Radio World®

Digital Editing & Production in Buyer's Guide

Vol 21, No 5 | Radio's Best Read Newspaper | March 5, 1997

CEMAManeuvers on DAR, Takes on DAB

by Matt Spangler

ATLANTA The NAB criticized the Consumer Electronics Manufacturers Association for asking the FCC to abandon DARS spectrum auctions and instead allocate existing spectrum to DAB.

Specifically, the DAB system CEMA members endorse is the Eureka-147 DAB.

NAB President and CEO Edward O. Fritts called the move by CEMA "underhanded, backhanded tactics." He spoke at last month's Radio Advertising Bureau Marketing & Leadership Conference.

He hinted that NAB will have more to say on the topic.

"If CEMA's looking for a fight, they damn sure found one," Fritts said.

The *ex parte* filing with the FCC said, in essence, that the association's DAB field tests, which included testing of the VOA/JPL S-band (satellite) system, show that satellite DAB service is unworkable because it can't be "seamless." In mobile testing, the satellite signal was not received smoothly and continuously.

"DAR cannot be successfully provided at S-band or on existing frequencies using IBOC/IBAC methods," the filing stated. "The commission must immediately reconsider its proposal to use the S-band spectrum for purposes of providing DAR within the U.S."

Lon Levin of American Mobile Radio, a DARS proponent, said that satellite systems never claimed to provide seamless coverage.

CEMA President Gary Shapiro

NAB President Edward O. Fritts

"Seamless coverage was not the issue," he said. "Seamless coverage is only achieved by a combination of satellites and terrestrial, which is what we've proposed."

The filing also stated that CEMA conclusions about the satellite service "are consistent with the FCC's own DAR Pioneer Preference Panel findings that the proposed S-band services would require substantial terrestrial buildout in order to be viable as a seamless service."

Last year the FCC panel recommended that the commission deny "pioneer preference" to CD Radio, the first company to apply for the right to offer DARS services. The preference guarantees a company a license for distributing a service.

CEMA concluded by recommending that the FCC consider allocating spectrum other than the S-band — L-band (1452 - 1492 MHz), VHF or UHF — to DAB.

In a draft report released in January, the CEMA DAR subcommittee said that, of all systems it had tested, only the Eureka-147 L-band system "offers the

See DAB, page 6 ▶

FCC Responds to Rep. Dingell on Liquor Ads

by Bob Rusk

WASHINGTON In a strongly worded letter to Rep. John D. Dingell, D-Mich., Federal Communications Commission Chairman Reed E. Hundt reiterated his stance that distilled spirits advertising on radio and television demands scrutiny.

Dingell, a ranking member of the House Commerce Committee, wrote Hundt asking for an explanation of the commission's authority to regulate alcoholic beverage advertising.

Rep. John D. Dingell

Dingell wrote that the members of his committee "have been closely observing the developing controversy surrounding beverage alcohol advertising." Dingell wrote: "... we view with great seriousness the role of the Congress in this controversy. As we consider the issues surrounding broadcast advertising for beverage alcohol, I want to understand more fully your views and those of each of your fellow commissioners about your agency's ability, competence and jurisdiction to address those issues."

A commission divided?

Dingell addressed nine areas, which included whether the Telecommunications Act gives the FCC "the ability to censor

See DINGELL, page 6 ▶

Digital Radio Highlights. . .
See Center Spread For Special 8-Page Supplement

Circle (8) On Render Service Card

Minority Radio Ownership Drop Seen by NTIA

by Jacqueline Conciatore

WASHINGTON Minority ownership of commercial radio stations is likely to show a decline from 1995 figures, according to an official of the National Telecommunications and Information Administration.

The percentage of stations owned or controlled by minorities — largely black and Hispanic broadcasters — has held fairly steady, at 2.9 percent, since 1992. But Clear Channel Communications' $140 million acquisition of US Radio, based in Philadelphia, helped bring the numbers down. Ragan Henry's US Radio — 13 FMs and 5 AMs — was the second-largest radio holding by a minority, said LaVern James of NTIA.

Although NTIA's Minority Telecommunications Development Program (MTDP) hasn't finished its

See NTIA, page 8 ▶

World Radio History

NEWSWATCH

FCC Lengthens License Terms

WASHINGTON The Federal Communications Commission has extended the term of a broadcast license to eight years. The Telecommunications Act of 1996 gave the FCC authority to extend the licenses from the previous term of seven years. Translator and auxiliary licenses were also extended to eight years.

Media Access Project had requested that the public interest requirement for stations be extended in exchange for lengthening the license term. The commission rejected this request.

For those stations whose license renewals were granted in the current cycle, the licenses were extended to eight years as well. The license renewal application deadline for those stations in the current cycle is not affected.

NPR VP Buzenberg Resigns

WASHINGTON Bill Buzenberg, vice president for news and information of National Public Radio, resigned in January amid speculation that he was forced out by NPR President Delano Lewis. Buzenberg had been with NPR for 18 years, seven in his last position. Rumors of friction between Buzenberg and Lewis had surfaced for at least two of those years.

Some at NPR speculated that Buzenberg and Lewis had management philosophies that clashed. John Dinges, a former managing editor with NPR, said, "It's clear that Bill Buzenberg is not a corporate manager, and that's the thing Del most holds against him."

Others thought that Lewis held Buzenberg accountable for the EEO controversy that has plagued NPR recently and produced three lawsuits alleging racial/gender/religious discrimination. Buzenberg said that this was never an issue, and further defended his record with minority hiring and promotion.

Lewis claimed that he and Buzenberg had arrived at a "mutual" decision.

Buzenberg expressed interest in coming back to the news department as a reporter. During his sabbatical, he plans to co-author a book with his wife about former CBS News President Richard Salant.

An NPR spokesman said the news department hopes to hire a replacement before the Public Radio Conference in June.

DOJ Looks Further into Cox Purchase in Syracuse

ATLANTA The Department of Justice issued a civil investigative demand (CID) to Cox Radio last month due to its planned purchase of NewCity Communications, which would give Cox a total of five stations in the Syracuse, N.Y., market. It doesn't appear that the DOJ action will hold up the deal.

Cox completed its Hart-Scott-Rodino (HSR) filing last July, giving Justice

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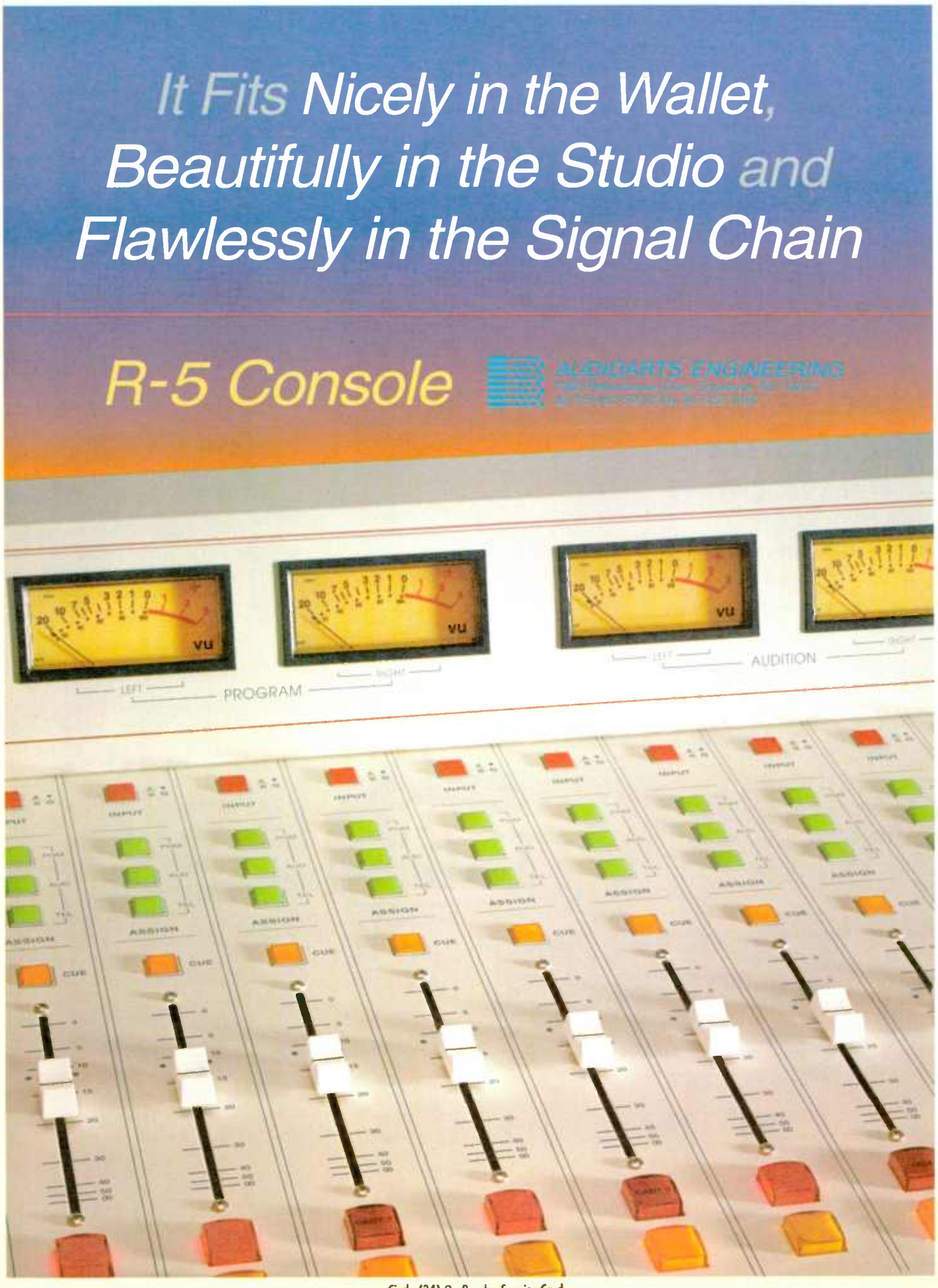

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No Light for Some Dark Stations

by Matt Spangler

WASHINGTON The lights have been turned out for good for a handful of stations that have been off the air for 12 consecutive months. On Feb. 10 the Federal Communications Commission revoked the licenses of 32 silent stations — 23 AM and 9 FM.

The FCC ruling, mandated by the Telecommunications Act of 1996, states that the license of a broadcast station that remains off the air for any consecutive 12-month period will expire "notwithstanding any provision, term or condition of the license to the contrary." Feb. 7 marked the one-year anniversary of the passage of the legislation.

The number of stations set to expire decreased significantly in the last week before the deadline, from 118 (87 AM and 31 FM) to 32.

About 59 stations had been granted Special Temporary Authority (STA) status by the deadline, which would hold off the expiration of their licenses as they attempted to resume operation. "The vast majority of them are people who seem very sincere about pursuing permanent operation," said Stuart Bedell, assistant chief of the FCC's Audio Services Division. "We would assume that almost all of them would return to the air almost on a regular basis with licensed facilities in relatively short order."

How long must a station stay on the air to be considered at full operation? The question is unanswered. Bedell said that after things have "settled down," he will review the list of stations that have informed the FCC that they have resumed operations.

"In those cases where it appears or seems very clear that someone went on the air strictly as an evasive tactic or strictly to try to buy themselves another year, and if it appears to be an abuse of our processes and procedures," Bedell said, "we still have the right and the ability (under the Telecommunications Act) to issue orders to show cause why the licenses shouldn't be revoked because of their silent status."

Stations that came on the air for only a day, simply to avoid 12 months of silence, will be in the dark too.

Bedell and other industry sources agree that in most cases, stations go dark for economic motives. Said Bedell, "... the licensee may have lost interest in these particular stations and pursued other business interests."

An **RW** source said the "typical" dark station has lost its tower, tower lease, ability to light or any combination of those factors. Indeed, WCGA(AM) in Woodbine, Ga. lost its tower and could not afford to operate it

See DARK, page 8 ▶

O.J. Squeezes President's State of Union Address

by John Montone

WASHINGTON O.J. got more air time than the president, and the Republicans were the big losers on one frantic news night in early February.

At talk station WMAL(AM) in Washington, News Director John Mathew laughed when asked about how he handled the colliding news stories of Feb. 4. "Too bad radio is such a linear medium," he said, envious of his TV brethren, who could carry the State of the Union address while splitting the screen or running a crawl to keep viewers on top of developments in Santa Monica.

WMAL, which had been promoting live coverage of the president's speech, kept its word, but Mathew reserved the right to change his mind. "We went wall-to-wall O.J. at 7:45," he said. "If the verdict came early on in the speech, we would have run a bulletin and gone back to Clinton, but if it happened 30 minutes in, we would have stayed with O.J."

As it happened, the speech ended just in time and WMAL was able to switch back to exclusive Simpson coverage. Lost in the shuffle was the Republican response by Oklahoma Rep. J.C. Watts.

Defending his decision, Mathew said, "I believe in balance, but it wasn't a close

See O.J., page 6 ▶

NEWSWATCH

▶ NEWSWATCH, continued from page 2

numerous documents related to the effect of the acquisition on the Syracuse market. The decision to issue a CID, described as an "administrative subpoena," suggests that Justice apparently is not satisfied. Maritza Pichon, chief financial officer of Cox, said the CID is "the tool that DOJ uses to virtually ask anybody about anything for any reason." She was unable to comment on other information DOJ is requesting.

FCC approval of the acquisition is still pending. Cox expects the deal to close in the first half of 1997.

"We have applied with the FCC for approval of the deal ... The DOJ would have to sue us in court to stop the transaction," Pichon said.

Karmazin and Smith Join Westinghouse Board

PITTSBURGH Westinghouse Electric Corp. cemented its relationship with the new chairman and chief executive officer of CBS Radio, Mel Karmazin, by electing him to the company's board of directors. Westinghouse Chairman and CEO Michael Jordan said Karmazin "has captured the attention of Wall Street and the entire media industry as a tough competitor and successful leader."

Also elected to the board was Bell Atlantic Chairman and CEO Raymond W. Smith. He was a key player in the merger between Bell Atlantic and NYNEX. Perhaps giving insight into future moves, Jordan said of Smith, "We will draw on his experience and expertise as we invest in new technologies and media ventures around the world."

SBE Certifies Engineers

INDIANAPOLIS Engineers now have two more titles to add after their names: CEA or CEV. Society of Broadcast Engineers Chairman David Carr announced the two new certifications, Certified Engineer Audio and Certified Engineer Video. They are designed for studio, production and non-broadcast engineers who wish to obtain SBE certification.

Tests for the certification will include the same level of technical questions found on the five-year-level Television Broadcast Engineer and Radio Broadcast Engineer tests. Questions on high-power RF, EAS, microwave, satellite and FCC transmission standards will be excluded.

For information, contact SBE Certification Director Linda Godby at (317) 253-1640.

Radio Show Committee Meets; Seattle to Host in 1998

WASHINGTON The National Association of Broadcasters 1997 Radio Show Steering Committee is already at work. Meanwhile, NAB picked Seattle as the site for the 1998 show.

An NAB spokeswoman said the first meeting of the 1997 steering group was an orientation for committee members. The committee is chaired by John Gehron, co-chief operating officer of American Radio Systems. The NAB Radio Show is Sept. 17-20 at the New Orleans Convention Center.

Looking ahead, NAB announced at its winter board meeting that Seattle will host the 1998 radio show.

Barbara Walters Will Receive Award at NAB '97

WASHINGTON ABC news correspondent and anchor Barbara Walters will receive the 1997 Distinguished Service Award at the NAB show in Las Vegas. The award recognizes a broadcaster "who has made a significant and lasting contribution to the American system of broadcasting." Walters will receive the award at the All-Industry Opening of the show April 7.

Though she is best known for her work in television — including NBC's "Today Show" and ABC's "20/20" and "Barbara Walters Specials" — Walters has also done work in radio. During her affiliation with NBC, she contributed on a regular basis to the NBC Radio Network.

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5

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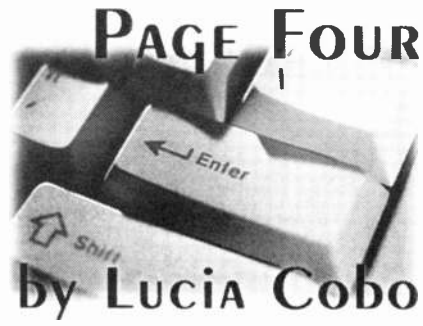
'He Said, She Said' ...



Page Four

by Lucia Cobo

Is it polite for a publication editor to say: "I told you so"?

Polite or not, here it is. I told you that EIA had less than pure motives in conducting its version of "fair and impartial testing" of digital audio broadcasting systems. The latest news — that CEMA, a division of EIA led by Gary Shapiro, had petitioned the Federal Communications Commission to allocate VHF, UHF and/or L-band for digital radio in the United States — is, in the words of NAB President and CEO Eddie Fritts: a "cockamamie scheme."

It is also proof positive that CEMA never had any intention of finding any system other than its member-endorsed and funded Eureka-147 DAB as the choice for a standard for DAB for the United States.

Back in December, (the Dec. 5, 1996, issue to be exact), Gary Shapiro wrote, and I quote: "Anyone who reviews the last 40 issues of **RW** will see that EIA is owed a major apology. EIA was painted as being one-sided by both USADR and **RW**. ... I won't hold my breath waiting for the apology. Until USADR changes its management team (and **RW** adds a healthy dose of skepticism), I will doubt any of their future claims without further unbiased, third-party testing."

It is galling that so much time and effort now appears to have been wasted by broadcasters in coordinated testing efforts with EIA as it is now obvious the IBOC proponents never stood a chance.

Not only does **RW** not apologize, Gary, but as its editor in chief, I will gladly and frequently reference our unmatched coverage of the DAB story over the last five years.

Eddie Fritts said it best in his speech to the RAB Marketing Leadership Conference attendees: "My friends, underhanded-backhanded tactics do not engender cooperation. You can be sure NAB will be standing in the doorway to block any of your cockamamie schemes."

You can be sure, Gary, that **RW** will be standing on the sidelines reporting on those same schemes.

U.S. broadcasters' first choice for a DAB solution is an IBOC one. They should be allowed to explore that possibility until it runs its course. Westinghouse has made a commitment to digital broadcasting in this country in both television and radio. AT&T has something to say on the digital radio subject. These are huge entities with a lot of brain power and clout. If anyone can solve the IBOC DAB question, they are a good bet. If no such solution is tenable, then the U.S. broadcasters should be the ones to decide where and how to proceed.

The EIA cannot force a European choice down the throats of U.S. broadcasters merely because it wants its members to be able to sell new receivers. They will have a chance to make IBOC receivers and I'm sure, given the size of the U.S. consumer market, they will gladly seize that chance.

Alienating a group as important and powerful as the NAB and its member stations is one surefire way to ensure that the process goes on without you.

★ ★ ★

Speaking of the RAB conference, held last month in Atlanta, what a great show! Gary Fries, RAB President and CEO, demonstrated once again how he and his talented group have energized the sales side of the business. From an attendance standpoint, this one was definitely the biggest RAB ever. Exhibitors were reporting good results from the floor, and all the sessions I tried to attend — every single one of them — was standing room only.

What was different, too, from other RAB conferences I have attended, was the seriousness of the crowd. Not that everyone did not have a good time. But the level of professionalism in radio's sales executives is something that is in direct correlation to the efforts the Gary Fries RAB has put forth. Radio is truly poised to exploit its new efficiencies of scale. And the RAB, with the *marketing* leadership conference, is trying to steer radio's sales force into a better approach to serving clients.

"There has never been a better time to be in radio," he said. "But our future is a different relationship with our advertisers. We must reside in the minds and in the industries of our advertisers."

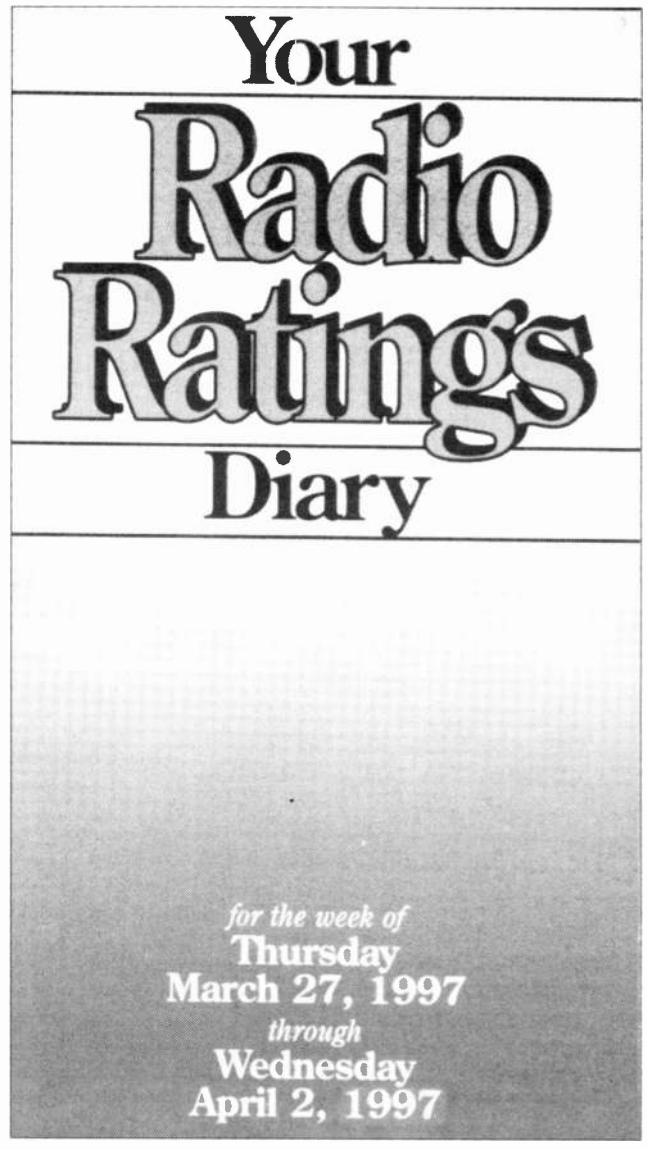
Part of RAB's effort was evident in the large presence of Arbitron at the show.

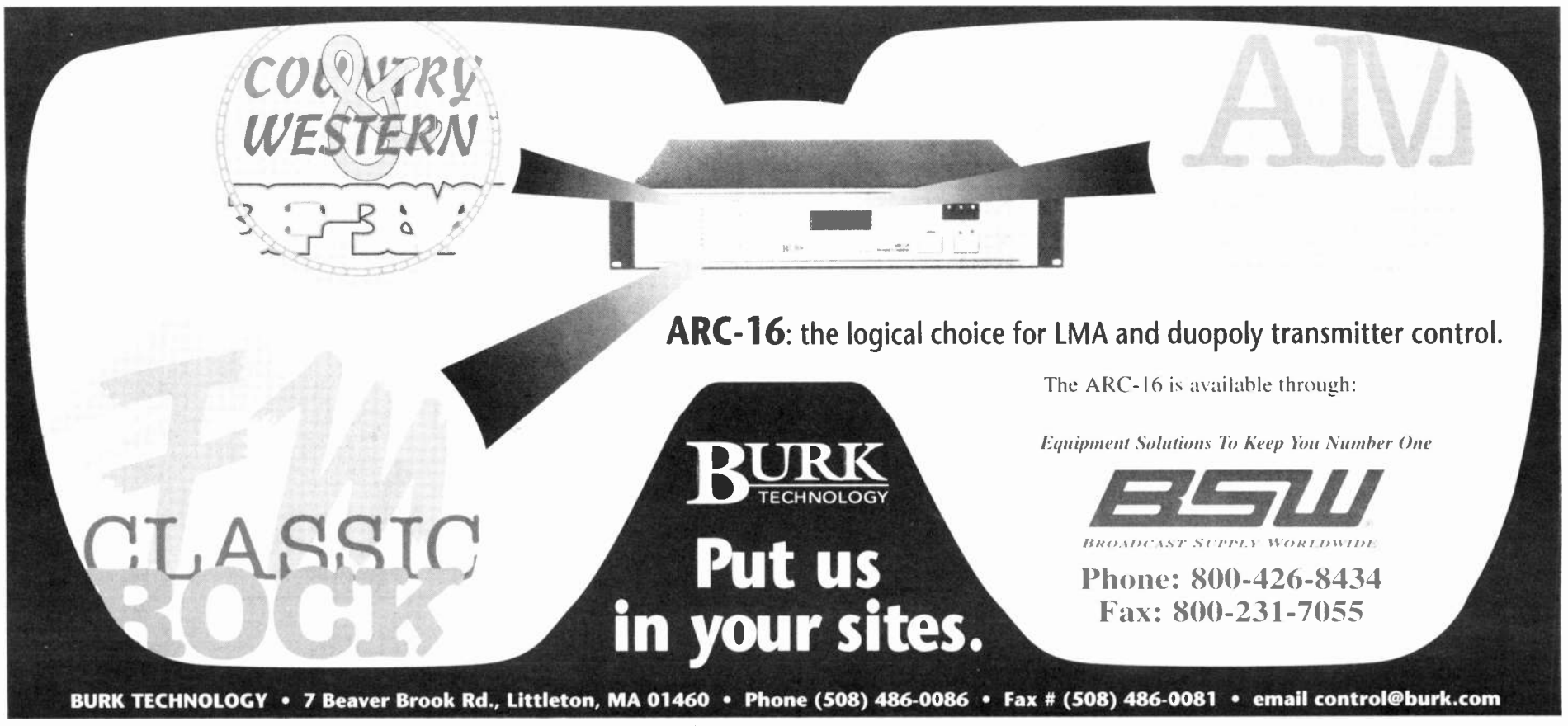
First, Arbitron unveiled the first editions — hot off the press — of the new qualitative diary for the 135 smallest markets. (I had a picture of the event too, but unfortunately, the roll of film was damaged and the pictures lost). Arbitron's Pierre Bouvard presented the diary to Gary Fries, because, as he said, "Gary was an inspiring force" in the effort. Data collected from this diary will be put into the Maximiser free of charge.

Arbitron also released the results of a huge perceptual study it commissioned for the RAB on newspaper. Key advertising decision makers were polled on their views about media in general, newspaper in particular. The results will help the RAB steer the radio industry toward more effective selling against and in conjunction with newspaper. An unexpected result was that direct mail is surprisingly competitive to radio, strong second choice of many advertisers.

The study is, in Gary Fries' words, "the beginning of a journey of major growth." Armed with the information gleaned from this study, radio can better grow its percentage of advertising dollars, said Fries. As the advertising community's perception of radio improves, so too should radio's share, he added.

That's it for now. There is plenty more to write about, but I guess I'll wait until next time.





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Nothing Boils the Blood Like an EAS Editorial

Go back to Zorgon

Dear **RW**,

Re Tom Taggart's bizarre Guest Commentary, "EAS Is Little More Than Excuse for Fine," in the Jan. 22 issue: The writer must be from another planet, as he fails to understand anything about EAS *or* EBS. EBS has not been considered an attack warning since 1972, once we figured out that those Russian missiles in their nice, titanium-hulled submarines will get here quicker than an EBS activation anyway.

Of the 15,000 or so EBS activations, most have been for weather emergencies and for 911 system failures. But EBS has had some notable failures, mostly due to operator error.

The writer states, "After 20 years of 'this is a test' and 22 seconds of hum, everyone realized that the public was tuning out the message." He then contradicts himself by saying, "The present EBS tone at least conveys some information to the public." Well, the EBS attention tone is still a part of the EAS protocol. We just won't be hearing it as much anymore.

Taggart complains that his primary relay hires operators have IQs lower than plant life. So why not just let them run the EAS system in automatic mode? Also, unless the station is an LP1, the operators don't originate messages, only forward them. If the EAS is set up right, this can be done by pushing a couple of buttons.

Just like the old EBS system, the EAS should be tied into the program line. You want to trust those operators to have the proper pot on your board turned up?

Station operators won't have to "fumble for 10 minutes" to key in "WSW" or any other codes to air an alert. They either press "forward message" or let the system handle it automatically.

By the way, that "$39.95 Radio Shack weather radio" should be tied into one of the EAS monitor inputs. That way, weather bulletins can be handled without operator intervention.

Better yet, Taggart should just go back to the planet Zorgon and tell everyone there that there is no intelligent life on Earth. Meanwhile, we Earthlings will be putting together an alerting system that really works – finally.

Glen Kippel
General Manager
KHCS(FM), Palm Desert, Calif.
(also LECC Secretary, Riverside-San Bernardino, Co. ECA)

A standing 'O'

Dear **RW**,

I would like to offer Tom Taggart a standing ovation. He has taken a stand echoed by dozens in the industry. The EAS system is yet another inane attempt of the FCC to bureaucratically control something that is best left in the hands of broadcasters. If a broadcaster doesn't let the public know of emergencies, that would surely be grounds to contest the license.

We do need a method of distributing national emergency messages. EAS doesn't fully meet that need. With many state plans out here in the "wild west," the PEP cannot be heard by the local stations. In some instances, the PEP is a statewide satellite network. Does this mean that every local broadcaster should have access to the satellite network in order to relay a national EAN? That would appear to be the precedent set by the FCC and the state emergency coordinating committee.

With today's technology, EAS simply has no purpose at our facilities. We have enough problems with keeping them operating at peak efficiency. More bureaucracy will only make matters worse.

However, I encourage you to buy the best weather radio you can. Get your local cable outlet to provide you with access to the Weather Channel, and become good friends with your local LP1 and LP2 stations. Then, when EAS fails, you'll have a real emergency system to fall back on.

Edward C. Dulaney
Chief Engineer
KLZ-KLTT-KLDC(AM), Denver

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Falls Church, VA 22041

e-mail:
74103.2435@compuserve.com

A tool box, not an appliance

Dear **RW**,

The people involved in the battle to fix EBS worked for a decade without financial gain and few accolades, to realize a system that would save lives and property. While many of them were SBE members, the SBE didn't enter the picture until after the FCC announced the rules, and their role has been stellar as educators and facilitators. No other broadcast organization participated in the technical process of EAS.

Thus, these zealots, the understaffed and engineer-less (attorney-rich) FCC, and later, several competing manufacturers, put EAS together. The results are frightening good.

Tom Taggart's complaints fall into either the "Tom hasn't a clue" category or the "there are a few less-than-optimum things about the EAS" category. Not one of his complaints applied to the technology presented the FCC, but more to the changes and implementation the FCC introduced. The EAS that the FCC introduced does leave a few opportunities for improvement. I know that the SBE EAS committee is aware and working well with the FCC. And everyone involved on that level seems to know that you have to get through the installation phase before you can tweak.

So, Tom, support the SBE. Optimize EAS. I'd hate to think that your guest editorial was just a "talk-radio" tactic in print, and that your energy will be wasted on smoke instead of fire. I challenge those who unlock the power of EAS to the benefit of their station and community to share their successes in **RW**, and suggest the enlightenment that will be gained from this year's disasters. EAS is a tool box, not an appliance. How broadcasters use the tools will determine their success or failure.

Tom, I'd advise that you stay away from power tools until you read and understand the instructions (try the SBE EAS Primer). I wish you luck, my friend.

Fred Baumgartner
Retired Zealot
Denver

– Correction –

The article "Loud and Clear With the CAD-Equitek E-200" (Feb. 5, page 45) listed an incorrect phone number for information. The correct phone numbers (in Ohio) are (800) 762-9266 or (216) 593-1111; fax: (216) 593-5395.

The proper full name of the company is CAD Professional Microphones.

Take Them Up On Their Offer

Do you own or run a radio station? Are you a small business person, feeling the pinch of the competitive, post-Telecom radio marketplace? Check out the Telecommunications Development Fund, or TDF.

As Sharon Rae reports on page 11, the board members are now in place, appointed by FCC Chairman Reed Hundt. Congress created the fund to help small businesses and to stimulate new technology. Hundt himself said he's looking forward to the "many benefits that are sure to come" to small telecommunications businesses.

The money comes from spectrum auctions. At last report, the fund held $6.6 million. Whether you like the idea of auctions or not, you should learn if the fund can benefit you.

RW asked, but the answer is unclear. Catherine Sandoval of the FCC Office of Communications Business Opportunities said the purpose of the fund is to make loans and investments to help small communications businesses, to "promote innovation, economic development, job development, competition and universal service." That's pretty vague. Pressed on whether radio stations specifically will benefit, she said it's too early to tell. But she welcomes input from entrepreneurs.

"We'd like to hear from small businesses about what they perceive to be the gaps in the capital market and how TDF can help to fill those gaps," she said.

Radio owners and managers know too well about gaps in the capital market. They are left out all too often from government programs that are intended to help businesses. Here is a fund created specifically to help small telecommunications enterprises. That spells r-a-d-i-o to us.

Catherine Sandoval's phone number is (202) 418-0990. Why not take her up on her offer?

We urge radio stations to tell the fund's members about their needs.

—**RW**

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Next Issue of Radio World
March 19, 1997

World Radio History

Hundt: Booze Ads Merit Concern

▶ DINGELL, continued from page 1

specific programming or advertising" and the FCC's authority to "censor or regulate specific programming or advertising before it actually airs."

In his response, Hundt stated, "The FCC's authority stems from its powers under Title III of the Communications Act to ensure that the grant or renewal of broadcast and other radio licenses serves the 'public interest, convenience and necessity.'"

"The Act also gives the FCC the authority to promulgate whatever rules or regulations are necessary to carry out the provisions of the Act, including rules which bear on its licensing responsibilities," he continued.

The FCC is divided on this controversial issue. Commissioners James H. Quello and Rachelle B. Chong both wrote that the act does not give the commission such power.

"I see nothing in the Communications Act that gives this agency the authority to censor specific programming or advertising," Chong stated in her letter. "Quite the contrary, Section 326 of the Act specifically denies the FCC any such authority."

Commissioner Susan Ness was less certain of the FCC's proper involvement. She wrote, "While I have not reached any definitive conclusions regarding the commission's 'ability, competence and jurisdiction' to take any particular action regarding the advertising of liquor over the (n)ation's airwaves, I firmly believe that it is within the purview of the commission to consider such issues, to research them, and to debate them."

Up in smoke

Dingell stated that the Federal Trade Commission has explicit authority to address advertising matters. He termed the FCC's interest in this area "particularly troublesome."

But Hundt argued that the language in the Communications Act "has historically and consistently provided an ample jurisdictional basis for the FCC to evaluate broadcasters' use of their licenses, including their advertising activities, and to take action when the public interest requires it."

As an example, he pointed to the FCC's proposal in 1969 to ban the broadcast of cigarette commercials by radio and television stations.

"... the FTC and the FCC exercise concurrent jurisdiction over broadcast advertisement," Hundt stated.

Addressing another point, Dingell said that when the FCC was originally established, Congress "carefully limited the commission's authority. For example, Congress has never given the commission the ability to censor specific programming or advertising.

"... It is unclear that Congress could give the commission the ability to do (this) in a manner consistent with the First Amendment."

In his response, Commissioner Quello cited a Supreme Court decision reaffirming the alcohol industry's free speech rights, but was concerned about the possible negative effects alcohol ads could have on minors.

"... (t)he First Amendment does not convey unlimited rights to any speaker, commercial or otherwise. I am deeply concerned about striking a proper balance between free speech and the protection of our children, but I believe that Congress, not the FCC, should strike the public interest balance," wrote Quello.

Meanwhile, Senate Commerce Committee hearings on hard liquor advertising have been postponed until jurisdictional wrinkles are ironed out. According to a Commerce Committee spokesman, senators must decide which subcommittee will oversee the hearings — consumer affairs (FTC jurisdiction) or communications (FCC jurisdiction). Hearings could get underway in March.

O.J. Edges Out President

▶ O.J., continued from page 3

call. O.J. is certainly a hotter topic." But Mathew admitted he might have made a different call if he had been in charge at an all-news operation.

Across the nation at KNX(AM) Los Angeles, News Director Robert Sims' instincts and experience were put to the test that night.

Sims had competing interests to consider. "We are the station people rely on to carry a presidential speech," he said. On the other hand, the Simpson trials have been the dominant stories in the L.A. area for two years. Sims struggled before coming up with a Solomonic decision. "There was no elegant way to do this — the alternatives were all pretty messy," he said.

At 4:05 PST, O.J. became the lead story. It stayed on top right through the State of the Union and the verdict. However, KNX listeners heard the President's address in its entirety: Sims recorded the speech and aired it from 7 to 8 p.m.

He said that allowed the station to present both stories in a more thorough manner.

In addition to letting listeners know the verdict, this approach enabled Sims to "give people some word that things were calm," a reference to local concern that a period of civil disorder might follow the verdict.

Le coverage à la carte

Radio networks did not have to make the same difficult choice as local newsrooms; they just had to make sure their affiliates got complete coverage of both stories.

Bernard Gershon, vice president of ABC Radio News, said he doesn't recall a busier time since the Oklahoma City bombing.

"From 7:45 EST to 11:59 we provided continuous anchor coverage of O.J., and from 9 to 10 we had anchor coverage of the State of the Union and the Republican response," he said.

Gershon said the network philosophy is to "provide affiliates with an à la carte menu of coverage options," and on Feb. 4 the menu was loaded with blackboard specials. He said it was the first time in memory ABC fed five separate, simultaneous anchored events.

"At 9 and 10 p.m. we had the Information Network Newscast, the Entertainment Network Newscast, a top-of-the-air status report of both stories, anchor coverage of O.J. and anchor coverage of the State of the Union," he said.

Affiliates had only to look at the menu and make their choices.

CEMA Proposes New Plan to FCC

▶ DAB, continued from page 1

audio quality and signal robustness performance that listeners would expect from a new DAR service."

Fritts expressed no complaint with the CEMA statement, as far as it came out against DARS.

As for DAB, however, he implied that CEMA was giving an unfair edge to Eureka. "... CEMA's motivation is to get DAB to the market ahead of the broadcasters' IBOC systems," he told the RAB conference attendees. Precisely because no new spectrum need be allocated to IBOC, he said, it should be adopted as the DAB standard.

Fritts also felt betrayed by CEMA. "The irony of this unexpected action is that CEMA is a partner with NAB in a number of projects and they didn't even have the courtesy of giving us the heads-up on their underhanded proposal," he said.

CD Radio filed a response with the FCC refuting CEMA claims: "... satellite DARS can provide good service at S-Band; there is little meaningful difference between S-Band and L-Band for this service and L-Band cannot be used for SDARS because it is already used for critical government services." (The government uses the L-band for mobile aeronautical telemetry systems.)

The response further claims that "CEMA confuses (the) needs for terrestrial DARS (TDARS) and satellite DARS (SDARS)."

CD Radio found flaws within the CEMA testing. The filing pointed out that CEMA only fully tested one system (the Eureka-147), which "had no diversity (spatial, frequency or time) and operated at (a) low elevation angle from a medium-powered satellite."

Cliff Burnstein of Primosphere, another DARS proponent, also brought the CEMA testing into question, saying there was no evidence to back up its assertions about the satellite service. He did not appear concerned that the FCC would act upon the CEMA request.

