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DAB at the Border

Canadian cities launch digital radio, even as IBOC moves ahead in the U.S. Are multi-mode receivers next?

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Consolidation goes mile-high in Colorado's Front Range.

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Radio World

The Newspaper for Radio Managers and Engineers

November 24, 1999

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DIGITAL NEWS

FCC Begins Terrestrial Digital Rule Process

by Leslie Stimson

WASHINGTON The FCC has laid down an initial road map for developing radio's digital audio broadcasting systems. Proponents of in-band, on-channel DAB technology expressed pleasure that the regulatory process has taken a large step forward.



Observers said the release this month of the long-awaited Notice of Proposed Rule Making on digital audio broadcasting shows the FCC believes in the development of DAB technology for radio, a vital step in bringing new digital systems to stations and receivers to consumers.

"It's a positive and historic step forward," said USA Digital Radio President and Chief Executive Officer Robert Struble. "Specifically, the commission has found merit in our assertion that workable IBOC technology represents the best means of implementing DAB in the United States."

DAB in the public interest

The FCC stated in the NPRM that "fostering the development and implementation of terrestrial DAB is in the

public interest." The document seeks public comment on tentative criteria so it can decide whether a specific DAB system would be viable as a national standard.

Comments to MM Docket 99-325 would be due 75 days after publication in the Federal Register, which would work out to approximately mid-January. The exact date was not set at press time.

The FCC stated clearly that the document is not a specific IBOC rule making. It seeks comments on whether components of other digital broadcasting systems, such as satellite-delivered DAB and Eureka-147, should be included.

The commission also raised the possibility of using new spectrum, along with current radio allocations, for a national terrestrial DAB service. Observers said the inclusion of non-IBOC alternatives was not a surprise, as the genesis of this proceeding was in 1990 when the FCC first began considering rules for digital systems. The original proceeding became the rules for satellite-delivered DAB.

But proponents developing in-band, on-channel DAB technology were heartened by the document's content, which some said gave more direction on selection criteria than they had expected. None of the proponents developing IBOC DAB

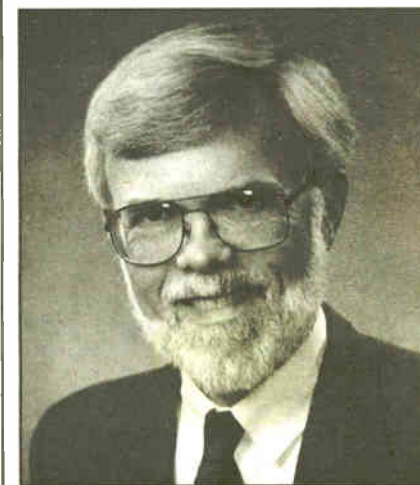
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NEWS MAKER

Andy Butler Is New SBE President

by Randy J. Stine

ALEXANDRIA, Va. He may have missed the Society of Broadcast Engineers' annual meeting in Wisconsin



Andy Butler

last month to be with his wife and new baby. But when the SBE installed new officers during that meeting, his name **See BUTLER, page 12**

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◆ NEWSWATCH ◆

LPFM Docket Closes

WASHINGTON The FCC public comment period for the proposal to create a new class of low-power service was scheduled to close Nov. 15.

In extending the comment period for the fourth time earlier this year, the commission tied LPFM to the proceeding for in-band, on-channel digital audio broadcasting. Public comments for LPFM were due 14 days after the FCC released its IBOC Notice of Proposed Rule Making (Nov. 1).

The FCC delayed releasing the IBOC NPRM at its Oct. 21 meeting, reportedly because commissioners could not agree on how or whether to relate the two proceedings.

RMLC Sues BMI

NEW YORK The Radio Music License Committee, on behalf of approximately 3,000 stations, has filed suit against Broadcast Music Inc. over the way BMI charges stations to use its copyrighted music. The suit comes after three years of negotiations.

In papers in federal district court in New York, the stations allege that while their use of BMI music has declined, BMI continues to seek license fees based on a percentage of the station's advertising revenues.

The stations have asked the court to set fees that do not make BMI a revenue partner of the stations. The stations also seek alternatives to BMI's so-called "blanket" license, which requires stations to pay a set fee regardless of how much BMI music they air.

The RMLC said its stations prefer to pay only for music they actually use.

The RMLC says since consolidation, its stations are using less BMI-copyrighted music. BMI disagrees.

Enforcement Changes Seen

WASHINGTON The FCC's new Enforcement Bureau was due to be operational on Nov. 8. FCC Chairman Bill Kennard first set out plans of the new enforcement bureau to Congress this spring, during hearings to reauthorize the agency.

The new bureau consolidates enforcement duties and staffers from four bureaus into one.

Of the four divisions of the enforcement bureau, only two concern broadcasters: the Technical and Public Safety Division and the Investigations and Hearings Division.

The former is responsible for resolving disputes over technical issues such as tower

See NEWSWATCH, page 3 ▶

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NEWS ANALYSIS

Mergers: How Much Is Too Much?

Brokers See No End in Sight; Advertising Agencies Wonder if They Will Feel the Pinch

by Randy J. Stine

When Clear Channel Communications Inc. announced it would acquire AMFM Inc., executives of the new radio giant praised their expected combined revenues and market share. But not everyone is sold on the idea of a radio group with almost 900 stations.

Most advertisers and advertising agencies say they have lost bargaining power, now that they must negotiate with a smaller base of owners in a con-

centrated radio market.

"Radio consolidation is good for radio station owners, but not for advertisers," said Howard Nass, vice president of local broadcast for TN Media. "Consolidation eliminates competition, and when you eliminate competition you usually see advertising rates go up."

In a perfect world, Nass said, consolidation would mean cost savings for owners who would pass those savings on to advertisers through lower rates.

"But in the real world, no matter the industry, you never see those savings passed on," he said.

If radio rates become too high, Nass sees advertisers putting more of their ad budgets into local cable and local television.

Allan Banks, executive media director, North America for Saatchi & Saatchi Advertising, said continuing consolidation is confusing for some advertisers.



Steve Pruett, Communications Equity Associates

One-stop shopping

"You keep hearing about one-stop-shopping and how these groups can handle all of your advertising needs. It's not like that yet, and I don't know if it will ever happen. It sure sounds good. Meanwhile our clients wonder why rates are going up," Banks said.

While radio advertising rates have been rising steadily since the passage of the Telecommunications Act of 1996, according to Banks, some of that increase can be attributed to a solid economy.

"Rates have gone up partly because of supply and demand and partly due to consolidation. With the activity in the marketplace, from financial to the 'dot-com' business, the demand is there right now. But part of the increase can be attributed to consolidation," Banks said.

But Bob Igel, president of broadcast for the Media Edge division of Young & Rubicam Inc., said he does not fear the new Clear Channel or any other radio group.

"The sky is not falling on the ad-buying field," he said. "I don't agree philosophically with those who say consolidation hurts our business or makes our job more difficult. However, it will be a period of adaptation and change in how we do business."

One of Igel's favorite sayings is that "strong media companies make strong partners." He believes consolidation has made radio a more formidable industry.

Consolidation has even occurred in the ranks of the advertising agencies in the past year. Just last month for example, Interpublic Group merged

See MERGERS, page 7

NEWSWATCH

► NEWSWATCH, continued from page 2 marking and lighting, EAS rules, equipment and unauthorized construction or operation. The latter will be used to resolve non-technical complaints against stations such as indecency, enhanced underwriting announcements and unauthorized transfer of control.

Other station matters, such as licensing and compliance with EEO regulations, will remain with the Mass Media Bureau.

David Solomon is the bureau chief of the Enforcement Bureau. Solomon has been deputy general counsel since 1994.

Jane Mago is the new deputy bureau chief. Mago has been serving as senior legal advisor to Commissioner Michael Powell and previously held the same position with former Commissioner Rachelle Chong.

sells a telecom business to any purchaser, but reinvests the sales proceeds in an eligible small business.

The bill directs the Commerce and Treasury Departments to work together to establish the criteria, such as net worth limits and gross revenues, that must be met for a small business or individual to be eligible for the program.

"This bill will create an incentive structure that works with the realities of the communications landscape," stated FCC Commissioner Michael Powell. "It recognizes that there is room in this industry for small and large players and it sets the stage for greater participation by many who have traditionally been left out."

CEMA's Hanover Steps Down

ARLINGTON, Va. The head of engineering for the Consumer Electronics Manufacturers Association, George Hanover, announced his retirement effective Oct. 1.

Hanover was CEMA's vice president of technology and standards. He worked closely with the FCC and other federal agencies to create standards used in developing regulations such as closed captioning and content advisory, aka the V-chip. Hanover had been with CEMA 12 years. He will continue to work with the association as a consultant.

CEMA's Director of Technology and Standards Ralph Justus will serve as acting department head.

New Ownership Bill Unveiled

WASHINGTON U.S. Senate Commerce Committee Chairman Sens. John McCain (R-Ariz.) and Telecom Subcommittee Chairman Conrad Burns (R-Mont.) have introduced legislation similar to the former minority tax certificate program.

Under the Telecommunications Ownership Diversification Act of 1999, deferrals on the gains realized from the sale of a telecom company would be allowed under two circumstances: if the seller sells a telecom business to an eligible small-business purchaser and then reinvests the proceeds in another telecom business, and second, if the seller

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?

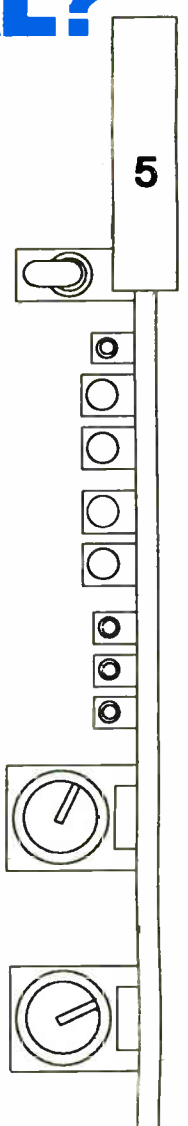
Certainly the stone wheel must have looked to the caveman to be the greatest discovery that ever could be. And to the simple farmer of the 1800's, the steam engine was the most modern contrivance that his mind could imagine. But neither was a terminal technology. Both have been replaced as time marches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

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

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DAB ... One of These Days

The FCC's Notice of Proposed Rule Making moves digital radio to the forefront of industry attention. It also means arguments over standards and test procedures are likely to intensify.

The NPRM itself is "historic," as described by the president of USA Digital Radio. And I'm fascinated at the prospect, however small, that the commission may be open to other creative solutions. It specifically said it would take ideas about how satellite and Eureka digital technology might be implemented.

The FCC may be hedging its bets; it clearly doesn't intend to pick a standard unless it has to. But if IBOC is not a shoe-in, we may also be in for a lot more debate and delay.

Proponents and regulators are saying the right things about how excited they are over the FCC moving forward. But the wheels grind slowly — too slowly for some. And there are many doubters.

In his online column, our Masked Engineer Guy Wire recently wrote, "Many radio engineers, consultants and industry observers are a little apprehensive about the current state of IBOC DAB and what it will really bring to radio's table for the next millennium. ...

"Each proponent has been digging deep to find and discredit any weakness of the others' design. It's just too reminiscent of the battle waged in the war to establish AM stereo. Motorola won the battle but the industry lost the war. We can only hope it will be different this time."

A recent e-mail from one equipment supplier typifies a simmering sense of frustration among many about how long the research and testing are taking.

"We're all blowing it! If many more technologies encroach on radio, and if we all don't demand a 'Manhattan Project' on IBOC, we might all polish our résumés, because our traditional customer ain't gonna need new equipment.

"Why is it going to take another year for IBOC? We're way behind the curve, now. Unlike the advent of TV, color TV and FM, there's vicious competition out there for ears and eyeballs. Very high-tech competition.

"By the time IBOC is approved, will anybody care? Sounds like DTV!"

I might add that "another year" is probably optimistic. Watch these pages, there's more to come.

★ ★ ★



Jim Armstrong of Gentner, Dave Rau of Audemat/Applied Wireless, Paul Anderson of Logitek, Cindy Edwards of ABG, Dave Strode of Fidelipac, Elaine Jones of Davicom and Vic Carpenter of Orban

Thirty exhibitors and some 200 attendees showed up at the Audio Broadcast Group show in Raleigh-Durham, N.C., one of the better regional conferences we've seen over the past seven years.

It typically draws from the Carolinas and Virginia. Organizer Cindy Edwards told Sharon Rae of *RW* that some folks showed up from the other side of Atlanta.

"People seemed to really be ready to buy now," said Edwards. "We always have the lookers, everybody wants to see the new technology."

Tom Raehl is a staff engineer for WMHK(FM) in Columbia, S.C., a Christian radio outfit. He said he was enjoying the show.

"I'm really learning a lot and finding plenty of reasons to talk to everybody," he said. "Even the wire display was quite fascinating."

Raehl was referring to Gepco's goodies. Greg Hansen was showing off prototypes of the new 5596 Series digital audio cables. The 5596M and 5596EZ are designed for 96 kHz transmission.

Chris Crump, director of broadcast sales and marketing for Symetrix, called the show "phenomenal."

"It's always nice when customers come by and say 'Hey, I've got five of those in my studio and I'm gonna buy more.'"

From the Editor



Paul J. McLane

said. "Most of which I can't afford. We're a public radio station. We just got through with our fund drive to stay on the air for another six months."

Sharon Rae and our colleague John Casey also took a two-and-a-half-hour ride south to New Bern, N.C., to see how Wheatstone fared during Hurricane Floyd. In an earlier column, I told you about that beautiful new manufacturing facility. When the Weather Channel reported storms bearing down on New Bern, we thought of Wheatstone and its employees, as well as all the broadcasters in that area. We're happy to report that President Gary Snow, his staff and their new building were not affected.

Prism Fund Helps Minorities

More ownership of stations by minorities and women is the goal of the Prism Fund, an investment initiative announced by leading broadcasters at NAB headquarters. Its goal is \$1 billion in purchase power. For more on the fund, see the opinion box on page 70.



Listening to CBS chief Mel Karmazin speak at the announcement are, from left, Jimmy Lee of Chase Capital Partners; Dennis FitzSimons, president of Tribune Broadcasting; Robert Okun of NBC in Washington; Preston Padden of Disney/ABC; and Reg Hollinger, Chase Capital Partners.

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GUEST COMMENTARY

Think Before Changing AM Rules

by Ralph E. Evans III

At the risk of adding to the bedlam regarding the AM Notice of Proposed Rule Making, MM#93-177, I would like to voice a few observations from my perspective of 40 years as a consultant, and as co-founder of Evans Associates. The proceeding is intended to allow stations to use updated technology to make it easier and less expensive to do performance verifications of AM directional antenna systems. Reply comments are due Nov. 24.

I believe there are substantial issues which should be raised with respect to such major changes in the regulatory environment as are envisioned by the NPRM.

There has always been an unfortunate schism in the professional broadcast engineering community, dividing the so-called "desk engineers" from the "field engineers." Although these perspectives are not necessarily mutually exclusive, practitioners tend to fall into one camp, perhaps as a consequence of information overload, and the resulting headaches.

Theory vs. practice

Consequently, desk engineers tend to be theorists, who base their designs on established regulations and formulas.

Infrastructure built according to theoretical precepts are generally internally monitored without regard to verifying field measurements. This is the manner in which directional FM antennas are installed today.

On the other hand, the field engineer believes that the basic mission of industry regulation and professional standards is to reach a verifiable end result, using whatever techniques and materials are apropos at a given time and place. This has always been the manner in which AM arrays have been constructed and proven.

In my view, there are two problems with the exclusively desk-driven theoretical approach. One is that unknown real-world factors will render the original assumptions invalid, and the other is that there is no feedback path which could be used to improve the theoretical model.

Lack of this "error correcting" path has the potential to impede efforts to change the specifications to reflect new innovations.

But isn't AM dead? Who cares?

I believe we should care, because if AM dies, it will be at least the third time for this particular phoenix bird. It is my opinion that any owner who can't find suitable programming for his/her AM station today is suffering more from a lack of imagination than from market abuse.

Broadcast engineers should use every opportunity to "close the loop" by using valuable field data to verify and improve regulations and specifications, to be ready for the next resurrection. We should not necessarily dismiss nonconforming field and proof data as corrupt, even if it does not agree with our expectations.

Field engineers should inform our professional organizations or the FCC when real-world data casts doubt upon existing paradigms; and both desk and field engineers must not shirk from their professional responsibilities for fear of "rocking the boat" or "derailing the process." The solution for troublesome field data is not to eliminate knowledge of the field data, but to use it to improve the technol-

ogy used by our industry.

Complete exclusion of field measurements is not contemplated by the NPRM before us, but the trend it represents is clear. It does not strain credibility to envision a time in the near future when "reduction" becomes "elimination."

Eliminating real-world information as a feedback path would reduce the incidence of headaches to engineers, managers and regulators, but I doubt such

We can envision a time when 'reduction' of field measurements becomes 'elimination.'

changes would maintain the legacy process of steady improvement to our robust and vibrant broadcast network.

When field measurement expertise is a lost art, and field meters are no longer economically manufactured, it will be impossible to verify either system improvements or array impairments.

As examples of the havoc which could be caused, consider AM stations built in the 1950s and early '60s. It was widely assumed that "zero nulls" could be used to protect co-channel stations, and that arrays employing short towers spaced closely together could save on land costs.

Advocates of these concepts, which were initially supported by theory, were eventually crushed under the weight of massive field data. Measurements taken during the intervening 40 years demonstrate conclusively that zero nulls can *not* be achieved, and that short-spaced short tower arrays have serious stability and efficiency problems.

At the time these realizations dawned, it made a lot of heads hurt; the price of progress appears to be a hurt head, as well as eternal vigilance.

The maintenance of the required vigilance tends to be difficult and financially unrewarding. We as engineers tend to become bogged down in arcane matters while ignoring the broader implications engendered by major shifts in policy such as is represented by the NPRM.

What would happen if we lost the self-correcting, stable process that has served us well all these years? I believe the result would be a slippery slope to a European broadcast model of shrill, unimaginative archaic old fossils dotting the landscape like so many broken windmills (broadcast stations and/or broadcast engineers — take your pick).

Our professional role would then be reduced to jockeying for position in a race where the horse is specified, the pace is regulated, and the result is fixed.

The case history of WNYR (now WDCZ) in Rochester, N.Y., is instructive.

Recently, over the course of two years, WNYR documented a steady erosion of its service area due to interference from a co-channel station in Toronto, Ontario. Field research showed that the Toronto station's signal was being reflected from a massive nearby building, which was being built in several phases.

Ultimately, the 2 mV/m contour from Canada invaded the state of New York, causing a daytime 40 mV/m limit for

WNYR. As a first reaction, the Canadian Department of Communications, initially supported by the FCC, opined that theory did not allow such interference to exist (hah — remember the War of 1812, Yankee).

Ultimately, armed with extensive field data and the North American Regional Broadcasting Agreement, the problem was recognized and solved with the assistance of the U.S. State Department and the FCC International Branch by moving

WNYR to 990 kHz, a Canadian clear channel. With the soon-to-be instituted "open-ended" reduced verification model, this problem could easily have had no solution, since the NARBA tends to follow domestic practices.

Rather than reduce or eliminate the field data, I would suggest that desk and field engineers alike (AFCCE, FCC, SBE, et. al.) create a North American Data Bank which actually makes field

information available for use by design engineers and innovators.

In this manner, we could improve the feedback path instead of crippling or breaking it. Some may answer that field work is expensive and boring, and requires that we get out of the office. It has been known to interfere with poker club and golf.

Requirements and regulations

But without the requirement for periodic monitoring and proofs, the associated AM station will never know there is a coverage or interference problem, so their potential headache can easily become someone else's. I have found that very few parasitic radiators (power lines, unregistered towers, water towers, etc.) would have been identified absent today's monitoring and measurement regulations.

As an old fossil in this business, my stakes are limited, so I have no intention of getting off of my chair and penning an urgent and impassioned response to the FCC in this case.

But a word to you kids out there — beware. Reality *does* matter, and sometimes it takes a major war to sort things out after perception and prevarication replace verification and responsibility.

Now excuse me, I have to go play golf.

■ ■ ■

Ralph E. Evans III is a founding partner of Evans Associates in Thiensville, Wis. Reach him at iii@evansassoc.com

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Circle (4) On Reader Service Card

Broadcasters Clinic Draws Record Number

by Doug Vernier

MADISON, Wis. The 25th annual Broadcasters Clinic and Upper Midwest Regional Society of Broadcast Engineers Meeting attracted record numbers of attendees and exhibitors.

The annual event was combined with the SBE's national membership meeting and awards dinner this year.

More than 200 people attended. Some participants saw this as part of a trend away from larger association meetings and toward regional gatherings.

On the floor

Approximately 80 exhibitors displayed an array of new products.

"We never had more than 65 before," organizer Don Borchert said. "My conclusion is that the concurrence of the national meeting and the regional clinic was good for everyone."

The greater part of the first day of the clinic was spent with radio topics.

SBE General Counsel Chris Imlay delivered the luncheon address. He outlined SBE activities on behalf of its members, reporting that serious problems facing broadcasting are the potential loss

of auxiliary spectrum and the lack of a public policy at the FCC for assigning



Fred Baumgartner, Robert Goza and Douglas Garlinger, from left, trustees of the Ennes Educational Foundation Trust, accept a \$3,000 contribution from Continental Electronics for the Ennes Scholarship and Education Fund. Presenting the check on behalf of Continental was Martin 'Sandy' Sandberg.

and reassigning spectrum.

An example is the proposed reduc-

tion of the 2 GHz band. There are other powerful groups that seem to have the ear of the FCC on these matters. The SBE is working with Congress and the FCC, Imlay said, to facilitate the interest of its members.

Attendees heard from SBE board member Dane Ericksen of the consulting firm Hammett and Edison on the

Ericksen was named SBE Broadcast Engineer of the Year during the Clinic.

Bob Raasch of Solutions Inc. in Wisconsin provided an overview of the benefits of ISDN and presented a "survival guide." The cost for an ISDN line in many cities has dropped to about \$40 per month — not bad, he suggested, for a pair of two-way 64 kb B channels and a two-way 16 kb D channel.

Terminal adapters using inverse multiplexing are used to bond the B channels together to produce a 128 kb pathway that can handle even the most demanding stereo.

Tips to avoid trouble

Raasch offered tips for radio broadcasters to avoid trouble. For example, the user should make sure there are no loading coils in the ISDN pairs. Even within the ISDN standard, equipment manufacturers have a lot of leeway. When choosing equipment, he suggested, try to stick with the same manufacturer to avoid incompatibilities. Allow sufficient lead-time for the telephone company when ordering an ISDN line.

In some areas, ISDN may not be available. Be sure to check well in advance. Where it is available, the phone company must prequalify the loop.

Generally, the terminal adapter's instruction manual will detail the ISDN order code required. Be sure to provide this number when you place your order. Establish a test date and pre-test the installation with a call through test and with a test tone, Raasch suggested.

Finally, treat the ISDN line as you would any other outside entry line by using a surge protector and a UPS to protect equipment and provide additional service.

See CLINIC, page 8 ▶

topic of low-power FM. Ericksen often prepares SBE technical filings to the commission, and he reviewed the debate for attendees.

The society has raised questions about potential interference issues and argued that FCC Chairman Bill Kennard should take more input from the engineering community before concluding that low-power radio is compatible with a possible in-band digital service.

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SBE Award Winners

The Society of Broadcast Engineers announced winners of its annual awards during the Broadcasters Clinic.

Dane Ericksen was named Broadcast Engineer of the Year. He is senior engineer for Hammett & Edison Inc., a member of the SBE board, chairman of the society's FCC Liaison Committee and of Chapter 40 in San Francisco, and a member of several committees. He has worked in the Field Operations Bureau for the FCC.

Michael P. Scott was co-named Educator of the Year for a third year. He is lead instructor at the Communications Technologies Department of Bates Technical College in Tacoma, Wash., and serves on the Ennes Educational Foundation Trust Scholarship Committee.

Bruce Zieminski, director of Engineering/Operations at the Armed Forces Radio and Television Service Broadcast Center, was co-named Educator of the Year.

Other award winners include:

Best Regional Convention or Conference — Electronic Media Expo '98, Seattle, sponsored by Chapter 16.

Best Chapter Newsletter (Tie) — "SBE Chapter 24 Newsletter," Madison, Wis., edited by Mike Norton; and "Water Cooled" Chapter 124, Northwestern Oregon, edited by Kent Randles.

Best Frequency Coordination Effort — Chapter 24, Madison, Wis., Tom Smith, frequency coordinator

Best Web Site — Chapter 37, District of Columbia, www.sbe37.org, Dan Ryson, Webmaster

Most Certified Chapter — Chapter 132, Fort Meade, Md., Albert Kent, chairman

Highest Member Attendance — Chapter 126, Saipan, Robert Springer, chairman

Greatest Growth in Members — Chapter 111, Huntsville, Ala., Walter Bridges, chairman

Brokers Say Merger Mania Goes On

► **MERGERS**, continued from page 3
two of its divisions, Ammirati Puris Lintas and Lowe & Partners Worldwide. Is that the direct result of what is happening in radio?

"I think consolidation is affecting all walks of business right now. Radio is just more high-profile," said Jean Pool, executive vice president of North America Media for J. Walter Thompson Co. "It would be very difficult for agencies to reach the point of holding all the power like some radio groups do right now."

Radio consolidation just makes Pool's job tougher, she said.

"My job is to negotiate for my client the best rate I can find. It's just not beneficial when I have fewer people to negotiate with. Free competition is what this country was built on, but right now the deck is stacked against us when buying radio time," Pool said.

The Media Access Project, a Washington-based non-profit public-interest telecommunications law firm, has been an active voice favoring the FCC's low-power proposals. The MAP's opinion of consolidation is unfavorable.

Less diversity, competition

"We are against consolidation in general. We think it negatively impacts listeners and advertisers from both a diversity and competition standpoint," said Cheryl Leanza, deputy director of the group.

Leanza said she hoped some of the stations that Clear Channel plans to divest are sold to minority owners such as Hispanic Broadcasting or Radio One Inc.

An active radio market is good for business for media brokers. Brokers have been busy mapping out acquisition strategy and striking deals between radio groups ever since the Telecommunications Act of 1996.

Blackburn & Co. President Richard Blackburn said he believes consolidation is far from over.

"I think the Clear Channel/AMFM deal is the biggest we'll see for a long time. However, if radio groups want to grow, and it appears they do, the easiest way to do it quickly is through striking a major deal," Blackburn said.

One of the driving forces in the consolidation trend, Blackburn said, has been publicly owned broadcast companies whose investors demand growth and big returns on their investments.

Clear Channel plans to spin off about 125 stations to satisfy FCC ownership limits before it closes the AMFM deal in late 2000. Blackburn figures that Infinity, Clear Channel's major competitor and now the nation's second-largest radio group, will pursue properties. Other likely suitors include Citadel Communications, Entercom and Emmis Communications.

"It wasn't that long ago that a billion-dollar radio deal was considered huge," said Steve Pruett, managing director of Communication Equity Associates.

The Clear Channel/AMFM deal is worth \$23 billion.

"That's phenomenal and shocking at the same time," said Pruett, who is representing several groups looking to pick up some of Clear Channel's

divestitures.

Pruett said it is not a matter of if mega-mergers continue, but rather when.

Entercom were for sale it would likely fetch nearly \$3 billion. Pruett pegged the price for Citadel at between at

It wasn't that long ago that a billion-dollar radio deal was considered huge.

— Steve Pruett

He thinks groups outside the top five might be the most active.

For example, Pruett said, if

between \$1.6 billion and \$1.9 billion. He said to his knowledge neither company is for sale.



Cheryl Leanza, MAP

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Little Fallout From List Swaps

by Leslie Peters

Public radio stations are reporting that listener support is as robust as ever less than four months after news broke that some public broadcasters had engaged in mailing list trades with political organizations.

Fall is traditionally public radio's heaviest fundraising period, with on-air



pledge drives, mail appeals and telemarketing campaigns that start in late August and run through early December.

Though less than 10 percent of the nation's federally funded public broadcasting licensees were involved in the summer's list-swapping scandal, some industry professionals had speculated that listeners might voice their disapproval by withholding donations this fall (RW, Aug. 18). So far there appears to be no cause for concern.

At WGBH(FM) in Boston, where the mailing list issue first surfaced, an August pledge drive brought in listener contributions of \$235,000, exceeding the

goal by \$5,000, according to station publicity director Leah Hollenberger.

"There has been no negative reaction from most of our constituents," said Mary Hobart, vice president for development at Connecticut Public Broadcasting. Though Connecticut's public radio and television operations had been two of the 53 stations named in the controversy, Hobart said that recent fundraising results were "strong."

