of radio's prime target audience is "on the radar," but not causing any changes in radio programming, yet.

Hmmm.

I think the newspaper is stretching this point, and engaging in a bit of wishful thinking. Not surprising, in a competing medium. But keep an eye on your morning franchise.

★ ★ ★

I'm pleased to welcome Laura Dely to the staff of *Radio World* as our new business editor.

A graduate of Kalamazoo College, she was working at Macy's in the late 1980s when she successfully pitched a story to *Monitor Radio* about a visually impaired baseball announcer.

From that start in journalism, she

From the Editor



Paul J. McLane

went to work for a community newspaper in Boston, and eventually moved to Manhattan, where she worked on the air as a news contributor to public stations WNYC-AM-FM and filed freelance stories for NPR, the BBC and "The World" on PRI.

Later, she took a news desk job across town at WOR(AM) in New York. After moving to the Washington area, she took on more contract work at NPR, where she has written, produced and voiced numerous stories.

Dely edits *GM Journal* and is our main contact person for news about radio business, stations and groups. Contact her via e-mail at ldely@imaspub.com

★ ★ ★

Meanwhile, *RW* is seeking a technical editor/writer to join our staff.

This position is ideal for someone who loves the radio industry, loves playing with audio hardware and has experience in journalism or technical writing. That describes many of our readers perfectly.

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In the Wake of a Traffic Deal

► TRAFFIC, continued from page 2 operations.

Plans are for the two to remain separate, but with the potential to share some aircraft and other resources.

Both Metro and Shadow operate on a barter system.

"It was brilliant for CBS and Westwood One," said John Lund, president of the Lund Consultants to Broadcast Management in San Francisco. "When you look at how those pieces all fit together under the CBS



John Lund

umbrella, it is a nice fit."

But Lund, whose consulting company works with more than 100 radio stations in the United States, said he and his clients are somewhat concerned about a lack of competition in the traffic reporting business.

"Most major markets will now have only Westwood One product to choose from. That means the stations could be forced to give up more inventory for the service, without question," he said. "When there is no competition, there is no free market."

In San Francisco, for example, where Infinity owns KCBS(AM) and six other stations, the Infinity-owned stations have always carried Shadow Traffic. Lund said. Station managers of non-Infinity stations that carry Metro Traffic could feel like they are "lining the pockets of the competition." Lund specifically mentioned KGO(AM), owned by ABC Inc., as a Metro subscriber.

"I really think this merger could open up an avenue for another traffic provider to jump in. Or more of the major radio groups will do what Clear Channel has done and start providing their own traffic to their cluster of stations," Lund said.

Clear Channel Communications provides its own traffic to its stations in San Diego, Los Angeles, Tampa-St. Petersburg, Cincinnati and Memphis.

Local stations

Dennis Winslow, program director at KLDE(FM), a Metro affiliate in Houston, said the AMFM Media station might someday consider doing its own traffic.

"As the radio business grows, you are going to see the tentacles reaching in from different areas and many of these major broadcast groups will become intertwined in some ways. We are certainly not opposed to working with Westwood One, but with this many stations in a market, I think we could make it profitable doing it ourselves," Winslow said.

AMFM Media owns eight stations in Houston.

In New York, David Bernstein, program director at longtime Metro affiliate WOR(AM), said he expects little change in the way Metro does business.

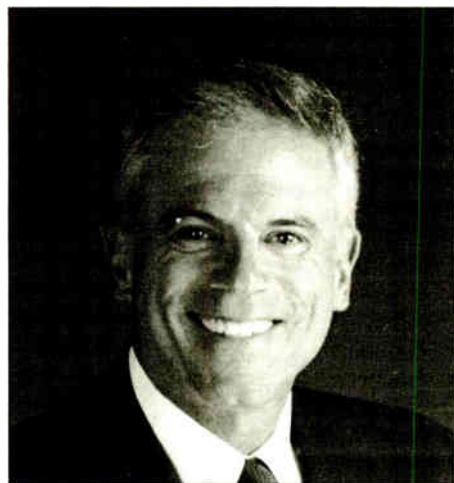
"First and foremost, these people are broadcasters and they know the broadcast game. Things may change in the boardroom at Metro, but we expect the same quality product we've always received," Bernstein said.

"They (Metro) always treat me like I'm their only affiliate," said Phil Boyce, program director at Metro affiliate WABC(AM) in New York. "So I assume they must treat all of their affiliates the same way, which is extraordinary."

Customer service aside, Boyce feels Metro is the best of the traffic services.

"There is no doubt that they (Metro) are the best at what they do. We get a polished sound and serve our listeners without the investment in equipment and bodies."

The transaction had been in the works for a long time. "I personally pursued this deal for over three years," said David Saperstein, Metro chief executive officer and founder of the Houston-based company in 1978.



David Saperstein

"At times it would be us buying them, and then the other way around."

Saperstein, 59, noted that both he and Karmazin saw many advantages in being one instead of two.

"Metro will soon have the news-gathering and delivery expertise of Westwood One on our side. And no one knows the traffic business better than we do," he said.

Ed Shane, president of the research and consulting firm Shane Media Services in Houston, said it was logical for Metro and Shadow to pursue each other.

"I'm a bit surprised the deal wasn't the other way around because Metro is by far the larger and more respected of the two," he said. "Outsourced traffic has become a huge business and it's pretty much all Westwood One now."

Metro operates in 80 markets and provides reporting services for 1,700 radio stations. It has nearly 2,500 employees. Shadow serves 16 markets and 300 stations.

Now, executives of both companies need to figure out how to mesh their resources. Metro and Shadow duplicate services in 16 markets. Saperstein said operations will remain separate in those markets for now.

"We will share some helicopters and other major expenses where we can," he said.

Internet presence

Saperstein estimated savings of \$8 million to \$10 million the next two years for the companies. Some of that money will be used to expand Metro's presence on the Internet.

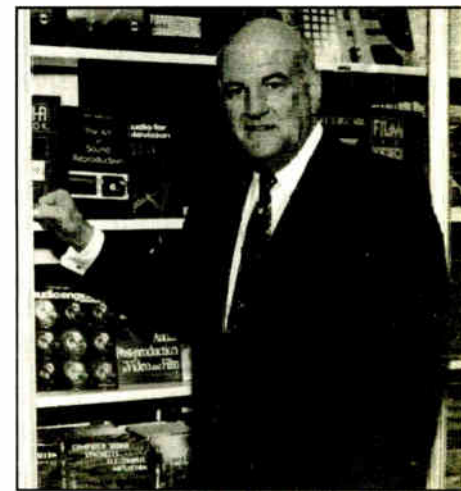
"That is our biggest area for potentially rapid growth. We have always held back a little bit, but now with Westwood One's resources we'll certainly expand our presence on the Internet," he said.

The Metro Source wire and audio service also stands to benefit from the merger. Saperstein said. "With Westwood One's content and news-gathering divisions contributing, the Source will be even better."

The Source is a newsroom operating system that can be used for digital editing and receiving audio feeds, along with its wire capabilities.

Saperstein said no layoffs are planned once the sale is completed this fall.

"This is the same as broadcasting, a talent-driven business," Saperstein said. "We have talented people on the air and collecting information who like to compete. It doesn't matter if it's with the guy across the hallway or not,



Ed Shane

they still want to win."

Saperstein owns 53 percent of Metro stock. He will join the WW1 board after the sale. Metro President Charles Bortnick will become president and chief operating officer of WW1's combined traffic division.

How many people depend on traffic reports everyday? According to Lund, traffic reporting is big business in major markets.

"Traffic is very important and is used by nearly 70 percent of most station's listeners in major markets. In some cases our research has shown it is twice as popular as sports and in many cities it's almost as important as the weather," he said.

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USADR's IBOC Research Update

► USADR, continued from page 3

the receiver to deliver an additional power gain. Only the USADR system, designed with redundant sidebands, can take advantage of code and power combining.

Station acquisition or tuning time is a critical system requirement. Listeners are used to tuning in a station without the delays associated with digital acquisition. In digital transmission systems, signal robustness is traded-off versus tuning time.

Interleavers, which are portions of control code integral to all DAB systems, drive this trade-off. Short interleavers lead to rapid tuning, but result in higher rates of audio dropouts; long interleavers provide more robust performance but result in longer tuning times.

USADR has designed its system to meet both objectives by incorporating a long interleaver to ensure the required signal robustness while achieving instant tuning by using the available analog signal and seamlessly blending to digital after the digital signal is acquired. At the edge of a station's coverage area, blending to analog prevents abrupt digital dropouts (the dreaded digital "cliff effect") by using the host analog audio as a backup channel.

The USADR system, employing the above techniques, is designed to ensure a superior robust signal within a station's coverage area compared to a system employing multiple unique audio "streams."

Figure 2 illustrates predicted system performance plotted against distance from the transmitter. Systems employing this "streaming" approach have lower audio quality due to the additional overhead required to support multiple audio streams. In the presence of interference, noise or multipath, USADR's proprietary techniques maintain unimpaired digital audio quality while "streaming systems," by design, degrade and eventually mute. Near the edge of coverage, USADR's system will seamlessly blend to analog, ensuring an acceptable listening experi-

ence without dropouts.

USADR's Total System Approach applies the above digital signaling techniques to ensure delivery of a superior listening experience in the challenging AM and FM bands. USADR's system is based on extensive research and experimentation, and represents the optimization of a number of signaling techniques to deliver the finest digital radio service throughout the country.

We look forward to continuing to work with you in the coming months to implement this exciting new technology.

■ ■ ■

Glynn Walden is vice president of broadcast engineering and Rick Martinson is director of DAB development for USA Digital Radio.

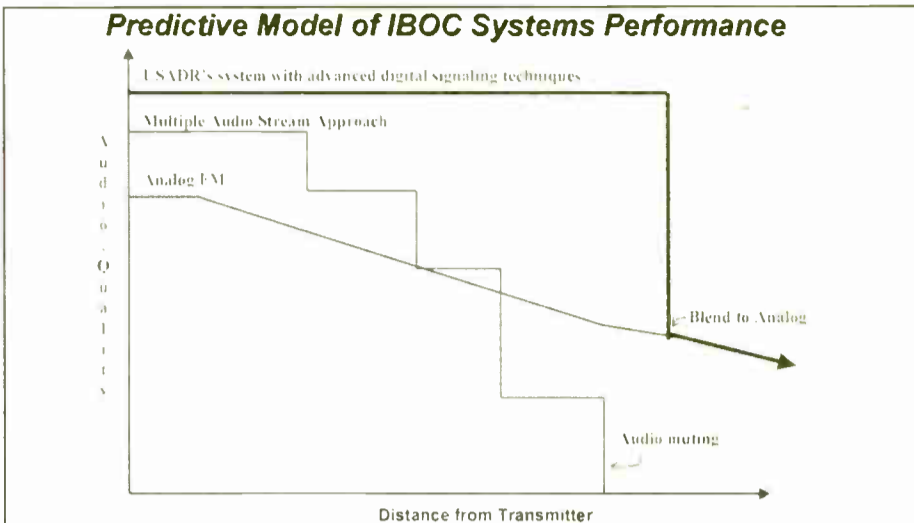
DIGITAL NEWS

USADR Tests On 12 Stations

COLUMBIA, Md. USA Digital Radio is testing its prototype in-band, on-channel digital audio broadcasting systems on 12 stations. With most of the test equipment already installed, tests efforts are underway at several stations. The stations are:

- New York: WCBS(AM), WNEW(FM)
- Washington: WETA(FM), WHFS(FM), WJFK-FM, WTOP(AM)
- San Francisco: KLLC(FM), KYCY(AM)
- Baltimore: WPOC(FM)
- Cincinnati: WNOP(AM), experimental test station 1660(AM)
- Columbia, Md.: experimental test station-93.5 FM

Glynn Walden, USADR director of engineering, said it takes about a day to install the necessary equipment to be able to transmit the hybrid analog/IBOC DAB signal. USADR is providing test stations with a digital



audio exciter and a digital audio processor. For FMs, the combiners have already been installed by USADR. At each station, USADR is using the station's existing antenna to transmit the hybrid signal.

USADR is using transmitters from QEI Corp., Harris Corp., Broadcast Electronics Inc. and Continental



(l-r) USADR's Patrick Malley and Bill Elliott pose in the test van.

Electronics Corp.

USADR staff and some Xetron Corp. staff will drive test vans equipped with prototype receivers and spectrum analyzers to record the received hybrid sig-

nals. Xetron is helping USADR with its AM testing.

New to the USADR team for the testing effort is broadcast engineer Bill Elliott from WYUU(AM), Tampa, Fla.

Walden said USADR needs to be finished with the testing in November in order to submit test results to the National Radio Systems DAB Subcommittee by Dec. 15.

USADR President and Chief Executive Officer Robert Struble said that USADR conducted its first IBOC broadcast in 1992 at WILL-FM, Urbana, Ill.

"USA Digital Radio has logged over 10,000 hours of IBOC DAB live broadcasts," he said.

He estimated initial IBOC receiver costs at about \$1,000 per unit.

LDR to Demo IBOC System

WARREN, N.J. Lucent Digital Radio, which broadcast a hybrid analog/IBOC DAB signal on WJJB-FM, Lincroft, N.J., will have a demonstration of its IBOC DAB system at the NAB Radio Show.

Audio consultant James Loupas of James Loupas Consultants in Coppell, Texas, will give end-to-end demonstrations, showing the path of the LDR IBOC air chain from the transmitter, to the combiner, to the STL to the listener.

The demo will include information and equipment from manufacturers that are working with LDR to develop IBOC-compatible equipment.

LDR has announced testing deals with Orban and Telos Systems to ensure Lucent's patented Perceptual Audio Coder is compatible with their audio processing equipment in a station's studio. LDR will also demonstrate PAC at its booth.

LDR also announced a testing deal with QEI Corp. to develop IBOC-compatible transmitters.

"We made a promise to the industry to develop the (IBOC) technology and be commercially viable, said LDR President Suren Pai. "What you're seeing at this show is our concept for making our system work end-to-end. That has been our objective and we are realizing it."

The results of the WJJB-FM tests will be detailed as well.

—Leslie Stimson

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LPFM Receiver Studies Conflict

by Leslie Stimson

WASHINGTON Among several receiver studies filed with the FCC over the volatile issue of low-power FM, the biggest came from the NAB. Its filing contains more than 500 pages.

NAB President and Chief Executive Officer Eddie Fritts said the document was "one of the most exhaustive filings" the association has turned into the FCC.

The NAB's seven-month study was commissioned by its new spectrum integrity task force, chaired by Bonneville International President and Chief Executive Officer Bruce Reese.

NAB research focused on two steps: comprehensive lab testing of a broad sample of FM receivers to determine the impact that second- and third-adjacent channel interference has on these receivers; and tabular and graphical analyses of the impact the proposed LPFM service could have in the 60 markets studied by the FCC.

Twenty-eight receivers were tested for performance in the presence of co-, first-, second- and third-adjacent channel interference by Carl T. Jones Corp. The receivers included car radios, personal radios, clock radios, portables and home stereos.

Consulting engineers Moffet, Larson & Johnson advised NAB to determine the audio signal-to-noise ratio at which a received FM signal would experience interference. MLJ said it takes a 5 dB drop in the S/N ratio for the typical listener to notice interference.

Receiver performance

The findings demonstrate that the ability of receivers to reject interference from closely-spaced channels varies greatly. Jones engineers concluded the performance standards of many receivers have dropped in recent years.

"In the 60 markets tested, fully 4.2 million people could face additional interference from proposed low-power 1000-watt stations," said Fritts. "For the 100-watt assignments, nearly 6 million Americans could experience interference caused directly by the low-power stations."

Using the NAB data, research firm Dataworld was able to write a computer program to analyze each geographic location in the 60 markets studied by the commission to determine the interference impact of the LPFMs.

Figure 1 on page 8 shows predicted interference caused by LP1000 stations in Columbus, Ohio.

Dataworld also analyzed what the interference effects would be on FM stations owned by ABC in four markets — Minneapolis, Atlanta, Washington, D.C., and Dallas. In Atlanta, for example, the data showed there could be 11 potential LPFM allocations, four of which would be adjacent to ABC stations. Also in Atlanta, the data showed 37 potential LP100 allocations, with 12 adjacent to ABC stations.

Bert Goldman, vice president of engineering, radio division, ABC Inc., said the FCC's assumption that third- and second-adjacent channel protection can be eliminated is wrong.

"Pressures on receiver manufacturers to reduce the size and cost of their products has, in many cases, reduced receiver adjacent channel rejection to far less than what it is presently anticipated by the rules. ... Tightening the receiver front end to suffi-

ciently protect it from second- and third-adjacent interference will usually increase the distortion in the receiver and cause poorer quality audio to be demodulated."

The Consumer Electronic Manufacturers Association, with support from National Public Radio and the Corporation for Public Broadcasting, conducted a study of 16 receivers with consultant Thomas Keller and test manager Robert McCutcheon, using the RMC Technologies test lab in North Olmsted, Ohio.

Ralph Justus, CEMA director of technology and standards, said, "Our tests found that even modern FM radios will experience extensive objectionable interference if the LPFM service is deployed as pro-

posed." He also said LPFM could threaten emerging digital broadcast formats.

"The strength of the LPFM signal and the location of the transmitter will determine the specific impact the introduction of LPFM will have on the digital signal," said USADR in comments to the FCC. "The stronger the LPFM signal and the farther the transmitter from the full-power station's transmitter, the greater the impact of the LPFM station on the digital signal."

By contrast, a group of LPFM supporters commissioned a receiver study that was conducted by Broadcast Signal Lab, L.L.P. in Cambridge, Mass. The supporters included a coalition of LPFM advocates including the National Lawyers

Guild Committee on Democratic Communications, the Media Access Project, the Microradio Empowerment Coalition, the Prometheus Radio Project and others.

Of the 10 receivers studied, the results suggest there is room to relax the interference rules.

"LPFM signals were shown to create only minimal interference within several hundred feet of the transmitters, with many receivers showing no interference even within that small radius," the group stated.

"Any interference within this small blanketing area is easily remedied by low-cost filters, which all radio stations (including the potential LPFM stations) are already required to provide to listeners encountering interference problems in that zone."

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Thousands Comment on LPFM

► LPFM, continued from page 1
changing the current interference protections to allow the new service.

The NAB conducted its own seven-month study and found that, in 60 markets tested, 4.2 million people could face additional interference from proposed low-power 1000-watt stations. (See story, page 7).

Many other organizations and individuals filed comments.

How much more interference on the FM band would be acceptable to allow LPFM stations is crucial, stated Ohio State University, which holds licenses for six noncommercial stations.

"Ohio State does, however, believe that the standard for determination on that issue (interference) should *not* be that there be *no* interference whatever with existing stations' signals. Some *minimal* amount of interference that occurs *both* outside of existing stations' protected geographical contours *and* at the peripheries of their protected spectrum allocations *may* be an acceptable trade off for the benefits of increased diversity on the airwaves."

Observers say LPFM does have a chance of approval, probably in medium to small markets. FCC Chairman Kennard has made it clear to his employees and to broadcasters that LPFM is a priority for the commission, in order to fulfill the FCC's goal of increasing radio ownership diversity.

Many broadcasters, including Clear Channel Communications, Cox Radio,

Inc., Cumulus Media, Inc., Greater Media, Big City Radio, Radio One, Inc., Hispanic Broadcasting and the National Religious Broadcasters, strongly oppose LPFM based on interference concerns.

David Mance, president of several stations in upstate New York wrote, "Small markets will be affected the most severely ... the mom and pop stations that still exist will have 1,000-watt stations, that will, in essence, cover the same limited population areas that we need to survive. Many of my stations are in communities with less than 5,000 people in them. There's not enough room for additional competition in such arenas."

Mance cited interference to his station from a translator on the same frequency as his station WCDO-AM-FM, Sidney, N.Y. The 50 W translator was 40 miles away from his transmitter site in Binghamton.

"The interference caused a degradation of our signal with numerous listener complaints. After much protesting, the FCC reversed their decision and forced the translator to re-locate. Will there be such remedies under the LPFM proposal?"

The FCC has proposed giving primary service status to LP1000 stations (60 meter maximum antenna height), and secondary status for LP100 stations (30 meter maximum antenna height) and the "micro" class of 1 to 10 W.

Primary service stations are protected from interference, from each other, through channel separation requirements,

and from secondary services.

If a secondary service causes interference to a station that enjoys primary status, the secondary station must eliminate the interference. This may be accomplished through reducing power, lowering the antenna, changing antenna direction, moving to another site, or going dark.

Noncommercial Class D, FM translator and FM booster stations are secondary services. Primary stations are not required to protect them from interference.

Broadcasters also expressed concern that the proposal to relax channel protection requirements could affect their transition to digital radio. The commission has proposed eliminating third-adjacent channel protections and either eliminating or relaxing those for second-adjacencies, and has released suggested channel spacings for the possible LPFM allocations at different power levels (RW, March 17).

In addition to NAB, which released independent receiver test results, National Public Radio joined with the Consumer Electronics Manufacturers Association and the Corporation for Public Broadcasting to sponsor lab tests reviewing the commission's proposals. NPR said the testing proved the FCC's assumptions about relaxing interference protections are "untenable." LPFM supporters disagreed.

Impact on IBOC quality

Several broadcasters say it would be premature to move forward on LPFM allocations until an in-band, on-channel DAB standard is selected. USA Digital Radio said eliminating second- and third-adjacent channel protections would affect IBOC.

"Although the design of the digital receiver front end and the high-power amplifier stage of the digital transmitter will determine the extent of the interference, USADR's studies indicate the digital signal will be harmed by the LPFM signal," the proponent wrote.

Lucent Digital Radio, also an IBOC proponent, said, "The analysis that we have conducted to date, while not complete, leads us to be pessimistic about the effects of permitting low-power FM stations on adjacent channels. Our analysis suggests that it will be difficult for addi-

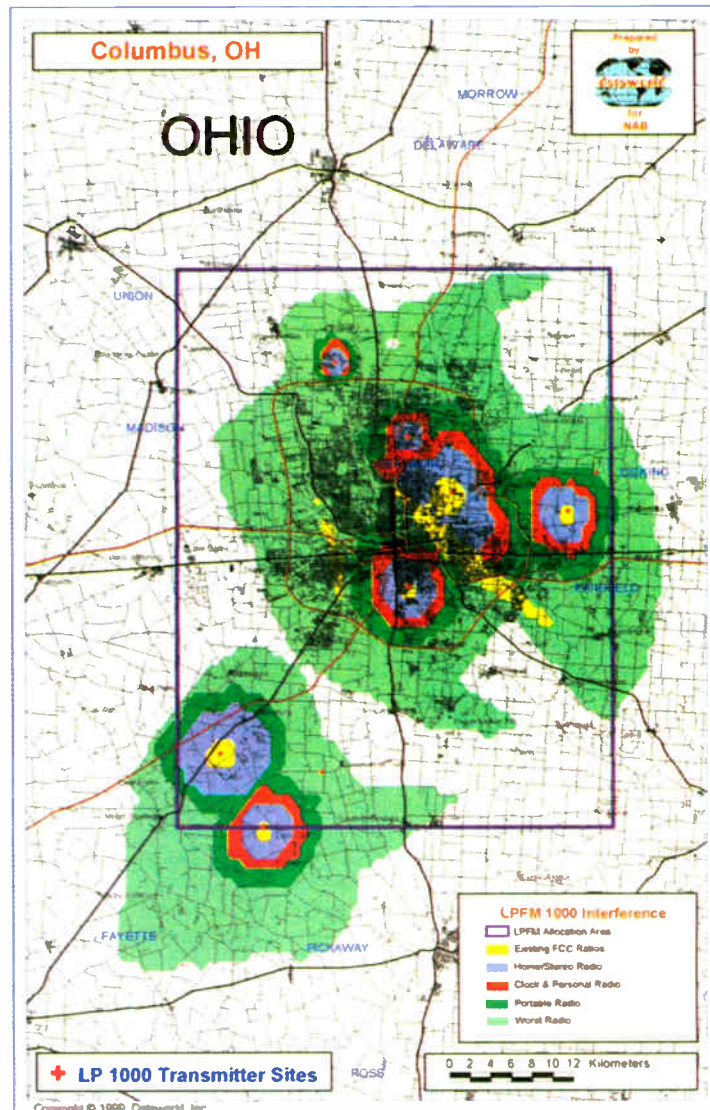
tional low-power analog and new digital IBOC signals to co-exist and serve their intended service areas."

LDR suggested LPFMs be given secondary status and said receivers would have to be redesigned to include better filtering.

LPFM supporters say it may take a while to achieve an IBOC standard, and delaying LPFM until then is unnecessary.

Unclear at this point is whether LPFMs would be licensed as primary or secondary services and whether they would be allocated on the commercial or noncommercial portion of the FM band.

Observers said if the commission does



This map from the NAB filing shows predicted interference caused by 1000-watt LPFM stations in Columbus, Ohio.

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RTNDA99: Charting the Future

by Bob Rusk

CHARLOTTE, N.C. More than 4,000 broadcast professionals from across the country and throughout the world are expected to attend the 1999 Radio-Television News Directors Association International Conference and Exhibit which takes place Sept. 29 - Oct. 2 at the Charlotte Convention Center.

"The theme of the convention is facing the future and preparing for the next millennium," said Barbara Cochran, president of RTNDA.

With that in mind, the opening gen-

eral session, Thursday's "Local Web Journalism, Broadcast Style," promises a discussion on how successful stations meld their on-air news with online news.

Web participation

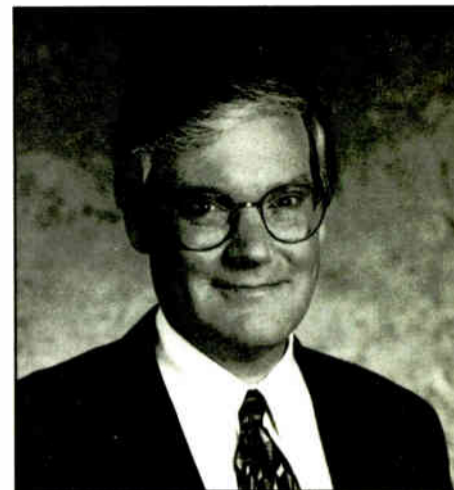
Jim Forsyth, news director at Clear Channel Communications-owned news-talk outlet WOAI(AM) in San Antonio, Texas, will be a panelist at the session. He said, "It's important that people be able to utilize a Web site, not just look at it. They have to be able to participate in it in a meaningful way."

Two of the most popular sessions will surely be Friday's "I Want to Write Like Bob Dotson" and — due to popular demand — the encore presentation, "I STILL Want to Write Like Bob Dotson."

Dotson, an Emmy Award-winning NBC News correspondent, presented a similar talk last year that attracted a standing-room-only crowd. Dotson said his tips apply equally to radio and television news writers.

"This is for people who want to learn something about storytelling," said Dotson, who, early in his career, worked at KMOX(AM) in St. Louis and WKY(AM) in Oklahoma City. "I do talk about visual storytelling, but certainly people in radio do that with words. All storytelling starts with gathering good details and telling people things that they might have missed."

Dotson, who will accept an Edward R. Murrow award for writing at RTNDA99, said, "Storytelling has gotten lost in our business due to time pressures. It's like putting on a circus. We pat each other on the back because we



Bob Dotson

There isn't necessarily time to absorb the story and tell it the way you would like to. So I try to give tips on how to put grace back into storytelling, even at the speed of spot news."

Dotson will recommend writing the middle of a story first. "It's the easiest part," he said, "filled with facts or figures that can stay or go, depending on the amount of time you're finally given for the story. Beginning in the middle helps me jumpstart my writing. I don't stare at a blank computer screen, wasting time, searching for the perfect



Charlotte Skyline

eral session on Thursday, Sept. 30, "The New Millennium, What News Leaders Need to Know," features a trio of speakers: Michael Bloomberg, founder, Bloomberg Financial Markets; Robert Pittman, president and chief operating officer, America Online; and the Rev. Jesse Jackson, president and founder of the Rainbow/PUSH Coalition.

Among the more than 50 sessions on tap at RTNDA99, several will be devoted to the technical and programming challenges news professionals will encounter in the 21st century. One of

"For example, at WOAI we operate real-time chat boards in which listeners can talk with the hosts and guests live. (In addition), we not only run our local news on the Web, but we have places where people can leave comments, provide us with story tips, (and) even become an editor. It's not just passive responses, it's active participation."

In addition to these and other offerings in the technology/new media program track, this year there will be an expanded reporter/producer track that includes professional education sessions.

I try to give tips on how to put grace back into storytelling, even at the speed of spot news.

— Bob Dotson

have the circus tent up, but people come for the trapeze act. We haven't got time for the trapeze act, though, when it's so difficult just getting things done, (like) getting the live hookup from the jungle for the radio feed.

opening line. The opening line, I craft last, after I already know how the story ends."

Two Thursday sessions will also focus on the importance of top-notch storytelling: "Writing News for TV and Radio" (presented by Mervin Block, writing coach, Television Newswriting Workshop) and "Making Dull Stories Sizzle" (presented by Deborah Potter, executive director, NewsLab).

Exchange of views

New at RTNDA99 are sessions aimed at journalism educators, including Thursday's "Teaching Tomorrow's News Leaders." RTNDA's Cochran said, "There is a concern among news directors that students are just not getting radio training anymore. One Friday session, 'J. Profs.: Lead, Follow, or Get Out of the Way?,' will bring educators and news directors together to have a frank and candid exchange of views."

Jerry Bell, news director at Clear Channel-owned KOA(AM) in Denver, said the lack of qualified applicants has become a problem in radio today.