Jon Stern, senior legal advisor with the FCC's International Bureau, said that the commission will give the CEMA proposal its due consideration.

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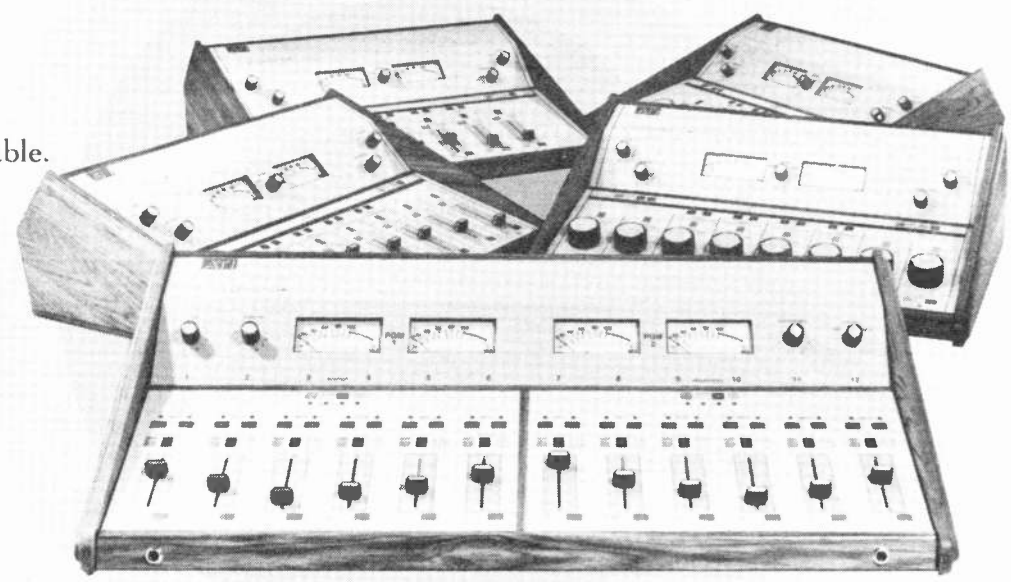

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World Radio History

Fight for Tower Space Ahead?

by Lynn Meadows

WASHINGTON As digital television (DTV) inches closer to reality, radio station owners may want to start watching its progress more closely. It raises questions of competition, for tower space as well as ad dollars. But radio owners need not panic — yet.

The advent of DTV, however, might signify a threat to radio. For FM stations that lease antenna space on towers owned by TV stations, the introduction of DTV just might mean eviction.

Getting the boot

DTV development in the United States rivals the controversy and delays found in the development of digital radio. The Federal Communications Commission started its search for a DTV standard in 1987 and finally adopted one last December — nine years later. Despite the progress, much work has yet to be done, including spectrum assignments and the creation of a timetable for the DTV transition period.

TV stations will be required to simulcast their digital and analog signals for a period of time, to give the public time to buy new sets. A new digital signal means stations will need an extra antenna, which means finding more tower space close to the television station's analog antenna.

Troy Conner, owner of Tower Maintenance Specialists and columnist for **RW**, said the slow progress of DTV had led a lot of people to think it was not going to happen. It was "new news" five years ago, said Conner. Then all anybody heard was, "The standard is stalled."

But television stations are taking DTV seriously and planning now. One TV station in southeastern Virginia recently built a 1,000-foot tower to share with another television station. According to the station's engineer, it built extra capacity for DTV antennas into the new tower.

He predicted DTV will be available in major markets within two to three years. Preparedness has everything to do with how quickly DTV becomes a reality, he said.

Because most towers are at full capacity now, he said, "Most stations will be in the worst case rather than the best case," and added that the possibility of owners evicting FM antennas was real.

"If it is a tower owner that needs the capacity, that could happen."

Don Amacker, vice president of marketing for Landmark Tower Corp., which specializes in tower engineering, analysis, design and fabrication, guessed that roughly 80 to 90 percent of the towers in the country would not be in compliance with the added load of a DTV antenna.

Amacker said towers built early were designed for one specific load, with virtually no space left over for growth. In those days, tower owners did not foresee the growth of prime tower leasing space.

Extra space on a tower, however, does not guarantee room for a DTV antenna, said Amacker. He said that on small antennas, the lines may be 1-5/8 inches thick. A television line could be up to 15 inches thick.

"People ought to be concerned," said Conner. He said FM station managers with space on TV towers should begin to inquire now whether they will get the boot.

Brown Sanders, vice president of Marketing for PiRod Inc., which specializes in custom-engineered towers for cellular, PCS, broadcast and microwave services, said developments are still "early in the game."

"There is so much that has to be done" before a station can provide DTV, he said. Nonetheless, he said, FM stations renting space on television towers may want to ask what the television station's plans are.

"Ask the question just for peace of mind, if nothing else," he said.

Under analysis

"DTV has increased our workload considerably," said Amacker. He said many broadcasters are having their towers analyzed to see if they can hold an extra DTV antenna and what the options are if a tower cannot. Other stations are asking for quotes on new structures so they can provide space for themselves and the competition.

FM station owners probably need not worry about eviction if they have a lease with renewal options in effect, said Amacker. But, he said, if the tower is not properly analyzed and an additional heavy load is added, all tenants on that tower must be aware of its integrity.

Amacker recommended that tower tenants ask two questions. Does the tower owner plan to accommodate DTV antennas and, if so, will the tower owner have a complete structural analysis done and make it available for review? The information may also be of interest to a tenant station's insurance company.

Randy Holt, president of Signal Tower Communications, which specializes in site management and related engineering services, said engineers he has talked to point out that many sites are full now and will not have room to hang the new DTV antennas. The choice boils down to building a new tower or knocking someone off the existing one.

"I'd be checking with my engineering folks to see what's likely to happen," said Holt. Other good ideas: check the lease terms, and talk to your station's attorney.

But, if it does start looking like your antenna will be without a home, Holt suggested stations "begin calling people like me" to see what other tower space is available. As for any signs of panic, Holt said he has not seen any FM stations do anything tangible about DTV yet.

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World Radio History

Ownership Down in '96

▶ NTIA, continued from page 1

annual station survey for 1996, a decline is inevitable because minorities made no major station buys in 1996, said James. NTIA expects to release the 1996 figures in April.

In 1995, the number of minority-owned commercial radio stations increased by one: AM stations decreased from 180 to 175 stations, while FMs increased from 112 to 118. Minority-owned TV stations increased from 31 to 37.

Whether relaxation of broadcast ownership limits has hurt the minority broadcast entrepreneur is "speculative" at this point, James said. But NTIA is studying the question, and will release its analysis of the effects of 1992's duopoly rules change in April. When the FCC raised its ownership caps, critics predicted the change would harm minority broadcasters, who would be unable to compete with wealthier and larger station and group owners.

Show me the money!

The deregulation has allowed some Hispanic broadcasters, such as "Z Radio" in Los Angeles, to move aggressively into new markets, said Carlos Lopez of the Hispanic Radio Network and former owner of KNMX(AM) in Las Vegas, N.M. He believes many Hispanic broadcasters feel most comfortable buying and starting Spanish-language stations. "I wouldn't want to buy a station and program in English," he said, because "English radio is very good" at what it does.

But economic as well as regulatory factors determine the presence of minority owners in broadcasting. Lack of accessible capital has long kept the share of radio outlets owned or controlled by minorities to less than 3 percent. A 1995 report from the MTDP concluded that barriers to capital force minority entrepreneurs to buy less lucrative properties, such as AM stations or those with inferior signals. These deficiencies ultimately reduce a company's ability to attract advertising dollars.

In 1995 Congress axed what NTIA said was one of the most effective government programs for harvesting minority ownership: the FCC's tax certificate program. That incentive program, begun in 1978, allowed radio and television owners who sold their stations to minority buyers to defer their tax payment on any capital gain. Programs that aren't industry-specific, such as assistance from the Commerce Department's Minority Business Development Agency, aren't as productive, James said, largely because station purchase and startup requires such heavy capital infusions.

The agency plans a conference following its release of the 1996 minority ownership data and its analysis on the impact of 1992's duopoly rules. James expected the conference to produce a discussion of successful entrepreneurial strategies for broadcasters.

MINORITY OWNED COMMERCIAL BROADCAST STATIONS
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		Industry Totals	Minority Totals		Black		Hispanic		Asian		Native American	
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	FM	5,044	112	2.2%	71	1.4%	35	.7%	3	.06%	3	.06%
	TV	1,155	23	2.7%	21	1.8%	9	.8%	1	.09%	0	0%
	Total	11,126	323	2.9%	193	1.7%	120	1.1%	5	.04%	5	.04%
1995	AM	4,906	175	3.6%	99	2.0%	72	1.5%	2	.04%	2	.04%
	FM	5,285	118	2.2%	77	1.5%	34	.6%	3	.06%	4	.08%
	TV	1,221	37	3.0%	27	2.2%	9	.7%	1	.08%	0	0%
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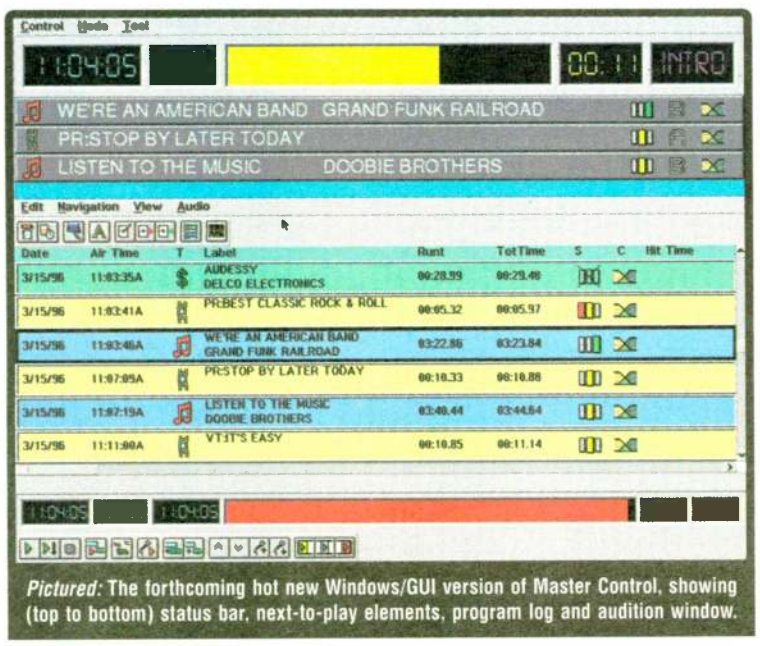

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Time's Up For 32 Dark Stations

▶ DARK, continued from page 3

again for a couple of years; it resumed operation the week before the deadline.

The dark stations have a last chance to get back on the air before the lights are turned out on them permanently. After the deadline, the FCC sent letters to stations still silent, telling them, in effect, that according to the commission's records, they had been silent for 12 consecutive months. If a station has resumed operations and can document this, it has 30 days from the receipt of the letter to respond. If the commission doesn't hear from the station within that time, it will delete the station call letters and initiate all other internal processing necessary to remove it from the commission's records.

Bedell said the FCC is not sure what will happen to the spectrum left over for FM stations whose licenses expired. On the other hand, he said it was entirely possible that, if an entity complies with the new AM technical rules, it could apply for an expired AM license.

World Radio History

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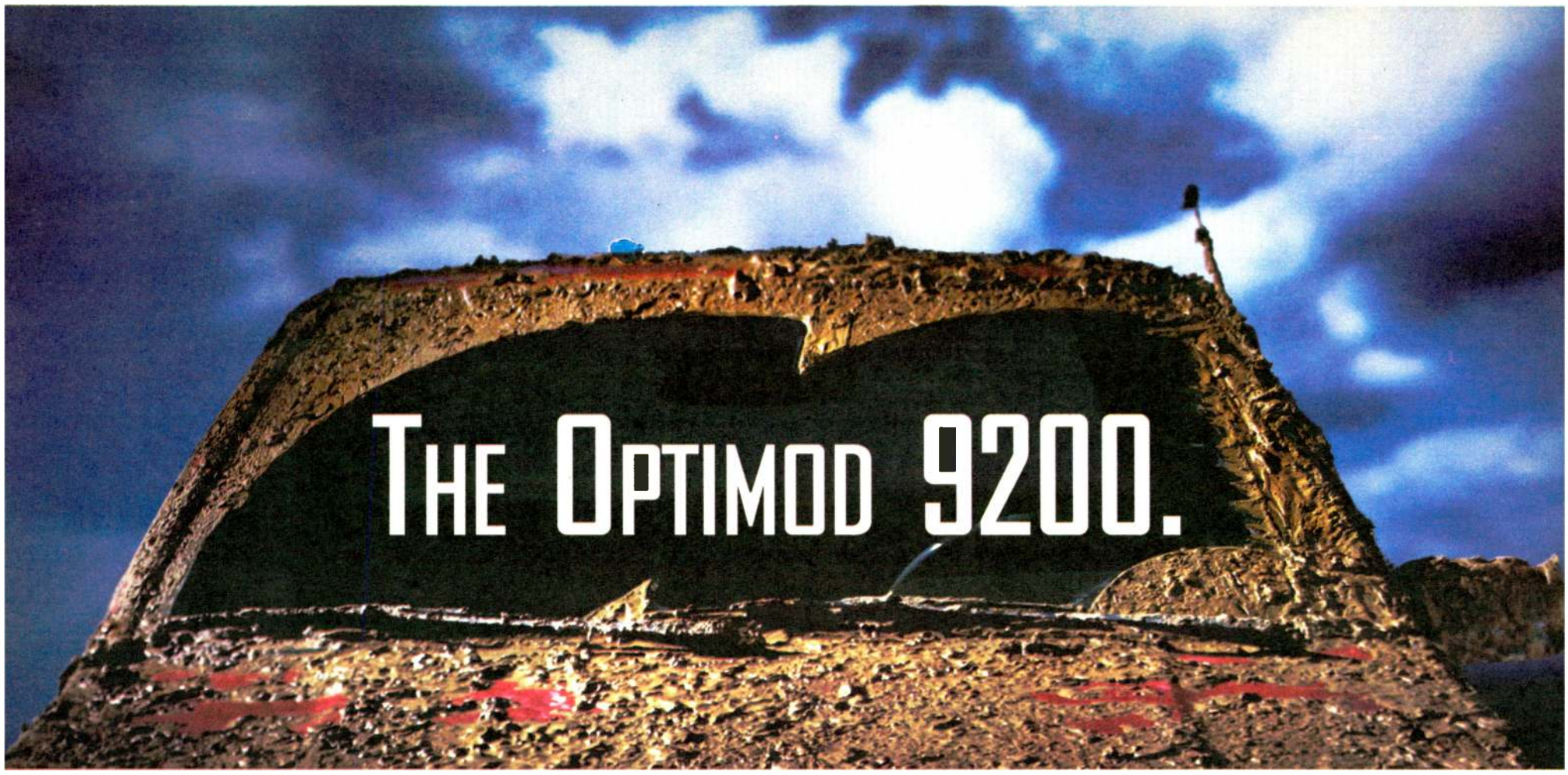

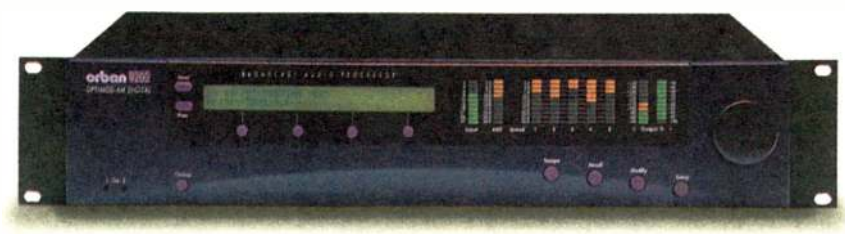

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World Radio History

Capital Fund Board Is Now Set

by Sharon Rae

WASHINGTON The final leg in the development of a fund to assist small communications businesses is now in place. FCC Chairman Reed E. Hundt appointed public sector board members to the Telecommunications Development Fund, or TDF.

The fund, a provision developed by Congress to provide access to capital for small businesses, was created by the Telecommunications Act of 1996. The fund is also intended to stimulate the development of new technology, support universal service and promote employment and training and the delivery of telecommunications services to underserved rural and urban areas.

It is unclear at this point how the fund will benefit radio stations.

Private and public

The TDF required Hundt to appoint seven directors — four representatives from the private sector and three from the public sector — who have experience in finance, investment banking, government banking, communications law and administrative practice and public policy.

Hundt announced the appointments of Ginger Ehn Lew, Kirsten Moy and William E. Kennard to the public sector seats of the TDF.

"Their leadership qualities and combined experience in government, telecommunications policy and economic and business development will be of immense value to the TDF Board and the promotion of public and private sector partnerships," Hundt stated.

The TDF will make loans and investments for small communications businesses.

Ginger Ehn Lew, deputy administrator of the U.S. Small Business Administration (SBA), brings expertise from her former position as general counsel at the U.S. Department of Commerce and as top adviser to the late Secretary Ron Brown. Lew also has served as deputy assistant secretary of state for East Asia during the Carter Administration.

SBA spokeswoman Jeanne Saddler said Lew is excited about her position on the TDF, and knows the fund will be an important resource for small companies.

"The fund is a very important mechanism to help small businesses enter the telecommunications industry, and that is a very important industry to our growing economy," Saddler said. "Ms. Lew has experience both with small businesses in the private sector and with growing businesses in technical areas."

Kirsten Moy, director of the Community Development Financial Institutions Fund in the U.S. Department of Treasury, and William E. Kennard, general counsel of the FCC, round out the appointments. Moy is formerly senior vice president and portfolio manager of Equitable Real Estate Management in New York City. Kennard formerly served as a partner and member of the board of directors of a Washington law firm specializing in communications law.

"I look forward to hearing about the accomplishments of the board and the many benefits that are sure to come to small businesses in the telecommunications industry," said Hundt.

Lew, Moy and Kennard join the private sector members of the TDF board: Interim Chair Solomon Trujillo, president and CEO of U.S. West Communications, Richard Fields, managing director of Allen and Company Inc., Thomas A. Hart Jr., partner with Ginsburg, Feldman and Bress, and Debra L. Lee, president and CEO of Black Entertainment Television Holdings Inc.

Good news for radio?

Catherine Sandoval of the FCC Office of Communications Business Opportunities told **RW** in an earlier interview that the TDF is good news.

"The purpose of the TDF, according to the statute, is to make loans to, and equity investments in small communications businesses," Sandoval said. "The purpose is to promote innovation, economic development, job development, competition and universal service."

She indicated that it's too early to determine who will benefit from TDF monies.

Sandoval's office still welcomes input from entrepreneurs. "We'd like to hear from small businesses about what they perceive to be the gaps in the capital market and how TDF can help to fill those gaps," she said.

The statute authorizes the TDF to earn interest from the payments that bidders submit to participate in spectrum auctions. The fund currently has $6.6 million, and will earn more interest from other auctions in 1997.

The Office of Communications Business Opportunities in Washington can be reached at (202) 418-0990.

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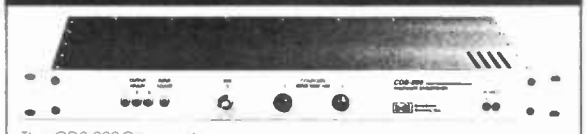

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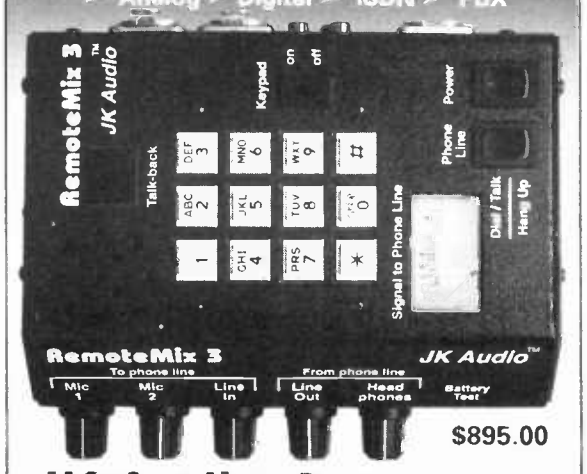

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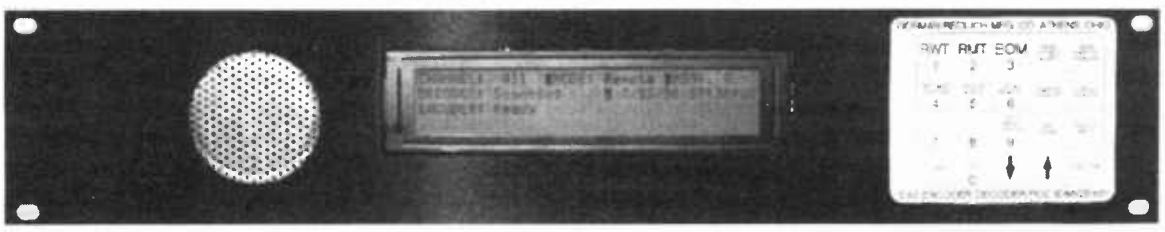

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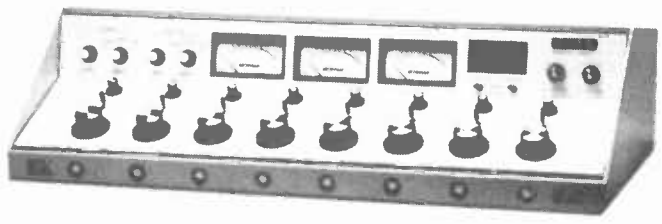

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World Radio History

PERSONNEL LEVEL

Networking: Get Started on It

Start Now; Have a Clear Purpose and System To Boost Your Career Through Personal Contacts

Sue Jones

What can you do to increase your personal and professional value? Networking often is an underdeveloped skill because we may be unsure how to do it well. To develop the skill, you must work at it actively. Passively sitting at an industry function, meeting a few people and hoping for the best will yield few results. If you actively work at developing the talent, it can provide you with contacts, information and possible career advancement.

Consider networking an investment in your future and part of your continuing education, just as you would a course on improving your management skills.

To begin increasing your effectiveness, think strategically.

1. Network now. Once you need those contacts, it's too late to start. Take time to attend local radio and broadcast industry meetings and presentations. Join those groups that provide you with what you seek. Joining will get you started, but you must participate to gain the maximum benefit. Active participation means more than just attending the meetings.

Volunteer to work on a committee. It will take some time, but this is one way to develop a working relationship with others in the industry. You will get to know the other committee members' strengths, as will they get to know yours. This is an excellent way to demonstrate your abilities to a potential employer, or possibly find an assistant. Of course, it is also a good way to develop a bad reputation, if you do a poor job.

Volunteer to make a presentation to the group in one of your areas of expertise. For example, if you are an engineer, you might consider a presentation about a new or evolving technology, the potential benefits or current problems that could be useful to program directors or general managers. Think how ISDN has changed the broadcasting industry.

If you have any experience in leading a local group, committee or seminar, add it to your resume. This demonstrates a wide interest and commitment in the broadcasting industry, which has a much wider scope than your current job.

2. Get out there. If given the opportunity by your employer, attend state and national conferences and shows such as the NAB convention. Everyone leaves these events with something: information about new products or services; names of colleagues in the field; increased awareness of new directions and thinking in broadcasting.

Many local groups as well as national events offer seminars and presentations. They can increase your awareness or give you a different perspective. Sometimes, seeing the new products and trends can alert you to coming changes in the industry and how they will affect your station's performance and ratings. Even if you must pay for your transportation and lodging, this expense is well invested in your future.

3. Know your purpose. Identify what you want to gain from networking activities. This is critical. If you are looking for information, define the type and how you can use it to your benefit. If you want to increase the number of contacts you have in the industry, think about the most useful type of contact. Determine how they may help you develop your knowledge, grow professionally and increase your professional value. Once you have clearly defined objectives, you can target your efforts and use your time to achieve your objective more effectively.

4. Create mutually beneficial relationships. Networking works in two directions. To sustain itself, the relationship should be mutually beneficial. This may be as simple as exchanging information about a topic of mutual interest, giving a job lead or providing a professional reference.

Make sure that every personal call or note brings something of value to your contact. Otherwise the value of the relationship declines.

Knowing which contacts may be the most helpful to you is tricky. Look for common interests, an ability to bring value to the relationship, and a high level of expertise and professionalism. If the networking relationship is unbalanced, ask your networking affiliate how you can help him or her, or be clear in explaining how he or she can help you. You must be selective; you cannot keep strong ties and contacts with everyone you meet.

5. Cultivate those relationships. Once you have identified some common interests, build trust and credibility with your contact. Spend some time talking with and listening to the other person. Truly understand who he or she is and how you can help.

Next, educate the other person about you, your work and expertise, and what *you* might need. Networking depends upon the ability to build value with each other. Take responsibility for the relationship and concentrate first on what you can offer. The more you give, the more that will come back to you. Invest the time necessary to grow the relationship, be willing to listen, and take action using your skills and talents. You will develop a reputation for assisting others. When you have a need, others will recall the times that you helped them.

Keep in touch

6. Develop a "touch-base system." After you have cultivated some key contacts, you have to keep in touch on a periodic basis. Your previous efforts will be less valuable if you do not keep the relationship active. Keep in contact by investing the time to make a telephone call or personalize an article of interest with a note. A quarterly contact is usually enough to keep the relationship active without being a pest.

Make sure that every personal call or note brings something of value to your contact. Otherwise the value of the relationship declines. Professionals are too busy for idle talk, so think before you call. Every impression should enhance the relationship, send a professional image and deliver a constant message.

Networking contributions can open career and business opportunities if you are willing to invest the time to develop the skills and relationships. It could be one of the best career moves you ever make.

■■■

Sue Jones is a principal in Bisset Communications, a communications management firm located in the Washington area. Contact her at (703) 503-4999.

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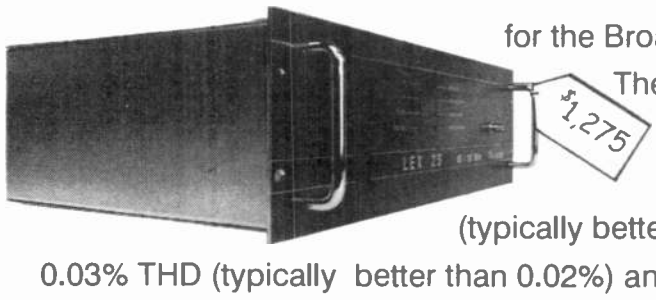

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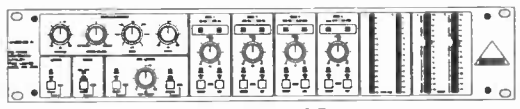

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READER SERVICE NO. 20

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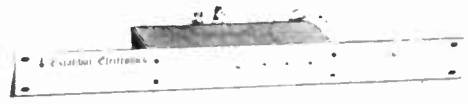

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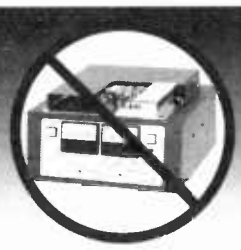

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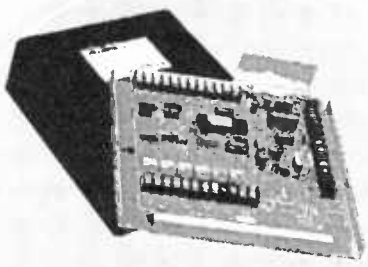

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READER SERVICE NO. 130

World Radio History

Radio Studies POTS Codecs

Alan R. Peterson

A relatively new telephone device now available can send broadcast-quality digital audio over standard dialup telephone lines. This device is a Plain Old Telephone Service Coder/Decoder, generically known as a POTS codec. Broadcasters who want to improve the quality of their remote audio, but can't or won't install ISDN lines, are attracted to these devices, which are finding homes in the equipment kits of leading radio organizations.

Four manufacturers are in the POTS codec arena. Musicam USA lays claim to being first with the FieldFone in 1995. Comrex came out with the HotLine codec and Marti Electronics debuted the Smarti codec in 1996. Overseas manufacturer A.E.T.A. makes the Scoop Reporter, distributed domestically by Harris.

A POTS codec can deliver as much as

The Comrex HotLine

10 kHz frequency response from lines capable of 3 kHz at best.

How does it work?

Put in simple terms, a codec digitizes audio, compresses the digital information with a standard or proprietary algorithm, then sends the data stream out via modem. A receiver reconstructs the audio for recording or broadcast with a minimum of delay.

"Digitizing audio is the easy part," said Dave Lin, product manager of audio products for Musicam USA. "Psychoacoustic processing is the next necessary step, to discard any informa-

The A.E.T.A. Scoop Reporter, From Harris

tion that is redundant or irrelevant."

The FieldFone uses a Musicam-enhanced version of MPEG Layer III compression, while Comrex uses a proprietary compression format in the HotLine. Marti Electronics has also moved into Layer III encoding for the Smarti codec, which is shipping during the first quarter of 1997.

The A.E.T.A. Scoop Reporter uses an approach called Code Extracted Linear Prediction (CLEP). This process analyzes speech and transmits information to synthesize a replica. This allows high data reduction for voice, but could have an effect on music and background noise.

Jim Woods, director of studio products for Harris, said, "The unit is actually capable of reproducing AM-quality music, although it is optimized for voice, not for transmitting music." Indeed the name of the device suggests it is designed as a reporting device, for voice work.

Broadcast-quality audio must be analyzed and compressed before it is sent out via modem to accommodate an upper limit imposed by the nature of POTS telephone lines: 28.8 kilobits (kb) is the desired level.

The modem

Lin said, "The modem must be a high-performance device that can connect reliably and error-free." Also, it must be a synchronous modem.

Most modems are asynchronous. Lin stated asynchronous modems spend 20 percent of their time sending start and stop status bits, reducing the amount of relevant data in a given period by one-fifth. Synchronous modems include this information along with data, getting the most out of modem efficiency. A modem must also be full-duplex to send and receive audio simultaneously.

The modem used in the FieldFone is a high-performance unit provided by "a major manufacturer" of modems, according to Lin. Woods described a Hays modem as the Scoop Reporter's critical link to the phone lines. The Comrex HotLine uses the Rockwell V34 modem chipset; the Smarti uses an off-the-shelf U.S. Robotics modem on a proprietary motherboard.

On the line

The biggest snag remains the telephone lines.

Analog line noise notwithstanding, modems would like to handshake at about 28.8 kb in real life and look for rates as high as 33.6 kb on the bench. In the real world, lines can often be 24 kb or lower, resulting in seriously affected bandwidth or even loss of signal.

Line conditions can cause data rates to fluctuate widely during a single call. The codec must respond to these changes quickly and smoothly with minimum disruption to the audio.

See POTS, page 21 ▶

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Philip Urso, GM
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"We've had five DAD workstations in action for over a year, and I really don't know how we could get along without the system. It allows all three of our stations to present a consistent on-air sound and frees the talent to concentrate more on communicating with the audience. We're still finding new and innovative ways of using the system a year later. In my opinion, if you're planning on automation, you can't do it RIGHT without ENCO!"

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Chuck Whitaker, PD
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The standout #1 leader in reliable, high performance, digital ready consoles for radio, Arrakis has several console lines to meet your every application. The 1200 series is ideal for compact installations. The modular 12,000 series is available in 8, 18, & 28 channel mainframes. The 22000 Gemini series features optional video monitors and switchers for digital workstation control.

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Call Arrakis to find out how easy it is to design and build your next studio.

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Complete systems...

As illustrated in the Sony Worldwide Networks master control studio on the right (one of seven Arrakis studios in the Manhattan, New York complex), Arrakis can provide complete major market studios with Arrakis consoles, digital workstations, video-audio switchers, furniture, and system prewiring.

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Manhattan, New York

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World Radio History

Jammin' for Bread

JAM'N 94.5 and Boston concert-goers helped the hungry to the tune of $30,000, or the equivalent of 5,000 bags of groceries. Fifteen thousand fans came to Super Jam '96 at the FleetCenter in December to hear the likes of La Bouche, Keith Sweat, Maxi Priest, Montell Jordan, Run-DMC and The Sugarhill Gang. Project Bread, a non-profit organization devoted to alleviating hunger in Massachusetts, was the beneficiary.

Pictured (l-r) are WJMN(FM) Program Director Cadillac Jack, Keith Sweat and Music Director Cat Collins.

Eliminate Carts for $7,000

Scott Studios' Spot Box

At last! A commercial player that *works just like carts*, but with digital audio that *sounds like compact discs*.

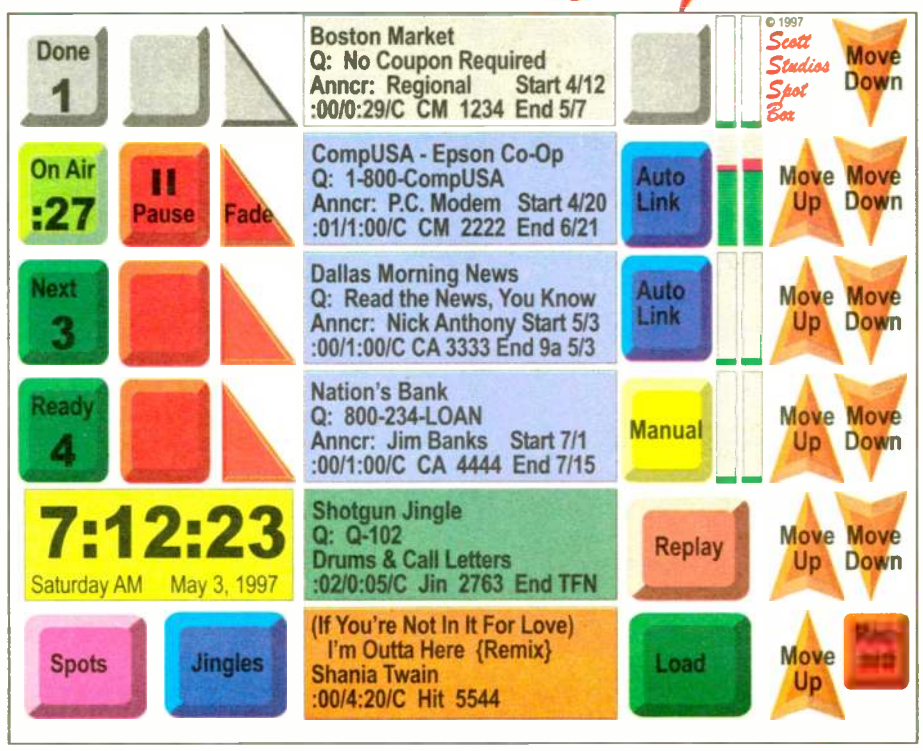
It's Scott Studios' new *Spot Box*. It's the *first* hard disk "cart" replacement that jocks *really like*!

It's *easy to use*: You get four Start buttons for four recordings, just like a quadruple deck "cart" player.

The Start button clearly counts down the remaining time of each cut. Every deck shows "bar graph" VU levels.

When a "cart" finishes, the label and buttons turn grey to lock out accidental re-play. It can air again with a touch of the Replay button (at the lower right). If there are more than four "carts" in the set, the "on deck" spot moves from the fifth line (at the right of the time and date) to the grey deck that had played. The Spot Box can also remote start CD players.

The Manual-Auto button (at the right of each label) lets you start each spot manually or have the Spot Box smoothly start the next one itself. Automatic sequencing can also be turned on or off globally, by categories or shifts.



Here's a reduced size view of Scott Studios' 5"x8¼" Spot Box. You get easy access to hundreds of commercials, jingles, sounders, comedy and other recordings. All audio is CD quality digital from hard drives.

Pause buttons can stop (and resume) playback of any cut. During a Pause, the Start button can replay that recording from the beginning.

Each deck has a Fade button. It helps if you need to fade something out gracefully with one touch.

The Spots and Jingles buttons at the lower left take you to a "Wall of Carts" screen that shows *all* of your hundreds of recordings. You can jump immediately to whatever you want by touching the first letter of its name on the large alphabet at the top of that screen. Pick and play it quickly in any "cart" deck.

Start Button Actual Size

As an option, we can automatically bring logs into the Spot Box from your traffic computer. Then, after the spot set has finished, the Load button at the lower right automatically brings in the next break.

You can quickly rearrange the order of any recordings with the Up and Down Arrows.

Scott Studios' Spot Box not only *sounds better* than any "carts" you've ever heard, its labels *look better* and are easier to read than any "carts" you've ever seen!

You get four legible lines of useful label information: Names, numbers, out-cues, announcers, intros, lengths, endings, copy info, start and end dates and times, schedule times, and anything else you want. Labels are even color coded. When you have several cuts rotating as one number, you see exact lengths. Both the name and out cue match the exact cut that plays. The Spot Box even rotates recorded tags.

If you have several stations in one building, record each spot only once. It's instantly playable in *every* desired studios' Spot Box, without re-dubbing or retyping labels. Cuts can be locked so they only play on designated stations or shifts.

You also get printouts showing *exactly* when each spot plays!

Best of all, Scott Studios' digital audio is *affordable*. A "four-deck" Spot Box player storing 600 minutes in stereo starts at $6,000. You can record and edit spots or phone calls in the air studio during songs for only $1,000 more. A production studio recorder-editor is $5,000, and it can even go on-the-air if needed. 600 additional minutes of stereo storage is only $250. Larger screens and a variety of backup options are available. At Scott's low prices, you can afford as much storage and redundancy as you want.

Also check out Scott Studios' Hot Box. It plays *any* of 62 "Hot Keys" *instantly* at the touch of a finger. You get 52 sets of 62 clearly labeled Hot Keys: 3,224 digital cuts for only $5,000.

Scott Studios also offers other digital systems for satellite formats, music on hard drive and voice track automation. Call 800-SCOTT-77 for details, or a no-obligation trial in *your* station.

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BOOK REVIEW

'Net Book Stands Out In the Surf

Tom Vernon

It takes more than Web audio to make a site worth coming back to. If you've got an inkling to do more with your station's site, or want a better understanding of how the entertainment business is adapting to the Internet, "Creating Internet Entertainment" is worth a read.

Written by Jeannie Novak and Pete Markiewicz, this 450-page book is a definitive guide to planning, creating, operating and maintaining entertainment-based sites on the Web. Included with the text is a CD-ROM packed with Internet connectivity software, development tools, multimedia helper applications and plug-in tools. PC and Mac programs are included.

The book is divided into five sections. The first introduces the concept of entertainment on the Web, or "Intertainment." The authors present examples of some of the best entertainment sites, and explain how this medium is different than traditional entertainment. They touch on the differences between Internet broadcasting and traditional over-the-air activities: Internet broadcasting is accomplished through audio or video streaming. Technical limitations of the Internet limit the audience to several thousand people at once. The relatively low cost of entry has brought about a renaissance of a new type of alternative radio, reminiscent of the free-form broadcasters of the mid-'70s.