At WUSF(FM) in Tampa, Fla., a recent direct-mail solicitation "surpassed our

"What they should be worried about is congressional fallout," said Ken Johnson, press spokesman for Rep. Billy Tauzin (R-La.), chairman of the House Telecom subcommittee. Reacting to reports of undiminished listener support, Johnson said, "We don't buy the argument that people don't care about this issue. They don't want their personal identity information swapped with political parties."

He said that Rep. Tauzin still expects to introduce a bill that will

Would listeners withhold donations in protest of the controversy? So far, station managers say, the answer is no.

expectations by a few thousand dollars," said membership director Evelyn Massaro. Though joint licensee WUSF-TV was one of 29 public television stations involved in mailing list exchanges, Massaro reports "very little fallout" from radio listeners.

prohibit public broadcasters from the "purchase, sale or rental of lists with political organizations" — even though the restrictions mirror the Corporation for Public Broadcasting's recently instituted policy.

CPB prohibits any mailing-list transactions with political organizations or candidates, with an immediate, total withdrawal of CPB funding as the penalty for failing to comply.

"Our trust in CPB is somewhat eroded. We want to make list swapping a criminal offense," said Johnson.

In addition to legislation about mailing lists, public broadcasters are faced with a long wait on FY 2001 federal funding.

According to Ken Johnson, Rep. Tauzin's continuing displeasure over the issue will delay a hearing on future public broadcasting appropriations. He said, "The subcommittee has a lot of pressing telecommunications matters to address this session. Public broadcasting has been given a ticket to the back of the bus."

For Tauzin, CPB and stations, the big issue is keeping the trust — and the support — of public broadcasting's listeners and viewers. Nationally, listeners directly contribute more than a third of public radio's funding, according to CPB, and more than half when "listener-sensitive income" like underwriting is counted. Federal grants comprise about 14 percent.

Over the summer, stations scrambled to reassure supporters that their trust had not been misplaced. At Minnesota Public Radio, the largest public radio operation involved in the list controversy, "We've added disclosure statements to every listener mailing. 'Opt out' is everywhere," said Sarann Slattery, vice president for development. "Opt out" is industry shorthand for letting listeners delete their names from future mailing list exchanges.

A few stations have stopped mailing list transactions completely. "We want to remove any doubt in members' minds that we're exchanging or selling their names," said Art Ellis, spokesman for WHY-FM and TV in Philadelphia.

Madison Meeting Well-Attended

► CLINIC, continued from page 6 reliability.

Paul Anderson of Logitek discussed the advantages of routers over patch panels and distribution amplifiers.

Routers, he said, are gaining more acceptance in radio, particularly as stations begin converting to digital. They have the advantage of



Steve Lampen was a presenter at the Broadcasters Clinic.

flexibility and remote control. Wideband routers can accept all types of digital audio signals, and some can be configured to handle either digital or analog signals on both input and outputs. The best routers, Anderson said, will configure sampling rates automatically.

NEWS WATCH

CEMA Is Now CEA

ARLINGTON, Va. The Consumer Electronics Manufacturers Association has changed its name and plans to become a separately incorporated organization from the EIA.

The new name is the Consumer Electronics Association. CEA President Gary Shapiro said the name CEA "better reflects the excitement and innovation of the consumer electronics industry."

The association's membership base is broadening, said Shapiro, with the addition of new information technology and Internet companies. The name change and separate incorporation will allow the association to represent the traditional consumer electronic interests while also positioning the group for the future.

The announcement comes after an earlier decision by the Electronics Industries Alliance to allow separate incorporation for its allied associations. The incorporation is expected to be complete by the end of this year.

—Leslie Stimson

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DAB NPRM Issued

► DAB, continued from page 1
systems were surprised that the document was broad and not specific to IBOC.

"They can't come out and say 'We support something' when it's something they haven't seen yet," said Digital Radio Express investor and executive Dwight Taylor. "They said, 'If IBOC is feasible, IBOC is favored.' They've never said that before."

'Fair question'

Suren Pai, president and chief executive officer of Lucent Digital Radio said, "It's a fair question to ask, whether it's IBOC or something else. It's our responsibility as a proponent to show that IBOC performs."

Peter Doyle, deputy chief of the FCC's Audio Services Division of the Mass Media Bureau, said the commission did not want to close off any options when it wrote the NPRM.

"We're not really at a point where we can be certain IBOC will work. It seemed imprudent to focus exclusively on technology that may not take us to a DAB system."

The FCC raised the possibility of using current TV Channel 6 at 82-88 MHz, adjacent to the radio FM band, concurrently with proposed IBOC systems, which assume stations retain current allocations. It acknowledges, however, that the earliest TV would give back this spectrum as it transitions to digital in many areas is in 2007.

Several sources said this approach is questionable because TV is not under a mandate to give up this spectrum by a set date until digital TV receivers reach certain penetration levels.

But if that spectrum were joined with the FM band, one FCC source said, certain markets might enjoy as much as 30 percent more bandwidth. That possibility intrigues the commission, which also wants comments on ways to allow new entrants, including possible low-power stations, on the crowded FM band.

USADR and LDR are concerned over possible interference to FM stations

using IBOC if the commission relaxes second- and third-adjacent channel protections to allow low-power stations. In this proceeding, the commission wants to know about the potential for enhancing the robustness of IBOC systems to reject undesired second- and third-adjacent channel signals.

Performance objectives

The NPRM states that the Consumer Electronics Manufacturers Association, recently renamed the Consumer Electronics Association, correctly frames the FCC's goals when CEA wrote, "The commission's challenge is to craft a terrestrial DAB service that meets both

Fostering the development and implementation of terrestrial DAB is in the public interest.

demanding performance objectives and the public's expectations."

"CEA isn't advocating a certain brand" of DAB, said spokesman Matt Swanston. "Our position is, 'Get it done in a way that doesn't interfere with existing services and offers a level of coverage and compatibility that consumers expect.'"

The commission has several goals for a new DAB service, including spectrum efficiency and compatibility.

"We tentatively conclude that IBOC systems should minimize interference to reception of host and adjacent-channel analog signals during hybrid modes of operations, including for FM stations, interference to subcarriers," the NPRM states.

Spectrum efficiency is important because it is one of the ways in which radio's transition to digital can be easier and less time-consuming than TV's.

IBOC proponents consider their systems "spectrum efficient" because they allow a station to remain on the same frequency allocation as it transitions to digital. Current IBOC systems are premised on doubling the bandwidth licensed to AM and FM stations to 20 kHz and 400 kHz respectively, matching the current emission masks.

The FCC recognizes that additional bandwidth for digital sidebands is a feature of the IBOC hybrid mode and that system proponents envision retaining the additional bandwidth when they go all-digital.

The commission wants to know whether these channel bandwidths are spectrum efficient and whether a signal architecture that shifts audio carriage from the sidebands to a center band in the all-digital mode is more efficient than one that continues to operate on the sidebands.

In order to remain spectrum efficient,

when compared to non-IBOC alternatives.

The initial selection criteria suggested by the commission parallels much of the criteria suggested by the DAB subcommittee of the National Radio Systems Committee, the standards-setting body sponsored jointly by NAB and CEA, and also suggested by USA Digital Radio in its Petition for Rule Making on DAB submitted last fall.

Growing Pains of Digital Radio

by Leslie Stimson

WASHINGTON In its Notice of Proposed Rule Making for digital audio broadcasting systems, the FCC left open the question of who will select a DAB standard. In fact, the commission questions whether advances in digital signal processor chips in receiver technology make a DAB transmission standard unnecessary.

Uniformly, in previous comments to last fall's Petition for Rule Making by USA Digital Radio, commenters said a single standard is necessary to eliminate a so-called Beta vs. VHS type of situation exacerbated by a multiple transmission standard.

"Chip technology is important," said USA Digital Radio President Robert Struble. "The DSP allows you to upgrade the system over time. It's better used for that than to support multiple standards." More standards would mean more chips and higher-cost receivers, he said.

But getting to that one standard is at the heart of an on-going industry dispute the commission is watching to see if it has to step in and resolve.

The DAB Subcommittee of the National Radio Systems Committee, a standard-setting body made up of members of NAB and CEA, has agreements from all three IBOC proponents to submit full system lab and field test data on Dec. 15 for evaluation. The FCC has asked for data submissions at the same time.

In the NPRM, the FCC commended the NRSC for its members' expertise, and expects "to revisit the effectiveness and appropriateness" of the NRSC's effort once the FCC has had a chance to review the NRSC's report on each system, expected in the first quarter of 2000.

LDR's Pai said that means it had confidence in the NRSC process in the past but is prepared to step in now. LDR believes the FCC should select a system and called the NRSC process in question because committee members cannot agree on further head-to-head system comparisons (RW, Oct. 27, p. 3).

NRSC Chairman Charlie Morgan said, "We will evaluate those systems and will determine if any of them are worth becoming a standard. We will not be derailed from that direction."

The NRSC expects to decide at its January meeting whether to go forward with further testing and begin a formal standards-setting process.

— From the FCC NPRM

IBOC systems must make certain trade-offs in robustness and audio quality to avoid interference to in-band analog transmissions.

"Although the sharing of spectrum may facilitate a transition to DAB, it may also result in lesser digital performance during the transition period," the NPRM states. The FCC seeks comment on how each system handles those trade-offs.

It also said a comparison of IBOC and new spectrum alternatives must consider the timeframe within which each system could go all-digital and what short-term performance advantages, if any, hybrid IBOC systems offer over analog service.

A related question posed by the commission is whether the trade-offs necessary to permit IBOC digital transmissions in the hybrid mode would extend into the all-digital mode, i.e., limit the potential for enhanced audio fidelity and robustness

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Andy Butler New SBE President

► BUTLER, continued from page 1
was at the top of the list.

James "Andy" Butler, 50, is the new president of the SBE, replacing Edward J. Miller as head of a professional organization representing more than 5,600 radio and television engineers and technicians.

"I'm very excited and honored to lead this tremendous organization," Butler said.

Butler, whose full-time job is director of engineering for the Public Broadcasting Service, said engineers are facing many issues as the new millennium approaches. One of his top priorities is making sure engineers receive training to guarantee they understand the latest technologies.

The digital future

"The information flow must be there to make sure engineers learn enough to effectively deal with all of the possibilities of the digital future," he said.

With training and education being Butler's top priorities during his one-year term, he hopes to help an industry that needs a rapid update on digital technology for radio.

"Right now the only people who are really up to date are people like myself who had a chance to be involved in creating the technology," he said. "The people who actually deal with it in the trenches don't get the chance to go to the national shows and see the demonstrations, or have a chance to sit in on industry standard setting meetings in Washington. They are the ones we can help."

Though currently working in television, Butler started his radio career nearly 40 years ago in Missouri. He recalls hanging around the transmitter site of an AM station when he was just 11 years old.

"That was at a time when you still had to man an AM directional site when it was on

the air. And these were rather expert guys who had nothing to do but watch the transmitter run. Hence, they had plenty of time to show a young kid the ropes," Butler said.

Butler said he was always fascinated by electronics and remembers receiving a hand-me-down Knight All-American five-tube radio that his father had built in the 1930s. Butler was president of the audio-visual club in high school and was in charge of audio for school plays and assemblies.

Butler has bachelor and master of science degrees in engineering management from the University of Missouri at Rolla.

Throughout his career, Butler seems to have been involved in radio breakthroughs in both programming and engineering.

"I had the privilege of working with my first Sonomag carousel automation system back in 1970 at then-KTTR(AM) in Rolla," he said. "It was my first experience in unattended automation. But even then you could see the benefits of it."

Later, Butler went to work for Dave

spends his time focused on the future of broadcast engineering and the demands engineers will face.

"Our field is changing incredibly fast. I'm afraid many engineers are at the point of information overload," he said.

SBE's membership has grown despite the loss of many good engineering candidates to more lucrative fields such as computer engineering and the wireless industry.

"We are pulling from several areas to continue our growth. One is people who may not be engineers but have technical responsibilities ... things like machine maintenance and production. And we have certification programs within the society to support them."

Butler hopes to see continued growth in the SBE's new Youth Membership program.

"This is what we really need to do. I think broadcasting is a very worthy career. We need to share the fascination we have for radio and television with young people. We may not have the flash

'Our field is changing incredibly fast. I'm afraid many engineers are at the point of information overload.'

Scott, now of Scott Studios, at KFMZ(FM) in Columbia, Mo., as program director.

"Dave had heard about this guy in Rolla who had an automated station that was doing pretty well and he wanted to know my secrets," Butler said with a chuckle.

According to Butler, his biggest career break came when Gary Stevens of Doubleday Broadcasting hired him as an engineer at KWK(AM) in St. Louis in 1978. He eventually became director of engineering for Doubleday.

"Doubleday was in a heavy acquisition and expansion mode in the early '80s and I had a chance to build new facilities in New York, Chicago, Denver and Detroit. That was a great opportunity to work on a bunch of projects and get to meet people who maybe did things differently than I did," he said.

Following his stint with Doubleday, Butler held director of engineering posts at stations owned by Emmis Communications in New York and Hearst Broadcasting (now Hearst-Argyle) in Baltimore.

In 1992, Butler elected to work for the NAB in Washington as staff engineer for conference programming.

"Working for the NAB was one of the most interesting times of my life, but also most stressful," he said. "Working for a trade association is different from working for a public or private company."

Leaving some of the stress behind, Butler joined Broadcast Electronics Inc. as marketing manager in 1994.

"That was a blast. I worked on AudioVault and many other systems. There was great opportunity to work on cross-integration between audio consoles and AudioVault products," he said.

He has worked for Public Broadcasting since 1995.

An SBE member since 1978, Butler

of the computer industry, but maybe that's all they have to offer," he said.

With more local chapters than ever, Butler said SBE's goal should not be how many new chapters to start, but in the quality of the services the chapters provide.

"I would like to see good and meaningful training at all 104 chapters. I think we have a ways to go on that. But overall I'm very happy with the relationships we have with all chapters," he said.

While broadcasters have been preparing for Y2K by reviewing their computer and other technology systems, Butler thinks the issue should not be a major catastrophe for broadcasters.

"Even if things are not planned out to the very minute, the steps major manufacturers have taken should leave radio in good shape. The manufacturers have made a good conscientious effort to let people know the things they need to fix. I think we will see some major problems globally, but not in the continental United States," Butler said.

Radio changes

While some engineers are losing their jobs due to consolidation, overall, Butler thinks radio ownership consolidation has generally been good for engineers.

"I think it has created large enough organizations that they can take engineers seriously and have enough resources to actually pay an engineer well. The bad news is that there is so much work to be done that it's real tough to have the time to learn these new things," Butler said.

SBE's recent comments to the FCC shared the group's concern over low-power FM proposals. Butler said the SBE wants to protect the integrity of the service.

"We are very concerned about interfer-



Andy Butler

ence and receivability of broadcast signals within certain marketplaces," Butler said. "We think the FCC has some very well-established interference criteria that has been proven over a long period of time. Don't throw them out the window. We want them to continue to protect the integrity of radio service."

Other threats to radio such as the Internet and satellite-delivered digital radio are real, Butler said.

IBOC predictions

"But I still think there will be room for everything. IBOC (in-band, on-channel digital audio broadcasting) will be successful if there is a single standard. I think (the) rollout will be 2001," Butler said. "I think over-the-air broadcasting is still the very best way to inform and entertain mass audiences. Will it change? Yes. Will it become more specialized? Yes. But it will be viable for a very long time."

With more stations installing computer-based digital cart replacement and audio management systems, what does Butler expect the radio studio of the future to look like?

"There has become an accepted 'rightness' to the performance space that we provide to the talent that performs. I don't think you should throw that away because you're now manipulating files off a computer rather than audio from a cart deck. So the studios will look the same; however, the infrastructure underneath it will continue to be radically different," Butler said.

Asked if any remote transmission system might become as popular as ISDN has in radio, Butler said he does not foresee any new format coming along soon.

"I think ISDN is a real robust way of transmitting information. I think we'll keep seeing improvements made to it. And just the universal availability of service makes it real attractive to stay with that technology," he said.

Butler believes the radio industry someday will see cellular technology that supports traditional broadcast bandwidth transmission.

During his one-year term as president, Butler wants to convince more engineers to join the SBE by pointing out several benefits.

Why should an engineer or other radio professional join SBE?

"One thing I've figured out is that technology is never finished. It's a continuing evolution of services," he said. "And it's a chance to take advantage of a support system that's already in place. We all build our support system by networking and making acquaintances throughout our careers. Joining SBE is a good way to jump-start that process," Butler said.

Butler lives with his wife Jill and son Everett in Annandale, Va.

Colleagues Comment on Butler

"Andy Butler is a credit to our profession and to SBE. From his leadership in the early national SBE conventions in St. Louis, to his engineering management work in Columbia, Mo., St. Louis, New York and Washington, his many years of leadership as an SBE board member and officer — and our first executive director (his salary was \$1/year), Andy has tirelessly and selflessly worked for the best interests of broadcast engineers nationwide, and will serve SBE well as its new president."

*Chuck Kelly
Former President, SBE
Director, International Sales
Broadcast Electronics Inc.*

"Andy has a strong background to draw upon as the new SBE president. He knows the broadcasting industry and he knows broadcasting technical issues.

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*Lynn Claudy
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The Digital STL Comes of Age

Radio Stations Have More Choices Than Ever in Digital Tools to Move Their Signal to the Transmitter

W.C. Alexander

In years past, broadcasters had just a few options for delivering program material from one location to another. Many years ago, the dedicated, equalized telco loop was a method of choice. These special circuits, which consisted simply of copper wire, equalizers and amplifiers, were usually quite reliable and exhibited acceptable audio performance.

Stereo operation presented a challenge, however, as achieving equal phasing

between two discrete equalized circuits was sometimes difficult. Still, for decades, telephone companies provided high-quality broadcast studio-transmitter links (STLs).

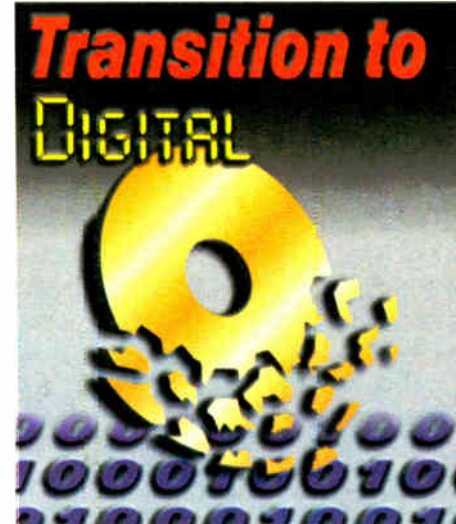
Later came over-the-air 950 MHz STL systems. Wideband systems could be used in either composite or discrete (split-channel) modes for stereo, or a monaural system could be used with less than half the RF bandwidth of a stereo system.

Phasing was not a factor with composite systems, and was not usually a

problem when identical left- and right-channel transmitters and receivers were used in discrete systems. The discrete systems provided a degree of redundancy that the composite systems could not offer.

Channel congestion is probably the biggest problem with 950 MHz over-the-air systems today. The use of antenna farms in metropolitan areas makes channel congestion and frequency coordination even more difficult, as there are only a few STL channels available.

In some frequency-congested areas, it is necessary for some stations to use multiple hops in order to bring their STL signal in from a different azimuth than another



station using the same frequency. This is expensive, but performance and reliability often make such an arrangement more attractive than leased telco lines.

Benefits of digital

For many years, manufacturers of broadcast STL and remote pickup (RPU) equipment have sought ways to reduce the RF bandwidth of their systems. Less bandwidth means more users can occupy the same band of frequencies with less interference. Some degree of success was attained, mostly through the use of better filtering, but there were no quantum breakthroughs — until digital came onto the scene.

We often labor under the impression that digital is always better. Many certainly thought that when the CD first came along, but today, a lot of people in the recording and broadcast industries as well as many audiophiles would argue the point.

Regardless, digital does have a good deal to offer, particularly in STL applications. Some of the advantages are much-improved noise immunity; elimination of transmission-path-dependent harmonic distortion, intermodulation distortion and crosstalk; spectrum efficiency; and degradation-free multiple-hop regeneration of the digital signal.

In the digital transmission world, there are two basic choices: linear and coded modulation. Linear means that input audio is sampled and transmitted without any alteration or coding. Coded modulation does the same thing, then removes unneeded elements, adds error correction and reduces the required bit rate and bandwidth necessary to carry the audio signal without perceptible degradation.

A linear system of a fixed bandwidth can carry many more audio channels than a coded system, but without coding/decoding delay. On the other hand, coded systems typically offer a more robust link with better error correction than linear systems.

Early digital STL systems mainly consisted of add-on encoders and decoders that could be used with existing composite STL links. This was a real breakthrough, as it allowed broadcasters to transmit four coded 15 kHz audio channels plus a pair of data signals over one 500 kHz STL channel.

Moseley's DSP-6000 was such a system, and it has been quite successful. TFT also pioneered an add-on system, the DMM92. Both are still in production and can provide an economical alternative to those who want to make the jump to digital without tossing their analog composite STL investment out the window.

Today, broadcasters have many digital STL (DSTL) options.

Several manufacturers offer integrated digital over-the-air links. Other products

See STL, page 21 ▶

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Know Thy Tube Transmitter

James G. Withers

This is the last in a three-part series about the basics of tube construction and practical implementation in modern broadcast transmitters. The previous part appeared Nov. 10.

The screen has an enormous impact on the operation of the tetrode. In most transmitters that I have seen, a variable rheostat is connected between the screen power supply and the screen grid, and is used to vary the DC voltage applied to the tube. This in turn varies the output power of the tube.

The rheostat is fairly high wattage

(up to 300 or 400 watts on bigger transmitters) and is almost always this control, or disconnecting the DC lead from the rheostat wiper leading to

Transmitters can be lethal devices. Charged high-voltage filter capacitors have taken lives.

motor-driven, so it can be easily interfaced for remote power control. Using the screen, it is possible to drop the output power to next to zero, even

though the plate voltage is on.

This can be a useful diagnostic tool. Input circuits can be tuned, IPA stages can be monitored, all while the tube is idling along at minimum plate current, with little or no power out.

However, the reverse — disconnecting the plate supply while leaving the screen supply connected — cannot be done. In that case, the screen will try to take the place of the plate, and will draw much more current than it is capable of dissipating. Again, the screen overload had better trip, or the result will not be pretty.

Complex collector

The plate circuit of a tetrode RF power amplifier is at once simple and complex — simple, because, after all, it is nothing more than a collector of electrons feeding a tuned circuit that couples the maximum amount of RF energy into the antenna. It is complex because it has several thousand volts applied and can draw several amperes of current. This is high-power stuff and must be treated with respect, lest the transmitter, the operator or both, get burned up.

The plate must be capable of dissipating enormous amounts of heat, while conducting enormous amounts of RF energy into the tuned circuit and out to the antenna. To facilitate the dissipation of the heat, direct-drive blower motors, forcing several thousand CFM of air past the tube, are used. All transmitters using forced air to cool the tubes have air pressure switches which immediately shut down the transmitter if the air pressure drops.

Different manufacturers use different methods, but all plate circuits must isolate the DC voltage from the RF signal. Some transmitters use very high dielectric strength "plate blockers," which are thin sheets of insulating mylar, capable of withstanding plate voltages measured in thousands of volts.

Others apply DC power to a large inductor, which is connected directly to the plate and insulated from the cavity walls by large standoff insulators. Again, the method is not important. All of them have idiosyncrasies as to how they tune and ease of maintenance.

The important point for the RF maintenance engineer to understand is the underlying principle at work. There must be a way to conduct high-voltage DC power to the plate, while insulating it from the RF output, which from a DC standpoint, is at ground potential.

Speaking of the DC plate voltage, as mentioned above, it is very high, with correspondingly high current capability. Remembering the lowly diode, (now exclusively replaced by the solid state diode), as AC line voltage is stepped up to a high potential through the plate transformer, it is rectified by diodes (whether tube or solid state). This, however, does not complete the conversion of AC to DC. The diodes simply stop current flow in one direction and allow it in the other.

Arch theory

Instead of a sine wave, then, there are a series of ellipsoidal waves, all on the same side of the zero crossover point. Think of an infinite number of arches (like the Gateway Arch in St. Louis) set side by side, and you'll get

See TUBE, page 28 ▶

Citadel Selects Scott Studios as "the Best" Digital System



Larry Wilson (at right), CEO of Citadel Communications Corp., shakes hands with Dave Scott as Citadel standardizes on Scott Systems for its 124 stations and future acquisitions.

Citadel Communications Corp., one of America's top 10 radio groups in 1998 revenues, selects Scott Studios Corp. as its sole supplier of on-air digital audio delivery systems for its 124 radio stations and future acquisitions.

"We thoroughly investigated all of the competitive digital air studio systems and decided upon the best one," says Larry Wilson, CEO of Citadel Communications. "Our regional Presidents and Vice Presidents of engineering and programming spent nearly a year analyzing different options. While no system or manufacturer is 100% flawless, it became obvious to us that Scott Studios is the very best. Their long history of excellent service commitment, the quality of their digital studio products and competitive pricing were our primary reasons for selecting Scott Studios."

Dave Scott, CEO of Scott Studios Corp. says, "It's an honor to be Citadel's sole digital audio vendor and take their other brands as trade-ins on our new equipment. Our systems are designed by announcers, for announcers."

"Of Scott's 61 employees, 43 are former jocks and PDs with 700 years collective radio experience. Competitors work more from the engineer's perspective, although we have 20 former chief engineers on staff also. Scott Studios' digital fits DJs like a glove."

After adding five Oklahoma City stations and other pending transactions, Citadel will own or operate 124 radio stations in 23 mid-sized markets such as Providence, Salt Lake City and Albuquerque.

Citadel is well known across the country for attaining topnotch competitive programming success, and the addition of Scott Studios announcer friendly technology will help Citadel announcers deliver superior information, entertainment and service to their 8,000,000+ weekly listeners.

Citadel's stations are not the only ones who choose Scott: More U.S. radio stations use Scott Studios' than any other digital system, with 5,046 Scott digital workstations in 2,202 U.S. stations. Nine of the ten top-billing groups have Scott Systems.

Scott Systems are the easiest to use! They're intuitive, straightforward, simple, yet the most powerful!

Scott Studios is famous for our uncompressed digital systems at a compressed price, (but we work equally well in MPEG and MP3). Scott Studios' audio quality is the very best and plays on laptops or PCs with ordinary sound cards. We pre-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 also 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!

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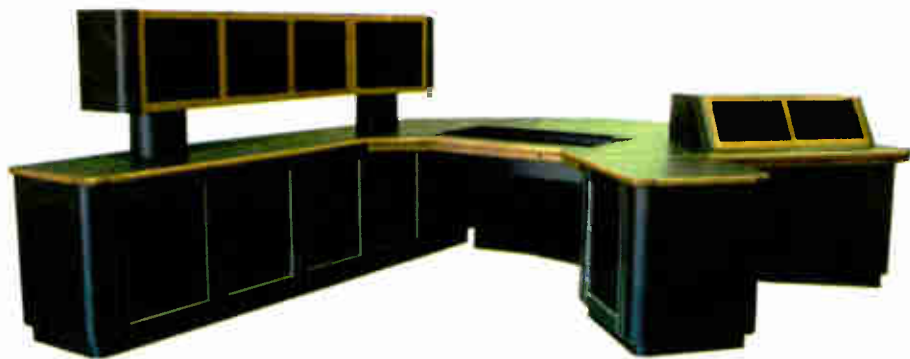


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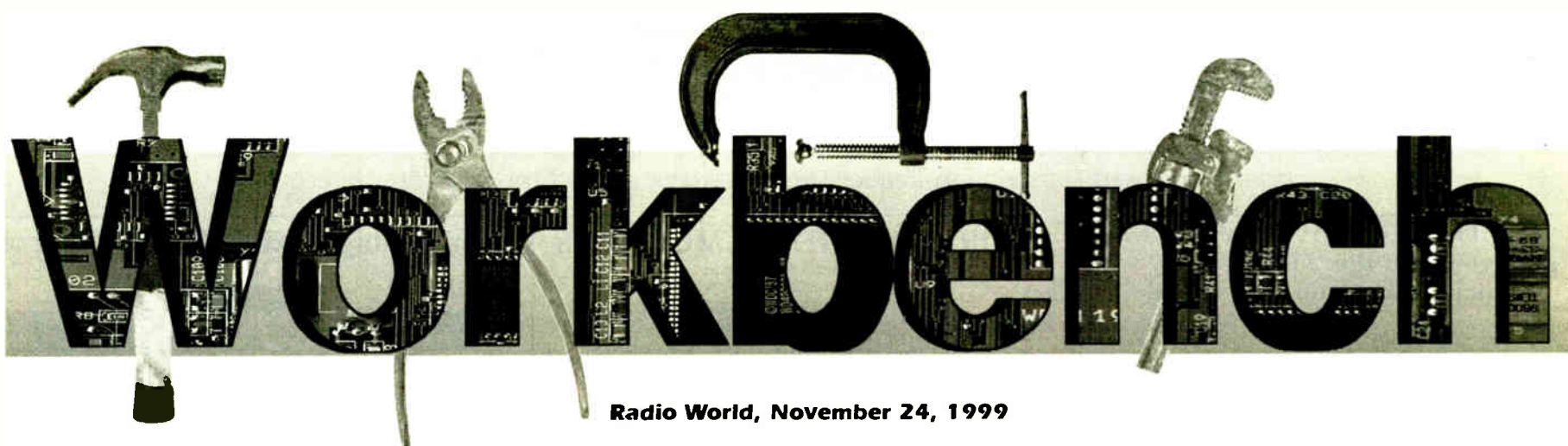
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Radio World, November 24, 1999

Spindles: Hang 'em and Spin 'em!