"The talent pool is a lot smaller these days," he said. "It's not good enough anymore just to put an ad in some trade publications and hope you get responses. You don't get very many quality responses. Both the quality level and number of applicants are issues news directors face. I used to get more than 100 resumes on a job

See RTNDA, page 12 ▶

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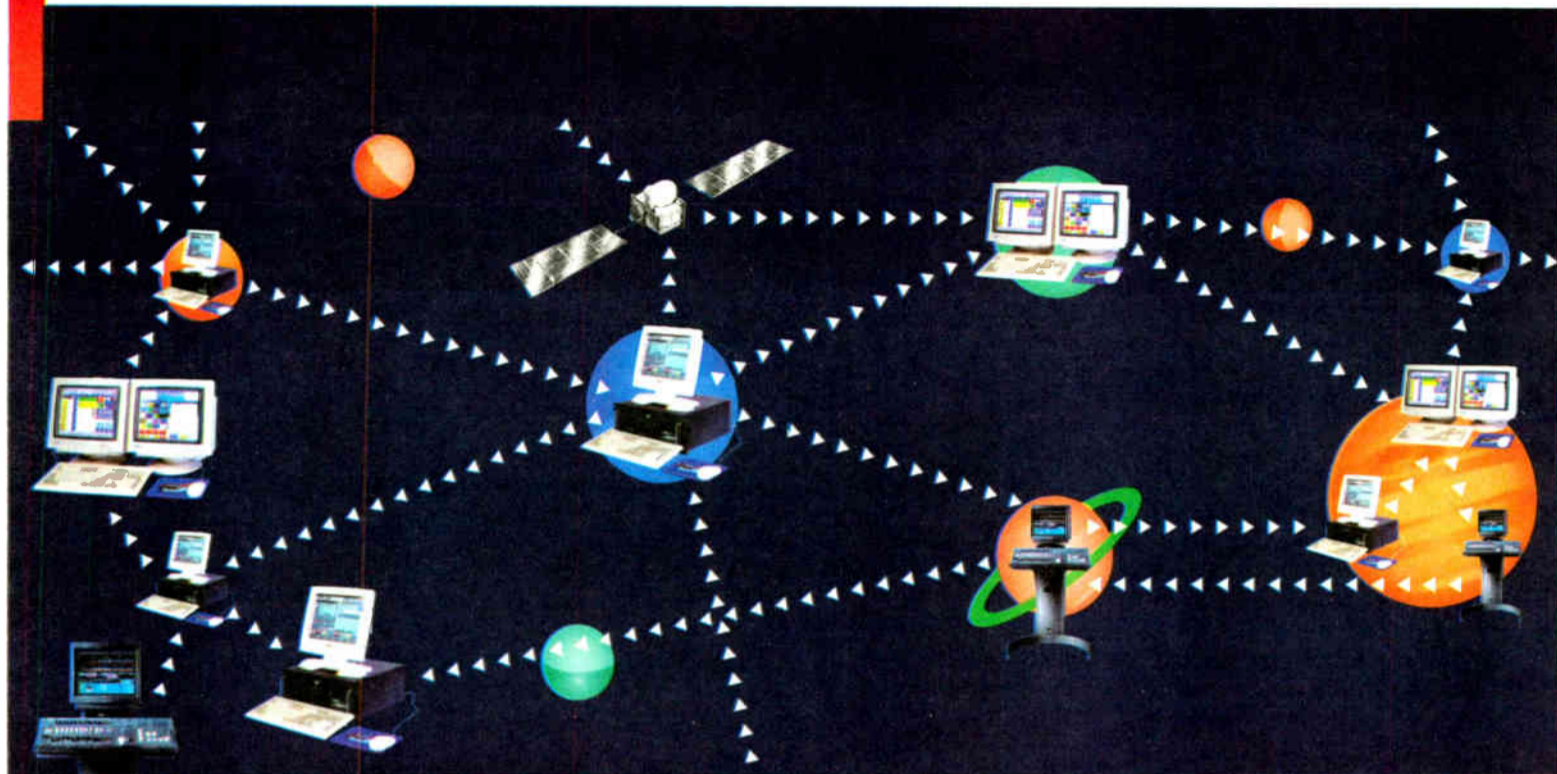
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News People Gather at RTNDA

► RTNDA, continued from page 10 opening. Now it's half that or less."

Bell said while consolidation has played a big part in creating the problem, another factor is that fewer stations in small markets are doing as much news as they used to.

"We traditionally have looked to

MissouriNet, who will suggest that new hires evaluate how they spend the first 45 minutes at work each day.

"That's a critical time in getting the day started and making it productive," said Priddy. "Some folks spend that time yakking with co-workers and accomplishing little. Others orient

Straight to You," moderated by KOA's Bell. "Even though television does some traffic reporting, this is something that radio still owns," he said.

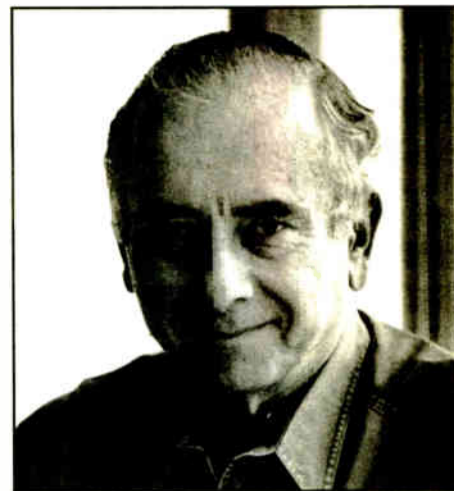
"When people are in their cars, they need information. (Seemingly), everybody does traffic, so how do you make yours stand out as the best in town?"

The answer includes not only reporting on drive-time bottlenecks, but giving listeners what they really need: alternate routes.

"We will be showcasing a partnership that the Denver Clear Channel stations have started with the trucking industry," said Bell. "Truckers are out on the roads morning, noon, and night and are good traffic spotters."

Exhibits

When attendees are not in session, there will be plenty of time to visit the exhibit floor, with more than 130 exhibitors covering 50,000 square feet at the convention center. Of special note: On Thursday and Friday, immediately following the luncheons, there will be two hours of exhibit time when no sessions are scheduled, as well as dessert and coffee. Companies offering goods and services this year



Mervin Block

"What's News," narrated by CBS reporter Charles Osgood. Then, attendees can also explore interactive displays covering major world events. Other features include news photos, historic news artifacts, a timeline of 20th century news, and a look at the power of the First Amendment.

Speakers and awards

Five major events at RTNDA99 will give attendees the opportunity to hear some of the biggest industry names talk about the news business. MSNBC anchor Brian Williams will keynote the Edward R. Murrow Awards Ceremony on Wednesday evening. The Thursday luncheon speaker will be John Roberts, CBS News correspondent and Sunday Evening News anchor. The Friday luncheon speaker will be Ron Insana, CNBC anchor. And on Saturday, the luncheon speaker will be Sen. John McCain (R-Ariz.).

See RTNDA, page 14 ►

One expert says new hires should evaluate how they spend the first 45 minutes at work each day.

smaller markets as our farm teams. But so many of these stations are now running syndicated programming or not running news at all because of economic factors," he said.

A Thursday session in the student track, "Teaching New Dogs Old Tricks," is aimed at better preparing people for a career in radio newsgathering and writing. One of the panelists will be Bob Priddy, news director,

themselves to the developing issues in the state or community. Some time spent assessing the day before going out to cover the first assignment can lead to improved local knowledge and creativity."

Traffic drives listeners

A session of interest to newcomers and veterans alike will be Saturday's "Traffic Reports that Drive Listeners



Deborah Potter

include Associated Press Broadcast Services, Broadcast Electronics Inc. and Radio Computing Services.

The RTNDA's Cochran said the convention offers an excellent opportunity for news directors and engineers to shop the floor together, taking a look at what is available to help run their respective stations more efficiently and cost-effectively.

In an effort to attract more technical employees and managers to RTNDA99, an engineering seminar — with the budget-conscious title, "Proven Ways to Cut Costs" — is scheduled for Wednesday. Panelists include Sterling Davis, vice president of engineering, Cox Broadcasting; and Bruce Lane, manager of applications engineering, Tektronix Inc.

One of the most popular attractions at the convention is expected to be NewsCapade, a mobile exhibit created by the Virginia-based Newseum (an interactive museum of news).

NewsCapade will showcase many of the museum's most popular artifacts, videos, and displays, which will be located on the exhibit floor, in a 2,000-square-foot vaulted pavilion. Inside, attendees may view the Newseum's award-winning film,

APB Winners Honored

The Associated Press Broadcasters will hold an awards gala on Oct. 1 to honor winners of the 1998 APB Awards, recognizing outstanding broadcast journalism among its radio and TV members.

Winners will be honored at the Mint Museum in Charlotte, N.C., in conjunction with the RTNDA International Conference and Exhibit.

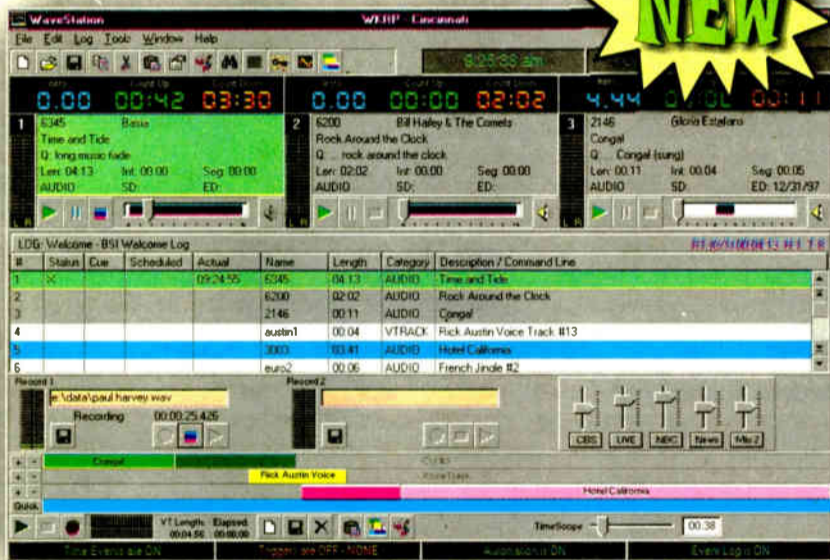
"Coming from the world's largest news-gathering organization, the APB Award is one of the most prestigious honors a news organization can receive," said Scott Herman, president of the APB Advisory Board and vice president and general manager of WINS(AM) and WNEW(FM) in New York.

The radio winners are:

Best Radio Spot News: "Jonesboro Fire," by WSB(AM) in Atlanta, for its coverage of a fire that broke out in the evidence room of the Jonesboro police department. Among other pieces of evidence, the room also housed hundreds of pounds of ammunition.

Best Radio Enterprise Reporting: "Sisterhood of Hope," by WHAS(AM) in Louisville, Ky., for its portrait of a group of women and their quest to help AIDS- and HIV-infected women with the creation of Louisville's House of Ruth.

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Honors Presented at RTNDA

► RTNDA, continued from page 12
chairman of the Senate Commerce Committee.

Finally, on Saturday night, RTNDA's highest honor, the Paul White Award, will be presented. This year the recipient is Tom Johnson, chairman, president and chief executive officer, CNN News Group. Johnson has overall responsibility for CNN/U.S., CNN Headline News, CNN International, CNNfn, CNN Airport Network, CNN Radio, CNN Radio Noticia, CNN Interactive, CNN enEspañol, and CNN/SI.

Under Johnson's leadership, CNN has won the George Foster Peabody Award and the Golden Cable ACE for its coverage of the war in the Gulf and the abortive coup in the former Soviet Union, as well as awards for its coverage of the crisis in Bosnia.

Johnson's award

"Tom Johnson has guided the shop at CNN through eight years of incredible growth and has left a mark on the way the rest of us do business," said Lucy Himstedt, past chairwoman of RTNDA and vice president/general manager of WFIE-TV in Evansville, Ind.. "Also, I applaud the way he handled the Tailwind situation. He showed all of us that when you make a mistake it's best to publicly admit you are wrong and then reevaluate internal sys-

tems that allowed the mistake to happen in the first place. I admire his courage."

Many of the festivities at RTNDA99

How to Go

What: The Radio-Television News Directors Association's International Conference and Exhibition

Where: Charlotte Convention Center, Charlotte, N.C.

When: Sept. 29-Oct. 2

Information: Phone (202) 659-6510, fax (202) 223-4007, Web site www.rtnda.org/convention/ or e-mail rtnda@rtnda.org

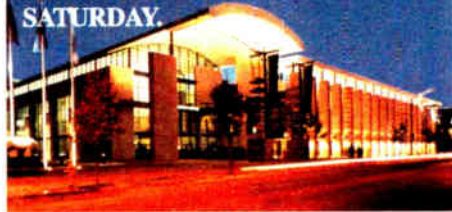
Exhibit Hours:

Wednesday, Sept. 29: 1-6 p.m.

Thursday, Sept. 30: 9 a.m.-5 p.m.

Friday, Oct. 1: 9 a.m.-4:30 p.m.

EXHIBIT FLOOR CLOSED ON SATURDAY.



will be open to attendees' spouses and guests. The spouse/guest package includes admittance to the RTNDA99 Millennium Event Opening Reception, the Murrow Awards Ceremony and post-awards reception, the Paul White Awards Reception and Banquet, and the RTNDF Live Auction & Reception. In addition, an event away from the convention center is scheduled for each day. On Thursday, it's a city tour of Charlotte; Friday features a visit to the Charlotte Motor Speedway; and a

LPFM Beliefs Strong

► LPFM, continued from page 8

LPFM stations can offset the loss of diversity of ownership that has occurred," it wrote.

The SRG also said LPFM represents an inefficient use of spectrum, will not be a financially viable public service and "will damage federally-supported services now delivered by public radio stations."

The National Federation of Community Broadcasters, which counts some 200 stations as members, supports the proposal. It said the spectrum needs of noncommercial stations are "more acute" than those of commercial stations, as there are not enough noncommercial stations to meet listeners' needs for diverse programming. It favors licensing three power levels, LP1000, LP1000 and LP10, as a primary service and says existing translators should be protected from interference.

National Public Radio said the FCC should reconsider licensing LPFMs on a primary basis, as they are "likely to dis-

"shop 'til you drop" stop at an 80-store outlet center.

With all of this and more, RTNDA99 is shaping up to have something for everyone in the radio and television news business — news directors and producers, anchors and reporters, engineers, and educators, and students.

One veteran attendee, Mike Cavender, news director, WGNX-TV in Atlanta, said, "I've attended every RTNDA convention for the past 15 years, and each year I learn something new. With technology changing as rapidly as it does in our business, RTNDA99 is an excellent way to keep up with those changes."

mary and secondary, and, if approved, for LPFM stations.

"At the present, FM translators and licensed stations within the noncommercial portion of the FM band are allocated on the basis of overlap between service and interfering field strength contours while commercial FM stations are allotted on the basis of distance separations."

The firm stated that the distance separation allotment method may be outdated.

How the FCC would enforce compliance with equipment certification and power limits is a great concern to many broadcasters.

Enforcement

In its comments, ABC Inc. asked how often LPFMs would be inspected.

"When inspected, how will an inspector know what the actual ERP (effective radiated power) of the station is? It is easy to tell the difference between a 10,000-watt and a 20,000-watt transmitter. It is not so easy to determine the ERP of a 100-watt transmitter with a 1,000-watt linear amplifier hidden in the attic."

LPFM supporters generally believe that as radio has become more lucrative and groups have expanded, its programming has suffered. They believe LPFM would increase opportunities for ownership and widen current formats.

"As a weekly radio host and programmer with 15 years of experience in all aspects of the underdog world of college radio, I can say with certainty that there is enormous interest in a multitude of music styles that are never allowed airtime on commercial radio," stated Anne Slinn, a scientist with the Massachusetts Institute of Technology and a host on WMBR-FM, Cambridge, Mass.

Amador Bustos, president and chief executive officer of Z-Spanish Media, licensee of 34 Hispanic-formatted stations, said there are already opportunities for minorities to own and program stations.

"Among the stations most impacted will be suburban FMs, whose listeners in urban areas will likely lose those services. ... Many of these suburban FMs are minority-owned and minority-programmed stations. Such stations are often the best way for groups providing service to minority groups and other non-mainstream audiences to get into the current radio marketplace."

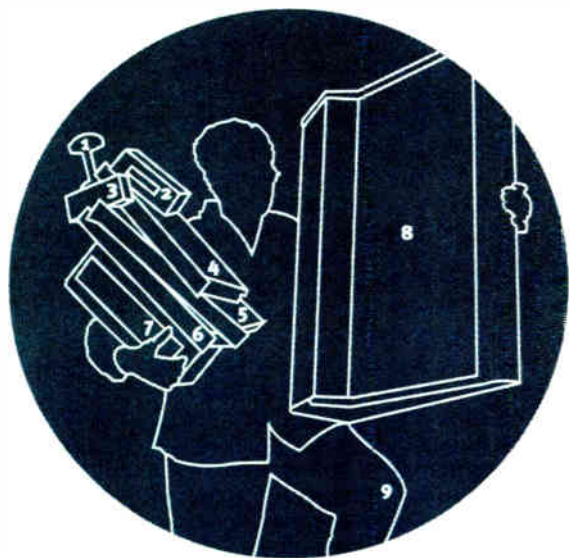
Technical questions are at the heart of the debate.

rupt public radio service to a substantial segment of the public that relies on auxiliary translator and booster stations."

NPR said that "grandfathering" existing facilities is not enough because that approach does not address "the displacement of some facilities by full-service stations and the difficulty of reestablishing auxiliary service in competition with other full-service stations and primary LPFM stations."

Several commenters said it would be hard to determine frequency allocations for the new service because the commission has not yet determined its new contour predictor method, part of the FM technical streamlining proceeding (RW, May 12).

Consulting engineering firm du Treil, Lundin & Rackley, Inc., said that the FCC may consider exploring contour overlap standards for all FMs, both pri-



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- 8 RS-12a millenium console
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Circle (27) On Reader Service Card

RCS Offers XML Data Formats

Recent articles in *RW* have focused on efforts to create industry standards that would let various radio computer systems interact with each other.

Now Radio Computing Services (RCS), which makes Selector music scheduling software, has proposed a broadcast industry-wide adoption of a standards-based open architecture.

According to Dr. Andrew Economos, president of RCS, "We determined a need in the industry among enterprise-level radio groups who wanted to find a way to link all their systems together.

"Because Selector is so pervasive in our industry," he said, "RCS wants to encourage the use of XML and COM technology as a vehicle by which all products and all vendors who choose to can interface with it."

Economos said RCS is working with other vendors to encourage the adoption of these formats.

"I have to say, everyone's been very cooperative," Economos told *RW*. "We're acting as a catalyst here, and because of Selector's broad base we deal with a lot of these people. I've talked to 15 heads of companies like BE, Prophet, Dalet, CBSI, Scott, Computer Concepts.

"We sent them our white paper, and are preparing an extensive document that enumerates standards about each of the fields."

What benefit would such a standard bring to radio users?

"Suppose you had Selector and Linker for scheduling music and promos, with a traffic system like Marketron and an Enco studio system," Economos said. "If you made a last-minute sale in Marketron, it would appear on the log for Enco as well as Linker. Also, if a spot or song is missed in the studio, either the PD or the traffic manager could react in a timely manner. Another example of interoperability would be that the audio from Enco could be auditioned and segued from Selector in the PD's office."

Economos hopes to collect comments and discuss a proposed set of standards with other vendors during *The NAB Radio Show*, with the goal of forming a standards committee.

The following is an abbreviated version of a white paper from RCS, titled "The Open Architecture Initiative." The full paper is available from RCS; contact information appears at the end of the article.

Radio Computing Services proposes a standards-based, open architecture

initiative for the broadcast radio industry. We propose introducing a set of formats for representing schedule, song and traffic data based upon the industry standard eXtensible Markup Language (XML), as well as a set of Component Object Model (COM) interfaces for interacting with Selector, Linker and Master Control NT.

The goal behind this initiative is to foster interoperability between products from different vendors. Right now each system can communicate in its own format, and certain systems can accept input in other formats, but overall, the functionality offered by solutions comprised of systems from different vendors is very limited. Enterprise-level radio groups need to be able to tie together their varying systems, and

What is needed is a standard way to represent the data at the core of the broadcast so that it can be easily transmitted among systems, across WANs and over the Internet.

direct access to databases is not the answer.

What is needed, and we are providing, is a standard way to represent the data at the core of the broadcast — schedule, song information, media information, traffic data etc. — so that it can be easily transmitted among systems, across WANs and over the Internet. XML is the open industry standard for data interchange formats, and RCS is offering its XML data formats, or "schemas," for public use by all radio system vendors.

In addition, we are providing a set of programming interfaces, based upon the Microsoft COM standard, which will allow applications to directly and dynamically interact with Selector, Linker and Master Control NT.

When combined, the XML data formats and COM interfaces will allow third-party applications to import data into and export data from Selector, browse the schedule over the Internet, or access and change the RCS living log. Such applications can be built with any Windows programming language or web tools.

This white paper briefly describes the technology, formats, and interfaces that form this initiative.

What is XML?

XML is a W3C standard for data representation. The design goals for XML are:

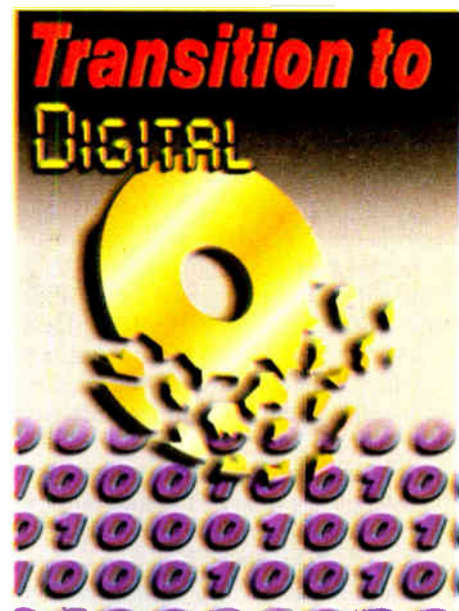
1. XML shall be straightforwardly usable over the Internet.
2. XML shall support a wide variety of applications.
3. XML shall be compatible with SGML.
4. It shall be easy to write programs which process XML documents.
5. The number of optional features in XML is to be kept to the absolute minimum, ideally zero.
6. XML documents should be human-legible and reasonably clear.

7. The XML design should be prepared quickly.
8. The design of XML shall be formal and concise.
9. XML documents shall be easy to create.
10. Terseness in XML markup is of minimal importance.

XML Schemas are text files that are used to define the structure and content of an XML document. XML is extensible in that new schemas can be defined to support new document types.

Both the schemas and the resulting documents are human readable. Parsers for XML are freely and readily available, thus alleviating the burden of producing unique parsers for each vendor's data format. Some parsers can utilize the schemas to validate a document to ensure that it is well formed, and thus help insure that the output produced by one vendor can be consumed by another.

XML is flexible in that schemas can be defined where not all fields are mandatory, thus allowing the same



schema to be used in different contexts where more or less data is required. In addition, it is quite trivial to make applications that are tolerant of additions to the schema made after they were written, thus reducing the rigidity between systems that need to work together.

A movement is under way to establish XML as a standard way of defining all data interchange. There are also many industry-based efforts to define vertical vocabularies and schemas. The RCS initiative is one such effort, with its focus on the radio industry.

Among the data types specified in the RCS XML Schemas are: schedule, songs, artists, links, spots, events, sponsors, products, media and notes.

Actual excerpts of some XML data in the Schedule format are available in the full version of this white paper, from RCS.

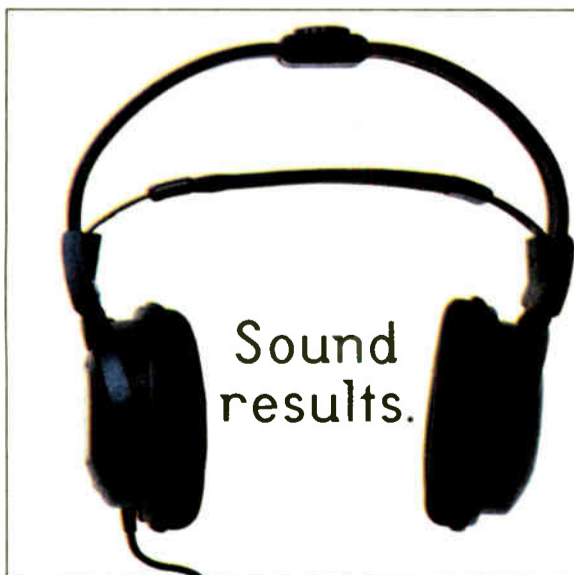
What is COM?

COM, the Component Object Model, is a Microsoft specification for the definition and delivery of component software, and a standard for interoperability on the Windows platform.

Using COM, interfaces can be defined and components delivered that can be consumed by a variety of applications written in any number of COM-compatible languages such as Visual C++ and Visual Basic, as well as being used by scripting languages in web development environments like Microsoft's Internet Information Server and Active Server Pages.

RCS is providing ScheduleReader and ScheduleWriter components that allow for the reading and editing of schedule, and SelectorReader and SelectorWriter components that support the reading of

See RCS, page 29 ►



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New England Show Draws 500

Bob Shotwell

There are a number of regional SBE and state broadcast association shows worth the travel and the day out of the office.

One such show, an annual event since 1986, is the Northern New England Broadcasters Show, which attracted more than 500 people to the Manchester, N.H., Holiday Inn on a hot summer day this year.

Although top-heavy with video, the show had plenty to keep the interest of a radio broadcast engineer, in exhibits, papers and 109 booths.

Vincent Kajunski, the district director of the FCC New England District Office

and a regular speaker at SBE and amateur radio events, gave the most popular talk.

With more than 30 years at the commission, he has seen more changes in radio and FCC regulation than most engineers may see in their lifetimes. His talk covered subjects ranging from pirates and LPFM, to the alternate inspection program.

An ongoing problem

Regarding pirates, Kajunski called the matter an ongoing problem.

"Since January 1, 1998, the Boston office has conducted 81 investigations resulting in approximately 45 pirate stations throughout all of New England

being identified, shut down or in the process of being shut down," he said. "There are at present 11 pirate cases on active investigation by the New England District Office."

And not all pirates have weighed anchor in the FM band. Several illegal operations have been identified on AM.

"A couple have been found using 10-watt, Part 90-type information transmitters in a totally illegal manner," he said, while others "have been using type-accepted Part 15.219 equipment" in a manner which extends coverage well beyond what was originally anticipated by, for example, mounting the units on hilltops and on

tall buildings.

On the topic of low-power FM, he recounted an incident in which a Massachusetts pirate operation was "staffed" by eight broadcast industry employees who had formerly purchased airtime from a few Boston-area AM stations in order to provide a programming service to the minority community.

The individuals argued that, due to group ownership, only one station was now willing to make air time available, but at quadruple the rate, hence the illegal station.

Vincent said that pirate has ceased operating.

A spirited discussion on LPFM took place among broadcasters in the audience, many of whom cited the need to resolve technical issues. Would a digital FM service put renewed demands on first- and second-adjacent protection?

One New Hampshire broadcaster argued that current service could be compromised, beyond any impact on future digital radio. While receiver selectivity is cited as a justification for ratcheting down adjacent-channel protection, he said, the improved sensitivity of receivers also allows listeners to enjoy reception well beyond a station's predicted range, especially in rural areas.

On EAS, Kajunski reminded stations to make certain that they are monitoring the correct stations and relaying information for the proper areas. This can be a particularly easy trap to fall into if a number of stations, licensed to different communities, operate in a combined facility, he said. Not all stations may have the same monitoring assignments.

Sign policy

Kajunski also touched on tower registration, reminding his audience that the registration number must be posted on or very near the tower such that it is visible to the public.

He said there is an "interpretation put out by the Wireless Bureau that it must be visible from the 'public area.'"

For example, he described a large area surrounding a tower site that is fenced off, posted with "No Trespassing" signs, and protected by a locked gate at the access road. He said a duplication of the tower registration should be visible at the gate, so a person could determine the registration number without trespassing.

Although this is not specifically required by the rules, those in attendance seemed to agree that signs are cheaper than attorney fees.

On the exhibit floor, companies such as Harris/Intraplex, Parsons Audio Services, Radio Computing Services, Have Inc. and Shively touted their wares to radio buyers.

Technet Systems Group had the makings of a serious AM-FM broadcast facility, including a Millennium console from Radio Systems and solid-state transmitters from Broadcast Electronics.

Wolf Coach showed a sports utility vehicle outfitted for any occasion. Designed with video in mind, the SUV also is suitable for radio remotes, thanks to the layout of the equipment and its rugged telescoping boom. Wolf Coach can modify SUVs including Cherokees, Durangos, Expeditions and Tahoes to hold two racks of equipment and masts up to 30 feet, and to supply six hours of power without a generator.