Content provider profile

Like the medium itself, the Internet audience is a different breed. While consumers of traditional entertainment are largely passive, Internet users are actively involved with the medium. The demographics of Web users are more upscale than the general population. The myth that the Web is a "boys club" is dispelled; studies show that in certain areas women comprise 47 percent of the total audience.

Content providers range from traditional media powerhouses like ABC/Capital Cities to smaller players such as radio stations, independent filmmakers and musicians. The authors posit that this diverse group has some characteristics in common. All are risk takers, ready to gamble on an untried medium. They are flexible, ready to experiment. They are willing to have a dialogue with the audience. They are willing to learn new ways to create Internet content.

The second section of "Creating Internet Entertainment" targets readers seeking to design entertainment-based Web sites. The authors devote a chapter to software, hardware and personnel, and provide some examples of Internet production studios with job descriptions of production personnel.

I can't envision any but the largest stations devoting extensive resources to maintaining a Web page. The average broadcaster may find this information valuable, however, as a checklist to evaluate potential site developers.

See SURF, page 19 ▶

World Radio History

▶ SURF, continued from page 18

Once you've got a site, how do you keep surfers coming back? That's the subject of the third section of the book. The first lesson for broadcasters involves site publicity. One chapter is devoted to net publicity and marketing strategies for Intertainment sites, ranging from paid ads on high-traffic sites, to reciprocal links with other Web pages, to free postings. The goal is not only to increase traffic (or hits), but also to ensure that you attract return visitors. If you've got something stellar, submit it to as many award sites as possible. Being recognized by the "Point Top 5%" or the "Yahoo! Cool Site of the Day" guarantees high traffic through your site.

Learn from the logs

The Internet is not the only way to promote your Web page. Traditional media such as newspapers and magazines are still prime vehicles for users to glean information on new sites. Cross-promotion is gaining importance. Ever notice how many TV ads include the sponsor's URL?

Getting people to visit your WWW page is one thing, getting them to come back and "hang out" is another. Due to its interactive character, the Web is a prime vehicle for content updates and site modifications. For radio stations, changing content such as new music samples, contest info, or a billboard of local concerts and cultural events are good examples.

Arbitron results are used by stations to determine market share; Web access logs give a similar wealth of information about who is accessing and downloading information from your site. Data such as the Internet address of the user, time and date of access, as well as geographic and organizational distribution of the audience are readily available for your use. If analysis and statistics aren't your cup of tea, try a log analysis service that provides number crunching and analysis.

Some enter this game with visions of cash cows dancing in their heads. While you can indeed make money off your site, experts predict that a well-developed site, with $150,000 in development costs, will not turn a profit until the year 2000. Ways to generate cash flow include selling subscriptions to your site, paid advertising, selling merchandise, and a pay-per-view system. Most of us might do better to think in terms of just covering our expenses.

The fourth section of the book looks at the burgeoning entertainment resources already out there. The playing field includes traditional entertainment media that have hung out a shingle on the Web, such as film companies, magazines, and yes, radio stations. Others are new forms of entertainment. One is episodic Web fiction, in which a story is serialized and installments presented at regular intervals. Sites devoted to the collaborative arts provide a space for artists to create auditory, visual or verbal works. Chat rooms, MultiUser Domains (MUDs) and MultiUser Domains Object-Oriented (MOOs) provide opportunities for social fantasy and gaming with several players.

The final section of "Creating Internet Entertainment" is devoted to future trends. The growing popularity of Intertainment is a shift away from the earliest use of the Web and Internet as a research tool for academics and playground for computer hackers. The use of audio and video streaming is expected to increase dramatically, as multimedia on the Web moves away from downloading an entire program before playback towards streaming in real time. That's good news for radio broadcasters, because this demand will result in better tools.

While the entire book is well written and worth reading, potential Internet broadcasters will benefit in particular from the sections on publicity and plucking information from Web access logs. "Creating Internet Entertainment" sells for $39.99 and is published by John Wiley & Sons, 605 Third Ave., New York, N.Y. 10158-0012. Call (800) 225-5945.

■■■

Tom Vernon divides his time between consulting and completion of a Ph.D. Send him e-mail at tlvernon@aol.com *or call (717) 367-5595.*

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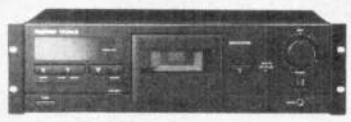
The relatively low cost of entry has brought about a renaissance of a new type of alternative radio.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World Radio History

Digital Audio Goes to POTS

▶ POTS, continued from page 15

Lynn Distler, vice president of Comrex, has seen her company's HotLine codec continue to work with data rates sagging to 12 kb. Audio bandwidth falls to 5 kHz but the connection remains.

Another issue is audio delay, which could run as long as a half-second in some instances. In best-case for the HotLine, this coding delay happens in as little as an eighth of a second (0.125 sec).

Distler said, "This is why stations need a mix-minus when they use this box. The host in the field trying to do real-time talk will hear his voice with a delay and get confused."

Marti Smarti

The Contadina Tomato Paste TV commercials claimed "eight great tomatoes in a little bitty can." In a way, digital transmission over phone lines works the same. How is it possible to move 28,000 bits over a phone line designed to pass only 3,000 Hz?

If data were transmitted serially — one bit following another like the cars of a train — the upper limit would be slightly less than the phone's frequency response. But thanks to a lot of tricks, the data stream fits.

When one modem contacts another, they "handshake," analyze line conditions and agree on a rate to exchange information. They both switch up or down to that rate, then begin the show.

Three qualities can be modulated: phase, frequency and amplitude. By varying each, a large degree of information can be sent down in the period it would take to send slower serial information.

Tom Hartnett, vice president of engineering for Comrex, explained it in wonderfully simple terms: "Large amounts of data can be sent by 'wiggling' every aspect that can be detected at the receiving end."

Consider amplitude. Several bits of information can be expressed as a degree of voltage. For purposes of explanation only, say a single bit sent downline at 0.5 V expresses "0010." Another bit sent at 0.75 V could be interpreted at the receiving end as "1001," and so on. Four times the information is possible in the space occupied by one element of data.

By extension, other qualities of the data stream can be expressed by altering frequency and shifting phase.

Can modems reach infinite speeds? No. The Shannon Theorem spoils our fun.

Put simply, given a fixed bandwidth and signal-to-noise level over a communications channel, the Shannon Theorem defines the greatest number of bits per second that can cross that channel. Certain inconveniences — such as noise level, frequency range and the speed of light — place a cap on how much data can be moved.

Even with this limitation, moving 28.8 kb or better over 3 kHz analog voice lines is possible, and is how computers and POTS codecs communicate over standard phone connections.

— Alan R. Peterson

Shootout

Major radio organizations studying the possible uses of POTS codecs have experimented with several from the sites of recent news events, including President Clinton's inauguration.

Bruce Berenson of the CBS Radio Division in New York had the opportunity to test the HotLine and the FieldFone in several different situations. Plans are to add a POTS codec as a backup to the "sports kit" remote rack for network sports broadcasts.

"About a year and a half ago, it was very hard to get a good connection," said Berenson. "Even on the best phone lines we would get a 'warbly' sound. Musicam USA had a software fix that worked pretty well."

Berenson discovered a real difference in line quality during an A/B test. One test looped audio once around New York City and back; the other was a long-distance connection from the Superdome in New Orleans. The longer connection seemed more stable.

From New Orleans, Berenson monitored all-news WCBS(AM) and an unnamed jazz station via both POTS codecs on identical lines tied together at CBS master control. The two units successfully connected at 26.4 kb.

"Both sounded fine and did real well. The differences became apparent when WCBS was fed down the line," said Berenson. The connections were stable and clean, but Berenson favored the Comrex unit because "it sounded warmer."

Lin of Musicam USA said, "It's just a preference, really. Purely subjective. If you get 10 people together to listen, you'll get 10 different reactions. You will get 9 kHz mono from a POTS codec, which is not CD-quality."

Other factors noted by Berenson: He felt the HotLine was more portable than the FieldFone, but wished the HotLine had a separate control for return audio.

He said, "The level of return audio is tied to the headset. If you want a comfortable listening level on your cans, you are going to overdrive your inbound recording level."

FieldFone by Musicam USA

Portability was also an issue with Dick Owen, director of special events for Westwood One in Arlington, Va. His division has given the FieldFone an extensive workout.

"Our reporters out in the field or assigned to a story on the run need something small — along the size of a modem — virtually in the kit bag all the time. We like the idea of having codecs available as a backup option to our ISDN lines," said Owen.

"I don't know how useful they are going to be for our reporters, but as a backup to some of our bigger productions out in the field, they're great. In a situation where it absolutely has to be better than a POTS line, this is better than a POTS line," he said.

Because of the relative newness of the Marti Smarti, nobody contacted has evaluated one.

Conclusions

A codec improves on POTS service by extending the frequency range to make the signal less telephonic. Expect to pay $6,000 to $8,000 for a pair of POTS codecs.

Much of the quality depends on the "first and last mile" between the terminations and the central office (CO), but even at 5 kHz, a POTS codec can offer better than an extra half-octave above normal phone response.

Users interviewed by **RW** expressed interest in a more portable unit, which may be a likely development for the future. In the meantime, the present generation of POTS codecs can squeeze a lot of bandwidth into a small frequency window.

■ ■ ■

For information on the HotLine, contact Comrex at (508) 263-1800. Data on the A.E.T.A. Scoop Reporter is available from Harris at (800) 622-0022. Marti Electronics can be reached at (817) 645-9163. Information on the FieldFone can be obtained from Musicam USA at (908) 739-5600.

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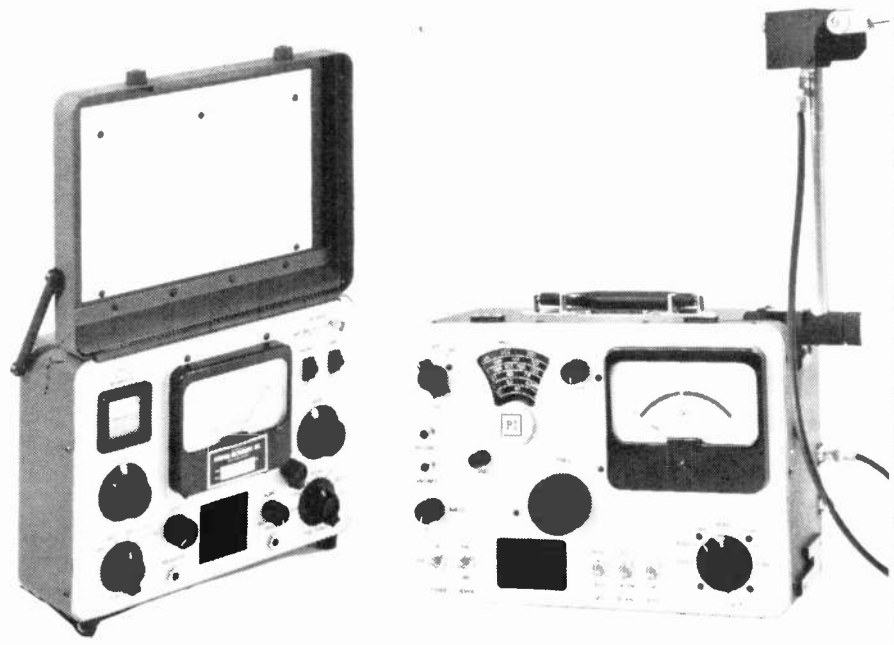

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World Radio History

SIGNAL-TO-NOISE

MIT Group Hears Promise in Echo

Frank Beacham

In an era of global distribution of digital audio programming, how can producers "mark" their productions to identify intellectual property, prevent content manipulation and provide annotation? Use a new technique called "echo hiding," says the News in the Future group at the Massachusetts Institute of Technology's Media Lab. Experimental software is now being used at the lab to embed data into audio programs by introducing a slight "echo" that is perceived as added resonance, or richness, by the human ear.

This in-band form of steganography (the placement of a digital ID tag in any one of a variety of media) is so robust, its inventors say it will stay with the signal even after compression and editing.

Walter Bender, director of News in the Future research, explained how echo hiding works: "If I took a piece of paper and put it about 10 inches from my mouth while I'm talking, I introduce a little bit of echo. That echo is very similar to the kind of resonance that you get in your vocal track. Now if I vary the distance of that piece of paper from my mouth — say I go from 10 inches to 12 inches and back again — I am varying the time delay in that echo. That time delay becomes my ones and zeros. That's how I encode data."

The data are hidden by varying three parameters of the echo: initial amplitude, decay rate and offset (or delay). As the delay between the original audio signal and the echo decreases, the two signals blend. At a certain point the human ear can't distinguish between the two. While this precise "blending point" depends on the quality of the recording, the amount of background noise in the recording, and the particular listener, it usually occurs at around 1/1000th of a second.

"The neat thing," said Bender, "is that a little bit of resonance added to a voice is considered an enhancement as opposed to degradation in most situations." The difference, he said, between signals with and without the echo is similar to the difference between listening to a compact disc on headphones and listening to the same CD from speakers, where one hears echoes caused by room acoustics.

Selected echo

Certain kinds of program material — especially classical music — might be altered by the echo in an undesirable way, said Bender. In such cases, he suggests, the echo mark should be used only in the parts of the program where it is not objectionable, such as narration and credits.

Bender, AT&T Media Lab Fellow Daniel Gruhl and graduate student Tony Lu have been working with News in the Future sponsor ABC Radio to test echo hiding for sound quality and robustness through compression systems. "We worked with ABC Radio and evaluated (the degree of echo hiding) at different levels," said Bender. "We've gotten the right numbers for them."

Though echo hiding has immediate applications as a digital "watermark" for audio programming, Bender sees broader implications for the technology. "I think it is going to be more and more important that we have a description associated with audio," he said. "That description might be as simple as who, when, where and what. But it might also be something like embedding a URL in the audio so you can get information from the Internet. This goes far beyond adding a watermark for copyright information."

Mics and tape recorders could be built to introduce a data tag into the audio.

Echo hiding is now being done with a software application running on a Pentium PC at the Media Lab. However, Bender said there's no reason that microphones and tape recorders can't be built to introduce a data tag into the audio during the recording process. "I like echo hiding because it's in-band," he said. "It's always part of the signal. It doesn't matter where the signal goes — the data never gets lost."

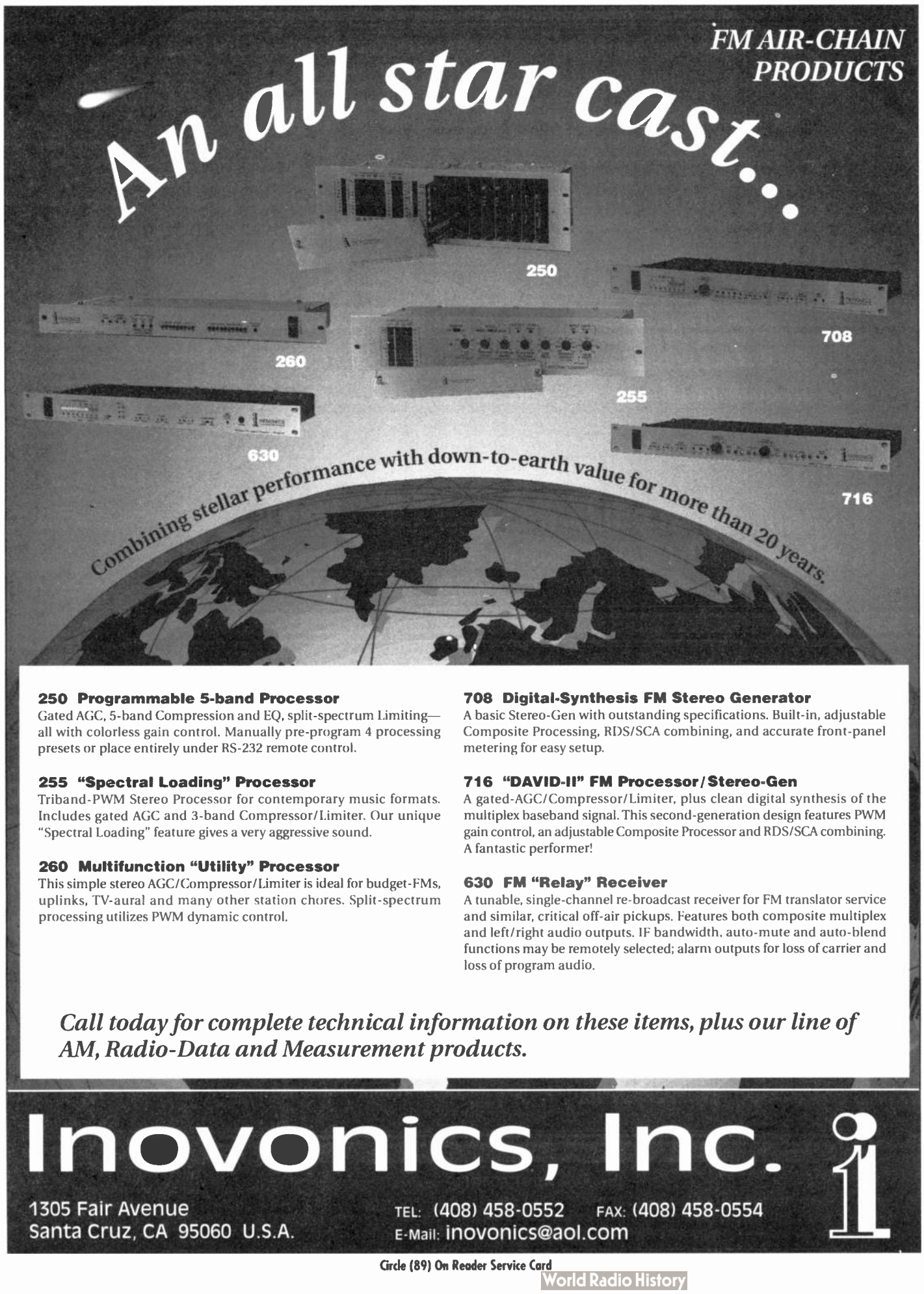
Echo hiding differs from another technology — spread spectrum — that's also being considered for watermarking applications. Spread spectrum was developed at MIT in the 1950s for military applications. Echo hiding has advantages over spread spectrum, said Bender, because it is more robust and requires less of a signal to lock onto for decoding, something that's important in processing very short audio clips.

Currently, the Media Lab's echo hiding technology is experimental. However, Bender said any of the News in the Future project sponsors can bring it to market and there is currently interest in doing so. "It's pretty close to being marketable," he said. "We've got real time implementation now in the software."

For more on echo hiding, visit *http://nif.www.media.mit.edu/DataHiding/sound.html*

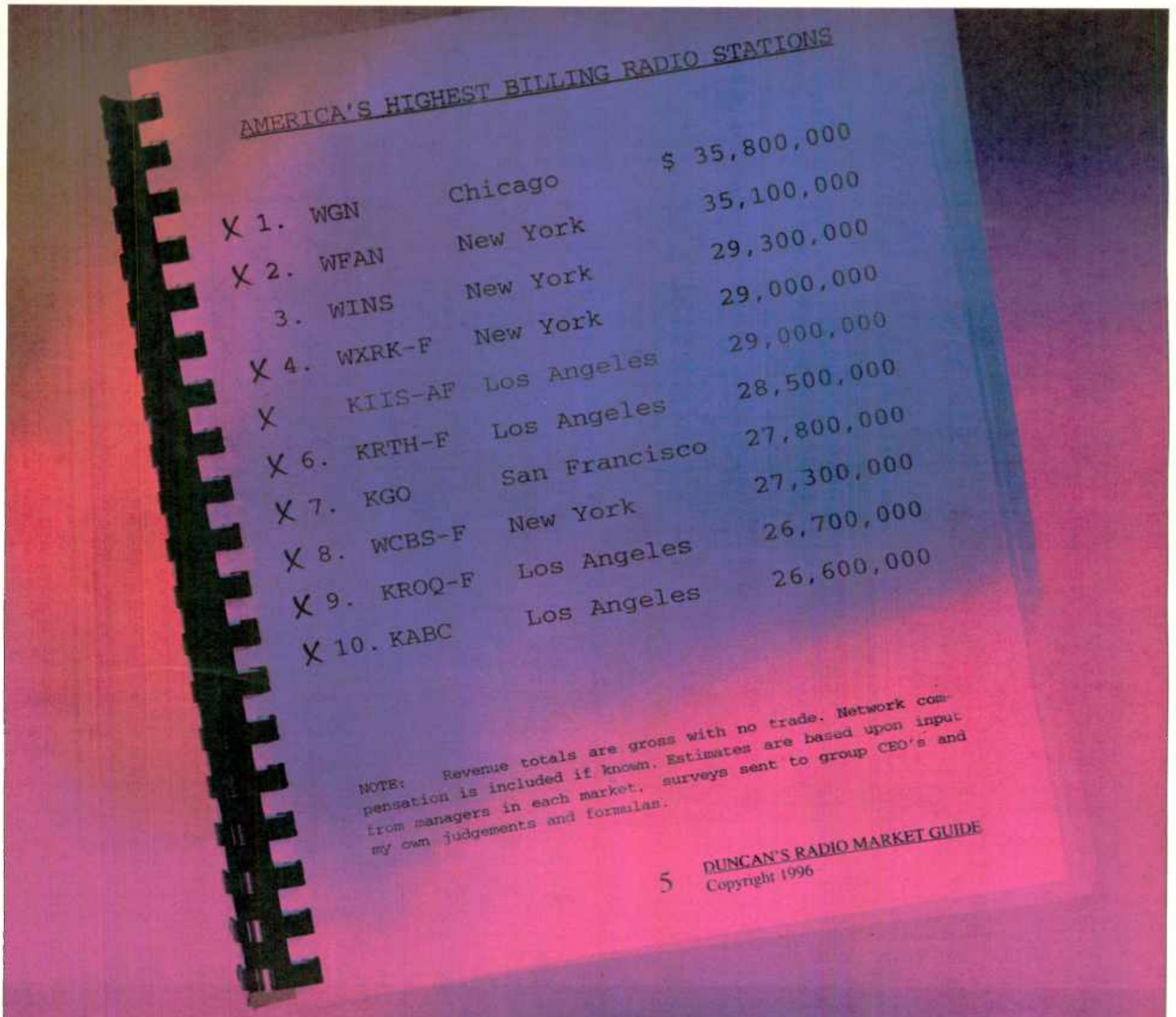
■■■

Frank Beacham is a New York-based writer and producer. Visit his web site at www.beacham.com. *Mail: 163 Amsterdam Ave. #361, New York, NY 10023. E-mail:* frank@beacham.com



Circle (89) On Reader Service Card

World Radio History



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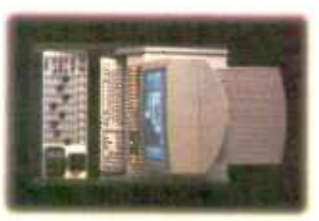

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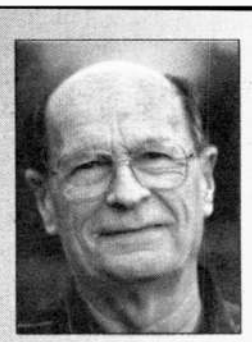
World Radio History

Studio Sessions



Rupert Neve Gets Grammy

See Page 27

PRODUCT EVALUATION

Mass-duplicate CDs with MediaForm

Tom Vernon

Think of it as more of a paradigm shift than a new piece of equipment. That was one of the comments I heard as we wrapped up our 30-day evaluation of MediaForm's CD-2500/A Audio Generator.

This box lets you burn your own CDs and duplicate up to 25 discs at a time. Our test environment was the production studios of the World Cafe, a nationally-syndicated program that showcases the music of singer-songwriters in daily 2-hour programs distributed over PRI. If your work involves production and distribution of any kind of syndicated audio programming, the savings in time and energy gained from the CD-2500 may amaze you.

Two-piece set

The Audio Generator has both hardware and software components. The box itself contains a Yamaha 4X CD-R drive, as well as input and output hoppers for stacking up 25 recordable CDs. It measures 8 x 22 x 9 inches, weighs 40 pounds and ties into your computer via the SCSI port.

If you are using a PC, Hohner's Red Roaster software is included. It enables you to produce Red Book audio CDs, complete with index number, track number, track start time, UPS/EAN coding and copy protection.

It is really two software packages bundled together: Samplitude writes the table of contents (TOC), while Point interprets the TOC and controls the burning of the CD. For Mac users, Toast CD-DA 2.0 is the software of choice.

System requirements are modest. For PCs, you'll need a 486/33 or better with 8 MB RAM. Your hard disk should have an access time of less than 19 msec, and a transfer rate greater than 600kb per second. A SCSI host adapter and ASPI cabling are required.

In a Mac environment, you will need a 68040 or Power Macintosh with at least 4 MB RAM, running System 7.0 or above. System 7.5 is recommended. If you are already editing sound on a hard drive, your machines are probably well beyond these minimum requirements.

Over the last three years, production of the World Cafe has evolved from quarter-inch open reel, to DAT and hard disk editing with SAW Plus. Although the enhanced sound quality of DAT vs. open reel was noticeable, there was no reduction in production time as we phased out our reel equipment. DAT is a fragile medium, and unattended dubbing of material for a nationally-syndicated show is not a good idea. Many hours are spent with someone baby-sitting DAT dubs in real time.

Fast Burn: The MediaForm CD-2500/A

The beauty of CD-R mastering and dubbing is that it happens 4X real time. This cuts 90 minutes out of the time needed to master a 2-hour show like World Cafe. When you are producing six shows a week, this time savings really adds up, as shown in Table 1.

Table 1: Time Savings With CD-2500/A

	Without MediaForm (hours)	With MediaForm (hours)
Pull CDs, "rack" them up in studio	1.0	1.0
Load music/elements	2.0	0.5
Mix a 2-hour show	2.0	2.0
Master a 2-hour show	2.5	0.5
TOTAL	7.5	4.0
TOTAL FOR 6 SHOWS/WK	45.0	24.0
TOTAL ATTENDED TIME	45.0	18.0

If you need to make multiple copies, just load the hopper with up to 25 CD-Rs at the end of the day, start the dubbing process, come back the next morning, and collect your finished CDs from the exit hopper.

Use care while inserting blank CDs into the caddies. Handle discs by the edges. Any fingerprints or dirt on the recording surface of the CD may result in errors and a wasted CD.

Another precaution: Let nothing interrupt the recording process, lest the delays result in a trashed CD. We created a 1 GB partition on a fast drive. The drive was defragmented regularly so that we could pull data from it as quickly and easily as possible.

Another reason CD-Rs are becoming an attractive option is the falling cost of the medium. A few years ago, discs sold for about $25 each, limiting their use to high-end corporate environments. Today, when purchased in bulk, Sony CD-Rs can be had for as little as $5, comparable to the cost of DAT tapes. A fully-loaded CD can store about 75 minutes of audio.

During the trial period we had access to both the Hohner and MediaForm help lines. Everything went so smoothly we never had to make a call to either.

The only glitch we noticed with the software was that Samplitude will only load 52 files before it locks up. We found a way to work around that.

The cooling fan on the 2500 is a bit too loud for a production environment. We simply left it off until we were ready for it. Aside from the fan, the process is silent, except for the reassuring "clank" as completed CDs are ejected into the metal Exit bin.

Is CD-R a suitable medium for archiving programs? That remains an open question. At this point, it seems about as stable as any other format.

The engineering department enjoyed some reduction in time maintaining DAT machines. While we still use DAT for backup, we need fewer machines, and those in service get less wear and tear. About the only maintenance the 2500 needs is an occasional cleaning of the rubber roller that ejects completed CDs.

We were surprised to learn that the CD-2500 and the other devices in MediaForm's catalog are American-made. Okay, the Yamaha 4X CD writer comes from overseas, but everything else is assembled in Exton, Pa., a suburb of Philadelphia.

This may be a blessing if you need warranty repairs or other technical work, as this technology is beyond the reach of most engineering departments. The 2500 comes with a 12-month warranty from Yamaha. After that, repairs are handled by MediaForm.

There are other applications we did not have time to explore. One idea was to use the CD-R medium as a replacement for cart machines at WXPN(FM) Philadelphia. Although not recommended, it is technically possible to write a few tracks on the CD-R, take the disc out, use it, and add more cuts later. We envisioned putting promos and underwriting announcements on CD and adding new material until all 99 tracks were filled, then discarding the CD. In addition to the

See RECORDER, page 28 ▶

Ernie 'The Love Boat' Anderson Dies at 73

Alan R. Peterson

Ernie Anderson, the West Coast voice-over legend well known for the tagline "The Loooovve Boat," died at his home in Los Angeles on Feb. 6. He was 73.

Anderson was born in Lynn, Mass., in 1923. His radio roots stretch back to 1947 to his first job at WSKI(AM), Burlington, Vt.

He moved on to a station in Providence, R.I., where he was fired for riding his motorcycle through the halls of the station.

In 1958, he was an air personality for WHK(AM), Cleveland, then moved into television at WJW-TV. During that time, he formed a comedy team with Tim Conway.

In 1966, Anderson moved to Hollywood to pursue an acting career. He was sidetracked by booth announcer jobs and voice-over projects which, over time, grew into his full-time vocation.

Anderson had been the promo voice for ABC television since 1973 and recently voiced spots for Ford Motors and Sports Illustrated magazine. His voice graced the TV productions "Roots," "The Winds of War" and the Shell Oil "Bicentennial Minutes" series.

He was most recently heard as the announcer for ABC-TV's "America's Funniest Home Videos." Viewers once saw him appear live on that show, reading the scripted intro and heckling host Bob Saget. Anderson preferred working with a Sennheiser overhead shotgun mic.

Anderson was able to hone his craft into a multi-million dollar business, voicing for a number of clients and projects. He is arguably best-remembered for his promos and tag lines for ABC's "The Love Boat." His voice was so permanently linked to the show, Anderson was informally referred to as Ernie "Love Boat" Anderson.

He reportedly had a stroke last year. Announcing duties for "America's Funniest Home Videos" were deferred mostly to Music Of Your Life radio personality Gary Owens.

According to his agents Sutton, Barth and Vennari, Ernie Anderson is survived by his wife Bonnie and seven children.

World Radio History

Make Money by Sounding Funny

Alan R. Peterson

Production people and voice talents are always on the lookout for "that next gig," and often come across employment ads that say something like, "Must have cartoons playing inside your head 24 hours a day."

Perhaps there is an opportunity for you to jump into doing funny voices for small animation projects or CD-ROM authoring. Your demo tape is good, but too "straight," and needs some cartoony voices to camp things up a little bit. So where do funny voices come from?

Strangely enough, they come from the ear first before the voicebox.

Righteous, dude!

A hot voice right now is the 20-something Californian "*duuude*!" attitude. In real life, they are accepted and tolerated, but in commercials and cartoons, they become something larger. All you need do is listen, record and critique, and in a few tries you will have it.

Dialects require a little work but can happen in time. It never hurts to be able to pull off Scotty or a Brooklyn cabbie. But that still leaves you trying to discover original cartoon voices.

Even with bucketloads of digital technology, you can still perform funny (and profitable) characters simply by using the vocal equipment given you by your parents on your birthday. Here is a fast way to wet your feet and begin playing with kooky character voices for radio or animation.

Remember Marvin Martian from the Warner Brothers cartoons? The little guy with the gladiator helmet who was always taking guff from Bugs Bunny? Position the inside of your mouth to produce a sustained "R" sound and, without varying this position, say "I'm going to blow up the earth" in a slightly British accent. It's a rough approximation, but you are already 95 percent on your way to doing Marvin.

So what about original voices? Pick a simple phrase like "That's the ugliest car I ever saw." Now speak the phrase with the inside of your mouth set to a sustained vowel position.

Try to imitate the science teacher you had in ninth grade.

In other words, think "E," then say the phrase. It will sound a little like Ren from the Nickelodeon TV show, but it is officially your creation.

Place the mouth machinery to an "uh" position, then do the ugly car line. There is your classic "Mugsy" dimwit crook voice. An "O" position results in a quasi-Alfred Hitchcock.

Practice several positions with different lines. Screw your face up into that little pucker-mouth grimace that Cabbage Patch kids are famous for, then deliver your lines. Glide through several vowel positions while speaking your copy.

Curl your lower lip up and over your bottom teeth and talk at half-speed for the model "gramps" voice. Hold your nose! Try every trick you can to generate a timbre different from your own voice.

Once you have had enough fun, combine these tricks with the dialects you already know. For an added dimension, try to imitate the science teacher you had in ninth grade.

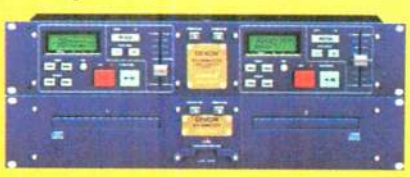
It sounds like a lot of work to do all this, but when you are picked to be the voice of Norbert the Trombone-playing Clam for Saturday morning TV — and being offered double AFTRA rates to do it — you will know it was well worth the effort.

SHORT TAKE

Denon CD Anniversary

Denon Electronics announced the launch of its limited-production fifth anniversary DN-2000F double CD player, originally introduced in 1991.

The DN-2000F LTD transport and controller have deep blue faceplates and engraved gold plaques with personal reference numbers.



Gold screws around the front panels further dress up the appearance of the DN-2000F LTD.

The dual transport design and separate controller make the DN-2000F LTD suitable for remote DJ work.

The unit will ship in April and is available only during 1997. Suggested price is $1,300.

For information, contact Denon Electronics at (201) 575-7810 or circle ***Reader Service 32.***

— Alan R. Peterson

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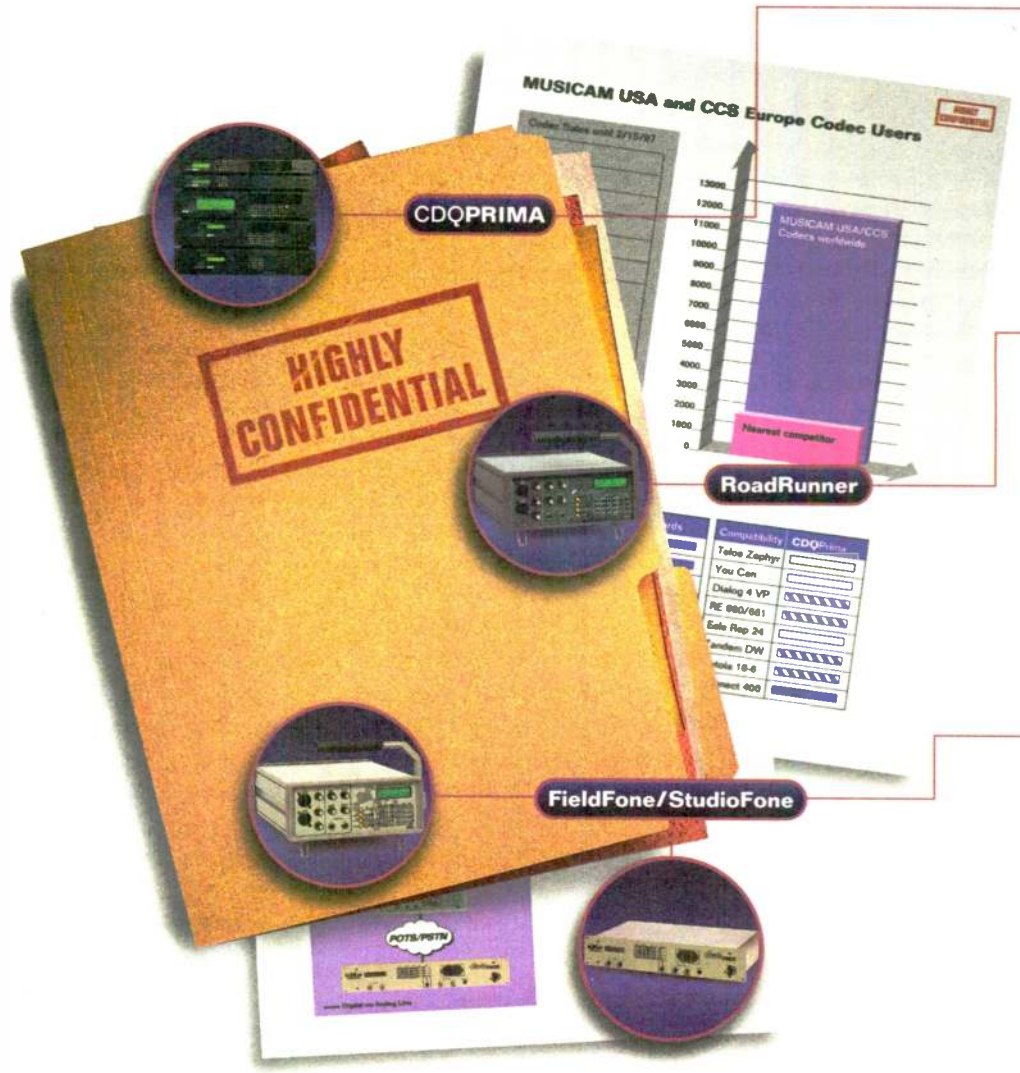

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World Radio History

PRODUCT EVALUATION

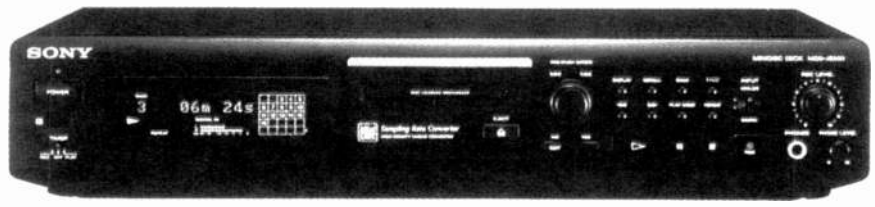
Sony MD Deck Does Mornings at WRCY

Chris O'Brien

Yet again, my addiction to cool gadgets has been reactivated by the assignment desk at **RW**. I think there is some complex scheme afoot to separate Chris O'Brien from his new equipment budget because once again, at the end of another "in-studio" test, I purchased the test equipment.

It's a sickness, really.

In all seriousness, I was given this assignment because I am a believer in MiniDisc technology and its practical use in the broadcast environment.



Sony MDS-JE500 MiniDisc Recorder

In appearance, the MDS-JE500 looks as if it belongs in any home stereo stack. Its size is just slightly smaller than a VCR and about the same size as a single-play home CD player. (This information is valuable. You might want to find room in your home or studio audio stack for the MDS-JE500.)

The MDS-JE500 is attractive, with plenty of knobs, buttons and cool-looking lights that are so necessary to any audiophile. It goes without saying, of course, that all of these great-looking features are only the packaging. The real wonders of the MDS-JE500 are in its working features.

Like its cousin the MDS-B3 pro MiniDisc recorder/player, the MDS-JE500 has impressive recording and editing ability. But it is really not designed for the live studio environment. Its many bells and whistles, lights and knobs are certain to cause operator distraction.