John Bisset

In one of the first *Workbench* columns many years ago, I ran a photo similar to that in Figure 1. Imagine my surprise to see the idea in use today!

Using the plastic wire-routing spindles, you can store cross-connect wire easily and neatly. The spindle is screwed into the telephone wallboard using a dry-wall screw. When Bell engineers

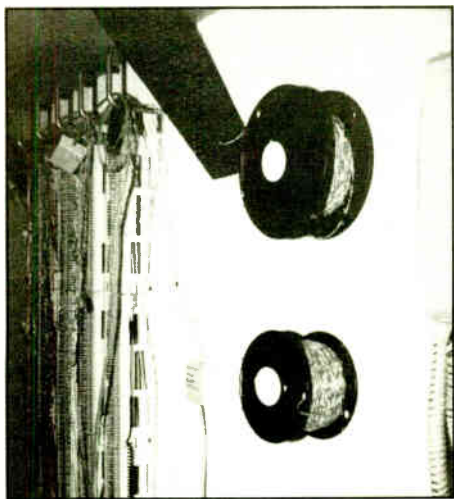


Figure 1: Spindles hold telco wire reels.

designed the spindles and the center holes in the wire spools, I can't help but think they had the application shown in Figure 1 in mind.

Bruce Blanchard of WSCL(FM) at Salisbury State University in Maryland put together the reels shown in Figure 1. (I forgot to ask if he got the idea

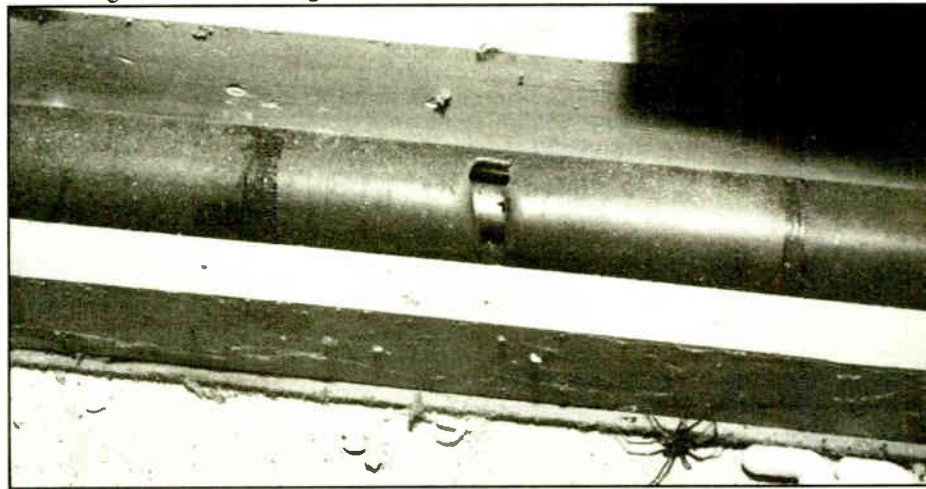


Figure 2: A close call — or a lousy shot.

from that long-ago *Workbench* column!) The spindles are just the right size to permit the reels to spin as wire is spooled off. With the turnover in engineering over the last 10 years, some folks may not have seen this approach to wire management.

As for the punchblock wiring, that belongs to the telco company, not Bruce. There's only so much you can do to keep the telco blocks neat, short of re-wiring everything yourself!

★ ★ ★

Al Kazlauckas is the chief for the AMFM stations in Cleveland. Al wrote

regarding the loss of a phone coupler when doing a remote (*Workbench*, July 21).

Al offered a caution when clipping into the "mic" portion of a telephone handset. Make sure you lower the mixer volume! Most phone systems will not take a 0 dBm signal, not to mention +4!

To avoid clipping your audio, watch the levels. Better yet, buy a little coupler box, the type manufactured by Gentner and others, that permits you to clip the handset cord into the box, and feed your audio into the phone with no level problems.

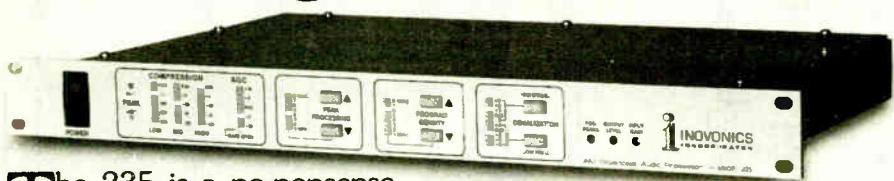
Not only will this interface work with POTS (plain old telephone service) phones, but it will also work with the digital sets found at many car dealerships or stores.

Thanks, Al, for the ideas, and your support of the *Workbench* column!

★ ★ ★

Some stations have all the luck! When the engineer was paged to the transmitter See WORKBENCH, page 27 ▶

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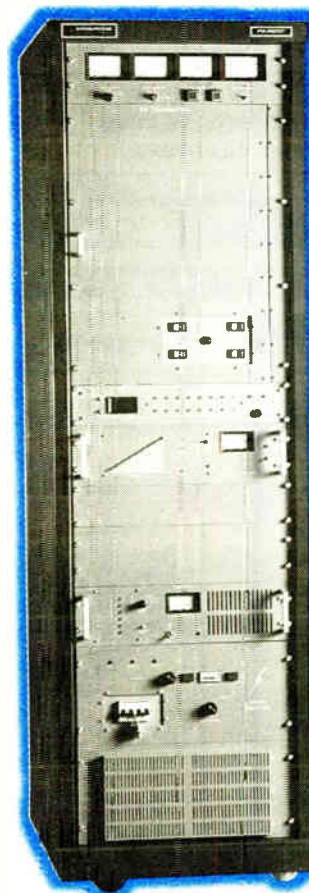
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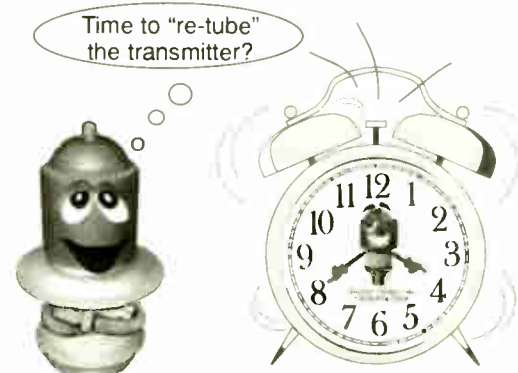
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Digital STL Options

► STL, continued from page 14

are available that operate in the 2.4 GHz S-band and utilize spread-spectrum, code division multiple access (CDMA) technology. T1/E1-based products are also available that use hard-wired point-to-point T1 circuits, digital point-to-point terrestrial microwave or other conveyances.

950 MHz over-the-air systems are probably the most popular DSTL option for broadcasters. The reasons are legion, but among them are that existing paths are already coordinated, licensed and established, with antennas and feed lines in place; existing analog equipment can either be converted to digital with an add-on encoder/decoder or used as an analog backup; and 950 MHz is familiar territory to most broadcasters.

Among the equipment commercially available for this application

is the aforementioned TFT DMM92 and Moseley DSP6000. Both offer two- or four-channel capability plus data. TFT offers a choice of apt-X or Musicam coding; Moseley offers ADPCM or ISO/MPEG. Both systems can be made to work with many different composite STL systems, even those of other makes. Some adaptations may require transmitter and/or receiver filter changes for the system to work properly, however.

Integrated 950 MHz systems are available from companies like Harris Broadcast Electronics and Moseley.

The Harris CD Link transmits uncompressed AES3 digital audio in 300 kHz RF

channels in the 950 MHz STL band. The company markets it as an economical way to complete the path for uncompressed AES3 digital audio from the studio to the transmitter. By connecting into the digital input of a Harris Digit CD Digital FM



Harris offers the CD Link uncompressed digital STL.

Exciter, the user gets an uncompressed path "from the studio through generation of the FM broadcast waveform."

Moseley's Starlink SL9003Q offers several combinations of audio and data, including four-channel linear audio plus two data channels. More audio channels are available if ISO/MPEG is used. It is possible to combine linear and ISO/MPEG for STL and ICR or other applications in a single SL9003Q system.

BE's DSTL is a descendant of the early Dolby system, and it offers two or four 15 kHz audio channels plus data using Dolby AC-2 coding with less than 9 ms of audio delay.

A caveat: Many early claims that converting to digital would solve most if not all 950 MHz link or path problems are simply not true. My firsthand experience has shown that a bad analog path usually makes for a bad digital path as well.

In one very frustrating incident, an otherwise-acceptable 36-mile analog link over water would simply not work with digital. The reason: multipath distortion

audio bandwidth stereo RPU applications.

QEI manufactures the Quick-Link II, which comes configured for 15 kHz stereo transmission using either mic or line level. Configuration (frequency, bandwidth, data rate and audio level) is alterable by RS232 connection. Moseley's Starlink 9001SS also offers 15 kHz stereo operation and ISO/MPEG or ADPCM coding are selectable.

With the growth of the Internet, T1 lines have gained popularity, and broadcasters have joined high-speed Internet users in utilizing them for point-to-point applications. These lines can carry up to 24 channels of 64 kb each, combined in any way the user wants them. In most areas, T1 offers a reliable, high-quality alternative to an over-the-air link. Where terrain or obstructions would otherwise require a multiple-hop over-the-air link, a T1 circuit can offer an alternative that is often priced less per month than the tower rental at the relay site.

T1-based systems are extremely flexible, offering bidirectional

operation with many combinations of linear and coded audio channels plus data channels. There are tradeoffs between delay, error correction and robustness which must be considered when configuring a system. Keep in mind that even a few milliseconds of delay can be objectionable to on-air talent listening to an off-air feed in headphones.

caused by changing signal reflections off the water. We never noticed a problem with the analog signal, but the digital link would not work reliably.

QEI and Moseley are among the manufacturers of spread-spectrum, CDMA systems. Such systems have the advantage of requiring no FCC licensing or coordination and are generally immune from interference. The downside is that they are generally short-haul links, requiring a completely clear path. They are an attractive option for short-notice STL applications (when the boss tells you, "By the way, we just LMAed a station across town. We go on the air with it tomorrow.") and for uncompressed, full

operation with many combinations of linear and coded audio channels plus data channels. There are tradeoffs between delay, error correction and robustness which must be considered when configuring a system. Keep in mind that even a few milliseconds of delay can be objectionable to on-air talent listening to an off-air feed in headphones.

QEI has for many years manufactured the CAT-Link. The CAT-Link is a linear system offering up to four bandwidth-limited channels each direction. A typical system might consist of two 15 kHz,

See STL, page 25 ►

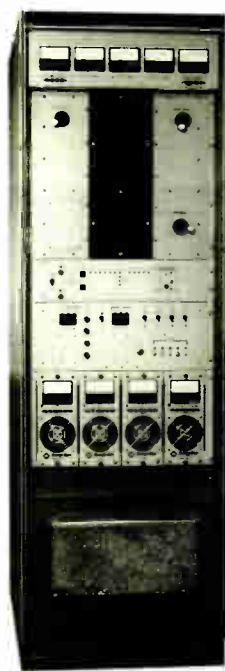
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GUEST COMMENTARY

What About DAB at the Border?

Tim Brown

I write this as Canada's largest city is in the midst of an exciting digital radio launch. At present, 19 of Toronto's stations are simulcasting their AM and FM broadcasts on the L Band using technology associated with the well-established Eureka-147 standard.

In the near future, more of the city's stations will be added. Numerous suburban stations will follow shortly thereafter. In parallel, Montreal and Vancouver stations will launch prior to the end of this year.

Not only is the sound quality and inter-

ference immunity spectacular with Eureka-147, the Program Associated Data (PAD) emanating from the receiver's screen adds a new dimension to the radio listening experience. Dramatic enhancements to PAD are anticipated in the near future with high-resolution graphics, voice response and listener interactive applications now under development.

Multi-mode receivers

As a Canadian completely sold on the Eureka-147 approach, I dream of a day when the United States abandons in-band, on-channel (IBOC) in favor of the Eureka-147 system. I doubt my dream is

a realistic one due to U.S. military requirements in the L Band, along with other constraints unique to U.S. spectrum assignments.

Many U.S. residents are likely aware of the large volume of traffic moving across the U.S./Canadian border every day. For cross-border compatibility, we might have to see multi-mode receivers manufactured where both Eureka-147 and IBOC standards are supported.

This is how PCS (Personal Communication System) digital phones have evolved in Canada. Because PCS network coverage is rela-

tively limited when compared with traditional analogue cellular, we've seen a proliferation of dual-mode phones. If the dual-mode phone user is within PCS coverage, he/she gets all the benefits of PCS technology. If they "roam" beyond PCS coverage into the old analog network, they lose PCS features and digital audio quality — but at least they have coverage.

It should be noted that not only are these dual-mode phones handling two different protocols (a given PCS standard and the analog protocol known as AMPS), they are also supporting two different frequency bands (1900 MHz in PCS mode and 800 MHz in the analog cellular mode).

This is not unlike my multi-mode digital radio receiver concept, where three different frequency bands (AM, FM and L Band) as well as the Eureka-147 and IBOC link protocols would need to be supported.

For the transition years, things get quite complicated. First off, we would still need receivers to incorporate today's AM and FM analog bands. This results in a multi-mode receiver — AM/FM analog, AM/FM IBOC, and L Band Eureka-147. With costs for a single mode Eureka-147 L Band receiver very high at this point, my idea for a multi-mode receiver might end up being absurdly expensive.

IBOC isolation

The alternative is for the United States to operate in isolation with its choice of IBOC. At some point in the future, it

**As a Canadian
sold on Eureka-147,
I dream of a day
when the U.S.
abandons IBOC.**

might look like the rest of the world using Eureka-147 is operating in isolation from a U.S. perspective.

With Canada's three largest cities, making up over 35 percent of the country's population, living within 75 kilometers of the U.S. border, it concerns me that this lack of agreement on standardization could someday threaten our country's spirited launch of digital radio.

In the meantime, we hope for affordable Eureka-147 "L" Band mobile, portable and home receivers. I know in the PCS business, we had to highly subsidize the dual-mode phone costs in order to win over new subscribers in those early days. It seems to be working. Now volumes are sufficiently high that we're seeing the benefit of much lower unit costs on these phones.

That said, the launch of PCS services in Canada could have been much less complicated and much less costly if we didn't have the requirement to support another wireless standard.

Tim Brown lives in Toronto. Reach him at tim.brown@microcell.ca

RW welcomes other points of view. Send e-mail to radioworld@imaspub.com or write to the address on the inside last page of this issue.

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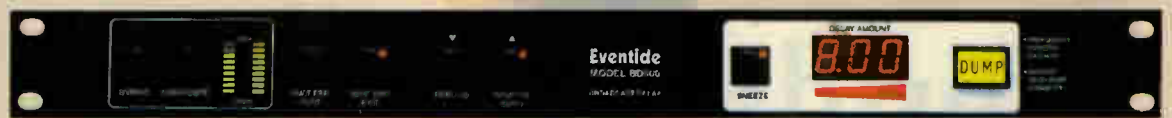
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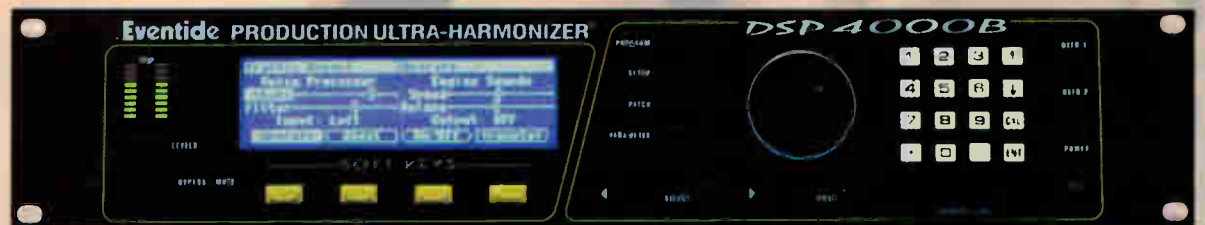
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STLs Go Digital

▶ STL, continued from page 21
 one 10 kHz and one 3 kHz audio channel in each direction. Because the QEI system is linear, there is no perceptible delay, but the tradeoff is lower channel capacity and less robustness.

Moseley offers the Starlink 9003T1 system for T1 applications. It can be configured with a wide array of audio and data options, and can be ordered using ISO/MPEG or apt-X ADPCM coding.

Harris recently acquired the Intraplex line of T1-based STL systems. The Intraplex STL Plus system can be ordered with up to eight 15 kHz stereo channels in each direction using apt-X or ISO/MPEG coding. Linear audio is also available, but with reduced channel capacity. Other options include asynchronous data

at the transmitter site) and various ring-down/telephone applications. They can be configured to any of the popular T1 line codings and framing options, making them very flexible in terms of network connection.

Keep in mind that the more information that is carried on a T1 channel, the lower the bit rate per channel and the greater the overall audio delay. In systems carrying a significant number of audio channels, it will be necessary to make alternate arrangements for open-air monitoring.

The best way to deal with this is to put all but the last stage (stereo generator/clipper) of audio processing at the studio and take a DA feed to the studio headphones. In this way, the talent hears a true off-air monitor except when

unreliable circuits, probably due to poor local telco facilities (bad copper, repeaters and muxes) that have given no small amount of trouble. The most reliable circuits have been the oldest and those that are fiber-optic from end to end. Despite the occasional service problems, we will continue to use T1 as a preferred method of signal transmission between sites.

We have all heard for years the warnings of conflicting coding algorithms. Some claim serious audio degradation as a

over a T1 circuit to a studio. There, it was decoded, mixed and re-coded ISO/MPEG at 128 kbps and sent to a transmitter site for broadcast.

The resulting audio, even though all the coding algorithms and bit rates were the same, contained significant and objectionable artifacts. That system could have been much cleaner had the equipment manufacturers offered compatible digital inputs and outputs, which would have eliminated several encode/decode cycles.



T1 technology puts a big data pipeline at the disposal of the radio user. Among the companies offering T1 products is Moseley.

(four independent RS-232 or RS-422 data ports), wideband data (for off-premises LAN use), two- and four-wire voice, and wideband voice.

Because of the high channel capacity and bi-directional operation, most of the available T1 products can carry not only program audio from the studio to transmitter, but also remote control, telemetry, air monitor audio, satellite feeds (if the downlink must be located

the mic is turned on, when the processed audio feed is heard. Such an arrangement may be necessary in higher-capacity coded over-the-air DSTL systems.

I have used T1-based products in STL applications in major markets from coast to coast since it first became available. In most markets, except for the inevitable contractor cable-cuts, the service and equipment has been very reliable.

We have, however, had some very



Broadcast Electronics DSTL uses Dolby AC-2 coding.

result of stacking algorithms, while others report no problems. This phenomenon does bear consideration, however. Multiple passes through even the same algorithm can produce significant coding artifacts.

In one rather complex system with which I have been involved, audio was ISO/MPEG coded at 128 kbps and uplinked, then decoded back to audio at a downlink site and then re-encoded ISO/MPEG at 128 kbps and transmitted

Unlike composite and discrete analog systems, digital systems require considerable planning. In most cases, conversion will not be simply "plug-and-play." If you're considering making the leap to digital, the result will probably be well worth the investment, but for the system to work properly, it must be well thought out.

We can't list all manufacturers of STL link systems here; ask your broadcast supplier for the options available to you.

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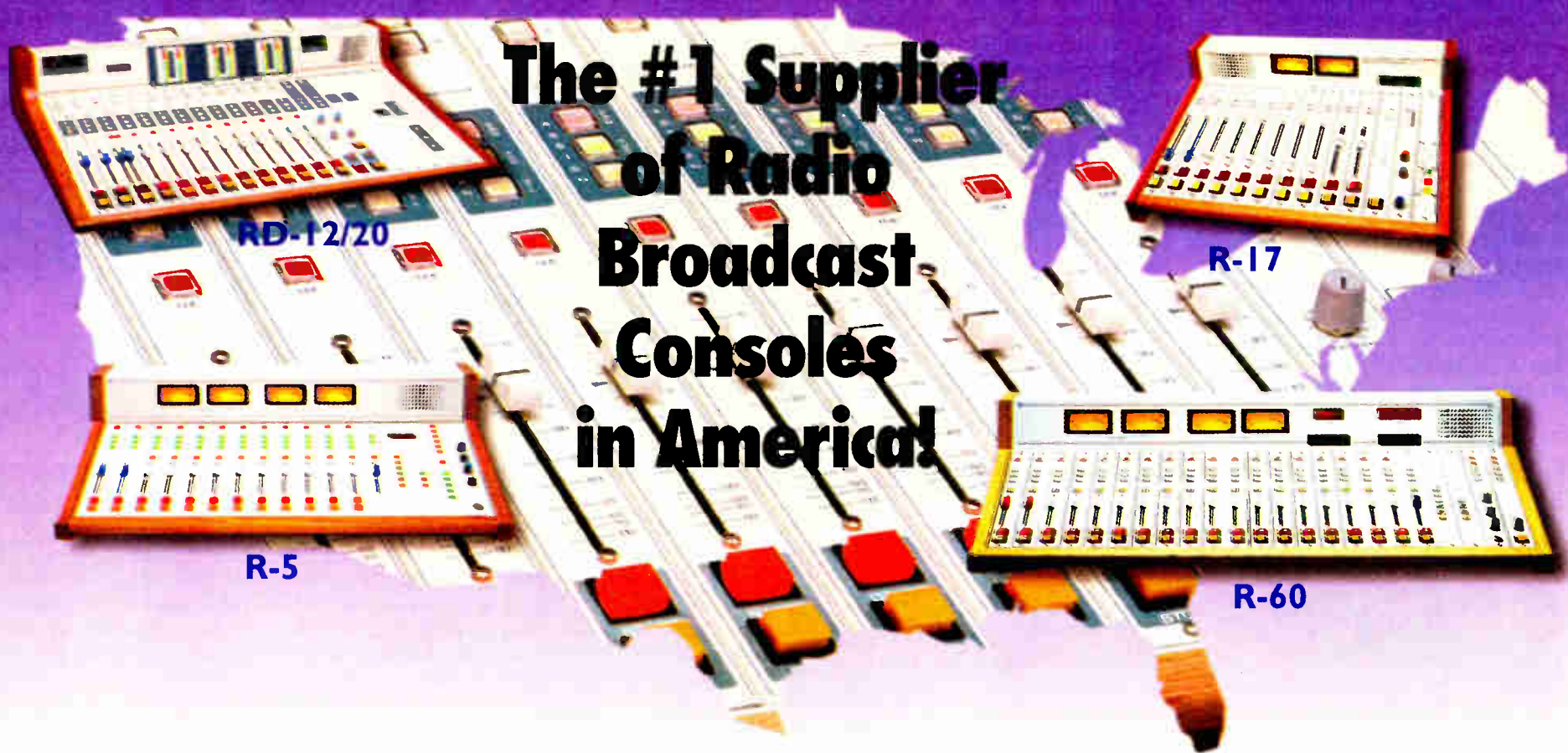
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Secret of a Tiny Cable

► **WORKBENCH**, continued from page 19
 site to check out a low-pressure alarm on the remote control, he wasn't sure what to expect. The station was still on the air; in fact everything looked nearly normal. There was a slight rise in VSWR, but nothing substantial.

The biggest problem was the line wouldn't hold any nitrogen. You could hear it just pour out of the tank as the valve was turned on.

When the tower rigger arrived, the damage to the line shown in Figure 2 on page 19 was discovered. The bullet grazed the outer conductor, but missed the center.

Thank goodness the vandal was a poor shot!

★ ★ ★

We spoke of Belden's mini-starquad 1804A cable in the Aug. 18 issue. Steve Lampen at Belden, who also contributes to **RW**, wrote to explain the "secret" to the ruggedness of this tiny cable.

It's pretty neat, and I thought you'd like to hear about it. The conductors in the mini-starquad cable are silver-coated copper alloy, much stronger than copper.

The silver is added to bring the resistance back down to copper. The combination makes this cable stronger than many full-sized mic cables.

Steve reports that one of his first customers used the 1804A to wire up headphones, because the jocks would rip the cords off the phones (sound familiar?). This little cable solved the problem. Now, if they forget to unplug the headphones before walking away, the cable pulls the headphones off their heads.

With the ruggedness of such a tiny diameter cable, I'm sure *Workbench* readers can come up with all kinds of uses. Here's one: How about a 6- or 10-

cable mic or headphone snake for remotes, not much larger than a standard-size mic cable?

Let me know what you come up with. For a sample of the mini-starquad 1804A, circle **Reader Service 59**.

★ ★ ★

Finding inexpensive solutions to customer problems is part of what makes this business fun. Cam Eicher, the manager of Harris' Broadcast Center, came up with the following inexpensive way to monitor tower lights.

Seems a customer had a relay site with no broadcast transmitters, but with tower lights that needed monitoring. It seemed overkill to purchase a full-fledged remote control system just to find out if the lights failed. He need-

ed a box that would dial out if the lights fail, and also permit dialing in to verify proper operation.

Cam suggested a Broadcast Tools DC-8A combined with a Sine or SSAC current sensor. Both are available from your equipment distributor. You can even use multiple sensors to provide side light as well as beacon indications.

■ ■ ■

John Bisset has worked as a chief engineer and contract engineer for more than 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 send e-mail to jbisset@harris.com

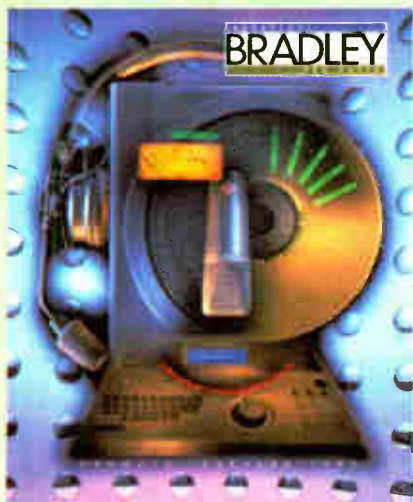
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Transmitters Need Expert Care

► TUBE, continued from page 16
the picture of diode rectified AC.

This is indeed DC, because it does all flow in one direction (all of the arches are right side up, instead of alternating right side up, then upside down), but it is not filtered DC. That is to say, there are still great variations in voltage between the top of the arch and the bottoms of each leg.

Experiments

These variations are smoothed out by the use of filter capacitors and inductors. As we all remember from Ben Franklin's experiments with lightning, electricity can be stored between

two plates, in a material called a dielectric. This was known to Ben as a Leyden jar, but we now call them filter capacitors.

As the bumpy DC voltage is applied to a filter cap, it is stored in the dielec-

Despite the growth in solid-state, tube-type transmitters remain an important part of our industry.

tric until a voltage equal to, or a little greater than, the peak of the applied

DC voltage is built up. Then, as the DC voltage falls off from the peak of the arch down the leg towards zero, the capacitor reverses its function, and bleeds voltage off, into the circuit, sustaining the DC voltage until it starts to build up again.

In this way, the DC voltage is dramatically smoothed out. However, while useful, this stored voltage "capacity" creates a safety problem for us transmitter types.

Imagine that the capacitor is going about its business, storing up and then releasing the 8,000 or 9,000 volts that is typically on the plate circuit of a broadcast transmitter. Then, out of the blue, the circuit is opened — maybe through a broken wire, or a ground return resistor that opens up, or, as has been known to happen, the plates are turned on while the tube is out of the socket.

Suddenly, the capacitor, which has a stored charge, has no way to release that charge. So it sits there ... and sits there ... and sits there, for hours, or in extreme cases, days.

