

◆ NEWSWATCH ◆

No Refund For KKIQ

WASHINGTON The FCC has upheld an earlier decision and has denied a request for a refund on a \$10,000 fine for KKIQ(FM), Livermore, Calif. The commission originally fined the station in 1998 for Equal Employment Opportunity rule violations. Eight months later, the U.S. Court for Appeals for the D.C. Circuit declared the broadcast EEO rules unconstitutional.

In the meantime, the station did not challenge the fine and paid it in full. The FCC said that because the station did not chal-

lenge the fine within the allowed 30-day period, the payment was "voluntary" and the forfeiture became final upon payment.

KKIQ stated, "It is contrary to the public interest and common sense" to establish a policy that means stations are not obligated to pay fines when they are issued.

Lotteries for Duopoly Filings

WASHINGTON The FCC will use lotteries to distinguish among transfer applications filed on the same day by

companies taking advantage of the new rules that allow TV duopolies and cross ownership of radio/TV/other media. The commission said it would include in the lotteries all transfer and assignment applications relating to stations in the same market that are filed on the same day. The order in which the applications are processed is important because the FCC will only allow a certain amount of duopolies in each market, taking into account market size and the number of media outlets (RW, Sept. 1).

CBS and Viacom said applications should be prioritized based on whoever announced their deal first, while ABC

said they should be reviewed in the order they are received.

The commission said monitoring application order second by second was unworkable.

Sennheiser's Griese Dies

WEDEMARK, Germany Sennheiser acoustic and electronic pioneer Hans-Joachim Griese has died at the age of 83.

More than 45 patents bear his name. Best known are Griese's contributions to the development of condenser microphones, particularly RF biased condenser mics and symmetrical push-pull transducers for RF condenser mics.

In the early 1950s, Griese worked for Grundig, where many of his patents were granted, including patents for receiver circuits and the development

See NEWSWATCH, page 3 ▶

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Index

FEATURES	
Workbench: Get Your Y2K Checklist in Order by John Bisset	12
Nagra Gets Flashy With ARES-C by Paul Kaminski	14
Measurement, Test Setup Can Help Groups by Frank McCoy	17
Cat 5 Connectors for Audio Folks by Steve Lampen	19
The License Can Tell You a Lot by Ed Montgomery	20
On-Air Comedians, Warts and All by Read G. Burgan	24
GM JOURNAL	
Net Is the New Audio Pipeline by Alan R. Peterson	26
Clear Channel's Net Deal Unlikely the Last by Steve Sullivan	26
The Story of the Season's Songs by Ken R.	29
Web Watch by Carl Lindemann	35
STUDIO SESSIONS	
SF Makes Noise Reduction a Breeze by Read G. Burgan	41
Broadcasting a Worship Service by Bruce Bartlett	41
Nomad's All-in-One Listening by Carl Lindemann	43
Sound Blaster Eases Workstation Overload by Carl Lindemann	43
Why I Hate My DAT Machines by Ken R.	47
Avoid Outdated Station Web Pages by Alan R. Peterson	48
A Second Opinion on DartPro98 by Read G. Burgan	54
READERS FORUM	
	62

DIGITAL NEWS

FCC Mulls IBOC, New Spectrum

On Nov. 1, the FCC released a historic Notice of Proposed Rule Making called "Digital Audio Broadcasting Systems and Their Impact on the Terrestrial Radio Broadcast Service." Comments on MM Docket 99-325 are due on Jan. 24, 2000, and replies by Feb. 22, 2000.

The following are excerpts from the NPRM. Footnotes have been omitted in this version. The full version is available online at www.fcc.gov

DAB origination

In 1990, the commission opened a proceeding (GEN Docket 90-357) to consider the authorization of digital radio services. The proceeding initially addressed both a satellite DARS and a terrestrial DAB service. As the record developed, however, it became evident that the IBOC DAB systems then under consideration for a terrestrial service were not technically feasible, and the proceeding ultimately focused on satellite DARS spectrum allocation, service and licensing issues.

DAB policy goals

It is our objective to foster a rapid and non-disruptive transition to DAB for broadcasters and listeners. A viable system must minimize interference to analog AM and FM stations during that period when digital and analog service operate concurrently. The commission also will favor systems that do not require

and consequently, "administratively efficient" because this approach would not raise new spectrum allocation and licensing issues.