Obviously, the price of the MDS-JE500 and the MDS-B3 are vastly different. The latter is more than $2,000. The former is less than $500.

The Test

As usual, I created a challenging test scenario for the MDS-JE500.

(Fight bell effect) In this cor-ner ... the rabid, overworked, underpaid and generally grumpy morning show producer weighing in at 220 pounds. In the other cor-ner, the MDS-JE500 weighing in at 7 pounds 11 ounces. (Applause effect!)

I have brainwashed all of my employees into my way of thinking about MiniDisc technology, and my morning show producer is particularly fanatic about MiniDiscs. Who better to put this machine through its paces?

We utilize two studios and a total of three MiniDisc players during our morning show, so we were able to plug the MDS-JE500 right into our daily regime with few problems. Problems, you say? Yes, problems.

Product Capsule:
Sony MDS-JE500 MiniDisc Recorder

Thumbs Up	Thumbs Down
✓ Digital Audio Quality	✓ Cumbersome as an on-air device
✓ Ease of Operation	✓ Consumer-Style RCA I/O
✓ Lightweight	
✓ For home or production room use	
✓ Inexpensive (under $500)	

For more information call Sony at (201) 930-1000, or circle **Reader Service 2**

One of the things we discovered quickly is that when doing the morning show, the announcer/producer team is moving fast and found the MDS-JE500 cumbersome in this high-speed environment. So early on, we acknowledged that the MDS-JE500 belongs with the producer in the production room and not with the on-air announcer.

Let me reiterate that the MDS-JE500 was not designed like the MDS-B3 for on-air work, so its cumbersome qualities are no big deal.

The other slight problem we encountered is the remote control. This is not very useful to our morning show producer, because the box itself has everything required to get the job done, sans remote.

Still, the MDS-JE500 became the preferred machine of our morning team after only a few days. This was not because of its looks, its great sound quality or its editing abilities, but because of just one thing: that nifty AMS wheel! The AMS wheel made finding cuts a snap and recuing even easier.

Engineer-ese

For those who would like the technical details to help make a decision, here they are.

The frequency response is from 5 Hz

See SONY, page 27 ▶

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World Radio History

SHORT TAKE

Waves Releases From TDM

Waves Ltd. announced the release of the TDM Bundle, a set of DSP Plug-ins for ProTools.

The TDM Bundle includes the Q10 Paragraphic EQ, L1 Ultramaximizer, S1 Stereo Imager, the C1 Compressor/Gate and TrueVerb Room Emulator and Reverberator. Other elements include a psychoacoustic analyzer, a batch file wave converter and lossless SDII audio compression program.

Waves plug-ins are "component" plug-ins, in that they can be separated into smaller modules. It is possible for a user to have up to four different Waves processes active on the main output for mastering.

The TDM Bundle has a suggested price of $2,300 and requires Digidesign ProTools TDM hardware and a compatible Mac computer. The bundle also supports SDII-NuBus and Native Power Pack platforms.

For information, contact Waves Ltd., at (423) 689-5395 or circle ***Reader Service 31.***

Sony MD Deck On-Air

▶ SONY, continued from page 26

to 20 kHz, ±0.3 dB. Wow and flutter, like nearly all digital devices, is below measurable limit. The signal-to-noise ratio is better than 96 dB during playback.

A semiconductor laser of continuous emission duration comprises the optical pickup. The MD spins at 400 to 900 rpm.

Error correction consists of Advanced Cross Interleave Reed Solomon Code (ACIRC), the modulation system is the Eight-to-Fourteen Modulation scheme (EFM) and the MDS-JE500 samples at 44.1 kHz.

Installation is a breeze with simple RCA connections. Also standard on the MDS-JE500 is digital connection for synchro-recording with other digital devices.

The MDS-JE500 is priced right and is easy to use for the first-timer trying out MiniDisc technology. To those naysayers who insist that MiniDisc technology is not for broadcasting, wake up and smell the modulation!

A MiniDisc is better than reel-to-reel or cart anyday and much easier to edit, so get with the program and check out the MDS-JE500.

■■■

Thanks to Sound Sales Inc. of Columbia, Md., for providing a unit for this evaluation. Chris O'Brien is program director for WRCY(FM), Thunder 107.7 in Washington. You can reach Chris at (703) 631-2576 or obrien@tidalwave.net

Console Guru Neve Honored

Legend Rupert Neve Can Claim One More Honor in His Illustrious Career: the Grammy Award

Alan R. Peterson

The name Rupert Neve is well-known to anyone familiar with high-end audio mixers, mic preamps and EQs. Now the man behind the famous consoles has another honor: Grammy Award winner.

At the nominee reception held last month in New York, Neve — now a consultant for Amek — received the Technical Grammy for unique and important contributions to the technical evolution of music. The award category was established in 1993 and has since been presented to two other individuals: Dr. Thomas G. Stockham, Jr., and Ray Dolby.

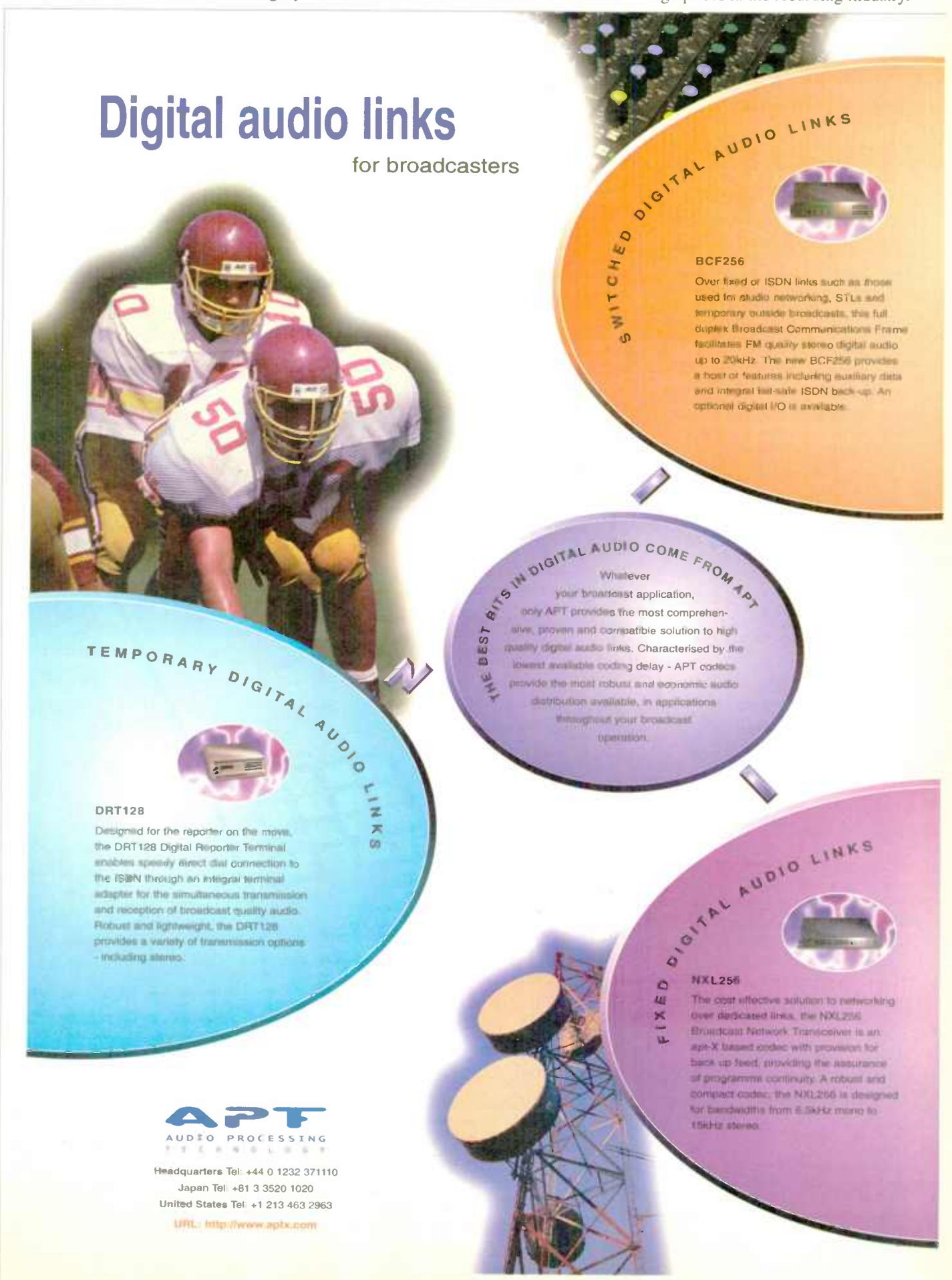
Neve's recording consoles are highly prized for their sound quality. His earlier efforts included the design of transformers and a disc recording company. In 1961, Neve was commissioned to construct a mixer for a London studio and the rest became legend. Neve built tube-based mixers until 1964, when he constructed a 16-channel transistor mixer for Phillips Records.

New products

Neve's current efforts for Amek have resulted in the creation of the large-format 9098 "Ultimate Analog Console" and the 9098 line of rackmount studio products. These include remote-controlled mic amplifiers, an equalizer and a dual compressor-limiter.

Neve's designs still incorporate traditional transformer and EQ concepts on which he established his reputation.

The popularity of Neve's designs continues to this day. Older Neve preamplifiers and console components command high prices in the recording industry.



Circle (64) On Reader Service Card

World Radio History

Syndicate a Show With MediaForm

▶ RECORDER, continued from page 24

uncertainty of the recording process, we foresaw the necessity of adding two more CD players.

Another idea was to use the 2500 to generate revenue. Although you are limited with the MediaForm package to Red Book audio mastering, nothing prevents you from purchasing additional software to master other CD formats, such as ISO 9660, Mac/ISO hybrid, Photo CD, CD-I, CD Plus, Macintosh HFS or Video CD. This is an especially interesting idea in a university environment. You may be able to create a profit center by offering your CD mastering and duplicating services to other parts of the organization. University business offices and libraries often are interested in archiving data on CDs. With a bit of aggressive marketing, you might find other customers on campus.

Looking good

If your profit center starts to fly, you will want to deliver a professional-looking product. Adhesive labels are a big no-no, because they can throw a spinning CD out of balance and cause problems during playback. Neat writing on the surface with a Sharpie pen does the trick, but looks amateurish. Specialized ink jet printers with permanent ink do a professional job. You can create your artwork on graphics packages like Corel Draw or Adobe Photoshop, much as you would with a paper medium. Unfortunately, four-color CD-R printers cost around $3,000. On second thought, the Sharpie pen doesn't look all that bad, does it?

The CD-R medium is a bit different than store-bought CDs. The industrial CD recording process uses the familiar aluminum discs, while the commercial process with the 2500 uses gold discs. Both types look the same to a CD player.

To summarize, all of the things they say in the sales literature are true. Stations and production houses that are delivering regular streams of broadcast quality content can realize a considerable savings in time and energy with the 2500. The process is simple enough that anyone using computers for production should have no trouble mastering the process.

Special thanks to World Cafe producer Joe Taylor for road testing the CD-2500/A Audio Generator and calculating the time savings it created.

■■■

For information on the CD-2500 or MediaForm's other products, call (800) 220-1215, visit their Web page at http://www.mediaform.com *or* ***circle Reader Service 5****.*

Tom Vernon divides his time between consulting and completion of a Ph.D. Send him e-mail at TLVernon@aol.com *or call (717) 367-5595.*

Circle (90) On Reader Service Card

Neumann U87A Mic Impresses

Michael Leclair

WBUR(FM) is a National Public Radio affiliate in Boston with a news and information format. We produce local, long-form news stories that are inserted into programming distributed by NPR.

We also produce programs that are aired nationwide, including "Car Talk," "Only A Game" and "The Connection." All of these programs are produced to the highest technical standards and demand a high-quality microphone.

Studio microphone selection for voice work involves a number of factors. Many microphone users learn how to get the sound they like from a particular model and get good results from fairly simple microphones.

In order to achieve consistency in our sound, we standardized on the use of the Neumann U87A and its earlier version, the U87, for all of our studio voice track recording.

Location

Some microphones give excellent performance in a particular studio, but do not sound as good elsewhere. Some sound perfect on particular voices, but poor on others.

At WBUR we have 11 different studio spaces, ranging from booths for one announcer to talk show studios accommodating an announcer and three guests.

We have many types of announcers on staff, including reporters and program hosts, and a continuous stream of guests and clients from other news organizations.

Although one mic type may not always be best for all situations, the U87A provides consistent quality on voice work. Additionally, the U87A features a distinctive, open sound that has become a signature for our radio station.

The Neumann U87A is designed to be a high-end studio announcer

See MIC, page 37 ▶

World Radio History

BROADCAST Communiqué

HARRIS CORPORATION, BROADCAST DIVISION | DIGITAL RADIO HIGHLIGHTS | NAB 1997

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4 **Why Would You Want An Uncompressed Digital Audio Air Chain and How Can You Go About Implementing One?**

A panel of Harris staff members with expertise on digital products from the radio studio through the antenna discuss the benefits of digital technology in general and the uncompressed digital audio air chain in particular. Harris staffers also share tips for implementing the digital chain.

6 **Harris Staffers To Present Six Papers At NAB 1997 Engineering Conference**

From examining and implementing new digital technologies to adjusting emergency services plans to meet new requirements, Harris staff members will address vital industry concerns.

6 **How And Why You Should Convert To An All-Digital Studio Path**

Harris VP and Radio Product Manager Geoff Mendenhall shares information and advantages of the AES3 digital path.

HARRIS

Harris CD LINK™ 950 MHz Aural STL Completes Uncompressed Digital Air Chain

Premiering at NAB 1997, Harris' CD LINK™, a 950MHz digital STL, overcomes the final technical hurdle in the totally uncompressed digital audio air-chain. This revolutionary STL transports *uncompressed* AES3 studio-standard digital audio over a standard 300kHz RF channel.

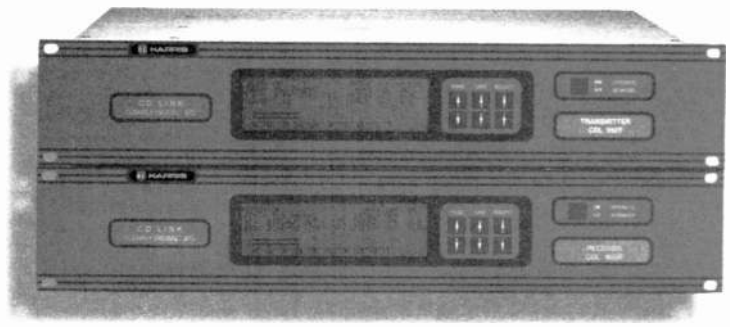
Until now, it has been common to have at least one component that uses lossy compression in the digital audio chain. Lossy compression is a bit reduction technique used to fit a digital signal into a specified bandwidth. This technique uses psychoacoustic digital compression algorithms that commonly eliminate 75% of a signal's digital audio content. Content that is eliminated becomes irretrievable.

When two or more components in an air-chain use lossy compression, cascading algorithms can occur, causing very noticeable distortions in audio quality. Until now, all 950MHz STLs have used lossy compression. CD LINK gives you all the sound your studio is capable of producing.

The CD LINK provides superior performance with a typical signal-to-noise ratio of 93dB and frequency response of +/-0.1dB. Beyond a robust signal with improved fade margins, CD LINK offers many other user benefits. A spectrum-efficient RF design allows CD LINK to transport one AES3 stereo signal and two data channels simultaneously. An analog stereo composite output as well as two 6kHz or one 12kHz auxiliary audio channels are available as options.

The CD LINK's transmitter and receiver are each housed in a single, 3-1/2" rack-mountable chassis which contains all digital and RF circuits. The unit, which is designed for ease of installation with an AES3 XLR or optical input connector, Type N RF output connector and a universal AC power supply, fits in the place of existing analog STLs.

For more information about the CD LINK and complete specifications, please send your written request to Harris via fax (217-222-0581) or e-mail (hbd@harris.com).



Harris CD LINK™ Benefits

CLEARLY DIGITAL

- Drops in place of existing 950MHz STLs.
- Provides uncompressed digital audio.
- Fits in standard 300kHz bandwidth.
- Delivers better audio.
- Has better fade margins.
- Provides higher-quality auxiliary audio than most other solutions (two 6kHz or one 12kHz audio channels for SCA use or for feeding an AM transmitter).
- Has extra data capacity in form of RS232 port (either two 4800 baud or one 9600 and one 4800 baud).
- At studio, accepts either analog or AES3 input. At transmitter end, can output *simultaneously* AES3, L and R analog. With optional DSP stereo generator, can output *simultaneously* composite baseband to a back-up analog exciter.*

*NOTE: Some people might want to buy CD LINK before DIGIT, Harris' digital FM exciter, because this feature allows them to have the processor back at the studio!

Radio Moves To The South Hall --Booth 5909

World Radio History

PRODUCT Showcase

Harris DRC1000 — Bringing the Benefits Of A Digital Audio Console To Radio

The Harris DRC1000 digital audio console delivers present and future "state of the art" capabilities in a secure and reliable user friendly design. The DRC1000 provides the high level of digital sonic quality you expect, while exceeding expectations in every feature. The power of this console is all made possible by utilizing 32 bit internal precision floating point DSP technology. Each Audio Processing Unit contains six (6) Sharc DSPs simultaneously sharing capabilities to offer "awesome" processing power.

The DRC1000 uses simple, easy to read on-screen graphics, LED source la-

bels, and lighted soft keys. Users find it simple to learn and easy to use. An internal security system allows for any of the adjustable configuration screens to be "Locked Out" from users. If you want your talent to only use the faders and start stop buttons, no problem. Do you have someone who wants microphones on the right side of the console during an air shift? Digital makes it easy! Why spend hours reconfiguring your hardware? With the DRC1000's powerful software, you can reconfigure your console to match your needs in just seconds.

Each Audio Processing Unit on the DRC1000 includes 11 stereo (22 mono) AES3 (AES/EBU) digital inputs. Inputs 1 through 8 (mono) can optionally be ordered analog and work at either mic or line level. Unlike most consoles, these inputs can be named and assigned to any of the 10 Penny and Giles 100 mm throw faders.

The APU has 7 stereo (14 mono) AES3 output busses. Output busses are simultaneously available in digital and analog. Two of the analog outputs utilize 20 bit digital to analog converters for highest quality. The remaining five analog busses utilize high quality 18 bit digital to analog converters. This input to output bus structure gives the flexibility to utilize the console the way you want. Matrix configurations can be stored and changed at any time. Output matrix changes this easy offer the flexibility you need without a routing switcher. Should an application require additional routing switchers, the DRC1000 can optionally control them via serial communications.

Various pieces of digital source equipment to be used may have different sample rates. The console, by design, brings all sources together into a single audio signal. As a major portion of the digital audio stream, sampling rates must also be blended together to create the output needed to match the remainder of your digital signal stream. The DRC1000 has automatic internal sample rate conversion for each input. This console will accept 32 kHz, 44.1 kHz, or 48 kHz in either AES3 or SPDIF. Simply engage the converter for any input that does not already match the desired output sample rate. The DRC1000 takes care of the rest. No need to buy a lot of additional equipment.

The DRC1000 offers a 5 band parametric equalizer as a standard feature. Filters include: low shelf, notch, bandpass, peak, and high shelf. You may use one or all five EQs simultaneously on any input. The console stores this information along with all of its other parameters in the user configuration. In this fashion, each user can have preferred equalization settings recalled when they use the console. Pan, compressor/limiter, and AGC are also included in the standard package. Options like reverb and pitch shift are also available.

No matter what the future holds for your operation, the DRC1000 will keep you in stride. It is designed to be expandable and to grow as you do. Today's digital products offer us new levels of efficiency never before thought possible. All of these capabilities in a reliable, yet easy to use package. Call TOLL-FREE 1-800-622-0022 today to see how the DRC1000 can improve your sound, your staff's capabilities, and your bottom line.

Harris A2D2A— An Inexpensive, High-Quality A/D And D/A Converter That Works Like A Hog

"This thing works like a hog!"

Maybe it is not the kind of quote that ends up in an advertisement, but it is how KKDA-AM/FM's Paul Strickland praises the Harris A2D2A digital converter. His Grand Prairie, Texas, station took delivery of the new A/D-D/A converter last November and he is convinced it was the right decision.

KKDA uses the A2D2A as part of a T1 STL line. The unit converts studio program audio into an uncompressed 44.1 kHz data stream, then feeds the digital signal into an Intraplex T1 digital interface. The signal is reconstructed at the transmitter site.

Other stations such as KEX-KKRZ, Portland, Ore., and WDVE-FM, Pittsburgh have also discovered the inexpensive, high-quality Harris device. Applications include standalone A/D conversion for workstations, DAT recorders and digital multitrack recorders.

The 20-bit A2D2A has standard XLR and quarter-inch analog connectors and supports both AES3/EBU and SPDIF formats. Three standard sample rates — 48, 44.1 and 32 kHz — are available and the unit can lock to an external AES3/EBU reference signal.

The front panel has been kept very simple, with two analog input controls, a stereo link button and four push buttons to select sample rate. Calibrated LED indicators track input level. One front-panel LED confirms a digital signal is present for conversion back to analog.

Input impedances are 20k ohm balanced, 10k ohm unbalanced. Signal-to-noise ratio is better than 95dBFS on the analog output. The A2D2A can perform simultaneous A/D and D/A conversions and factory specs claim 100 dB of a-weighted dynamic range in both signal paths. The 1 RU-high converter weighs under nine pounds and uses a line lump external power supply. The product is certified CE ready for European use as well. Domestically, the Harris A2D2A is priced at $599. To learn more, phone TOLL-FREE:1-800-622-0022.

(Reprinted with permission of Radio World)

Orban DSE 7000FX— Radio's Best-Selling Workstation Adds Four Times More DSP Power

Now, it's the DSE 7000*FX*! Orban has made significant gut-level changes to the best-selling workstation in radio. By going inside and adding four times the digital signal processing power, Orban's opened up all kinds of possibilities for the DSE. This new platform allows them to continually add more effects and capabilities while always keeping the ease of use that has made the DSE legendary.

Orban™ parametric equalization, Optimod™ compression, and Lexicon™ digital reverberation are now built into the DSE 7000FX. These are some of the best known names in audio processing. And although you might expect to pay thousands for such high-end studio effects, they all come standard in the DSE 7000FX.

With this new expandable platform, it'll be easy to add more and new capabilities to the DSE, all to make your job easier. As they're developed, these new DSE capabilities will come to you on a simple floppy disk, free of charge. So not only will your DSE stay current, so will your sound.

Equalization by Orban, compression by Optimod, reverb by Lexicon and the technology, the brains and resourcefulness of one of radio's most positively powerful companies... The DSE 7000FX is number one and pushing that envelope.

Once you try the DSE 7000FX, we're convinced you'll convert. That's why we'd like to offer you a demo* unit to try. Keep it for a week and see what happens. Play with it. Experiment. Fight over it. Just see if the DSE doesn't boost the speed of production and the creativity of spots. And see if you're ready to come on board with the best selling, best equipped digital workstation in radio. Phone TOLL-FREE 1-800-622-0022 for the full story.

*Subject to credit approval

Harris DIGIT® CD Digital FM Exciter Adds Requested Second-Generation Features

Harris' DIGIT® is the world's first digital FM exciter. True CD-quality sound is only one significant advantage that has made more than 950 DIGITs the choice of broadcasters worldwide and the industry-standard FM exciter since introduction in 1993.

Now in its second generation, DIGIT® CD builds on the proven benefits of DIGIT to provide even better performance and more features!

DIGIT CD offers superb performance by using Direct Digital Synthesis (DDS) to generate an on-air signal with true 16-bit digital audio quality. DIGIT is available with either an analog input module or a digital input module which allows direct connection to digital (AES3) program sources, with no loss of digital audio quality.

The digital input module includes a DSP-based stereo generator and a digital composite limiter (DCL). For AES3 digital audio input, DIGIT CD's stereo signal-to-noise ratio is 83dB. The DCL, an implementation of the WAVES L1 Ultramaximizer™ used by many digital recording studios, further enhances performance by using proprietary look-ahead circuitry to anticipate and eliminate overmodulation peaks before they occur.

DIGIT CD replaces the voltage controlled oscillator (VCO) traditionally used in analog exciters for program modulation with a 32-bit numerically controlled oscillator. VCO/PLL problems — for example, poor low-frequency separation and PLL unlock from audio transients — are eliminated. DIGIT CD is immune to subsonic transients that can cause faults in an analog exciter and force a station off the air. Drift-free circuits maintain DIGIT CD's original performance year after year, without operator adjustments.

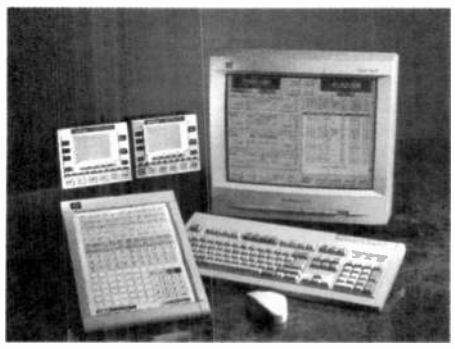
For N+1 operation, DIGIT CD allows any assigned channel to be selected with no requirements for output tuning.

In addition to improved stereo signal-to-noise performance, DIGIT CD can be ordered for externally-controlled carrier frequency synchronization (GPS) capability for use in on-channel "booster" systems. DIGIT CD also includes a synchronous AM reduction circuit as a standard feature.

For more information about DIGIT CD, please fax your request to 217-222-0581 or e-mail hbd@harris.com.

World Radio History

PRODUCT Showcase



Orban AirTime™: More Than A Digital Delivery System... A Cure!

Designed for Radio and TV broadcast, AirTime (Orban's next-generation DDS) provides all the benefits of digital delivery and gives you a computer-based solution — a better solution — to manage audio, without forcing you to undergo a painful adjustment.

You can all work the same way as before, with some welcomed improvements. For example, audio and support information can be accessed from one convenient database. With the system's built-in network, your staff will no longer have to walk a cart from studio to studio or even initiate sending audio over a network. AirTime will handle the transfer automatically.

AirTime can benefit everyone in your station or studio who uses the technology, from on-air talent to traffic and administration, from interns to veteran staff.

A complete interface toolbox: AirTime includes cart machine emulators, sound slate key-pads, touch screens and traditional computer workstations for live assist and automation functions.

An old familiar face: Your on-air talent will have no trouble using our playback cart emulator, Sound Cube. It looks and works like an analog cart machine with large lighted START, STOP and RE-CUE buttons. So training is minimal.

Customized sound with the push of a button: With Sound Slate™, your on-air talent can instantly call up their own libraries of intros, liners or sound effects. To play a cut, on-air talent simply calls up his or her scene and pushes the appropriate button on the Sound Slate.

The power of Sound Screen: You can choose a touch screen option — Sound Screen™ — that lets you run your entire operation at the touch of a finger. It's well-suited for on-air applications, but it can also be powerful tool for administrative tasks.

For traditional control: We also offer Sound Station™ workstations: an on-air model to quickly and easily deliver sources; a production model to create, edit, record and name sources; and a traffic model to efficiently manage all audio sources (perfect for scheduling).

Whichever option you choose, you'll enjoy the benefits of working with the AirTime system.

Load up most delivery systems with work and they'll slow down as demand increases. That's true even for systems with the most powerful Pentium processors. AirTime is an exception. Our real-time operating system prioritizes all tasks on 32 hierarchy levels, giving critical jobs such as playing audio and database sorts primary attention. So, if the system is fully loaded running month-end traffic reports and cleaning up files, when a disc jockey or engineer hits PLAY, a cut will air instantly.

When you're ready to expand your operation, AirTime will grow with you. You can easily and cost-effectively add storage, channels, extensions and users without duplicating your entire system.

The right operating system can give a delivery system all the power and flexibility it needs to adapt to any environment. AirTime has that system: a true multi-user, multi-tasking, real-time operating system — QNX — that runs on a Pentium/PCI computer. QNX is based on UNIX, a proven, rugged operating system that can stand up to even the most demanding applications.

For more than 25 years, Orban has been the first name in broadcast solutions. As such, there's a commitment to making the digital evolution as smooth as possible for our customers, providing them with premier products and technical expertise to meet their changing needs. Give Harris a call TOLL-FREE at 1-800-622-0022 and hear more about what AirTime can do for you.

Harris Platinum Z Transmitters— Finally! True Digital Modulation And Solid State Reliability At A Price Comparable To Vacuum Tube Transmitters

If you've always thought you'd have to pay a premium price for solid state FM transmitters in the middle power ranges, think again.

Harris' latest generation of FM transmitters — CD Series Platinum Z — combines field-proven solid state technology and Harris' world-standard DIGIT CD digital FM exciter for the price of a vacuum tube transmitter.

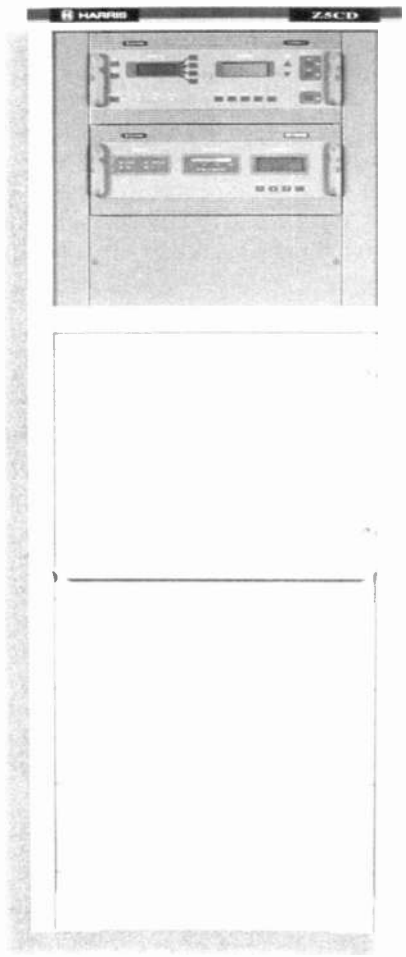
Making their debut at NAB 1996 at the 5kW level, Platinum Z CD Series transmitters now are available in 2kW and 10kW models as well and can be combined for higher power applications.

Platinum Z transmitters offer incomparable value. These ultra-reliable transmitters use the same devices that have achieved an MTBF in excess of 250,000 hours in hundreds of Platinum FM transmitters on the air worldwide. Multiple broadband 800W RF power amplifier modules operate in a parallel configuration to produce rated transmitter power.

With Platinum Z transmitters, Harris introduces a unique, patented combining system. The system — called Z-plane combining — delivers full power to the antenna even if a hot-pluggable power amplifier module is removed from the transmitter.

Reliability and on-air serviceability are further enhanced by extensive redundancy. Among redundant components are IPAs and power supplies (5kW and above). Dual exciters are optional, and Platinum Z transmitters include built-in exciter switching.

We invite you to learn how a Harris Platinum Z CD Series transmitter can give



you the CD-quality performance your listeners demand with unmatched reliability and cost effectiveness. For more information, please fax your request to 217-222-0581 or e-mail hbd@harris.com.

Don't Forget—

Catch A Ride on the Digital Bus In Booth 5909 of the South Hall!

CD2001, Third-Generation Harris CD Cart Machine, Adds AES3 Digital Output To Its List Of Benefits

The CD Cart Machine®, model CD2001 by Harris — now in its third generation — has become a market leader throughout the U.S. — the world's toughest, most competitive radio market.

Now, it's ready for the world.

Why? Because DJs rely on it to start fast and play flawlessly. Because Program Directors trust the autolock feature to prevent dead air. Because management knows that the CD Cart system is the best way to keep valuable music libraries safe from peanut butter, cowboy boots, finger prints, dust, chair rollers, high heel shoes and all the enemies of "perfect forever" compact disc performance. Because engineers know a well-designed, well-built and serviceable machine when they see one. AND because the CD Cart Machine is now AES3 digital out, too. The CD2001 features a digital output with world-standard, 3-pin AES3 as well as an analog stereo output.

Still other enhancements have been made: The servo adjustment is now automatic, and the 16-bit microprocessor is now on board. Surface mount technology is used, and the certified CE-ready unit is manufactured in an ISO 9001-registered factory. It adds up to an even more reliable unir!

Of course we've kept the features that have made previous generations of the Harris CD Cart Machine so popular:

- Autolock feature prevents dead air.
- Cue to music, ready to play.
- Recognizes syndicators' Index 3 subcodes.
- Large, bright flashing EOM (End Of Message) indicator can be programmed for 5 to 35 seconds of "early warning" time before track ends.
- Track number can be preselected with track keys or jog/shuttle wheel.
- Advanced linear tracking system cuts start lag time to under 200 msec.
- Runs cooler than any other CD cart machine for long life.
- Uses industry standard CD cartridges.
- Cartridge port door keeps dust and contamination away from laser.
- Broadcast-ready XLR outputs (stereo analog, plus AES/EBU) and remote interface.
- Heavy cast aluminum deck plate.
- Vertically mounted circuit boards with optional extender cards for fast servicing.
- Top cover and servo board remove easily for cleaning.
- Floating internal mechanism enhances shock resistance.
- Rolling shafts and ball bearings at all moving points for longevity.

For more information about the CD2001, please phone the Broadcast Center TOLL-FREE at 1-800-622-0022.

World Radio History

Why You Would Want An *Uncompressed* Digital Audio Air Chain And How You Can Implement One

Since the first digital radio product made its appearance nearly 17 years ago and the CD replaced the LP and tape as the quality standard, radio broadcasting has been edging toward an uncompressed digital audio air-chain. At NAB '97 with introduction of CD LINK™, a revolutionary 950MHz STL that transports uncompressed audio in a standard, 300kHz bandwidth, Harris will provide the last link in this chain. In this roundtable discussion, Harris participants discuss the benefits of CD LINK and the uncompressed air-chain, its evolution, and how broadcasters can begin implementation.

Roundtable participants include Geoff Mendenhall, VP - Radio Product Line Manager; Jim Woods, Studio Product Line Director; Daryl Buechting, FM Product Manager; Don Taylor, U.S. Radio Field Sales Manager; Dick Fry, FM Applications Engineer, and Rick Funk, Digital Studio Products Specialist.

Q. Why would a broadcaster want an uncompressed digital audio air chain?

Geoff Mendenhall: Better audio.

Rick Funk: Compressed audio, by its nature, is destructive. It's not really the compression so much as it is the bit reduction. Bits that are thrown out in a compression algorithm cannot be retrieved. We have accepted compression because the loss is done in such a way that it's not significantly perceived by the human ear. But broadcasting, through history, has been a more perfect science than that. We've always wanted to strive for the best audio quality, so it's natural to strive for uncompressed audio.

Geoff Mendenhall: Broadcasters want to deliver 100% of the audio content to their audience — not the 25% that remains after compression. Better audio means freedom from artifacts while delivering 100% of the information. It also means eliminating problems associated with cascading compression. The signal only gets worse as one compression scheme takes out some of the information then another compression scheme takes more information from what was left. There's a lot of concern about that.

Rick Funk: Technology to this point has not offered the possibility of transferring digital audio from Point A to Point B over a standard STL without compression. The person who has wanted uncompressed audio has had to go to T-1 links.

Don Taylor: One value of uncompressed digital audio is that it allows you to put the audio processor anywhere you want in the air chain.

Rick Funk: People have wanted to put their processors at the studio, where it is very accessible for adjusting the processing parameters.

Don Taylor: There's an added value to having the processor more accessible. If there's a failure, the engineer can get another signal on the air much more easily.

Q. What is the real significance of the CD LINK, broadcasting's first uncompressed digital audio STL?

Jim Woods: The CD LINK is the last link in the completely uncompressed chain. Now broadcasters can "engineer" their facilities to the level they feel they need to be at from a competitive standpoint. There are no longer any technical hurdles. There still are some economic issues in the studio — for example, do you want to store uncompressed digital audio, and how do you manage that? But that's an economic issue and, consequently, a business decision. The uncompressed digital STL was a technical hurdle.

Daryl Buechting: As an uncompressed digital STL, CD LINK allows you to avoid compression distortions.

Geoff Mendenhall: It's now possible to provide a transparent, distortionless path all the way to the digital exciter, which can then convert that data directly into an essentially perfect analog RF signal. Before DIGIT (Harris' digital FM exciter was introduced in 1993 and is on air at approximately 950 sites worldwide), there wasn't a strong need or desire to extend the digital source all the way out to the transmitter. Now that we have a digital exciter that can accept AES3 data directly, it makes it much more attractive to provide uncompressed AES3 data all the way out to the transmitter.

Q. What are the advantages of a digital STL?

Geoff Mendenhall: By shipping the audio out as data via STL, you have better fade margins. The product you deliver to your listeners with an analog STL cannot be any better than the signal-to-noise ratio of the STL link, and that can vary with fade and interference. With a digital STL, you either get perfect data or you get nothing, and you probably can operate at 20 to 30dB lower signal levels (or worse signal-to-noise ratio) and still get perfect audio through.

Also, you don't have to worry about hum pickup. In the case of composite STLs or other methods of transferring analog audio, you don't have to worry about affects on stereo separation because of phase shift in the transport medium. In the case of split STLs with L and R, you don't have to worry about channel matching levels, or matching preemphasis, or matching phase between L and R channels. All of those things are perfect.

Dick Fry: A lot of these benefits were provided by manufacturers of digital modems for analog STL equipment. There were data reduction losses, but there were still benefits of improved fade margin and better signal-to-noise ratios, so there was a market — even with an analog exciter.

Geoff Mendenhall: That's right. As a first step, people were willing to accept data reduction and know that 75% of their audio data would never make it on the air because they could enjoy the benefits of better fade margins and elimination of hum and level match. Now they can have all those advantages, plus they can have 100% of their audio.

Daryl Buechting: CD LINK drops in place of an existing 950MHz analog STL, so it's very easy to install. And it fits in the 300kHz bandwidth, the same as a composite stereo STL.

Q. Have we heard from broadcasters who have been waiting for an uncompressed STL before aggressively implementing their digital air chains?

Geoff Mendenhall: That's what we've been hearing. Let me give you a little of Harris' philosophy: Why are we doing this? It certainly wasn't that we wanted to attack anyone: it was purely that we needed this product to complete the uncompressed digital air chain and accelerate acceptance of DIGIT and our other digital product offerings. Acceptance of these things has been held back because there was a missing piece — the uncompressed link. None of our vendors or suppliers have been able to provide us this product, even though we've asked for it a number of times over the years. Finally we decided to do it ourselves, because it is important to the overall 100% uncompressed path.

Jim Woods: This product completes a chain that allows people to make value decisions about their audio chain. If cascading compression algorithms or pure audio are not of concern, this product may not be of interest. But if cascading algorithms and the other resulting issues are of concern, then this product provides another alternative.

Q. There are many advantages to going digital, aren't there?

Jim Woods: Yes. I think it allows for some very simple interconnects: it solves a lot of interface issues among various pieces of equipment and allows broadcasters to deliver the highest quality, most reliable audio.