Lethal charge

This is the stuff of which widows are made. There are many safety devices built into transmitters to eliminate this danger — interlocks, bleeder resistors, etc. — but still, every once in a while, someone touches a charged high-voltage filter capacitor and goes to the big Transmitter Shack in the Sky.

So beware: this series of articles is a primer. Experience and a patient transmitter expert willing to impart some hard-earned practical knowledge are needed before anyone should go poking around in a high-power, tube-type transmitter.

Tube transmitters, on a cost-per-watt basis, still have a much lower initial purchase price than solid-state rigs. Additionally, there are hundreds, perhaps thousands of existing tube transmitters still in service. So it is likely that even a young broadcast engineer will run across one of them in his or her career. When that happens, we hope this short introduction will have served to take some of the mystery out of the lowly vacuum tube humming along inside.

■ ■ ■

Jim Withers is vice president of engineering for Pacific Broadcasting. Send him e-mail to jim@koplar.com



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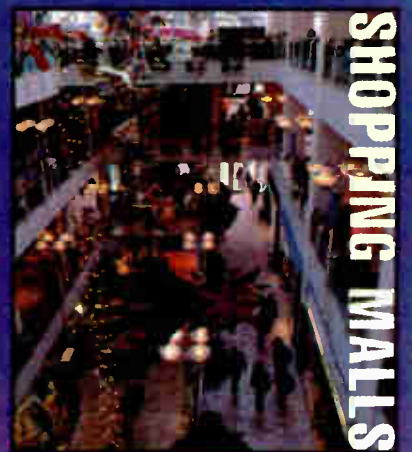
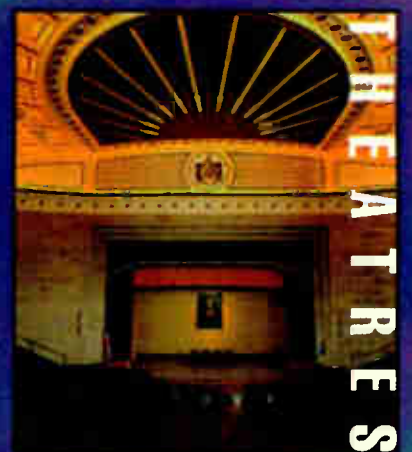
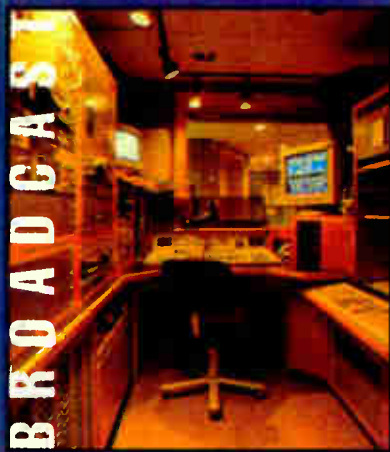
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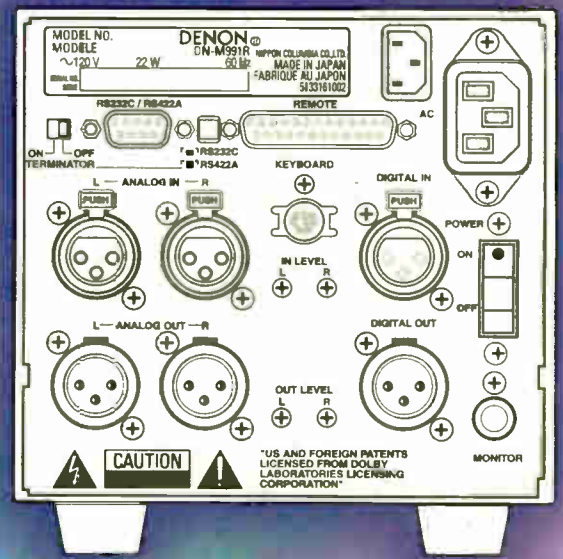


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Circle (34) On Reader Service Card
World Radio History

MARKET WATCH

Merger Impact Felt in Denver Radio

Joanne Ostrow

Call Denver a Clear Channel town. That certainly won't change when the massive merger of the company with AMFM takes effect.

While Clear Channel owns eight stations in the market, its merger partner owns six.

What had been a battle of titans now becomes a guessing game. The new group must divest six stations. Insiders say it will be the six AMFM properties that will be sold. Analysts value the Denver AMFM stations at \$50 million to \$60 million. But a Clear Channel executive said nothing

had been decided as of early November.

Who will buy the divested stations?

It's all speculative, but CBS' Infinity is among the most mentioned, and Hispanic and Cox are said to be interested in expanding to Denver. Clear Channel is encouraging minority owners to consider buying the spin-offs, which would both reduce direct competition and favorably position the merger application before FCC reviewers.

While critics question the concentration of radio ownership in fewer hands and contend it has resulted in a profusion

KCNC-TV newsroom for talent.

Geographically isolated in the step-child Mountain Time zone, the Denver-Boulder market is problematic.

"The market is over-radioed by any measure you can apply," said Larsen. "There are stations on every available frequency and we don't have other cities nearby to share the frequencies with."

Larsen, who has responsibilities for 15 additional stations in three markets beyond Denver (Fort Collins, Colo., and Casper and Cheyenne, Wyo.), said the geographic nature of the market causes only slight



Bob Call of KYGO-FM

group owner, Clear Channel controls roughly 48 percent of the market's annual radio advertising billings, according to BIA Research.

Moreover, Clear Channel controls the majority of talk-radio outlets in Denver, including former Jacor stations KOA(AM), KHOW(AM), and KTLK(AM).

Before the merger, AMFM (formerly Chancellor) controlled approximately 18 percent of the Denver market's annual radio billings, with strength in the younger male demographics with the "Jamie and Danny Show" on KALC(FM) and Howard Stern on KXPK(FM).

Jefferson-Pilot follows, with some 18 percent of the advertising billings, led by KYGO-FM, the area's longtime country music king. BIA estimates that KYGO's 1998 revenues totalled \$16.5 million.

Tribune Broadcasting accounts for some 13 percent, boosted by its AC station KOSI(FM).

"The market has tripled as far as revenues are concerned in the 16 years that I've been here," said Larsen.

Historically, certain Denver stations have been recognized nationally as pace-setters, including KBCO-FM, birthplace of the adult album alternative, or AAA, format, and KYGO, the dominant country music station for the past decade.

See DENVER, page 32 ▶

Denver Radio Snapshot

Market Rank: 23
Revenue Rank: 14
Number of FMs: 18
Number of AMs: 24

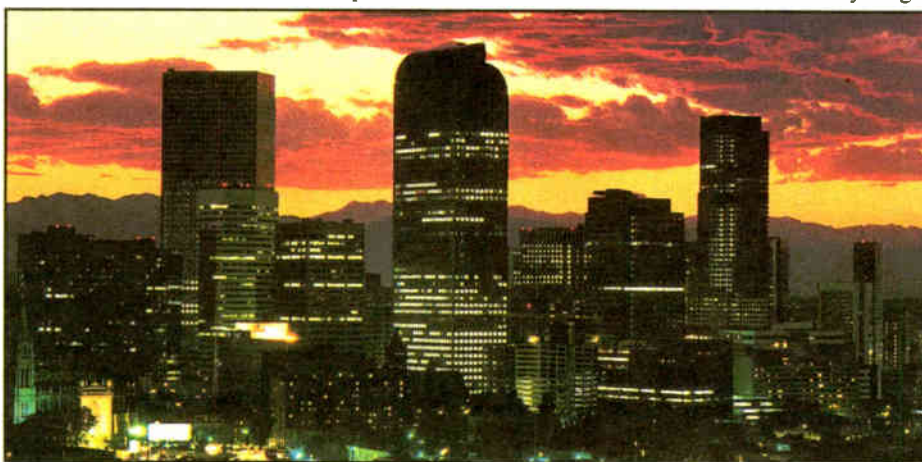
Estimated Revenue:
1995: \$109.3 million
1996: \$117.6 million
1997: \$134.0 million
1998: \$151.5 million
1999: \$163.6 million

Revenue Growth:
'92-'97: 11.5%
'98-'02: 8.5% (est.)

Local Revenue: 70%
National Revenue: 30%

1997 Population: 2,182,600
Per Capita Income: \$18,813
Median Income: \$38,180
Average Household Income: \$46,591

BIA RESEARCH
Source: BIA Research



Denver Skyline

of syndicated product and the lack of a dedicated all-news outlet, Clear Channel's Denver AM group Vice President/General Manager Lee Larsen defended the trend.

"If it were not for consolidation, your neighborhood radio station would be close to extinction," he said.

Industry veterans voice the optimistic possibility that the Clear Channel-AMFM merger could result in an all-news radio format joining the local lineup. If Infinity were to buy the cluster of former AMFM properties, for instance, it could draw on the local CBS-owned

troubles: it is difficult to get FM signals into mountain communities, he said, and many stations have translators in foothill sites near Boulder and Evergreen.

However, most of the population is located on the vast flatlands.

The nation's No. 23 radio market as ranked by Arbitron, the Denver/Boulder metro is a battleground for 42 intensely competitive local outlets seeking the ears of 2.1 million listeners.

While Clear Channel is the proverbial 800-pound gorilla, the former AMFM, Jefferson-Pilot and Tribune each own two of the top-10 outlets. As Denver's largest

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Radio in the Mile-High City

► DENVER, continued from page 31

Each has had influence beyond the market.

KOA, originally "king of agriculture," now a powerhouse news-talk-sports station, is the 1999 NAB Marconi Legendary Station of the Year, and remains one of two dominant stations in ratings and revenue.

KOA had roughly \$25.1 million in 1998 revenues. KOA's expenses are also highest in the market, due to its major sports franchises, which eat at least half the revenues.

"KOA, with 75 years of history, is one of the great AM stations and it has evolved with the times," said Robin Bertolucci, Clear Channel's director of AM programming for the Rocky Mountain region. She attributes the station's success to its "energetic, dynamic" style and reputation for "credible information."

Sports also are important part of KOA's success. KOA carries Broncos football and Rockies baseball, while KHOW carries Colorado University football games. The station's powerful signal, covering eight states at night, also contributes to its stature.

After the oil-based economy bottomed out in the 1980s, Denver saw several bleak years. A stronger, more diversified economy revived in the mid-'90s, helped by the new, architecturally distinctive Denver International Airport and the addition of a new baseball stadium, Coors Field, both in the past four years.

The financial boom continues with an influx of high-tech firms joining the cluster of cable TV companies headquartered here. A slew of national retailers have followed, along with urban sprawl and traffic problems.

Clear Channel's Larsen names former Denver Mayor Federico Peña as the key to the city's current robust economy. Peña expanded the convention center, started the expanded airport and helping to launch the Colorado Rockies, the "Mile High City's" first Major League Baseball team.

Natives lament losing the wide-open spaces to seas of red tile suburban roofs. The suburban sprawl was notably depicted in a photo in a 1996 National Geographic article that infuriated some local business owners.

The area's continued population boom

AM sister station KCKK(AM).

"We found two distinctively different tastes within the country format," Call said. At the moment, country has started to suffer from an onrush of new artists. But Denver listeners are receptive. KYGO is the top-billing station in the market.



Steve Kelley (in tank) and techs prepare a promotion for 'Kids Newspaper Day.'

and retail growth have boosted the local radio economy. As elsewhere, Denver "dot-com" business is taking off and turning primarily to radio for advertising.

Clear Channel's Larsen estimated the "dot-com" business comprises 7 percent of Denver's radio ad revenue, but, he said, "We're just beginning — it's a very hot category of advertiser."

In 1997, the first year of significant "dot-com" advertising, the market recorded \$134 million in radio billings, up from the \$117 million total the previous year, according to BIA's 1999 Radio Market Report. Estimated gross revenues for 1999 are \$164 million, a 40 percent increase in just two years.

"In the early '80s Denver had five stations doing country music," according to KYGO General Manager Bob Call of Jefferson Pilot. Two remain: current-country station KYGO and country gold

On the talk side, the local airwaves have reverberated as Denver has found itself on the dateline of many recent national news stories.

"Lately there has been a lot of national

focus on Denver," Bertolucci said. Her list includes: two Bronco Super Bowl wins, the Columbine shootings, the international economic "Summit of the Eight," the Oklahoma City bombing trial and the murder of JonBenet Ramsey.

Beyond breaking headlines, Denver radio takes note of the public's mania for sports.

Bertolucci said people in Denver have a fascination with sports. With four major league teams — the Broncos, Rockies, Avalanche and Nuggets — and a blatantly boosterish spirit, non-sports junkies are out of luck during portions of the program schedule.

If Denver radio isn't armchair quarterbacking the Broncos, it is second-guessing the Ramsey case. KHOW talk show host Peter Boyles has hammered away at the story, and created controversy for his tabloid style, which he calls "yellow radio." Boyles has boosted his profile with regular appearances on "Inside Edition," MSNBC, "Geraldo" and other cable TV shows to discuss the Ramsey murder. He donates all compensation for those appearances.

Since KXPK(FM) picked up his show in late 1998, Stern has tripled the station's ratings in his morning timeslot among the target 18-34 demo.

Competitors suggest AMFM has experienced a series of PR miscues and blunders.

"A lot of non-common sense decisions are being made," Tribune's David Juris

See DENVER, page 33 ►

Denver Radio Market Overview

Stations	Owner	BIA's 1998 Est. Station Revenue (in Smil.)	Format	Winter 1999 Rating
KOA(AM)	Clear Channel	25.1	Nws/Tlk/Spt	7.5
KYGO-FM	Jefferson-Pilot	16.5	Country	7.2
KBCO-FM	Clear Channel	9.9	Alternative	7.0
KOSI(FM)	Tribune Broadcasting	11.9	LtRck/Varty	6.7
KQKS(FM)	Jefferson-Pilot	5.5	CHR/Rhymc	6.1
KRFX(FM)	Clear Channel	11.2	Clsc Rock	5.3
KALC(FM)	AMFM Inc.	8.4	Hot AC	4.8
KXKL-FM	AMFM Inc.	8.7	Oldies	4.5
KHIH(FM)	Clear Channel	5.8	Smooth Jazz	4.2
KHOW(AM)	Clear Channel	7.7	News/Talk	3.8
KKHK(FM)	Tribune Broadcasting	8.1	Clsc Rock	3.8
KBPI(FM)	Clear Channel	5.1	Alternative	3.6
KCKK(FM)	Jefferson-Pilot	1.4	Country	3.3
KIMN(FM)	AMFM Inc.	6.2	Lite AC	3.1
KEZW(AM)	Tribune Broadcasting	1.7	BgBnd/Nstlg	2.6
KTCL(FM)	Clear Channel	2.5	Alternative	2.5
KXPK(FM)	AMFM Inc.	5.2	New Rock	2.2
KDJM(FM)	AMFM Inc.	2.7	R&B Oldies	2.0
KKFN(AM)	Jefferson-Pilot	2.2	Sports	1.7
KTLK(AM)	Clear Channel	1.6	Talk	0.8
KMXA(AM)	EXCL	1.1	Spanish	0.8
KJMN(FM)	EXCL	0.8	Spanish	0.7
KJME(AM)	Montana Media Inc.	N/A	Spanish	0.7
KVOD(AM)	AMFM Inc.	0.8	Classical	0.6
KNUS(AM)	Salem Comm. Corp.	N/A	Nws/Tlk/Spt	0.5
KCKK(AM)	Jefferson-Pilot	0.8	Country	0.3

Stations are ranked in order of Arbitron Winter '99 12+ share. Copyright 1999 The Arbitron Company. May not be quoted or reproduced without the prior written permission of Arbitron. Other information provided by BIA Research through its MEDIA Access Pro Radio Analyzer Database software.

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► DENVER, continued from page 32 observed shortly before the AMFM/Clear Channel merger was announced.

The most recent firestorm in Denver radio occurred when AMFM unceremoniously moved longtime classical music station KVOD from the FM band to AM, substituting the "Jammin' Oldies" format on the FM signal.

Market Manager Bob Visotcky defied listeners to tell the difference between AM and FM. Classical music devotees were outraged. They protested the decision and continue to hold public meetings to seek alternative solutions.

Meanwhile, Denver's public radio audience has been critical of NPR station KCFR(FM). Since 1991, when Colorado Public Radio was formed, the station has narrowed its classical play list and dropped popular NPR programs such as "Fresh Air." These actions helped CPR buy small stations in towns throughout the state to extend its reach as a statewide organization.

Max Wycisk, Colorado Public Radio president and KCFR manager, allowed that in dividing attention between classical music and news-information audiences, the station has alienated both.

"Our listeners tell us what they want. They say they want two stations, one all-talk and one all-music," Wycisk said.

The station broadcasts appeals for "bequests" from listeners in order to buy a second frequency to split the formats. Wycisk's eventual goal is to take a classical music format national: he's already linked with Los Angeles NPR affiliate KUSC to create a format that

presents the music in a non-pedantic, "human" way.

"The problem for classical music formats is that the cost of radio's 'beachfront property' makes it more difficult to operate," said Jefferson-Pilot's Bob Call. "Eventually, direct-broadcast satellite and Internet broadcasting will fill that gap."

Other public radio stations on what's known as the "Front Range" of the Rockies are KGNU(FM), with Native American programming, and KUVO(FM), known for Latin and jazz programming.

Like all markets, Denver radio faces increasing competition from audio on the Internet as myriad news and music sources seem to grow every month. Many Denver stations are streaming audio.

The market's newest addition is both a broadcast and Internet venture.

Working Assets purchased adult contemporary KBVI(AM) 1490, which had been dark since 1998, from Bolder Valley Investments early this year. On Oct. 20, Working Assets launched KWAB(AM), with progressive news, talk and alternative music programming. KWAB will simulcast real-time via the Internet at www.workingassetsradio.com

Working with a 1 kW station in Boulder, KWAB GM Chuck Lontine sees the Internet as the obvious future.

The locally produced talk and news programming is devoted to liberal causes on issues from the environment to human rights and politics. That suits Boulder's

progressive activist community.

Over \$1 million has been invested in the station with the mission of providing what Lontine calls "radio for change."



Lee Larsen of Clear Channel

The goal is to set up a mini-network of stations — he's looking at properties in Olympia, Wash., and Marin, Calif. — with Boulder as the flagship.

Lontine said it's possible to talk on the air about global warming and local high school football in the same breath.

"Clear Channel (in Bolder) is conservative, in-your-face hot talk and sports," Lontine said. "I was looking for something to compete, to appeal to people's brains."

Lontine acknowledges the launch is risky, but believes commercial radio

these days is almost insulting.

Even the old-style media scene is growing: the market will gain a fifth local TV news outlet early in 2000 when Fox launches a newscast.

Meanwhile, two dailies — The Denver Post and the Denver Rocky Mountain News — are fighting one of the last newspaper wars in the country.

In the aftermath of Denver's 30-year-old classical music institution being yanked from its FM berth, there has been much talk about the digital future for niche formats here. For classical music fans, the answer may be satellite digital radio.

Subscription satellite radio may recreate the radio landscape. Offering 100 or more channels of audio content, CD Radio and XM Satellite will increase competitive pressures in every market.

Another question is the possibility of IBOC digital radio. Like managers elsewhere, the people who run Denver radio stations are watching developments in DAB.

"Local radio will win in the digital world with an in-band, on-channel standard. It's the way that local radio will be able to compete with satellite and keep local radio local," Call said.

The Denver-Boulder market, with its fierce competition, high education levels and interest in new media, is likely to embrace the digital future as quickly as any major market.

■ ■ ■

Joanne Ostrow has been television and radio critic for the Denver Post for 15 years. Previously she was a staff writer for the Washington Post.

Tucson flexes its digital backbone



Shannon Black, on-air talent at KRQQ FM, at the Vadis DC console.

"After looking at several options, we decided on the Vadis platform and DC consoles from Klotz," says John Decker, Chief Engineer, Capstar Communications, Tucson. "Why? First our install would be much faster since most of the plant wiring would be reduced to a simple Ethernet line and a fiber optic cable connecting each room with our rack room.

"Secondly, all four stations were to be housed in the same facility, and we had to share audio sources all around the plant. This is a function that is part of the Klotz system. Our entire plant is now based on a digital audio 'backbone' that provides an improved audio signal.

"We also purchased five DC consoles. The air talent finds the DC consoles simple to operate. They can put any source in our plant on any fader of the console with a simple LCD button in the meter bridge. Giving the operator the ability to call up any source to a fader is great since each operator prefers a different arrangement of sources on the console."

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Flinn Biggest Winner in Auction

Craig Johnston

George Flinn of Memphis-based Flinn Broadcasting was the runaway winner in the FCC's first broadcast spectrum auction, which concluded Oct. 8. He picked up construction permits for FM stations in Des Arc, Ark.; Great Falls, Mont.; Huntsville, Utah; and Grenada, Sardis and State College, Miss.

Flinn said he entered bids for 16 or 18 permits. "As some of them got too high, we had to quit bidding on them. Of the six we did win, half of them were more expensive than I had expected and half cost less, so it evened out."

Flinn, a Memphis radiologist, bought his

first radio station in 1976. Prior to his auction acquisitions, he owed 11 AM and FM stations along with three PAX TV affiliates.

Outlook Communications Inc. won two of the top-10 most expensive construction permits of the auction, in Lexington, Ky. and Mukwonago, Wis. The company is new to broadcast ownership.

"We feel very good about winning both," said Tom Gilligan, one of Outlook's three owners. "We're also glad we didn't get caught up in out of control bidding that, on the surface, seems to have taken place in other markets."

Gilligan of Columbus, Ohio, is an offi-

N.C. He said Outlook was formed "to go after radio stations while we still could."

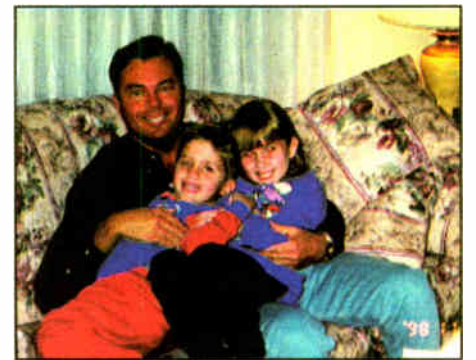
His partners in Outlook Communications, William L. Yde III of Tucson, Ariz. and Donald R. Bussell of Charlotte, N.C. are officers and directors as well as 33 percent stockholders of Media Properties Inc., which holds construction permits for several television stations across Southern and Western states.

Rich rewards

The audio spectrum portion of the auction brought in winning bids totaling more than \$37 million, with another

later begged for buyouts.

In this auction, participants were required to make an up-front payment to the FCC of at least the minimum opening



Outlook co-owner Tom Gilligan sits with his niece and nephew

It's too early to judge the success of this auction process, but we now have a better idea what this spectrum is worth.

— Rep. Billy Tauzin

cer, director and a 25-percent stockholder of Northwest Television Inc. which has pending applications for construction permits for new television stations in Lincoln, Neb., Galesburg, Ill., Holbrook, Ariz., Newton, Iowa, Minden, La. and Greenville,

\$20 million from TV spectrum awarded in the same auction.

The commission is confident that all of the bids will be paid in full. After a wireless auction three years ago that brought in surprisingly high bids, some winners

bid amount for each auction in which they were eligible. Winning bidders were required to supplement their up-front payment (if necessary) to cover a 20 percent down payment by Oct. 26, 12 business days after the close of the auction.

"This auction was procedurally different," said FCC Attorney Lisa Scanlan. "There was no provision for installment payments in this auction, and all of the participants had been competing for these permits for years."

The auction process was the last resort in awarding the construction permits. Following years of unproductive negotiation between competitors, there was a rush to settle prior to the auction, saving the winners the auction price.

Thirty-three AM and FM construction permits that were originally scheduled for auction were pulled off the block prior to bidding.

Newcomer's break

The auction was set up with two levels of bidding credits to give advantage to "new entrants" to mass media. An applicant with no "cognizable" interest in any broadcast facility or other medium of mass communication was given a 35-percent bidding credit.

Applicants with cognizable interest in no more than three mass media facilities were given 25-percent bidding credits. The bidding credits reduce the winning price by the percent indicated.

Of the 94 FM construction permits auctioned, 29 winners had a 35-percent bidding credit, another 17 had a 25-percent bidding credit, and 47 will pay the full winning bid price.

Outlook Communications' final bill from the auction illustrates how the credits are applied.

Outlook won FM50, in Lexington, Ill., part of the Bloomington market, with a winning bid of \$1.03 million, but will only pay the FCC \$772,500 because it qualified for a 25-percent credit.

This scenario repeated itself with the bidding for FM135 in Mukwonago, Wis., part of the Milwaukee market. Outlook bid \$1.68 million, but will pay \$1.26 million for FM135, more than half a million dollars less than the commission's minimum opening bid.

One permit, in Susanville, Calif., received no bids. Scanlan said the Susanville permit will likely be put into the next auction, yet to be scheduled, which will be of the open rather than closed variety.

Eight of the permits received a single bid. The final construction permit award to be settled through the auction, for Hattiesburg, Miss., took 34 rounds of

See AUCTION, page 45 ►

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Coffee: Regular double tall mocha, with whip

Favorite piece of equipment: Cutting Edge Omnia

Hobbies: Antique radios and classic blues

Favorite color: Blue

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IN APPRECIATION

Shepherd: A Master Tale-Teller

Carl Lindemann

When I saw Jean Shepherd's obituary on the wires, the first thing I remembered about him wasn't his legendary career as a tall-tale teller on WOR(AM) in New York.

Nor was it the terrific books and articles he wrote or even his perennially favorite holiday film "A Christmas Story."

Instead, I remembered my encounter with him when I was a teenager in the mid-1970s.

Friend of the family

As it happened, he was an amateur radio friend of my father, W2MLM. One night, he arrived at our door as an unexpected houseguest. Other than his "call," K2ORS, I had no idea of his radio identity. As I was to discover, he gave new meaning to the term ham radio.

Unlike some adults, Shepherd took a keen interest in my 15-year-old tastes. He asked what kind of music I liked. When I shared my appreciation of the Beatles he interrupted, "I was the Beatles' tour manager in the United States."

Naturally, I wanted some inside information about what was going on behind the scenes with the lads. Instead of the usual tawdry tales of groupies and the like, he announced that he was the keeper of a Terrible Truth. It was so terrible, in fact, that I simply would not believe it. So there was no point in revealing it.

Then he feigned an attempt to change the subject.

No such luck. Inevitably, I encouraged him to give me a try. After some pleading, he begrudged me the honor of taking me into his confidence.

What was the "truth" behind the Beatles? Lennon and McCartney did not write those songs, he claimed. A

crack team of Tin Pan Alley songwriters was, in fact, the creative genius behind the band.

"You don't really believe those two guys could have written so many great songs, do you?" He glared at me as if to ask if I was as gullible as the others.

I protested. What about the usual story — Paul as the "feeling" balladeer contrasting with John the "Rocker" revolutionary?

"All part of the image," he said.



A Young Shep On the Air

Respectfully, I offered to disagree with his "interpretation" — I could hardly call our visitor a liar. He wasn't going for my offer of a stalemate.

"See? I told you. You wouldn't believe it. That's why I didn't want to tell you!"

He had me. No matter what, he was right after all.

This was "Shep." Even when the light went off in the "On Air" sign, he was still on. He was one of our greatest storytellers. As such, who cared about the reality behind the story? What's important is the story itself.

His professional radio career began at age 16 doing weekly sportscasts on a local station in Indiana. Starting in

1956, he held the mic at WOR(AM) for 21 years. He began as the overnight announcer there, then became a fixture weeknights from 10:15 to 11p.m.

Long before George Carlin and the rest, Shepherd mastered the art of satire and black humor. He was a satiric, yet sympathetic mix of Lenny Bruce, Mark Twain and Mad Magazine.

Storyteller

At times, his stories took on their own reality. His connection with the "Night People" tuning in on him overnights in 1956 made for a legendary practical joke.

He encouraged listeners to visit local bookstores and ask for a copy of "I, Libertine" by one Fredrick R. Ewing. Agitation for the imaginary novel created both demand and backlash. Purportedly, it was a risqué depiction of court life in eighteenth-century Britain.

This piqued the public's interest — and the scorn of moralists.

Listeners reported reactions to their requests for the book at bookstores. While no bookshop anywhere had "I, Libertine" on its shelves, often store clerks claimed to have read the racy tome and offered praise or criticism for the book. Before the practical joke was exposed, the buzz for "I, Libertine" was national.

"I felt like a guy at the bottom of a mountain who threw a couple of pebbles up and suddenly a 400-trillion-ton avalanche falls on him!" Shepherd recalled in a 1968 interview. Finally, the fantasy was fully realized when he co-authored "I, Libertine" with science fiction writer Theodore Sturgeon.