Finally, they contend that IBOC would enable stations to preserve their current frequency identities and coverage areas, service features that are important to broadcasters and would promote a non-disruptive transition to DAB service.

licensees' IBOC transition to all-digital broadcasting.

Compatibility of IBOC, LPFM

In our LPFM Notice, we recognized the importance of taking into consideration "the implications of 2nd-adjacent channel protection for the possible conversion" to a DAB system. Similarly, we ask here how a DAB

'A non-disruptive transition for consumers must protect listeners' investment in more than one-half billion radio receivers.'

We believe that these arguments have merit and that a workable IBOC system would be superior to a new-spectrum DAB system in several respects.

Emission masks

However, an IBOC approach also raises spectrum efficiency concerns. Current IBOC system designs are premised on doubling the bandwidth licensed to AM and FM stations to 20 kHz and 400 kHz, respectively, spectrum

system could be designed to protect a possible future LPFM service.

USADR petition

In its Petition (filed Oct. 7, 1998), USADR acknowledges that laboratory and field testing also are necessary to demonstrate the system's viability. It states, however, that it expects to complete such testing before the end of the year and that "preproduction systems will be operational beginning in early 2000," with the capability of commencing commercial service later that year. Likewise, Lucent states that "substantial progress has been made in 1999 toward completing our IBOC system design and having it demonstrated in the laboratory and in the field," and that "(a) completely tested and ready IBOC digital system is only months away. (Editor's note: The FCC said it had little technical information on the system being developed by Digital Radio Express.)

Eureka-147 DAB systems

DAB systems are now being implemented in Canada, Europe, and elsewhere utilizing See DAB, page 7 ▶

'We request comment on whether the spectrum at 82-88 MHz ... could be reallocated to DAB service at the end of the DTV transition.'

burdensome investments in new broadcast transmission equipment.

A non-disruptive transition for consumers must protect listeners' investment in over one-half billion radio receivers. It is equally important that the commission's DAB technical rules make it possible for manufacturers to produce reasonably priced digital receivers.

IBOC DAB model

Proponents contend that IBOC technology represents the best means of implementing DAB in the United States. They note its promise of superior audio fidelity, signal robustness, and new and improved ancillary services. They also contend that IBOC technology would be spectrally efficient, in that it would not require a new spectrum allocation,

which is currently included under current "emission masks." We recognize that the additional bandwidth for digital sidebands is an inherent feature of the IBOC hybrid mode. However, the IBOC system proponents envision that AM and FM stations would retain the additional bandwidth in an all-digital operating environment. A permanent expansion of the channel bandwidth might constitute a fundamental change in spectrum assignment principles.

We seek comment on the spectrum efficiency of the current IBOC system designs generally and, in particular, on using 400-kHz FM and 20-kHz AM channel bandwidths in the all-digital IBOC mode.

We also seek comment on whether spectrum may be returned at the end of the

NEWSWATCH

▶ NEWSWATCH, continued from page 2 of a stereo multiplex scheme, which later became an integral part of the FM-stereo standard still in use.

In 1956, Griese began working for Prof. Fritz Sennheiser. Until he retired in 1981, Griese was responsible for the creation of numerous product lines.

Online Call Signs Begin

WASHINGTON The FCC has begun implementing its online call sign reservation and authorization system. The system, available 24 hours a day, allows users to determine the availability of call signs and to request an initial call sign or change a current one. The system provides users with a paper form and the correct fee amount. To access the new system, go to www.fcc.gov/mmb

Calaff Named To OET

WASHINGTON Bob Calaff, interim legal advisor to FCC Commissioner Harold Furchtgott-Roth, has become associate chief of the Office of Engineering and Technology. His responsibilities include advising OET Chief Dale Hatfield on legal and policy issues. OET is responsible for managing non-government spectrum use and is the FCC's technical adviser.

Calaff joined the FCC in 1994 and has advised Furchtgott-Roth, Chairman Bill Kennard and Commissioner Michael Powell on wireless issues.

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So, Watcha Doin' Friday Night?

I was sitting in the office of a newly hired radio chief engineer a week or two ago, watching him fast-forward through the recorded videotape in the station's security system.

The screen showed images of the night before from several cameras, and a large digital date displayed below them. The parking lot, the back door, the empty hallways flashed by.

"I don't know, Paul," the engineer said, shaking his head as he watched. "There's an awful lot of systems in this radio station that haven't been checked for Y2K."