Don Taylor: To piggyback, it is far easier to wire AES3 in a studio than it is to wire L and R analog pairs. You only have half the amount of wire. Plus, you don't have to worry about phase reversals, and you don't have to worry about one wire being longer than the other so that the left channel arrives at a different time than the right channel does. All of these issues just go away...

Dick Fry: Equalization... frequency response and degradation over long lengths of wire are eliminated by going to digital.

Jim Woods: In my mind, the benefit is better audio and simpler equipment interconnects. The digital chain provides high-quality audio with no signal degradation from the studio to the output of the transmitter.

Don Taylor: There's less risk as far as reliability and ease of installation are concerned. You take a less technical person, and that person will be far more successful with a digital installation [than an analog installation].

Geoff Mendenhall: That's because you don't have all the tweaks. With analog, you've got to adjust levels, you've got to avoid clipping, and you've got to get levels matched. There are consistency issues, too. A digital system gives you better audio and more consistency. The only thing you have to set is maybe two levels — on the audio processor output and on the DIGIT input — and those levels are for both channels simultaneously. It's more of a plug and play/works or doesn't work scenario.

Don Taylor: It's easier to troubleshoot...

Daryl Buechting: ...and AES3 test equipment *is* available...

Don Taylor: ...and there no longer is the need to figure out where the Left channel left us and where the Right channel left us because it's going to be a continuous stream until the point of failure.

Q. How should a broadcaster go about implementing the uncompressed digital air chain?

Geoff Mendenhall: I would start where the biggest benefits would be: I'd start at the transmitter and work backwards. There may already be digital audio sources at the studio, but still there's an analog console. However, if you replace your exciter with a digital exciter, you'll get an immediate improvement in audio. From there, go with a digital link back to the studio. At that point, you can drive that digital link with an audio processor that accepts analog audio from the studio and converts it to data. In case of the CD LINK, you have a choice of feeding analog audio or AES3 data into it. If you have analog audio from your audio processor at the studio, CD LINK will convert it to AES3 data and transport it all the way out to DIGIT in the AES3 mode. By buying just two pieces — DIGIT and CD LINK — you can make a major improvement to your broadcast air chain. Then when you get ready, you can upgrade the audio processing to fully digital and continue to work backward through the studio until you get to the source.

Daryl Buechting: Harris can package everything together.

Jim Woods: We represent digital sources from CD players to DAT. We are delivering digital consoles and expect NAB 97 to be a watershed. We represent hard disk audio systems to fit different needs — a variety of solutions from Arrakis DIGILINK products to Enco DAD to Orban DDS. We have the unique ability to bundle the digital products together to meet the customers' specific requirements. We represent high-value solutions and can deliver a competitive package to meet our customers' requirements.

Geoff Mendenhall: Back to the question, "Have we heard many customers say they're waiting for an uncompressed broadcast solution?" The answer is yes. I hear it all the time. I hear it at trade shows. I hear it in phone calls — that there are many broadcasters who have NOT converted to compressed STLs because they have been waiting for this solution. I believe there is going to be a huge demand. By the time we're six months out from NAB, I believe the CD LINK should be the world standard.

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World Radio History

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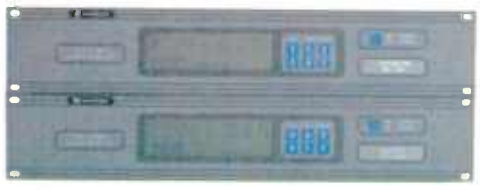
CD LINK™ STL
Full CD-quality sound that blows minds and blows away competition.

If you thought an *uncompressed* Studio-to-Transmitter Link was impossible in a 300 kHz bandwidth, think again. *Harris makes it economical and easy* for you to have an uncompressed bit-for-bit AES3 path that delivers rich, full, digital sound like your audience has never heard before from an FM broadcast station. Sound that can boost ratings, attract more advertisers, make your station more profitable, draw hotter talent, and start an upward success spiral that leaves your competitors singing the compressed digital blues.



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Now the radio broadcast chain can be 100% digital, with CD-quality sound uncompromised by dueling algorithms and lossy compression schemes. Whether your present STL is analog or digital, a Harris CD LINK STL can provide AES3, left/right analog, composite stereo, one 12 kHz or two 6 kHz AUX audio channels, plus data and remote control channels.

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Harris Staffers To Present Six Papers During NAB 1997 Engineering Conference

Harris staff members will present six papers — five on understanding and implementing new digital technologies and one on planning for continued on-air operation in emergencies — during NAB 1997. Copies of any of Harris' papers are available by sending your written request via fax to 217-222-0581 or e-mail to hbd@harris.com. The line-up follows:

Designing and Building the Digital Studio Facility - A Nuts and Bolts Approach
by
Gary R. Hardwick,
Sales Specialist

Is the punch tool a thing of the past? What is required to upgrade an existing facility to incorporate digital technology? What are the key considerations in planning the digital studio for the next decade and beyond? This paper answers these questions — and more.

Performance of Modern AM Modulation Methods into Varied Antenna Conditions
by
John Delay,
AM Product Manager,
and
Hilmer I. Swanson,
Senior Staff Scientist
and winner of the National Association of Broadcasters 1990 Engineering Achievement Award

With the demands of today's broadcast formats and potential for future digital broadcasting in the AM band, it is more important than ever to understand different modulation techniques and their performance under varying antenna conditions. This paper compares the performance of digitally modulated transmitters and PDM transmitters under a variety of conditions.

Advances in Digitally Modulated RF Systems
by
Tim W. Dittmer,
Manager of Radio Engineering

This paper will examine several digital modulation techniques that are used to modulate RF carriers. Digital modems designed to upgrade analog RF systems will be compared to RF systems designed from the ground up to digitally modulate RF carriers. Additionally, systems using source compression algorithms for data reduction will be discussed and compared to uncompressed systems.

Planning Your Digital Television Transmission System
by
Robert J. Plonka
Principal Engineer

A fundamental requirement for planning a digital TV system is to determine the transmitter power rating as it relates to the FCC 6th NPRM allocations table. This paper discusses the peak to average power ratio in 8-VSB transmitter systems and its relationship to transmitter power ratings and linearity issues. Two other areas covered are 1) accommodating an adjacent DTV channel, and 2) frequency coordination.

Implementing Digital Television: WRAL Case Study
by
David C. Danielsons
Principal Engineer

This paper documents the installation and test of WRAL-HD in Raleigh, North Carolina, the first commercial DTV station on the air. Topics include transmitter installation and initial check-out, transmitter setup and performance with NTSC, IOT tuning for the 8-VSB ATSC signal, power calibration of the transmitter using a liquid cooled glycol system, and "on air" transmitter performance with the DTV signal.

Staying on the Air: Case Studies in Emergency Planning - Radio/TV,
by David C. Kobe,
Manager, Broadcast Technology Training Center

Transmitter hardware is evolving rapidly with changes that often involve breakthrough technologies. In fact, many stations are losing ground and lack a comprehensive plan to cover emergencies. This paper compares emergencies that have turned into disasters with emergencies that have been handled effectively. Are you prepared to meet the demands of digital and microprocessor technologies, solid state, and surface mount technologies? And what impact will future technologies have on your operation?

Don't Forget To Catch The Digital Bus to Harris Booth 5909 In The South Hall!

How And Why Should You Convert To An All-Digital Studio To Transmitter Path?

by Geoff Mendenhall, VP- Radio Product Line Manager

The acceptance of the AES/EBU serial digital audio data interface standard by all the major broadcast equipment manufacturers makes it possible to build an All Digital studio with an All Digital link to the transmitter using standard off-the-shelf equipment.

The AES3 (Audio Engineering Society/ European Broadcast Union) serial data standard is defined in AES3-1985, ANSI S4.40-1992 and AES3-1992 documents as the digital audio data format to be used as the interface standard for audio sources, mixing/control equipment, audio processing equipment, STL equipment, and transmitter inputs. The European Broadcasting Union has republished a standard which is identical to the AES3 standard, except for the use of transformer coupling. Some highlights of the AES3 data format are:

- The interface format can accommodate 16, 20 or 24-bits of digital audio information.
- The interface handles serial data transmission of two channels of digitized audio over a conventional shielded, twisted-pair wire, for distances up to 100 meters.
- The interface uses standard 3 pin, XLR-type connectors, carrying balanced, RS-422 compatible signals that are polarity independent. The input and output impedance for the interface is 110 ohms.
- The data is sent least significant bit (LSB) first, with alternating subframes for Channel 1 and Channel 2.
- The data is self-clocking, and does not require an additional CLOCK connection to synchronize the source and destination.
- Auxiliary data bits are available to transport system control information along with the audio data.

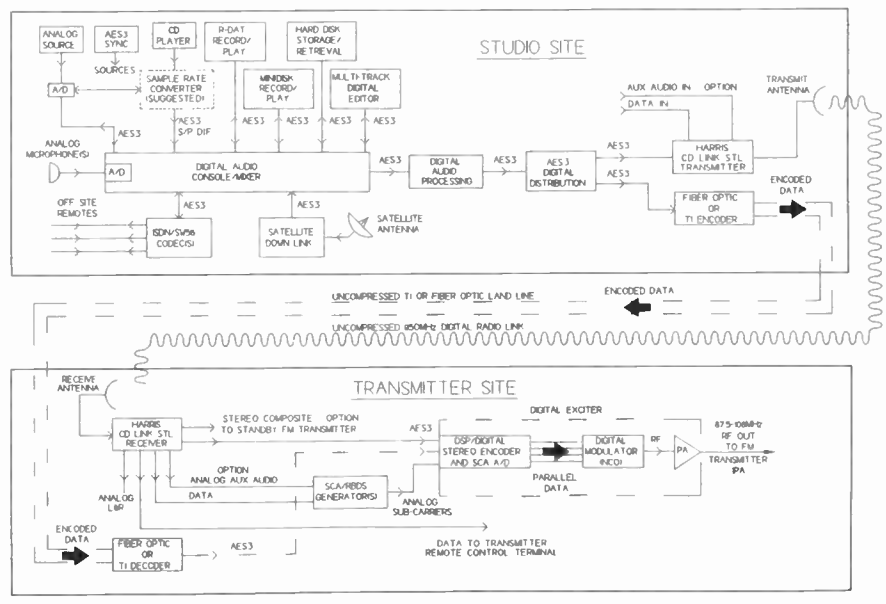
Standard AES3 transmit and receive chipsets support the three commonly used data rates of 48.0kHz, 44.1kHz, and 32.0kHz. Since the current FM stereo transmission standard limits the frequency response of the left and right channels to a maximum of 15kHz, a 32kHz data rate is often used.

The AES3 output from the studio console can be distributed to other locations including the transmitter site. Two common ways to deliver the AES3 data are either through a digital STL radio link or through a T1 digital telephone line. Digital STL's and Digital STL modems (used to upgrade analog STL's) are now available. Analog phone lines are being replaced by T1 digital phone lines capable of carrying high data rates. A new generation of digital audio processing equipment accepts a digital audio input, processes this data fully in the digital domain, and outputs this processed data without any analog to digital (A/D) or digital to analog (D/A) conversions. There are many advantages to using an All Digital path to your transmitter over discrete analog or baseband transmission. The advantages of an All Digital path include:

1. The elimination of all intervening A/D and D/A conversions and the distortions they introduce.
2. Full digital quality delivered to the "On-Air" signal without the noise and distortion build-up of an analog system.
3. Plug and Play - easy interfacing between equipment without worries about level adjustments or hum pickup.
4. Absolute frequency response and amplitude matching between stereo channels.
5. Absolute phase matching and differential phase stability between stereo channels.
6. Absolute stability and repeatability day-after-day, year-after-year without adjustments.
7. Resistance to interference
8. Greatly improved fade margin for radio links.
9. Half the cable population - one AES3 cable replaces two analog cables.
10. Ability to transport some auxiliary control data along with audio data on one cable.

Harris offers a full range of AES3 compatible equipment including the revolutionary CD LINK uncompressed STL and the industry leading DIGIT® CD digital FM exciter to make the transition to a full digital air chain easy.

THE ALL-DIGITAL UNCOMPRESSED PATH FROM SOURCE TO TRANSMITTER



World Radio History

The New Harris Uncompressed Digital STL

By: Andy Laird
Vice President, Engineering/Radio Group
Heritage Media Corporation

BACKGROUND

The improvements in CD players, audio console design, audio processors and digital FM exciters have, in my opinion, made the 950 MHz STL system the weak audio link in the broadcast audio chain. True lossless or non bit rate reduced digital systems are available for T-1 and at the 23 GHz bands. And these sound great! But my experiences at 23 GHz have been very disappointing from a reliability standpoint. T-1, on the other hand, is reasonably reliable but you have to pay for the circuit every month. Presently we use lossless T-1 equipment at seven of our stations where single hop 950 MHz systems are not possible and/or where a backhaul from the transmitter site is needed. These STLs truly sound better than any of our 950 MHz composite systems. They also sound better than the two 950 MHz systems we have operating with compressed digital encoders/decoders. Why is this?

The digital systems currently available for the 950 MHz band use bit rate reduction, most commonly four to one. This is presumably necessary to reduce the transmission bandwidth to fit into a 950 MHz STL channel. This is called perceptual coding. Perceptual coding works because of the inability of our hearing to notice certain details (they are masked) while other distracting audio events are taking place. The perceptual coder throws away the data that it thinks will be masked by our hearing. It's my opinion that typical broadcast audio processing unmasks the perceptual coding, making the bit rate reduction audible. Additionally, the stacking of different types of bit rate reduction used in distribution systems (such as satellite, ISDN and dial-up), with those used in floppy and hard disk storage systems, and then shoving all that through an additional round of bit rate reduced STL, creates even worse sound than can be imagined just by listening to each element on its own.

CONTACT

So, when Geoff Mendenhall of Harris Corporation called and asked if I would be interested in evaluating a new 950 MHz band STL, I was very interested. After signing a non-disclosure agreement, I found out that the system was uncompressed 16 bit linear digital using no bit rate reduction, the same as the T-1 systems we like so much. And on top of that, the transmission will fit within an existing 300 kHz 950 MHz channel and have two RS-232 ports in addition to auxiliary audio channels. Seemed like magic to me. I wanted to see it and hear it in operation. Subjective judgments of audio quality would be made, compared to our favorite T-1 system.

PLANNING

The Heritage FM station WAMG was convenient for this comparison. The main STL is a T-1 circuit using an Intraplex lossless digital system. The station plays "soft favorites" which include some newly recorded music. The main T-1 STL consists of an Intraplex encoder/decoder system. The Intraplex system provides L and R audio out into an Orban 8200 processor. The AES/EBU output of the 8200 is fed to the main transmitter's DIGIT* exciter.

THE TEST SET-UP

For the evaluation, we compared the audio quality of the uncompressed digital 950 MHz system operating closed loop into a dummy load with the "on air" T-1 system.

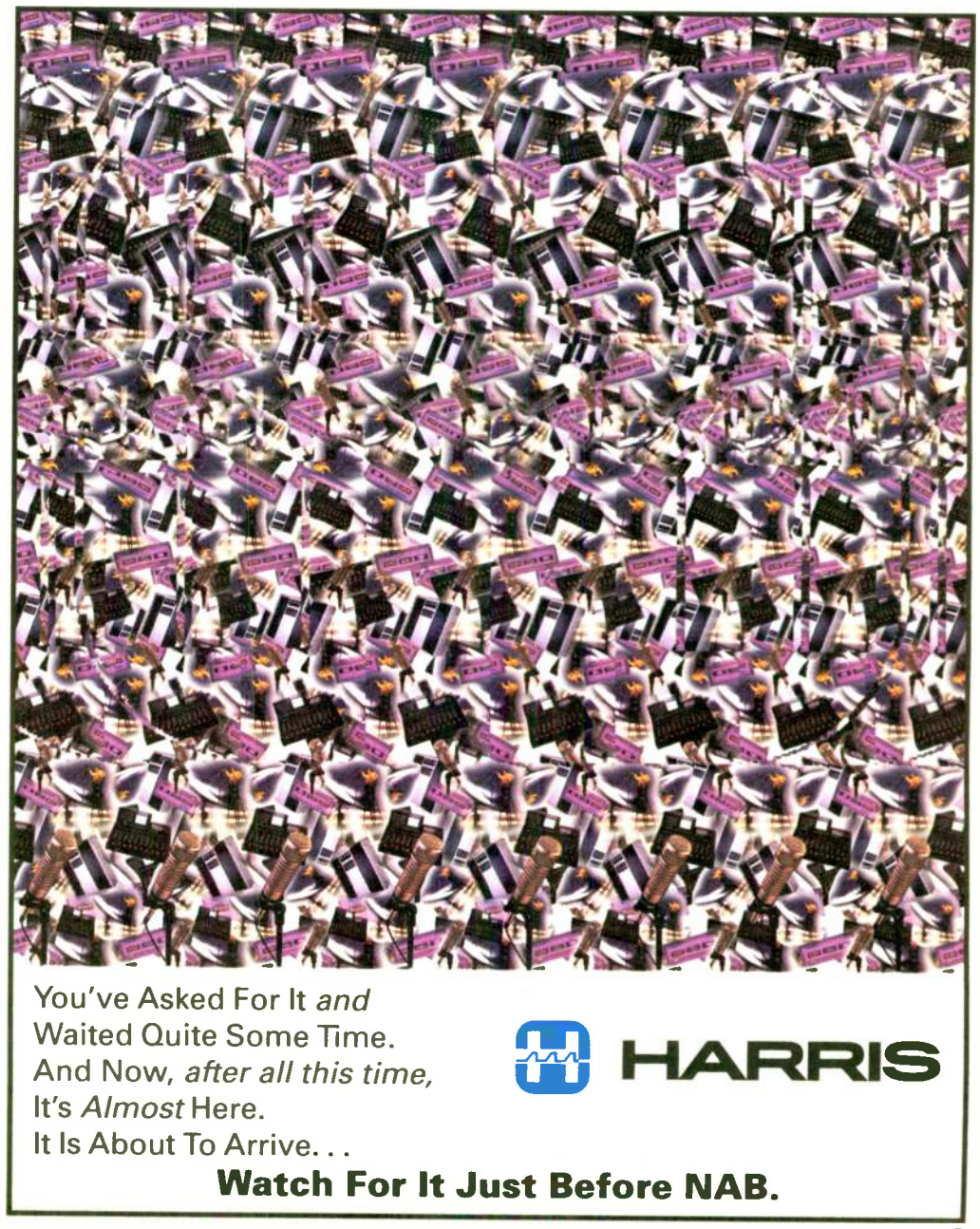
Occupied bandwidth: Terminating the output of the transmitter through a 20 watt 50 ohm attenuator, then through a precise step attenuator, the output was connected to a spectrum analyzer. The RF spectrum does not look like the "hay stack" that you would normally see from 950 MHz equipment. The energy distribution is very flat across the top and falls off almost vertically at the edges of the channel (300 kHz). It looks more like stacked hay bales as opposed to a hay stack. The cut off on either side of the 300 kHz is very sharp. The total occupied bandwidth of the digital STL fits into a standard 300 kHz, 950 MHz channel.

Fade margin: The attenuated output of the transmitter was removed from the spectrum analyzer and coupled into the receiver. We adjusted the step attenuator feeding the digital STL receiver to provide about the same 200 microvolt signal level being delivered to the backup analog STL. The output was then reduced with a precision step attenuator until just where the error correction circuitry began to operate. This was around 10 microvolts. As the signal level was reduced to 5 microvolts, the receiver muted. We measured about a 30 dB fade margin before receiver mute. The error correction circuit worked very smoothly with no clicks or pops down to the mute point of the receiver.

Operation and Diagnostics: The front panel LCD display provides a full array of operating parameters and membrane control buttons. In addition, several diagnostic tools are included to troubleshoot problems. The receiver also stores a history of error corrections.

CONCLUSIONS

We heard no difference between the T-1 system and the uncompressed digital STL system. Comparing music or voice revealed no sonic differences between the two systems. This did not surprise us since both the T-1 system and the new Harris digital STL transport data that is "bit for bit" identical at both ends of the link. Frankly, I was knocked out by the total performance of the system. There is no doubt that the system passes audio quality that Heritage stations have only been able to achieve through the use of non bit rate reduced T-1 systems. In addition to the audio, the system has the promise of greatly improving STL band congestion problems. The first adjacent channel rejection of the system will allow you to use two adjacent channels from the same transmit site to the same receive site with no interference. I think the future is looking very bright for Harris' new uncompressed 950 MHz STL.



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Neumann Mic Is Big Hit in Boston

▶ MIC, continued from page 28

microphone, featuring a large-diaphragm transducer and a built-in FET low-noise preamplifier.

Locating the preamplifier in the capsule results in a low level of self-noise from the microphone. The mic has switch-selectable omni, cardioid and figure-eight patterns.

It also has a switch-selectable high-pass filter (bass cut) and a 10 dB pad. This last item is quite useful; the U87A has an unusually high output level due to the built-in preamp.

Consoles without adequate headroom in their microphone preamp stages need this additional attenuation before the console to prevent input stage clipping. For engineers accustomed to dynamic mics with output levels between -50 and -55 dBu, the U87A's output level of -40 dBu can be quite a surprise.

A well-made isolation mount for the U87A is available from Neumann. It uses the standard 5/8"-27 threaded mount found on most microphone booms, and suspends the microphone at the base. I find these worthwhile in our studios, particularly in the talk room where inexperienced users could potentially thump or kick tables accidentally.

Another essential accessory is the foam windscreen. These accessories can be purchased with the microphone as a kit, providing some discount from the price of the individual pieces.

How does it sound?

To characterize the sound of a microphone is always a subjective endeavor. I would describe the sound of a Neumann U87A as open, light and airy. Like many microphones for vocal use, it has a slight boost in the frequency response centered at approximately 8 kHz. The bass frequencies are smooth but natural, without the artificial boost of some designs.

When properly used, the U87A is remarkably free of distortion, producing some of the cleanest and clearest sound that I have heard from a transducer.

While evaluating microphones, I made an A/B comparison between the U87A and a popular, high-quality dynamic microphone that is used in many radio stations. Both mics produced an excellent, warm sound with a balanced frequency response. The Neumann sounded sweeter, however, due to its lower distortion.

This is not a microphone to use up close. The large diaphragm is susceptible to breath and wind, like a ribbon microphone. For this reason, I find some kind of external windscreen, such as the open-cell foam ball available from Neumann, to be almost essential.

Proximity

The U87A is best used at a distance of about 6 to 8 inches from the mouth. Those announcers with better projection can back off even more.

We suspend the microphone on a table boom from the top, although I have seen them used from the side and bottom as well for better sight lines. It is our experience that if an announcer has trouble with plosive popping, angling the body of the microphone slightly away from the mouth will help without hurting the sound of the voice.

As an interview microphone, the U87A works well with inexperienced users, although its size can be intimidating.

However, I should include a warning that the U87A can cause troubles in small rooms or when several of these microphones are used simultaneously. The off-axis response of the U87A is fairly hot, which can allow reflected sound to find its way into the microphone and sum with the original source. In small rooms this can cause a hollow, phase-canceled sound if the microphone is mounted near a window or reflective wall.

In a room with multiple mics, off-axis sound can also cause the same hollowness if an announcer voice is picked up simultaneously by more than one microphone.

To avoid these problems, I usually recommend that U87As be separated by at least 3 feet from one another and any reflective surfaces other than tabletops. We designed in a minimum of 4 feet of separation in our current studios and have enjoyed excellent results without a hint of phase coloration.

Overall, the U87A is one of the finest vocal microphones available. Any studio that requires demanding, high-fidelity sound will be pleased to use this microphone.

■■■

Michael Leclair is chief engineer of WBUR Boston.

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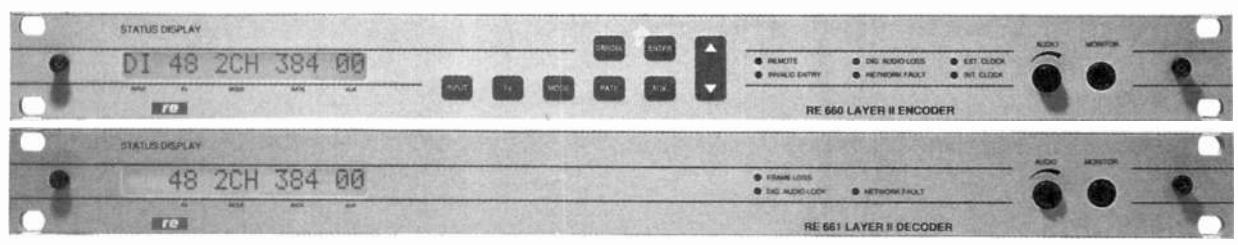

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World Radio History

PRODUCT GUIDE

Companies with new product announcements for Studio Sessions Product Guide should send them to:
Radio World, c/o Studio Sessions Editor, P.O. Box 1214, Falls Church, Va. 22041

Digitech Processor

Digitech, a subsidiary of Harman International, has updated the Studio Quad digital processor.

The new Studio Quad V2 offers a number of new features, including 80 new programs arranged in sets of similar type for easy navigation. New effect "modules" include a Rotary Speaker simulator, Smooth Pitch Shifter, Harmony, Analog Delay, Room Echo and Compressor.

Owners of the original Studio Quad can get a software upgrade for $99.95. New units are available for $549.95.

For information, contact Digitech at (801) 566-8800 or ***circle Reader Service 110.***

Ensoniq Workstation

Ensoniq Corp. debuted PARIS, the Professional Audio Recording Integrated System, with up to 128 tracks of digital audio for both Mac and PC platforms. The PARIS system is the result of a joint development program between Ensoniq and Intelligent Devices.

A recent demonstration had the PARIS system spooling 16 tracks off an Iomega Jaz drive, but the system is capable of eight times the amount of data flow. The

core system consists of the Ensoniq EDS-1000 PCI card and CD-ROM. A dedicated hardware controller is available.

An integral automated 128-track digital mixer includes dynamics processing, four-band parametric EQ, auxiliary sends and a highly realistic reverb. Plug-in architecture supports third-party development of additional effects and software features. PARIS can also support multiple cards to extend real-time processing power and I/O capability.

The PARIS bundle with control surface is available for less than $3,000.

For information, contact Ensoniq at (610) 647-3930 or ***circle Reader Service 84.***

Earthworks Preamplifier

Earthworks, Inc., is introducing a new line of mic preamplifiers to complement its OM1/TC30K and TC40K microphones. An effects box for musicians is also in the works.

The LAB1 microphone preamp has an ultra-wide frequency response of less than 2 Hz to better than 200 kHz.

A future model dual recording preamplifier is claimed to have unprecendented transparency and 2 µs impulse response.

The LAB1 microphone is expected from Earthworks in mid-March.

Earthworks is also preparing to ship the Dirtbox, an overdrive device designed for musicians, especially guiatr players.

According to company literature, Earthworks "recycled" distortion taken from other products, or as the company puts it, the device contains "distortion we took out of our mics and saved up so guitarists can put it to good use."

Details on the Dirtbox are available from the company.

For information, contact Earthworks at (603) 654-6427 or circle ***Reader Service 108.***

Fostex Multitrack

Fostex of America demonstrated the new DMT-8VL hard disk digital recorder/editor at the recent NAMM show in Anaheim, Calif.

Rather than four tracks of compressed digital audio, the new recorder offers eight tracks of uncompressed, 16-bit, 44.1 kHz audio and a full-featured analog mixing console area with two-band EQ and effects send.

Each channel has an 80mm long-throw fader and input selector switch. A fluorescent display panel shows the operational status of all machine and recording functions.

The DMT-8VL is an expandable platform. Fostex is researching the implementation of removable hard drives. Retail price of the unit is to be $1,295.

For information, contact Fostex at (310) 921-1112 or ***circle Reader Service 58.***

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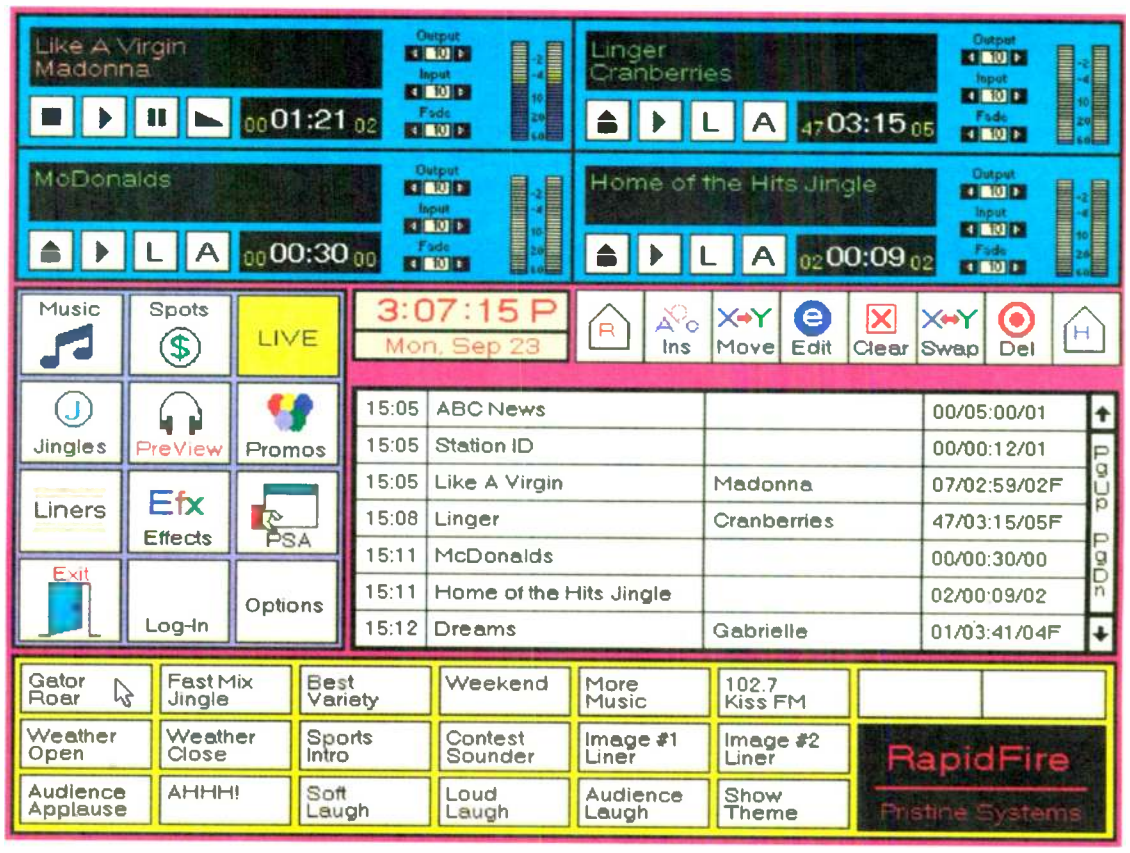

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World Radio History

Running Radio

Radio's Top Billers: See Page 46

Radio World | Resource for Business, Programming & Sales | March 5, 1997

Now You Can Sell Your Radio Station on Line

Lee Harris

Radio people were early adopters of the Internet, using it to trade information and promote their stations. One type of information broadcasters sought from the beginning was a listing of stations for sale and prospective buyers.

Gene Kauffman, owner/manager of KCLN-FM and KLNT(AM) in Clinton, Iowa, was one of those surfing in search of properties. Like everybody else on that quest, he was frustrated. "It seemed to me that the 'net was a logical place to set up a central location where people selling stations and people looking to buy stations could meet. I was certain somebody had already done it, but I searched around the 'net and found nothing, so I thought, why not? A couple of weeks later, I had the site up and running and the response has been terrific."

Buy, sell, connect

Using Microsoft's Front Page design program, *www.buysellradio.com* was Kauffman's first effort as a webmaster, and all things considered, it's not bad. "The objective of the website is not to be fancy, it's to make it a workable place for people to go. I keep referring to it as the big bulletin board in the sky," he said.

It's more like a series of bulletin boards. Although the domain name is *buysellradio.com*, the site allows you to post a radio station, a television station or a cable system for sale. A "For Sale" posting costs $150 and remains up until the property is sold, or the seller requests removal from the site. "Wanted" postings are $25 per month. A recent visit to the "For Sale" section turned up a range of offerings, from a full-time AM in upstate New York for $250,000 to a 6 kW FM in the upper Midwest for a cool $2 million. On the other side of the website ledger, there has been no shortage of prospective buyers, especially for construction permits. One guy is even looking for stand-alone AM's!

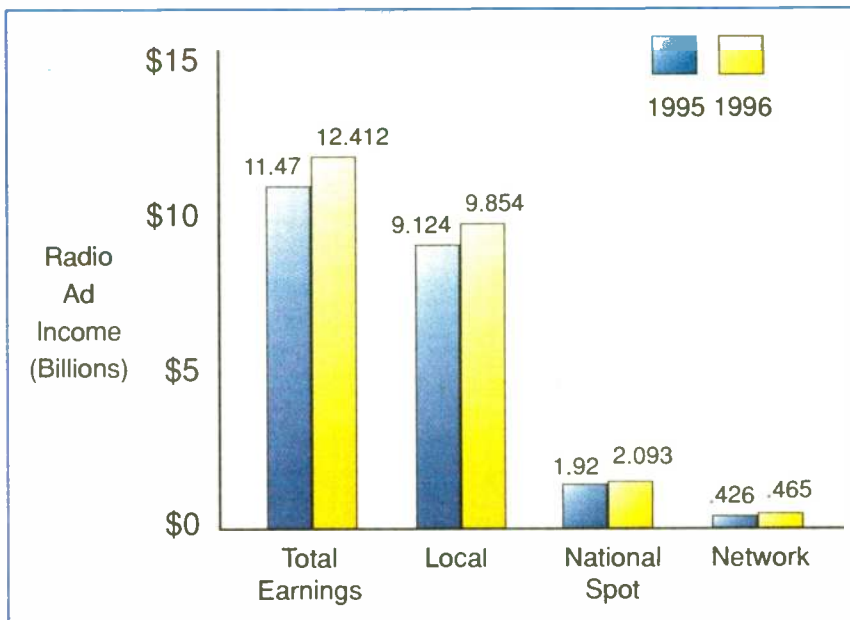
"Two of the largest medium- to large-market group operators regularly visit the site and have made inquiries via e-mail to sellers. Ed Christian, CEO of Saga Communications, is a daily visitor," Kauffman said.

The site also has a section called "Connections."

"This is for experienced broadcasters who might need investors to get started in their first station," Kauffman said, "and it's also for investors with no broadcasting experience who are looking to hook up with a broadcaster."

It's the cyberspace version of that offer you've heard so many times at the state broadcasters' convention or in a phone call from your consulting engineer: "A 35-year veteran radio manager has option on Southern FM sleeper. Looking for

See BUYSELL, page 43 ▶



Radio earned more than $12 billion in advertising in 1996, an industry record. Earnings were up 8 percent from 1995, according to a report from the Radio Advertising Bureau.

National and local radio increased 9 and 8 percent, respectively, as shown above. Network advertising increased 9 percent, with revenues of $465 million.

RAB President Gary Fries said that it was still too early in the game to attribute any growth in advertising revenue to industry deregulation and/or consolidation. "I believe it's the natural impact of the way radio has been growing at a pace faster than other advertising media," Fries said.

— Matt Spangler

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The FM Signal Puzzle Has Many Vital Pieces

Ed Montgomery

This is the sixth installment in a multipart series intended "to make the new generation of FM broadcast station managers aware of the equipment for which they are responsible and to help them periodically review how the equipment is operating." The previous installment appeared Feb. 19.

Last time we discussed the early history of FM VHF as well as radiation characteristics and polarization methods. Let's pick up with high-gain antennas and cover new ground on tower height and transmitter location. All affect the coverage of an FM signal.

Focusing a signal

High-gain antennas employ multiple radiating elements, usually spaced one wavelength apart on the tower. Such an array will focus the vertical radiation more towards a horizontal direction, reinforcing the power directed towards the horizon. FCC station classifications impose limits on a given station's coverage, which cannot exceed a specific radius. Replacing a low-gain antenna with a high-gain device will require a specific reduction of transmitter power to avoid exceeding its licensed coverage area.

High-gain antennas have advantages and disadvantages. They do make better use of transmitted power and can reduce the electric cost and power requirements of the transmitter. However, they can also create "holes" in reception and increase multipathing.

In areas where the terrain surrounding the transmitter site is relatively flat, a high-gain antenna can provide exceptional service. Where the terrain is hilly, a high-gain antenna tends to overshoot low-lying areas and valleys. This becomes a significant problem when broadcasting to automobiles.

If a car drives into a valley, it is more likely to lose the signal or cause the receiver to switch to another, stronger signal. In rough terrain, an antenna with less gain has a better opportunity to serve the valley areas because the radiation pattern fills the "holes" better.

See FM, page 45 ▶

World Radio History

School Generates Jobs

D.C. Culbertson

The trend to distance learning and extended learning reaches to all parts of education. But the approach is not new to the Columbia School of Broadcasting, founded in California in 1964 with the aim of finding and training motivated people for successful careers in broadcasting. It works through both home study and in-classroom approaches. The program has three regional centers; the largest is in Bailey's Crossroads, Va., near Washington, and serves as the national enrollment center. The other two centers are in Kansas City and Honolulu.

The school's primary course is Radio Announcing, offered in both English and Spanish, requiring 600 hours of work. It takes from six to 18 months to complete. The school also offers hands-on instruction courses in basic radio production and television announcing, and an extended learning course in sports play-by-play. Radio Production, often taken in conjunction with the home-study course, takes from six to nine weeks, meeting four hours a week. The Radio Play-by-Play Sportscasting course takes five to 12 months.

Basic announcing

The basic announcing course, divided into six 100-hour sections, stresses voice development and various uses of the voice in broadcasting, from music announcing to traffic reports. If possible, the student uses production facilities at the school; if not, the school arranges use of facilities at a local station. Students send completed assignments to one of the

Photos by Alan R. Peterson

school's instructors, who are located all over the country. The instructor grades the assignment and prepares written and audio tape critiques. The student also attends private production meetings every two to three weeks. At the end of the course, the student prepares a resume and audition tape, and receives an application for an FCC broadcast license. CSB also offers a 24-hour job line and placement assistance.

School officials say it has 150-200 students worldwide, ranging in age from 15 to over 60. Some have no prior broadcast experience; others have related college degrees or are already working, usually in small markets. The number of instructors fluctuates between 20 and 25. Many have degrees in communication or have authored books about various aspects of broadcasting. All have extensive experience with on-air or on-camera work.

Although the school has an open enrollment policy for its independent study course, requirements for prospective students are strict. Interested students must have completed high school or its equivalent, must pass a written broadcast aptitude test and must record a vocal audition.