Shepherd was best known for weaving a world rich with characters, comedy and crisis. His Midwestern tales of Ralph Parker, the Bumpuses, Red

See SHEP, page 43 ▶

Stations Eye Lessons of 'Black Hoes'

Bill Mann

If the recent, nationally broadcast "Black Hoes" promotion/public relations fiasco at Los Angeles Disney station KLOS(FM) on the Mark and Brian Show proved one thing, it's that managers need a well-thought-out game plan in case their own staff gets in hot water.

Disney was sued in August by a KLOS female employee who contends she never received an apology from anyone in the corporation following the six-week Mark and Brian promotion that awarded dark, plastic gardening tools called "black hoes" as gag prizes on the air.

The Congress of Racial Equality



Host Bernie Ward had his own on-air problem not long ago.

was angered by what it said was "too little and too late" when the corporation issued an apology only moments before a CORE press conference to announce a Disney boycott. Following the apology, CORE told the Los Angeles Times that it would call for a national boycott unless Disney promised to revamp the Mark and Brian show.

The Associated Press reported that ABC executives met at CORE headquarters Oct. 18 to talk about the situation. ABC spokeswoman Julie Hoover said, "We agreed to start a dialogue," according to the AP.

What can station managers learn from this and similar controversies? Those who have been there say stations should make plans in advance, so employees know what to do when a promotion goes bad or an air talent lets something inflammatory on the air.

Bob Moore, who watched the Mark and Brian situation blow up across town, is general manager of Infinity talk station KLSX(FM) in Los Angeles. He agreed with his program director, Jack Silver, when Silver said "You need a game plan in mind for situations like that."

Moore has a four-step plan:

One: Don't react immediately.

Knowledge is power. Don't make immediate judgments. Find out exactly what went out over your air. Find

See RAGE, page 40 ▶

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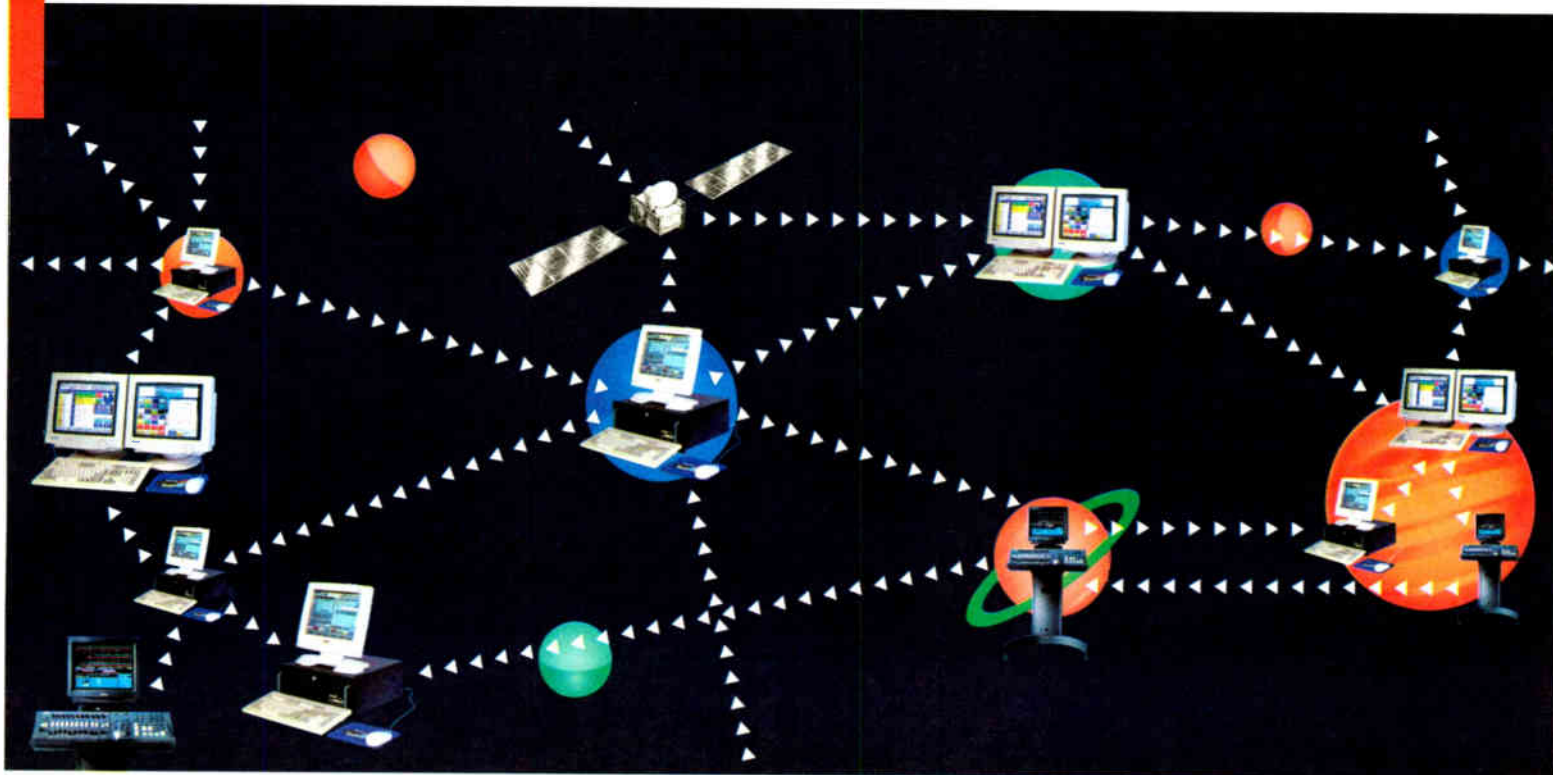
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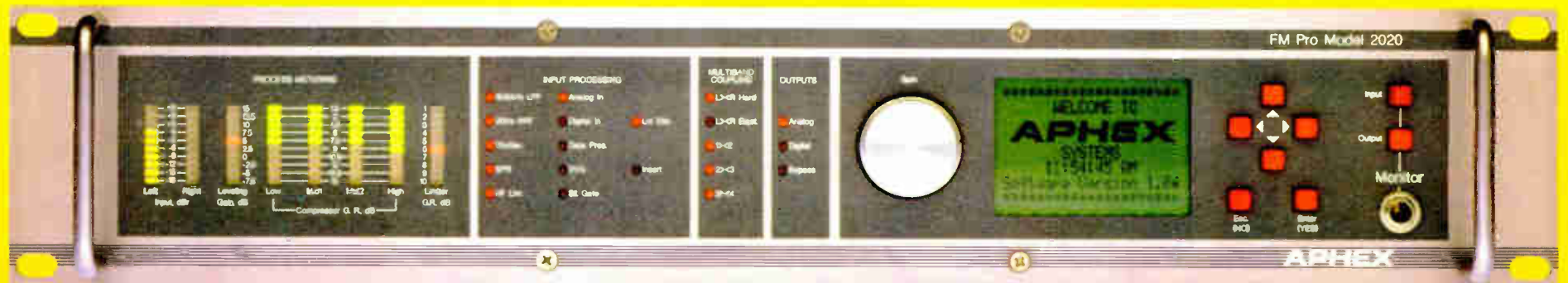
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PROMO POWER

Make Food Talk Pay

Mark Lapidus

I probably shouldn't be writing this article near dinnertime — I can't stop thinking about food. In my present state of hunger, I've started considering how food and radio are inexplicably connected. They are both necessities, meaning that we expect to have them on demand. Each comes in different flavors, with radio having many formats for different tastes and food having many styles for different people. And, it seems that few morning DJs can do a show without being feted on-air by a local restaurant. Does food really have a place on radio? You betcha! Read on and *bon appetite*.

Food for thought

Too often, restaurants are getting free plugs on the airwaves for supplying DJs with food. Sometimes this is straight plug-ola with the jock talking about the supplier on-air without anybody's knowledge, let alone permission. More often, the PD or marketing director knows, but has not alerted the sales department.

Food and radio are inexplicably connected.

Why? Because the feeling is that the DJ may not like the food or restaurant which is selected. If all parties would just communicate their needs, a lot can be accomplished.

Money can be obtained for the plugs, the DJ can get the food he wants, and the PD rest assured that he's satisfied his GM by being "sales friendly."

Is it worth the money? Yes. You'll be pleasantly surprised to learn what some places will pay and deliver when asked. If your morning show doesn't like to eat while on-air (or has a weight problem!), the same thing can be done with coffee and bagels.

Let's move on to remotes and appearances. Do you have food and beverages available for listeners who show their support and interest just by showing up? If not, why not?

You can approach it — s'cuse the pun — piecemeal, or you can cut deals which entitle one supplier — like a sub shop — to do an entire quarter. They get mentions in live liners, thanks, grateful comments from the on-site DJ and many sampling opportunities. Many will even deliver the food when asked.

Web grub

Is there room for food on your Web site? Come on, you know the question is rhetorical. Everybody is in the mad rush to build a database. We all know that the easiest way to get someone's e-mail address is to offer something for free.

Why not create a free food area, where your site surfers can enter to win

by entering their vital stats along with their gastric requests. Highlight winners daily to prove that the contest is legit. You could even create a dining club area where you highlight restaurants that offer half-off deals with a printable coupon from your site.

For example, "Get 50% Off Pizza! Click here."

The link takes them to a page which is a coupon that they can print out and either take to a location or hand to a delivery person. The only caution here is that you must have reasonable traffic

See PROMO, page 43 ▶



Photo credit: Pizza Today Magazine

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Blunders Happen; Plan Ahead

► RAGE, continued from page 36

out the facts. Howard Stern and others have been accused of saying many things they didn't say."

Two: Calmly gather as much professional counseling as you can.

"Your attorneys, your PR firm — get their useful input," Moore said.

Three: Handle the situation delicately and quietly.

"At this point, if your air talent was out of line, give a retraction or suspend him/her. I'm not sure apologies are always called for," Moore said.

The KSLX exec recalled a story about a competitor in L.A., KFI(AM) GM Bob Neal.

"About six months after the Rodney King riots, KFI bought a billboard at the corner of Florence and Normandie reading, 'We Incite L.A.' A number of black groups were upset and stormed into Bob's office. They were aghast when they found out he was an African-American. Bob told them calmly that he wouldn't apologize because 'This is what we do. We put controversial people on the air like Rush Limbaugh, Dr. Laura, and John and Ken. We do incite.'"

Moore said, "When you apologize, you undermine your talent."

Four: Constantly re-instill your company's policies and the FCC rules.

"Tell your talent what you can and can't say, what's a personal attack. What is libel and slander." That alone can head

off a number of potentially bad situations, Moore said.

When to apologize

On the other hand, Jack Swanson of San Francisco's news-talk giant KGO(AM), which recently won a Marconi Award for best major-market station, is big on apologies when something too controversial goes on the air. In

everybody. You sit down and do a lot of listening. We had 30 or so people meet here, including at least one member of the board of supervisors. Do *not* close your door. Do *not* refuse to take calls.

"Open your door. Do a lot of listening. Generally, I've found these groups don't want the talent fired. They want an apology. And they usually get it. I explain we don't want to hurt anyone."

Once you ask performers to dance on the edge of a razor blade, it's a real dangerous situation. One slip can be very damaging.

— Jack Swanson

a politically charged town like San Francisco, Swanson has had plenty of practice at dealing with such situations.

Three years ago, for example, evening talk host Bernie Ward didn't hit the squelch button soon enough and a listener's racial epithet about blacks went over the air. It wasn't a personality or a promotion out of control, of course, but it was still a situation Swanson had to handle nonetheless.

Swanson, who was swamped with angry calls, including one from Mayor Willie Brown, said, "First, you meet with

Said Swanson, who is also an attorney, "Remember, most community groups don't want to be the ones responsible for having a popular personality fired or taken off the air. In my experience, many of these groups want to use such incidents as leverage to get programming directed at their special needs. They want to go into a broadcast station and get a meeting with the top bosses. They already have access, but they may not know that."

Swanson not only must deal with San Francisco's many diverse racial groups,

but also with his city's sizable gay community. He had to defuse a much-publicized situation five years ago on KGO's sister station KSFO(AM). (He is also KSFO's operations manager.)

Swanson eventually fired KSFO right-wing morning air personality J. Paul Emerson — he calls it "one of the toughest situations in my radio career" — after Emerson continued to insist that AIDS could be transmitted through the air, an assertion that infuriated many San Francisco gays.

Hard work

"I spent a whole day at the public library researching the transmission of AIDS," Swanson said, "and there was some documentation that supported Emerson. Plus, he had a physician who came on the air and supported his position.

"It was an untenable situation because J. Paul wasn't going to back down. He was going to keep hammering away at the issue. I don't think the guy was anti-gay, either. But we were being picketed, and it was an ongoing situation that would only get worse, so I had to let him go."

Swanson was asked whether managers today sometimes purposely go out and find controversial air talent because they know they'll get a ratings bump.

"Oh, absolutely. A lot of managers want controversy, then have a hard time dealing with it. And once you ask performers to dance on the edge of a razor blade, it's a real dangerous situation. One slip can be very damaging. This isn't a science. It's an art."

Sometimes, Swanson said, "you hire

See RAGE, page 41 ►

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► RAGE, continued from page 40 someone who's got an edge, and even you're not sure if they go over the line because the line has moved. Five years ago, some of our talk hosts couldn't say a lot of the things they do now. The line of what the public considers good taste has clearly moved."

Atlanta-based consultant Tom Barnes (he includes several top-10 market clients on his roster) agreed. "You need a game plan."

He suggests this one:

"A. You have to have media contacts who can help you put things in context so things don't get out of control. You can just pick up the phone and call them.

"And B. Support your talent publicly — otherwise, they shouldn't be working for you."

Barnes also said it's important to separate the person from the behavior.

"Point out to anyone offended the things your air talent does for the community. Most big names do a lot of com-

Believe me, our listeners will complain. Immediately. I think rock stations, frankly, can get away with more. Country stations are also pretty sensitive to these issues."

"We won't even let the word 'hoes' in a song on our air," Carter said. "If something goes on the air that we get complaints about, we investigate. Then we'll call the talent in and discipline him/her if necessary."

As for as apologies, Carter said, "I prefer to let sleeping dogs lie. Don't make a big deal out of it. But if someone goes to a TV station, for example, then sure, I'll go out and apologize for the station and say we don't condone it and that we've taken steps to make sure it doesn't happen again."

Talk stations get a lot of the heat these days — it seems to go with the territory. Mike Harrison, editor and publisher of talk-

show trade publication Talkers, said many managers these days will sign controversial air talent they know will create controversy.

"But you don't want to build success by hurting people. And it takes a manager with both savvy and diplomacy to tell Jews and blacks that a certain talk host is engaged in a legitimate debate about controversial issues like Israel and affirmative action, for example. A manager has to be damned smart to deal with all this," Harrison said.

"The job of GM or PD of a talk station demands both intellectual credentials and an understanding of some complex sociological issues," Harrison said.

And above all, if your air talent creates a firestorm, Harrison said, "A manager has to be able to think on his or her feet. And if groups come to you and demand an air talent be fired, you have to be prepared to take the heat."



Bob Moore

You don't want to build success by hurting people.

— Mike Harrison

munity service. Certainly encourage your talent to do community work. That way, if something happens they're more likely to be forgiven."

Damage control

Bill Minckler, veteran general manager of Clear Channel's Portland, Ore., highly rated AC outlet KKCW(FM) said, "I'll usually apologize to anyone who's offended if it's helpful. And I'll take listeners' complaints and personally tell them 'thanks for the call.'"

Minckler offered this advice for his fellow managers: "If you want to have a wild and crazy morning show, remember that few do it well. You have to treat listeners with respect. I think Mark and Brian do that, and, yes, Howard Stern does that, too."

Mike Carter, general manager of Kansas City, Mo., urban station KPRS(FM), said, "Black stations are extra-sensitive to community issues.

Too Close for Comfort: KLOS

Some managers from other stations who followed the KLOS "Black Hoes" affair think the station handled it poorly. They had these comments:

Said one general manager, "How many people had to sign off on that? You can't blame Mark and Brian for this. And the reaction by the station was a classic case of the mouth talking before the brain was engaged."

"They did a horrible job of handling it," another GM said. "I can't believe the GM didn't know about it. There's a GM and a PD here who aren't paying attention — and a promotion director who's not communicating."

— Bill Mann

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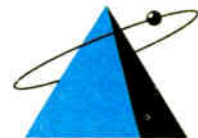
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SpotTaxi Looks to the Net

SpotTaxi.com plans to launch a new radio ad distribution service in January, using the Internet.

SpotTaxi.com said the service was created in response to the lack of high-quality, cost-efficient radio distribution methods. Its Web site will provide integrated traffic instructions, timely billing services and extensive customer support, in addition to access to radio spots via any computer with Internet capabilities.

SpotTaxi.com is a launch of Central Media Inc. of Seattle, supported by a first round of investment by The Ackerly Group.

For more information, contact George Lange at Central Media Inc. in Seattle at (206) 903-3400, send e-mail to georgel@spottaxi.com or circle Reader Service 78.

'Pulse' Celebrates 10 Years

"Pulse of the Planet," the two-minute daily series heard on more than 300 public and commercial stations worldwide, marked its 10th anniversary with a broadcast of its 2,000th show on Oct. 29.

Hosted from its inception by Producer Jim Metzner, "Pulse" has grown from its original, strictly environmental focus to include science,

technology and culture.

"The broader point of view has been very exciting," said Metzner. "And it's fun for listeners because they never know



Jim Metzner collects audio for Pulse of the Planet.

exactly what to expect — they just know the program will be timely, relevant and off the beaten track."

Listeners have heard mountain gorillas barking, ant stridulations, water drumming, camel bleating, elephant seal rumbles and the squeak of the naked mole rat. Human contributors have included naturalist Edward O. Wilson, primatologist Jane Goodall, wildlife expert George Schaller and other notable scientists.

Five two-minute segments are distributed by CD each week, which stations may repeat up to three times.

"I frequently have phone calls from listeners who have heard something on 'Pulse of the Planet' about which they want information," said Leo J. Siedo, program director of KUT(FM) in Austin, Texas.

For more information, contact Keith Brickhouse at Murray Street Productions in New York at (800) 793-1673, send e-mail to pulse@murraystreet.com or circle Reader Service 79.

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While only a fraction of the calls actually make it to the air, Komando promises a reply to any questions e-mailed to her. More than 5 million fans visit her Web site www.komando.com each month and 180,000 receive her weekly newsletter.

Komando also is a columnist for *Radio World*, author of a nationally syndicated newspaper column and computer editor of *Popular Mechanics* magazine.

For more information contact affiliate relations at WestStar TalkRadio Network in Arizona at (602) 381-8200, ext. 200 or circle Reader Service 80.

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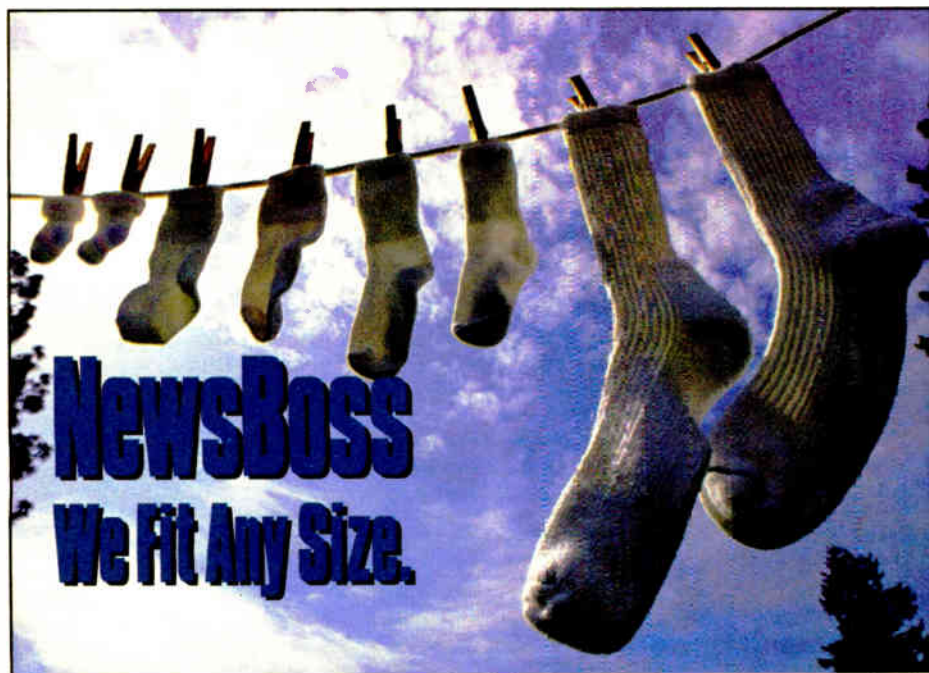
"This will be the first time that people from Buffalo to San Diego to Milan to Cape Town to Sofia, Bulgaria, will be



able to hear the same request and the same song at the same time on their radio," said Ben Manilla, president of Ben Manilla Productions, which handles affiliate sales.

RVN also promotes dialog between listeners via its Web site at www.radiovoyager.com

Stations receive 12 minutes of local See STATION SERVICES, page 44 ▶



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NAB President Eddie Fritts was honored at The John Bayliss Broadcast Foundation Media Roast Oct. 21 at the Pierre Hotel in New York City. From left: John David of NAB; Erica Farber of R&R; Bill Stakelin, Regent Communications; honoree Fritts; Tim Menowsky, AMFM University; and Stu Olds, Katz Radio Group.

Don't Leave Money on The 'Table'

► **PROMO**, continued from page 39 on your Web site — the results are highly measurable. Another Web site area might contain restaurant reviews or simply recommendations.

Before we leave pizza behind, let's not forget that chains deliver thousands of pies in your hot zip codes! Try forging a relationship with one of these dough mongers who is willing to put a flyer on the top of the box promoting your station and something specific to you — like listening at a given time to win something.

If you think it's fun baking a cake in your kitchen, you should try baking/building the world's largest chocolate cake or dishing out your frequency's weight in pasta for national pasta day (if there isn't one, you can always invent one!).

Let's finalize things with fish. If you're near the coast, consider

The easiest way to get someone's e-mail address is to offer something for free.

doing an all-day Fish Festival for the number-one fish caught in your area. Local fisherman love to participate in such ventures and there are many sponsorship opportunities once it's established. It's important to keep the admission either free or low-dough to benefit a charity.

I'd do the next column about tying in weight-loss businesses, but something I heard from a listener gave me pause. She asked me if all radio DJs were fat; she'd heard several DJs that week endorsing weight-loss programs. After I finished laughing, I pondered how she'd feel about hearing so many endorsements for the new laser eye procedures. What's next, vasectomies? Pass the pizza, please. I'm sticking to food.

■■■
Mark Lapidus is the president of Lapidus Media. Reach him via e-mail at lapidus@erols.com

Check out Guy Wire at www.rwonline.com

Jean Shepherd: Story Man, Wit

► **SHEP**, continued from page 36

Ryder BB Guns and the rest came from his radio work. They were collected in his books "In God We Trust — All Others Pay Cash" and "Wanda Hickey's Night Of Golden Memories."

"A Christmas Story" brought these characters to the movie audience. Today, the film has become the Post Modernist substitute for "It's a Wonderful Life" during the holiday season.

Perhaps the most preposterous tale of all is the reality of Shepherd's storytelling talent. He created an entire cosmos of characters from whole cloth on-air. Compare this to what goes into producing the direct descendent of

Shepherd's work, "A Prairie Home Companion."

I was the Beatles' tour manager in the United States.

— Jean Shepherd

Today, it takes Garrison Keillor and a whole staff of gifted writers to create the

world of "Lake Wobegon" on a weekly basis. Shepherd ad-libbed his stories nightly.

Much as he kidded me by raising doubts about the Beatles' ability to pen so many hits, his own talent was, in its own way, of the same stature.

For those versed in the importance of scripts and show-prep, Shepherd's genius for free-form radio seems impossible. With his wit, maintaining a sardonic perspective on life was the only show-prep necessary.

■■■

Carl Lindemann writes frequently about new equipment and the Internet for *Radio World*.

GATEWAYS IP2: LIVE CONNECTION WITH REMOTE SITES VIA INTERNET

**NETWORLD
INTEROP 99**
PARIS - BOOTH P 39



NEW IP2 : gateways to build remote networks.

The IP2 range is essential to connect remote equipment to a technical Intranet network. Accessible via a simple Web Browser, the remote machines can send emails and generate log files.

IP2 :

- V24, Ethernet access and telnet, ftp, http, web servers;
- gateways and proxy: RS32, Modbus ↔ telnet, snmp, http;
- supports: Java applets, cgi scripts, mp3, snmp, smtp;
- ideal in broadcasting products : rack and oem board solutions.

The IP2 gateways are simple to implement and completely open-ended.

And since operating transmission sites in an IP network has now become essential, IP2 is obviously implemented in AZTEC RADIOMEDIA's RDS encoders, Darc encoders, Digiplexers and FMTELS .

Whilst waiting for your applications.



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► **STATION SERVICES**, continued from page 42
 inventory per hour, with two minutes reserved for RVN national spots. The digital feed is available on a market-exclusive basis and embeds cues to allow stations to localize content in either automated or live-assist. RVN also provides customized elements for affiliates.

For additional information, contact Paul Bartishevich at RVN in Ithaca, N.Y., send e-mail to pbart@flpradio.com or circle Reader Service 83.

Green Schemes

Nick Federoff is host of two gardening programs that discuss all aspects of indoor and outdoor gardening and living ideas.

Billed as "the only coast-to-coast friendly gardening show host," Federoff is one, if not the only gardening expert who has a degree in ornamental horticulture and owned a successful landscape business.

"He has both book knowledge and hands-on experience," said George Peterson, spokesman for Environmental Media Broadcasting, a sponsor of "Nick Federoff on Gardening."

"Things Green Minute," also hosted by Federoff, is a 90-second vignette incorporating caller questions, e-mails or timely monologues.

The program is available on standard cassette or as an MP3 file on a market-exclusive basis.

For more information contact Dan



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Stevens in California at (562) 945-6469 or circle Reader Service 82.

Make Your Web Site Look Smart

Radio stations can add "The Talk of the Internet" from LookSmart radio to their Web sites for free.

LookSmart provides "entertaining, original streaming media content from LookSmart radio at no cost or effort for you."

Each LookSmart Radio Show features Net-related and worldwide news,

celebrity guests, Internet stock reports, site reviews, horoscopes and more.

The idea is to provide entertainment to visitors while they use your site. The interactive forum also includes LookSmart Radio backstage, which promises to bring a behind-the-scenes look at the world of music.

LookSmart's distribution model allows a "partner" to link for free to the entire show or to individual segments.

For more information contact Val Landi in California at (415) 597-8555 or circle Reader Service 81.

Celebs Pitch Radio to Advertisers

Radio stars turned out for "Brand-building Through Network Radio" at the Association of National Advertisers' 1999 Annual Conference. The event was held at The Ritz-Carlton in Amelia Island, Fla., in October.

Pictured from left are personality Tom Joyner of ABC Radio Networks; ANA President and CEO John J. Sarsen Jr.; outgoing ANA Chairman John Costello; American Urban Radio Network White House correspondent April Ryan; AMFM's Top 40 host Casey Kasem; Rush Limbaugh of Premiere Radio Networks; and Charles Osgood, host of the "The Osgood Files" on CBS Radio Network.



Photo by Grand Berkhuert

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Dollar Power Wins Radio Space

► AUCTION, continued from page 34 bidding through nine days. Abundant Life Inc. submitted the winning \$879,000 bid, though after its 35-percent bidding credit, the price is reduced to \$571,350.

A winning bid for an FM construction permit does not mean the applicant is home free. Each was required to make any final amendments to their Long-Form Application(s) by Nov. 12. Those applications will be placed on public notice, triggering the 10-day period for filing of petitions to deny.

Flinn said he was impressed with the smoothness of the process.

"It was well-conducted and went like clockwork. Except for one problem with their server, which affected a couple of rounds of bidding, we had our results back between two and three minutes each time."

Flinn's sentiments on the effectiveness of the process were echoed by Gilligan, vice president of Outlook Communications.

"It went well for us, and fortunately we didn't experience any of the problems we had been cautioned about."

FCC Attorney-Advisor Shaun Mahar said that it was smooth from the FCC's standpoint.

"Even though this was the first broadcasting spectrum auction, it was run by the FCC's Wireless Telecommunications Bureau Auctions and Industry Analysis Division. They have overseen more than 20 similar spectrum auctions in the wireless arena. The auction process

Special 'K' Status?

Did a former law partner of FCC Chairman Bill Kennard obtain special consideration for his client in the auction for a CP in Pahrump, Nev.?