The security system at this major Midwest station was working properly, but the date on the screen was an immediate reminder that radio stations are home to dozens of date-sensitive systems. This engineer was worried not only about security but about business computers, elevators, Web streaming hardware and such. Many of these systems are not considered critical to the mission of airing an FM or AM signal, but could still have an impact on our lives if they fail on Jan. 1.

As we report throughout this issue of *RW*, radio owners, engineers and suppliers have been aggressive in preparing for the 2000 turnover. Groups appointed Y2K managers; the NAB published legal and technical tips; convention panelists compared notes; *RW* published numerous articles and columns over the past two years.

Most of the experts we interviewed do not expect calamities on that Friday night. But privately, some in radio worry that their efforts have not been as thorough as possible, and that planning was haphazard or incomplete.

Not all stations have done top-to-bottom Y2K "proofs," it seems. And I doubt this is limited to standalone operators in small markets.

Radio itself is "mission critical" to our society. Nothing would prove this more than if we were to suffer widespread power or infrastructure problems on Jan. 1. How many people own battery-operated TVs or computers?

The first place people will turn in this unlikely event is to radio, expecting that our stations will be on the air. Listeners

don't know anything about generators or backup STLs. They just know they want someone to be there when they turn on that radio by the beam of a flashlight, to tell them what the heck is going on.

That's one reason many engineers will celebrate the beginning of 2000 in front of a computer terminal at work, and many others will be tied to their pagers. At better stations, their bosses will be there, too.

Of course, no manager will express doubt publicly. It's all under control, they tell us. And in fact, I don't expect major calamities. Radio has had a lot of time to prepare.

The best thing that could happen is a



Promotions Manager David G. Hintz, right, and Radio Coordinator Juan Tejada work in the studio at the Rock and Roll Hall of Fame and Museum in Cleveland.

collective yawn, some delayed partying, and we'll all show up for work on Monday saying it was no big deal.

Look for our coverage throughout this issue, and in the opinion box in *Readers Forum* on page 62. Good luck.

★ ★ ★

Oops! In the photo from the Audio Broadcast Group convention that appeared here in the Nov. 24 issue, I mistakenly identified Dan Rau of ATDI, Audemat and Applied Wireless as "Dave" Rau. Give me a break, I've only known the guy for 10 years or so. Sorry, "Dave."

★ ★ ★

In my recent whirlwind tour through Ohio, I visited the Rock and Roll Hall of Fame and Museum in Cleveland.

Check this out for your next remote: Stations can use the radio studio at the hall for remotes, at no charge. The studio, sponsored by Radio Shack, is equipped with ISDN and other phone technologies for signal distribution, and is available all year except Thanksgiving and Christmas. Morning shows and Fridays are the most popular broadcast times.

Promotions Manager Dave Hintz tells

From the Editor



Paul J. McLane

remote. If you're interested, contact Juan Tejada at (216) 515-8436 or via e-mail to jtejada@rockhall.org

You can also go to the Web site at www.rrhofm-radio.com. It gives updates on exhibits and events, and information on how to do a broadcast. The site is equipped with Telos Audioactive, and all broadcasts from the studio can be heard from the site.

★ ★ ★

And here's a tip of the editorial hat to Jim Withers, whose recent three-part series in *RW* about the basics of tubes in transmitters was a hit.

Jim wrote to tell us, "I thought that you would like to know that I have gotten a couple of dozen favorable e-mails from engineers thanking me for the series."