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bandwidth, robustness and connectivity to equipment in the all-digital air chain. But most importantly, the Starlink SL9003Q is from your friends at Moseley—continuing four decades of leadership and innovation in the broadcast industry. Attain the summit of peak audio performance with the Starlink SL9003Q. ▲

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World Radio History

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USA
DIGITAL
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The Latest News From
USA Digital Radio

BYTES

September 1999

IN THIS ISSUE

- EASE Program Update
- Agreements with Kenwood and Texas Instruments
- AM and FM Field Testing of IBOC DAB
- Testimonials from Coalition Transmission Equipment Manufacturers:

Andrew Passive Power Products

Broadcast Electronics

Continental Electronics

Energy-Onix

Nautel

Orban

QEI

Shively Labs

Telos Systems/Cutting Edge

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August 31 – Sept 2, 1999
Booth 729

Broadcasters EASE into Digital Radio

USA Digital Radio demonstrated its strong commitment to radio broadcasters in April of this year by establishing the Early Adopter Station Enhancement "EASE" program. The goal of EASE is to engage broadcast managers and engineers in the rollout of USADR's In-Band On-Channel Digital Audio Broadcasting (IBOC DAB) technology by offering a number of services to members. There is no cost to participate in the EASE program, and it is open to all radio stations in the United States. Member stations already registered in the program range from those planning to implement IBOC DAB as soon as it is available to those who are evaluating the requirements of transitioning to IBOC DAB in the future.

Benefits of EASE membership include free station assessments, early access to transmission equipment manufacturers, advance announcements of key milestones, and representation through an IBOC DAB Broadcaster Rollout Advisory Board. Station assessments will address the question USADR is most frequently asked by broadcasters:

"What is required to transition my station to digital?" Participating stations are asked to submit a form detailing the station's current equipment. Broadcast engineers at USADR evaluate the information, and a custom report is issued outlining the equipment options required for a transition to digital.

USA Digital Radio views the EASE program as a pivotal step in achieving the success of its IBOC DAB technology. "Without the support of broadcasters, IBOC DAB simply could not happen," said Bob Struble, president and CEO of USA Digital Radio. "Through the EASE program, we are better able to educate – and be educated by – those stations looking ahead to their digital future."

More than 550 stations responded within weeks to the initial announcement of the EASE program and membership continues to grow. An equal number of AM and FM stations from forty-six states are currently represented with about half of them located in smaller, non-arbitron rated markets.

IBOC DAB Test Stations Selected, Testing Underway

The final phase of mobile field testing of USA Digital Radio's AM and FM IBOC DAB systems has begun in Columbia, Maryland and will continue throughout the summer and fall of 1999 in various cities across the U.S.

Successful FM testing has already been conducted at USADR's experimental test station 93.5-FM in Columbia, Maryland, where digital music was broadcast and received in a mobile environment. AM testing is also underway at Xetron's (USADR's development partner) experimental test station 1660-AM in Cincinnati.

Other test sites to be used in this testing phase include KLLC-FM and KYCY-AM in

San Francisco, WCBS-AM and WNEW-FM in New York, WETA-FM, WHFS-FM, WJFK-FM, and WTOP-AM in Washington, DC, WNOP-AM in Cincinnati, and WPOC-FM in Baltimore. Tests will be conducted at these stations under experimental licenses issued by the FCC, with most equipment already installed and mobile test efforts scheduled to begin soon. The stations were selected based on the guidelines established by the National Radio Systems Committee (NRSC) which require challenging tests in conditions of multipath, noise and interference.

Transmission Equipment Manufacturers: Why

For the last year, USA Digital Radio has been building the coalition necessary to ensure a successful rollout of its In-Band On-Channel Digital Audio Broadcasting technology. The coalition now includes broadcasters and manufacturers of transmission equipment, DSP chips and receivers and continues to grow. We recently asked representatives from the transmission equipment manufacturers the question, "Why did your company choose to participate in the USA Digital Radio IBOC DAB coalition?" Here is a sample of their responses.



**Larry J. Boone, Sales and Marketing Director
Andrew Passive Power Products, Gray, Maine**

Responsibilities: Responsible for worldwide sales of RF systems.

"Andrew Passive Power Products is one of the largest suppliers of RF systems in the USA and the world's largest supplier of digital broadcast filters. We are proud to participate in the USADR IBOC coalition for the provision of high performance filters, combiners and systems to meet all the FM broadcasters' needs for system implementation."



**James R. "Rick" Carpenter, Vice President, RF Systems
Broadcast Electronics, Inc., Quincy, Illinois**

Responsibilities: General manager for the overall performance of the RF Systems Division, which includes the RF Transmitter Group, and Marti Electronics, Inc., in Cleburne, TX.

"Broadcast Electronics has been working with USADR informally since the first IBOC over-the-air testing at WILL in Urbana, IL, almost 10 years ago. Broadcast Electronics believes that USADR now has a strategy and the resources in place to convert IBOC technology from a laboratory curiosity to a commercially viable system for our radio customers."



**Daniel L. Dickey, Vice President of Engineering
Continental Electronics Corp., Dallas, Texas**

Responsibilities: Leads research and development programs, oversees new product development and is responsible for making the company's digital vision a reality.

"CEC always has participated in the standard-setting processes for digital broadcasting and is a member of several standards organizations for digital broadcasting (ATSC, DRM, Eureka-147 and DVB). The USADR IBOC coalition is an important initial step in setting standards for digital radio in the United States, and CEC intends to remain active in this critical process."



**Bernard Wise, President
Energy-Onix Broadcast Equipment Co., Valatie, New York**

Responsibilities: Manages company's business and technical development efforts.

"We at Energy-Onix continue to be impressed with both the financial and technical resources USADR has committed to the development of IBOC digital radio. I believe they are uniquely suited to make IBOC DAB a reality and I am looking forward to working with USADR in assisting radio stations in the adoption of digital broadcasting."



**David J. Grace, President and Chief Executive Officer
Nautel Limited, Tantallon, Nova Scotia**

Responsibilities: Oversees operations and strategic planning for development of future products and markets.

"Nautel's expertise is design and manufacture of solid-state radio transmitters. We are committed to serving the AM and FM broadcasting community through technological innovation. The advent of In-Band On-Channel Digital Audio Broadcasting offers enormous benefits in terms of competitive audio quality. Producing IBOC-compatible transmitters will protect our customers' investment in the future of radio."



USADR Expands Commercialization Efforts To Ready Audio In

Kenwood Corporation, a leading manufacturer of aftermarket automotive and home audio products, entered a joint technology and marketing agreement with USA Digital Radio in May 1999. Under the terms of the agreement, the companies will work together to develop, test, and promote IBOC DAB receivers for consumers and coordinate strategies for the market launch of IBOC technology. This agree-



ment highlights USA Digital Radio's continued efforts to build the coalition necessary to deliver digital AM and FM radio to consumers.

Through their relationship with USADR, Kenwood hopes to "enhance the consumer listening experience while providing growth opportunities for audio retailers," according to Bob Law, Vice President, Mobile Electronics of Kenwood USA.

USA Digital Radio projects the first commercial receivers will be available to consumers in early 2001, soon after the first stations begin broadcasting IBOC DAB. Early receivers are likely to be high-end, aftermarket and home hi-fi models like those produced by Kenwood.

Texas Instruments, the worldwide leader and pioneer in digital signal processing solutions, signed a joint commercialization agreement with USA Digital Radio in July

They Joined USADR's IBOC DAB Coalition



Amy Huson, Vice President, Business Development
Orban, San Leandro, California

Responsibilities: Keeps the sales, marketing and customer service efforts of Orban in sync with the broadcast industry.

"When IBOC happens, broadcasters won't have the time to see if equipment from different manufacturers integrates easily and effectively. We need to do that now. That's why engineering exchanges between Orban and USA Digital Radio are so important."



Charles H. Haubrich, President
QEI Corporation, Williamstown, New Jersey

Responsibilities: Oversees all aspects of product development, marketing and sales for QEI.

"QEI chose to participate in the USA Digital Radio coalition to better position our transmission, monitoring and digital transport products for In-Band On-Channel (IBOC). Since USA Digital Radio has initiated much of the IBOC effort to date, it seemed a logical pairing to merge our transmission experience with their research and development program. We see this as a mutually beneficial partnership making us well positioned for the future of IBOC."



Paul A. Wescott, Chief Executive Officer
Shively Labs, Bridgton, Maine

Responsibilities: Oversees sales and marketing efforts in addition to executive and administration responsibilities.

"Shively Labs has been an active participant in DAB development for years. We think USADR is on the right track and we are happy to have the opportunity to include our advanced filter technology in USADR's IBOC coalition. It's also another opportunity to serve our important customers who are also USADR owners."

Shively Labs



Michael Dosch, Managing Director
Telos Systems/Cutting Edge, Cleveland, Ohio

Responsibilities: Oversees all day-to-day business activities and company strategic planning.

"We at Telos Systems/Cutting Edge consider the advent of IBOC to be one of the most significant and exciting advances in radio broadcasting technology since FM Stereo. The advent of DAB will enable radio stations to give their advertisers and listening audience more value than ever before. We are strategically committed to DAB and are looking forward to helping the industry define and implement future standards."



USA Digital Radio expresses its thanks to the following companies for supplying field test equipment and support:

Belar Electronics Labs, Inc.; Bird Electronics, Inc.; Broadcast Electronics, Inc.; Central Tower, Inc.; Circuit Research Labs; Continental Electronics Corp.; Delta Electronics; Dielectric; Harris Corporation; Intraplex, Inc.; KYW; MB QUART Electronics; Nautel Limited; Orban; QEI Corporation; Shively Labs; Telos Systems/Cutting Edge; WARW; WINS; WJZ-TV

Industry for Digital Broadcasts

1999. The agreement calls for TI and USADR to work

together on the development and marketing of DSP chips, based on the programmable TMS320C6000 family of products. The chips will host IBOC DAB software, ultimately allowing USADR's technology to be integrated into radio receivers. The availability of DSP chips



containing USADR technology will be an important factor in receiver manufacturers' decisions to produce IBOC DAB receivers in the future.

TI's interest in working with USADR is due in large part to the huge market potential of digital radio coupled with the growing and strong coalition that USA Digital Radio has put in-place. "With 600 million radios in use throughout the United States today, the emerging market of Digital Audio

Broadcasting offers tremendous growth potential," said Mike Hames, manager of TI's DSP business.

Joint technical development efforts are already underway. Engineers from USA Digital Radio are working with their counterparts at Texas Instruments to integrate IBOC DAB software into TI's DSP chip technology.



USA Digital Radio, Inc.
8865 Stanford Boulevard
Suite 202
Columbia, Maryland 21045

SOUND BYTES

The USA Digital Radio Newsletter

We are looking for your input. Contact:

David Salemi

Marketing Director and Editor-in-Chief

8865 Stanford Boulevard, Suite 202

Columbia, Maryland 21045

410-872-1533, 410-872-1560 fax

salemi@usadr.com

www.usadr.com

Come Hear The Difference

NAB Radio Show

Orange County Convention Center

Orlando, Florida

August 31 – Sept 2, 1999

Booth 729



USA Digital Radio invites you to participate in

EASE (Early Adopter Station Enhancement)

– An early adopter program promoting broadcaster participation in In-Band On-Channel Digital Audio Broadcasting (IBOC DAB) implementation

The EASE program provides broadcasters with:

- free station assessments which will detail the necessary actions and equipment required to convert to IBOC DAB,
- early access to transmission equipment manufacturers under agreement with USA Digital Radio,
- advance announcements of key activities,
- access to and potential representation on an IBOC DAB Broadcaster Rollout Advisory Board,
- and many potential business arrangements downstream.

To receive more information and an EASE registration packet, please call Scott Stull, Marketing Manager, at 410-872-1578 or e-mail him at stull@usadr.com.



KIIS-FM, InXsys Form Venture

InXsys Broadcast Networks, a radio Web content provider and division of BuySellBid.com, formed a strategic venture with Clear Channel Communications station KIIS-FM in Los Angeles.

InXsys will create an original audio and video programming broadcast network for the Internet called KIISFMI, found at www.kiisfmi.com

The network will not be a simulcast of KIIS-FM, but "a completely new alternative programming defined as the 'next top 40,'" InXsys announced. Programs will include interviews, new music showcases, breaking music, video entertainment and "lots of interactivity."



The site launch is planned for Sept. 6.

For information, contact InXsys in Virginia at (703) 684-4427, send e-mail to stash@inxsys.com or circle Reader Service 57.

Cumulus Chooses BSI

Cumulus Media Inc. will standardize its radio stations on non-proprietary digital studio and audio software from Broadcast Software International.

"We have all the major radio station systems in operation in one or more markets," said Richard



BSI WaveStation

Weening, Executive Chairman of Cumulus. "While there are several fine systems out there, we conclude that BSI WaveStation is the easiest to use, the most versatile and reliable, and because of their open standards architecture the most compatible with our other plans."

BSI said its non-proprietary approach allows users to make their own decisions about what PC hardware to use. BSI automation and other digital audio products run on any Microsoft Windows operating system (95, 98, or NT) and are compliant with

any Microsoft Windows-compatible audio hardware.

For information, contact BSI in Oregon at (541) 338-8588, visit www.cumulusmedia.com or circle Reader Service 61.

New Northwest Taps BP

New Northwest Broadcasters, a group founded by radio executives Michael O'Shea and Ivan Braiker, has chosen TotalRadio music programming service from Broadcast Programming.

BP provides music logs, libraries, current updates and hard-drive system integration for various formats and digital programming systems on a station-by-station basis. The operation is under the direction of NNB VP/Programming Scotty Brink.

Edie Hilliard, president of Broadcast Programming, said the deal "demonstrates how we can tailor a service package to the exact needs of a developing group as well as the hundreds of individual radio stations and clusters we already serve."

New Northwest Broadcasters, based in Seattle, owns, or has under contract, 48 stations in 12 markets in Alaska, Oregon, Washington and Montana.

Recently, Jones International Networks Ltd. agreed to acquire Broadcast Programming from Broadcast Electronics Inc. That transaction was expected to close in late summer.

For information, contact BP at (800) 426-9082 or (206) 728-2741, send e-mail

to experts@bpradio.com or circle Reader Service 58.

VIO Helps Visually Impaired

CartWorks/dbm System Inc. has installed several new CartWorks VIO systems.

Through integration with screen reader software and speech hardware, the Visually Impaired Option provides blind operators equal access to the computer-based CartWorks digital audio system. VIO systems were installed recently at Mississippi Authority for Educational Television's Radio Reading Service. Radio Reading Service of Mississippi provides programming and receivers for more than 3,000 blind and sight-impaired people in the state free of charge.

The CartWorks system automates programming between satellite networks, computer digital audio, DAT machines and cassette decks (which will be used until all programming is dubbed into the computer).

"If we had viewed it from a purely financial perspective, this product probably wouldn't exist," said George Thomas, president of dbm Systems. "(But) we started this company to build professional digital audio systems that anyone could operate. We've always tried to keep the user interface straightforward and simple, yet maintain the power and flexibility."

For information, contact the company in Mississippi at (800) 795-7234, e-mail to gthomas@cartworks.com or circle Reader Service 62.

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Workbench

Radio World, September 1, 1999

Put Old Cabinets to New Uses

John Bisset

So what do you do with those old Scully reel-to-reel roll-around cabinets collecting dust at your transmitter site?

Mike Fast at WCBM in Baltimore pressed them into service in his con-



Figure 1: A new use for an old reel-to-reel cabinet not only saves the station money, but improves operator efficiency.

trol room, with a slight modification. Mike uses the Fidelipac 3.5-inch floppy disk machines, and as you can see

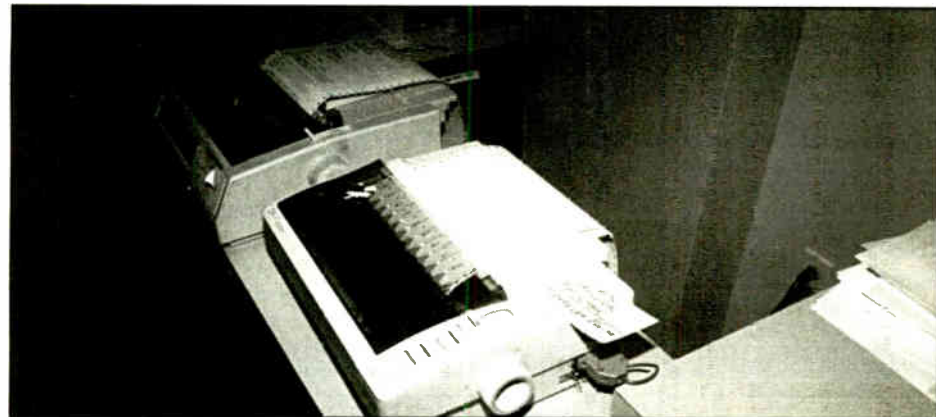


Figure 2: A sliding shelf for printers eliminates the need to crawl under the printer to replace paper.

in Figure 1, when the deck area is replaced with a sectioned tray, all promos, spots and jingles are within easy reach of the jock.

Using floppy disk dividers, the disks can be easily categorized. Since a number



Figure 3: Check mounting bolts, cable waterproofing and the feed horn assembly before winter.

of stations are using MiniDisc technology, a tray can be fashioned for them as well.

Mike shares another "carpenter's tip" for the busy newsroom. Figure 2 shows how his newsroom printers were mounted on a sliding shelf. Shown in the "pulled out" position, the sliding action makes feeding paper into the printer a lot easier.

Gone are the days of crawling under the printer shelf trying to feed paper up through a narrow slot!

Fall is a good time to check on satellite feed horns.

If the weather and insect deterring disk is not covering the feed-horn opening, save

yourself a lot of trouble by installing one. In Figure 3, you see the exposed feedhorn opening — a welcome mat for bees, and on

larger dishes, birds or squirrels. If your feed-horn doesn't have a cover, and you can't easily locate one, at least spritz some bee killer around the opening to deter insects.

While you're up on the ladder, check for a waterproof LNB connection and proper

cable support. One last thing: Gently stress the tripod feed horn supports and LNB support to exposed loose bolts. If any bolts are missing or corroded, replace them.

You'll be thankful for this pre-winter maintenance — ask anyone who's had to work on a dish in the biting cold and ice of winter. Talk about a slippery slope!

Walt Jamison wrote to express some concern about adequate ventilation of wall-rats (or wall warts) when wrapped in rubber inner tube and held in place with a hose clamp.

His point is that some of these get

warm and the rubber insulator may prevent proper cooling. As an alternative, Walt suggests using a tie wrap to hold the wall-rat in place. Whatever is used, keep that AC adapter properly secured!

Ralph Winquist, a consultant in Lake Worth, Fla., sent me a copy of the latest Antique Electronic Supply flier.

In addition to a variety of electronic parts, these folks stock small signal tubes — which, they add, are Y2K compliant!

If you'd like a copy of their catalog, circle **Reader Service 54**.

Figure 4 shows a spark gap that did its job over the summer.

See WORKBENCH, page 29 ▶



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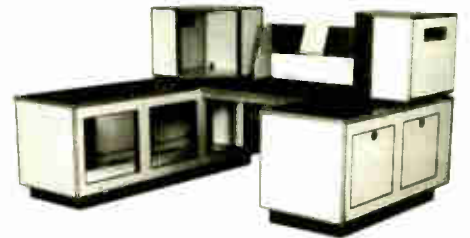
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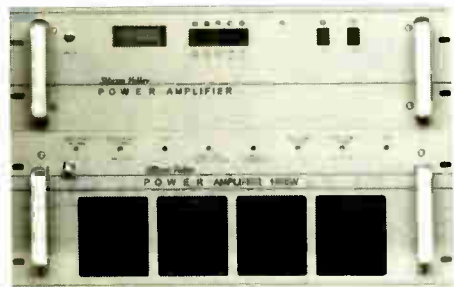
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Fractal Antennas Offer Benefits

Tom Vernon

Since they were first described by the French mathematician Benoit Mandelbrot in the mid-1970s, repeating geometric figures known as fractals have fascinated computer scientists, mathematicians and graphic artists.

These "broken curves" have been used to explain naturally-occurring phenomenon such as lightning, galactic clusters and clouds. Many computer-image compression schemes are based on fractals. Until recently, however, there have been few

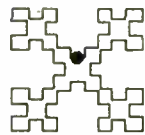


Figure 1: A schematic comparison of a fractal loop, top, and folded dipole, bottom, reveals radical shrinkage at comparative gain. This resonant fractal loop is almost 95 percent efficient with a 7-percent bandwidth.

hardware applications of fractal geometry.

Fractal antennas and fractal arrays are notable exceptions.

A fractal element antenna, or FEA, is one that has been shaped in a fractal fashion, either through bending or shaping a volume, or introducing holes. They are based on fractal shapes such as the Sierpinski triangle, Mandelbrot tree, Koch curve, and Koch island. The advantage of FEAs, when compared to conventional antenna designs, center around size and bandwidth.

Size can be shrunk from two to four times with surprisingly good performance. Multiband performance is possible at non-harmonic frequencies, and at higher frequencies the FEA is naturally broadband. Polarization and phasing of FEAs also are possible.

The theory of fractal antenna operation is steeped in mathematics, but in its most basic form, it comes down to this: In order for an antenna to work equally well at all frequencies, it must satisfy two criteria: it must be symmetrical about a point, and it must be self-similar, having the same basic appearance at every scale; that is, it has to be fractal.

In many cases, the use of fractal element antennas can simplify circuit design, reduce construction costs and improve reliability. Because FEAs are self-loading, no antenna tuning coils or capacitors are necessary. Often they do not require any

matching components to achieve multi-band or broadband performance.

Much of the manufacturing and research on fractal antennas is being done by Fractal Antenna Systems Inc., a privately-held company with manufacturing facilities in Ft. Lauderdale, Fla., and research and development labs in Belmont, Mass.

The company holds key patent pending positions on the technology. Its founder, Dr. Nathan Cohen, is a professor of Applied Science and Telecommunications at Boston University.

While much of the current research and developmental work has centered on the 900 MHz, PCS and S-band applications, fractal antenna design techniques can be applied to any frequency and any type of antenna, such as dipoles, monopoles, and helices. Replacing the spring stubby on cell phones with a fractal design results in a more efficient antenna, one that is cheaper to manufacture, and broadband enough that designers are considering including a GPS receiver in future cell phones.

"We have been able to use a fractalized helix to shrink the height to one-third normal with the same gain," Cohen said. The trade-off with this reduction in size is a decrease in bandwidth to slightly less than 25 percent."

While the company does not actively manufacture antennas for broadcasters, Fractal Antenna Systems does a lot of cus-



Figure 3: A fractal end-fire helix in a transparent radome attains the same gain as a regular helix three times its height. Shown here, a 675 MHz antenna measures 7.5 cm in diameter and about 12 cm high. Gain is about 7 dBi. A similar design for 450 MHz is 12 cm in diameter and 18 cm high.

tom work, and welcomes all inquiries. The most promising applications would seem to be in the 450 MHz RPU and 950 MHz STL arenas. In addition to the increased

Cohen initially reported his findings at an ARRL convention in 1994, and published the first article on FEAs in 1995.

University researchers confirmed his findings, and investigations into FEAs continue at Penn State, UCLA and UPC in Spain.

Research on the related field of fractal

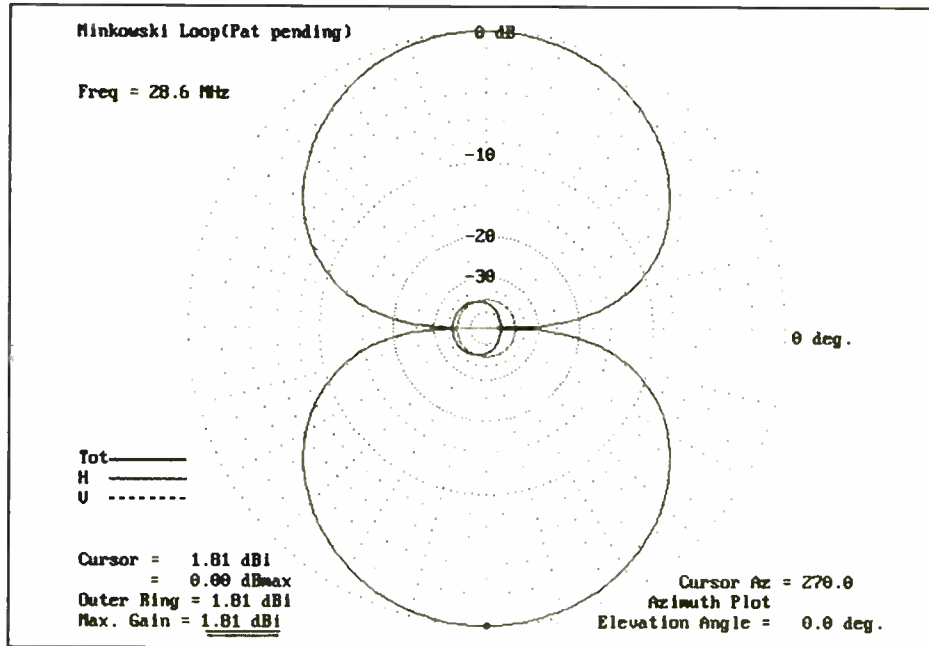


Figure 2: The free-space gain pattern for this fractal loop gives dipole-like coverage with negligible losses compared to a dipole.

bandwidth that FEAs afford, the reduced size may be an important consideration for broadcasters when aesthetics or wind loading are important considerations.

Fractal antennas have existed for a long time, although they were not consciously designed as such. Log periodic antennas are fractal in nature. While they have been around for more than 40 years, their behavior was not completely understood until fractal techniques were applied.

Another type of aerial, the randomly bent antenna, is really based on random fractals.

A radio amateur and Boston apartment dweller with space limitations, Cohen assembled the first true FEA in 1988 to work the 2-meter amateur band. He later built a 10-meter dipole and worked dozens of stations in Europe with 1 watt.

arrays is under way at the University of Pennsylvania in Philadelphia. Antenna arrays traditionally have been constructed with elements either randomly scattered or regularly spaced. By using a fractal arrangement, efficient arrays can be constructed with a quarter of the number of elements used in a conventional design.

To learn more about fractal element antennas, including construction plans for a 10-meter fractal dipole, visit the company Web page at www.fractenna.com. Some interesting 3D fractal antenna student projects are on display at www.ant-lab.ee.ucla.edu/~johnng/fractal.html

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

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Moore Is Voice of 'NASCAR Today'

Paul Kaminski

A recent *RW* article on the Department of Defense's Defense Information School (DINFOS) mentioned the names of famous alumni who served at American Forces Radio and Television Service outposts around the world.

One of those alumni is known to NASCAR fans who listen to Motor Racing Network radio broadcasts. He is Joe Moore, a 1972 graduate of the Defense Information School's Broadcaster's Course which was then taught at Ft. Benjamin Harrison, Ind.

Moore combined a lifelong interest in racing with the contacts and training gained with AFRTS, to find his present position with MRN. For Moore, an Army broadcaster, it was the culmination of a wish.

"I was baby-sitting the MRN broadcast one day," he said, recalling time spent at the AFRTS station at Udapao Air Base in Thailand. "The broadcasts always tied me back to home, and got me to wishing I could do that."

Many voices

Moore is MRN Radio's "do-it-all" guy. Besides his raceday work as a turn reporter, he is the voice of MRN's daily news program "NASCAR Today." He also fills in for Eli Gold, the host of MRN's "NASCAR Live" weekly talk show.

Perhaps the roots of his versatility were developed during his tour of duty at Udapao AB.

"We did it all, since our outlet had both radio and television. I did the afternoon show on radio and the evening news on television," he said. "We had lots of equipment, but not enough people, so we doubled up, whether it was news, production or traffic."

One of his most memorable broadcasts was a local, live broadcast of the Bob Hope USO show there in 1972.

"The B-52s were still bombing targets; many of the guys on the flight line couldn't

get away to see the program in person. So we broadcast the show live on radio."

After the Army, Joe returned to his native Wilmington, N.C., to work at WHSL(AM). A stint at WEOO(AM) near Smithfield, Va., put him in position to combine his interest in racing and his abilities as an announcer.

\$150 a night

Joe Carver, the promoter at nearby Langley Speedway, asked Moore to be the race announcer there.



Joe Moore, left, interviews Winston Cup veteran Dave Marcis.

"I said I didn't know the first thing about being a race announcer. Joe said, 'If you like it, you can talk about it.'"

"When he offered me \$150 a night, which was more than I got on my DJ gigs, I said 'I'm there.'"

Five years at Langley Speedway, with stops at Virginia Raceway and Dixieland Speedway, brought Moore to the attention of the Sawyer family, owners of Richmond International Raceway. His public address work at Richmond drew the interest of MRN Radio.

"Mike Joy (now CBS-TV's race anchor) ran MRN at the time and asked me to come down to Daytona for an audition," Moore said. "My audition was as a

turn reporter during a Daytona Dash series race.

"They put me up on a scaffold to describe the action. I was, to say the least, intimidated. I thought I didn't do very well, and figured it was a free trip to Daytona, if nothing else. Then they called me back."

Moore's first broadcast for MRN was a Busch Series race, in NASCAR's Triple-A division, at Darlington in September of 1981. That led to a call for the 1982 Daytona 500, as the turn four reporter.

The race had a line-up of stock car broadcasting legends and legends-to-be: Barney Hall and Mike Joy handled the play by play. Eli Gold, who would go on to anchor MRN broadcasts and work for TNN as their race anchor, was in turn one. Mark Garrow, now the host of Capital Sports' "Winston Cup Today," was in turn three, and Moore in Turn four.

Pit reporters were Ned Jarrett (1961 and 1965 Winston Cup Champion, CBS-TV analyst and Dale Jarrett's dad) and Dr. Jerry Punch (a licensed emergency room physician, former NC State quarterback, race-track announcer and now an anchor/analyst for ESPN and ABC-TV Sports).

"The heat was on," said Moore. "I had parts of race cars flying by me, Harry Gant's hood came past me, it was wild.

"I was glad John McMullin (broadcast producer) was talking in my ear to calm me down."

He began working all the Winston Cup races in 1984. In August of last year, Moore became the host of "NASCAR Today" when Allen Bestwick (race co-anchor with Barney Hall and television host) wanted to cut back his schedule.