Insiders say that the attorney who represented Ramona Lee Hayes-Bell in the FM construction permit auction is a former law partner of Kennard, and that it is highly unusual for the FCC to make exceptions to its filing deadlines, as was the case in special auction No. 27.

Because her up-front payment for the Pahrump permit was not received by the deadline, Hayes-Bell had been disqualified to participate in auction 25. Attributing late payment to an error by Nevada State Bank, Hayes-Bell sought reconsideration by the FCC.

By direction of the office of the chairman, the Hayes-Bell application was reinstated and the Pahrump market was removed from Auction 25 to allow time to reconstitute the pool of applicants.

Kennard was not available for comment on the matter. An FCC spokesperson said Hayes-Bell was granted a payment extension because "her bank did not wire the funds to the FCC's Mellon Bank account as Ms. Hayes-Bell directed them to do. No other consideration was given in this matter."

Both competing applicants, Pahrump Valley Broadcasters Inc. and Milton Bozanic, said they will file objections to the grant of the up-front payment waiver.

Bell was the high bidder for the Pahrump spectrum at \$265,000, which was discounted to \$172,500 due to her 35-percent bidding credit.

— Craig Johnston and Laura Dely

went smoothly, with only slight delays reported on one day."

Auctioning broadcast spectrum came as a result of the federal 1997 Balanced Budget Act, which mandated competitive bidding for deciding the winner among mutually exclusive applications filed after July 1, 1997, and gave the commission discretion on those filed before that date. The FCC chose to settle the earlier applications through the competitive bidding process as well.

This auction, No. 25, was termed a "Closed Auction" because it was open only to those who had filed mutually exclusive applications for the construction permits now being auctioned.

"The fact that this was a Closed Auction made it procedurally all the more challenging," Scanlan said. "We were pleased with the level of participation."

Remote bidding

Bidders could participate online using FCC bidding software or via telephone. The small number who participated by telephone spoke with bidding assistants who entered the bid via computer at the FCC and read the results back to the bidder.

After the termination of the pleading cycle for petitions to deny, the FCC will issue a public notice announcing that it is prepared to award the construction permits of the winning bidders whose applications

are uncontested. Uncontested winners must pay the balance of their bid to the FCC within 10 days following that notice.


Where petitions to deny are filed against a construction permit, the final payment public notice will be delayed until the petitions have been reviewed.

"For better or worse, the auctions seemed a fair way to settle competing licenses," said House Telecommunications Subcommittee Chairman Billy Tauzin, R-La. "It's too early to judge the success of this auction process, but we now have a better idea what this spectrum is worth."

■ ■ ■

Craig Johnston is an independent video, Web and multimedia producer as well as director of IMAS Academy Worldwide, which offers in-country technical seminars to broadcasters. Reach him at Craig@IMASACADEMY.com

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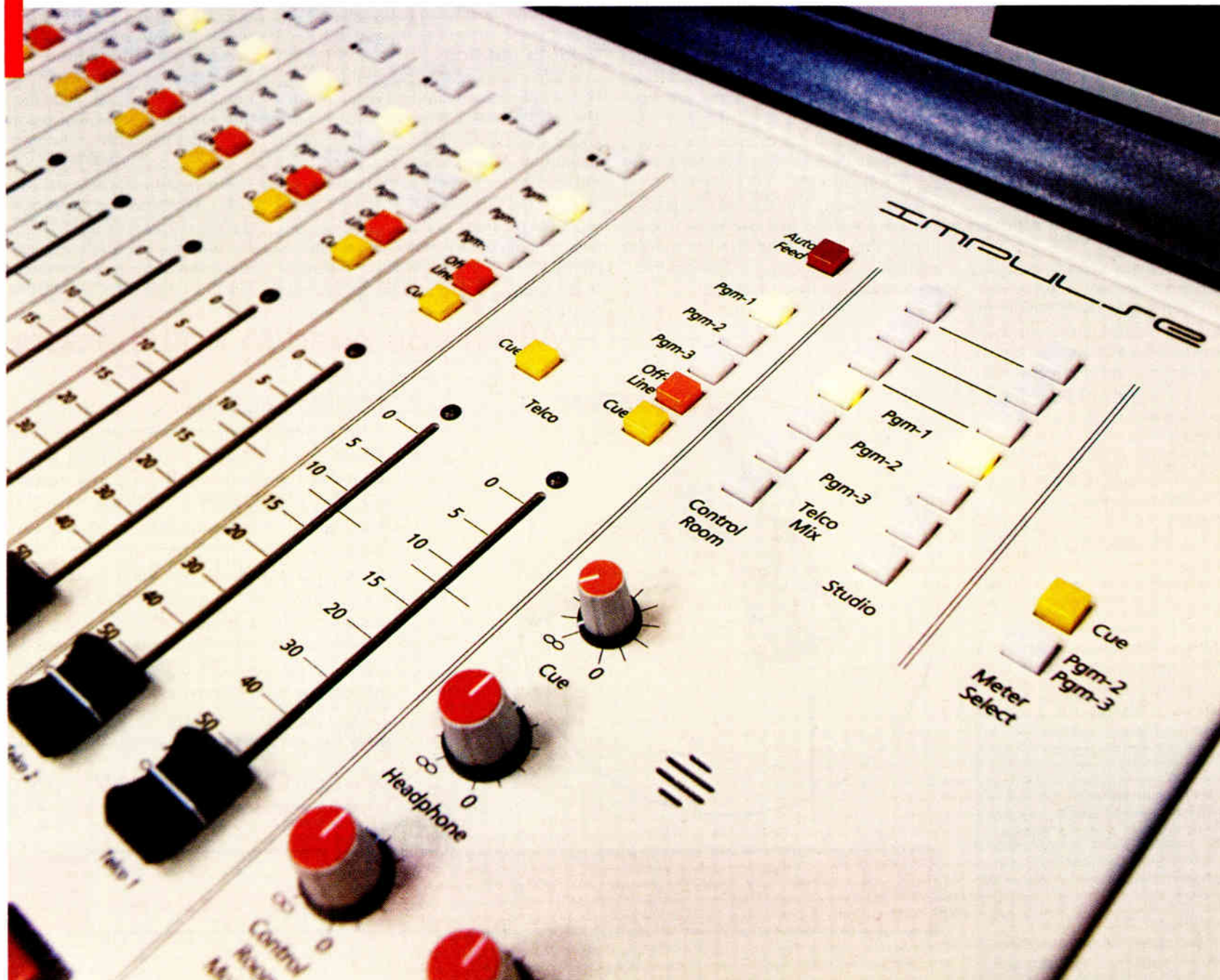


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Page 50**

Radio World

Resource for Radio Production and Recording

November 24, 1999

PRODUCT EVALUATION

Stakes Raised With Vegas Pro

Carl Lindemann

Sonic Foundry's new Vegas Pro multitrack is the long-awaited companion to its Sound Forge audio processing program.

Radio producers often use products created for the pro audio market. Fortunately, the tasks of cutting commercials, creating station imaging and ID spots are simple compared to a pro audio producer's needs.

The production for a music CD typically will require 24 or more tracks. As a production director, I seldom need eight tracks. In fact, four tracks often work fine.

With the proliferation of increasingly complicated multitracking software, radio producers look for software that is made for easy, intuitive use.

Many radio producers are running Sound Forge in the background behind their multitrackers of choice. The downside to this arrangement is that producers have to master two different program interfaces and toggle back and forth.

This is possible for a production director,

but nearly impossible to train air staff to do.

If you have already invested in Sound Forge, Vegas Pro offers integration with a familiar, shared interface. As a standalone, it is more than capable of handling radio production.

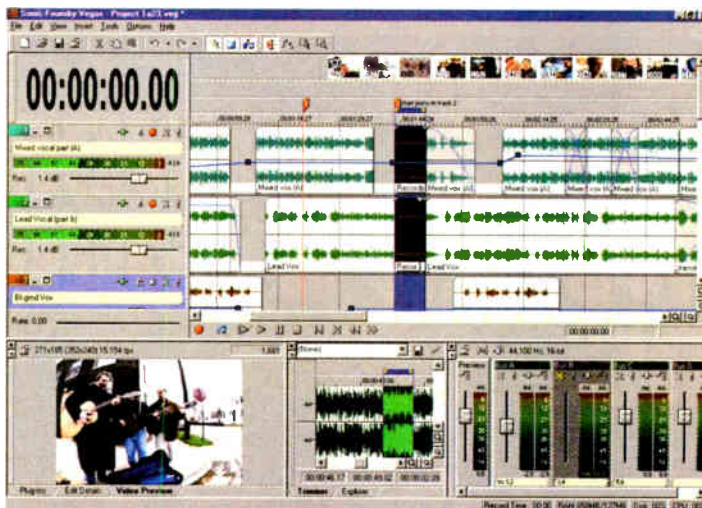
More powerful

Vegas Pro's interface shares a lot with Sound Forge. The zoom in and zoom out buttons are the same, as well as the close adherence to Windows conventions.

There are three key windows to the interface — the track view, the mixer and the trimmer. The trimmer gives a visual representation of the sound-file for splicing. Then, the splice is dropped and

dragged to the track view or the mixer.

I was able to use the program without too much difficulty. Admittedly, I found



the Sound Forge layout simple for the beginner, yet a bit cumbersome for the

advanced user. Vegas Pro has the same feel, but it is a reasonable compromise to serve a range of users.

Vegas Pro has all the basics features and some advanced ones too. It has a wealth of pro audio capabilities such as MIDI and SMPTE time code support, video production tie-ins, 24-bit 96 kHz capabilities and more.

The program can run on as many tracks as your hardware can handle. Even the slowest recommended system, a Pentium 200 with 128 MB of RAM, is more than enough to do the job for radio.

Each track has four-band EQ and compressor inserts, and accommodates DirectX plug-ins. If a user wants to do processing in real time on every track, he or she will need a faster CPU.

Tests of the system on a Pentium II 400 under Windows NT proved it has enough power to handle most anything. Again, these capabilities are more for the pro audio market.

With the multimedia support are several features that are welcome additions to

See VEGAS PRO, page 53 ▶

PAR Excellence: The Best at AES

For the fourth year in a row, the editors of our sister publication Pro Audio Review went through the aisles at the AES show and picked the best new gear on the floor.

Here's a sampler of winners with applications in radio or of special interest to our readers. For more about these products, pick up the November edition of Pro Audio Review or visit www.proaudioreview.com

Our thanks to the writers and editors of PAR for their assistance in compiling this list.



AKG 3000B Cardioid Condenser Mic

AKG quality for under \$500, with a large-diaphragm design and fixed cardioid pattern. Price: \$498 Contact: (800) 878-7571



Alesis Masterlink ML-9600 Master Disk Recorder

As it did with the ADAT, Alesis has come forward with a product for a rea-



sonable price that will have the competition scurrying to play catch-up. Ships with 3.2 GB internal drive. Price: \$1,699. Contact: (310) 255-3400

See PAR, page 54 ▶

PAR chose an unprecedented 34 award winners. Knowing that many pro audio products find a home in radio studios, we thought RW readers would be interested in learning about the best new equipment.

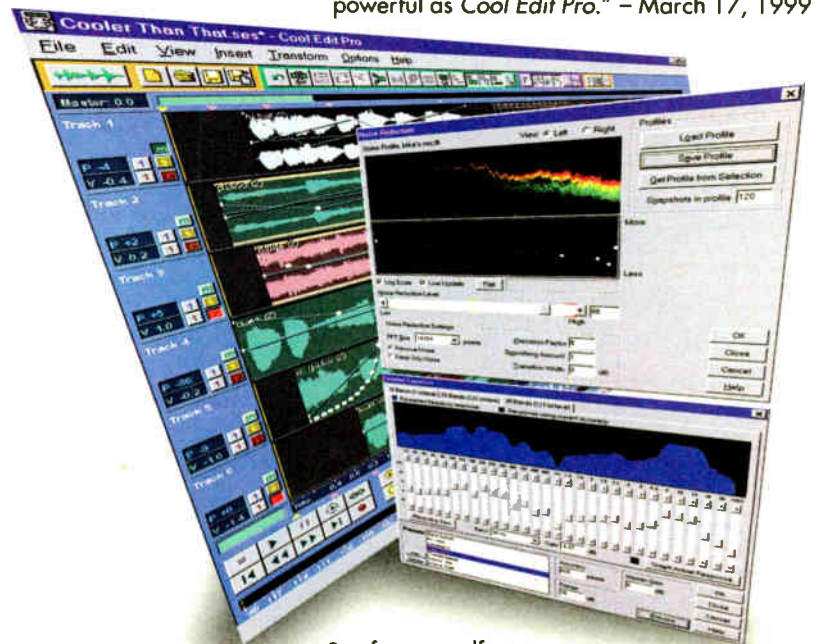
To qualify, a product must represent an innovative idea involving new technology or improve on an existing idea or product and/or increase efficiency for the end user. It must be scheduled to ship by next June. None of the gear was evaluated or bench tested.



Perhaps you've heard the buzz around Cool Edit Pro, the complete software multitrack recording studio. Why is it so popular?

It's so easy to use!

As one user said in Radio World, "When it comes to broadcast production, it is doubtful you will find an easier interface that is as inexpensive yet as powerful as Cool Edit Pro." — March 17, 1999



See for yourself. Download a demonstration version from <http://www.syntrillium.com>, or just give us a call and we'll send you a free demo/tutorial CD. Give Cool Edit Pro a try— you'll be amazed at what you can do!



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Circle (48) On Reader Service Card

New Mics in Abundance at AES

Ty Ford

New mics for a variety of applications were in plentiful supply on the display floor at the AES show this year. Not all were ready to ship, but most are or should be by the time you read this.

Radio users could find plenty for their studio or field applications. Users whose radio work extends to music recording, sound reinforcement and other specialty tasks also enjoyed an array of new products.

Here's a rundown, from A to S. Web sites will help you learn more.

From AEA (www.wesdooley.com) comes the R44CX ribbon mic for \$2,795,

a higher-output ribbon with extended high-frequency response.

AKG (www.akg-acoustics.com) released the C3000B, a 1-inch diaphragm condenser mic for \$498. Also, the new dual-diaphragm, noise-canceling, perspiration-proof, water-resistant CK 77 WR mini lav is available in flesh, white and black for \$300 to \$417 depending on termination.



AEA R44

Alesis (www.alesis.com), which has acquired Groove Tubes Electronics, brought the AM30 FET for \$499, AM40 mini tube for \$799 and AM11 FET for \$399 small-capsule slim-line condenser mics. The same body is used on the AM30 and AM40. The three capsules — cardioid, super-cardioid and omni — are available for \$129 each.



AM30 FET

Astatic (www.astatic.com) showed the new, less-visible 203sm suspended choir mic for \$278. The 215/220 series electret gooseneck podi-

um mic at \$243 and the extremely versatile, multi-patterned 230VP boundary mic for \$420.

Audio-Technica (www.audio-technics.com) is ready to ship the DSP-controlled, five-element AT895 for \$2,495, an adaptive-array microphone system for shotgun field recording. The AT895



AT895 Adaptive-Array Microphone System

Remote for \$2,995 includes pistol grip, zeppelin, shock mount and battery. Its new AT4047/SV cardioid condenser for \$695 claims the characteristics of early FET studio mics.

New from Audix (www.audixusa.com) is the CX-211 condenser for \$649, the bare-bones ADX-50 small electret cardioid for \$259, the ADX-51 for \$329 with pad and roll-off and the ADX-60 boundary mic for \$289.



Audix CX-211

Applied Microphone Technology (www.appliedmic.com) showed its new line of mics designed for individual musical instruments during live or studio performances. Prices range from \$260 to \$790, depending on the particular model and instrument.

The Azden RED (www.azden.com) uses infrared technology. The IRR-20 for \$350 is a two-channel receiver. It works with a handheld IRH-10 for \$165 or a bodypack IRB-10 for \$175. They broadcast over two frequencies and the receiver chooses the stronger signal. The IRD-10 sensor for \$60 can be used to expand the range of the mics.

From Baltic Latvian Universal Electronics (www.bluemic.com) will come the Dragonfly, a Class A, discrete, trans-



BLUE Dragonfly

formerless condenser mic with a rotating capsule grille. The 6-micron gold/aluminum diaphragm mic enters at the bottom of the Blue-line price list at \$1,095.

From beyerdynamic (www.beyerdynamic.com) is the SHM 88 miniature short shotgun and the hypercardioid,

See MICS, page 49 ▶

1 SHOWCASE. 2 NETWORKS. 5 STATIONS. 25 STUDIOS. 300 USERS.

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EMMIS Communications' \$25 million headquarters in Indianapolis did the math and built the most notable radio installation in the U.S. with AudioVAULT as its digital audio delivery system.

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**Solutions for
Tomorrow's Radio**

► MICS, continued from page 48
neodymium M 99 On-Air Announcer and V/O mic for \$795. Also new are the MCE 90 for \$699, a large-capsule, cardioid, electret condenser mic, the SMS 600 wireless IFB monitoring system, the TE 600 battery-powered camera-mount wireless receiver and the S 600/EM 686 wireless shotgun transmitter. The MCD 836 for \$1,799 and MCD 837 for \$1,999 are the world's first 24-bit digital shotgun microphones.



beyerdynamic M99

In addition to Brauner's (www.transaudiogroup.com/brauner/braunermain.html) Valvet two-pattern tube mic for \$2,695, it showed a Klaus Heyne modified VM1 and the original, both with continuously variable pattern, for \$4,995.



Brauner VM1

CAD (www.cadmics.com) had the ME F3 condenser for \$799 and the ME V4 tube mic for \$1,099.

Both are cardioids for broadcast, live and recording applications.

Countryman's new B6 mini lav was on display for \$389.

Crown (www.crownaudio.com) showed a matched pair of its small-diaphragm



CAD ME-V4

CM 700 cardioid condensers for \$589 and the new PZM 11LLWR weather resistant, box-mounted PZM for \$149.

DAP offers the new 3541 vocalist and instrument, large-diaphragm omni mic



Crown CM700

kit, including a solid-state preamp, tube preamp, shock mount and power supply for \$6,000.

Earthworks (www.earthwks.com) showed the SR77 for \$599, a small-cap-



Earthworks SR77

sule studio microphone in brass and aluminum, resulting from new in-house metal working capability.

Lectrosonics (www.lectrosonics.com) showed the new UCR210 wireless broadcast-quality system for \$3,295. The com-

pany also brought the Euro Series wireless IFB system for \$1,600 and the new low-cost UCR100 for \$1,495 for event videographers.

The Microtech Gefell (www.microtechgefell.com) M 990mt for \$1,695 is a new tube condenser with a cardioid pattern. The large pressure gradient gold Mylar transducer comes with the N 920.1 power supply and elastic suspension mount. It also brought the M 930mt and M 940mt for \$795 each; they are cardioid and super-cardioid pattern studio condenser mics with a 7dB-A noise floor and transformer-less output.

This was German Mikrofonbauhaun's (www.mbho.de) first show. MB has a line of dynamic, PZM, measurement, small- and large-diaphragm mics, Jecklin and Schneider discs, mountings and pop screens.

Neumann (www.neumannusa.com) introduced the KMS 105 for \$595, a handheld super-cardioid, live-performance vocal microphone. It boasts 145 dB maximum SPL, reduced handling noise and superior off-axis performance.

Pearl (www.pearl.se) introduced its new MSH10 stereo mic for \$1,910 and showed its MS8 cardioid for \$1,820.

The Schoeps (www.schoeps.de) VariMike Stereo Microphone System comprises two pairs of omni and figure-eight capsules and the DSP-4P microphone processor. The DSP-4P provides AD/DA conversion, pattern manipulation, EQ. Shipping should be by the first of the year; pricing has not yet been set.

Sennheiser (www.sennheiserusa.com) showed the revised MKH 80-A mic and the Evolution 100, 300 and 500 In-ear Monitor series.

Shure (www.shure.com) showed its new low-profile Beta 91 for \$341 and the miniature Beta 98D/S for \$395, which are for live performance and recording applications. The Beta 91 is the successor to the SM91 for kick drum. The Beta 98D/S is a miniature condenser unit designed expressly for toms.

Sony (www.sony.com/proaudio) showed the new WRT-807A for \$780, a wireless performance 800MHz, 10mW output wireless system with 94 PLL-syn-

thesized UHF frequencies. On a single AA battery, the WRT-807A provides five hours of operation.

Soundelux (www.soundelux.com) showed the new continuously variable-patterned U99 tube mic large diaphragm, dual back plate, dual membrane studio mic for \$1,995.

Suppliers: Do you offer a new mic for radio that was not mentioned here? Tell our readers about it. Send e-mail to radioworld@imaspub.com
Check out Ty Ford's equipment reviews and V/O files at www.jagunet.com/~tford
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Denon MiniDisc Deck Succeeds in Cart Style

Allen J. Singer

We were all impressed with the incorporation of the compact disc into radio about 15 years ago, as a medium that could replace the vinyl LP.

What would they think of next? The answer: MD.

For three years, the MiniDisc has been favored by many radio stations as a replacement for cart decks and as a storage medium. MDs offer endless applications — commercials, promos, music, news actualities, the list goes on.

From small markets to networks, MD machines are a permanent part of the hardware landscape. Broadcasters such as Voice of America and National Public Radio incorporated MDs in its broadcasts, and the list continues to grow.

Updates

Denon Electronics has done well by building CD players designed to look and act like cart tape machines. Now the company offers the third generation of MiniDisc Recorders, the DN-M991R.

This sleek deck, sold through pro dealers and carrying a retail price of \$2,299, will slide into the same 1/3-rack space as the professional Denon CD and cart decks, even using the same audio and remote connections.

The record function is done with the optional RC-650.

One new feature is the larger display compared to the old 990. It provides the user a tremendous amount of information. Now the user does not scroll between screens to get needed information.

The deck now offers a standard PS/2 keyboard connector for playback, recording, program input, editing, hot



The DN-M991R MiniDisc Recorder

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See DENON, page 56 ►

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Readers Respond to CD-R Debate

Bruce Bartlett

In our recent discussion about CD-Rs and distortion (RW, Sept. 15), Marty Elliot, chief engineer of B.E.K. Productions, voiced a complaint about a CD-R sent to a local radio station. It sounded distorted over the air, but sounded perfect when played at home.

I asked RW readers for help with this problem, and received several replies. Thanks for your suggestions!

Heating up

SBE Broadcast Engineer Bob Henry at KNME-TV University of New Mexico had this to say.

"I have experienced this particular problem with one of my CD-Rs where the audio sounds distorted. There are times when the audio playing back starts to sound rough. This problem becomes more apparent to the point that the audio will start to cut out or just stop playing altogether.

"I can wait an hour or so, and play the same CD in the same player fine," he said. "There is a rumor that CD-Rs can be affected by heat from the CD player. Therefore, a CD-R may play back better when it's cool, at room temperature, rather than when it becomes warm.

"Bruce is correct about the high

error rates in certain CD players causing distortion due to inadequate error correction. He mentioned that the reflectivity is not as great with CD-Rs compared to standard CDs.

"It should be noted that a CD player's laser does not last forever; it deteriorates with use. A weak laser beam can result in certain audio playback problems.

"Lasers in commercial machines are aligned for standard pre-recorded CDs. The data stream eye pattern that is output from the optical pickup is usually set up to a standard test CD intended for this purpose. Most repair shops have a laser power meter to



Companies are making more and better CD-Rs. But the format has its own special considerations.

determine laser strength and tools for alignment," Henry wrote.

"The dyes used in CD-Rs are not as permanent as the pits in the polycarbonate layer in a pressed CD. The silver and gold dyes promise a much longer storage life, whereas the blue and green have an expected storage

A CD laser doesn't last forever; it deteriorates with use.

— Bob Henry

life of around five years, which is something the manufacturers don't always tell you!

"The belief that digital audio or video will completely stop if the error rate becomes too high is not true in all cases. The better the error correction, the better the data interpolation, thus resulting in a cleaner sounding D/A conversion. Quality of D/A converters can vary between CD players."

Player/disc incompatibility

Tim Starnes, recording engineer at WSCL-FM, responded, "I am an audio engineer for an NPR station in Maryland. I have the same Marantz CDR-630.

"In the past, I have recorded many musical performances on CD-R for air and had no problem during broadcast. I did, however, encounter a problem when I burned a CD-R. It played fine in the Marantz, but then sounded like garbage in other CD players.

"After a long process of elimination, I figured it out. For so long, I've had great luck with Memorex CD-Rs, but then suddenly I got a bad batch! I tried Quantegy CD-Rs with the same setup and it worked everywhere!"

Randy Tanner at the XL Group Inc. said, "A couple of years ago, I invested in a Philips CDD 2600 CD recorder for my computer. I made a test CD-R that sounded as good as expected

"Later, I purchased some Ricoh CD-Rs, made a couple of CDs, and asked a co-worker to listen. He placed the Ricoh in a very early model Discman, and the playback was distorted.

"The best way I can explain the sound is that the digital noise seemed

See RESPONSE, page 53 ▶

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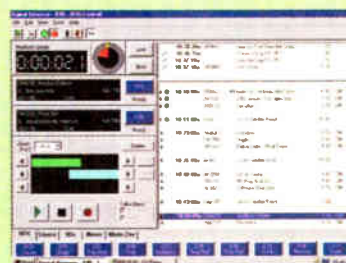
—David Brown at KALS Radio

KALS Radio needed to do more at their station without adding people. So they had some demanding criteria for their new live assist system. It had to be easy to use and maintain. Flexible enough to handle multiple program sources. And not something that would trash their audio quality with heavy compression.

David Brown, Program Director, selected Digital Universe.

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When You Work With Bad Copy

Travis

The recording session was not going too well.

To start with, it was with a new client. When I have not worked with someone before, I am always a little tense.

Though I have enough work to grow reasonably confident of my abilities in the voice-over booth, there is always that little voice in the back of my head asking, "What makes you think you're good enough to do this for a living?"

Even after thousands of successful voice-over jobs over many years, I still worry a bit whenever I work with someone new.

The copy was tough. The writer of the piece apparently had been determined to prove his or her writing ability.

They got the idea that by using big words that nobody understood, combined with lots of alliteration, good voice-over commercial copy *somehow* would result.

It didn't, and it turned me into Elmer Fudd.

The spot had to be done in less than 60 seconds, but it occupied two-and-a-quarter pages of double-spaced copy.

It took 40 takes before I could get all the way through without a mistake, but No. 40 timed out at 70-seconds. The words, "Who wrote this piece of garbage!" came flying out of my mouth.

I already knew that I had said the wrong thing even before the word "garbage" was uttered, but out it came before I had enough self-control to stop myself.

The commercial producer slowly moved his hand toward the talkback button on the console in front of him. I already knew his response.

"I did." He said it with no emotion of any kind that I could detect.

Total silence lasted for what seemed to be over five minutes.

I searched my mind for a way out. I am not one who is prone to this kind of behavior. I am normally a very easy-going individual. Although I can be rattled in a tense situation, I usually have enough composure to deal with impending disaster, just not this time.

Several possible courses of action went through my mind.

I could blow up and storm out of the studio. That might bring a needed feeling of superiority for about 30 seconds, but that hardly seemed a good way to enhance my career or get paid.

I could take the apologetic route, but I could not come up with any way to accomplish that without seeming totally insincere or a complete idiot.

I also tried to create, in my mind, a way to turn the situation into some kind of joke. I looked again at the producer, but I felt like a complete idiot again.

It was the producer who saved me from the situation. The total silence really lasted only about a second; it just seemed to be five minutes. He said, "I guess we need to take some of the copy out if this is going to work. This always happens when I write something at the last minute like this."

My mind just then turned off for what seemed a half-hour, but was only seconds in reality and came back online with a huge sigh of relief.

The producer then deleted about half of the copy from the spot, including all of the alliteration. We finished the spot without further incident.

The producer has since called me in to do a few more spots over the last few years. I have no idea if I would have gotten more calls from him if I hadn't uttered the "garbage" remark.

Dukes of hazard

Poorly written copy is an occupational hazard to the voice-over professional and I get all kinds of copy.

Sometimes, the words sparkle. They just flow from the paper through my lungs and out of my mouth. I can tell I am providing exactly what the writer has in mind on the first take. I don't even have to think or do anything else, when the copy truly is magical. Most of the time, however, the copy is going to be somewhat less magical. Often, the copy simply cannot be read in the time allotted.

When I already know a producer, there is never a problem. I know where the script came from and I have some sense of the producer's sensitivities. There are a few producers, writers and directors with whom I work who expect me to help fix up the script during the session.

Some writer/directors have a real problem accepting changes from talent. If I sense that is the situation, I'll just keep my mouth shut and try to do the best job I can to make the copy work. If there's a problem, it will often become evident to the writer/producer, who will then suggest making changes.