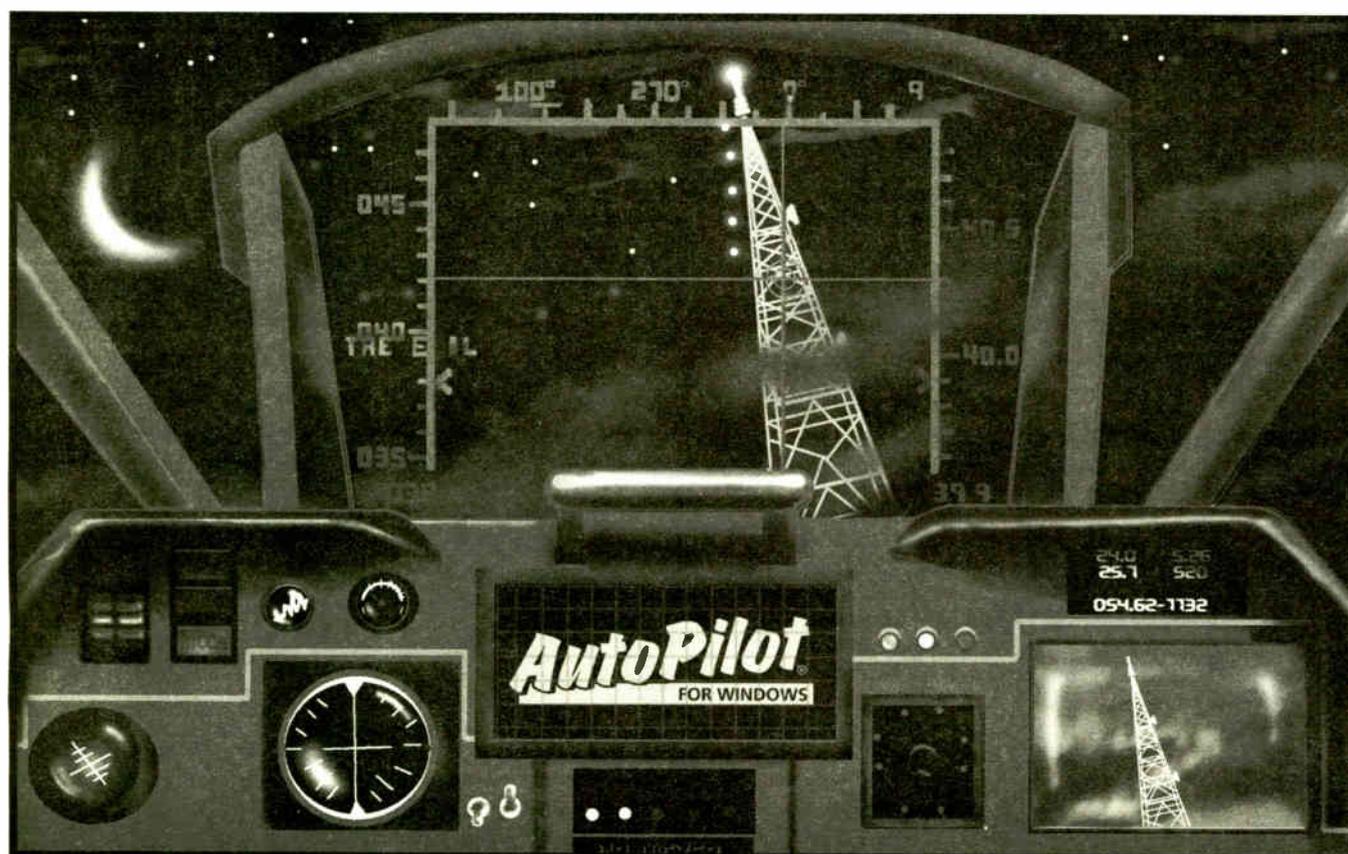
"I would, of course, like to believe that it is my succinct and concise writing that is warranting so many feedback e-mails from your readers, but I suspect it is just that mine has been the only article written on vacuum tubes in a long time. Thanks for publishing it."

Jim is too humble; his articles were most informative. In case you missed the series, you can find it at www.rwonline.com

Happy holidays.

Correction

The story about CD Radio on page 1 of the Nov. 10 issue stated that the service will operate in the L-band portion of the spectrum. CD Radio is licensed to operate in the S band.



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Radio Ready for New Millennium

► STATIONS, continued from page 1
computer software, automation systems and traffic systems not up to Y2K specs. Even some phone systems needed a fix.

"Some of our questionnaires to our engineers were so specific, it seemed we broke everything down to the last nut and screw," said Sterling Davis, vice president of engineering for Cox Broadcasting, the parent company of Cox Radio Inc.

Redundancy is a word engineers use to describe their efforts as they tested, upgraded and checked off equipment as "2000 compliant."

Dane Ericksen, senior engineer for consulting firm Hammett and Edison Inc., said his office had not been overwhelmed by Y2K questions from radio stations.

Are you ready?

"We have not fielded any phone calls from our clients over last-minute Y2K concerns. That tells me that at least the big broadcast groups are ready," Ericksen said. "However, I think smaller broadcast stations might be less-prepared."