"I have an ISDN line in my house, with a Mackie board, a 360 Digi/Cart and a telephone hybrid. Sometimes we'll tape the program, other days we do the program live at 4:45 p.m. Eastern Time. Doing 'NASCAR Today' helps me keep on top of what's happening with the drivers, owners and crew chiefs, and it's helped my play by play, too."

He also is the host of a syndicated television show called "Raceline," which deals with NASCAR Winston Cup racing. The audio from those interviews is often dubbed to Moore's Digi/Cart and is heard on "NASCAR Today."

Too much tech?

One of the biggest changes Moore has seen in the coverage of racing is the increasing number of technology stories about engines, tires, etc. But he feels the people in racing are the big story.

"Most of the technical stuff goes over people's heads," he said. "Race fans are interested in the people in the sport; they're heroes to the fan."

Moore says the racing community and AFRTS have similarities.

"Like AFRTS, you have a structure and guidelines with sponsors, etc. The trick is to be wide open within the structure and work inside the guidelines."

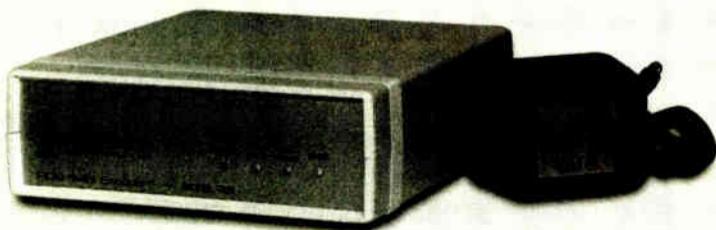
A postscript: Joe and his wife went back to Thailand last year to revisit the base where he was stationed. He said it was a hassle to get back on base and finally had to cajole the base commander into letting him visit. He reports the building that housed the station is now a barracks.

■ ■ ■

Paul Kaminski is himself a DINFOS graduate (Army Print Journalist Course in August 1971) and AFRTS alumnus (News Director, Armed Forces Desert Network, 1991). His e-mail address is motorsportsradio@compuserve.com

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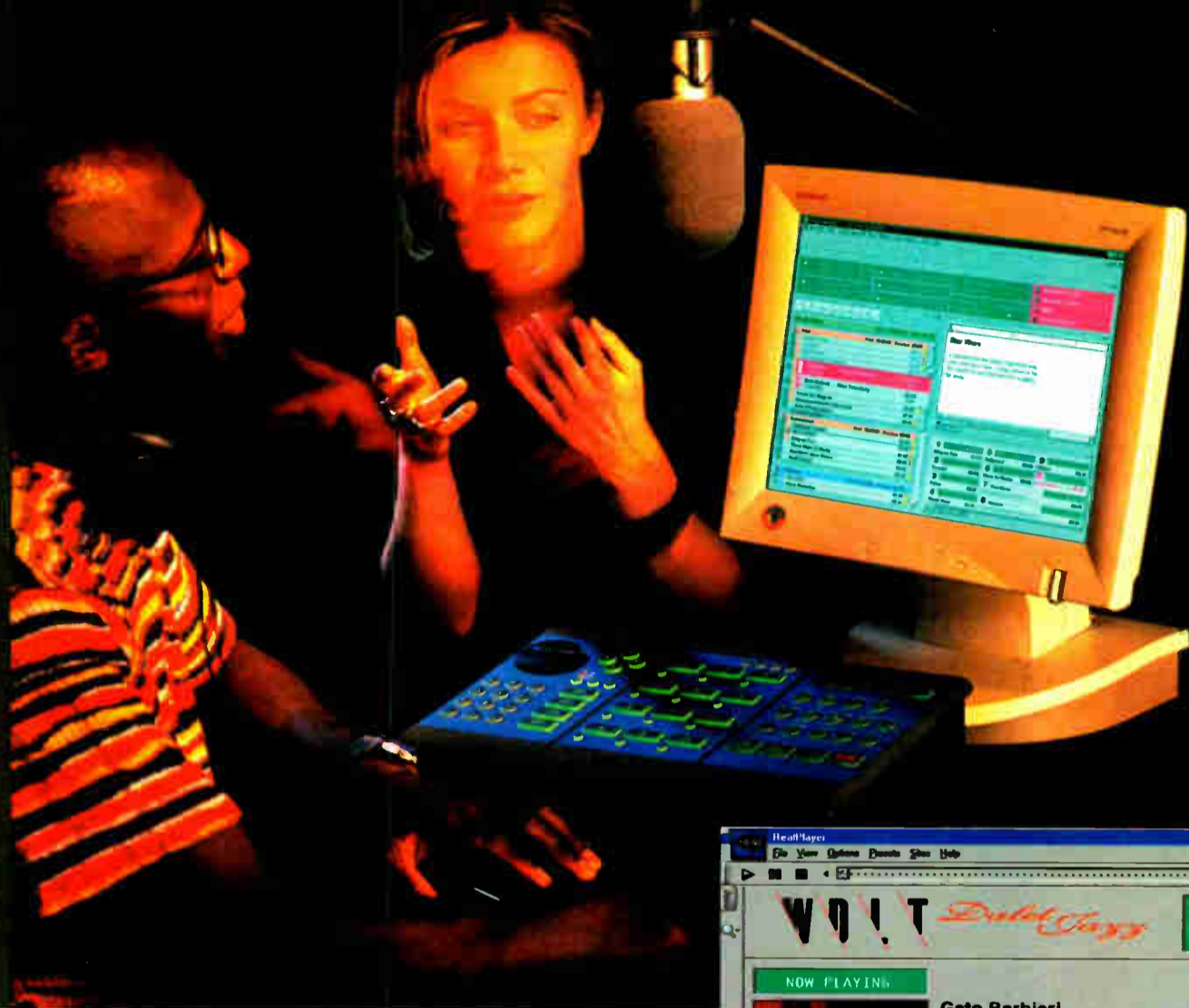
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Music Scheduler is an optional module that provides primary and alternate schedule recommendations based upon station defined rules, broadcast history, and title attributes. Since Music Scheduler is integrated with Dalet5.1, stations can avoid the importing and exporting hassles often associated with third-party scheduling software.

On-Air Flexibility

Dalet5.1 offers many options that provide stations flexibility in their on-air operations. A single workstation can be used to record call-ins or interviews in the studio while a program is being played. The on-air staff has greater operational flexibility through the use of an optional control panel and multiple monitors. And, stations can switch between live and automated programming with relative ease.

More broadcasters worldwide choose Dalet than any other system. Among our references: Emmis, Journal, ABC, Radio Unica, Sinclair, Crawford, CNN Radio, BBC (UK), CBC (Canada). Etc.

Highlights

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- Group Connectivity
- Music Scheduling
- Internet Broadcasting
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- Integrated Editors
- Broadcast History
- Macros
- Year 2000 compliant



◆ MARKETPLACE ◆

Products for the Radio Broadcast Professional

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New Features for Courier

Version 1.5 of the Courier portable hard-disk recorder is available from Sonifex Ltd. The V1.5 software offers multiple-cut, multiple-mark cut-and-paste editing capability.

Features include a modem that allows audio to be sent back to the studio from a remote location. Recordings can be made in the AIFF format, so Mac users can compile recordings in the field and edit them directly on the Mac.



Cut-and-paste editing is performed by adding sections of recordings to a playlist which can be sorted, edited and saved. A clip from other cuts can be duplicated and saved as a new file and clips can be re-edited to produce a number of different interviews.

Courier supports several different international modem types and can use a "Script" file to negotiate dialing into a server. Multiple-audio recording can be selected and transferred very simply. Courier also features a phone book for permanently storing frequently used numbers.

Software for the product can be downloaded from the Sonifex Web site.

For more information, contact Sonifex Ltd. in the U.K. at +44-1933-650-700, fax +44-1933-650-726, send e-mail to sales@sonifex.co.uk or circle Reader Service 71.

New 1 kW FM Transmitter

New from Richardson Electronics is Model BT1K, a 1 kW FM transmitter suitable for traditional broadcast, churches, universities and service applications.

The solid-state unit is broadband, allowing the frequency to be changed in seconds. Modular construction makes the unit easy to customize, test and maintain.

A built-in filter eliminates the need



for external filtering. The compact design allows the RF power module to be replaced easily.

For information, contact the supplier in Illinois at (630) 208-2200, send e-mail to info@rell.com or circle Reader Service 60.

Protect 15 Devices at Once

The SX-2120 from Surge-X provides surge protection and power conditioning for up to 15 pieces of audio, broadcast and computer gear.

The rackable unit occupies two rack spaces. Its rear panel features 14 standard grounded AC receptacles, divided into two separate banks of six outlets that may be switched on or off via front-panel rocker switches, plus two outlets that are permanently on.

A courtesy outlet is on the unit's face. The SX-2120 is rated for 20-amp use and incorporates the company's new Impedance Tolerant EMI/RFI filtering. Suggested retail price is \$599.

For information, contact New Frontier Electronics in Pennsylvania at (215) 862-9344, send e-mail

to anew@frontierelec.com or circle Reader Service 66.



See MARKETPLACE, page 25 ▶

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* Items must be new, current models and available from an authorized dealer. Ads must be in p

▶ MARKETPLACE, continued from page 24

Digital and Analog I/O

The **Audioarts RD-12**, which was briefly marketed as the Sparky, is a digital on-air console that accepts and outputs both analog and digital signals.

The RD-12 offers an open architecture design with 12 inputs, three stereo busses, multiple-format A/D input converters, machine control, digital mix-minus and phone module support for two callers. The console features a clock, timer, bright vertical VU metering and optional intercom.

For information, contact the company at (252) 638-7000, send e-mail to sales@wheatstone.com or circle Reader Service 68.

Modulation Monitor

The AM Modulation Monitor 923A is new from **TFT Inc.**

The monitor offers a carrier shift level meter and a PMDD circuit that allows digital peak modulation indication. A modulation calibrator eliminates the need for external calibration; a voltmeter facilitates proof-of-performance measurements.

The unit is NRSC compliant. TFT offers an optional frequency-agile AM band Preselector for off-air monitoring.

For more information, contact TFT in California at (800) 347-3383, fax to (408) 727-5942 or circle Reader Service 72.

Edit Center Desk Systems

A new furniture system from **Middle Atlantic Products Inc.** is designed for broadcast production, post and video work.

Edit Center Desk Systems use an adaptable design and are offered with a choice of two high-pressure laminate tops, either cherry or graphite. Each system is built around a central desk, available as 60 or 84 inches wide, and includes an overbridge in one of two styles: with equipment bays underneath, or with an open span between the supports.



Pivoting speaker platforms are supplied with both overbridge models. Side bay racks feature front and rear rails, noise control and forced-air filtering cooling.

Setups can be ordered as prepackaged systems or configured by compo-

ment. All pieces ship in crates. Retail prices begin at \$3,000.

For information, contact Middle Atlantic in New Jersey at (973) 839-1011, visit the Web site at www.middleatlantic.com or circle Reader Service 67.

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Sennheiser Wireless Works All-Star Game

Sennheiser wireless mics got plenty of use at baseball's All-Star game this summer.

Sound reinforcement company Rock City Sound mixed from the roof along the first base line, for a bird's-eye view. On the roof was a gaggle of antennas including Sennheiser SAS-116 Antenna Distribution Systems and two A2003 wideband UHF receiver antennas, connecting to eight EM 1031-U receivers, used to interface with SKM 3072-U, SKM 5000 handheld mics and a number of ME-3005E capsules.

ESPN aired the celebrity hitting challenge and home run derby. In-stadium interviews and play-by-play announcements used on-field Sennheiser wireless mics. At the game, the Moffetts sang the Canadian national anthem and Donna Summer the U.S. national anthem using Sennheiser 3072-U Series handheld



Actor Kevin Costner uses the SKM3072-U wireless mic to announce the All Century Team.

mics. Fox aired the game, at the beginning of which Kevin Costner announced the "All-Century" team with the 3072-U.

Engineers at Fox Network Sports provided unusual sound effects with a MKE102 microphone and a SK250 transmitter and antenna in each base on the diamond.

For information, contact Sennheiser in Connecticut at (860) 434-9190, visit the Web site at www.sennheiserusa.com or circle Reader Service 82.

BOOK REVIEW

Off the Air With Sports Legends

Peter King

At first glance, "The Sportscaster's Dozen," written by Matt Fulks, would seem to appeal only to those who grew up listening to the dozen play-by-play men, who, for the most part, tell their own stories in their own words. After delving into the first few pages, however this longtime northeastern resident (and six-year southeastern resident) found he was greatly mistaken.

I grew up listening to baseball broadcasts up and down the east coast and straggling signals from the Midwest. In those days, I paid little attention to college

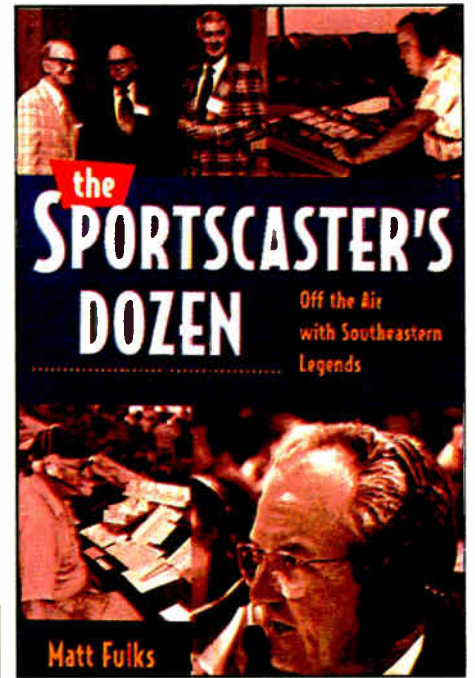
sports. I'd never heard of the likes of Otis Boggs (University of Florida), Al Ciraldo (Georgia Tech), Cawood Ledford (University of Kentucky) and Bob Harris (Duke University) until coming south. I knew nothing about them until reading their stories ... and what stories they tell!

These men were among the pioneers of play-by-play sports, and their stories are a throwback to the days where great working conditions and technological toys were few and far between. Otis Boggs' story about passing an audition and working through WRUF-FM, Gainesville, Fla., announcer "training school" is a reminder that perhaps

today's announcers don't get the formal training once required before stepping in front of an open microphone. Like many of us, Boggs' big break — his very first play-by-play assignment — came as a surprise. The regular announcer couldn't make the broadcast for a high school basketball game, so Boggs got the call.

Radio days

The careers of these 12 legends began long before there were 24-hour cable and radio sports networks, satellites, and the Internet. They worked in a time when radio was the vital link



Good, Better and the Best Digital Systems

It's a fact: *More* U.S. radio stations choose Scott Studios' than any other digital system! 2,125 U.S. stations use 4,916 Scott digital workstations. Nine of the ten top-billing groups have Scott Systems. They're the easiest to use! Scott Systems are intuitive, straightforward, simple, yet the most powerful!

Scott Studios is famous for our uncom-pressed digital systems at a compressed price, (but we work equally well in MPEG). Scott Studios' audio quality is the very best and plays on laptops or PCs with ordinary sound cards. We dub your startup music library free. Your PD can auto-transfer songs digitally in seconds with a CD-ROM deck in his or her office.

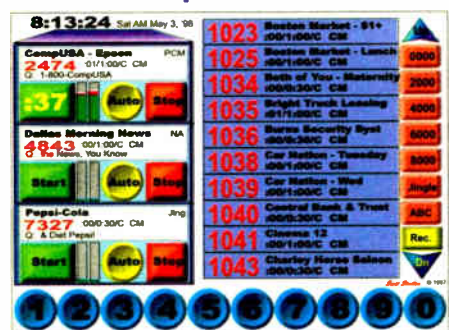
Scott gives you industrial quality 19" rack computers, but *nothing* is proprietary: functional equivalents are available at computer stores. You also get 24 hour toll-free tech support!

Scott lets you choose your operating system: Linux, Novell, NT, Windows, DOS or any combination. You also choose from three systems: Good, better, best. One's right for you!



The Scott System is radio's most user-friendly. You get instant airplay or audition of any song simply by spelling a few letters of its title or artist. You see when songs played last and when they'll play next. You also get voice tracking while listening to music in context, hot keys, automatic recording of phone calls and graphic waveform editing, all in one computer!

Good Spot Box



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

Spot Box has only the one screen, so announcers always know what's playing. On the left of the screen, three digital players have legible labels for each spot and VU bars show levels. Buttons show countdown times and flash as each recording ends.

At the right of the screen, "Cart Walls" let you pick and play any recording by name, number or category. Or, number keys at the bottom load spots quickly from your log.

Scott's Spot Box includes a recorder and is very inexpensive. Options include log imports from traffic computers and music on hard drive.

Better AXS 2000+



AXS (pronounced ax'-cess) 2000+ is radio's premier digital audio system for automation and live assist. AXS 2000+ is fully featured, with 99 sets of 28 instant play Hot Keys, log editing in the studio, live copy on-screen, big countdown timers, recording and editing of phone calls, spots and network shows.

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

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

See Scott Studios' Booth 607 at the NAB Radio Show in Orlando, Aug. 31-Sept. 2

Best Scott' System

The Scott' System (pictured above) is radio's most powerful digital system!

Your log is on the left side of the LCD touchscreen. Instant access Hot Keys or spur-of-the-moment "Cart Walls" are on the right with lightning-quick access to any recording. Phone calls record automatically and can be edited to air quickly. You can also record and edit spots or voice tracks in the air studio or go on the air from production.

Scott' options include *Invincible* seamless redundancy with self-healing fail-safes, newsrooms, 16-track editors, time and temperature announce, and auto-transfer of spots and voice trax to distant stations over WAN or Internet.

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between fans and their teams.

The anecdotes are entertaining and fun; you'll find many familiar names and themes as common threads weaving the dozen legends' tales together. Additionally, you may find much common ground between these men and yourself when you read about why they got into the broadcasting business. You'll also read about many of the athletes and coaches they covered, from Bear Bryant to Michael Jordan. ("The early days," no less.)

They worked in a time when radio was the vital link between fans and their teams.

The practical jokes performed on and by these legends are a reminder this is supposed to be a fun business, and the "oops" stories are especially human, a reminder that even legends make mistakes (like one Tennessee broadcaster who said the "F" word when he thought he had hit the cough button).

"The Sportscaster's Dozen" should be required reading for up-and-coming radio sports talent; it's not just a look back to the "good old days" or "golden era" of radio, but it also provides perspective and teaches real lessons in preparation for live game broadcasts.

Jack Cristal, the Mississippi State play-by-play legend, devotes several pages to game prep which are applicable today; he reminds us that radio is still truly the only one-to-one medium:

"You've been taught to talk to one person. If there happen to be five million people listening, that's a marvelous thing ... (but) if there was only one person listening, you'd have to do the same job."

Otis Boggs speaks of doing your homework and respecting the people you work with and those you cover. Many of today's play-by-play announcers seem to strive for sizzle over substance, but Louisiana State University's Jack Ferguson says it all comes down to three things: the score, who's playing and how much time's left in the game. Ferguson laments the butchering of the English language by many of today's announcers:

"It takes as much breath to say it right as it does to say it wrong."

Get The Scoop Anywhere, Anytime

Field reporting the way it's supposed to work. Introducing the all new Scoop Reporter II portable CODEC from AETA Audio. This rugged unit combines POTS and ISDN facilities with an integrated three-channel mixer and internal battery supply. Featuring 99 user programmable presets, the Scoop Reporter II will handle two microphones and one line level input. A balanced XLR output can be used for studio producer IFB and Mix-Minus feeds from studio, or to feed the local PA. The Scoop Reporter II will operate on voltages from 85 to 240 volts at 47 to 440Hz. When AC is not available or fails, the unit will run on standard "D" cell alkaline batteries. The intuitive interface is so easy to use, your talent will be able to run a remote broadcast with no technical assistance. And with our 24-hour technical support, you'll never miss another field report. The Scoop Reporter is the all-in-one box that will get the scoop anywhere, anytime.

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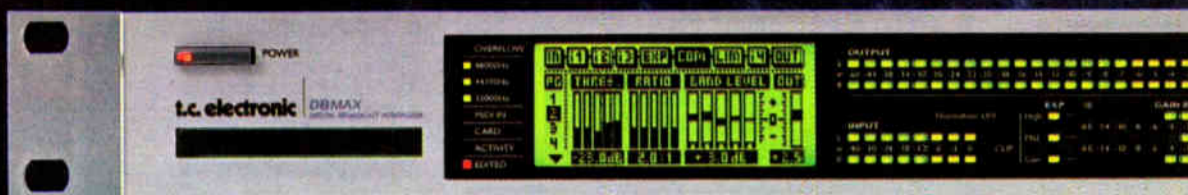
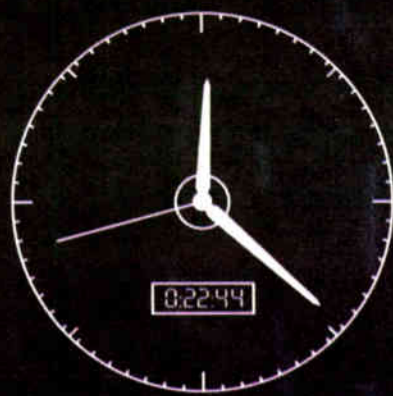
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Grasp the future today

Experience the world's most extensive dynamics shaping tool for transmission applications and improve your transmission NOW:

- ▶ Optimize efficiency with 5-band compression to achieve powerful sound control
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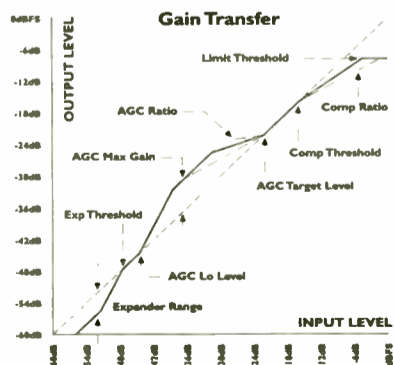
The DSP engine uses precision calculations at a full processing rate to keep aliasing distortion low and audio bandwidth high.

- ▶ Bandwidth: Processing at 48kHz sampling for 24kHz audio
- ▶ Resolution: Processing of all 24 bits of an AES/EBU signal
- ▶ A/D-D/A: 24 bit resolution with analog pre-scaling

Insert Additional Processing & Functionality

The 5-band expansion, compression and limiting functions of the DBMAX are supported by a variety of additional DSP insert possibilities - all can be used simultaneously at 48kHz:

- ▶ AGC™ (Automatic Gain Control)
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D22 - Precision. Control. Reliability.

TC Electronic proudly introduces the D22 - a dedicated Dual-In/Dual-Out digital delay, specifically designed to comply with the demanding needs of the broadcast industry, providing seamless "on the fly" delay-updating without audio clicks, pitch changes and/or other unwanted sonic artifacts.

Applications

The D22's ability to seamlessly update the delay either via the Tap key, the Adjust wheel or the Nudge keys makes it ideal for on-air situations (Earthlink Compensation). Another application for which the D22 is ideal would be for TV stations with a need to synchronize picture and sound (Lip Sync).

Ultimate Hardware

The D22 is equipped with industry-leading 24 bit AES/EBU and S/PDIF digital interface and 24 bit A/D-D/A converters. The Delay algorithm itself carries a full 24 bit signal through to the Output. Even when bypassing the D22, true 24 bit resolution is maintained, leaving the digital signal untouched. When used in analog setups the D22 contains Relays, enabling hardwired bypass to ensure uninterrupted signal flow in the event of an unexpected loss of power to the unit.

Unique User Interface

The resolution of the delay can be displayed in frames, sub-frames as well as milliseconds and sub-milliseconds (0.1 ms increments), allocated individually to each of the two delay time controls. The Tap control features both a Preview and an Instant mode. The Preview Tap mode enables preview of the tapped delay time before it is inserted in the actual audio chain, while the Instant Tap inserts the tapped delay time immediately. When the D22 is being used in a more "fixed" environment, the User Interface also has a Keyboard Lock function.

Remote Options

The D22 can be remote controlled via RS-485, allowing the user to change Delay time or even the full setup from a distance. GPI (General Purpose Impulse) allows external control of Tap Tempo as well as digital fade on the Master Output.

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Circle (7) On Reader Service Card

World Radio History

Spark Gap Does Its Job

► WORKBENCH, continued from page 19

The burn marks are indicative of the lightning choosing this path, instead of through the coupling network. While there's still light at the end of the day, this is a good time to get out the crocus cloth and clean off the ball gap carbon grunge.

Pitting of the spark gap can cause sustained arcs, since the pits narrow the gap space. Working on the spark gap should, of course, only be done with

the transmitter off, and when there is no threat of storms. After cleaning the spark gap, it may need to be reset. Remember, a 1-inch-wide opening won't work.

Setting the spark gap is a two-person job. Place the spark gap close enough for arcs to occur when the signal is heavily modulated. Then make the gap slightly larger, so the arcing ceases. You've now set the gap so that it is wide enough that regular modulation won't cause an arc, but close enough for a lightning bolt to jump it to ground.

■■■

John Bisset has worked as a chief engineer and contract engineer for near-



Figure 4: Clean spark gaps protect the coupling network. Carbon and pitting can be removed with crocus cloth.

ly 30 years. He is a district sales manager for Harris Corp. He can be reached at (703) 323-8011.

Submissions for this column are

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

XML and COM From RCS

► RCS, continued from page 15

Selector song data, the modification of same, and the addition of new songs.

These components generate and accept data in the XML formats described above. They are much more than mere import/export utilities — the components can be embedded in applications and Web server pages to provide dynamic interactivity with the Selector and Master Control NT systems.

An excerpt from an Active Server Page that reads and displays schedule is available in the full white paper from RCS.

We anticipate these tools will be used to build on-demand, dynamic traffic reconciliation, interactive Web reporting applications, multi-station information transfer, and much richer automation system interfacing than is currently possible with the log import/export technology of yesterday.

Summary

RCS is committed to providing a viable and complete solution for interoperability with our products based upon open standards.

By utilizing a neutral-ground, XML-based data format specification we avoid all the problems involved in proprietary data format exposure and binding — systems written to work with the XML spec will work with any other system utilizing the same spec. The COM components we are providing make it extremely easy to interact with our systems, and will avoid the problems associated with raw data access since the components will ensure that any changes you request are compatible with the Selector and Master Control NT systems.

For more information, contact Radio Computing Services in New York at (914) 428-4600 or send e-mail to info@rcsworks.com

■■■

RW welcomes other points of view. Send comments to radioworld@imaspub.com



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Southeastern Legends in Sports

► BOOK REVIEW, continued from page 26
John Forney of the University of Alabama recommends that up-and-

many hosts seem to speak only to hear the sound of their own voices?)
Fulks has put together a marvelous

stardom and seemingly instant careers, it's a refreshing look back to a simpler time without sugar coating.

The Sportscaster's Dozen provides perspective by looking into the past, but it also gives us lessons in how to prepare a better broadcast and paint a compelling picture for today's and tomorrow's radio listener, as we compete with television, cable, satellite and the Internet for a piece of the pie.

"The Sportscaster's Dozen" is published by Masters Press in Chicago. Retail price is \$18.95.

■ ■ ■

Peter King is an Orlando-based reporter for CBS News Radio. Contact him at Pkingnews@aol.com

These stories are a throwback to the days where great working conditions and technological toys were few and far between.

coming sportscasters read voraciously and learn the art of hosting a talk show without getting carried away. (How

collection of tales that look at the ups and downs of his sportscasters dozen. In a time of instant information, instant

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Numix 18

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Consumer Electronics Thrives

A new report from the Consumer Electronics Manufacturers Association gives insight into how our electronics marketplace has changed.

More of us are watching movies at home, thanks to VCRs, cable, satellite dishes and DVDs. Computers now are used in almost half of all American households. Also, in the past year, the report states, a "spectacular" reduction in price and the addition of multifunction models in all product categories helped make homebound workers more efficient.

Meanwhile, we now stay connected in different ways—using pagers, wireless phones, cordless phones, handheld and notebook computers and the Net.

Annual factory sales of consumer electronics in the United States continue to grow, reaching \$76 billion in 1998, up 5 percent from the year



before. CEMA called this performance remarkable, given the existing household penetration of these products.

Within the audio industry, CEMA said, affordability and increased performance are driving demand. DVD's 5.1 channel formats are having an effect on the sales of audio receivers. The relaunch of the recordable MiniDisc format, the rollout of affordable CD-R and the sale of the first Rio stereo player are seen as factors helping demand for audio products.

"Last year saw continuing changes in tradition-shattering product designs that simplify purchase and hookup, fit unobtrusively in a home's decor or fill a need that reflects new music-listening habits at home," the report states. "Whereas the core audio customer was once a serious music listener who assembled a complex system of standard-size components ... audio consumers today are listening to music in more than one room in a house — often as background to other activities."

As a result, CEMA said, traditional suppliers of home audio components have developed multimedia speakers, tabletop radio-CD players, under-cabinet CD/radios and a broad selection of "microsize" stereo systems.

The report predicts that the launch of satellite digital audio radio services will have a positive impact on the sale of home and car receivers.

Interestingly, the report found that the percentage of online consumers listening to audio via the Internet on a home PC dropped from 33 percent in 1997 to 25 percent one year later.

One-On-One Sports Scores

Bob Rusk

"Papa" Joe Chevalier is a fan's man, but the One-On-One Sports Radio Network host is no fan of agents. He uses words like "rodents" and "weasels" to describe them. So when Chevalier brought on a retired agent as a guest, he pulled no punches. "Do you have to be ruthless, do you have to be a cutthroat to make it as a baseball agent?" Chevalier asked.