Whenever I start working with a new client, I tactfully or sometimes not so tactfully try to do everything I can to find out who wrote the script. Frequently, that person also will be the director. If the script seems to have problems, I will find out if we have the option of making changes at the session.

I have found the most difficult writers are those who have experience in print media, but are new to writing

spoken word.

They know how to make words look good visually, but do not understand that spoken word is a different medium. Because they are in a different situation, there is a tendency to be a little insecure and extremely resistant to taking suggestions.

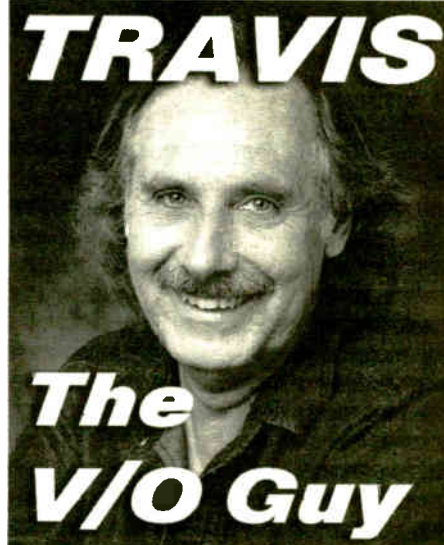
I usually keep my ideas to myself at first. Then after we have worked on a few jobs, I recommend reading the copy out loud as they write. They usually are amazed at the difference.

Take my breath away

The recording engineer can solve some problems. When the spot is running long, cut breaths and replace them with a smaller amount of blank space so the sentences do not seem to run together. This can shave three or four seconds from a 60-second commercial. Time compression algorithms have improved, allowing the engineer to squeeze the spot into a perfect length.

A commercial producer I worked with, who used to cut breaths out of commercials, got a 10-minute video narration project to record and cut all the breaths out of that too. It sounded fine, but when the video was played for the audience, about half way through people started literally gasping for air. Cutting out breaths works well, but be careful how it is used.

During the last few years, copy written by lawyers has become a new prob-



lem. I have done spots where two-thirds of the copy was legal disclaimers. It cannot be changed and they cannot write for the ear. I have found no way around this, except to do everything possible to get all the words in, make them understandable. Then use time compression if all else fails.

One bright spot is that over the years, the quality of copy has improved. I have no idea if it is due to a higher quality of client, if I have been learning to deal with a poor copy, or if use of e-mail is improving everybody's writing.

Better copy does make the job a lot more fun.

■ ■ ■

Travis the V/O Guy is a veteran voice-over artist writing from California. Send e-mail to vo-guy@voice-guy.com

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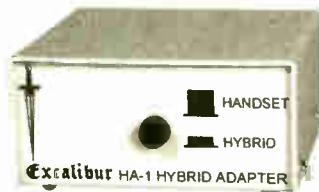
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READER SERVICE NO. 99

CD-R Distortion

► **RESPONSE**, continued from page 50 to follow the modulation of the audio. Ten-percent distortion would not be an exaggeration," Tanner wrote.

"I tried the TDK, and with all other variables remaining, the results were without the distortion.

"I am not blaming the Ricoh CD-R. We each need to find a successful formula, between computer, CD recorder, media, etc. for each individual setup."

Out of phase

Paul Stamler, a writer for Recording magazine, wrote, "When I find a CD manufactured or burned that sounds good on the stereo but badly distorted on the air, most of the time the problem is excessive difference signal.

"Marty should play his CD into an oscilloscope set in XY mode, which puts the left channel horizontal, and the right channel vertical. If a lot of trace shows up in the upper left-hand and lower right-hand corner, that means there is a lot of

out-of-phase material, which is overloading the difference signal portion of the composite signal.

"This phenomenon does not necessarily have to come from out-of-phase material. A disc with excessive separation can cause this, even if the material is in phase. It often does happen, which is why the scope check is useful.

"Alternatively, Marty should try subtracting one channel from the other. If the result is large, there is the problem," Stamler wrote.

"This has nothing to do with the format. The same problem crops up in recordings on tape, commercial CDs and even on LPs, although usually, material with this much difference signal won't cut properly on a lathe."

■■■
Bruce Bartlett is the author of "Practical Recording Techniques 2nd Ed." and "On-Location Recording Techniques" published by Focal Press. Reach him in c/o RW.

Causes of Distortion

Bob Klacza

Several audio enthusiasts and I encountered the phenomenon described by Bruce Bartlett. In analyzing why a CD-R sounds the way it does on certain players, let's start with an overview of CD error correction.

When playing an audio CD, if the data contains no disc reading errors, the audio data is decoded and fed into the D/A converter without alteration. This ideal case occurs rarely, and usually in clean-room conditions.

Three levels of player processing occur when reading errors are detected.

The first level of error detection and correction is a single bit error in a block of data. The Cyclic Redundancy Check Code used in the disc corrects exactly. The data is now a perfect duplicate of what was recorded with no audible defect.

The next level is error concealment. The incorrect bits of audio data are replaced with a straight-line interpolation from the last known good bit of data to the next good bit of data. The audible effect can be a loss of small amounts of high frequencies.

As this interpolation occurs, high-frequency data is the first thing to be lost. The sound from the disc becomes somewhat dulled and distorted. It is easy to get 5 to 8 percent of THD if there are significant amounts of interpolation and test equipment is used to measure the audio output of a high frequency sine waves.

The next step of error processing involves large amounts of bad data, which might make the player mute. The disc will sound dull and garbled.

Most people would eject the disc for normal inspection and cleaning. I have seen discs that were heavily fingerprinted which resulted in complete recovery. Usually the disc is so damaged that it becomes unplayable.

The play-ability defects can be classified into poor recovered RF amplitude and/or excessive noise causing deterioration and misplacement of the waveform's zero crossings points. The recovered RF amplitude can be seen reading the voltage output of the CD player laser pickup.

An oscilloscope eye-pattern is a useful tool to view this by showing the presence of excessive amplitude degradation and waveform noise. In computer data transmission terms, if the eye in the pattern closes, either by diminished amplitude or increased noise, errors occur in the data recovery.

The coating thickness, uniformity and reflectivity uniformity are major components of recovered RF amplitude. Variation and excessive noise can occur from improper cleaning, chemical purity and processing and poor photographic development in the chemical layers. These sound like the phenomena that occurred during the playing of those particular CD-Rs. The station's CD players could not handle the lower amplitude or greater noise.

An extensive Web site for technical CD-R audio measurements is www.pcvtech.com. It shows recovered RF amplitudes and play-ability of many brands of CD-Rs and recorders.

A book that explains the intricacies of error detection, correction and concealment is "The Sony Book of Digital Audio Technology" from Tab Books.

Restoration of CDs and CD-Rs can be accomplished using plastic polishing compounds found in auto paint and finishing supply stores. If only minor reading surface defects are present, Meguiar's #10 Professional Plastic Polish will work. If serious scratches and abrasions are present, start with Meguiar's #17 Professional Plastic Cleaner and follow with #10 Polish.

The author is audio engineer with the Jeep Division of Daimler Chrysler.

Sonic's Inside Straight

► **VEGAS PRO**, continued from page 47 any radio producer's setup. The real-time resampling, scrubbing, and auto-crossfades are terrific.

Usually, there has to be a house sample rate. Mixing and matching audio recorded at different sample rates can be a mess. Typically, playback defaults to the lower sampling rate, so a 48 kHz cut played at 44.1 kHz sounds slow.

Vegas Pro allows combining different sampling rates with different file formats. It worked seamlessly with WAV files on one track and MP3 files on others. The program reads a variety of file formats including AIF, AVI, ASF and WMA. It handled most any source material without having to convert it into the house file format/sampling rate.

Scrubbing is a sticky issue with radio producers. Those trained in the razor and tape era like to listen for edit points. Most digital editors listen with their eyes by looking at the waveform display for the edit points.

The digital equivalent of scrubbing is a challenge for software designers. Vegas Pro has a scrub switch to alter the playback between +2x and -2x speeds, making it easier to find the beginning and ending without having to play back in real time. It is not quite the same as rocking the reels with your hands, but it does a fair job of approximating the experience.

For those that "hear" by looking at the waveform, scrubbing is not as important. Vegas Pro retains the image of the sound file when it is pasted onto the track view.

Some early multitrackers only displayed the waveform in the editor. Matching the breaks in different cuts was strictly hit-or-miss. Having the waveform displayed allows for "hitting the goalposts" faster to line up voiceovers and sound beds.

Another terrific feature is the auto-crossfade. Some systems perform crossfades by putting the segments on separate tracks, which can be a major undertaking to make it sound flawless.

Vegas Pro keeps the segments on the same track, by superimposing them on top of each other. The program processes the fade according to preset levels, which really helps when you are trying to crank out spots.

Betting high

Vegas Pro's \$699 suggested retail price puts it on the higher side for radio products, considering that integration with other Sonic Foundry products like Sound Forge 4.5 and CD Architect will cost a few extra hundred more.

It would be nice if Sonic Foundry offered a "stripped" version geared towards radio, but that is unlikely. Even at a higher price, the program pays for itself in the time and effort saved with its advanced features.

With Vegas Pro, Sonic Foundry now has a complete suite of products for audio production. Poker players might say Sonic Foundry has successfully drawn an inside straight.

Product Capsule: Sonic Foundry Vegas Pro

Thumbs Up

- ✓ State-of-the-art integrated multi-track solution
- ✓ Shares similar interfaces with Sound Forge
- ✓ Excellent auto-crossfade and scrubbing

Thumbs Down

- ✓ Windows-standard interface paradigm somewhat clumsy for advanced users

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► PAR, continued from page 47

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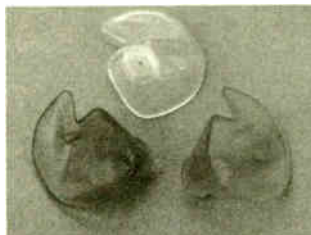
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Nagra Ares-P Handheld Recorder/Player

Nagra brings its Flash RAM digital recording technology into a smaller, lower-priced package.



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Contact: (800) 813-1663

PMC AML1 Active Close-field Loudspeaker

These speakers even sounded great in the booth — which is saying a lot if you've ever been to a loud trade show. A wide sweet spot with nice stereo imaging.
Price: \$4,695 per pair
Contact: (800) 849-2914



Soundelux U99 Microphone
In the tradition of the U95, the variable-pattern U99 ups the ante with its Blue-designed large diaphragm capsule.
Price: \$1,999
Contact: (323) 603-3226



Symetrix 527E Voice Processor

High-gain mic pre with phantom power, high/low cut, comp/limiter, downward expander, three-band para EQ. It is a great mic pre/comp/EQ.
Price: \$599
Contact: (425) 787-3222

Omnia ToolVox

All-digital mic processor from the folks at Telos/Cutting Edge who gave us the on-air Omnia. They did their homework and came up with a one-stop box for the

production studio or on-air use. Deceptively simple looking but feature packed. Bravo!
Price: \$1,980
Contact: (216) 241-7225

Tascam DA-78HR 8-track recorder player

DTRS-based format, 44.1 or 48 kHz record/play at 24-bit word depth.
Price: \$3,199
Contact: (323) 726-0303

TerraSonde Audio Toolbox

An unbelievable bag of testing tricks that a tech, musician, home/project or pro studio owner could benefit from. Winner of a Cool Stuff Award from RW at NAB99.
Price: \$999
Contact: (303) 545-5848

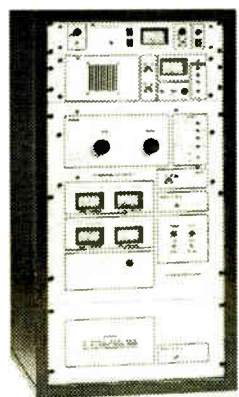


See PAR, page 56 ►

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Reliability

With thousands of stations around the world using our systems, Dalet has the proven expertise to keep your

station on the air. Dalet5.1 goes one step further with Netback2, a powerful utility that complements hardware redundancy (RAID arrays or mirrored servers) by backing up logs and sound files onto a secondary workstation. At a moment's notice, that workstation can be activated and broadcasting restored.

Superior Audio Quality

A variety of high quality sound formats designed to provide stations flexibility in managing their sound libraries is supported. Depending on a station's storage and audio needs, audio can be stored and edited in MPEG and/or LINEAR.



Group Connectivity

Many stations are now part of groups in which operations, production resources, sound files, and schedules must be shared. Stations that are co-located can use a single Dalet system while stations in different sites can easily and cost effectively exchange information and audio over the Internet or Wide Area Network.



Integrated Editors

Surfer and Mix Editor, tools for editing sound files and creating segues, are now easier to use and offer greater precision through the improved use of visual cues and an enhanced scrubbing tool. Additionally, Surfer has been refined with easier to use drag and drop editing, preset zooms, multi-track locators, and time stamping - all of which make editing a breeze. Because both tools are integrated with Dalet5.1, edits, once saved, are available for immediate broadcast.

Music Scheduling

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

- Linear Audio/Mpeg
- Group Connectivity
- Music Scheduling
- Internet Broadcasting
- Archiving
- Backup and Redundancy
- Integrated Editors
- Broadcast History
- Macros
- Year 2000 compliant



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The Amazing Denon MiniDisc

► DENON, continued from page 49 tracks without any breaks, which is great for commercials. A user can program up to 25 tracks for playback per program, with three programs max, for 75 total, and can undo two edits in the event of a mistake.

The unit can auto-record when a signal is detected and now offers automatic lev-

991 is that it can be set to start a second deck while recording if the first disk becomes full.

It has a buffer to prevent skipping. The deck also offers +/- 8 percent pitch control in 0.1 increments, much more flexible than its predecessor.

The DN-M991R features balanced analog I/O XLR and digital I/O with both

in the same space a cart deck or CD player occupies. In fact, the front face resembles a cart deck, as with similar Denon CD models. Just plug- in the audio and get ready to rock and/or roll.

On the front lines

The deck performed as expected. Tom Sandman, the production director of Warm 98 and Mojo 94.9, liked it.

He appreciated the easy recording and playback of clean sound and especially liked the quick accessibility and easy labeling. He noted when playing back actualities recorded on a portable MD, there were not any breakups, digital pops or clicks in the audio.

During the trial period, Tom did use many of the features. He did not care to study the manual to use some of the advanced features, rather than just figuring it out on his own. As a result, he would have liked it better if there were an on-board tutorial for the first-time user.

Denon points out that the features are selectable from the front or by keyboard, but contends that familiarity with the unit helps. Otherwise, from Tom it was thumbs-up.

Denon Electronics is known for its quality. The company incorporates current broadcast philosophies and modern



Production Director Tom Sandman likes his Denon MD.

el setting from -36 to -72dB.

An important feature is the pre-UTOC system that prevents loss of data in case of power failure. The unit also has seamless sleep to prevent additional wear when powered up but not in use.

The most interesting new feature of the

AES/EBU and S/PDIF. Like most MDs, it records at 44.1 kHz, but now has a built-in Sample Rate Converter on the input. It uses a 16-bit A/D converter and an 18-bit D/A converter. The unit weighs 12.8 pounds and is just under 16 inches deep.

Installation was simple. The deck fits

Product Capsule:

Denon DN-M991R
MiniDisc Recorder/Player



Thumbs Up

- ✓ Easy installation
- ✓ Good audio quality
- ✓ Assortment of useful features
- ✓ Easy recording and playback
- ✓ Sleek design



Thumbs Down

- ✓ Must study manual for some features

For more information contact the company in New Jersey at (973) 396-0810, check out the Web site at www.del.denon.com or circle

Reader Service 93.

technologies into the DN-M991R. I agree with Denon when it says this machine offers good features for its price.

Alas, cart decks are on their way out, and the advantages of a MD system far outweigh those of cart decks. The versatility of these little discs allow for maximum flexibility in the environment of the modern radio station, although any station can use them to their benefit.

♦ PRODUCT GUIDE ♦

Products for Radio Production

Mail info and photos to: RW Product Guide, P.O. Box 1214, Falls Church, VA 22041

Audioarts Digital Line Expands

Wheatstone has introduced a second digital Audioarts console, the RD-20.

The company said sales of its RD-12 indicated users wanted a

in North Carolina at (252) 638-7000, send e-mail to sales@wheatstone.com or circle Reader Service 116.



20-position version of the affordable digital board.

The modular RD-20 uses floating point 32-bit DSP processors to handle complex tasks. It accepts analog and digital inputs, processes them in the digital domain and outputs the signal in digital and analog.

The console offers features for talk segments including a digital mix-minus to feed up to four callers on a single, selected bus. It has three stereo busses with digital and analog outs. Digital inputs accept AES/EBU and S/PDIF. An external line preselector accepts eight analog, digital or mixed A/D inputs with both A/D outputs.

Output sample rates are user-selectable at 32, 44.1 or 48 kHz. The RD-20 can output any of those as house sync. Features include two-caller Superphone module, control room/studio modules, clock, timer, optional intercom, and pre-select and tape remote panels.

For information, contact the company

Fairlight Moves HQ to U.S.

Radio equipment users can expect to hear more from Fairlight On Air.

The Fairlight Group Inc. announced it will move its world headquarters from Sydney, Australia, to the new corporate campus in Hollywood, Calif., effective January 1.

President and CEO David Hannay said the United States is the company's largest market.

Audio R&D, as well as design and manufacturing will stay in Australia.

In March, Fairlight acquired Ogenic On Air Systems and then merged with Vamos in September. The companies combined are now called Fairlight On Air.

Vamos has developed a digital storage system for professional broadcast radio use. Ogenic is known for its Virtuoso digital storage system for radio, consoles and turnkey installation and project management services.

For information, call the company in California at (323) 465-0700, visit the Web site www.fairlightogenic.com.au, or circle Reader Service 139.

PAR Excellence

► PAR, continued from page 54

Waves C4 Multi-band Parametric Processor

Waves has always been on the edge of plug-in technology with some of the best sounding products available. The C4 carries on the tradition.

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Other winners of the PAR Excellence Award include:

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API 7600 Input Module

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Crane Song Spider 8-channel Class A mic preamp, mixer and A/D converter

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DK-Audio MSD600M Master Stereo Display

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EVI Audio Sx80

Lightweight speaker system
Contact: (616) 695-6831

Fairlight Merlin Disk-based Multitrack Recorder

Contact: (323) 465-0070

Genelec 1036A Active Monitor

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Neumann KMS 105 Vocalist Microphone

Contact: (860) 434-5220

QSC PTX Series Professional Touring Amplifiers

Contact: (800) 854-4079

Tascam MX-2424 Multitrack Hard Disk Recorder/Editor

Contact: (323) 726-0303

TC Electronic System 6000 Audio Signal Processor

Contact: (805) 373-1828

Sony 8-channel AD-1800RS and DA-1800RS DSD converters

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Sony OxfordR3 V2 Software

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Soundcraft Series TWO Live Sound Console

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Yamaha PM1D Digital Live Sound Console

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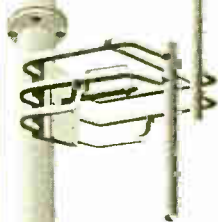
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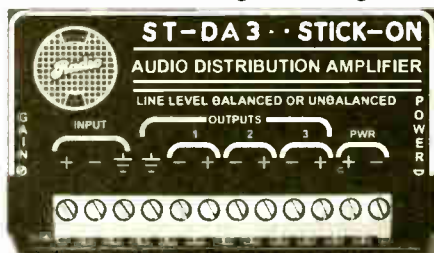
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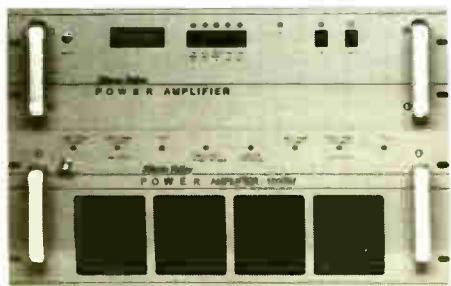


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Buyer's Guide



Tech Updates Inside

Radio World

Source Gear & Studio Essentials

November 24, 1999

USER REPORT

HHB's CDR-850 Burns Affordably

by Rich Rarey
Broadcast/Recording Technician
National Public Radio

WASHINGTON Lately, CD-RW recorders have burst into the market like mosquitoes from standing water.

The folks at HHB Communications Ltd. have introduced a CD-RW recorder worthy of attention from recording studios, radio stations, production houses and other professional venues.

Priced at \$1,249, the HHB model CDR-850 will receive justified attention from musicians and home-audio enthusiasts as well.

The nitty gritty

Make no mistake, the CDR-850 is a production recorder for recording CD-R and CD-RW discs. While the unit is packed with features that allow a variety of input formats, HHB has left out some features that production operations desire in their playback CD decks: variable

speed, time code output, extensive wired transport control and the like.

The CDR-850 comes ready for rack mounting and is only two RU high. HHB thoughtfully mounted the CD drawer above the display, which I find makes things easier if the unit is placed high in a rack.

The rear panel exposes a variety of

control functions, play, record, stop and the like, but neither the jack nor infrared remote offer the finalize function.

The knob I liked the most on the front panel was the input selector. It is a conventional knob that is clearly marked and offers two choices for analog XLR input levels: +4 dBu and -8 dBu. The software menu control allows selection of analog



The CDR-850

signals to the world and accepts a variety in return from digital S/PDIF I/O to unbalanced I/O on RCA. An eight-pin DIN jack exposes wired basic remote-

output level between +4 and -8. The input selector is disabled when the CDR-850 is in record — a nice safety feature.

A concentric analog input-level knob controls left and right analog input levels.

While these two controls travel smoothly together, they resist being set separately. To the left of the input selector are the conventional drawer open/close, record and record mute buttons.

On the CDR-850 the record mute lasts 4 seconds, and longer if one holds the button down. Pressing record sets the recorder up in record-ready mode and pressing the play button initiates recording. The record-ready mode times out after 10 minutes and the recorder drops to stop mode.

The digital-synchro button coordinates digital dubs by activating the track increment when the S/PDIF data stream contains an ID flag. Single cuts or entire CDs, DATs, MDs or DCCs can be copied with CD-R-W track numbers matching the original source.

Unfortunately, track increment signals from modern professional AES/EBU sources aren't recognized by the CDR-850, but provision for track synchronization is made through the conventional "automatic track increment" scheme.

With this scheme, the CDR-850 increments the track when the level falls below a user-selectable value for two seconds. This is used for automatic analog track increments as well, and the menu provides

See HHB, page 63

USER REPORT

NHTPro M-00 Brings in the Power

by Tom Jung
Founder
DMP Music

STANFORD, Conn. Powered speakers have become extremely popular in pro audio over the past year or so due to price/performance issues, as well as convenience. Powered monitors now

with a built-in power amplifier. The configuration is a two-way acoustic suspension design, housing a 4-1/2-inch treated paper woofer and a 1-inch soft fabric dome tweeter. The drivers are proprietary and designed in-house.

A high-current, fully discrete 75 W (continuous RMS) amplifier powers



The NHTPro M-00: No Longer Passive

come in all shapes, sizes and power capabilities, and can benefit radio users.

The NHTPro M-00 (\$375 each, retail) falls into the smallish category, measuring in at just 9 x 5.7 x 7.3 inches. Originally designed as the passive consumer speaker, the Super 0, NHT Pro M-00 was redesigned in a cast-aluminum zinc alloy enclosure

both the woofer and tweeter through a passive crossover centered at 2.2 kHz. Peak acoustical power is rated at 111 dB SPL at 1 meter, which is high for a monitor this size but, based on my listening test, the M-00 will more than likely do it. The frequency response is rated at 93 Hz to 20 kHz

See NHTPro, page 63

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Cart #	Cart Name	Length	Buttons
348	Marines	:30	1 Stop
218	Coca Cola	:60	2 Rdy
398	Pizza Hut	:60	3 Rdy
			4 Stop
			5 Stop
			6 Stop

00:02:03 Loop Trip Unload

12:16:35

On The Air

Time	Cart	Title	Artist	Length	Intro	End	Type
12:13:07	L025	Liner # 2		00:55			LC
12:13:12	M1012	Photograph	Def Leppard	04:54	:22		F MUS
12:18:06	M2174	Friends	Elton John	02:20	:05		C MUS
12:20:26	M1732	Dance The Night	Van Halen	02:47	:13		F MUS
12:23:13	V026	Voice Track 26		00:12			VTK
12:23:25	DALIVE	SPOT SET		03:00			I COM
12:26:25	J011	Jingle / Fast		00:06			Jin
12:26:31	M0713	Listen To Her Heart	Tom Petty	02:48	:11		C MUS
12:29:19	V027	Voice Track 27		00:15			VTK
12:29:34	M2214	Black Friday	Steely Dan	03:40	:12		F MUS
12:33:14	M0015	All Day Music	War	04:04	:19		F MUS
12:37:18	L015	Liner # 15		00:15			LC

00:03:23

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TECH UPDATES

Acoustical Solutions

Signature Ceiling Sound Blocker Tiles from Acoustical Solutions feature an inch-thick 6.0 PCF high-density fiberglass core; foil-backed, mass-loaded flexible barrier for high STC requirements; a variety of standard facing, colors, textures and patterns; and standard lay-in tiles with regular edge reveal available.

Other features include three finishes: Two mil white pebble grain, white nubby cloth or Signature white fabric. Its acoustical properties feature an NRC rating of .80-.90 and an STC rating of 26-single pass. The tile's core, fabric and adhesive are fire rated at class A-ASTM E-84.

For more information contact Acoustical Solutions in Virginia at (800) 782-5742, fax (804) 346-8808, visit www.acousticalsolutions.com or circle Reader Service 62.

Alesis

The MasterLink ML-9600 from Alesis is a mixdown and mastering system that combines hard-disk recording and editing, digital signal processing and CD creation in a single unit.

The unit stores, delivers and plays stereo 24-bit, 96 kHz audio on standard recordable CDs and can also produce and playback conventional 16-bit, 44.1 kHz Red Book format CDs.

MasterLink features a 3.2 GB internal hard drive with editing signal processing and mastering functions, a 4X CD-R and 24-bit A/D and D/A converters.

The MasterLink also marks the

debut of CD24, an Alesis technology that enhances the resolution of Red Book standard audio CDs. MasterLink uses standard CD-R media to write 24-bit/96 kHz.

Because MasterLink CD24 files are common AIFF audio files tagged with a proprietary header for playback on the unit itself, audio data written to disc in the CD24 format can also be imported as AIFF files into current digital audio workstations. The MasterLink ML-9600 list price is \$1,699.

For more information contact Alesis in California at (310) 255-3400, fax (310) 255-3401, visit the Web site at www.alesis.com or circle Reader Service 94.

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TerraSonde

The Audio Toolbox is a DSP-powered, hand-held test, measurement and acoustic analysis device. Manufactured by TerraSonde, it includes balanced and unbalanced I/O, a built-in microphone and speaker, graphical LCD display and encoder knob.

The unit runs on AC or battery. A single encoder knob, resulting in a point-and-click user interface, operates all functions, and the user can upgrade software in the field.

Functions include acoustic analysis, sound level meter, real-time analyzer (1/12 octave with 20 memories), energy-time graph with delay calculation, RT60, speaker/mic/equipment polarity, and noise criteria.

Test functions include signal generator (sine and square wave, white and pink noise), stereo dB level meter, frequency counter, S/N, sweeps (including amplitude, impedance, sine wave), sample scope with phase meter and distortion meter.

The Audio Toolbox includes an instrument tuner; timecode reader, generator and analyzer with frame rate reader; MIDI analyzer/generator; headphone monitor amplifier; phantom power

tester; and cable tester.

In addition to the standard plastic case version, TerraSonde offers a rack-mount version, which will be released in January. The rack-mount version, the Audio Toolbox Plus, will feature an anodized-aluminum case and a built-in rechargeable battery system.



For more information contact TerraSonde in Colorado at (303) 545-5848 or (888) 433 2821, fax (303) 545-5848, visit www.TerraSonde.com or circle Reader Service 63.

Radio Design Labs

The RU-SM16 Digital Audio Meter from Radio Design Labs is designed for applications in which audio level metering is to be designed into a system, or added to existing equipment.

The RU-SM16 has two line-level inputs — each input permits the connection of balanced or unbalanced, high- or low-impedance audio lines. Connections are made using full-size barrier block terminals.

Jumpers on the rear panel allow the installer to set each meter individually for either peak or average audio level display.

In stereo applications, either peak or average typically is selected. In monaural installations, it may be

advantageous to feed the mono source to both meters, setting one for peak and the other for average. In either mode, the upper three LEDs (+10, +14, +18) remain in the peak-hold mode.



The RU-SM16 uses large LEDs for visibility. Each channel input has a write-on label area for identification of the source or function being metered.