Instructors use a grading system of pluses and minuses. More than one "D" results in academic probation. Three lateness count as one absence, and missed work must be made up. Students must conduct themselves professionally, and may be dismissed for unacceptable conduct. Tuition for the Radio Announcing

See COLUMBIA, page 45 ▶

James Lashley is a student advisor and former Washington radio personality.

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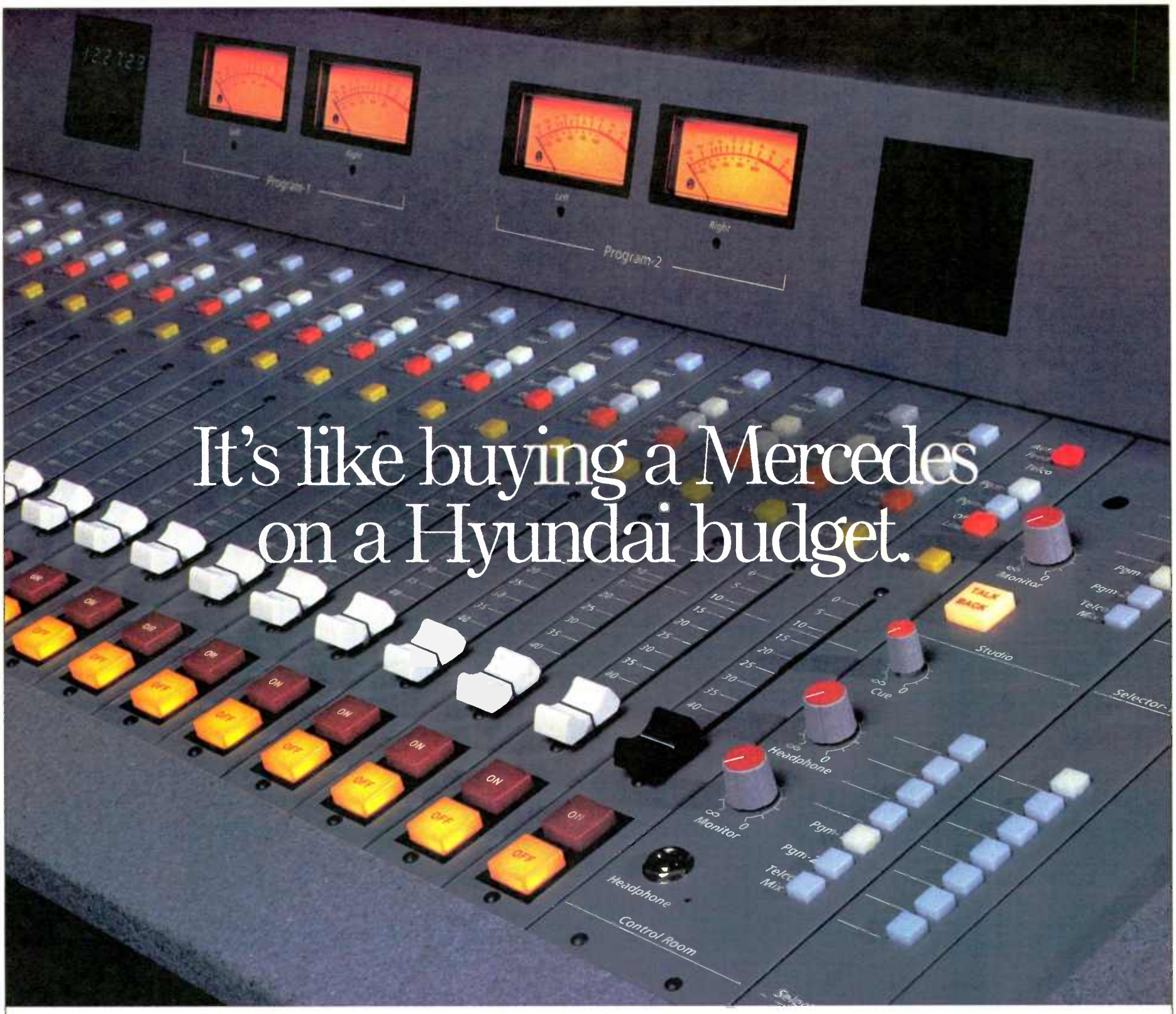

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PACIFIC RESEARCH & ENGINEERING

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World Radio History

Buy or Sell at *buysellradio.com*

▶ BUYSELL, continued from page 40

Investor(s). Total cash required under $50,000, plus assumption of some liabilities. Recent divorce prevents me from being able to do it alone. If you have a sincere interest and can move quickly we can both make a killing on this one!"

Given the multimedia capabilities of the Web, station owners trying to sell their properties through *buysellradio.com* have an opportunity to make a powerful virtual presentation to prospective buyers. Eventually the site may feature downloadable video tours of stations, real-time audio from the advertised station and even password-protected financials.

For the moment, Kauffman is keeping things simple. "Right now we can post any number of pictures of the facility. Also, on our open (as opposed to blind box) listings, where the market of the station is listed, we can link directly to Census Bureau information on the market, already posted on the Web. I expect we'll soon have to go to some sort of database so users can check for stations by calls, or market."

Kauffman wants the site to grow into an even larger resource for broadcasters and investors. "We have a legal section that gives an outline of FCC procedures in purchasing a broadcast station. That was prepared by John Garziglia of the Washington law firm of Pepper & Corazzini."

This doesn't seem like the sort of place Mel Karmazin would go surfing for new radio stations to add to his CBS/Westinghouse/Infinity stable, and Kauffman isn't really expecting Mel to drop by anytime soon. "Contrary to popular belief, mom-and-pop stations are still out there and many of them are doing quite well," he said. "I'm hearing from a lot of single-station owners who are looking to expand, maybe in their own vicinity, and there's also a lot of interest from smaller group owners."

That interest is not confined to the United States. The Web is famous for breaking down international barriers. Among the early posters on the site was a Russian national, holding a construction permit to build a station in a fairly large Russian city. "He's looking for an American partner with some radio experience, and I suspect some radio money to help put this thing on the air," Kauffman said.

He does not consider himself in competition with brokers; in fact, he encourages them to list their properties on the site. "I see it as a really efficient means of advertising for brokers, and we already have a number using the site. Stations can be added and deleted instantly, and the brokers can post as much or as little information as they like. They can also send a packet of information to a prospect instantly, by e-mail."

The big question, of course, is whether *buysellradio.com* has resulted in any done deals. As of early February, Kauffman said he'd had one sale, "and you know these things take time. Some of the people looking for investors and several people looking for stations have gotten some traffic." He reported 400-600 hits on the site per day.

■■■

Lee Harris is morning anchor at all-news WINS(AM) and a former station owner. He is also president of Harris Media, a website design and hosting firm. Contact him via e-mail at lee@harrisnet.com

64 Years Ago

Reprinted from
Radio World
January 21, 1933.
Editor's note: The RW of old, printed for a time in the 1920s and 1930s and today's RW are unrelated except in name.

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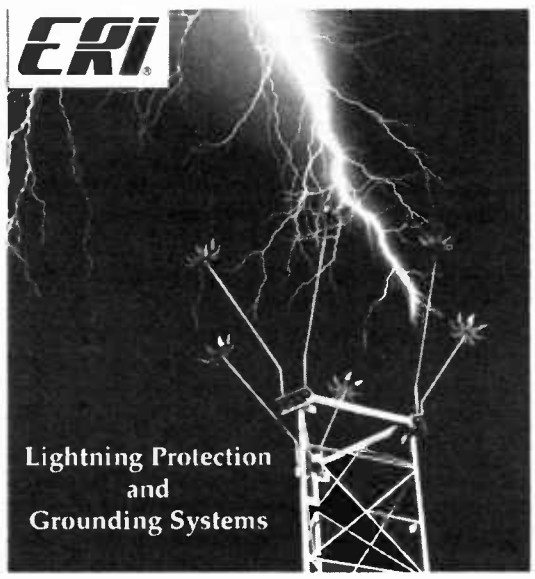

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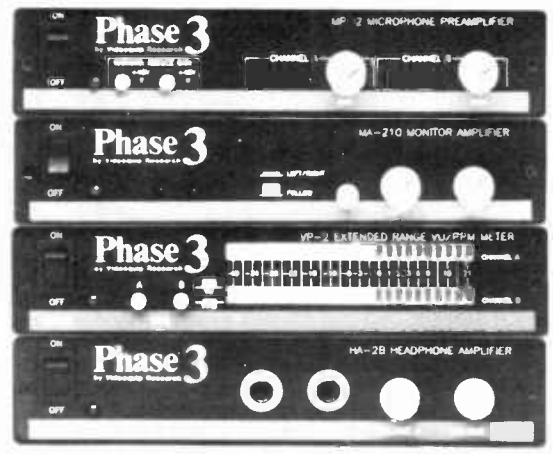

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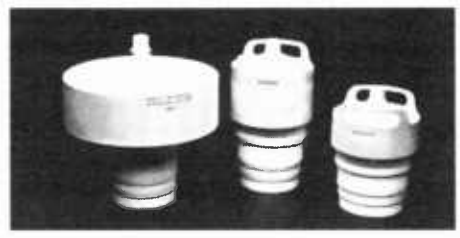

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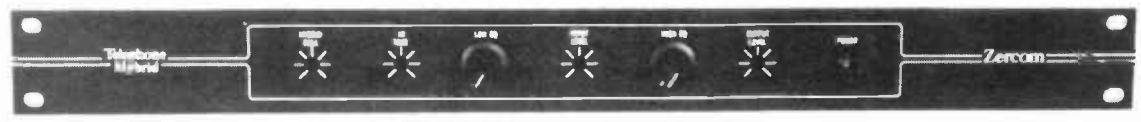

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READER SERVICE NO. 127

World Radio History

What's On That Stick?

▶ FM, continued from page 40

Broadcasters must also consider antenna height. Height Above Average Terrain (HAAT) is determined by the FCC and is established by the class of the station. If the broadcasting station is not serving its area as effectively as the owner thinks it should, tower height and transmitter location may be the problems.

Sky high

Sometimes it is better to raise the height of the antenna above the station license limit. The FCC will permit this, with a reduction of power proportionate to the increase of tower height. In an area with many hills and valleys, increased antenna height usually is advantageous.

The interaction of antenna gain, tower height and transmitter power determines effective radiated power (ERP). The goal is a balance that will cover your service area with the best possible signal. An antenna service can plot the expected coverage of your station.

Computer technology and topographical maps can help predict where the signal will go and what steps you might consider to improve it. Experts can also estimate station coverage using USGS topographical maps and the FCC 50/50 chart. This is the probability chart from FCC Part 73.333. It is used for estimated field strength exceeded at 50 percent of potential receiver locations for at least 50 percent of the time.

Another tool to estimate line-of-sight coverage is the formula:

$$D = 1.22\ (\sqrt{h_1} + \sqrt{h_2})$$

Where:
D is the line-of-sight distance in miles.

h_1 = Transmitting antenna height in feet.

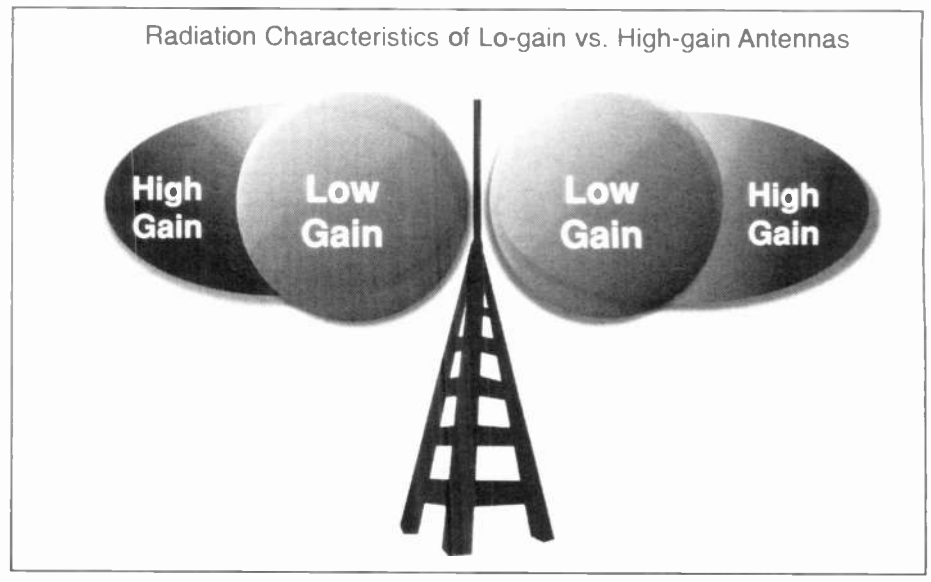
h_2 = Receiving antenna height in feet.

1.22 is a constant.

Location is everything

Transmitter location is of paramount importance.

Every market is different in terms of geography. The goal is to find a high site that lets you beam an unobstructed signal into the populated area. Transmitters can sometimes serve a community best when they are located away from their primary service area, in order to deliver a signal to a residential area. In many cities, residential districts are not downtown. A directional antenna can help.



In major markets, providing a signal into downtown is as important as the residential coverage area. Some stations find it necessary to relocate to serve the downtown district. That's why an FM site is often found with TV transmitters atop the highest building in the city.

The signal radiating off the antenna high above the city can be weak. The signal should reach the service area at a low angle, nearly parallel to the ground, creating less chance for signal cancellation in the receiver antenna. This occurs several miles from the antenna site.

No matter where the transmitter is, expect some signal cancellation around it.

The transmitter location is important. Some sites were established before large buildings were built around them. Moving a site requires much thought and consultation with a broadcast engineer familiar with FCC law, the terrain of your service area, the class of station and the market or portion of the market a broadcaster wishes to serve.

Additional considerations: What is the best antenna gain, taking terrain into account? Should some form of beam-tilt be considered? Is the antenna mounted on the side or the top of the tower, and how does this affect the station's coverage?

Broadcast Graduates Succeed

▶ COLUMBIA, continued from page 41

program is $2990. Deferred payment plans are available, but financial aid is not.

High-profile graduates

The tuition and discipline seem to pay off. Because of turnover in broadcasting jobs and because many students use different names on-air, school officials don't attempt to publish placement figures. But Roy Blair, president of the Columbia School for the Washington metro area, said he has long believed that one in every two students goes on to a job in the business.

Some are in high-profile positions. Chris Marlow was an announcer for the 1996 Olympics in Atlanta. Ken Noble is a DJ at KRWM(FM) in Seattle and past winner of a trade magazine's Major Market Air Personality of the Year award. Rob Scorpio is program director of KBXX(FM) Houston. Ed Murray, within a year of graduation in 1988, became a morning drive air personality in San Francisco. One current student, Patricia Terrell, recently won a Student Achievement Award from the National Academy of Television Art & Sciences for a locally-produced PSA.

In the mid-Atlantic area, graduates include Hal Hubbard, working for Metro Networks. Ron Kitzmiller at WFRE(FM)-WFMD(AM) in Frederick, Md., and Charlie Maxx at WRCY(FM), "Thunder Country" in Manassas, Va. Many other graduates work farther afield, from California to Nigeria. While many work for private and university-owned stations, others work for national networks such as Armed Forces Radio, the Voice of America and Associated Press Radio.

■ ■ ■

*This is one in a series of occasional articles about the way broadcasting is taught. D.C. Culbertson is a frequent contributor to **RW**. For more information about the school, call (703) 820-2020.*

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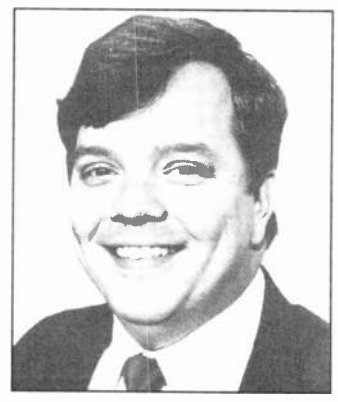

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– WWJ Radio, Detroit, MI
– AP Broadcast, Washington D.C.

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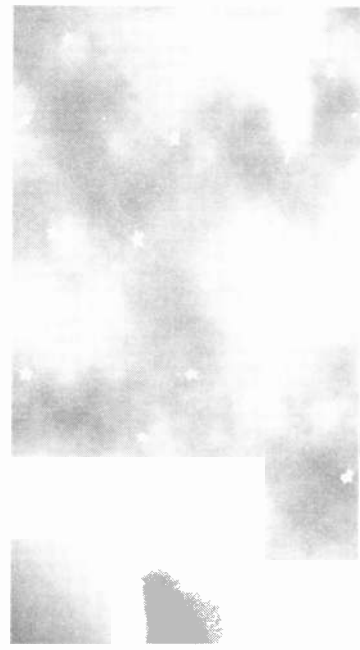
MILLENNIUM REPORT



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World Radio History

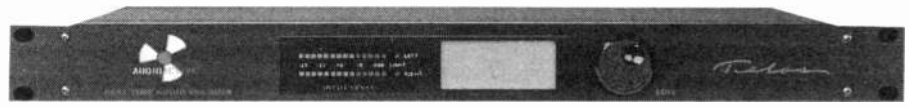
Olympia Readies Audioactive Net

Alan Haber

A network of radio stations webcasting with Telos Systems Audioactive technology is being readied for an April roll-out by St. Louis syndicator Olympia Online.

Olympia Vice President William Moir said the number of initial participating stations will depend on the sponsor secured to anchor the network. At press time, Olympia was close to signing a major sponsor; Moir said he is in touch with others as well.

Meanwhile, Cleveland oldies station WMJI(FM) has decided to graduate from test to full-blown status with Audioactive. Program Director Denny Sanders sat down with General Manager Rich Weinkauf and Chief Engineer Jeff Keith; both were impressed with Audioactive's sound quality. They made the decision to broadcast on the Internet with Audioactive in December.



The Telos Audioactive encoder enables stations to stream audio to listeners via the Internet.

It wasn't just the "enthusiastic response" the station received to its Audioactive broadcasts that tipped the cyber-scales for Sanders; it was the tone of the e-mails the station received, some from former Cleveland residents who wanted to get a taste of home.

Sanders considers WMJI's cyber-presence an extension of the station's local signal. A presence on the Internet "adds to our image locally," he said. He's excited about the prospects of selling to advertisers an introductory audio message, and of splitting spot loads between local and international audiences.

AUDIOACTIVE

Audioactive listeners are happy with what they hear, if a selection of e-mails is any indication.

Consider the experience of Steve Harbert. In his office, using Time Warner's Road Runner Internet cable service, he compared the Internet feed of Cleveland classical station WCLV(FM) to the quality of the same station's signal on his AM/FM stereo. "I was surprised that the Internet feed sounded much better than the stereo," he said.

Bill Hogsett, a WCLV listener in Shaker Heights, Ohio, e-mailed Telos to say he was impressed with what he heard. "I really questioned whether Audioactive would sound as good as RealAudio 3.0," he wrote. "I have a dual-

WMJI Majic 105.7

channel ISDN line ... I listen to WCLV most mornings. I use my computer before going to work."

Audioactive, he wrote, "sounds really good. I don't think I can tell the difference from my radio. I need to listen to more music to be sure, but my first impression is that it works really well."

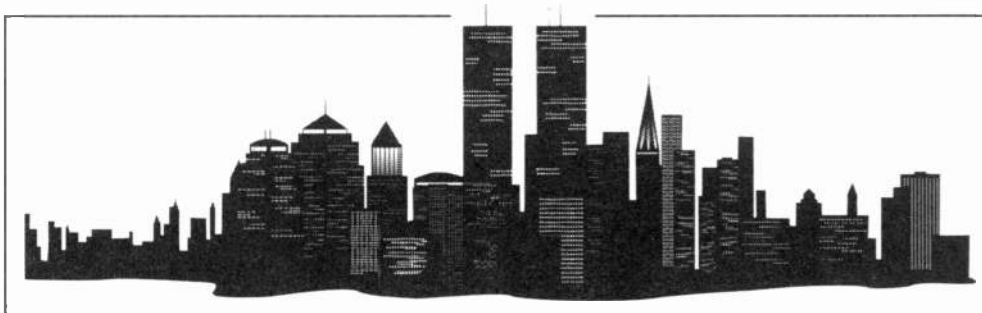
Rhys Price Jones, a member of the faculty at Oberlin College in Ohio, noted that he was impressed with what he heard. His most cherished benefit? Less wear and tear on his feet, apparently. Listening to WCLV through his computer, he wrote, "saves me at least five meters of walking to my radio."

Telos Systems will demonstrate the Audioactive system for real-time Internet audio at the Sands Convention Center during NAB '97 in Las Vegas.

The Audioactive hardware/software system is based around a dedicated encoder designed to offer more processing power than systems tied into general-purpose CPUs. A multiple-DSP chip compression engine performs MPEG Layer III data reduction to the audio.

Audioactive is fully compatible with the Macromedia Shockwave plug-in, which allows Web browsers to receive live Audioactive broadcasts. The system also supports NetShow 1.0, the new streaming media service for the Microsoft Internet Information Server. This platform delivers live and on-demand multimedia content over the Internet and via corporate intranets.

The demonstration will be at the Telos Systems display at Booth i5250 in the Sands Convention Center. A separate exhibit at Radio Hall Booth 3006 will feature the Telos line of ISDN codecs.



CBS Dominates Top Radio Billers

BIA's 1996 Est. Revenue (000's)

Rank	Change	Calls	Market		Owner
1	–	WFAN(AM)	New York	42,300	CBS Corp.
2	–	WGN(AM)	Chicago	37,900	Tribune Broadcasting Co.
3	–	WINS(AM)	New York	32,100	CBS Corp.
4	+2	KRTH(FM)	Los Angeles	31,000	CBS Corp.
5	+3	WCBS-FM	New York	30,700	CBS Corp.
6	–1	WXRK(FM)	New York	30,650	CBS Corp.
7	+9	WLTW(FM)	New York	30,300	Viacom International
8	+3	KVIL-FM	Dallas-Ft. Worth	30,000	CBS Corp.
9	–5	KGO(AM)	San Francisco	29,000	ABC, Inc. (Disney)
10	+4	KFI(AM)	Los Angeles	28,100	Cox Enterprises
10	–3	KIIS-FM	Los Angeles	28,100	Jacor Communications

New York's WFAN(AM) was the top-billing station in the country for the second year in a row. The sports-formatted station pulled in $42.3 million in 1996, a 4.4 percent increase over 1995, according to BIA estimates. CBS Corp. owned six of the top 11 money makers. The number two station was Tribune's WGN(AM) Chicago, which was number one in 1994 and 1993.

Viacom's WLTW(FM) New York vaulted from 16th to seventh on the list, with a 20-percent increase in estimated revenues.

Dropping out of the top 10 since last year: KROQ-FM, now number 17; and KLOS(FM), 21. Both are in Los Angeles.

Source: BIA's Investing in Radio 1997 and MasterAccess Radio Analyzer.

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Circle (41) On Reader Service Card

World Radio History

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Our Audioactive Internet Audio Suite is a range of hardware and software, designed for the professional user. Each component is designed for superior audio quality, simple installation, operation by non-technical staff, and long-term reliability. And as technology advances, Telos Systems will keep you up-to-date.

Finally, your prospective listeners need to be able to receive your signal. Our Audioactive software player is free for downloading and works with all major web browsers. And Audioactive is fully-compatible with Macromedia's free Shockwave player, already on the hard drives of tens of millions.

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World Radio History

Circle (27) On Reader Service Card

USER REPORT

Sound Forge's Knockout Production

by Shawn Bass
President, Shawn Bass Prod. &
Programming Director,
KDUC(FM) & KDUQ(FM)

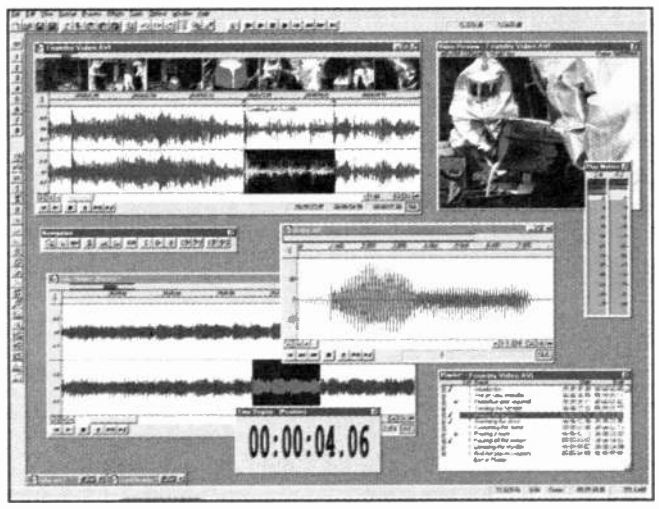
BARSTOW, Calif. Sound Forge is the future of radio production. This is a bold statement, but true nonetheless. Razor blades, reel-to-reel tape and bulk erasers are a few things not found at Shawn Bass Productions.

When I researched equipment to buy for my studio, I was sure that a sound effects processor, microphone processor and a four-track reel machine would be the first things in the shopping cart. But then I found Sound Forge, the digital sound editing software from **Sonic Foundry Inc.**, based in Wisconsin. Actually the words "sound editing" are light for a software product that can manipulate sound to many degrees.

A typical day goes like this: When I show up at 9:30 at the studios of Shawn Bass Productions — located in the same building as KDUC(FM) and KDUQ(FM) — there is already a growing pile of scripts off the fax machine. Some are for radio spots, others for sweepers and IDs and assorted oddball projects. I sift through them and put them in order of priority.

Work for the radio station comes first, because I can get other stuff done after-hours when there is no pressure from management or sales. Today, it's a 60-second radio spot for a fax preparation firm. It is their 10th anniversary, and I need to highlight that they are including free electronic filing with all returns.

Time to spark up the computer. I work with a 486 DX4-100 with 32 MB RAM, and 3 GB hard drive. CD-quality digital audio can take up a lot of space. Once Windows 95 is booted and ready, I hit the Record button, but not Start. This allows me to read through the script. Since I do not have a microphone processor, the microphone is still fairly raw. Time to put the Sound Forge in high gear.



Sound Forge: Digital Editing Software From Sonic Foundry

Under the Effects menu I find Dynamics, which will allow me to compress my voice. Unless I am doing voice-work for radio sweepers, I use a light compression, about 3:1. Since I need to highlight that the client is celebrating an anniversary, I have decided to make the words "10 great years" stand out.

To do this, I simply select the graphic EQ function under the process menu. I take out most of the bass frequencies — despite my name — and the voiceparts now sound like I am on a telephone, only better.

The next step is to make the word "free" in "free electronic fling" stand out. Back to the Effects menu for the Delay/Echo option. I have made a preset that delays one of the channels by a few milliseconds. This makes the words truly jump out.

From here I save the file, then start a new one where I record any sound effects and music that I will use in the finished product. I use another program to mix it down, but all processing is done within Sound Forge.

Once the spot is mixed down, there is an occasional need to use Sound Forge for post-production as well. Today, the spot wound up being one second over 60. While most people would just let this go or try to whack out a word to make it fit, I use Sound Forge to correct the problem. The Time/Compress/Expand option under the process menu allows me to shrink the spot to exactly 60 seconds without any noticeable compromise to the sound quality. It is clean and amazingly accurate.

While this was a simple project, don't let it fool you. Sound Forge can do some amazing things. Once, I wanted to create an "Alcoholics Anonymous" meeting-like atmosphere for an athletic club spot. I needed a crowd of 40 to 50 people to greet my couch addict with "Hi, Bob!" We were able to use Sound Forge to do it.

Without giving away any secrets, I can tell you that it is a little more complex than applying a reverb. There were only two of us, and we needed different pitches and vocal ranges to make the crowd sound accurate. And we did it.

Creativity, efficiency and control over sound is yours with digital editing software. Everything is easy to use, even the manual. Radio production can become simpler, better and much easier with Sound Forge. To make the best point I can in this limited space, there is nothing you can not do with Sound Forge.

For more information from Sonic Foundry, contact the company in Wisconsin at (608) 256-3133; fax: (608) 256-7300; or visit its website at http://www.sfoundry.com; *or* ***circle Reader Service 7.***

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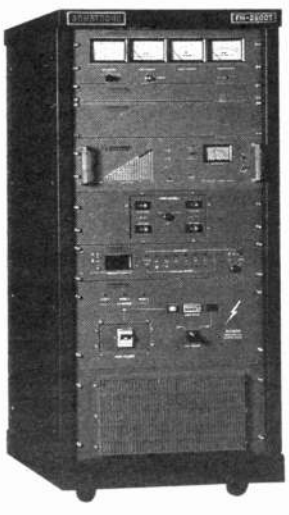

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Circle (119) On Reader Service Card

USER REPORT

ProTools Makes the Cut at KFOG (FM)

by Tom Koetting
Creative Director &
Freelance Producer
KFOG(FM)

SAN FRANCISCO KFOG(FM) is the San Francisco Bay Area's adult album rock station, winning in the 25-54 age demographic. We made the switch from analog production to digital in the fall of 1994, and chose **Digidesign's** ProTools III (pictured above, right) as the vehicle to take us into the new frontier. What started as a single shared system between KFOG and our sister station, KNBR(AM), has grown into a fleet of three interchangeable rigs working around the clock.

We choose ProTools III because of its reputation in the music production and film industries, and its unique open architecture and third-party support. The workstation handles EQ, reverb, compression, limiting and like effects with third-party software plug-ins working in real time. Beyond the convenience and cost savings of such a set-up, the performance of these plug-ins is astounding and inspires new work habits and creative ideas.

Studio A is our main production room at KFOG. I handle most of the imaging and promo work for our programming staff. My partner, Greg Portillo, relieves me in the afternoon to take care of most of the commercial work. Greg and I, along with other producers have personalized session templates stored on ProTools. They allow us to start new sessions with the track assignments, effects, hard drive partitions and mixing parameters on the "virtual console" configured from memory.

My standard session template is set for 10 audio tracks with three effect return faders for reverb, chorus, and delay, plus a master stereo fader for final processing. More audio tracks, effects and sub-mixes are a menu option away if a larger session demands it.

Once a new session is started, I can record new audio into the system or import audio stored elsewhere on any one of our on-line hard drives. For instance, I have about 50 people sampled separately, all saying "K-Fog." If I want an attention-grabber at the end of a promo, I can import, say, Pete Townshend, Bonnie Raitt and B.B. King each saying our call letters. Very fast, easy and effective.

After composing my promo with several jocks reading copy, song clips from

See PROTOOLS, page 50 ▶

World Radio History

SPECIAL REPORT

SMARTS Broadcast Systems: The Right Touch

EMMETSBURG, Iowa SMARTS Broadcast Systems offers a new product called the Right Touch, a standalone computer running under Windows 95 that allows the user to design custom interfaces to the Smartcaster Digital Audio and Storage System. The Right Touch is available in a touch screen model, but also works with a mouse or other similar user interface.

Each announcer can predefine hundreds of different buttons for sound effects, liners, news bites or other audio material. Anything that could be put on a cart can be put on an assignable button. Press the button and the audio plays.

Multi-tasking

Because the Right Touch runs in Windows 95, additional programs can run at the same time, allowing the operator to minimize the push buttons, and bring up word processors, the Internet, e-mail, and other programs.

The key to the Right Touch is that it runs on a separate processor from the Smartcaster. This allows the Smartcaster to continue to prioritize delivery of audio, and take commands as needed from the Right Touch System. The combination provides high reliability while allowing the user to work in a Windows environment.

This product can help rid the studio of the last vestiges of the cart machine.

This product can help rid the studio of the last vestiges of the cart machine. It has the flexibility to play through dedicated audio cards in the Smartcaster systems, so it appears as its own source on the control board. You can fade out music through one output and play a news sounder from the Right Touch, with audio actually coming from the same system. The company said it has the familiar feel of analog equipment, especially when used with the touch screen option, yet it has the quality and flexibility of digital systems.

The buttons available on the Right Touch can be grouped by announcer, so it is easy for a disc jockey to set up for a shift. Each button can display icons of the operator's choice (even the DJ's picture). The programmable, adaptable interface makes it much more jock-friendly as well as user-friendly. Playing audio by punching a virtual button on a computer screen is similar to playing audio by punching the button of a cart machine. But the carts, the racks, the laborious pulling and stacking of carts is gone. The audio is easy to find when you need it.

As with all Smartcaster systems, audio flows to the Right Touch from multiple sources including the local Smartcaster, a production unit, or a unit serving a sister station. It can also be captured from a distant station feeding via the Internet. This happens in the background; the announcer need not be concerned. Just punch the button and the audio plays.

Future enhancements include an interactive live program log screen that allows fast changes and revisions to the program schedule, direct from the Right Touch; network switching to either Air or Record busses from touch screen commands; and interfaces with data delivery systems to provide news, weather, weather mapping and other information on the same screen the announcer is using for operations.

Innovative design

The design of the Right Touch allows for expansion in multiple directions. The standard Windows 95 operating system allows for use of over-the-counter software to address specific problems and find solutions without impairing the basic function of the unit. For example, news bulletins, school closings and weather information can simply be e-mailed to the unit from the traffic department. Talk show hosts can use the same e-mail system to see who is on the phone.

The newsroom can use a standard word processor program to cut and paste a newscast so that it can be read off a standard word processor in the Right Touch system. The end user can create a custom product that is not wholly dependent on a single company's development cycle. The Right Touch breaks down barriers by allowing a proprietary system, the Smartcaster, to be controlled by an open architecture computer running commonplace software that is easily understood.

For more information from SMARTS Broadcast Systems, contact the company in Iowa at (800) 747-6278; fax: (800) 498-0618; e-mail: smarts@ncn.net*; or* ***circle Reader Service 33.***

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Circle (93) On Reader Service Card

World Radio History

AOR Station Wins With Digidesign

▶ PROTOOLS, continued from page 48

CDs and assorted wild audio, I am ready to mix. ProTools has several options for mixing. I like doing it with a mouse via the "volume graph" display in ProTools' edit window. The volume graph system is unique to ProTools and is a big time saver. While mixing, I can bring in and out any of the third-party TDM plug-ins that are installed.

In addition to the Digidesign-supplied plug-ins, we use the Antares MDT dynamics tool, the L1 limiter from Waves, TC Electronics' TC Tools reverb/chorus, GRM's special effects, and Intelligent Devices' PAA metering system.

My favorite plug-in has to be the MDT, an exceptional five-band compression system. I want to make sure our imaging is heard by even the casual KFOG listener. MDT really makes things jump through the radio. I have customized its parameters to add maximum density without the pumping and breathing that heavy compression yields.

One of my extra duties at KFOG is maintaining our growing private concert/live broadcast library. We frequently record touring acts at major studios and venues around the Bay Area and replay individual cuts from the shows. The master DATs are edited and processed in ProTools, then prepared for CD. The song files are loaded into another Digidesign application, MasterList CD, and burned onto a recordable CD.

Best peak limiter

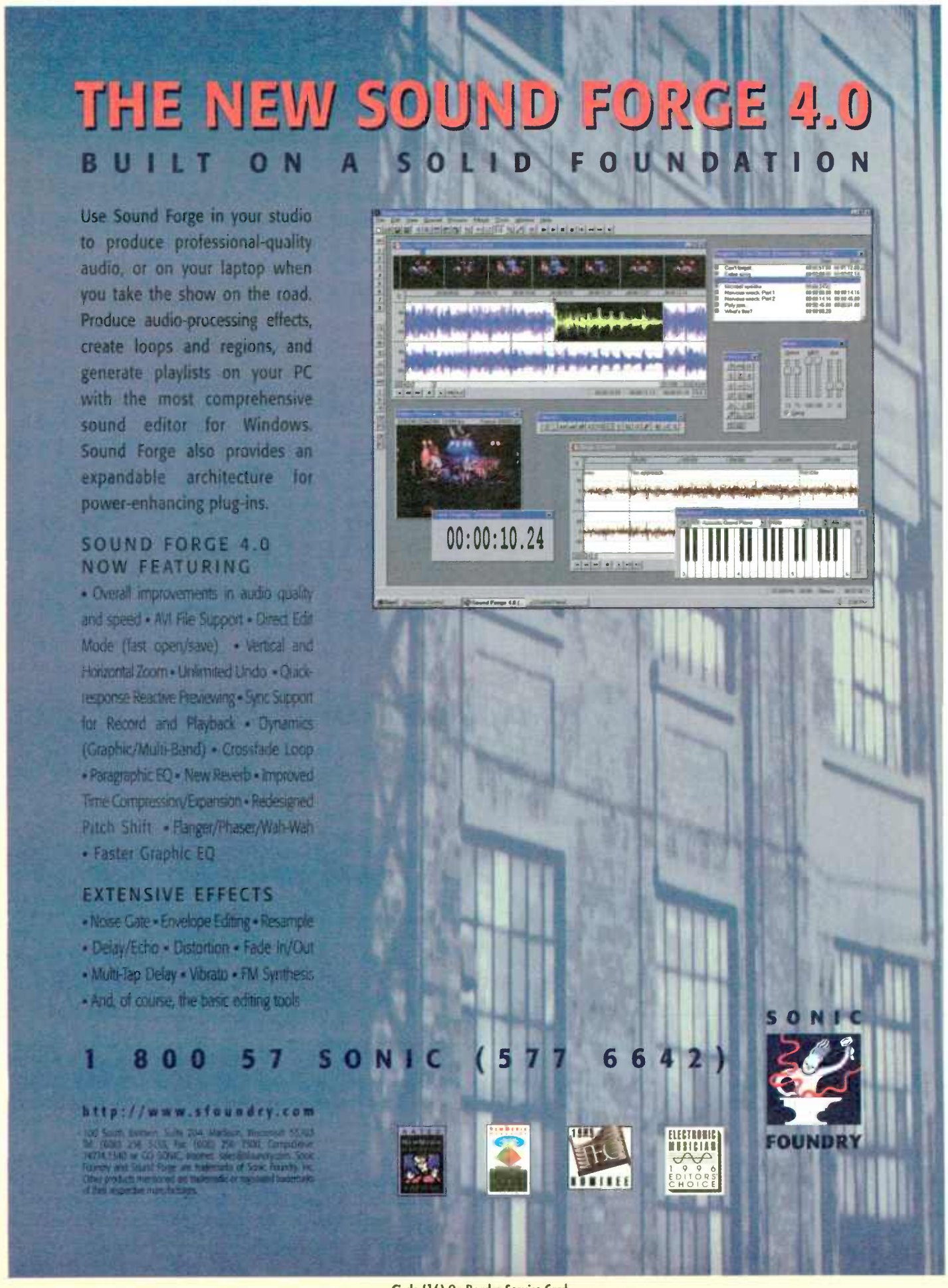
Today I am cleaning up a few tracks from recent shows by Melissa Etheridge, Elvis Costello and Suzanne Vega. All the tracks will be run through the L1 Ultramaximizer plug-in. Not only is the L1 the world's best peak limiter, but it also gets the 24-bit audio in ProTools down to 16-bit for CD with perfect noise-shaped dithering. In the end, our in-house CDs have the punch and presence to match major-label releases.