Chris Brennan

"Well, you don't have to be, but unfortunately the guys that are, are the guys that seem to get ahead," responded Ben J. Martin, author of "Caught Stealing," a baseball-themed book.

Such banter is what brings the audience in. According to Arbitron, One-On-One — with more than 400

See ONE-ON-ONE, page 34 ▶

Sell the Theater of the Mind

Ed Shane

In the fall of 1962, there was a big parade in Griffin, Ga., then a town of about 15,000 people and located about 40 miles south of Atlanta.

I don't remember the occasion, but there must have been a football game that weekend. High school bands, clowns and city dignitaries filed from Highway 75 around the town's main street where the pool hall, the variety store and the radio station were located.

It's the radio station that counts in this story. WRIX wanted to serve the citizens of Griffin who couldn't make it to the big parade, so we snaked a long mic cable to the front of the building, giving us a second-floor vantage point. The station's sales manager sat in the window, watched the activity, and described the scene to the listening audience.

The power of visual imagery

At the back of the building, with a view of only the alley between our building and the town's movie theater, I ran the control board, inserted the commercials (for the variety store), and experienced the parade — by radio.

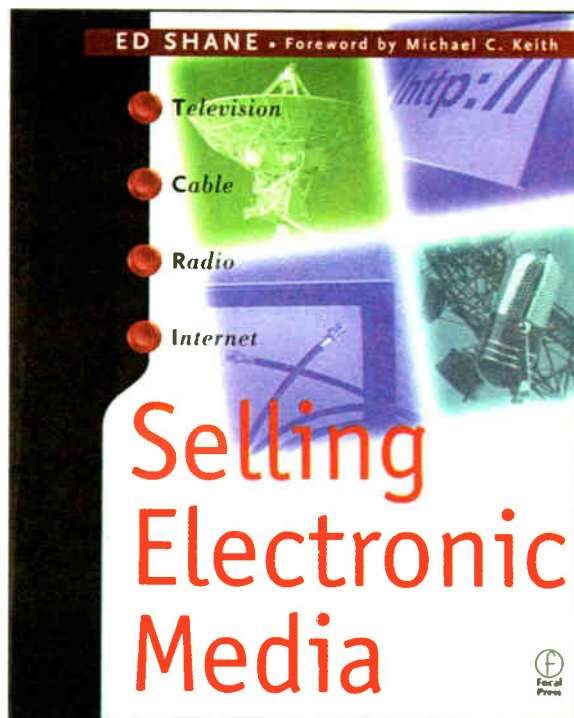
My wife, Pam, had a similar experience at baseball's spring training in 1998. I was working with the Astros radio network as a talent coach for members of the broadcast team. Pam joined us for a few innings in the broadcast booth.

She quickly discovered that, unless you're calling the play-by-play and seated right at the window of the booth, you can't see the field or the players from the booth. She had to rely on the commentary by Astros announcers Bill Brown and Alan Ashby.

"Sorry you can't see more," said Bill. "That's OK," Pam replied. "This is the

way I hear the games on the radio. I'm able to tell what's going on."

That fall day in Griffin when I was 16, and the spring day 30-something years later, are terrific examples of radio at its best: descriptive commentary that's a real service to listeners stuck in back rooms, unable to watch the clowns or the cheerleaders or the home run.



Call it "Theater of the Mind." It is radio's unique contribution to mass media. TV and cable services show the pictures, while various forms of interactive media mix and match sounds, pictures, text and animation. But only radio leaves it to the listener to create the image conjured by the words.

Cinderella

Before television, the "pictures" that entertained America were on the radio.

A man named "Raymond" opened a

squeaking door on the drama "Inner Sanctum," and the stories told behind the door made spines tingle for a half hour. The main character of "The Shadow" was a mental projection against a foggy night full of smoke from coal-burning furnaces. Those pictures were drawn with words and sound effects in the radio of the 1930s to the 1950s.

"Radio is an ideal sales vehicle to stretch the imagination as well as the mind," says Bill Burton, president of the Detroit Radio Advertising Group.

Selling smells

"What better medium to sell the great aromas of perfume, shaving lotion, a warm vegetable soup for lunch or the smell of turkey and ham cooking? There's no way you could convert these wonderful aromas to picture or film — but the visualization in the mind can be overwhelming.

"All great radio takes place in your mind. The characters and situations you identify with, the taste, smells, emotion, all come to life through the power of your imagination."

Advertising legend David Ogilvy called radio "the Cinderella of advertising media," because it often was left behind by major agencies.

In 1983, when he published "Ogilvy on Advertising," radio represented only 6 percent of total advertising in the United States. Radio's share of the advertising pie grew only slightly in the 14 years after Ogilvy's remark, but the medium is poised now to capture its fair share of dollars.

Radio found itself more vibrant than

See THEATER, page 43 ▶

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COLE'S LAW

FCC Watch: The Good, Bad & Ugly

Harry Cole

You have probably already read one or more news accounts of the FCC's (or, more accurately, the Mass Media Bureau's) sudden interest in issuing fines and forfeitures.

Perhaps the most noteworthy evidence of that interest came in late June, when the bureau let fly with a total of seven (count 'em, seven) notices of apparent liability, all directed to commonly-controlled entities which own at least seven stations. The total damage: north of \$70,000 in apparent liability, mostly attributable to violations of the commission's local public file rule.

Normally, the negativistic nabobs at Team Cole's Law would spend this column wagging a stern finger at our licensee readership, warning that this kind of thing could happen to you, blah, blah, blah (not, of course, that you shouldn't take our admonitions seriously). It is true that virtually any licensee could find itself on the wrong end of a fine, so appropriate precautions aimed at assuring maximum compliance are always a good idea.

The moral is ...

But this time around, the bureau's fines provide a good news/bad news story, with the good news outweighing the bad.

And just what is that good news? From the bureau's actions, it looks like it would be almost impossible to lose a broadcast license, and with a little luck you might also dodge any fines at all for obvious misconduct.

Before we explain that surprising (at least to some) conclusion, some background.

It appears that a number of corporate licensees with a common principal (one Mr. Bonilla) own stations in various California communities — KLNA(FM), Dunnigan; KIEZ(AM), Carmel Valley; KJDJ(AM), San Luis Obispo; KRQK(FM), Lompoc; KSBQ(AM), Santa Maria; KURS(AM), San Diego; and KTTA(FM), Esparto. Renewal applications for all of these stations were filed in 1997; five of those application had been granted by the end of 1997.

But on Dec. 31, 1997, one of Bonilla's "business creditors" launched a petition against all the stations. The petitioner raised a laundry list of allegations against the stations, claiming violations of the following: the public file rule; the false certification rule; the prohibition against unauthorized transfers of control or abdication of control; the requirement of FCC approval upon commencement or conclusion of certain bankruptcy proceedings; and nighttime power limitations.

The petitioner also threw in claims about alleged criminal conduct by Bonilla in Mexico.

The bureau managed to wash out many of the allegations without much difficulty; whether it did so convincingly is open to debate. Not having studied the various underlying pleadings, we won't bother to second-guess the bureau as to those claims.

But the bureau couldn't close its eyes to several of the allegations, most notably those charging public-file and false-certification violations. And for good reason,

Leaving aside the questions that remain about the seventh station's compliance, (not addressed in the bureau's decision letter), the largely undisputed evidence showed that there were major violations of the public file rule at six of the seven stations. (It's not clear whether the seventh station was actually in compliance or whether the petitioner just didn't bother to claim any violations there.)

Exactly how major were the violations? First, access to the files was improperly limited. At three of the stations, a representative of the petitioner was advised that the public file would not be available for a week. At another, the file was maintained

at a school library which was opened only 21.5 hours per week.

File attribution

At another, the file was supposedly maintained in the storage room of a local "mini-mart" convenience store and was not provided to the petitioner's representative; the licensee claimed that the unavailability of the file was attributable to the store clerk's "limited" command of English.

Because public files are required to be provided immediately upon request, all of these situations were problematic, although the bureau did seem to say that the school library was probably an

acceptable place to put the file, presumably because school officials would supposedly have made the file available during all regular business hours. But the problems didn't stop there.

As it turned out, once the files were located by the licensee — and it seems this happened only after the petition was filed with the commission, rather than at the time the petitioner's initial request for the files was presented to each station — the files were, er, somewhat short on documents. Missing were license renewal applications, ownership reports, employment reports, quarterly issues/programs lists and political advertising information.

Oops — that's just about every significant item supposed to be in the file (which raises a question of just what the "files" *did* contain — but let's not go

See COLE'S LAW, page 38 ▶

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Affiliates Profit From One-on-One

► ONE-ON-ONE, continued from page 31

affiliates — boasts 13 million listeners weekly. Six years since it took on the world of sports radio, it ranks as the most popular live, 24-hour sports talk radio network.

What sets One-On-One apart from the competition is that "the callers make the programming," said Chris Brennan, One-On-One chairman, president/CEO.

"We have some very entertaining and



'Papa' Joe Chevalier

knowledgeable hosts, but what makes us different is that our call volume is so large. That allows (us) to screen a number of callers to make the questions and issues presented to the hosts the highest quality."

He said more than 800,000 callers try to get in monthly.

Brennan said. "The difference between us and ESPN is that we're not heavily targeted to play-by-play. The only play-by-play that we do is University of Michigan football and some holiday events such as the Blue-Gray game.

"I don't see us becoming a play-by-play radio network. What makes us different is that we are an outlet for our listeners to have the ability to ask a question, vent a frustration or talk about an issue."

Affiliate support

The One-On-One affiliate list includes owned-and-operated stations WJWR(AM) in the New York area, KCTD(AM) in Los Angeles and WNRB(AM) in Boston. One-On-One has an LMA arrangement with WJKL(FM) in Chicago.

The network has scored a touchdown at Jefferson Broadcasting Co.-owned WTMT(AM) in Louisville, Ky., an affiliate for more than two years.

"Before the switch to One-On-One," said Operations Manager Dean Taylor, "we had been a country music outlet since our inception in 1958. It was a tough decision to make the switch, but proved to be one that we wished we had made sooner.

Holding their own

"In network-requested AT&T call tracking surveys, WTMT debuted as the fourth-highest calling market based on area codes that we serve," said Taylor. "We continue to hold that spot, according to the latest network survey.

"I can't say that the switch has given

Six years since it entered sports radio, One-On-One has more than 400 affiliates and 13 million listeners weekly.

us more listeners, but we seem to have as many listeners as before. However, the demographics are skewed to the affluent 25-54 audience, not the 45-plus audience that we had before," he said. "This new demographic is more of what our advertisers are looking for. We have definitely seen an improvement in the quality of our client list in addition to the quantity. It has definitely helped our bottom line."

One-On-One's Brennan declined to name specific accounts that advertise on the network, but said, "A lot of telephone, credit card, financial service, drug, auto, insurance, Internet and sports-related companies" are clients.

"The 25-54 male consumer is very difficult to reach in some instances," Brennan said. "Sports talk reaches that demo regularly. We cover about 97 percent of the United States, so the impact of reaching that demo in such a concentrated fashion is very sought after by a number of advertisers."

One-On-One is available to stations on a strictly barter basis, with no out-of-pocket expense, which Brennan termed a "win-win deal" for the network and affiliates. The affiliates get 12 minutes an hour to sell and the network takes three minutes.

"With the clearance levels we have, that's plenty of time for the network," Brennan said. "From the national perspective, we don't want to clutter our programming with spots. We try to provide more air time for the product."

Affiliates, primarily all-sports and news/talk stations, choose how much One-On-One programming to air, ranging anywhere from a few hours a day to around the clock.

For example, CBS/Infinity-owned WFNZ(AM) in Charlotte, N.C. ("Sports

Radio 610") runs the network primarily overnights and on weekends, said Michael A. Kellogg, the station's vice president and general manager.

"As a station that is experiencing terrific growth, One-On-One enables us to program within the format with a quality product at the right price," Kellogg said.

Helping affiliates reach and sustain that level of success is the network's priority, said Brennan.

Relationships

"Being station owners and operators ourselves gives us a very special relationship with affiliates," he said. "We clearly have a strong understanding of the issues and opportunities they face. It is a unique relationship that gives us insight into how we can help them."

In line with that, Brennan said, "We also want continually to expand our ratings and shares at our owned-and-operated stations. We want to break a book in New York, Los Angeles and Boston. The



Fast Facts

Headquarters: Northbrook, Illinois

Chairman, President/CEO:
Chris Brennan

Network Transmission: StarGuide satellite systems, Satcom C5, Transponder 3

Web site: www.1on1sports.com

Samples: Live programming can be heard on the listen line at (847) 509-1830

Business: One-On-One Sports Inc., a privately held corporation, was founded in 1991 to deliver closed-circuit, on-site broadcasts to spectators at premier sporting events. In 1993, One-On-One purchased the Sports Entertainment Network and renamed it the One-On-One Sports Radio Network.

Today the network provides live sports programming to radio stations 24 hours a day, seven days a week

impact of whatever rating and share we obtain is an added benefit to the network.

"Every new listener that we bring on locally at our O-and-Os is not only a listener that we capture locally, but is a new listener that we can sell to advertisers at the network level."

To reach that goal, One-On-One plans to augment the network lineup with local programming on stations.

"We don't want to be perceived as just a network service center," said Brennan. "We're not that. We do our own traffic and weather and play-by-play. The next extension is to do a local morning or afternoon show. The trend is to continually augment our product with localized programming that complements the network."

◆◆◆

This is one in a series of profiles of radio program providers. Bob Rusk is a regular contributor to RW. He operates the entertainment Web site www.CallingHollywood.com

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Alan Haber

Eclectic. Irreverent. Unpredictable. Edgy. Curious. Intellectual. Concerned. Aware.

Each of these is what non-commercial KCRW(FM) is, according to General Manager and Program Director Ruth Seymour, and she ought to know — she's been at the Santa Monica, Calif., college station since 1977.

About 400,000 curious minds tune into KCRW each week. The station began life in 1946, licensed to Santa Monica High School; it attracts ears roughly between the ages of 30 and 50. These folks are NPR listeners (KCRW is the southern California flagship for the network) and radio drama fans and connected-to-their-music types who constitute a "very, very, very plugged-in audience," Seymour said.

Freeform programming

All manner of freeform music programs, public affairs and viewpoints are presented to an audience that supports KCRW during two pledge drives held each year.

"If you have not built goodwill, if you have not been growing, if you have not attracted new listeners, if you have not been exciting enough, if you have not been relevant enough, if people aren't enthusiastic about you, they're not going to respond," said Seymour. "They can listen to the station for free anyway."

It's all about connecting with the audience.

"You really have to mean something in somebody's life for them to pick up the phone and give you some money," said Seymour. "I feel that raising money is very important because it keeps you honest. You cannot give the audience something you like or you feel is important or you feel would be good for them and have them respond."

The audience does respond. Seymour said the most recent pledge drive is expected to tally about \$2 million when the counting is done. More than 70 percent of KCRW's financial support comes from subscribers.

KCRW has expanded its audience by Webcasting to the world from its snazzy cyber-home at www.kcrw.org

The staff is supported by approximately 200 volunteers each week.

And they come from seemingly everywhere. Like Pete's Coffee Shop, where Seymour found herself one day.

"The woman sitting next to me recognized my voice and told me she was a subscriber. She was going to come in during the summer and volunteer to do the phones for the drive."

KCRW's pledge drives wouldn't be successful if the programs the station aired didn't connect so well with the audience. "It's the programs that bring people in ... talent is everything," said Seymour.

Those programs speak to the imaginations of listeners locally and around the world, from the long-running southern California issues-oriented "Which Way L.A." and the weekly look at politics, policy and popular culture "Left, Right and Center" to a

wide variety of music shows.

Music Director Nic Harcourt listens to all the new music that comes into the station — music that is played on a variety of programs from the Harcourt-hosted popular showcase that is "Morning Becomes Eclectic" (which features one-of-a-kind live performances by a wide array of artists) to Saturday/Sunday sister show "Weekend Becomes Eclectic" and a bursting-at-the-seams lineup of adventurous musical one-stops spinning the best in international, gospel, medieval, jazz, trance, hip-hop and don't stop — there is more. Much more.

There are about 150,000 CDs in

KCRW's library, from which some on-the-surface odd sets emerge — say, Dean Martin coming hot on the heels of Pulp. Adventurous programming — a great idea in this or any year.

New audiences

Part of Harcourt's job is to "open up new audiences — to take the station to people who perhaps aren't aware of it," he said. "It's a common mistake in most radio stations to think that everybody knows you're there. I'd learned a long time ago and I've seen it play out since I've been here as well — that there are many, many people who have no idea that we exist."



Ruth Seymour

See KCRW, page 43 ▶

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FCC Fine Watch

► COLE'S LAW, continued from page 33

there just now).

As it also turned out, the files' incompleteness was attributed to the departure from the licensee of an individual who had supposedly been in charge of keeping the public files current. But that individual left in "late 1994" — meaning that the files had apparently not been updated for at least three years prior to the filing of the petition. Another oops.

Triple oops

And as it also turned out, in the renewal applications of at least four of the stations, the licensee had certified that all documents required to be placed in the file had

indeed been placed in the public file.

But that certification was obviously

been able to figure out *before* it certified to the contrary in its renewal applications. Triple oops.

It looked like the licensee had shot downhill from arguably minor non-immediate availability of the file to gross non-

non-completeness, only to hit the brick wall of false certification of public file compliance at the bottom of the slope.

Here's the happy ending: the bureau didn't bat much of an eye, and certainly didn't see the need to whack the licensee for anything more than a relatively minor fine at each station, in the \$10,000-\$15,000 range (as opposed to the \$1 million-plus fines imposed on Infinity for Howard Stern broadcasts a few years ago).

The bureau's own language underscored the incongruity of its action. In its forfeiture letters, the bureau emphasized repeatedly that the public rule is designed to permit the public to "participate effectively in commission procedures concerning a broadcast licensee, including evaluation of its performance."

It also said that "proper analysis" of a renewal application is "critically dependent upon the accuracy and completeness" of the information provided by the licensee in the application. From this you might conclude that compliance with the public file rule as important, if not essential, to the bureau's performance of its regulatory duties. So you might have expected the bureau to be a little more upset about what evidence showed.

The fact that the licensee skated off with only relatively minor fines may send a bad signal to the industry. If this kind of non-compliant performance results in just a low-end fine, licensees may decide that, on a cost/benefit analysis, whatever upside there may be to non-compliance is worth the downside risk (bearing in mind, too, that the FCC itself did not ferret out the violations here — rather, it was a disgruntled "creditor" who blew the whistle).

We here at Cole's Law would like to discourage any such thinking. If the commission, or, more importantly, Congress, were to perceive a downturn in compliance with public interest-based rules, the likely response would be a return to greater regulation — including, possibly, increased risk of losing a license. The security of broadcast licenses is currently about as great as it has ever been in the history of the industry. That security can be preserved if cases such as the one described here remain the exception, rather than the rule.

If you have any questions about the bureau decisions described in this column, you should consult with your communications counsel.

■ ■ ■

Harry Cole is a principal in the Washington-based law firm of Bechtel & Cole, Chartered. He can be reached at (202) 833-4190 or via e-mail to coleslaw@erols.com

Although the FCC seems to have let a major violator off, owners should not read this as a free pass to ignore the public file rule.

inaccurate, as the licensee could (and, one would have thought, should) have completeness of the file, and then past that to chronic (at least three years) of gross

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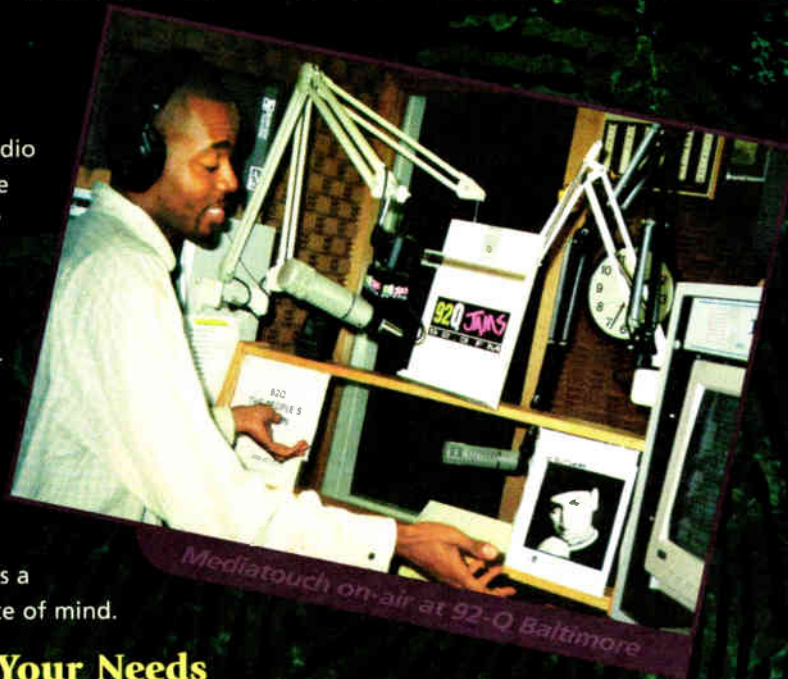
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Circle (11) On Reader Service Card

Swiss Find New Promotions Angles

Michael Hedges

U.S. radio managers spend a tremendous amount of time and money developing promotions for their stations. How are radio promotions handled abroad?

Consider the example of Switzerland.

Successful radio station promotions here, and throughout Europe, are a mixture of old and new, tried and true.

In the cantons of Switzerland, radio broadcasters attempt to sway listeners with a variety of plots and ploys. This country is, in fact, a microcosm of all the radio promotion tricks ever used. But it is also a place where new ideas are introduced.

Differences in culture, media usage and economics in the four linguistic regions force promotions and creative directors to target their ideas carefully.

Imaginative initiatives

Events certainly are among the most popular promotional devices for Swiss stations. Anything — from boat races to concerts to museum openings — is a sponsorship opportunity for radio stations targeting a particular audience.

In Switzerland, the advantage often lies with the various Swiss Broadcasting Corporation public services — Schweizerische Radio und Fernsehgesellschaft; Société Suisse de Radiodiffusion et Télévision; Società Svizzera di Radiotelevisione — which can leverage years of marketing expertise

and strong community ties to gain exclusive access to major events.

Private stations, either by choice or necessity, take a more selective, and often more creative, approach.

Radio Z in Zürich, for example, turned a community event into a major promotion in 1998 by sponsoring the 50th anniversary of Kloten airport.

Radio Z Managing Director Christian Gartmann explained that, in addition to airing a large number of promos, the station produced a week-long series about people who worked at Kloten. One day, the station broadcast live on the ground maintenance of airplanes with two journalists.

"This gave us the opportunity to visualize what is happening on site, which is a hard thing to do," said Gartmann. "Without investing money, we became one of the best noticed brands, beside Swissair, of course."

"SBC lodged an official protest with top officials at Swissair and the Kloten airport," Gartmann said. "They complained they should have been the only ones to be able to cover such an event."

In the Swiss Romande, the French-speaking part of western Switzerland, Geneva-based One FM invested in a major outdoor poster campaign to establish its name and new format. Hundreds of posters were posted on Geneva streets, in parks and the commercial districts advertising the launch of the youth-oriented station.

Two years later, the station enjoys strong name recognition and growing ratings in a market where the French youth station NRJ is a strong competitor.

Commercial stations frequently promote themselves with games and contests associated with advertisers. In another successful campaign for listeners, Radio Z offered a 100.9-second shopping spree at a sponsor's store to automobile owners whose cars were spotted sporting a Radio Z sticker.

"People liked the idea so much that station employees in Radio Z cars were forced to pull over by listeners because they thought the employees were the sticker spotters," Gartmann said.

"We had no casualties."

Imagination and daring ideas often result in award-winning promotions for radio stations. Radio Z tackled the difficult subject of the world of medicine and won the Axel Springer Prize for Young Journalists for a special on birthing. It was the first Swiss winner of the German award.

"We did a day-long special report on two patients and their operations: the birth of a child and an open-heart bypass," said Gartmann.

"Both reports were breathtaking," he said. "We broadcast from the site, which gave us the opportunity to talk about the hospital without sounding too commercial."

English-language radio station World Radio Geneva FM produced an interesting event on April Fool's Day in conjunction with British Airways. For the entire

day, the radio station became Radio BA, complete with new names for the shows, special reports and contests.

British Airways executives gave away tickets, and broadcast weather reports from BA aircraft approaching Geneva. Sponsored promotions can entertain listeners and sell at the same time.

Cross-media promotion

Marketing professionals understand the importance in attaching a visual reference to a product, and television, historically, has been the medium of choice. But high production and media costs have made it prohibitive for most radio stations.

The public radio stations, with deep coffers in the German- and Italian-speaking parts of Switzerland, however, have used television to promote specific programs or to build and maintain name recognition.

For private stations, the exploding popularity of the Internet provides a less costly marketing tool. Web sites abound with pictures of DJs and journalists, sponsors, programming and advertising rates. Most sites use audio in some form, some include audio snippets of programs or features or full-time Webcasts.

Gartmann said the radio industry is discovering the Internet because its costs are lower than television. "Spots can transport voices and connect them with faces. TV can do that but, now, so can the Internet."

■ ■ ■

Michael Hedges, a free-lance writer and media consultant, reports on the industry from Geneva, Switzerland. Contact him via e-mail to hedgeswrg@gve.ch

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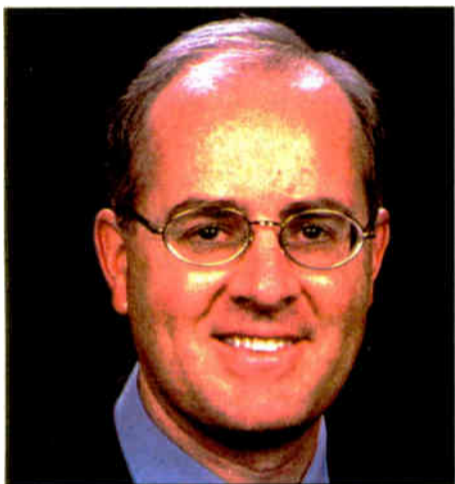
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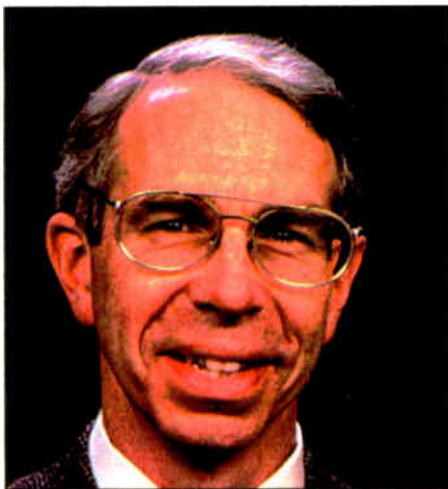
Orban Promotes Hession, Sawyer

Michael Hession, former vice president of operations for Orban, has been promoted to general manager. An eight-year veteran of the company, Hession assumes responsibility for managing Orban's operations and developments.



Michael Hession

Meantime, Rick Sawyer has been promoted to director of worldwide sales. He will supervise sales of all product lines through Orban's dealer networks in North America, Latin America, Europe, Asia, the Middle East, and Africa.



Rick Sawyer

Maxell Promotes Petruzzello

Maxell Corp. of America has promoted Anthony Petruzzello to director of sales of Maxell's Professional Media Products Group. Petruzzello was national accounts manager, network broadcast sales, to which he was promoted in mid-1998.

Maxell is a full-line manufacturer of consumer and professional media products.



Anthony Petruzzello

Radio Shows Names Legan Ad Manager

Radio Shows has added Laura Legan to its advertising sales staff. Legan is responsible for advertising sales for "The Dr. Toni Grant Program,"

a nationally syndicated program.

Legan comes to Radio Shows from Wyse Advertising Inc. in Cleveland, where she served as assistant media planner.

Radio Shows delivers both long- and short-form syndicated radio programming covering a variety of subject matters.

Tattershall Named VP, Broadcast Division, CCIC

Crown Castle International Corp. named Ray Tattershall vice president of its new build-to-suit broadcast division in the United States.

The broadcast operations, which are headquartered in Jupiter, Fla., will provide



Ray Tattershall

tower infrastructure and network support services to the U.S. broadcasting industry.

Before joining CCIC, Tattershall worked at the LeBlanc Group, where he was vice president of sales and marketing for LDL Communications.

BP Promotes Moultrie, Smith

Broadcast Programming has announced two new management appointments in the company's format programming division.

Ken Moultrie, a former programmer/consultant for BP, has been named direc-



Ken Moultrie

tor, BP Consulting Group.

L.J. Smith, programming manager, has been appointed director of programming, although he'll continue to serve his consulting clients.



L.J. Smith

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— Lillie Wade

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Use Power Of Radio In Sales

► THEATER, continued from page 31
ever as an advertising medium after deregulation. So vibrant that Jack Trout offered congratulations to radio for "fast outgrowing its fragmented, almost cottage-industry status."

Here's advice to radio management from Jack Trout, the man who gave the marketing world the "positioning" concept:

1. Sell the medium, not your stations. As a highly fragmented medium, just about all your energy and money was spent on beating up your direct competitors. Now that there's some critical mass in many markets, perhaps we'll begin to see some "my-medium-is-better-than-their-medium" efforts.

2. Make the medium easier to buy. Buying television or newspapers is a snap compared to buying radio. Putting together a major buy usually entails having to deal with a parade

Radio is an ideal vehicle to stretch the imagination as well as the mind.

— Bill Burton

of salespeople that spend a lot of time bad-mouthing other stations on the list.