For more information contact Radio Design Labs in California at (800) 281-2683, fax (805) 684-9316, visit the Web site at www.rdl.net or circle Reader Service 64.

Neumann M 147 Tube

The M 147 Tube from Neumann is a vacuum tube condenser microphone with cardioid characteristics.

The mic is built around the K 47 dual diaphragm capsule, inherited from the model's predecessors, the U 47 and the M 49.

Following the capsule is a tube that functions as an impedance converter. The next stage is a transformerless output circuit that features a low self-noise level.

The M 147 Tube can feed long microphone cables without affecting the quality of the audio signal.

The microphone is delivered as a set in an aluminum case and includes a microphone cable, a metal swivel mount for a mic stand, and a compact universal power supply for standard main sockets.

For more information contact

Neumann in Connecticut at (860) 434-5220, fax (860) 434-3148, visit the Web site at www.neumannusa.com or circle Reader Service 65.



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Circle (45) On Reader Service Card

World Radio History

TECH UPDATES

Nagra C-PP

The C-PP from Nagra combines the features of a digital recorder, non-destructive digital editor and ISDN codec in one unit.

There are two balanced line outputs as well as one AES/EBU digital output. Input levels are continuously variable for the microphones and software selectable for the line inputs. Analog output levels are software selectable.

Recording is performed on PCMCIA in a variety of compression algorithms with programmable automatic level

control. They include G.711 a-law and u-law, G.722 and MPEG-1 layer II at 64 kbps up to 192 kbps in mono or joint stereo. Sampling frequencies are selectable to 16, 24, 32 and 48 kHz.

With individual card sizes up to 192 megabytes, over three hours of stereo or six hours of mono recording can be placed on one card. The optional ISDN feature provides 64 kbps transmission of digital recordings with live audio feed if desired.

For more information contact Nagra in Tennessee at (800) 813-1663, fax (615) 726-5189, visit www.nagra.com or circle Reader Service 66.

Radio Systems

StudioHub from Radio Systems is a pre-wired cabling system for digital-ready operation. Utilizing CAT-5 shielded twisted-pair cables, StudioHub routes both analog and digital signals throughout a facility.

It's a wiring system consisting of pre-made patch cables, RJ-45 connectors, special connecting blocks and companion amplifiers that are designed to plug in and work together in any studio. Because StudioHub uses CAT-5 data cable, it works equally well for analog and digital studio wiring.

The CAT-5 cable used in StudioHub

consists of four tightly twisted pairs, surrounded by one common foil shield and drain wire.

StudioHub features pre-made source cables for studio gear and quick-connect blocks and peripheral amplifiers to harness studio gear together. System components quick-connect with RJ-45 jacks, and peripheral products are powered by the built-in "DC-link" system. The DC-link system powers up any active component when plugged into StudioHub.

For more information contact Radio Systems in New Jersey at (609) 467-8000, fax (609) 467-3044, visit the Web site at www.radiosystems.com or circle Reader Service 67.



Jeff DePolo wires StudioHub engineering wall in Roanoke, Va.

Klotz VADIS 3d

The VADIS 3d digital audio system is a global platform for mixing console and control surface manufacturers serving the broadcast, audio recording, multimedia and sound reinforcement industries.

The system is made by Klotz Digital Audio Communications.

VADIS interface cards emulate all popular audio formats. As a result, both analog and digital equipment can be connected to the VADIS media platform. External digital equipment can be connected to the VADIS platform via digital interfaces.

Analog inputs fed to the VADIS platform are converted using high-quality analog-to-digital converters and can be output from the network in standard digital formats as well as in analog form.

Data transport within the VADIS network is by way of fiber-optic connections. The system has the ability of a transfer rate of more than 1.5 Gigabits per second.

Due to the VADIS Klotz BIAN fiber optic network, which can be either a

star-network, a ring-network or a combination of both, a VADIS platform is able to distribute an unlimited number of audio channels.

Once audio data has been connected to a VADIS platform, it can be made available to any producer for his/her own productions without leaving the network.

The VADIS DSP modules allows



users to mix audio data from any source from the platform as required without losing the original audio signal — which remains available to all other users as well as in linear form for production purposes.

For more information contact Klotz Digital America at (678) 966-9900, fax (678) 966-9903, visit the Web site at www.klotzdigital.com or circle Reader Service 70.

Ward-Beck

The POD line of broadcast problem solvers is growing. The family of products from Ward-Beck includes analog and digital audio amplifiers; switchers; meters; analog video switchers; and utility DC control modules.

PODs are sized as half-rack units. They may be mounted singly or in pairs, or used as freestanding table-top equipment. PODs are housed in aluminum chassis and have their own integral power supplies.

Models include a balanced/unbalanced converter; 6 x 1 stereo switcher; stereo level VU meter; dual mic preamplifier; dual headset amplifier; miniature stereo headset amplifier; universal interface; stereo audio distribution amplifier; digital 6 x 1 AES3 switcher; digital audio monitor; digital reclocking distribution amp.

For more information contact Ward-Beck Systems Ltd. in Ontario at (800) 771-2556, fax (416) 335-5202, visit www.wbsltd.com or circle Reader Service 68.

Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

Automating Programs? No Problem!



The NEW SUB-03 Subaudible Tone Decoder

You can use the Sub-03 to automate your network feeds or take the guess work out of when to cut away from networks. The decoder listens to your audio source and gives you dry contact closures from any service that sends subaudible tones, including satellite receivers, RPU's and POTS frequency extenders. The decoder's relay contacts interface easily with your automation system. The Sub-03 is a reliable and inexpensive problem solver. The Sub-03 can be ordered set for 50/75Hz operation. Rack mount option (as shown) available. List Price only \$329.00. Check our website for more info or to download the latest manuals.

The Sub-03's features include:

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READER SERVICE NO. 160

HHB Delivers CD-R

► HHB, continued from page 59

six values from -66 dB to -36 dB. For AES/EBU and analog-source track incrementing, the "auto/manual track no" button must be set to auto (a segment in the display shows auto track).

For recordings initiated by the digital-synchro button, the auto track setting is irrelevant, although the user can press the write (manual) track button to manually increment a track (spoiling the synchronization).

Three buttons control the placement and erasure of skip IDs, which are supported by a growing number of CD players. Pressing skip ID twice writes a skip ID associated with the current track to the CDR-850's memory. Ejecting the disc will force the skip IDs to be written to the disc. When the disc is reinserted into the recorder, the IDs are recognized and the CDR-850 enters skip/play mode, where tracks with a skip ID are ignored.

Pressing the skip/play button turns this mode off and all tracks are revealed. Skip IDs can be removed by pressing the clear skip ID button twice. The erase button can be used for CD-RW discs. Pressing erase once sets the recorder to erase the last track recorded.

Pressing pause initiates the erasure, which takes only a few seconds. If the user wants to wipe the entire disc, pressing the erase button twice sets the recorder to erase all the tracks on the disc. As a safety feature, erasure cannot occur until the LED above the disc drawer flashes orange — that is, button strokes are not forward-stored. If one presses pause before the LED flashes and then decides against erasure, no harm is done.

When the CD-R-RW disc has the material and skip IDs arranged as desired, pressing the finalize button writes the table of contents onto the disc. The CDR-850 takes about four minutes to complete the finalization process.

The CDR-850 worked out of the box and pleasantly surprised me with its functionality along the way.

Filling the niche

Overall, I liked the HHB CDR-850 for its design and features, including the easy-to-understand display prompting.

I found the only serious weakness to be the manual, which was laid out in three languages. The English instructions were, as with many manuals, frequently stilted and syntactically odd-ball. And the unit is not very intuitive — i.e., "pause" initiates an erasure, "skip ID set" confirms a menu change, pressing "skip ID clear" twice confirms that you wish to delete a skip ID, etc.

Those inconveniences aside, the HHB CDR-850 fills a real need for rewritable CD burning, both for the home and project user and in the studio.

For information contact HHB in California at (310) 319-1111, fax (310) 319-1311, visit www.hhb.co.uk or circle Reader Service 60.

NHTPro M-00 Monitors Audio

► NHTPro continued from page 59
+/- 2 dB, which, while certainly not full range, is respectable for a monitor

winner's circle. Sold separately at \$375 each, retail, there are many monitoring situations where the M-00s fill

portable mix-down monitor, video and post-production, broadcast, mobile recording, home studio, 5.1 systems, fixed installation and distributed sound systems.

Virtually any place small accurate monitors are needed.

■ ■ ■

Tom Jung is the technical consultant for RW's sister publication, *Pro Audio Review*.

For more information contact NHTPro in California at (877) 464-8776, fax (707) 751-0271, visit the Web site at www.NHTPro.com or circle Reader Service 61.

Their full magnetic shielding makes them ideal for high-quality workstation monitoring.

of this size.

On the drawing board is a companion subwoofer called an S-00. This subwoofer is being designed to work with the roll-off characteristics of the M-00. The combination of the 00s should make an interesting full-range system.

Well-thought-out controls

Controls are minimal but well-thought-out. A distance proximity switch provides midfield and nearfield positions, the latter creating a gentle attenuation of high frequencies to compensate for HF absorption in-air — and it works. Switchable input sensitivity for either -10 or +4 dBu makes it compatible in almost all monitoring situations.

The M-00 automatically senses an incoming signal and powers up the internal amplifier from its standby mode.

Conversely, after 10 minutes with no signal present, the M-00 automatically powers down. In instances where the auto power feature is not wanted, it may be defeated with the auto on switch.

Both XLR and 1/4-inch unbalanced inputs are provided with the ability to daisy chain from one of the unused parallel connectors to a second M-00 — a nice feature for small commercial installations.

An RCA unbalance input is also available.

Getting the playback

Where the M-00 really shines is in a small environment where natural acoustic bass buildup makes larger speakers sound boomy. The M-00's high output capability, combined with the gentle roll-off of a sealed enclosure, lets the speaker couple nicely with small room acoustics.

Their full magnetic shielding makes them ideal for high-quality workstation monitoring.

With the forthcoming subwoofer, NHT Pro will have a nice, full-range, compact monitoring system.

The frequency response is fairly smooth, with a gentle roll-off starting at about 100 Hz. At 80 Hz, a high-pass filter kicks in with a fourth-order roll-off, thus protecting the small but powerful 4-1/2 inches woofer.

NHTPro also offers two other larger powered monitors: the A-10 and the A-20. These systems do not have built-in amplifiers. Both products include system-specific control amplifiers with more adjustment capabilities to help compensate for room acoustics.

When it comes to size, performance and price, the M-00 is definitely in the

the bill — compact audio workstations, high-end computer audio,

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The Master Control Studio, shown right, is one of seven Arrakis studios in Sony's Manhattan network origination center for SW Networks.



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TECH UPDATES

Acoustics First

The Art Diffusor, from **Acoustics First**, is designed to diffuse the mid and upper frequencies without affecting bass.

The Art Diffusor is a fully patented "binary array" design based on the work of Dr. Manfred Robert Schroeder. It is available in various configurations for recording, broadcast, theater and home listening rooms.

The original design, the model W, covers a bandwidth of 125 Hz through 16 kHz. It is available in a choice of seven hardwoods finished to order.

The model E provides the same bandwidth in an economical EPS plastic. However, even this model is available in 30 custom finishes.

The model C mounts in a standard ceiling grid and is available in fire-rated plastic with optional cutout for lights, speakers and sprinklers. The shallow model F reduces "flutter" with little pro-

trusion into the room.

The range of the Art Diffusor is extended over other designs via its angled end cap. This further controls specular reflections above 4 kHz.

For more information contact **Acoustics First Corp.** in Virginia at (804) 342-2900, fax (804) 342-1107, visit www.acousticsfirst.com or circle **Reader Service 71**.



Encoder, Remote Control From CircuitWerkes

The SEN-6 by **CircuitWerkes** is a single-channel, sub-audible tone encoder capable of generating 25 Hz, 35 Hz, 25/35 Hz combos, 50 Hz, 75 Hz and a combo 50/75 Hz.

The SEN-6 features tunable notch filtering for 25 and 35 Hz and an active, balanced, audio input and output. Custom frequencies are available upon request. The frequencies can be changed in the field by replacing one chip and retuning the notch filters.

A second "test mode" output port is provided so that the user can set tone levels without removing the SEN-6 from the audio chain. Remote control is provided from either screw terminals or a D-9 connector. The SEN-6 list price is \$399.

CircuitWerkes' DR-10 is a micro-processor based remote control that lets user operate studio equipment from a telephone.

It automatically answers the phone on a user-set number of rings and waits

for entry of the password (from none to eight digits), after which the DR-10's relays can be individually operated or programmed for momentary, latching or interlocked operation.

Each relay can be programmed to decode any of the 16 DTMF tones. Any relay can be tied to any other for modes such as latching and interlocked. Relays can return a beep acknowledge tone that tells the user when an output has been activated.

The DR-10 includes a two-tone sequence mode and an anti-falsing delay mode that prevent accidental contact closures when used for remote broadcasts. It has a simple hybrid and active, balanced audio in and out.

The Silencer option can be used to remove DTMF tones from the output audio. The DR-10 is priced at \$399 or \$548 with the Silencer option installed.

For more information contact **CircuitWerkes** in Florida at (352) 335-6555, fax (352) 380-0230, visit www.circuitwerkes.com or circle **Reader Service 72**.

New Tascam CD/Cassette Deck

The CD-A700 CD player and auto-reverse cassette deck features flexible output architecture and has balanced XLR and unbalanced RCA analog I/O and coaxial (S/PDIF) digital output. It is made by **Tascam**.



The unit features a 12-percent pitch control for both CD and cassette, and D-sub 15-pin parallel control I/O.

The CD-A700's CD and cassette operations work independently of one another except in CD-to-cassette dubbing. The CD Sync feature duplicates

program material from CD to cassette in a single-button command.

Other features include CD/cassette continuous play, individual counters, and CD Shuffle Play, Repeat Play, Intro Check, Program Play, Single Play, Fader Start/Stop, Event Start, Stop, Track Skip and Play Tally.

Cassette features include CPS, RTZ,

Play Forward, Play Reverse, Stop, Fast Forward, Rewind, Ready and Play Tally.

For more information contact **Tascam** in California at (323) 726-0303, fax (323) 727-7635, visit www.tascam.com or circle **Reader Service 73**.

Audio Technologies Inc.

Audio Technologies Inc.'s ML 200 Nanoamp is a dual microphone-to-line amplifier.

The unit has servo balanced line outputs at +22dBm. It also features front-panel selection of phantom power and preamp gain and an input/output peak flasher.

The direct instrumentation amplifier input stage yields -70 dBm, 20 Hz to 20 kHz noise performance and prevents the ringing-response and distortion problems of high-ratio input transformers.

External UL and

CE approved 24 VDC remote power modules drive several Nanoamps. The units can stack or rack mount one, two or three Nanoamps in 1-3/4 inches.

For more information contact **ATI** in Pennsylvania at (215) 443-0330, fax (215) 434-0394, visit www.atiguys.com or circle **Reader Service 75**.



Marantz CD Players

Marantz adds three new units to its professional family of compact disc players: the PMD330, PMD331 and PMD340.

All models feature a multi-function programmable cue button that enables control of playback; a 10-digit keypad for access of up to 99 tracks; A-B point audio loop playback; audible frame-by-frame search control; index searching; 21 preset functions for tailoring user preferences; digital pitch control (+/- 12 percent); and scrolling CD-Text display in five languages.

Each model includes RCA analog outputs, digital (S/PDIF format) coaxial output and RC5 remote input/output. Each can play CD-RW discs recorded on CD-RW compatible recorders.

The PMD331 and PMD340 offer all of the features of the PMD330. In addition, both provide the following

interfaces for versatile installation: XLR analog I/O, optical digital output, XLR (S/PDIF format) digital output, and a GPI port with fader start.

Also, the PMD331 and PMD340 each include a jog-wheel digital encoder that can control pitch or enable faster searches for cue points, pitch bend, an instant start feature, and a 10-



second audio buffer.

Exclusive to the PMD340 is a CD mechanism designed to hold up to heavy daily use and intensive track and disc changes.

The PMD330 has a suggested retail price of \$499; the PMD331 is \$629 and the PMD340 lists for \$789.

For more information, contact **Superscope Technologies Inc.** in Illinois at (630) 820-4800 (ext. 291), fax (630) 820-8103, visit www.superscope-marantzpro.com or circle **Reader Service 74**.

Benchmark A/D

The AD2404-96 is a four-channel audio A-to-D converter by **Benchmark Media Systems**. This converter system provides word lengths of up to 24-bit, and sample rates up to 96 kHz.

THD+N is -110 dB measured at -1 dB FS and the A-weighted dynamic range is 117.5 dB.



The unit includes selectable 16, 20 and 24-bit word lengths; sample rates of 44.1, 48, 88.2 and 96 kHz as well as varispeed; and digital-to-digital re-dithering. When operating in the 20-bit and 16-bit modes, the converter provides either TPDF or up to three choices of noise-shaped re-dithering.

The dual-cable function provides either normal or half-speed output of 96 kHz digital audio. A "dual port" option allows simultaneous output of both 24-bit data and 16 or 20-bit reduced word length data.

Intrinsic clock jitter is less than 9 picoseconds. The AD2404-96's phase-locked-loop eliminates jitter-induced

sidebands and provides clean lockup to an AES reference with block, frame and sample alignment.

Four nine-segment true-digital meters provide both a coarse scale for signal presence monitoring and a fine scale for precise level monitoring near Full-Scale-Digital. The 1 dB fine scale also has a selectable peak hold function that holds the highest peak until manually reset.

FSD detection is exact. Several different motherboards provide a choice of

digital interface connectors (XLR and BNC). All analog connectors are balanced XLR.

The AD2404-96 has an international power supply and is housed in a heavy, RF-tight chassis. An optional external redundant power supply provides power for up to 10 four-channel systems. The supply can also be operated as a dual non-redundant supply for powering up to 20 converters. An eight-channel A-to-D converter is also available.

For more information contact **Benchmark Media Systems Inc.** in New York at (315) 437-6300 or (800) 262-4675, fax (315) 437-8119, visit www.benchmarkmedia.com or circle **Reader Service 76**.

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Radio Systems DA 16 dist amp, gd cond, \$225. J Felz, 310-546-6451.

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Dynamax CTR30 R/P 3 stack stereo cart; Spotmaster 2100 stereo cart player; BE 2100C R/P single mono cart. B Dunnavant, 256-830-8300.

ITC cart machines, call for details. J Phillips, 419-782-8591.

ITC Delta (4) 3 stack stereo cart players; (6) ITC Delta single stereo cart players; ITC 3 stack stereo player. B Dunnavant, 256-830-8300.

WANT TO BUY

College FM radio station near Nashville is looking for company that refurbishes/tunes up ITC Delta Triple stack cart machines, Contact Howard Espravnik, 615-230-3618 or mre885@aol.com.

CD PLAYERS

WANT TO SELL

Denon DN951 CD player. B Dunnavant, WZYP, 256-830-8300.

Pioneer PDTM1 & PDTM2 triple 6-pak CD player, used w/Pristine system, most work, some for parts, \$1500/all +shpg. M Casey, 803-275-4444.

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Collins IC6A console (parts). B Dunnavant, WZYP, 256-830-8300.

Ramko DC38; Collins 212; Gates Yard 80; Gates The Producer; McMartin B-501; Ampro 8 chnl, BE dual PGM, Custom Langevin, Electrodyne, WE electric tube console. Call for details. J Phillips, 419-782-8591.

Sparta A-15, \$125. W Dougherty Jr, 573-998-3117.

Yamaha MR 1642, 15 inputs, 4 groups, stereo outs, hi, mid, low sweepable EQ, 3 aux sends, talkback & meters, \$300 +shpg. Philipp, 512-472-8975.

Logtek 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 lk-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

Console modules for RCA BC-7/BC-8 solid state consolelets. BA-71/72 preamp, BA-73 program amp, BX-71 power supply, BA-74 program amp, BA-78 cue amp. J Ballard, 201-348-7492.

Soundcraft 600/800, Tascam 2600, Auditronics 110A, Mackie 1604, Neotek Elite. W Gunn, 760-320-0728.

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Harris MSP; Texar Audio Prism; CRL SG-800, call for details. J Phillips, 419-782-8591.

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Orban Optimod 9100B, very clean, \$2500. K Smith, 517-732-2341.

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Station/Studio Services		\$175		

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ACTION-GRAM

EQUIPMENT LISTINGS

Radio World's Broadcast Equipment Exchange provides a FREE listing service for radio stations and recording studios only. All other end users will be charged. This FREE service does not apply to Employment Help Wanted ads or Stations For Sale ads. These are published on a paid basis only. Send your listings to us by filling out the form below. Please be aware that it takes one month for listings to appear. The listings run for two consecutive issues and must be resubmitted in order to run again. Thank you.

Please print and include all information:

Contact Name _____
 Title _____
 Company/Station _____
 Address _____
 City/State _____
 Zip Code _____
 Telephone _____

Are you currently a subscriber to Radio World?
 Yes No

Signature _____ Date _____
 Please check only one entry for each category:

I. Type of Firm

D. Combination AM/FM station F. Recording Studio
 A. Commercial AM station K. Syndicators/Service Providers
 M. Ind. Engineer
 B. Commercial FM station G. Audio for Video/TV Station
 C. Educational FM station H. Consultant/ind engineer
 E. Network/group owner I. Mfg. distributor or dealer
 L. Consultant J. Other
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II. Job Function

A. Ownership G. Sales
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 C. Engineering F. Other (specify)
 J. Promotion K. Production Mgt or Staff
 H. Programming/production

WTS WTB Category: _____
 Make: _____ Model: _____
 Brief Description: _____

 Price: _____

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 Make: _____ Model: _____
 Brief Description: _____

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WTS WTB Category: _____
 Make: _____ Model: _____
 Brief Description: _____

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*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

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◆ READERS FORUM ◆

DAB is a DUD

Dear RW,

I am a listener and am so disgusted by the offerings that I have been writing letters in support of anything that will solve the basic problem: Too few people owning too many stations. No diversity.

A slight increase in sound quality of inferior narrow programming will not solve the problem.

The problem radio has is not technology, it is what value system decides what is programmed.

I am waiting for the cost of cell-phone time in the United States to come down to world standards so that I can plug my Qualcomm "smart phone" into my car radio and surf RealAudio and MP3 "stations" on the Internet while I drive.

From what I have heard of digital radio and TV, it will be an utter farce, a mess of biblical proportions because the signals will be so fragile that rabbit ears and Walkmans will be worthless.

I have rarely bought a radio and I don't intend to start now.

DAB is a DUD as long as so few will

own so many. By the way, that is why Internet audio streaming does nothing for most radio stations, the programming stinks!

Luckily, there are some that stand out among the crowd, like Webactive.com, The Womb, etc. But those are all the same kind of people that never seem to win the anointment of the FCC.

I propose that we see if we can guide the IBOC snowball to a harmless cliff and get on with repealing the 1996 Telecom Act that is the real source of trouble.

Check out the Web site at <http://members.tripod.com/rad4rest-of-us/Solutions.htm#Digital>

Christopher Maxwell

Technician talk

Dear RW,

As a "POT" (Plain Ole Technician), I could be wrong, but perhaps you could ask one of your staff engineers about the accuracy in a statement made by Ed Montgomery in the story "Learn the Basics of Monitoring" in the Oct. 13 RW.

He states that the VU meter "is used to

that we are lucky to have.

We agreed to try the CAT-5 wire and see how the project progressed. If problems were encountered during the wiring stages, we could always abandon the CAT-5 and go with the more standard shielded-pair wire.

The lack of grounds was of interest to my assistant in Lancaster in particular, because of ground-related hum problems with ground loops introduced by poor power supplied by the utility company and the lack of a good common ground potential within the building.

To make a long story short, both studios are completed with absolutely no shielded wire used except for the microphone inputs, which are wired directly to each of the four studio mics.

The only problem we ran into was the need to run a separate ground wire from the console to the Comrex HotLine box in the Lancaster facility to correct a hum on this input. That ground was unnecessary in Reading, for whatever reason.

The studios are clean, quiet and sound fabulous, all on CAT-5 wire!

John Arndt

Director of Engineering
Clear Channel Broadcasting Inc.
Reading, Pa.

CAT-5 comments

Dear RW,

I read Frank McCoy's article "StudioHub Puts CAT-5 to Work" (RW, Oct. 13) about studio audio wiring with CAT-5 wire with no surprise.

We recently had capital improvement projects that included new FM studios for WRFY-FM in Reading, Pa., and WLAN-FM in Lancaster, Pa.

As these projects came near, I sat down with my assistant engineer in Lancaster and discussed how we would tackle them, keep both stations on the air and do a complete tear-out and rebuild of the old studios, not just a new console and furniture.

During these planning stages, I told my assistant that a few years back, a local TV station had done some rewiring of their facilities with CAT-5 wire with great success. I thought that we might want to try the same thing in our new studios.

Because of the different twisting per inch of the individual pairs in the cable, it was proposed to have excellent cross-talk characteristics. Grounding each piece of equipment is not really necessary in the rather low RF environment

Dollars for Diversity

The Prism Fund is a step in the right direction. The fund aims to make capital available to encourage minority and female ownership of radio and TV stations. It will be co-chaired by Lowry Mays of Clear Channel and Mel Karmazin of CBS.

Fund money will be managed by Chase Manhattan Corp. Its decisions will be independent of the industry investors. With an initial stake of \$175 million, the founders hope to raise more from broadcasters and institutional investors. They hope it will reach \$1 billion in purchasing power.

Groups that have contributed include A.H. Belo, Bonneville, CBS/Infinity, Clear Channel, Cox, Cumulus Media, Disney/ABC, Emmis, Fox, Granite Broadcasting, NBC, Radio One, Susquehanna, Tribune and Viacom. Counting Chase Capital Partners, there are 17 initial contributors with an average stake of \$10.3 million.

Questions come to mind after a glance at the recent sale prices of broadcast real estate. How many stations can a billion dollars really buy?

Will most of it be used toward the purchase of stand-alone stations? If so, how well can stand-alones do in the consolidated marketplace? How soon will funds be distributed? How will the fund decide who is worthy of support?

We'll learn soon. Meanwhile, it's easy to be cynical about the timing of this fund. It comes during a period of scrutiny over the huge mergers of Clear Channel/AMFM and CBS/Viacom, and following a year of pressure from FCC Chairman Kennard, champion of diversity.

And the bottom line certainly plays a role. The Prism Fund is a for-profit investment venture, as fund manager Reg Hollander emphasized.

But the founders of the fund deserve praise. Even if it is a relatively modest start, considering the scope of today's deals, it is also the first time any industry has voluntarily stepped forward to finance diversity in its ownership ranks, according to NAB. That's commendable.

And hundreds of millions of dollars is better than none.

At least the founding partners of the Prism Fund believe it will grow, and enrich them, and add color to the ranks of American media.

— RW

indicate the input levels into a console."

Having done a few "proofs," I always thought the VU meter was telling me what was coming out of the console. How could it measure input when those coffee-stained, cigarette ash-lined variable potentiometers lie in the path between the inputs and the VU meter?

Another item cogent to the discussion is that of ballistics. If I recall correctly, the speed and acceleration of the VU meter needle are rigidly defined. While not being a really "peak-reading" device, all VU meter needles should have the same rise time so that board operators can migrate from board to board and use the same level-adjustment procedures.

Brad Rohrer, KICTK
Owner
Wireless Works
Annapolis, Md.

Ed Montgomery replies:

The reader is right, the VU meter usually does reflect the output signal from the board.

However, it also indicates how a level must be adjusted from various input levels so the continuity of the output remains the same from source to source.

The intent in that part of the article was to emphasize that the outputs must remain constant from various inputs.

Mishkind murmurs

Dear RW,

Thank you for permission to quote from Barry Mishkind's Sept. 29 article on computer viruses ("Don't Let a Virus Get You Down").

Barry's words are so valuable that I would like to send quotes to friends in my address book.

Robert L. Greaige
Owner/Manager
Sentry Protection Services
Bayonet Point, Fla.

Write to Us

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READERS FORUM

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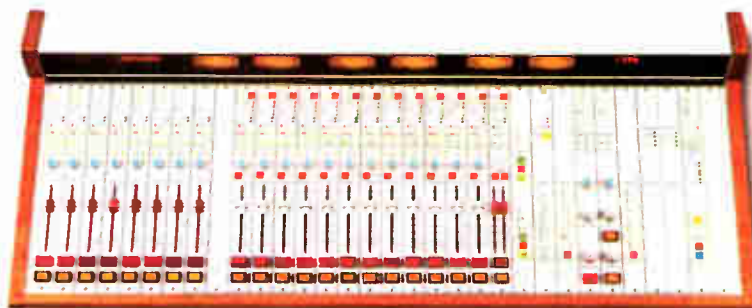


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