We archive our sessions in Studio A on a 1.3 GB MO drive and on the wildly popular Iomega Jaz drive. Mezzo Media Archiver — more third-party software — talks to the SCSI devices and backs up ProTools sessions in the background.

The Jaz drive was a recent purchase, intended as a sneaker-net to morning personality Dave Morey's new home studio. Dave has a scaled-down version of ProTools (ProTools PowerMix) and can bring sessions in on Jaz to mix at KFOG with TDM effects and automation on ProTools III. This defines vertical integration.

At the time of this writing, KFOG is eagerly awaiting the new ProTools update, v.4.0, with a more refined interface and total TDM plug-in automation. I sympathize with music producer and Talking Heads guitarist Jerry Harrison, who said it best recently when asked what he would do if someone took away his ProTools rig. He paused, then laughed and remarked, "I'd rent one!"

*For more information from Digidesign, contact the company in California at (415) 842-7900; fax: (415) 842-7999; **or circle Reader Service 59.***



USER REPORT

BBN Switches To MicroSound Audio Editor

by Jeff Apthorp
International Satellite Operations Manager
Bible Broadcasting Network

CHARLOTTE, N.C. We recently found ourselves facing an enormous project again. It seems like we never even finished the last go-round. But as the audio world continues to merge with the PC world, equipment seems to become obsolete faster than we can get purchase orders signed. Such was the case with our system of dubbing the 10,000-plus songs in our library to DAT for re-processing and preservation purposes.

We decided that playing music off of DATs was no longer economical with hard drive systems becoming attainable. We ended up going with Enco's DAD486 system for on-air playback. But for dedicated editors, we selected the **Micro Technology Unlimited** MicroSound editor. It's the best decision we've ever made.

First one

As it turns out, MTU was the first to demonstrate digital audio workstations in 1979. MicroSound is unique with 128 tracks available to play together, and it plugs in just like a DAT machine. Visually, it offers the most uncluttered screen I have seen, much like a word processor's. This was a big help in training non-computer and non-audio people. Also of critical importance is the audio quality, especially the A/D converters.

I have heard people say, "All the systems use digital audio, and digital is digital, right?" Wrong. I have tried other editors — even

See MICROSOUND, page 51 ▶

Circle (16) On Reader Service Card

World Radio History

USER REPORT

NewsRoom Helps Rev Up Efficiency

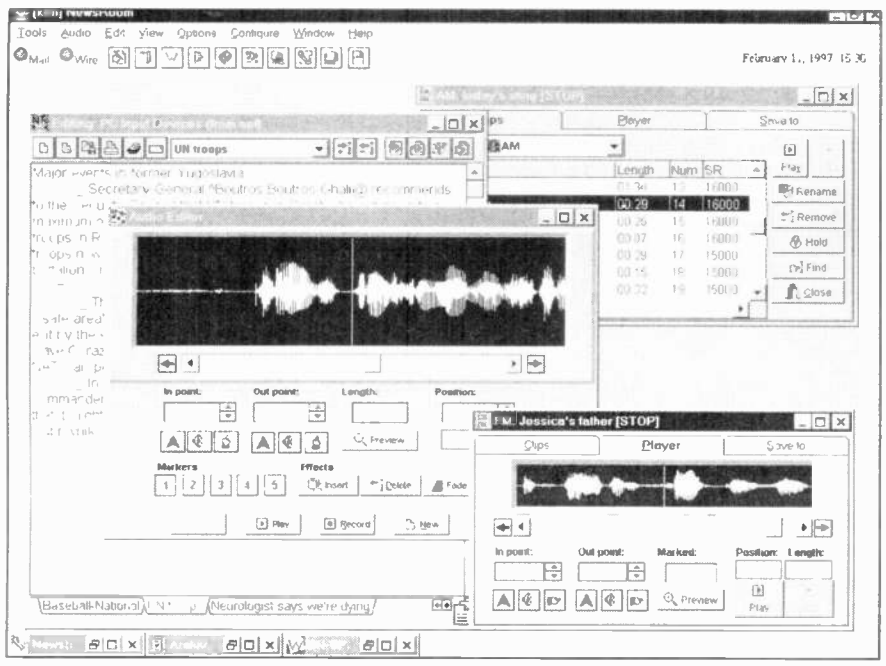
KLBJ(AM) Welcomes Audio Hard Disk System From Computer Concepts to Its News Staff

by Janet Evans
News Director
KLBJ(AM)

AUSTIN, Texas In some radio stations, the newsroom is the last area to be brought into the modern age. Long after the other studios have made the smooth transition to digital operations, many radio news centers still cart up actualities and even hunt-and-peck copy on scaled-down word processor/typewriter hybrids.

That's not so at KLBJ(AM). As a full-service news-talk AM, we have discovered that an efficient operation and quality programming are the keys to a loyal audience. We put that into practice in the level of our news reporting and the way we relate to our local community. Station management carries that concept over into the equipment with which we work.

KLBJ has been using a **Computer Concepts** DCS audio hard disk system for some time with satisfaction, so switching the news operation to the company's NewsRoom product was the next logical step.



Computer Concepts' NewsRoom Editor

Now that we have worked with NewsRoom, we understand that KLBJ is the first major station to test the product extensively. I am pleased to say we are happy with the results.

Satisfied customer

NewsRoom is a radio-friendly system. With so many news systems targeted to TV stations, we're happy to find designers who understand the particulars of what we need for radio news.

Our six-person news staff works on eight PCs to take news stories from source to broadcast. Reporters use any number of ways to generate stories and actualities: in-person coverage with tape brought back from an event, wire and news service stories, phone interviews, network news. NewsRoom handles all of this with ease.

The system automatically captures text and actualities from wire services and allows reporters to edit both the audio and the copy, or write original copy and link it to the audio in a way that eliminates playing the wrong sound bite with the incorrect story.

For wire service capture, the KLBJ news staff can actually "filter" information, searching for certain types of stories: sports scores, weather information or other categories, using key words. Also, the system can be programmed to automatically purge "stale" stories to conserve digital storage space.

Maximum flexibility

As a reporter, I especially like being able to write and edit copy, and then build newscast scripts right on screen. We can also change story lead-ins or freshen outros when following an ongoing story through the day.

These features help us stay current and allow us to stay on top of breaking news; greater efficiency results in more time spent on the quality of our reporting. The news staff appreciates the ability to "time" their newscasts while editing the script and the fact that, when we go on-air, NewsRoom can also act as a prompter — almost becoming a paperless way to do newscasts.

One additional area of efficiency for KLBJ news is the way the system lets each reporter's PC send stories to one place where the news anchor can build an entire newscast. All of the information is there. Because the station already uses DCS for audio hard disk storage, NewsRoom and DCS work together, an extra plus for live assist or automated situations.

The learning curve for the KLBJ news team was fairly painless. In fact, we had more trouble making the switch from DOS to Windows than we did learning the capabilities of NewsRoom.

At least as important as increased efficiency is the better quality of a digital system. Digital audio represents a step up, both for its actual sound and for editing. It helps us put better actualities on the air.

As we get more efficient on the systems, I'm hoping we can take advantage of some of NewsRoom's other features, such as e-mail to send and receive stories to and from other stations. I would love to integrate and consolidate emergency information, such as school closings.

An additional plus in using NewsRoom is something DCS users should know about: Computer Concepts' 24-hour support and attention to customer needs.

But what has to be near the top of my list in benefits is every news director's wish: a faster, efficient news operation.

For more information on NewsRoom, contact Computer Concepts in Kansas at (800) 255-6350; fax: (913) 541-0169; or ***circle Reader Service 85.***

BBN Fends Off Digital Obsolescence With MTU

▶ MICROSOUND, continued from page 50

ones with "professional" claims — that make fade and gain changes in steps. That method causes clicks and distortion in the audio. MicroSound distinguishes itself from the others by processing every sample. Who ever thinks about the math processing? Yet it is important in retaining the captured quality throughout the processing.

All editing is non-destructive, with a twist other manufacturers do not offer. We can go directly to any individual edit, and adjust or remove it. If we make 2,000 or more deletes, we can adjust or remove any one of them without touching the others. That means no levels of undo that throw away work.

Our projects can be archived to audio DAT machines or any PC media because the files are not proprietary. We can also transfer files over our Novell network, although any network will work.

I tried some other systems; this one easily put the tough decision to rest. We bought two editors from MTU and they have worked flawlessly for more than a year. My wife owns a recording studio and sold her digital multitrack machine because the MicroSound did the work faster and better. It is amazing to me how fast anyone can turn out quality projects with MicroSound, even without prior experience.

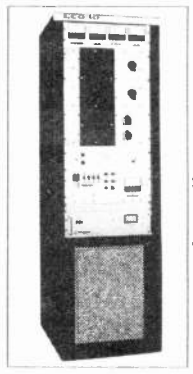
We use a real-time audio analyzer for music production. It showed MicroSound's roll-off to be an absolute brick wall. Picture a zero VU (100 percent) reading on one frequency and nada on the next one up. It hides dynamic noise filter "swishies," too. The Dnoise program was tough to use, but it was recently upgraded with an easier interface. It removes clicks, pops, crackle, background hiss, rumble, whatever is in a template — all in one pass.

It's addictive

The conversion from head cleaning to hard drives is inevitable for every station. If you have been hesitating to make the switch, my advice is to start with a good editor like MicroSound from a company like MTU that will support you. Get a feel for what a computer can do for your sound. Then, watch how all the tape machines go dark and the announcers fight for time on the editor. The productivity and quality of the MicroSound editor truly is addictive.

For more information from Micro Technology Unlimited, contact Dave Cox in North Carolina at (919) 870-0344; fax: (919) 870-7163; or ***circle Reader Service 109.***

Problem:



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World Radio History

USER REPORT

Top Billing for F.A.M.E. in L.A.

by Lukas Bower
Chief Engineer
World Wide Wadio

HOLLYWOOD World Wide Wadio's award-winning team specializes in writing and producing creative radio spots for top advertisers. As our business expanded, we realized that we needed to upgrade our studios to meet the growing demands of our clients. After an exhaustive search for a complete audio post-production solution, our staff chose the F.A.M.E. from **Fairlight**.

F.A.M.E. is an acronym for Fairlight Automated Mixer and Editor. The system includes a powerful 24-track recorder/editor and automated digital mixer. The F.A.M.E. is divided into several components: processing rack, control surface, Pentium PC and matrix.

The processing rack houses a multitasking DSP engine that handles editing, mixing, graphics and machine control. The control surface includes a dedicated hardware user interface for editing, as well as touch-sensitive motorized faders, an LCD touch screen and assignable controls for EQ, aux sends and dynamics. The Pentium PC is used for automation and is linked to communicate with the processing rack. The matrix provides automated routing of audio and can be used with analog or AES digital.

Quick adjustment

Our staff was able to adjust to the new system quickly. The hardware user interface for the 24-track editor is simple to understand. Each recording and editing function is accessed via a dedicated function key; five softkeys are located under a small LCD display. When a dedicated function key is pressed, the softkeys change status to reflect the options available for that function. Most functions can be performed on multiple tracks with 24 keys that allow quick track selection.

The F.A.M.E. at World Wide Wadio

Once the user becomes familiar with each function, operation is extremely fast. An added bonus for radio production is that most functions can be performed on-the-fly while in play and the results heard instantly.

The most exciting part of the F.A.M.E. system is the editor that integrates seamlessly with the automated mixer. While many consoles offer snapshot automation, F.A.M.E. allows dynamic real-time automation of level, mute, pan, EQ, aux send and compressor/expander/gate. The mixer behaves like an analog console, so operation is simple.

Several automation modes are available. One is touch-write, which writes new automation data when a fader is touched and otherwise reads the pre-existing data. Mixes can be saved and recalled quickly, especially helpful when performing revisions.

It is fast enough to satisfy the most demanding clients.

The mixer can be used in a variety of configurations, including LCRS and 5.1 surround. Each configuration can be saved as a preset that can be loaded in less than a minute. Operators can create their own presets, and presets can be set up for different applications.

Storage

The F.A.M.E. stores all 24 tracks of audio on a single SCSI disk. Removable hard disks and magneto-optical media can be hot-swapped without rebooting the system. This has proven useful. We use an inexpensive Fairlight MFX-3 Mini system for pre-production, and then we transfer files to the F.A.M.E. via removable hard drive.

We also create many custom sound effects and are able to save them on magneto-optical disks, which we can load at any time during a session. This saves many hours of unbillable backup and restore time.

The F.A.M.E. has proven to be a great investment for us. It is fast enough to satisfy the most demanding clients, and its flexibility allows us to handle a wide variety of work. Our staff likes the system because it is easy to use and extremely reliable. Of all the systems we investigated, F.A.M.E. is the obvious winner.

For more information from Fairlight, contact the company in California at (310) 287-1400; or ***circle Reader Service 111****.*

Circle (68) On Reader Service Card

World Radio History

USER REPORT

Orban: Big Payoff in Small Markets

by John Chickering
President
Chickering Associates

LUDINGTON, Mich. Chickering Associates is an advertising agency and broadcast production company serving regional and local clients, most of them in small markets throughout Michigan. We have been in business since 1980, producing radio spots and audiovisual soundtracks for industrial and retail clients of all kinds, from auto dealers and banks to tourism-related businesses.

In 1990, we branched out and bought WKLA-AM-FM radio here in Ludington, and then added four more stations over the next few years.

To keep pace with increasing production demands, we added a second production studio at WKLA. I spent nearly a year evaluating the available digital production systems, and finally purchased an **Orban** DSE-7000 in October 1995.

Tailored for broadcast

The DSE-7000 is an eight-track digital mixer and editor designed specifically for broadcast production. Recording is linear PCM (no compression artifacts to worry about), and editing is accomplished real-time in RAM memory with automatic shadowing to hard disk. The work surface is laid out like a familiar analog tape studio, with dedicated buttons and faders for each function.

Granted, the Orban was not the cheapest unit available, but I was convinced it would pay off in the long run. As it turns out, it paid off in the short run. The reason, I believe, has to do with the way radio advertising sells in small markets. I have had colleagues in small-market radio tell me that they work so close to the bone they cannot afford spending $15,000 on a production package.

My comeback is simple: What customers in small markets are really looking for are creative ideas. It is not a rating-driven market. Advertisers buy on the basis of the creative package that a station offers. If you do not have the creative tools you need to do the job, you cannot sell the advertising.

In a nutshell, that is why I kept the Orban workstation after I sold the stations last year.

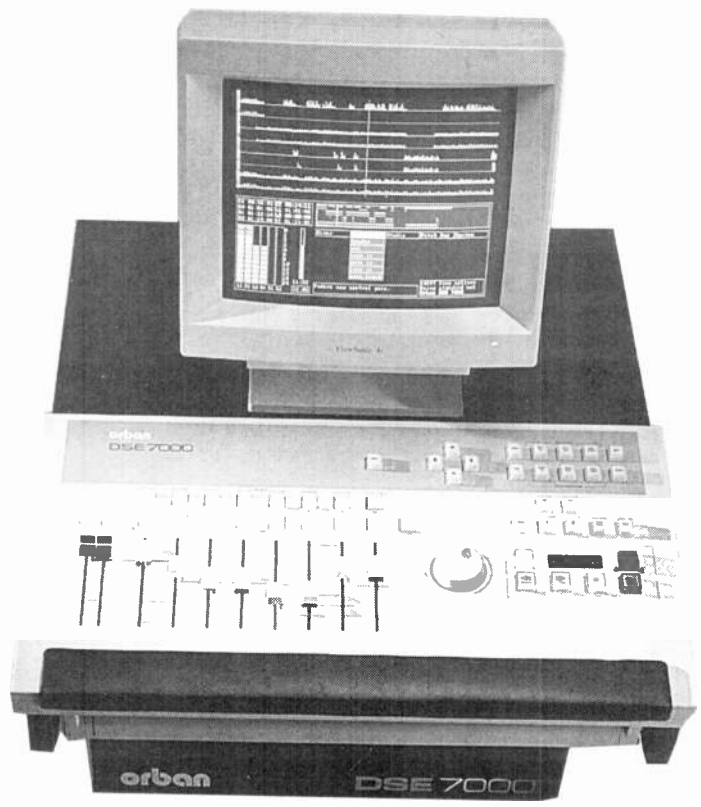
I absolutely refuse to work without it. It allows me to expand my capabilities, to work much faster and cleaner, and in a more creative mode.

The Orban works with such amazing speed because it is still (as far as I know) the only broadcast-oriented workstation that uses RAM-based editing. The RAM production mode is so clean, quick and flawless that I was immediately impressed by it. Everything else seemed clunky by comparison.

The other distinct advantage of the DSE is the well thought-out hardware interface. I had been working with analog production for years, and I discovered that I was doing more and better work on the DSE in a couple of hours.

The large work surface and sturdy controls were a refreshing change from Tinkertoy systems where you squint at a screen while pushing virtual faders with a mouse. No thanks.

A few months ago, we added Orban's FX multi-effects upgrade module, which has parametric EQ, compression and Lexicon digital reverb. Now that I have the effects engine inside, I find that I rarely turn on my outboard effects units. The effects quality is very good, and I do not hear the added noise that was generated by some of my outboard units.



The Orban DSE-7000

I guess the bottom line is the way my Orban lets me try things that would be virtually impossible on the old analog system and probably a pain on other workstations.

For example, last week I had a quick back-and-forth dialogue spot with two voices, but I could not get both of them in the studio at the same time.

So I recorded them separately with the Orban's cut and leader functions. I had everything lined up perfectly in a couple of minutes.

The pacing was so natural you couldn't tell it was spliced together.

Also, the pitch change feature makes the impossible seem easy. For example, I had a bed from the music library that was perfect for a spot, but it was a :60 and I was cutting a :30.

I liked the ending at :60, but the key changed up a fifth toward the end. With the DSE's pitch change, I grabbed the end of the bed, tuned it down to the original key, spliced it in, and it was absolutely perfect.

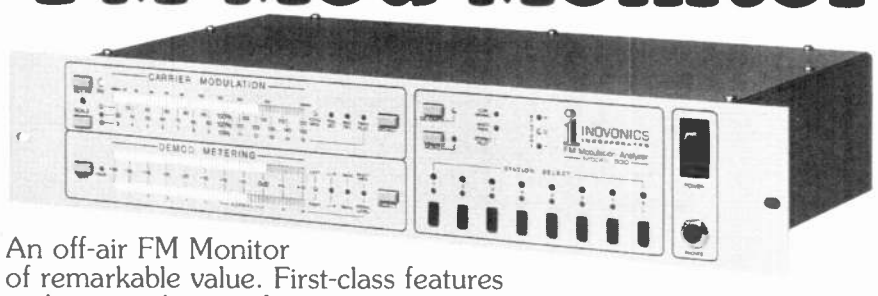
Speed and power

That kind of speed and power has paid for my Orban unit several times over. I know it sounds like I am raving, but I am actually a great cynic who is not easy to please.

I have been ripped off a number of times by inflated claims, which is why I find the DSE-7000 so exciting. It is truly a great product. When I am all done, it makes me sound like a better producer.

For more information from Orban, contact the company in California at (510) 351-3500; fax: (510) 351-0500; e-mail: custserv@orban.com; *or* ***circle Reader Service 18.***

A Best-Value FM Mod-Monitor



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World Radio History

USER REPORT

ABC Sound Has a Sonic Solution

by Royce Froehlich
Audio Engineer/Producer
ABC Sound

NEW YORK It is not easy to navigate a sophisticated digital audio workstation in the beginning, but it's well worth it once you get going. The ability to customize sounds makes producing promos and commercials — which is my mainstay — a relative breeze.

There are bits of advice I have for folks interested in digital systems, and I am tickled to write about **Sonic Solutions** because of the fun I have using it. It began when ABC Sound, a small division of ABC Radio Networks, installed Sonic Solutions' two eight-channel, networked system.

Fine tuning

I was faced with a dilemma. Not only was I unfamiliar with Sonic, I didn't know much about computers, period. (Advice for getting into any digital editing: learn computers first.) Now, however, I'm no longer a candidate for Jurassic Park!

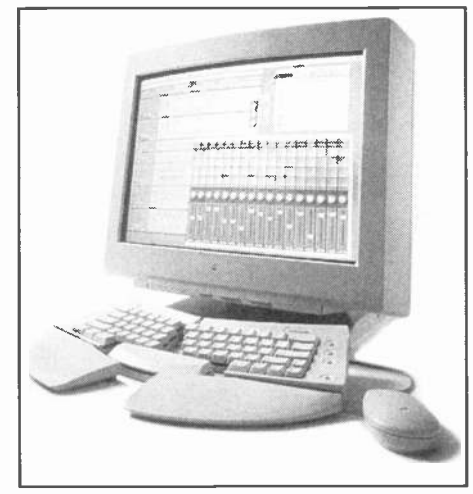
What I love is the ability to manipulate and fine-tune my work to a detailed degree. The cross-fade function takes editing to a new level. This is something that has to be seen, it would take too long to describe here. Pin-point sound level adjustments can make all the difference in creating emphasis in words that weren't there in the announcer's read. DSP functions make it possible to adjust sound lengths for better timings and to create effects, and precise punch in and out recording is a handy tool often used.

I mainly cut commercials for outside agencies and radio promos for the ABC-TV news magazine shows "20/20," "Primetime Live," and "Turning Point." Voice tracks are cut in our studios or producers provide them on Beta video tape, DAT or analog. We add music and special effects from our library. I take care of EQ in Sonic, and add some outboard treatments like compression, a BBE Sonic Maximizer and an Ultra-Harmonizer. These projects usually take from one to four hours. I operate a beta machine and a time-coded DAT through Sonic's transport controller. There are digital inputs that take CD and DAT signals directly, so you don't have to go through your mixer.

Another system application is long and short form radio program production. My favorite project, which I've worked on for the last three years, is the ABC Radio one-hour year-end wrap-up show, called "Playback." The amount of time needed to produce the show mirrored my learning curve. For the first one, I didn't leave work for three days. Yes, three whole days. I kept blowing up, primarily because I didn't know how to circumvent the Mac's memory limitation (we subsequently upped it to 40 MB).

There were many other things that slowed me down. (More advice: Memory is cheap nowadays. Bring a bagged lunch and put your savings into memory.) By this past year, the time it took to finish the project was due to editorial decisions and sweetening, not the editing system. I can tell I'm faster, I have to wait for the Mac to catch up with my moves.

Once the details are worked out, digital editing is like word processing. Most of the work is cut and paste. Like working with word processing applications, there are so many tricks, unless one has a chance to see the nuances of the system in action, there's no way to know about all its great features. I'm very lucky. I work with a world-class sound engineer who comes from the music production and advertising arenas. The same goes for the staff at Studio Consultants, suppliers of our system.



The Sonic Solutions Digital Workstation

Training

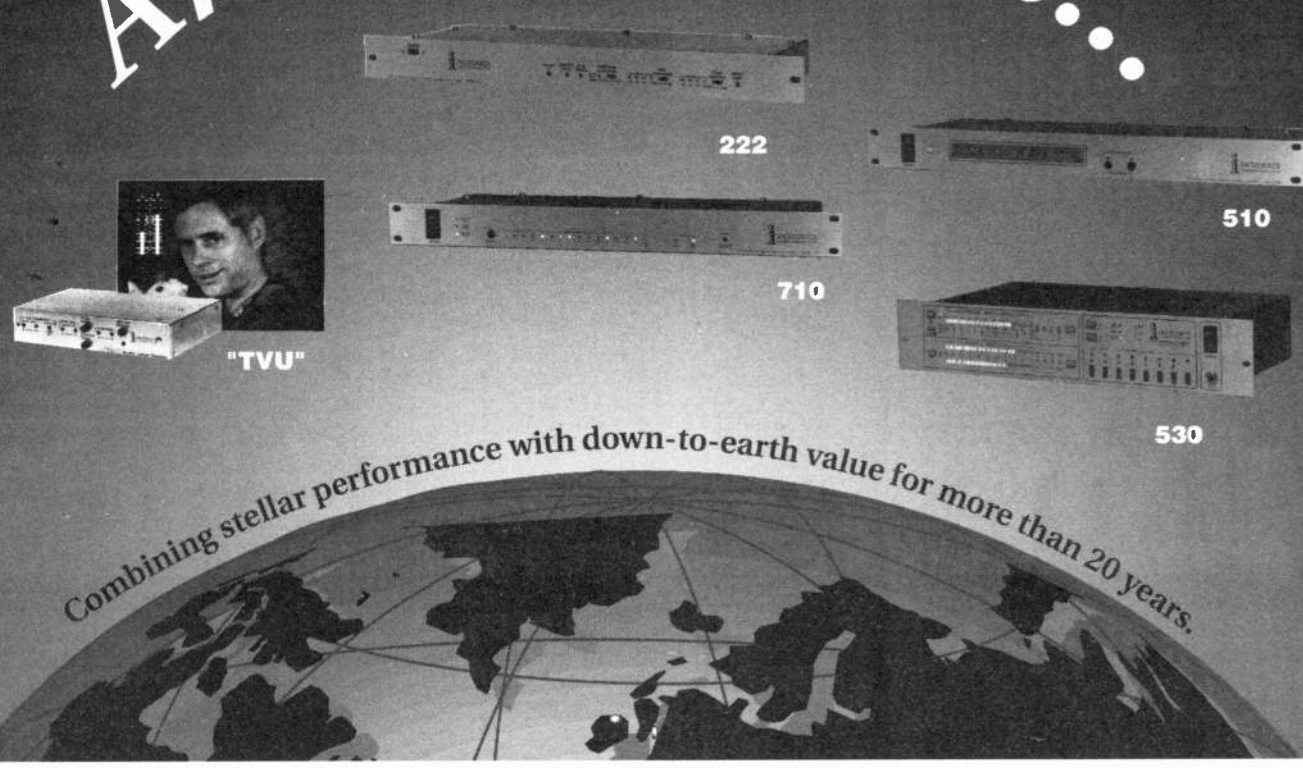
Be sure that a rep from Sonic (or dealer) customizes your Mac to run Sonic to its maximum and least problematic potential. There are things about the Macintosh system that conflict with Sonic's best interest. Also, go to product demos and learn new techniques.

ABC Sound is a small but powerful operation. We're making changes to go all-digital, with a Yamaha 02R and MIDI gear already installed in one room. Sonic is at the heart of both of them and offers solutions for all Radio Networks' production needs.

For more information from Sonic Solutions, contact the company in California at (415) 893-8000; fax: (415) 893-8003; or circle ***Reader Service 96.***

AM, RADIO-DATA AND MEASUREMENT PRODUCTS

An all star cast...



222 Asymmetrical AM Low-Pass Processor
Guarantees US "NRSC" compliance, or is available in several versions for international medium- and short-wave service. Combines compression, peak control and adaptive pre-emphasis.

530 Off-Air FM Modulation Monitor
Tunable Mod-Monitor gives accurate measurement of total mod., pilot injection, stereo separation, etc. The peak flasher, metering and alarms may be remotely located.

710 PROM-Based RDS/RBDS Encoder
Easiest, fastest and least-expensive Radio-Data implementation. "Static" mode permits selective transmission of 15 separate frames of data (IDs, flags, messages, etc.) with no computer or user-programming required. "Dynamic" mode allows optional on-line operation for song titles, contests, etc.

510 RDS/RBDS Decoder-Reader
Connects to any Mod-Monitor to give accurate subcarrier injection measurements, and to decode and read all the common RDS/RBDS data groups. Features an 80-character LCD display, simple, menu-driven operation, and an auxiliary RS-232 output port for data archiving.

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World Radio History

USER REPORT

SADiE Finds a Home at Signal Media

by Glenn Buercklin
Production Director
Signal Media of Arkansas

LITTLE ROCK, Ark. About two years ago, Signal Media began searching for a digital editor/recorder to replace our aging analog multitrack tape machine.

We already use another company's system as the heart of our station's programming. While it comes with a competent three-track recorder/editor, we needed a unit whose capabilities were broader and more flexible. The new editor had to operate on a Windows platform to ensure compatibility with the rest of our system. This was a little tricky for me because I had worked with a Macintosh-based multitrack editor that was user-friendly. With that experience to guide us, we started shopping. It didn't take us long to find **SADiE**.

SADiE is an acronym for Studio Audio Digital Editor. It is made by Studio Audio of Cambridge, England. We had been aware of SADiE's existence through word-of-mouth (another station across town has one), product reviews and other literature. We were not convinced that SADiE was the system for us until the Studio Audio office sent one of their specialists out to demo it.

SADiE's Digital Editor/Recorder

Pocket protectors, take note

SADiE uses a proprietary card (the X-ACT card) to perform most of its operations. From the card, the signal is routed through an optional breakout box containing I/O connections for a number of configurations — multipin, XLR, quarter-inch, etc. The AES and S/PDIF inputs accept digital protocols IEC 958 or AES 3-1992 formats, 32 kHz to 48 kHz plus 10 percent at 100 ohms impedance (AES) or 75 ohms impedance (S/PDIF).

SADiE supports two channels of analog input via two XLR female balanced connectors on the breakout box, or X-ACT D-type multi-way connector at the back of the X-ACT card. The X-ACT card features 16-bit, 64X oversampling delta sigma converters at 25 K ohm input impedance. Analog frequency response is 20 Hz - 20 kHz.

Translation: In 20 years of production, SADiE is the cleanest, most noise-free recording device I have used. Its noise floor is practically nonexistent, the A/D converters are pristine and its sonic integrity is astounding. Connecting SADiE to your existing bus structure is easy, with several different options (SMPTE and MIDI I/O) available through the breakout box.

In fact, options are what SADiE is all about. This system has features radio stations may not be using right now, but will be necessary in the future, like PQ Editing for CD mastering, SMPTE master/slave capability with multiple connector options, auto-conforming from imported edit decision lists and signal processing options ranging from parametric and graphic multi-band visualization to pitch shifting.

From a user standpoint, SADiE's operation is straightforward. You will do most of your work in three windows:

The Playlist window: Graphic representation of audio appears as waveform displays. Moving the cursor on the timeline at the playlist window's top enables random access playback. The recorded audio appears as colored blocks or "clips." Parameters (playback volume, name, fade-in/out shape and duration, etc.) can be adjusted by double-clicking the clip itself.

The Transport window contains function buttons for record and playback using familiar tape transport controls, along with cursor position display expressed in SMPTE timecode standard hours, minutes, seconds, frames and subframes.

The Levels window: This is designed to look and function like a console's mixing section. Here, the level of each audio stream and output channel can be individually or collectively increased, decreased and panned. The levels window features variably rewritable fader and pan automation, which allows mixes to be automated according to the project's requirements.

Free upgrades

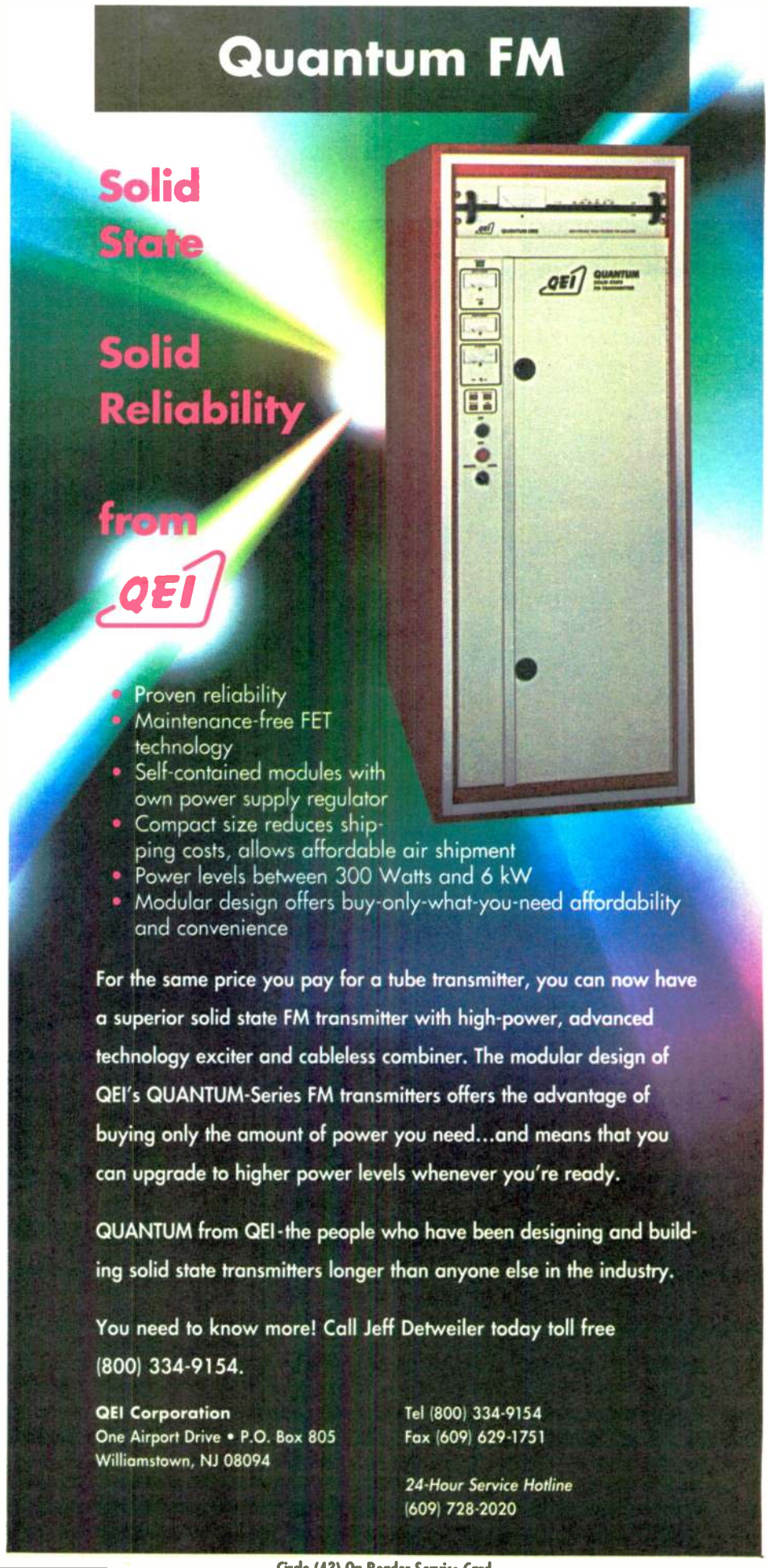
We are currently running SADiE on a 486 PC with 4 MB RAM. This is about to change because SADiE v.3 has arrived — free of charge, as are all software upgrades for the life of the system — and is optimized for Pentium processing at 16 MB RAM or better. Because SADiE is cursor-intensive, we are using a wireless pen and pad as an input device. The advantages to this are a small footprint, greater precision than a mouse or trackball, and ergonomic considerations.

As with all equipment, service after the sale is a prime factor in determining whether one has made a good choice. The people at SADiE have gone beyond the call of duty here. About six months after we purchased the system, the hard drive failed. I called Studio Audio, but their crew was at a trade show. I reached them there, and they took time out of their live demo (before several potential clients) to talk me through a recovery.

When that failed, they sent a new hard drive to us overnight. We were up the next morning. I can call Studio Audio with any question — hardware- or software-related — and they will find the answer. Dealing directly with SADiE's main U.S. office means not having to go through middlemen, either.

Yes, this sounds like a fan letter. It is. In my opinion, SADiE gives more bang for the buck than any multitrack hard-drive recorder on the market. The customer service makes the deal that much sweeter. Their commitment to random-access editing makes SADiE a great choice, now and later.

For more information from SADiE, contact the company in Tennessee at (615) 327-1140; fax: (615) 327-1699; or ***circle Reader Service 122.***



Circle (43) On Reader Service Card

World Radio History

USER REPORT

KKND Takes the Spectral Express

Spectral Express for Prisma Is Widely Hailed At Clear Channel Communications Stations

by Jason Ginty
Production Director
KKND(FM)

NEW ORLEANS The main reason I came to New Orleans (other than Bourbon Street) was to learn digital production. I had used eight-track analog equipment at two previous positions and had been looking for an opportunity to work with digital. My general manager said we were getting **Spectral's** Express for Prisma, which is what all Clear Channel Communications stations would be using.

The first day I grabbed the easy-to-follow user's guide and got rolling. Our Spectral digital audio workstation operates on a Pentium 120 with 16 MB RAM. The heart of the system is the Prisma card, a full-length, ISA slot card that is entirely host-independent.

Prisma card

The Prisma card is the main "engine" of the system. Audio is recorded onto a SCSI hard drive connected to the Prisma card. It has its own SCSI bus directly on the card, making it independent from the computer's operating system. We also are using an Iomega Jaz as a real-time device to record audio as well.

Being host-independent, the Prisma card allows the user to load Spectral's four software user interfaces, based on the user's degree of skill. Our Prisma system uses Spectral's AX-S A/D-D/A converter. It is a simple, two-in/two-out I/O.

The software I use for all my basic production is Express. The beauty of Express is that it only has two display panels: the Edit and Directory panels. Once inside the Edit panel, I noticed many of the controls resembled analog equipment.

The transport section of the Edit panel, which is used for play, record, etc., had the same symbols as a tape machine. The rest of the screen was simple in its layout, and big, too. No overlapping windows cluttered up the screen.

The Edit screen has eight tracks of mono or four tracks of stereo, or any combination thereof. All eight tracks can be displayed on screen so you can view the entire project. Each track has its own fader and pan controls. The faders can be "moused" during mixdown, just like an analog console. It does take a little practice, though.

Spectral's Express for Prisma

Do you need real faders? Spectral offers the optional JL Cooper CS-102 MIDI Control interface. Adjacent to each fader are solo and mute controls for each track. To record audio onto a track, simply put the "arming" button into Record, then hit Record and Play on the transport. When you are done recording, hit stop. A graphic waveform instantly appears on-screen, ready for editing, moving, cutting and pasting.

In the alternative music format, listeners like all of the in-your-face, panning, full-sounding, up-front, fat stuff. This is not a problem. I like to use a lot of different music cuts in promos and spots. The screen has plenty of room to throw in different SFX and music cuts. The Express will even automatically crossfade music cuts just by overlapping two segments on the same track.

A zoom-in, zoom-out feature lets you take closer looks at the waveform segments down to the sample. A loop feature and user-selectable "hot keys" are also useful.

The features I have described can all be done on the Edit screen. Time to get into the Directory, where you can keep track of all your audio and perform DSP functions.

Proved its stuff

Probably the coolest (and most abused) DSP features are the time compression/expansion tools. I can lay down a vocal track that is 63 seconds long, and then compress it to 60 seconds without changing the pitch. The Prisma card will time-compress or expand audio by 65 to 200 percent from the original length. It is really great for annoying car dealership disclaimers.

Other DSP features include Normalize, Gain Boost/Cut, Phase Invert, Sample Rate Conversion and DC offset. Do not worry about disk space. There are more than 400 minutes on our 2 GB fixed SCSI hard drive, and Jaz disks handle about 200 minutes. If you need more space, you can add up to four real-time drives and support up to three back-up devices for archiving audio.