3. Educate the users. Radio is pure sound. To do good radio you have to understand how to use sound and sound effects. Unfortunately, most creative types are picture-oriented, not sound-oriented. Many are happy just to run the soundtracks from their TV commercials.

Even in selling the medium, everything comes back to Theater of the Mind.

■ ■ ■

Ed Shane is chief executive of Shane Media Services.

This article was adapted for RW by the author from his new book "Selling Electronic Media," published by Focal Press/Butterworth-Heinemann. The retail price is \$44.95.

To order or for more information, call (800) 366-2665 and ask for ISBN No. 0240803272.

KCRW Aims for Bigger Audience

► KCRW, continued from page 35

So Harcourt wants to get out into the open air a bit more by doing remotes and such.

"I think that as commercial radio continues to get stale and, you know, predictable," said Harcourt, "then we're going to find an even bigger audience."

And KCRW's audience is a faithful one. "The majority of our audience doesn't listen to other radio stations," said Harcourt, "so they're listening to us for a reason."

They're listening for up-and-coming acts that are headed for the big time, and Harcourt is proud that now-

big names like Semisonic and Sixpence None the Richer have been featured and gone on to become big names.

"Those are always nice things because your intuition, if you like, is rewarded when six months later ... somebody like that breaks through," he said.

In the future, said Harcourt, "We'll continue to be edgy and we'll continue to be ahead of the curve and very

thoughtful about what we do as a music department."



Just as KCRW is, in the overall scheme of things, edgy and ahead of the curve and oh so right.

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Wheel of Fortune is the most popular game show in history with over 100 million

packages include CDs, tickets and videos.

"Radio Wheel of Fortune" is a barter-syndicated program with local sponsorship availability. The show is available on a market-exclusive basis.

For more information contact Jennifer Johnson in California at (818) 377-5300, fax (818) 377-5333, visit the Web site at www.premrad.com or circle Reader Service 64.

Radio College for Producers

A new online training site for radio producers is available. Western Public Radio and independent radio producer Robin White have put together Radio College, available online at www.radiocollege.org

R A D I O



C O L L E G E

The Web site features technical information, radio writing tips, digital audio production pointers, radio theater, investigation of ethics, speeches, business discussions and more. The resources section of the site features links to competitions for journalists, professional organizations and training resources.

Its organizers say Radio College is intended to be user-friendly toward the beginner to the senior producer alike.

For more information contact Robin White in California at (415) 437-9118, e-mail to info@radiocollege.org or circle Reader Service 59.

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A pair of new syndicated programs is available to radio stations. "Journey Into Jazz" and "Journey Into Song" promise listeners a refreshing change from run-of-the-mill radio programs.



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"Journey Into Jazz" presents a diverse blend of modern jazz including straight-ahead jazz, contemporary, Latin, big bands and vocals.

"Journey Into Song" is a showcase of vocals from greats such as Frank Sinatra, Nat Cole, Billy Eckstine, Ella Fitzgerald and Sarah Vaughn. Both programs are hosted by veteran jazz radio host and programmer Jim Murphy and were launched a year ago.



A Syndicated Radio Program featuring
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At present, 10 radio stations are airing the programs, which are available to stations on CD on a market-exclusive basis. Both shows run one hour.

For more information contact Jim Murphy toll-free in Maryland at (877) 204-0645 or circle Reader Service 63.

STATION SERVICES

Radio World

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United Stations and Dick Clark Target Millenium

United Stations Radio Networks is jumping onto the millennium bandwagon with a new program.

"Dick Clark's Countdown to 2000" is a daily radio vignette hosted by the legendary radio personality. The program, which debuted Aug. 2, features some of the most memorable moments of the 20th century.

Dick Clark, Rock and Roll Hall of Fame inductee, is also the co-founder of the United Stations Radio Network.



"Dick Clark's Countdown to 2000" is produced by Thirsty Ear Communications Inc., an independent New York production company. Thirsty Ear has obtained licensed access to the news archives of the BBC, allowing for a wide variety of cultural, political and social milestones from this century.

For more information contact Julie Harris in New York at (212) 869-1111 or circle Reader Service 65.

Truth in Advertising



The hype for digital audio has been deafening. While digital offers advantages for storage and control, it has severe limitations for dynamics processing. Indeed, Cutting Edge® claims their Omnia unit sounds almost as good as analog.

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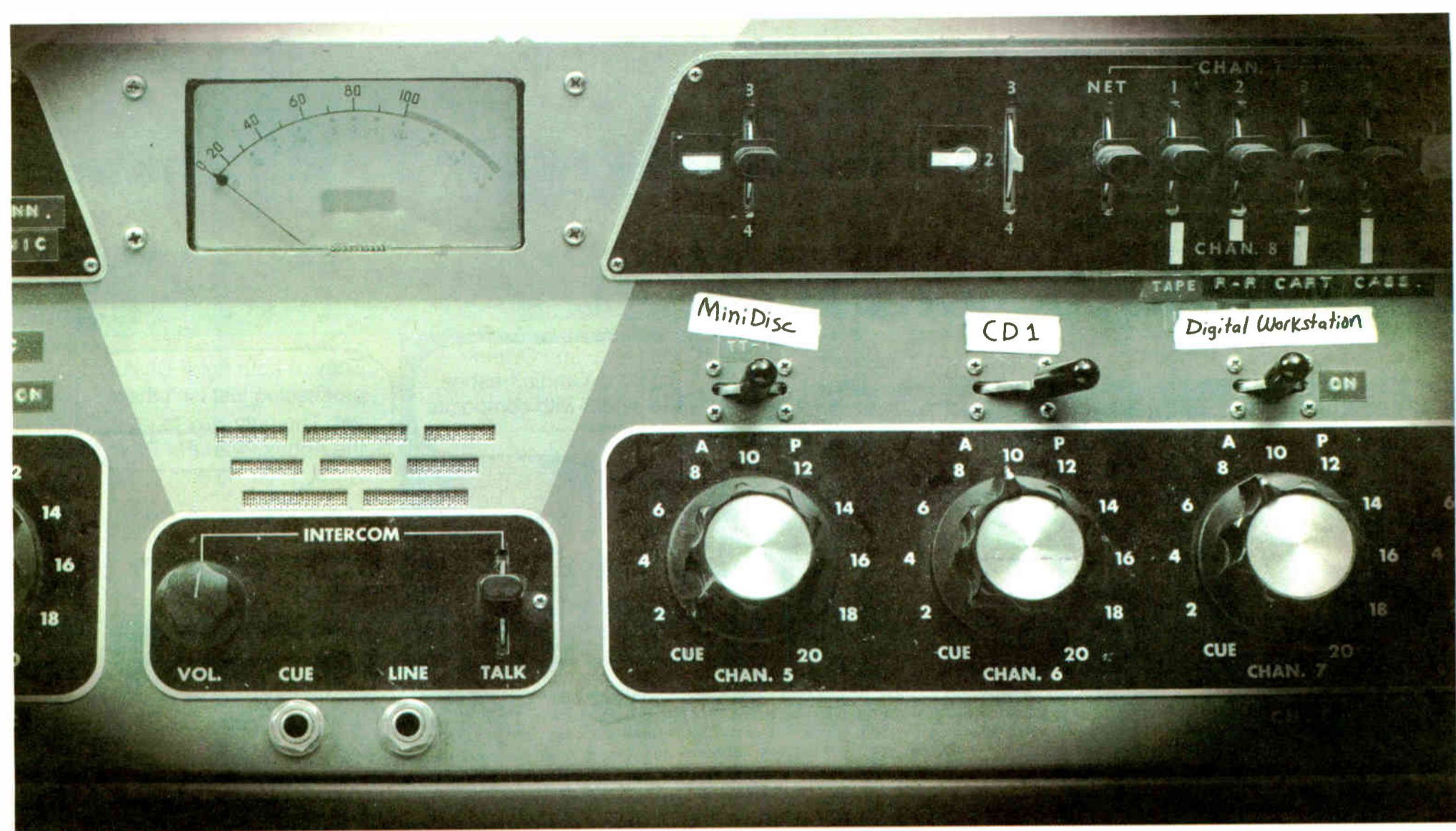
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See Page 60

Radio World

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September 1, 1999

AES Looks at Digital Radio

Carl Lindemann

More than 20,000 people are expected to attend the many sessions, presentations and workshops of the AES 107th Convention at the Jacob K. Javits Convention Center on Sept. 24-27.

"Each successive convention has exceeded the accomplishments of the previous year. And the 107th expects to raise the bar to the next level," Executive Director Roger Furness said.

For radio broadcasters, a centerpiece of events will be the Digital Audio Radio Conference on Saturday, Sept. 25, from 1 to 5:30 p.m.

Conference Chair David Bialik of DKB Broadcast Associates said this is a critical time in the industry.

"The DAR Conference is the culmination of conferences we've had in New York going back to the mid-'80's," he said. "This one is important because we're coming up on rule making. Also, we're focusing in on the IBOCs — Lucent Digital Radio, Digital Radio Express and USA Digital Radio. They



Technical tours during AES include a visit to the Empire State Building, right. The Chrysler Building is at left.

are sending their top engineers. Whether or not we'll have demonstrations is still up in the air."

The three companies are racing to develop technology to allow in-band, on-channel digital radio.

The DAR Conference will address both the technological and business challenges of making IBOC a consumer reality.

"There are many problems — reception, getting the receiver manufacturers to work with one of the standards, getting a standard adopted," Bialik said. "We also have the issue of multipath — interference from other stations and other uses of frequencies and also interference from terrestrial and non-terrestrial forces." Bialik said.

Will the IBOC proponents come together into a form of Grand Alliance, following the model of digital television? Bialik does not expect such a resolution will be coming at this conference.

"There are a lot of differences and a lot of different interests. It's similar to the com-



Chet Atkins will deliver the keynote address.

petition over different stereo standards."

Those differences will be up for open debate and discussion.

See AES OVERVIEW, page 56 ▶

PRODUCTION PROFILE

Music Is His Main Message at Z-100

Ken R.

"Once you understand music, the station promo becomes a symphony, with the voice as the lead instrument."

The speaker is Dave Foxx, production director for Z-100, WHTZ(FM), licensed to Newark, N.J., and serving the greater New York area.

"Everything should tie together and flow as one complete piece."

Foxx ought to know. His musical background includes 15 years of piano instruction, and that is reflected in the tools at hand. He is able to create his own musical beds in the production room with Roland D-50 and D110 synths, among other cool toys.

Division of labor

Z-100, part of the AMFM Inc. chain, is unlike many smaller market stations in that it can employ a person full-time to handle station imagery.

That means Foxx has the luxury of being able to focus on being the station voice for promos and IDs without the burden of having to crank out 15 car dealer spots a day.

He isn't saddled with a four-hour air-shift to drain his energy before his production shift. And Foxx can actually have as much as five days to think

about a particular promo before it needs to be completed.

For those laboring under the more typical "we-need-this-on-the-air-in-an-hour" schedule, this might seem like a dream.

"I started in Provo, Utah, at KOVO(AM) and KFMC(FM). I was there only three months when I got the call to go to WPGC to help with a labor problem," said Foxx, referring to the AM-FM combo in the Washington, D.C., market.

AFTRA was on strike, and Foxx was brought in as "management" so he could go on the air while the regular jobs walked the streets with picket signs.

"I was called 'scab' and worse, but I didn't care. Big-city lights attracted me, and before the strike was over, they offered me a job.

"I was there about 10 years, mostly on the air," Foxx said.

"I finally left because it was a dead end; actually I stayed there too long. Then Steve Kingston brought me to B-104 (Baltimore) for about six months. After he moved to New York, he hired me at Z-100 and I've been there 12 years now, practically a lifetime in radio years."

Kingston was operations manager when he hired Foxx.

The station studios are in Secaucus, N.J., but are in the process of moving to

See FOXX, page 48 ▶

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- Bob Hamilton, New Radio Star

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- Dave Oliwa, Radio And Production, May 1997

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Dave Foxx of Z-100

► FOXX, continued from page 47
N.J., but are in the process of moving to Jersey City.

At weekly meetings, key personnel at Z-100 discuss upcoming promotions and decide what level of support each will receive from the production department.

The staff in attendance usually includes Program Director Tom Poleman, Assistant PD Sharon Stevens, Operations Manager Kid Kelly, Writer Dave Brody and Commercial Director Hal Knapp.

Schedules

"Whether it's a fly-away with Will Smith for 'Wild Wild West' or something smaller like a simple giveaway, we decide how much production effort each promotion warrants. Then we come up with a schedule for completion," Foxx said.

"I write, voice and produce most of these pieces. Sometimes we use Leah Brandon from L.A. as a female voice via ISDN lines, but often it's just a solo effort."

The philosophical reason behind using one man to write and produce promos is clarity of vision.

"It just comes together faster and better this way. No one has to guess what

the writer meant."

When it's time to put it all together, Foxx has a full arsenal in his studio.

"We use a Neumann M-149 mic directly into ProTools without a preamp. Then we add compression and EQ within Waves (a software plug-in). ProTools can now run on either Mac or PC-based systems ... but I'm a big Mac guy."

In any station at any given moment, any piece of equipment can "glitch," but



Dave Foxx

Foxx is prepared.

"We had a computer go belly-up. I just

ran out to the computer store, took out our hard drive, plugged it into a new machine and was back up and running within two hours," said Foxx, who became computer-savvy at an early age when computers were his hobby at WPGC.

"I believe in backing up everything, and we use 8 mm tape (Exabyte 8505) running Mezzo software. It even works in the background while I'm doing something else."

Z-100 now saves promos and commercials to CD, using a Yamaha 100 burner, as well as cart.

Z-100 Gear Sampler

Hardware

Telos Zephyr ISDN codec
Neumann M-149 Microphone
Digidesign ProTools Mac-based Editor
Yamaha 100 CD burner

Software

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Roland D-110 synthesizer used for percussion

Back-Up

Exabyte 8505 8mm tape backup

theory so that you understand the difference between harmony and counterpoint. It'll help you put it together better."

Any tips for getting hired by the big stations?

"When I get demo tapes I always listen for new ideas, new ways of putting together voice, EFX, music, even silence," he said. "I am also interested in finding out if the applicant wrote the material."

Foxx also looks for flexibility.
"Can you do a low-key version, an intense version, something music-based. EFX-based? Put your stamp on your production so it can't be mistaken for anyone else's work."

Now in his mid-40s, Dave Foxx designs Web sites for companies in his spare time, and has his own site as well (www.foxxrun.com).

"I'm married and have a great big family, six kids between us, but they're all grown up and moved out. I'm a grandfather!"

As for the future, Dave Foxx plans on staying right where he is.

"I'm in love with my production job here at Z-100. I couldn't imagine anyplace being a step up from here."

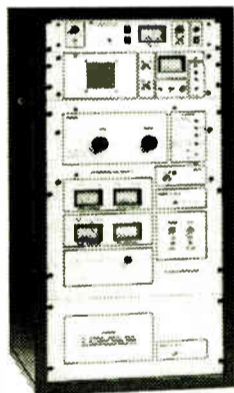
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SHORT TAKE

HHB Launches Longer MD

MiniDisc fans, HHB now offers what it calls the first 80-minute MiniDisc available outside Japan, and the first pro audio MD of that length anywhere.

The company says the new disc achieves extended recording time of 80 minutes stereo or 160 minutes mono, by "an ingenious reduction" of 0.1 microns in the groove width (from 1.2 to 1.1 microns), and a similar reduction in pitch (from 1.6 to 1.5 microns).

The new discs are compatible with all MD recorders and players.

HHB says sales of its conventional MD74 and MD Data discs have grown consistently since they were introduced two years ago. The company interprets

this to mean that audio professionals are accepting the recordable, digital format.

For information, contact the company in California at (310) 319-1111, fax to (310) 319-1311, e-mail to sales@hhbusa.com or circle Reader Service 154.



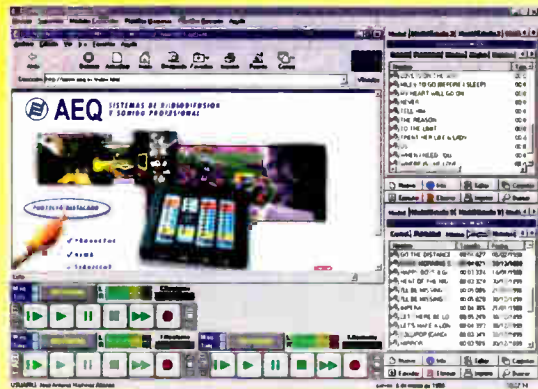
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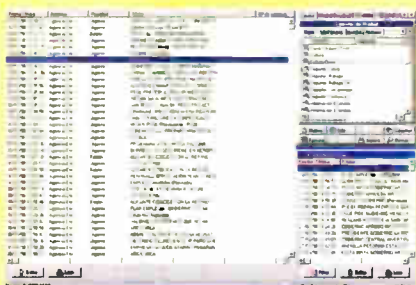
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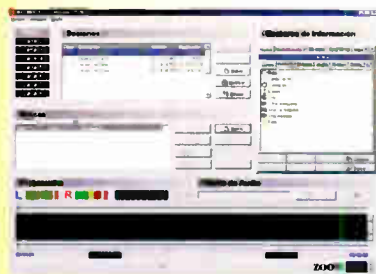


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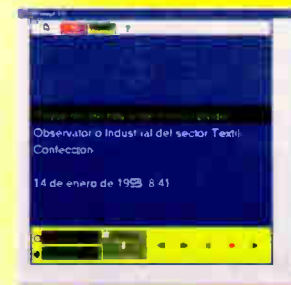
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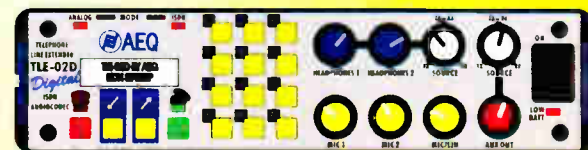
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DIGITAL DOMAIN

Digital: Not Ready for Prime Time

Mel Lambert

During that inevitable convention debriefing period we all go through with our technical colleagues, the subject almost always turns to one subject: "Is digital ready for prime time?"

By which we all mean: Have digital-based consoles, playback systems and signal routers reached a stage where we can obsolete our current analog components, and move to a fully integrated all-digital paradigm?

And the answer, sad to say, is "No."

Once again, despite looking everywhere during my sojourn in Las Vegas last spring,

I failed to be convinced that a major-market station has any alternative to the current hybrid analog/digital installation.

All-digital on-air consoles still cannot communicate in a realistic way with hard disk-based replay servers; very few automation systems are capable of being level-controlled from current-generation mixers; and digital signal-distribution routers are high-ticket items looking for radio-specific applications.

Why bother

What to do? Without the ability to route a signal to the control surface,

access stop/start and mix functions, and then distribute from that same control surface, we are back to where we came in: Why bother to attempt to manipulate the mic and line-levels signals that need to be combined, equalized and processed before being relayed to an eager audience within the all-digital domain?

But how to proceed, so that we, as technical types, can offer to our PDs and management the types of creative — and, let's not be coy, potentially cost-effective — benefits of an all-digital program chain?

Looking at some of the prototype

and production systems being displayed at NAB99 and other trade shows around the world (and I include the recent AES Convention in Munich, which offered an unusually high selection of broadcast-related offerings), I wonder if these and other manufacturers are proceeding along the right path to Nirvana.

And are we, as an industry, actively relaying our thoughts to these identifiable developers and innovators of system solutions so that ideas can be turned into practical silicon?

I would even welcome component elements that are fully plug-and-play compatible with one another, according to a well-articulated grand scheme.

Are we ready for an all-digital paradigm? Sadly, no.

I know several technical directors and chief engineers at leading stations around the country that are actively participating in such dialogs. But if current showings are anything to go by, it is going to be a long road from what we need to what we can utilize in a practical setting.

The only reason that I can identify for such slow progress is that there does not appear to be a consensus regarding what we need from each constituent elements, and how these goals might best be achieved. And here, I think, we might be getting to the heart of the dilemma.

Greater potential

All too often during discussions of this nature, we do not take a sufficiently bold step away from the analog paradigm with which all of us are familiar. We expect that, while making this analog-to-digital transition, new and emergent system components will behave pretty much as they did when we are not having to deal with bits and bytes.

But, if we are willing to forsake reel-to-reel analog tape and cart machines for RAM- and disk-based high-speed alternatives, I wonder why the same cannot be said for routers (making obsolete analog patch bays) and system terminals (ditto for our analog control surface and communications systems).

I concede that there are few manufacturers sufficiently well capitalized to provide each and every element in this signal path. And, with notable exceptions, those larger-sized companies that do have the resources often turn their developmental attention, for possibly obvious reasons, to the more lucrative video-based broadcast end of the hardware spectrum.

But even those firms that are developing — or would claim to have developed — that major item of technology, the Control Surface, all too often show little understanding of the operational potential of more radical design solutions, and one that needs not mimic so closely the shape and front-panel layout

See LAMBERT, page 53 ▶

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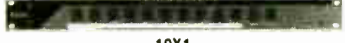
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Do We Have a Digital Solution?

► LAMBERT, continued from page 50 of its analog predecessors.

I fail to understand why, with all of these myriad ways in which assignable control elements — rotary and linear faders, switches and push-buttons — can be used to map virtual functions to our prehensile digits, and then remapped as these requirements change, that more nascent systems do not extend our creative options.

And isn't it time that we, as an industry, came to the conclusion that a Tower of Babel serves absolutely no purpose?

We can take that statement in one

of two ways. There seems to be a glaring lack of standardization between servers and routing topologies, in addition to a rational architectures for plug-

Even those firms developing control surfaces show little understanding of the operational potential of more radical design solutions.

manufacturers regarding serial/parallel protocols for controlling remote data in signal processors and other essential customizable items that add personali-

ty to computer-controlled systems. And consider that this consensus will only result from a continual and ongoing dialog between us — The Users — and them — The Hardware Innovators.

In upcoming columns, I plan to develop a vocabulary for such a dialog, and encourage any interested parties to share with me either on- on off-the-record their thoughts and ideas about potential solutions. You can reach me via email at mediap@earthlink.net

■ ■ ■

Mel Lambert has been involved with the production and broadcast industries on both sides of the Atlantic for several decades.

You Read It Here



Fifteen Years Ago

I have some good news ... and I have some bad news. The good news is for AM broadcasting and the bad news is for Motorola. Motorola's attempt to do the impossible, i.e., grab a monopoly without government support, has failed. Not even Motorola's old friends in Detroit were big enough to achieve the economists' version of perpetual motion. ...

Broadcasters in the major markets first carefully investigated all four (AM stereo) systems, Kahn, Magnavox, Harris and Motorola, and then went on-the-air with their choice. In New York, L.A., Chicago and San Francisco, the size and number of Kahn/Hazeltine system stations dominate. ...

Then Sony hammered shut the coffin by introducing a superb and inexpensive multi-system radio (soon to be modified as automatic car radios). Thus, it's all over in the major and controlling markets.

How do I know? Receiver manufacturers (including a number supposedly "committed to Motorola") are calling for help. They now know they cannot sell in the major markets. Los Angeles, by itself the number one car market in the U.S., destroyed any chance Motorola had to grab a monopoly.

Nothing can be more devastating to a receiver manufacturer than to have his new products frozen out of the major markets. Broadcasters can do very well with Sony and Sansui radios introducing AM stereo for another six months, but even a few weeks of receivers being rejected by the public is a major tragedy for receiver manufacturers.

No wonder Motorola is desperately flooding broadcasters with ads and hard-sell material. It hasn't worked, even though they have had Delco's support since Dec. 7, 1982. It surely isn't going to work now that broadcasters know they can control the issue, can pick the system they want and not knuckle under to Motorola or to anyone else who demands a monopoly. The crisis is over.

*Leonard Kahn
Guest Editorial
Aug. 15, 1984*

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New Product From Spacesaver

Contemporary design is coupled with flexible drawer layout for maximum storage capacity in the new ActiveStor Preconfigured Multimedia File Management System from Spacesaver.

Multiple-storage options include reel

microfiche, stationery and other items. Economical solutions and auxiliary storage are offered with preconfigured lateral files and overhead units.

ActiveStor bookcases are available in virtually any color and in four different heights to coordinate with the lateral file line.



storage and shelf dividers. A drawer divider system allows the user to configure 6-inch drawer interiors for diskettes,

For more information, contact Liz Valentine in Wisconsin at (920) 563-0728 or circle Reader Service 142.

Web Jockey Version 1.0 Released

Self-proclaimed as the "Internet's first online broadcast audio mixer," Web Jockey Version 1.0 has been released. This broadcast mixer solution uses any standard 200 MHz Pentium or better running Windows 98 and only one of any Sound Blaster-compliant sound cards.

Web Jockey software can be used for Internet radio, DJ services, AM/FM radio stations and remote broadcasts for a complete package price of \$299.95. For a trial version, download www.web-jock.com/down_index.htm

For more information contact James Flinn in Michigan at (906) 346-4984, fax (906) 346-9464, visit the Web site at www.web-jock.com or circle Reader Service 132.

GT Electronics Adds to AM Series Mics

Three new AM Series microphones will ship to dealers this fall.

Alesis Corp. announced the addition of three condenser mics to GT Electronics' lineup. The AM30 and AM40 are slender, front-address mics, designed for close miking of acoustical instruments and guitar amps. The AM11 is a large-diaphragm condenser for vocal work and acoustic instruments.

The AM Series is a collaborative effort between Alesis and vacuum tube maker Aspen Pittman.

The AM40 carries a retail price of \$799; the AM30 costs \$499 and the AM11 is \$399. The latter model has a bass roll-off switch and includes a pad to protect from overload.

For information, contact Alesis at (310) 255-3400, visit www.alesis.com or circle Reader Service 78.



AM11 Class-A FET Microphone

HHB Unveils CDR850 PLUS

The CDR850 from HHB is now available in a "PLUS" version, introduced to the industry for use with digital systems in all-digital applications.

New features include a word clock input, which enables the unit to be locked to a master clock source dur-

input, but also via its AES/EBU digital input, the coaxial and optical S/PDIF digital inputs, or its own internal clock.

Balanced digital output on an XLR is another new feature of the unit.

The HHB CDR850 PLUS will ship in September.

For more information contact Tracey



ing playback. A set of dip switches on the rear panel enables the CDR850 PLUS to reference its master clock source not only via the word clock

McPherson in California at (310) 319-1111, fax (310) 319-1311, send e-mail to sales@hhbusa.com or circle Reader Service 122.

Tascam Introduces CD-150

In response to requirements for an affordable commercial CD player without sacrificing essential features, Tascam offers the CD-150.

The CD-150 is primarily designed for studio and small PA applications. Features include ± 6 -percent variable pitch control and auto cue and programmable playback functions. The unit's

eight-time oversampling digital filter, multifunction eight-digit display, time display, music calendar and intro-check display.

It provides for shuffle play, 32-selection random programming, a four-way repeat function, music skip/search, a headphone jack with level control and a standard full-function infrared remote control.

For more information contact Roscoe Anthony in California at (323) 726-



2U rackmount construction allows easy system integration.

The CD-150 also features a one-bit,

0303, fax (323) 727-7635, e-mail to tascamsales@tascam.com or circle Reader Service 112.

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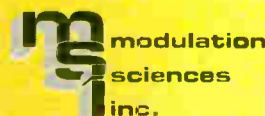
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New York City Hosts 107th AES

► AES OVERVIEW, continued from page 47

"The economic and technical impact digital audio radio will have is enormous. The AES DAR Conference is an opportunity to see how critical this is for the future of radio," Bialik said.

The IBOC proponents will be joined by other digital radio participants, and the conference will include a presentation from Ralph Justus of the Consumer Electronics Manufacturers Association on CEMA's proposed Mobile Multimedia Broadcast Service.

Another highlight of the conference is a tour of CD Radio's new broadcast facility, part of the planned launch of that satellite radio service.



Dave Bialik hosts the Digital Audio Radio Conference.

"They won't be online yet, so that's the best time to have a look," Bialik said.

According to Bialik, the Digital Audio Radio Conference is an open invitation to radio professionals to form a deeper relationship with AES.

"The DAR sessions will be open to all people attending — whether you have a free badge to just see the exhibits or the full package. Anyone can come to this.

"The point of opening this to all attendees is because AES recognizes that radio is an essential part of the audio industry. We're making a big initiative to bring radio broadcasters in as members and participants. In Europe, radio is a major participant in AES. In the U.S., it isn't," he said.



What: 107th AES Convention

Where: Jacob K. Javits Convention Center

When: Sept. 24-27, 1999

Theme: "Advancing The Art of Sound — Leading the World of Audio Into The 21st Century"

Attendance: More than 20,000 expected

Information: www.aes.org or call (800) 541-7299

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"We recognize the integral part radio broadcasting plays, and have it as a high priority to have this reciprocated."

Plenty for radio

For the rest of the convention, workshop chair Michael Solomon of CS&A has also made sure that radio is well represented.

"The New York show serves a big broadcast community. So I felt the workshop agenda should address the broadcast market," said Solomon.

One workshop will focus on broadcasting live events.

"We will have a seminar in new production techniques for sports and entertainment and special-events coverage. There are many innovative ways to mic these to enhance the on-air 'feel' to get the listener closer," he said.

"Fact & Fiction — Production & Delivery Via the Internet" is a panel discussion on using the Net both as a new medium for audio and as a way to deliver sound to traditional broadcast facilities.

In keeping with the convention's educational objectives, more than 100 papers will be presented.

"This year's papers cover a multitude of important topics and were carefully selected to expand the knowledge base of our field," said James Johnston, the papers chair.