I am still learning some things about the system, but with only five months on it, it has proved a great tool to make some amazing spots for clients and some rippin' promos and imaging stuff.

People I have spoken to who have worked with digital told me it would allow me to save time. That would be true, except I now spend more time playing around with different sounds and experimenting. Express gives me the freedom to push the envelope, and that is the reason I am a production director.

For more information from Spectral, contact the company in Washington at (206) 487-2931; (800) 407-5832; fax: (206) 487-3431; or ***circle Reader Service 70.***

TECHNOLOGY UPDATE

ARRAKIS

FORT COLLINS, Colo. **Arrakis** has updated its versatile emergency backup software that works with any on-air system.

Trak*Star 3, a multitrack digital editor, can back up any manufacturer's on-air workstation, live assist, satellite and automation equipment.

Features include high-speed, easy operation of graphics and audio, seamless audio scrubbing, audio play with variable speed and direction, digital fader/level control, punch in/punch out, effects send and receive, auto session back up, linear editing and up to 6-hour edit sessions.

The software update started shipping to registered Trak*Star owners last month.

For more information from Arrakis, contact Jon Young in Colorado at (303) 224-2248; or ***circle Reader Service 6.***

USER REPORT

NORA Rises Above Competition

by Alexander von Humbold
NORA (NordOstsee RAdio)
Editor-in-Chief

KIEL, Germany NordOstsee RAdio (NORA) in Germany is in a highly competitive radio market where mobility, flexibility and quickness are crucial.

NORA broadcasts from Kiel for northern German states Schleswig-Holstein, Hamburg, the western part of Mecklenburg-Vorpommern and the north of Niedersachsen. We broadcast a program consisting of oldies hits, up-to-date news, business news, cultural programming and sports.

Speedy system

The transmissions arrive from Hamburg, Luebeck and Suederbrarup near Flensburg. The DigiReporter at NORA has always performed without any difficulty, making it possible to transport news with high speed. The audio transmission takes place via an ISDN connection, also at high speed. An analogous modem, Internet, e-mail and fax are available.

NORA has used the DigiReporter from **mediatron** since early 1996. Hardware includes a Compaq Pentium laptop, DSP box, suitcase and connection cables.

Our computer is equipped with Windows 95, an ISDN PCMCIA card for communication and NewsEdit audio recording and editing software. It is compatible with mediatron's Pegasus, a digital broadcasting system, also installed in Kiel by mediatron.

NewsEdit
software ... is the professional tool for everyday work.

Mediatron's NewsEdit software was developed specifically for broadcasting editors; it is the professional tool for everyday work. The software includes the necessary digital processing features in the text- and audio-scope. The hard disk integrated into the notebook is used as a storage medium. It has a capacity of 2.15 GB. The system runs on MPEG audio coding and has 18 hours storage capacity in CD quality; therefore a miniature audio archive is possible with the device.

Recording and editing features include a moving modulation curve (unnecessary zooming and building-up of the curve), shuttle, jog and loop, cut, copy and insert, graphical cut display, direct access to other programs, password-protected productions and integrated office programs.

All communication functions are bi-directional. Sound transfer and communication is possible via the handy GSM and ISDN modem, along with Internet, e-mail and fax connectivity.

Mediatron's DigiReporter is flexible to use and easy to maintain, making it suitable for remotes. In operation for more than a year, it has been an extraordinarily smooth instrument.

For more information from mediatron, contact the company in Germany at 011+49-8131-8305-0; fax: 011+49-8131-8305-25; e-mail: info@mediatron.com*; visit its website at* www.mediatron.com*;* ***or circle Reader Service 44.***

World Radio History

Radio World

Broadcast Equipment Exchange

"Broadcast Equipment Exchange" accepts no responsibility for the condition of the equipment listed or for the specifics of transactions made between buyers and sellers.

AMPLIFIERS

Want To Sell

Dynaco PAS3X (2) tube type preamp, $150 ea. J Parsons, Parsons Sound Service, 2781 Fayson Circle, Deltona FL 32738. 904-532-0192.

JBL 2 way electronic crossover, $100; Crown D150 stereo amp, excel, $300. D Kocher, Digital Sound Makers, 1901 Hanover Ave, Allentown PA 18103. 610-776-1455.

McIntosh MI-60, excel cond, $775; McIntosh C-4 compensator for MI-60, gd cond, $125; Dynaco 60 W, vgc, $370; Dynaco MK IV amps (2), gd, $235 ea; Dynaco stereo 35, gd, $265; Dynaco stereo 35 SCA w/PAS preamp, vgc, $400/both; Fairchild 688 50 W transgard (2), one gd, $250, one fades, $200; Altec 407A amps (6) w/Altec pwr supply 9550A, mounted in trays w/Altec face plate for 19" rack mount, $425; preamps (12) designed by Bell Lab engineers; UTC-HA-108 xfrms, high quality, $60 ea. all +shpg. K Hardman, Hardman Eastman Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450 fax: 412-481-4458.

Rane HC6 headphone amp, $225. B Landry, WLMG, 1450 Poydras St 440, New Orleans LA 70112. 504-593-2107.

Want To Buy

WANTED
HiFi/Commerical tube amps, compressors, mixers, horn speakers. Altec, McIntosh, JBL, EV, WE, Tannoy, Marantz, Ampex, etc. 405-737-3312 FAX: 3355

ANTENNAS/ TOWERS/CABLES

Want To Sell

Cablewave 240' of 1-5/8" air Heliax cable, excl cond, BO; Andrew & Cablewave dehydrator, excl cond, BO. R Weigner, WRAP-LP, 29 Douglas Dr, Meredith NH 03253. 603-279-4758

ERI 1100 12 bay, high power tuned to 99.5, in warehouse near St Louis, $6500; (2) rejection filters, 12' long, 10" diameter, 98.5 kHz & 99.5 kHz, $500 ea; Windcharger 150, 300', triangular, 19" sides, beacons & side lights avail, $4000. J Googan, KGNV, POB 87, Washington MO 63090. 314-239-0400.

ERI FM-L 3E, tuned to 93.5, 10 yrs old, medium power, full wave, $1500. J Murphy, WJQZ, 82 Rail Road Ave, Wellsville NY 14895. 716-223-3591.

ERI 2-bay center feed, tuned to 93.7, new, $3000/BO. H Shumney, KSWG/KBSZ, 801 W Wickenburg Way, Wickenburg AZ 85390. 520-684-7804.

Rohn 45G 190', $500. R Newton, WAYM, POB 887, Brentwood TN 37024. 205-837-5276.

ERI FML 3 bay CP FM antenna w/heaters, $1350. D Case, KARN, 4021 W 8th, Little Rock AR 72225. 501-661-7590.

Hughey & Phillips KG-114 300mm code beacon, excel cond, $500 ea; Puregas 1500 air dryer, gd cond, $950. E Black, KXXY, 100 NE 28 St, Oklahoma City OK 73105. 405-524-3770.

Want To Buy

ERI FML-3 3 bay FM antenna system on or close to 93.9. RJ Miller, Miller Media Group, 111 W Main Cross, Taylorville IL. 217-824-3395.

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Circle (53) On Reader Service Card

AUDIO PRODUCTION

Want To Sell

Akai DR4D 4 trk digital editor, like new, $990. R Forsythe, Soundchoice, 2904 Prairie Ln, Lafayette IN 47904. 317-449-8201.

AKG BX20E echo chamber w/R20E remote & manual, excel cond, $2900; Burwen 1500A noise filter, gd, $125; Bogen amps, 10W, 30W, 35W, tubes 35W solid state, $30-$80; AKG C451E condenser shotgun system, 5 capsules, 2 xmtrs, 3 shock mounts, case, etc, working well, $455, all +shpg. K Hardman, Hardman Eastman Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450 fax: 412-481-4458.

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Circle (79) On Reader Service Card

Audiometric 2.8 audio distribution amplifier. Jim, GWTM Inc, 414 Washington, Defiance OH 43512. 419-782-8591.

Cart racks (2) each holds 400 carts. $125/ea. L Lanser, WWJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

dbx 266 dual compressor/ gate, $195. B Landry, WLMG, 1450 Poydras St 440, New Orleans LA 70112. 504-593-2107.

dbx 263 De-Esser inexpensive single-chnl unit, intended to remove excess sibilance from voices, $100. L Albert, MSU-TV, Box 2266 Univ Sta, Murray KY 42071. 502-762-4664.

Electro-Voice Sentry 100A 1 pr studio monitors, excl cond, in/out, $275 + shpg. E Toline, Audio Etc, 525 W Stratford Pl, Chicago IL 60657. 773-975-6598.

Gentner SPH-3 phone hybrids (3) w/manuals, $300/ea. R Miller, Miller Media Group, 111 W Main Cross, Taylorville IL 62568. 217-824-3395.

Ramsa WR-S 212 12 chan audio mixer w/3 band EQ, sweep mid & 3 aux sends, excel cond, $995; Lexicon LXP-5 multi FX stereo processor, performs reverb, delay & pitch FX to audio program, excel cond, $300; Fostex 4030 & 4035 synchronizer & remote, excel cond w/cables, $750; Samson MR-1 wireless MRI rcvr w/TX-3 xmtr w/Sony Lav mic & Samson hand held trans w/EV 757 mic, all excel cond, $500. N Madeo, Madeo Multimedia, 304 Bentley, Brewster NY 10509. 914-278-6401.

JBL 4333A 15" speaker, $950/pair; Vintage reconditioned tube mic pre's & mixers, $300-$700; ADC new patch bays, 1/4" 52 points, $169; ADC TT bays, $129 up; ADC new TT or 1/4" TRS cords, $9; Furman 1/4" to 1/4" patchbays, $95 each; like new tape, 1/2"x2500' 456, $15 each; 1" 456, 226, 250, $25 each; Rane ME15 graphic EQ, $150; Digitec 3.6 second delay, $150; new power dist/filter rack mount, $75. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

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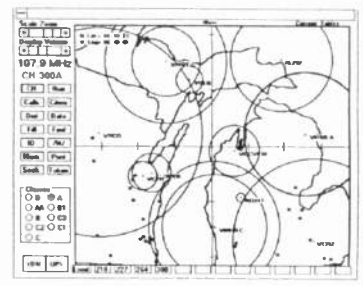

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Circle (105) On Reader Service Card

Shure mono mixer, $100; Shure 610 feedback controller, $85. D Kocher, Digital Sound Makers, 1901 Hanover Ave, Allentown PA 18103. 610-776-1455.

Tascam MM-100 rack mount stereo mixer, 8-chnl, 4 effect sends & receives, w/manual, $250/BO. K Carlson, Q Audio, 540 Blue Lakes Blvd N #614, Twin Falls ID 83301. 208-734-0695.

Telos Zephyr as new, w/built in terminal adapter, $3800. P Christensen, Christensen Prod, 11142 Raley Creek S, Jacksonville FL 32225. 904-739-3899.

Fostex 8700 time code gen, like new, $100. Don, Scales Film Sound, 3142 Market Pl, Bloomington IN 47403. 812-339-4446.

Want To Buy

Compressors & EQ's, tube & solid state. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

AUTOMATION EQUIPMENT

Want To Sell

Arrakis networked Digilink III w/Cartwall for live assist in studio, Digilink w/Trak Star hardware for prod studio, call for specs or info, excel working equip, $11500. L Zeve, WHYL, Box WHYL, Carlisle PA 17013. 717-249-1717.

Schafer System w/901 control unit w/cards, 902 switch memory, RAS/MOS memory, power supply (3) Sono-Mag Carousels, fair cond, needs work. P Mueller, KUTA, 2575 N Radio Hill Rd 6-1, Blanding UT 84511. 801-678-2261.

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Circle (209) On Reader Service Card

World Radio History

Harris 9002 operating when taken out of service in Nov, 14 yrs old w/extra system for parts, $1000; SMC 350 (3) carousels, mono, random select, $80 ea; ABC 1600S 16 event sequencer, $100. L Lanser, WWJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

SMC 350 Carousels, as is (6), $50/ea. R Miller, Miller Media Group, 111 W Main Cross, Taylorville IL 62568. 217-824-3395.

Colorado Magnetics Satcue 500 switcher; SMC DP-2 w/r-r's & Carousels, will part out. C Springer, KLMR, POB 890, Lamar CO 81052. 719-336-2206.

IGM EC System, (3) 48 tray stereo Insta-Carts, 24 stereo Go-Cart & computer, $2000/complete, will consider selling individually; Sentry FS12B System, (2) 48 tray stereo Insta-Carts, (2) 24 stereo Go-Carts, (4) 42 Go-Cart machines and computer, $2000/complete, will consider selling individually. C Mandel, KAMP, 626 Main St, El Centro CA 92243. 619-352-2277.

Want To Buy

SMC RC-50 50 event programmer for Carousels, must be cosmetically straight & w/manual, need not work. K Carlson, Q Audio, 540 Blue Lakes Blvd N #614, Twin Falls ID 83301. 208-734-0695.

CART MACHINES

Want To Sell

Ampex AG440 capstan motor, $150. H Sewell, Oakridge Music, 2001 Elton Rd, Haltom City TX 76117. 817-838-8001.

Harris R/P, $500; Harris play, $300. JP Cave, WLCC, POB 387, Luray VA 22835. 800-296-2283.

ITC 3D WP SP 99B mono & stereo, BO. Jim, GWTM Inc, 414 Washington, Defiance OH 43512. 419-782-8591.

ITC 3D (3) decks, PB only, mono w/3 tones, $225/ea; ITC ESL-IV splice finder, $100; Spotmaster cart winder, $75; Audicord Series A mono R/P w/3 tones, $125. L Lanser, WWJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

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HE HALL Electronics

Scully 284-B 8-trk 1" in gd shape, $3500 + shpg. H Sewell, Oakridge Music, 2001 Elton Rd, Haltom City TX 76117. 817-838-8001.

ITC upgrade pb to record, amps only, no deck, 3 tone, stereo, $175, or mono, $125. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Spotmaster TFIA cart winder, $50. M Taylor, KNEO, 10829 E Hwy 86, Neosho MO 64850. 417-451-5636.

ITC rack shelf for 99 series, $25. D Bailey, Rock Shoppe Prod, 10027 Church Rd, Dallas TX 75238. 214-343-0879.

SMC 790 w/sec tone, matching encode machine. C Springer, KLMR, POB 890, Lamar CO 81052. 719-336-2206.

ITC Delta - new pinch rollers: Mono playback (2), record/play (2), stereo record/play (1). MOTIVATED! Spotmaster series 2000 record (1). Wes, 818-798-9128.

ITC record amps, 3 tone, stereo, $250 or mono $150. W Gunn, 619-320-0728.

CONSOLES

Want To Sell

Ampro 5 chnl, 2 buses, 8 chnl, 2 buses, $100/both. JP Cave, WLCC, POB 387, Luray VA 22835. 800-296-2283.

Audioarts/Wheatstone 8X power supply w/phantom, excel cond, $200. D Kocher, Digital Sound Makers, 1901 Hanover Ave, Allentown PA 18103. 610-776-1455.

Shure M-67 mic mixer, gd cond, $200, will pay shpg. R Meyer, 805-962-8273.

Grommes G5M (2), 6 chnl mixer, tube type, like Altec 1567A, $300 ea; Ramko DC5AR, checked, $300. J Parsons, Parsons Sound Service, 2781 Fayson Circle, Deltona FL 32738. 904-532-0192.

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FAX 1-(408) 3634-0957

Harris Stereo 80, Auditronics 110 Grandson modules, Harris Micro Mac, CCA & Sparta slide-type boards. Jim, GWTM Inc, 414 Washington, Defiance OH 43512. 419-782-8591.

McMartin B-500 5-chnl mixer, $200. L Lanser, WWJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

Mackie 1202 12 chnl mixer, $195. B Landry, WLMG, 1450 Poydras St 440, New Orleans LA 70112. 504-593-2107.

MCI JH416 prewired w/Mogami cable, 18x16x4x2 w/producers desk & upgraded chips, all documents/manuals & spares, excel cond, $3000; Auditronics pwr supply for console, $100. D Bailey, Rock Shoppe Prod, 10027 Church Rd, Dallas TX 75238. 214-343-0879.

RCA BN-17A port remote 4-chnl mixer, removable front cover w/handle converts to own carrying case, original RCA manual incl, $250. L Albert, MSU-TV, Box 2266 Univ Sta, Murray KY 42071. 502-762-4664.

Tascam 208 8x4, $650; M216, 16x4, $1000; TOA RX308 8x4, $1000. M Hughes, Fresh Start, 896 W 11th St, Panama City FL 32401. 904-784-2146.

SQN 4S type 2 ENG stereo mixer, PortaBrace, excel cond, $2200. Don, Scales Film Sound, 3142 Market Pl, Bloomington IN 47403. 812-339-4446.

Soundcraft 600, 32x16, w/patchbay, mint, $6950; Tascam 512, 12x8 mixer, $750; Tascam 520, 20x8x16 mixer, $1750; Allen & Heath SYNCON 28x24, great sound, $8000; Ramsa 820 mixer, $2200. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Want To Buy

Rockwell Collins 5, 8 or 10 chnl stereo or mono; LPB Signature II or III, 5, 8 & 10 chnl stereo or mono consoles. A Sutton, WCRS, 637 E Durst Ave, Greenwood SC 29648. 864-223-8553.

Tascam or Otari 2 or 4 trk r-r, mono cart machines, slider stereo on-air consoles, etc. in excel cond. Media Arts Ctr, 1-800-887-2346 or fax 860-677-1141.

Langevin AM 5301 Leveline limiter/compressor, 4 tube w/manual, gd, $425 +shpg. K Hardman, Hardman Eastman Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450 fax: 412-481-4458.

UREI LA4 racked pair, silver face w/manual, xlnt cond, $1400/pr. M Schackow, Mark Schackow Recording, 307 4th Ave E, Lemmon SD 57638. 605-374-3424.

Want To Buy

Altec 436C or 438C would prefer no mods and xlnt shape. M Schackow, Mark Schackow Recording, 307 4th Ave E, Lemmon SD 57638. 605-374-3424.

Cash paid tube compress, amplifiers, on air signs. J Phillips, 414 Washington Ave, Defiance OH 43512. 800-OLD-MICS.

Optimod 9100A or 9100B w/NRSC card. A Sutton, WCRS, 637 E Durst Ave, Greenwood SC 29648. 864-223-8553.

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

MICROPHONES

Want To Sell

AKG D160E, $60; D190E, $90; D19E, $300; EV-607, $125; 624, $100; 644 sound spot, $200, 1751 condenser, $100; PL-9, $90; DL-95, $100; RCA-Aerodyne MI 6226 ribbon, $600. M Hughes, Fresh Start, 896 W 11th St, Panama City FL 32401. 904-784-2146.

Audio Technica ATM61HE hypercardioid mics (4), $90 ea; Luxo mic booms table mount (4), $25 ea; Audio Technica 8415 shock mounts (4), $25 ea. G Kornbluth, A&J Recdg Std, 225 W 57 St, NY NY 10019. 212-247-4860.

EV DL-42 shotgun (pair), vgc, $325 & $300; WE 639A birdcage, fine cond, $675; WE 633A saltshaker (pair), vgc, $230 ea; AKG C567E tie tack, vgc, $130; AKG D190E dynamic, gd cond, $60; AKG D1000E, excel, $60; AKG D200E cardioid (pair), vgc, $45 ea; EV 635A omnidynamic, vgc, $90; EV RE 85 noiseless lavalier, gd cond, $80, other EV & Shure mics, all +shpg. K Hardman, Hardman Eastman Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450 fax: 412-481-4458.

Shure SM-7 bdct mic w/built-in windscreen & shockmount, $200. C Smith, Action Comm, POB 21012, Washington DC 20009. 202-265-9135.

Sony C-74 short shotgun, 48V phantom, vgc, excl sound, $475. E Toline, Audio Etc, 525 W Stratford Pl, Chicago IL 60657. 773-975-6598.

Vega R33-77DII wireless mic system, vgc, $400. Don, Scales Film Sound, 3142 Market Pl, Bloomington IN 47403. 812-339-4446.

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Want To Sell

Aphex Compellor 320A leveler, compressor, stereo mdl, new in original box, $495; Orban digital Optimod 2200D, as new, $3400. P Christensen, Christensen Prod, 11142 Raley Creek St, Jacksonville FL 32225. 904-739-3899.

CBS 410 Volumax limiter w/manual, $50. P Russell, Bowdoin College, Sills Hall, Brunswick ME 04011. 207-725-3066.

dbx 163 overeasy compressor/limiter, inexpensive single chnl unit, uses 1/4" phone plugs, $100. L Albert, MSU-TV, Box 2266 Univ Sta, Murray KY 42071. 502-762-4664.

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Sennheiser, Neumann, AKG, many models. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

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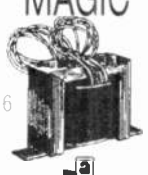
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Amateur radio handbooks, yrs '67, '69, '72, '76 & '81, $15/all. P Russell, Bowdoin College, Sills Hall, Brunswick ME 04011. 207-725-3066.

Langevin EQ 252, 7 band on 19" panel w/1/4" in/out, excel, $400; George Starbird mic booms (2), early 50's, excel cond, $475 ea; Symetrix TI-101 telephone interface, excel cond, $225; Crown IC-150 stereo console w/manual, vgc, $150 +shpg. K Hardman, Hardman Eastman Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450 fax: 412-481-4458.

National Schools home appliance home study course, 53 booklets, $75 +shpg. H McDonald, KKJV, POB 807, Veradale WA 99037. 509-484-4531.

Scully 250/255 Series rcdr/reproducer, R-R, (2), $250. M Taylor, KNEO, 10829 E Hwy 86, Neosho MO 64850. 417-451-5636.

WE 111C coils, $50 ea. WC Florian, WNIB, 1140 W Erie St, Chicago IL 60622. 312-633-9700.

CG-25R 25 Hz generator; (4) Otari ARS-1000 open reel machines; (3) Wegener 1816-24 freq agile satellite rcvr. C Mandel, KAMP, 626 Main St, El Centro CA 92243. 619-352-2277.

Circuit Werkes AC-2 telephone automatic audio coupler, 3 weeks old, like new, $100. B Barry, WAMB, 1617 Lebanon Rd, Nashville TN 37210. 615-889-1960.

Russ Lang RL600 cabinetry for Otari 5050B Series, excel cond, $200; ADC Pro Patch series patch bays (4), never installed, $450; ADC Pro Patch series patch bay, factory wired to short cables for attachment to block, normals brought out, excel cond, $200. D Bailey, Rock Shoppe Prod, 10027 Church Rd, Dallas TX 75238. 214-343-0879.

Want To Buy

CBS or NBC original call-letter plate for RCA 44 mic. M Harrington, POB 250995, Little Rock AR 72225.

McMartin AMR-3 AM receiver. WC Florian, WNIB, 1140 W Erie St, Chicago IL 60622. 312-633-9700.

Parts, variable vacuum capacitors. B Dickerson, WEAG, 1421 S Water St, Starke FL 32091. 904-964-5001.

Pioneer TAU-11 tape transport & RTU-11 amplifier, photo copies OK, also need control relays for TAU-11. H McDonald, KKJV, POB 807, Veradale WA 99037. 509-484-4531.

UTC inductors mdls MQE-5 50 millihenry or MQE-7 100 millihenry. R Brody, Filmworkers Club, 232 E Ohio St, Chicago IL 60611. 312-664-9333.

Transformer catalogs from major transformer companies like UTC, Triad, Freed, Peerless, etc. L Blackmon, RQ Studio, Hillcrest Rd #10, Medfield MA 02052. 508-359-1796.

Triad HS-1, HS-25; also UTC HA-105, HA-106. L Blackmon, RQ Studio, Hillcrest Rd #10, Medfield MA 02052. 508-359-1796.

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, NYNY 10003. 212-674-3060.

MONITORS

Want To Sell

Altec super duplex 604E (2) in original Altec enclosures, excel, $750 ea +shpg. K Hardman, Hardman Eastman Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450 fax: 412-481-4458.

TFT 763 w/preselector, 424A stereo, 730A SCA, $795/pkg. Jim, GWTM Inc, 414 Washington, Defiance OH 43512. 419-782-8591.

RECEIVERS & TRANSCEIVERS

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Wegener 1806 sat rcvr, 8 mos old, used 4 mos, in box, $450/BO. D Michaels, Z100FM, POB 1234, Mt Shasta CA 96067. 916-926-1332.

SCPS XE1000 universal, new, $700/BO. H Shumney, KSWG/KBSZ, 801 W Wickenburg Way, Wickenburg AZ 85390. 520-684-7804.

TFT 7707 STL rcvr, 951.0 MHz, $900; Collins 900F-1 SCA monitor, 67 kHz, $600. J Googan, KGNV, POB 87, Washington MO 63090. 314-239-0400.

Motorola MTX-900, 27 units, $300 ea; Motorola Spectra base, $550; Motorola base adapter, $250. W Sarokin, Sarokin Films, 23 Rutland St, Mt Kisco NY 10549. 414-666-0233.

Scientific Atlanta DSR-3610 DAT & SEDAT rcvr, $2800; Comstream ABR-200 digital rcvr, $1700; Universal electronics XE-1000 SCPC rcvr, $900. G Arroyo, WONQ, 1033 Semoran Blvd #253, Casselberry FL 32707. 407-830-0800.

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Ampex 350 7.5/15 (2), gd, 1 rack mount, 1 in console, $675 ea; Sony 850 2 trk w/remote, gd, $550; Sony 654-4 4 trk w/sel sync modification, $525, manuals for both Sony's, all +shpg. K Hardman, Hardman Eastman Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450 fax: 412-481-4458.

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Inovonics 375, $300/pr; Teac A7030 electrs, $150; Tascam 34B, like new, $700; Teac X1000R, like new, $400. J Parsons, Parsons Sound Service, 2781 Fayson Circle, Deltona FL 32738. 904-532-0192.

Marantz PMD 360 prof port stereo cassette rcdr, $250. S Lawson, Kak Productions, 928 Hyland Dr, Santa Rosa CA 95404. 707-528-4055.

Otari ARS 1000 (3) w/25 H tone detector; Ampex 350 (2) w/tube electronics, BO. L Lanser, WWJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

Revox B710 Mark II cassette recorder, new transport, gd heads, $250. S Bogart, Bogart Prod, 9 Twin Lakes Ct, Arlington TX 76016. 817-467-0158.

Tascam 32 10.5" 2-trk rcdr in nice shape w/rackmounts & manual, $400/BO. K Carlson, Q Audio, 540 Blue Lakes Blvd N #614, Twin Falls ID 83301. 208-734-0695.

Tascam 32 vgc, $700; Tascam Model 38 8-trk, $1200. M Hughes, Fresh Start, 896 W 11th St, Panama City FL 32401. 904-784-2146.

Tascam 32 like new, less than 100 hrs, w/remote cntrl, $1000/BO; Tascam MSR16 like new, less than 100 hrs, dbx NR, $2300. M Schackow, Mark Schackow Recording, 307 4th Ave E, Lemmon SD 57638. 605-374-3424.

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Tascam W-502R double auto reverse, cassette deck, $225. S Lawson, Kak Productions, 928 Hyland Dr, Santa Rosa CA 95404. 707-528-4055

Tascam 122 cassette rcdr, good shape, $400; Technic MK 85-11 cassette deck for parts only, $50. H Sewell, Oakridge Music, 2001 Elton Rd, Haltom City TX 76117. 817-838-8001.

Technic RSM-65, 85, 95 rack mount cassette rcdrs, RSM-95 w/RM kit, also known as M-65, M-85, & M-95, BO. J Diamond, Blue Diamond Co, 240 Chursgic Rd, Canonsburg PA 15317. 412-746-2540.

Ampex ATR-700, as is, $250; Otari 4 trk, works well & in decent cond, $450. S Spence, WUFM, POB 8470, Westerville OH 43086. 614-890-9977.

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Nagra 4 STC stereo rcdr w/timecode, 7" cover, ATN, vgc, $7500. Don, Scales Film Sound, 3142 Market Pl, Bloomington IN 47403. 812-339-4446.

Otari 5050 B III 2 trk r-r, like new, $2800; Panasonic 3900 DAT rcdr w/remote controller, $1850. J James, Marin Voice Studio, POB 1641, Sausilito CA 94966. 415-331-9346.

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Otari ARS 1000 (4), stereo r-r's, gd cond w/25 Hz cue detectors, priced to sell. C Mandel, KAMP, 626 Main St, El Centro CA 92243. 619-352-2277.

Scully 280 4 trk 1/2" in roll-around cabinet, gd working cond, $800/BO. F Badeauz, The Musk Faktory, 1812 Procter St, Port Arthur TX 77640. 409-982-7121.

Tascam DA-30 MKIII DAT, used 1x, excel cond, $650. D Bohanan, Bohanan Recdg, POB 21829, St Simons Island GA 31522. 912-638-9502.

Tascam 122 MKII cassette, 3 head rack size, 6 yrs old, $375. B Barry, WAMB, 1617 Lebanon Rd, Nashville TN 37210. 615-889-1960.

Fostex PD-4 portable digital audio recorder, time code generated, mint, new $6500, $4000/BO. 301-762-6999.

New & used Ampex 350 style tape transports, motors & parts, various prices. M Crosby, 408-363-1646.

Otari MX70's 16 trk 1", mint, 150 hrs w/video layback system, $6950; Tascam ATR60-2 in stand, $1200; Tascam ATR60-8, $2750; Tascam 58 8 trk, $1950; Tascam 38 8 trk, $1650; Otari 5050-8 Mk III, $2200; Ampex 440C-8 1", $2900; Ampex 1200 PURC cards, $400 ea; nakamichi 550 portable cassette, $250; Custom locator for ANY deck, $495. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Otari MX70 16 trk 1", like new, 150 hrs, $5950; MX70 video layback system, $900; gd used 1/2"x2500' 456 tape, $20; 1"x2500' 996 & 250, $35; Nagra III sync rcdr w/SLO resolver, $695/both; Nakamichi 550 great port cassette, $250; new 2" MRL short test tapes, $229. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

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Alesis ADAT must have less than 500 hrs use; Tascam DA 30 or DA 30 MK2 must be low hrs in xlnt cond. M Schackow, Mark Schackow Recording, 307 4th Ave E, Lemmon SD 57638. 605-374-3424.

Revox PR 99 MKIII, 2 trk & PR99 reproducers, 7.5 & 3.75 ips. B Barry, WAMB, 1617 Lebanon Rd, Nashville TN 37210. 615-889-1960.

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General Instruments Jerrold sat rcvr recently factory refurbished w/manuals, $500; General Instrument Jerrold sat mod FAM 300 recently factory refurbished w/manuals, $500. R Trumbo, KNLF, POB 117, Quincy CA 95971. 916-283-4145.

Universal XE-1000 SCPC rcvr, freq agile, $750/BO. M Shumway, KSWG, 801 W Wickenburg Way, Wickenburg AZ 85390. 602-254-6644.

Want To Buy

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Scotchcart oldies library, recorded but never on air, 732 ITC/Scotchcarts, $2800. D Bailey, Rock Shoppe Prod, 10027 Church Rd, Dallas TX 75238. 214-343-0879.

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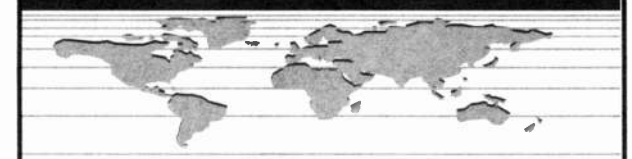

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Singer SSB-50 spectrum analyzer w/MF5 display, CA5 plug-in, MF50 mainframe, TTG3 gen, RF8 tuning unit, REC2 freq extender & HP 3200B VHF oscillator, gd cond, $2000. T Walker, WMVA, POB 3831, Martinsville VA 24115. 540-632-2152.

Want To Buy

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HP audio generator, older model, prefer rack mount, will consider others. W Steinbrecher, KRBD, POB 23600, Ketchikan AK 99901. 907-225-9175.

TRANSMITTERS

Want To Sell

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Continental 315 RI now in service since new in Nov '82, Power Rock on 1260 kHz, 1 kW cut-back, $12500. L Lanser, WWJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

CSI 500 W AM, CCA 10000 W FM, Jim, GWTM, Inc, 414 Washington, 414 Defiance OH 43512. 419-782-8591.

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World Radio History

Gates FM5H 5000 W at 92.1 w/TE3 exciter. just taken off air, $10000. R Miller. Miller Media Group. 111 W Main Cross, Taylorville IL 62568. 217-824-3395.

Harris FM300K 300 W solid state xmtr, amp only. factory recond in 1992, $1995. J Travis, WCIK. POB 506. Bath NY 14810. 607-7764151.

Collins 300-G AM. 250 W in excel cond. BO. S Bailey, WMRO. 701 N Blythe St. Gallatin TN 37066. 615-451-2131.

Collins 1979 831-G2 20 kW, less exciter w/manuals & some spares, on skid wrapped, ready to ship, excel cond. G Harrison, WFLS, 616 Amelia St, Fredericksburg VA 22401. 540-374-5459.

Continental 314R1 in excel cond, tuned to 1140 kHz, $7000. G Arroyo, WONQ. 1033 Semoran Blvd #253. Casselberry FL 32707. 407-830-0800.

Harris 2kW currently on air at 89.3 FM. $5000. J Stromquist. WNCB, 2828 Piedmont Ave. Duluth MN 55811. 218-722-3017.

Harris MX15 exciter in gd cond. $1700; RF module C Springer, KLMR. POB 890. Lamar CO 81052. 719-336-2206.

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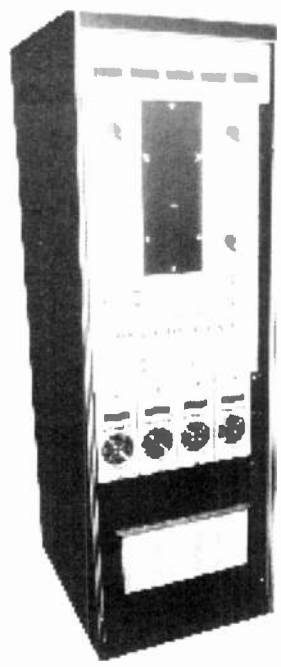

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4CX250R
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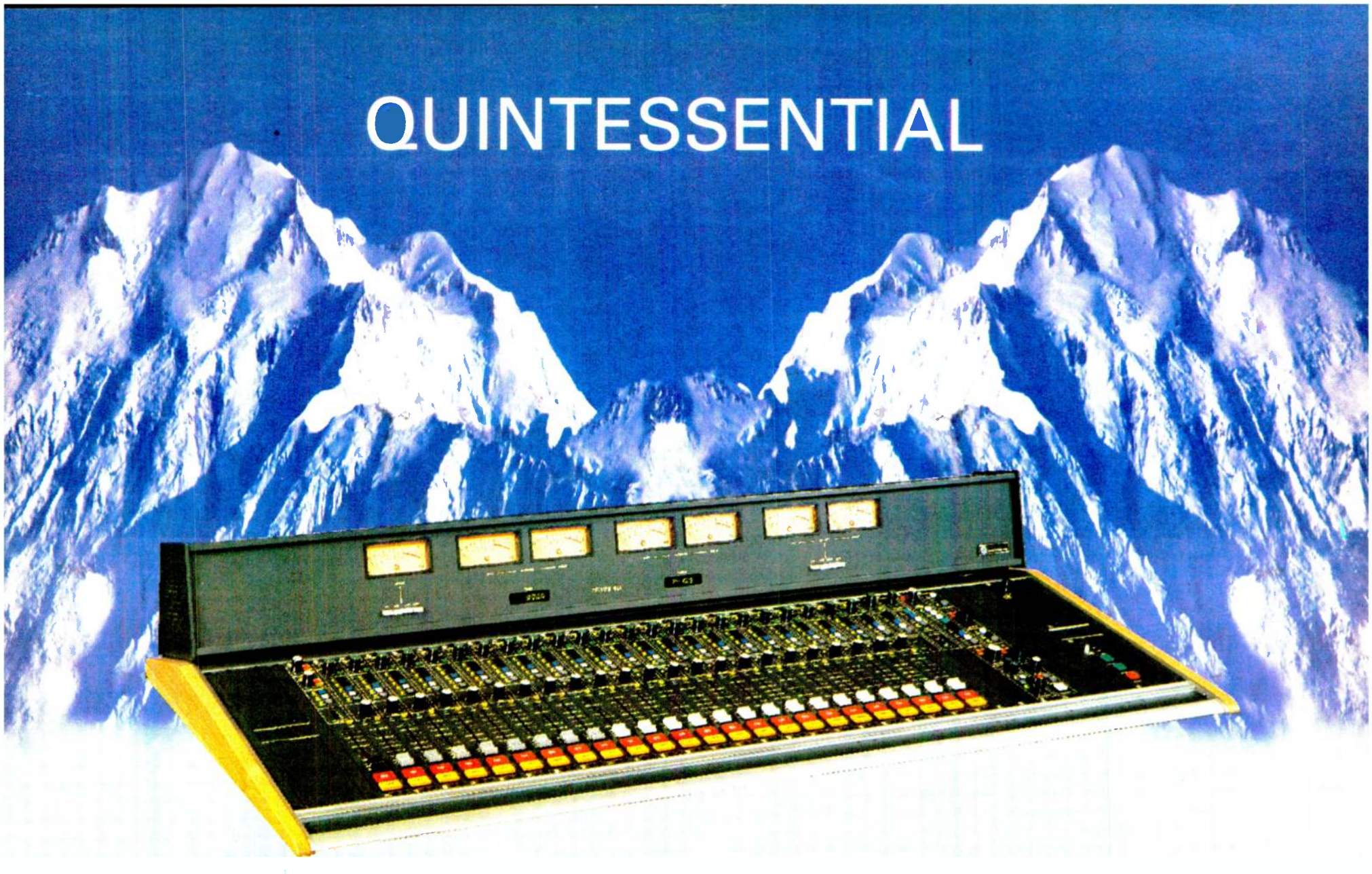
World Radio History



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World Radio History

Some Countries Have It ALL!

WSIX - Nashville, Tennessee
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A-500 Studio Furniture delivered March 1993
A-500 Console S/N 20789 delivered April 1993
A-500 Console S/N 20792 delivered April 1993
A-6000 Studio Furniture delivered March 1995
A-6000 Console S/N 22536 delivered March 1995
R-16 Console S/N 22557 delivered March 1995
SP-5 Console S/N 22593 delivered April 1995

1995 Academy of Country Music Award
1995 Marconi Country Music Award
1995 Billboard Country Music Award
1995 Country Music Association Award
1995 Country Music Association SRO Award
1995 Gavin Country Music Award
1996 Gavin Country Music Award
1996 Academy of Country Music Award

Wheatstone Model A-6000 Audio Console shown

Wheatstone Corporation
tel 315-452-5000 / Syracuse, NY.

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World Radio History