These are gathered into some 17 sessions. There are many pertinent to radio, including "Convergence of the PC and the Audio Production Facility," "World Wide Web Interface to Musical Material," "Distributed Networked-Based Broadcasting Structures" and many others on audio coding.

Lou Manno, the technical tours chair, has given a strong radio slant to the field trips in and around the city. This is the home of Radio City, and so a visit to NBC (as well as ABC) is a prerequisite.

The transmissions towers atop the Empire State Building and the World Trade Center also will be featured.

A trip to Edwin Howard Armstrong's facility in Alpine, N.J., is a chance to flesh out an understanding of the history of radio. This is where Armstrong invented the superheterodyne circuit in 1918, and then FM in 1933.

"If you've seen Ken Burn's documentary 'Empires of the Air,' this is a must-

See AES OVERVIEW, page 58 ►

Plenty to See on AES Floor

Carl Lindemann

Organizers of the 107th Audio Engineering Society Convention expect to attract more than 20,000 visitors to the Jacob K. Javits Convention Center in New York City on Sept. 24 to 27.

Beyond the papers and presentations, one of the major attractions is the showcase of new products and technologies.

The capacity to handle higher sampling rates and bitrates is increasingly common. Several new digital audio workstations and multitracker software applications will make their AES debut.

SADiE will introduce Artemis, a high-resolution DAW capable of 192 kHz editing through up to 24 inputs and outputs. SADiE also will release the CEDAR De-

ferent formats — ADAT, TDIF-1, SDIF-2, PD and AES/EBU.

For PC-based DAWs, Sonic Foundry will demonstrate its long-awaited multitracker Vegas. This is a crucial addition to the well-known Sound Forge, allowing complete audio production capabilities within the Sonic Foundry product lineup.

Syntrillium Software will feature the latest additions to its Cool Edit Pro pack-



Artemis DAW by SADiE



Lucid ADA8824 ADAT Interface

More than 100 vendors will demonstrate how they are "advancing the art of sound."

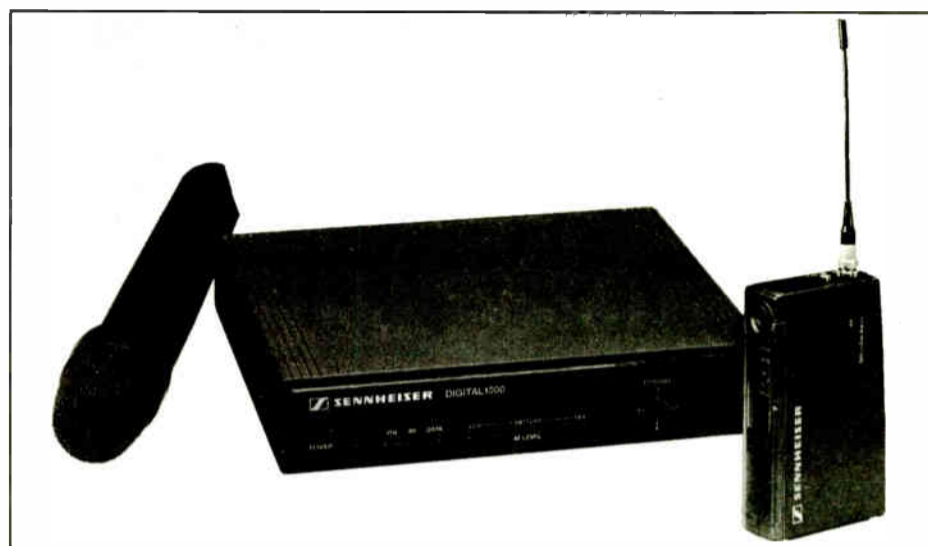
Plenty of A and D

As the end of the century nears, the capacity and capabilities of audio equipment continue to develop rapidly. Digital technologies have all but eliminated analog gear in several areas.

Still, we do live in an analog world. So bridging the gap between our ears and the digital domain is key.

Thump plug-in. CEDAR removes low-frequency disturbances that can mar recordings.

Otari will show two new recording/editing systems. The Advanta series is designed for large-format (high-resolution) recording. It is fully modular, scalable and can be configured to fit the needs of most any production facility. The RADAR II HDR Series is a 24-track/24-bit hard-disc multitrack recorder/editor that can simultaneously output across five dif-



Sennheiser Digital 1000 Wireless

ferent formats. The plug-in uses technology licensed from Fraunhofer IIS and Thomson Multimedia to allow Cool Edit Pro users to create, edit and compress audio for the Web, all in one program.

Any DAW's performance depends on audio converter quality. Lucid Technology's AD9624 analog-to-digital converter and the DA9624 digital-to-analog converter each

See AES FLOOR, page 58 ▶

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New Products at AES in NYC

► AES FLOOR, continued from page 57 take up a half-rack mount space to make for an effective 24-bit outboard solution. And don't forget that analog connectors are important, too. Neutrik USA will show its new BNC connectors as well as the Z + Y series of solderless XLR connectors.

For recording, Tascam will introduce the CD-R624M and CD-R624W software solutions for Mac and Windows. These packages both burn 100-percent Red Book-compliant audio CDs and popular data CD formats.

HHB will show a number of new CD-R, CD-RW, MO and MD discs among its hardware and recording media.

On the mic

Microphone products look both forward and to venerable (and venerated) classics.

Audio-Technica will introduce the AT4047/SV Cardioid Capacitor Microphone with "sonic characteristics reminiscent of early F.E.T. studio microphones."

Along with this homage to the classic condenser sound, A-T will also be looking forward to the next generation of directional microphones with the AT895 Adaptive-array Microphone Systems. The DSP-controlled five-element micro-



PreSonus VXP

phone array is a hybrid of acoustic, analog and digital design with a maximum off-axis rejection of up to 80 dB.

Neumann will introduce the latest additions to the KM 180 Miniature

Microphone Series. The KM 183 omnidirectional and KM 185 hypercardioid supplement the KM 184 cardioid unit. The KM 180 Series have newly developed DC-to-DC converters, so they are not affected when used



Tascam CD Burner Software

studio.

Cutting Edge's sister company, Telos, is introducing the Telos TWO ISDN Hybrid. This dedicated digital hybrid interfaces directly with ISDN BRI for improved caller voice quality and improved trans-hybrid loss.

Telos also will display a major revision to the Audioactive MP3 Production Studio. Version 2.0 includes batch encoding, command-line interface, ID3 tagging, CD-ripping, and light watermarking.

Digigram's new VX Pocket PC sound-card gets in-studio sound with a Windows or Macintosh laptop.

For those struggling with inadequate I/Os on pocket MiniDisc recorders and DAT units, PMI Audio Group's MD Report and MD Report Jr. give portables a docking station with full XLR connectivity.

A multitude of speakers, amplifiers and distribution amplifiers will also be on display. Rane's new and improved DA

107th AES Convention Comes to Big Apple

► AES OVERVIEW, continued from page 56 see," said Manno.

For a glimpse at the wired future, Technical Council Chair Wieslaw Woszczyk has scheduled a demonstration of high-speed/high-capacity 12/CANet multichannel sound/picture transmission linking McGill University and New York University.

ing the newest, latest technology as well as reinventing old technology. But we've left aside the music! The technology and engineers wouldn't be needed without the artists to record," Roy said.

The Platinum Producer panel will include such luminaries as Phil Ramone, Al Schmit and others.

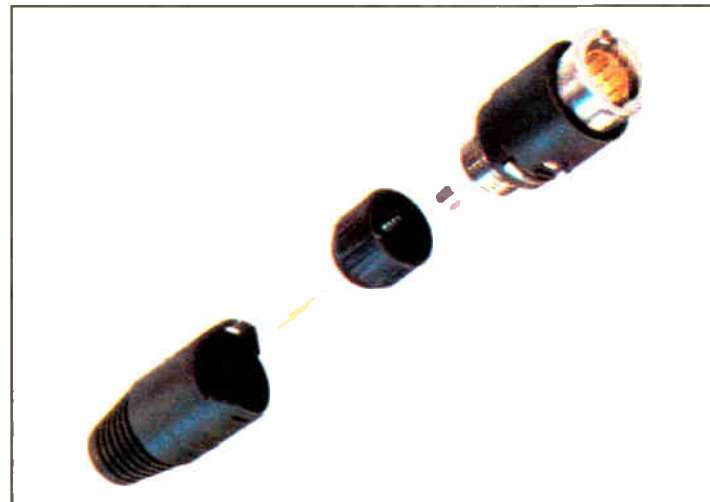
"We will feature artists with their

with unbalanced inputs on DAT or MiniDisc recorders.

Sennheiser will introduce the next generation of the MKE2 Red Dot miniature lavalier microphone, the MKE2-4 Gold as well as a 900 MHz wireless system, the Digital 1000 System that provides full, CD quality sound.

In the mix

Mixers and microphone preamps are key to realizing any mic's capabilities. Mackie will feature the 1642 VLZ PRO.



Neutrik BNC Connectors

This is the first completely new high-end professional compact mixer offered by Mackie in more than four years. The centerpiece of the 16-channel mixer (eight mic/line, two mic/stereo line and two stereo-line, four subs) is Mackie's new XDR professional-grade mic preamps.

Manley Laboratories will introduce the 16/2 Mixer, and demonstrate several classics: the "Massively Passive" Stereo EQ and the Manley VOXBOX mic pre-amp. PreSonus will introduce the VXP microphone processor. The VXP features a Class A mic-pre, smart compressor, deesser, expander, four-band EQ and brick wall limiter.

Cutting Edge made a splash at NAB99 with its Omnia ToolVox microphone processor. This unit is designed specifically for on-air broadcast processing. It includes AGC, compressor and noise gate; switchable phase rotation; flexible HP/LP and shelving filters; full parametric EQ; de-esser with psychoacoustically-based detection algorithm; reverb from Waves; built-in mic preamp with phantom power and 24-bit converters.

Technology for getting sound from remote locations continues to improve. Already, it is nearly indistinguishable from having these distant voices in the

216a Distribution Amplifier adds assignable outputs. The new assignment flexibility allows many new applications and a plethora of 2x16 routing possibilities.

Custom mix

The new Furman HDS-6/HR-6 Headphone Distribution System allows up to eight users to have their own custom mix. Hafler's P1000 amplifier provides voltage and current gain at the outputs, keeping signal level low in "front end" for simpler signal path (less gain stages required) resulting in exceptional sound quality. The P1000 runs 50 watts per channel into an 8 ohm load.

The TRM6 is a powered monitor that features the same circuitry as the P1000. The TRM6's sixth-order vented enclosure makes for extended low-frequency response in a small size.

JBL Professional is waiting for the convention to unveil what it says is "a significant new product introduction that brings together recent technology advances with improvements in manufacturing technologies and sets a new benchmark in performance."

So be sure to come to New York to see for yourself.



New York's Javits Center

During the show, an honorary membership in AES will be awarded to Sony Corp. Chairman of the Board Norio Ohga for his lifetime of contributions to the audio industry. Opening ceremonies on Sept. 24 will feature keynote remarks by country music legend and audio pioneer Chet Atkins.

While technology is the focus of AES, an addition to this year's convention tries to keep this in the perspective of the creative talent it serves.

Special Events Chair Lisa Roy will kick off the "AES Platinum Artist Series."

"AES has always been great for shar-

producers and engineers. We combine the technology and the musical elements. It's the first time we've done such a series. In the past, it's something that AES has left out," said Roy.

This all-star panel of producers also will explore the impact MP3 and other compressed audio formats will have on the music industry in particular and the communications industry in general.

Roy said attendees should expect the unexpected at the conference.

"It's the last year of the 20th century, and we've lots of surprises in store," she said.

AES Exhibitor List

The following is a selection of companies exhibiting at the AES show that are of interest to radio. For a complete list, see the program materials on-site.

Aardvark
Acoustic Systems
Acoustical Solutions Inc.
Akai Musical Instrument Corp.
AKG
Alesis Corp.
Allen & Heath
Amek — A Division of Harman International Industries
AMS Neve PLC
Aphex Systems
API Audio Products Inc.
Apogee Electronics Inc.
Apogee Sound Inc.
Applied Microphone Technology
ART — Applied Research & Technology
Arboretum Systems Inc.
ATI — Audio Technologies Inc.
Audio Accessories Inc.
Audio Engineering Associates
Audio Precision
Audio-Technica U.S. Inc.
ATI (Audio Toys Inc.)
AudioControl Industrial
Audix Corp.
Azden Corp.
Bag End Loudspeakers
BASF/EMTEC Pro Media
BEC Technologies Inc.
Behringer International
Belden Wire & Cable Company
Benchmark Media Systems Inc.
Beyerdynamic
Brainstorm Electronics Inc.
BSS
CAD Professional Microphones
Cadac Electronics Ltd.
Cakewalk
Calrec Audio Ltd.
Carver Professional Div. of Phoenix Gold
Cedar Audio Ltd.
Circuit Research Labs Inc.
Cirrus Logic/Crystal Brand
Clear-Com Intercom Systems
Coles/AEA
CommScope Inc. of North America
Community Professional Loudspeakers
Crane Song Ltd.
CreamWare US Inc.
Crest Audio Inc.
Crown International
Curtis Technology & Trade Inc.
Cutting Edge Technologies
D.W. Fearn
Dale Pro Audio
Dan Dugan Sound Design
DB Technologies
dbx Pro
DDA
Denon Electronics
Digidesign
Digigram
DigiTech
Disc Makers
DOD
Dolby Laboratories Inc.
Dorrough Electronics
DPA Microphones/TGI North America Inc.
Drawmer (USA)/Transamerica
DSP North America Ltd.
Dynaudio Acoustics/Munro Associates
E-mu Systems/Ensoniq
Earth Works
Eastern Acoustic Works Inc.
Electro-Voice
ETA Systems
Euphonix Inc.
Event Electronics
Eventide Inc.
Fairlight USA
Focusrite Audio Engineering/Group One
Fostex Corp. of America
Fraunhofer Institute Integrated Circuits (ITS)
Fuji Photo Film USA Inc.
Furman Sound
G PRIME Ltd.
Gefen Systems
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Gepeco International Inc.
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Liquid Audio
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Mackie Designs
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Martin Audio/T.G.I. North America Inc.

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Musicam USA
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N.A.R.A.S.
Nemal Electronics International Inc.
Network Music Inc.
Neumann
Neutrik USA Inc.
Otari Corp.
Pacific Microsonics Inc.
Panasonic Broadcast & Television
Peavey Electronics Corp.
Penny and Giles Control Inc.
Pioneer/TAD-Technical Audio Devices
PMI Audio Group
Precision Laboratories

Precision Systems Integrated
PreSonus Audio Electronics
Prime LED
Prism Media Products Inc
Pro Audio Review
Purple Audio Inc.
QSC Audio Products Inc.
Quantegy Inc.
Quested Monitoring Systems
RADIANT Audio Engineering Inc.
Radio World
RDL Radio Design Labs
Rane Corp.
Rapco Pro USA
RCS Enterprises
Renkus-Heinz Inc.
Retrospec Inc.
Roland Corp.
Rolls Corp.
RPG Diffusor Systems Inc.
Sabine Inc.
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Schoeps/Posthorn Recordings
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PRODUCT EVALUATION

Denon CD Player Is a Mixed Bag

Carl Lindemann

Denon's new rack-mountable DN-C630 CD player may be the ultimate studio unit for this format. The sound quality is excellent, it has all the necessary I/Os and it has a programmable interface that allows extensive manipulation of audio tracks.

Combined with a CD-R, the DN-C630 can double as an effective cart replacement.

It is reasonable to ask if this is the best way to approach the task at this stage of the game for radio users. The standalone CD player is definitely nearing the end of its life span, and the DN-C630's virtues should be judged in that context.

Anyone taking the time to master the unit's full capabilities may do better to simply load cuts into a live-assist/on-air automation system or other computer-based audio production package.

Super sound

Listening to the Denon's Super Linear Converter was a pleasure. It sounded terrific. The bass response was rich and full, unlike many CD players. The mids and highs didn't annoy or

induce listener fatigue — a common problem with "CD quality."

The unit has also been designed with CD-Rs in mind. It played most any disc fed into it. Badly scratched commercial CDs and CD-Rs made of substandard media (yes, not all CD-R blanks are created equal) all played without skipping. That is a rare accom-



The New DN-C630

plishment.

Even more surprising, it even managed to read a CD-RW disc. Most players are not designed to play their less reflective surface. There are also control options to play discs without TOC coding. If you get CDs from a variety of sources and have a problem getting them all to play, the DN-C630 is a good solution.

The DN-C630 comes with balanced XLR connectors as well as unbalanced RCA jacks. There is also a digital RCA

jack that can be programmed for S/PDIF or IEC 958 Type II (without subcode information).

The unit can be operated through a 25-pin remote control interface. You can monitor through the 1/4-inch headphone jack with volume control on the front panel.

For analog use, this is fine. But if

you work within the digital domain, this is limited. For production on a DAW, the preferred method of audio extraction is by skimming the data directly off the CD via a CD-ROM. Yes, you can do this here via the digital out, but you are confined to 1x read

Rack ears, XLR connectors and a control interface are among the features of this deck that will appeal to radio users.

speeds. Waiting to load production beds and other material in real time is wasteful when you can get 10x reads by CD-ROM audio extraction.

For those still editing with reels and razors, this is a moot point. But how many such Luddites remain?

Depending on how you look at it, the unit's greatest virtue/worst vice is its powerful, yet complicated controls. These allow programming of the track order. In fact, it can store data on track order for up to three discs.

Say you have a CD of effects for a show. You can fire these up in sequence as per the show's schedule of features. The DN-C630 also lets you select sound bites from the middle of tracks. The "A-B" function sets the beginning and end of splices.

The search buttons allow scrubbing at 1/75th of a second. This level of accuracy is good enough for "quick and dirty" editing. A plethora of presets also allows for user preferences in cueing and the like. If you like 5, 10, 15, or 20 ms of delay before the start of a cut, that can be programmed.

If you use the single-play function so that it stops after the selected track, the drop in sound level that triggers the end of the segment can also be changed. Instead of being at the mercy of factory presets, the end-user can craft these to suit the particular application and environment.

A pitch control allows the playback speed to vary +/- 10 percent.

Complex controls

The price of this vast level of flexibility is complexity. The interface is cumbersome. It is likely to take time and training

Product Capsule:

Denon DN-C630
CD Player



Thumbs Up

- ✓ Convenient rack design
- ✓ Useful pro and consumer I/O
- ✓ Programmable interface



Thumbs Down

- ✓ 1x read speeds
- ✓ Complex controls
- ✓ Translated manual

For information, contact Denon Electronics in New Jersey at (973) 575-7810, visit the Web site at www.del.denon.com or circle **Reader Service 90**.

before you get the hang of using the controls. DJs thinking to use this on-air would likely be discouraged by the prospect.

With manual in hand, I was able to

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September 1, 1999

USER REPORT

Intraplex Helps Stations Connect

by Max Turner
Engineering Manager
WFMS(FM)/WGGL(FM)/WGRL(FM)

INDIANAPOLIS In today's rapid-acquisition environment, station-engineering personnel increasingly face situations that require both creativity and ingenuity.

Market opportunities emerge faster than traditional "bricks and mortar" can keep up.

Fortunately, today's technology offers solutions that can help create and connect new studio facilities almost overnight and make the transition transparent to listeners.

Making more room

In 1997, our radio group already included WFMS, the highest-rated station in Indiana, and WGRL. "The Bear."

We acquired a third station, a Class A+ 6 kW station. This new license provided the opportunity to frequency-swap and create a new oldies station at one of our established dial positions.

The only problem we faced was that our existing studio and offices offered no room for expansion to accommodate the launch.

We recognized that the long-term answer to this problem was construction of a new facility to house all three stations and allow for future expansion. At the same time, we did not want to wait to take advantage of the acquisition and launch our new stations and frequency assignments.

Fortunately, we could draw on the experience of one of our sister stations, WNNX(FM) in Atlanta, which had created a fully functional temporary studio for live broadcasting from the 1996 Olympic games.

Using the Harris Intraplex STL Plus digital studio-to-transmitter (STL) system and digital T1 lines, WNNX had been able to create a multi-tier program audio, voice and data-communications network that linked its temporary broadcast facilities at Coca-Cola Olympic Park to the transmitter, home studio and office.

Creating the link

We found some storage space in a warehouse about three miles away from our existing studios. In it, we created an entire, fully soundproofed 15-by-15-foot "studio-in-a-box," including an adjoining engineering room, and sales and office space for the new station.

The key to making this unique venture work was our use of the Intraplex STL Plus system and a pair of T1 lines leased from Ameritech, linking our temporary and permanent locations.

The Intraplex multiplexers allowed us to move bi-directional 15 kHz uncom-



The Rack Room

pressed audio, connecting our warehouse studio to our main engineering core. This allowed us to send satellite or other programming to the studio and

facility.

In addition, we were able to connect our warehouse offices to the company's existing wide area network (WAN) for e-mail and sales programs, transfer of commercial spots from our servers and downloading satellite program feeds.

We were also able to extend our telephone network to our new remote facility, all on the same T1 pair.

We used the STL Plus and T1 lines to carry 12 off-premises extensions that networked our home switchboard and PBX transparently to studio and staff phones at the warehouse.

Our operators could transfer outside callers to the warehouse extensions, and inside calls required only normal four-digit extension dialing.

Four tons of candy

Our "temporary" set-up functioned flawlessly for almost a year and a half, while the new permanent home for all three stations was being built. In fact, we continued to use an adjoining space at the warehouse for storage needs, such as delivery of four tons of candy for a station state-fair promotion.

See STL, page 62 ▶

USER REPORT

WEOS(FM) Fits Needs With Telos

by Michael Black
General Manager
WEOS(FM)

GENEVA, N.Y. Remote broadcasting has always stretched the talents and patience of most broadcasters, whether they be the engineering staff or the talent. Tons of equipment, wires, and failures were — and in many cases still are — the norm.

POTS frequency extension created a more compact format, but the costs and size of the equipment, as well the setup, left a lot to be desired.

Enter ISDN — great quality and isolated bi-directional audio over one pair of copper wires. It seems too good to be true.

However, most of the equipment had to have add-ons in the form of mixers, headphone amps and the like, in order to facilitate the remote.

In some cases, with the amount of hardware needed for a simple remote growing out of control, I was back at square one.

Express testing

A few years ago, I received a phone call from Steve Church, president of Telos. We already were Zephyr users, and were satisfied with their performance.

His query: If you could have a com-

bined mixer and codec in one package, what would you like to see?

We talked for about an hour. Not too long after this, a new ISDN animal came onto the market — the ZephyrExpress.

This compact box seemed to answer all the demands one had regarding remotes: ISDN, stereo, with mic inputs and all the guts that could be taken on a plane in a carry-on. Again, it seemed too good to be true.

We received a ZephyrExpress to put

of our mono work locally, and added ISDN for stereo feeds.

When out on the road, the choices are ISDN or POTS. How would the ZephyrExpress fit into this mix of equipment?

When we opened the box, the first thing I thought was, "Is this all?" The ZephyrExpress consists simply of a small, lightweight black and teal case and an external power supply. Upon closer examination, however, we found



The ZephyrExpress

through the motions as beta tester.

Being a small public radio station that also has a commitment to our licensees for sports coverage, we have a variety of remote situations: stereo, mono, local, split feeds, and national feeds. We had relied on RPU for most

that Telos packed a lot into that case.

Intuitive features

The front panel contains controls for two stereo mic/line inputs and one stereo line input. There are two discrete

See TELOS, page 64 ▶

USER REPORT

Marti Digital STL Used at WGUL

by Paul Mueller
Chief Engineer
WGUL-FM

PALM HARBOR, Fla. A couple of years ago, we were given the task of developing a digital STL network to handle our growing group of stations spread over the west-central area of Florida.

The primary studios for WGUL are located at Palm Harbor. The main programming digital signal was then sent through a power divider to our FM transmitter site at Hickory Hill and the AM transmitter site as well.

We have been using the Marti STL-15C along with a digital encoder and the R-15C receiver with a decoder using two sets of a four foot 5C-48 Marti dishes.

This portion of the system has been working extremely well for over three years now. As a matter of fact, everyone — from management to program-

directly feed the digital processor and digital exciter. We were amazed at the overall performance of a system with such a low RF signal and how easily it all went together.

Clean, clear audio

The system utilizes a true digital carrier, allowing high receiver signal levels at



The Marti DSTL

ming — has been amazed at the quality and reliability of the system.

Getting the signal

Our programming needs required special digital methods to send our simulcast programming while allowing breakaways for local content at key sites. The system continued to grow with the last purchase being a Marti DSTL to link one site at Spring Lake.

This FM site has a new transmitter with a digital exciter and we wanted to keep the signal in the digital domain as far as possible. Among the factors that concerned us were the digital delay times, which we needed low enough to barely be noticeable.

great distances with extremely low bit error rates (BER).

The DSTL receiver makes use of 9-QPRS modulation from the transmitter and Dolby AC-2 audio coding, providing error-free audio with extremely low delay.

Our current application required only two channels of audio, but the DSTL can be configured for up to four 15 kHz channels, one 7.5 kHz channel and one 5 kHz channel — normally used for data remote control. This feature is very important to us, as our system continues to grow and we just never can tell when we might need that extra channel capability.

We protect the site from power grid

The DSTL receiver makes use of 9-QPRS modulation from the transmitter and Dolby AC-2 audio coding, providing error-free audio with extremely low delay.

We looked at all the systems on the market, and after careful consideration, chose the DSTL from Marti.

Also among our concerns, the weight consideration and the possibility of the wind misaligning the dishes over the STL path of 20-plus miles. After consultations with Marti, we had every confidence that the use of six-foot dishes with the DSTL would be highly reliable and provide us with the AES/EBU input at the studio.

The AES/EBU output at the receive end of the system would enable us to

fluctuations and have not had one dropout in the entire time we have been using the DSTL system, even shooting through some pretty crowded RF spectrum areas.

The sound is phenomenal and the easy installation, backed by the Marti support folks, have justified our decision to go with the Marti DSTL.

■■■

For more information contact Marti Electronics at (817) 645-9163, fax (817) 641-3869, visit www.marti-bdcast.com or circle Reader Service 91.

From the Warehouse To the Air

► STL, continued from page 61

Thanks to advanced planning and the cooperation of Harris-Intraplex, we have been able to re-deploy the Intraplex equipment purchased for our temporary studio as part of our expanded new technical facilities.

Once the station based in our original warehouse studio moved into the new building, we shifted one TI line and Intraplex system. This allowed us to quickly connect the new facility with our existing main engineering core, smoothing the transition.

From our new studio complex, we now employ TI circuits to three of our transmitter sites, using the Intraplex equipment for straight STL/TSL applications handling AES digital feeds.

Complete chain

The newly configured units are now a key factor in our ability to have completely digital air chains.

Our third Intraplex system, added

We were able to eliminate the need for repeaters, allowing more frequencies for remote broadcasts.

since the move, supports the backhaul of multiple RPU feeds from our auxiliary transmitter site for remote pick-ups. This has provided extremely quiet, clean audio backhaul from our remote pickups to the studios.

We discovered another nice feature that came into play. By utilizing the Intraplex channels, we were able to eliminate the need for repeaters, allowing us to have more frequencies available for remote broadcasts.

Because on-site visibility presence is a key feature of our marketing strategy, we can now have three or four remotes taking place at the same time.

The flexible multiplexing capabilities of the Intraplex units has enabled us to achieve multiple uses and, at the same time, have provided a much-improved signal-to-noise ratio where audio is concerned.

■■■

For more information contact Harris Intraplex at (978) 692-9000, fax (978) 486-0660 or circle Reader Service 84.

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USER REPORT

MPR Goes Public With Moseley STL

by **Ethan Torrey**
RF Engineer
KSJN(FM),
Minnesota Public Radio

SAINT PAUL, Minn. KSJN, Minnesota Public Radio's classical music station in the St. Paul-Minneapolis market, recently installed a **Moseley SL9003Q** Linear Digital Studio Transmitter Link. This replaced a PCL 6010/6020 system using DSP 6000 apt-x encode and decode boxes.

The apt-x system was originally installed as a response to a very crowded STL band. It was felt that this system would provide more robust performance under these conditions and this proved to be the case.

However, the data compression scheme and the classical music programming did not mix well. Stereo image was adversely affected and there was harshness to the sound quality.

The effects might have seemed subtle to many listeners and may have been entirely imperceptible when car-

and amplitude of the carrier, a single state of the carrier can represent several bits of information.

For example, if amplitude were quantized to eight possible levels, and phase shift to four possible positions, the result would be 32 possible states. Each symbol would then carry five bits of information ($2^5 = 32$).

The Moseley system can be set to 16, 32, or 64 QAM. These equate to 4, 5, and 6 bits per symbol respectively. Between the data density that this method provides, and the powerful error correction used, this system should be extremely reliable. This has proven to be the case for KSJN.

Getting from here to there

The Shoreview transmitter site, from which KSJN broadcasts, is located just north of St. Paul.

The 1,400-foot tower is home to 10 radio and five television stations. An additional site, about a mile to the west, carries several more broadcasters on two more 1,400-foot towers.



Moseley's SL9003Q

rying other material. But the classical music audience includes a large number of particularly critical listeners who would miss hearing the detail lost under this arrangement. By providing a linear, non-compressed path, the SL9003Q has eliminated these effects; much to the satisfaction of station management and the most critical of KSJN listeners.

Configure the possibilities

The SL9003Q is a modular system providing numerous configurations for different circumstances.

Among these are both two- and four-channel linear audio options at 32, 44.1 or 48 kHz sampling rates, along with additional data channels. MPEG encoding is also available, making it possible to carry several additional audio channels.

Data is interleaved to distribute any burst errors, and correction is accomplished using the Reed-Solomon algorithm. This is the same error correction method used in CD players. If an error occurs, its location is determined and the correct data is inserted in its place.

The heart of the system though is the use of Quadrature Amplitude Modulation. By varying both the phase

The STL transmit antenna is located in downtown St. Paul; a 10-mile hop to Shoreview. The previous STL had been combined onto a single antenna with that of MPR news station KNOW-FM.

After positioning an additional dish for the new system, the installation was essentially "plug-and-play." No changes were necessary at Shoreview other than to swap receivers.

The system was delivered configured for two uncompressed 44.1 kHz audio channels. Prior to installation, bench tests were performed. This included an A/B comparison of AES audio out of the receiver with that of a CD player feeding the transmitter. Absolutely no difference was detectable.

Setting parameters

When first installed in late March of this year, the system remained configured to carry two channels of audio at 44.1 kHz and 64 QAM.

At the transmit end, AES3 stereo is provided to the SL9003Q. At the receive end, AES3 stereo is fed from the SL9003Q to the stereo generator.

A menu-driven front-panel display provides access to diagnostic information and set-up control. This provides complete information on the link's performance.

See MOSELEY, page 64

TECH UPDATE

Gorman Redlich


The **Gorman Redlich EAS1** Encoder-Decoder is Y2K compatible and features five bi-directional RS232 inputs/outputs for computer modem, remote sign board, character generator and auxiliary panel; and six audio inputs on standard models. All audio inputs and outputs are transformer-isolated from encoder-decoder board.

Users can select between manual or automatic keypad mode. The unit also features automatic interruption of stereo program lines when pre-selected header code is received while in automatic operation, two minutes of digital audio

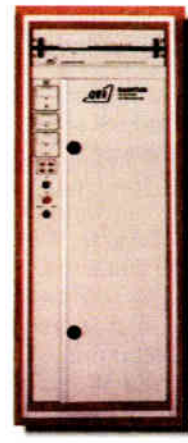
storage at 5 kHz, and five programmable relays to supply contact closures to handshake with automation equipment or signal other equipment.

The EAS1 now includes remote telephone access so alert messages can be originated from a remote location with a telephone DTMF keypad. Directions for use of remote telephone access can be accessed through the Gorman-Redlich Web site 24 hours a day. The unit also has a CMOS EPROM 32-pin 1-MB (128 K x 8) for future changes.


For more information contact Gorman-Redlich at (740) 593-3150, fax (740) 592-3898, visit the Web site at www.gorman-redlich.com or circle Reader Service 69.




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Zephyr Scores in Field Use

► TELOS, continued from page 61

monitor mixes controlled from the front panel with separate send and receive levels for each of the two monitor sources.

Balancing out the panel are the telephone keypad for dialing and a menu-selector knob. They also added a front monitor jack on the front panel.

Each pot — whether an input or monitor mix — has a button that enables not only the pot, but how it is assigned: either to left, right or both. Being a stereo mixer, panning of both the inputs and monitors is possible.

Telos included an extensive manual and the LCD menu screen is easy to read, with includes a comprehensive on-line help feature on the unit. All parameters are selected, changed, and stored by using the selector knob.

The beauty of the unit is that setups for multiple sites can be recalled and loaded, and it is simple to load them on your own. The unit is very intuitive and logically laid out. In a matter of minutes, you can be on the air and, I would dare to say, without reading the manual.

Many of the "hidden" features come to life in the menus — level pads for the mic and line pots; phantom power on the mic inputs; monitor pan assignments and much more.

Probably its most important feature is the Safe mode. This is great for sending the ZephyrExpress out on a remote, with headsets and the talent, and letting them plug it in with a minimum of difficulty.

In Safe mode, certain parameters such as SPIDs and switch types cannot be changed. This allows some anxiety relief for the engineering staff.

The ins and outs

The actual hookup is simple. All connectors are on the back and easily identifiable: mic and line inputs, monitor outs, and separate return audio outs.

The unit has built-in both the ISDN "U" and "S" interface, so you can use it with or without its built-in NT-1. Remote control ports and the like round out the

back panel.

In addition to Layer 3, Layer 2, and G.722 transmission modes for ISDN, the ability to call a POTS line is also available.

How handy is this? You could be doing the broadcast feed on one B channel, and calling the studio phone on the other, with *no* extra phone equipment. Additionally, this can also be used as a POTS-based backup feed of the program, should something happen at the studio end of the remote with the ISDN; alternatively it can serve as a POTS feed to another entity.

Even in some of the roughest situations, the ZephyrExpress has never presented us with problems.

The power supply uses a 4-pin XLR connector that gives a solid, reliable cord connection. There is plenty of cord on both ends of the power supply so it can be tucked out of the way.

The quality of the feed is excellent. The mic pre-amps are very quiet and the headroom is unbelievable. We have yet to really overload the unit.

The first lady and lacrosse

During the celebration of the 150th anniversary of the Women's Rights Movement in Seneca Falls, N.Y., WEOS originated 10 hours of live national feeds, additional production feeds and interviews from the various sites.

This included the opening speech by Hillary Rodham Clinton to the world, with two separate discrete feeds to different uplinks. All the while, the ZephyrExpress baked in the direct sunlight in 95-degree heat with no problems.

Other Zephyr uses have included live concert broadcasts along our beautiful lakefront, visiting speakers, and

ety of plug-in encoder, decoder, data and power supply modules to configure TEAM for current and future needs.

The basic TEAM mainframe contains a control processor and an AC power supply. Transmission network connections are made through a plug-in T1/E1 multiplexer or an X.21 module. You can specify a mix of up to six two-channel audio encoder or decoder modules. Dual redundant and battery power supplies are available.

TEAM provides 24-bit A-to-D and D-to-A converters, AES/EBU inputs and outputs and close adherence to all applicable standards for transmission, emissions and safety.

Audio and data modules are hot swappable should maintenance or system reconfiguration be required. In addition, remote contact closures and a variety of diagnostic and remote control functions.

■■■

For more information contact Musicam USA at (732) 709-5600, fax 732-739-1818, visit www.musicamusa.com or circle Reader Service 79.

live sports. This includes distribution of the international radio feed for the NCAA of its Men's Lacrosse Championships.

Even in some of the roughest situations, it has never presented us with problems.

Drop kick it

Speaking of rough situations, we possibly put the ZephyrExpress through one of its roughest tests. After baking it in the sun, freezing it in the cold, and putting it through a day of near monsoon rain, at one site, we were setting up to broadcast

a lacrosse game, where there was no press box.

The ZephyrExpress was sitting on the top of the bleacher section, about 40 feet off the ground when one of my students bumped into it, and sent it flying to the ground below.

We watched in horror as the ZephyrExpress hit the cement, bounced and landed in the grass adjacent to it. After assuring the student she still had a job, I sent her to the car to bring our backup rack mount Zephyr, and retrieve the ZephyrExpress.

Upon examination, we discovered a scuff mark and a grass stain on a corner of the unit, but nothing else *seemed* wrong. So, we plugged it in. Just as in the

old Timex commercials, it took a licking and kept on ticking.

Though I would not recommend you try this at home, it really showed me how durable the ZephyrExpress is and why it is a very handy remote tool.

Our talent loves the unit.

We use many students and community volunteers, and all are quite comfortable taking the unit out to remote sites, due to its simplicity and reliability.

In many situations, the ZephyrExpress is all we need; we just pack it in a small bag along with headsets and carry it to the remote site. If more inputs are needed, a small 12-input mini-mixer is a great add-on and provides everything we could need to do 99 percent of our remote broadcasts.

If there are any complaints, they are minor. Further advancements in DSP technology should allow Telos to provide the same audio horsepower with less heat and circuit boards, and eliminate the external power supply.

I would love to see one more mic input, but this omission is no doubt a tradeoff for having the stereo capabilities within such a compact package, and I do not want to give this up.

Adding an external mixer for the few occasions we need it is fine.

All in all, the ZephyrExpress is something that was really needed for the broadcast community.

We find it invaluable in our production toolbox, and in many cases, it is like the Swiss Army knife, providing so much in such a small package. It has made our life easier, and helped us produce more programming as a result.

■■■

Michael Black is a free-lance television audio engineer. He can be reached at (315) 781-3456.

For more information contact Telos Systems at (216) 241-7225, fax (216) 241-4103, visit the Web site at www.telos-systems.com or circle Reader Service 70.

Moseley STL Performs For KSJN in St. Paul

► MOSELEY, continued from page 63

including signal strength, local oscillator phase lock and power level, resettable bit and error counters, both pre- and post-error correction bit error rate (BER) and more.

Frequency, QAM mode, interleave depth and many more parameters are user configurable from the front panel. For example, after three months of

Performance has been flawless. The immediate improvements in stereo image, depth and warmth were apparent. The post-error correction BER is on the order of 1×10^{-11} . This essentially translates to 100-percent accuracy in the reproduced data.

The SL9003Q is robust, easy to install, easy to work with, easy to configure for any number of circum-

The immediate improvements in stereo image, depth and warmth were apparent.

stances, and, most importantly, it sounds great.

■■■

Ethan Torrey can be reached at etorrey@MPR.org

The simple process for making this change took about five minutes at each site, flipping one DIP switch and changing the aggregate data rate (another front-panel adjustment) on both the receiver and the transmitter.

For more information contact Moseley Associates Inc. at (805) 968-9621, fax (805) 685-9638, visit the Web site at www.moseleysb.com or circle Reader Service 80.

TECH UPDATE

Musicam USA

Musicam USA's TEAM T1/E1 audio multiplexer is an integrated network transmission system that can transmit and receive audio and data over T1, fractional T1, satellite, fiber optic, dedicated data and E1 lines.

A user can send and/or receive up to 12 audio channels in a variety of formats, based on needs and transmission-line capacity. Without switching modules, the unit can send audio as full 16-bit linear stereo with no compression and near-zero delay (in accord with the J.57 standard) MUSICAM-enhanced MPEG layer 2 at all MPEG-2 bit rates, MPEG layer 3 and J.41 format for transparent 384 kbps mono. Multiple Ancillary Data channels are also supported.

TEAM is ideal for STL use and multichannel audio transmission. The unit is self-contained in a 4U-high rack-mount chassis, and is modular in construction. Users can select from a vari-

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AMPLIFIERS

WANT TO BUY

Microtech 1200. W Gunn, 760-320-0728.

ANTENNAS/ TOWERS/CABLES

WANT TO SELL

Alesis Midiverb II, great cond, 16-bit, \$100; Technics SL-P1200 CD player, top load, var pitch, jog wheel, no digital outs, works but needs cleaning & alignment, \$300; 20-space targeted rack cabinet, opens front & back, rack rails frong & back, heavy duty, recessed, flip-up handles, no road use, gd shape, \$125. Bob, 800-940-2035.

Altec 439A & 436C tube compressor, fair cond, BO. D Lurtey, 864-370-1800 x2730.

RDS Phantom, (2) 500 meg hard drives, can accommodate four, AMX-84 switcher, 3 yrs old, \$5000/BO. Marion Garris, 803-516-8400.

Yamaha BP-2 bass pedals, prefer electronics only but would like schematic. B Meuse, 650-969-2433.

Orban Optimod 9000A, CBS Volumax 4300 audio limiter, RE20 spider shock mount 309A. Joe 860-433-6046 weekdays, 860-376-0134 evenings.

Dolby 301s; Neve 33609, 1072s, 1073s, 1081s, Urei LA4s, 1176s. W Gunn, 760-320-0728.

AUTOMATION EQUIPMENT

WANT TO SELL

Arrakis DL-3 (2), 2-2 gig drives w/expansion switcher, excel cond, latest software updates, network cards installed, \$5-6000. C Smith, 501-524-7194.

DCS computer automation system, 5 cpu chassis & 4 gig drives, 1HP, 14 port hub, call for details, will sell all or part, \$35,000/BO. E Kain, 504-581-7002.

Harris FA25 & TG-25 25hz tone gen & tone filters, \$200/both. H Kneller, 941-494-4111.

Schafer 903, incl keyboard, remote box, control unit, power supply, manuals & cables, BO; Instacart 48PBS stereo cart machine, incl control unit, control cards, brand new replacement heads & spare trays, BO. D Lurtey, 864-370-1800.

Arrakis automation: Digilink DL3, v4.3, 10 hr, Trakstar 3, 10 hr, remote program for PC operation, w/2 monitors, 2 keyboards & mice, Lantastic 6.0 software, RG-58 cables, Arrakis software, manuals, \$4650 +shpg. F Vobbe, 419-228-8835.

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CART MACHINES WANT TO SELL

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BE R/P mono machines, 3 stack stereo PB, BO. H Kneller, 941-494-4111.

Gates & ATC mono R/P units, fair-gd cond, BO. D Lurtey, 864-370-1800 x2730.

ITC SP & RA, 2 mono PB decks, \$100 ea, 1 mono R/P deck, \$300/BO, gd working cond. D Willey, 541-575-1840.

BE Spotmaster cart machines (2), never used, \$1000 ea. J Lalino, 315-891-3110.

ITC Delta 3D stereo w/record amp, record by Harris 12/98, very low hrs, \$900. J Maloney, 203-746-3659.

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CONSOLES WANT TO SELL

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McMartin 802B 8 chnl stereo on air board in gd working cond, \$400 +shpg. D Willey, 541-575-1840.

McMartin B-803 8 input dual chnl output, BO. D Lurtey, 864-370-1800 x2730.

Radio Systems RS-12, 12 mixer stereo console, 4 yrs old, gd cond, \$2500/BO. H Kneller, 941-494-4111.

Auditronics 110A 16x4, \$1200/BO. S Kozak, 440-871-5897.

Gates Yard 8 pot mono console, gd cond, \$500. J Cunningham, 580-265-4496.

PR&E BMX 3-22 console w/5 mic modules, 16 stereo line-input modules, telco, slate, studio & mono modules, digital timer, etc, excel cond, BO. Dave, 630-896-8888.

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Circle (100) On Reader Service Card

Wheatstone SP5 production console, \$5000/BO. T Evans, 207-942-3311.

Logitek 12 stereo mixer. Mike, 800-588-7411.

MCI 618 24 inputs (12 mono, 3 w/super EQ, 12 stereo) great prod board, \$6k, MCI 528 27 in recording board \$7k, Neve 8108 65 in, mint \$59k, D&R Orion 1k-nu 26 inline, (64 on mixdown) \$12k, Trident 70 28x16, \$8500, JL Cooper 16 trk automation, \$1200. W Gunn, 760-320-0728.

WANT TO BUY

Mackie 24-8 or Tascam 2600 MKII w/meter bridge. J Maloney, 203-746-3659.

Ramko DC5M5 schematics, copy OK or will copy & return. E Pacer, 724-532-1778.

Soundcraft 600/800, Tascam 2600, Auditronics 110A, Mackie 1604, Neotek Elite. W Gunn, 760-320-0728.

LIMITERS WANT TO SELL

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Harris MSP 90 Triband, mono tri-band AGC, gd working cond, \$400. H Kneller, 941-494-4111.

Modulation Sciences CP803 composite limiter, excel cond, \$400. R Potyka, 480-969-7707.

Orban Optimod FM 8100A/ST, two input cards, R&L & one metering card, \$800. C Marker, 906-249-1423.

CRL AM system, factory maintained, allows up to 150% pos peaks w/new xmtrs, \$900. R Miller, 808-572-5534.

Urei LA2A (extra meter added) \$2500, dbx 900 rack (4 comps/4 gates) \$1800, Gates Toplevel \$550, CBS Audimax, Volumax comps, Dynamic Presence EQ \$400 ea. W Gunn, 760-320-0728.

WANT TO BUY

Urei, dbx, Collins, RCA, Gates, Universal Audio. T Coffman, 619-571-5031.

Audio processing gear, 50's to 70's vintage, compressors, limiters, EQ, etc., any cond. P Wende, 604-205-7628.

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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Scala 5 element Yagi (2), like new cond, cut to 106.5FM, \$150 ea. C Marker, 906-249-1423.

10 bay w/radomes, 94.9 MHz, \$3000; 3 bays w/radomes 101.1 MHz, \$900; 3 bays freq unknown, \$750; 6' Anixter Mark STL dish, \$750. S Callahan/C Bowles, 508-775-5678.

ERI LPX 6E, tuned to 93.7 MHz, excel cond, \$1500/BO; ERI 5HPX 3E tuned to 93.7 MHz, excel cond, \$2500/BO; Shively 2020L 1-5/8" flange, excel cond, \$500/BO. L Ritchie, 540-459-8810.

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Shure Production Master, gd cond, BO. H Kneller, 941-494-4111.

Sony PCM501ES digital audio processor, \$500. B Meuse, 650-969-2433.

Audimax III processor, \$250; Tapco EQ, \$100; CRL Dynafex NR, \$200; CRL SMP-800 processor, \$250; Howe Phase Chaser, \$500. S Callahan/C Bowles, 508-775-5678.

ADC Propatch 1/4" punchblock patchbays, new, \$600 (many), ADC TT 144 point patchbays record, \$149-229, Switchcraft 1/4" 96 point, new, 2 spaces, \$249. W Gunn, 760-320-0728.

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WANT TO BUY

Aphex Dominator I; Aphex Aural Exciter II. B Jordan, 617-787-7589.

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Neumann U87s \$1800, Telefunken U48, long body, chrometop, New \$6800, Altec salt shaker mics, \$175/ea, Sony C37fet, ECM377 mics, \$600/ea, Neumann U89, w/shockmount \$1500. W Gunn, 760-320-0728.

WANT TO BUY

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RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 972-271-7625.

RCA ribbon mics. W Gunn, 760-320-0728.

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Peter Dahl 10 kW single phase plate xfmr & filter chokes, new, \$6000. J Bahr, 787-782-0364.

Spotmaster 4 pot console, \$150; Arrakis mono console, \$100; Moseley RPL-4 RPU rcvr, \$200; Ramko dist amp, \$200; Audisk audio recorder, \$100. S Callahan/ C Bowles, 508-775-5678.

WANT TO BUY

AM mod monitor, older unit from Belar, TFT, RCA, etc., any cond. P Wende, 604-205-7628.

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MONITORS

WANT TO SELL

Belar FM stereo & mod monitors, BO. J Lalino, 315-891-3110.

Altec 15" Valencias (voice of theater) \$600, Yamaha NS10Ms \$295, RSL 12" 3 says (same as JBL 4310) \$250. W Gunn, 760-320-0728.

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Ampex AG-440C, gd cond, \$2000 ea/BO. C Marker, 906-249-1423.

Adcom satellite receiver. J Biddle, 814-643-1711.

WANT TO BUY

Revox A-77 r-r R/P (3), \$100 ea. J Lalino, 315-891-3110.

RECORDERS

WANT TO SELL

Tascam 423 stand for roll-around use, doesn't include tape machine, BO; Pioneer CT W404R dual well stereo cassette deck, excel cond, BO. H Kneller, 941-494-4111.

Ampex 601 upright series r-r, gd cond, BO. J Biddle, 814-643-1711.

Teac A-3300-SX-2T r-r decks (2), 7.5-15 ips, 10" reels, gd heads, gd brakes, gd cond, \$250 ea; Teac A-7030 r-r, 2 trk w/1/4 trk aux PB head, separate electr included in cabinet w/NAB adapters, works but needs mech tweeking, 1 broken VU meter, \$150. Bob, 800-940-2035.

Otari ARS-1000 r-r, \$100 ea. H Kneller, 941-494-4111.

Revox A-77, fair-gd cond, BO; Magna Cord 1022, fair cond, BO. D Lurley, 864-370-1800 x2730.

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WANT TO BUY

Various vintage portable bdct tape recorders & related access, prior to 1970; Stencil-Hoffman M-5, M-5A vintage portable minitape bdct rcd, also photos & adverts; vintage magnetic audio tape rcds & storage boxes, plastic & metal, all sizes, especially AEG, Basf, Agfa, EMI, Telefunken. J Morinelli, 610-715-1720.

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REMOTE & MICROWAVE WANT TO SELL

Comrex 2XP Incoder, \$650. Tom, 1-800-860-9771.

Comrex Nexus (2), barely used, \$2300/both. R Henry, 407-267-3000.

Gentner Digital Hybrid ANA in excel working cond w/manual, \$400 +shpg. D Willey, 541-575-1840.

Musicam CDQ Prima 110 codec, simultaneous stereo send & receive, like new, includes ISDN modem, cables, manual, \$3400. Bob, 800-940-2035.

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WANT TO BUY

Roadrunner portable ISDN codec. Bob, 800-940-2035.

Marti 15-C composite rcvr. J Bahr, 787-728-0364.

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GTE Lenkurt 78C3 microwave system, 2 xmtr, 2 rcvr, u-pick, \$500. H Schnur, 252-752-2264.

Comstream ABR 200 sat rcvr, excel operating cond, \$1000/BO +shpg; Fairchild Dart 384, main frame w/cards, all in gd cond except control card doe not work, great spare parts unit, \$800 +shpg. D Willey, 541-575-1840.

Microphase MP2030S, (2) SCPC analog rcvrs, BO. H Kneller, 941-494-4111.

WANT TO BUY

Wegener DR96 receiver. Also a used 3.0 meter satellite dish. J Bahr, 787-728-0364.

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◆ READERS FORUM ◆

More low-power opinions

Dear RW.

I would like to express some views about the "pirate" or low-power radio situation. As I see it, most of the views expressed by the pirates to obtain radio spectrum are at best self-centered. The radio spectrum is by no means full in rural America, and if these folks really want a radio station, there are lots of struggling stations to be bought and new open channels in the rural parts of the country.

What I see are pirates who want a piece of prime spectrum in well-populated areas where they are automatically guaranteed listeners. Over the last 75-80 years, stations like ours have struggled to build up listenership and listener loyalty by providing quality entertainment and caring about our community.

Now the pirates want a free piece of this action and don't want to pay the price of building a mature radio spectrum. The AM and FM bands didn't just come about by magic; they are the product of hard work by many dedicated radio stations.

If the low-power pirates want spectrum, I propose the FCC sell them one channel outside the regular radio spectrum, and let them build up listenership and listener loyalty.

Tony Wortmann
Radio Technical Director
Stanton, Neb.

Dear RW.

Once again, I note that someone is writing a letter to you without doing homework. I refer to the letter from Bob Henry (RW, May 26) concerning John David's well-written comments concerning LPFM.

If Mr. Henry had done his homework, he would know that LPFM will cause interference to commercial FM broadcasting. It is inevitable, since the FCC wishes to relax the rules concerning contour overlap for 2nd- and 3rd-adjacent channels to accommodate LPFM. Surely a broadcast engineer could understand the ramifications of such a preposterous rule-making. Anytime that you have broadcast stations within a channel or two of each other, you will see interference.

Therefore, if the FCC gets its way, we will see the number of LPFM stations grow in number, even to the point of four or five in a market the size of Denver. Though my broadcast group doesn't own an FM signal in this market, I'll still fight tooth and nail against this.

I would suggest that anyone else who has any positive inclinations toward this proposal take some time and actually read it. Don't let the fringe "pirate" broadcasters push their chaos on legal broadcasters.

Edward C. Dulaney
Chief Engineer
KLZ(AM), KLTT(AM), KLDC(AM),
KCBR(AM), KCMN(AM)
Denver and Colorado Springs, Colo.

Physics of propagation

Dear RW.

I enjoyed W.C. Alexander's article, "The Basics of AM Propagation" (RW, April 28). It is good to have information on the physics of our medium brought to light from time to time, particularly for the newer people in our industry.

I do take issue with the statement "the need for sky wave service areas is arguably gone." I spent a good part of my early life in the deserts of California where the only radio service was night-sky wave reception of KFI (640 kHz) and KNX (1070) from Los Angeles, KGO (810) from San Francisco, and KSL (1160) from Salt Lake City.

I recently completed a construction project in central Kentucky where AM radio reception was also restricted to clear-channel sky wave service. With the exception of the Harrodsburg station, WHBN (1420), which cuts power to 47 watts at sundown and goes off the air later each evening, the clear channels were the only listenable stations. I reliably received the following each evening:

WSM (650) Nashville, Tenn.
WLW (700) Cincinnati
WBS (750) Atlanta
WJR (760) Detroit
WABC (770) New York
WBBM (780) Chicago
WBAP (820) Ft. Worth, Texas
WHAS (840) Louisville, Ky.
WLW (870) New Orleans
WBCS (880) New York
KDKA (1020) Pittsburgh

The rest of the AM band was an unlistenable jumble of noise.

There were many FM stations available with numerous continuous music formats. However for news, sports and talk shows, the AM stations are still king.

Those of us living in urban areas are spoiled by the numerous local stations we can receive without interference. We

More News, Less News

We live in the age of the information tidal wave. So why isn't radio news getting better? As journalists convene for the RTNDA show later this month, they have more resources available than ever. The list of sessions for radio at the convention is impressive. But few participants would argue that radio news has improved.

The fully staffed newsroom still exists, but is no longer typical. UPI recently left the radio arena with harsh words from its president about the outlook for our industry. Our news salaries would make a computer-savvy college grad laugh.

In many markets, it's common to hear news people reporting stories that clearly were pulled from that morning's newspaper — without attribution.

And when broadcast news coverage itself grabs headlines, as it will during times of national crisis or local tragedies, most of the attention and analysis of the media coverage focus on our TV and talk-show brethren. Why?

One problem is the way news is created. Although we are surrounded by many sources of information, much of it is "handed along." Daily, a small batch of stories and press releases enters the national data pipeline. These stories are rewritten and repeated over and over, on morning shows, on Net news pages and on the evening TV news. Much "news" is re-digested, from a small number of sources, fed through a few national filters. And consumers know they can find all that online.

How much of *your* news is created locally, and reported originally?

Radio news can do better. Indeed our industry offers many shining exceptions — stations that serve their communities by employing real journalists who write enterprise stories and bring local voices to the airwaves.

The Associated Press Broadcasters will hand out its APB Awards during the show. Winners include WSB(AM) Atlanta for its coverage of a fire at the Jonesboro police department, and WHAS(AM) Louisville, Ky., for its portrait of a group of women and their efforts to help AIDS- and HIV-infected women. Meanwhile, RTNDA will honor winners of its Edward R. Murrow Awards for achievement in electronic journalism. We commend the winners.

News remains a bedrock of the best stations, the best radio has to offer. But too many stations, in markets large and small, have surrendered that franchise, built on immediacy, relevance and localism.

— RW

should never lose sight of the tremendous number of people who live out in the sticks and rely on high-power clear-channel sky wave reception for their only AM service.

Jeremy R. Burnham
Project Engineer, Jacor
Los Angeles

Cris Alexander replies:

Several years ago, I did a very detailed study showing the need for sky wave service from Class A (then Class I) AM stations.

To do this, I took the 0.5 mV/m 50-percent sky wave field contour of WHO in Des Moines, Iowa, a centrally located clear with an exceptionally large sky wave contour (Franklin antenna). Then I plotted the service areas of every AM 2 mV/m ground wave and FM 1 mV/m between the WHO 2 mV/m ground wave and 0.5 mV/m 50 percent sky wave contour.

Next, I found all the "white areas" within that zone, areas where there was no other service. The total "white area" was found to be 12.9 percent of the total area (and this was mostly in the desert Southwest), and the population in the "white area" was, as I recall, 0.6 percent of that in the total study area.

My conclusion was that for the sake of 0.6 percent of the population, the FCC is denying nighttime service to millions because of the sky wave service protection afforded the Class I stations. Many of the daytimers and stations that must reduce power to very low levels at night would be allowed reasonable nighttime power and would undoubtedly serve a very significant portion of that unserved 0.6 percent. Also, that study was done pre-80-90, so all those new FM's would probably reduce the white areas even further.

All this is to say that my remark about the need for sky wave service being arguably gone was not just off the cuff. It was based on my own careful study.

Thanks, Mr. Burnham, for reading and taking the time to respond.

Write to Us

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READERS FORUM

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Radio World

Vol. 23, No. 18 September 1, 1999

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NEXT ISSUE OF RADIO WORLD SEPTEMBER 15, 1999

For address changes, send current and new address to RW a month in advance at P.O. Box 1214, Falls Church, VA 22041. Unsolicited manuscripts are welcomed for review; send to the attention of the appropriate editor.

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Radio World (ISSN 0274-8541) is published bi-weekly by IMAS Publishing (USA) Inc., P.O. Box 1214, Falls Church, VA 22041. Phone: (703) 998-7600, Fax: (703) 998-2966. Periodicals postage rates are paid at Falls Church, VA 22046 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 1214, Falls Church, VA 22041. REPRINTS: Reprints of all articles in this issue are available. Call or write Michael Crossett, P.O. Box 1214, Falls Church, VA 22041, (703) 998-7600, Fax: (703) 998-2966. Copyright 1999 by IMAS Publishing (USA), Inc. All rights reserved.
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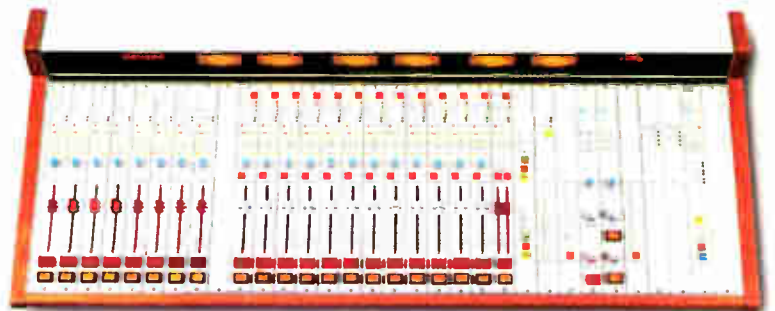


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