Those major broadcast groups such as Clear Channel Communications and Infinity Broadcasting have dedicated enormous amounts of manpower and resources to guarantee uninterrupted service.

"I guess we have the luxury of throwing a lot of people at the problem," said Steve Davis, corporate engineer for Clear Channel Communications. "The biggest help was a database we used to track the progression of each station."

Davis said Clear Channel's 512 radio stations are at 100-percent Y2K compliance when it comes to hard-drive automation and audio delivery systems.

Clear Channel's aggressive acquisition strategy in 1999, especially the merger with Jacor Communications Inc., meant more work for Davis and his team.

"Jacor was a bit behind on where they should have been. However, by tracking the criteria with the database, we were able to make the fixes where we had to," Davis said.

Infinity had extensive Y2K plans. The company divided its 180 stations into six regions, each served by a regional project manager.

Paul Donovan, Infinity engineering manager in Boston, managed the Northeast region, consisting of Boston, New York City, Hartford, Conn., and Buffalo, N.Y.

He said company engineers embraced the plan, which began in 1998.

"We started with an electronic asset inventory of all the stations. From that we classified things as mission critical if they were vital to the operations — things like automation, remote controls and our news operations," Donovan said.

The Infinity regional project managers visited stations on a monthly basis and then reported their findings to Raymond Benedict, the company's top Y2K coordinator.

"Ray's philosophy is that this issue is no different than anything else facing engineers on a daily basis. In the end, the important thing is keeping our stations on the air," Donovan said.

AMFM Inc. and its 443 stations are as well-prepared as can be, according to Frank McCoy, the company's director of engineering.

"But with as many stations as we have and so many markets, it's probably inevitable somewhere we'll have a glitch.

But, it's more likely it will have to do with something that's beyond our control, like the phones," McCoy said.

The group's information systems department will be at company headquarters in Dallas to answer questions from stations that have problems.

"I'm confident our information technology people and engineers have this thing locked down to a negligible impact upon our stations," said Charles Morgan, senior vice president at Susquehanna Radio Corp.

The group's 23 radio stations each completed a comprehensive study of critical systems a month ago. The checks included computer hardware and software, building services and even security.

"There is nothing to be overlooked, right down to the elevators in some of our buildings," Morgan said.

Generators have attracted a good deal of attention over the past few months.

"Never before have generators received such loving care," said John Ehde, vice president of engineering for Salem Communications Corp.

Ehde said his groups 57 stations would have their generator fuel tanks topped off in case they lose power. If a power outage persists, stations have contingency plans in place for extra fuel deliveries.

"We replaced a ton of computers and spent money left and right on computer consultants," said David Stewart, director of engineering for Hispanic Broadcasting Corp. "We found it to be a fairly expensive process."

Stewart said the group's 44 radio stations found easy Y2K fixes for many problems. However, one particular PC-based audio storage system used by some Hispanic stations will need some help at the stroke of midnight.

"During testing when it hit midnight, the thing just stopped. It wouldn't roll over. But if you shut it down, turn it back on and give it the new date you have no problem," Stewart said. He declined to identify the system in question.

"So as 'Auld Lang Syne' is playing, we'll be re-booting," he said.

Stewart plans a conference call involving most Hispanic stations on New Year's Eve and said, "Every engineer in the company will be at their respective stations."

On call?

Most of the corporate engineers said they would let local management decide whether to require engineers to be at their stations. Infinity being one of the exceptions. All said engineers would at least be on call.

"We are leaving it up to individual stations. However, I think most managers will want engineers at the stations," said Terry Baun, vice president and director of engineering for Cumulus Broadcasting Inc.

Bob Hawkins, chief engineer for Emmis-owned WENS(FM), Shelbyville, Ind., and WNAP-FM, Indianapolis, said he will be at the stations that night. However, he said, "It would take an act of Congress to bring our stations down. I'm that confident."

At WPLY(FM), Philadelphia, Director of Engineering Mark Humphrey will also ring in the New Year at the station. Humphrey was one of the 25 members of SBE Chapter 18 who visited Philadelphia Electric Company Energy, the city's utility provider, to discuss power stability concerns.

"The general feeling we all came away with was that we won't have a problem with the power grid that night," Humphrey said. Just in case, PECO will have a crew on standby in the area of the Roxborough

run generators if necessary.

"We do have a contingency plan in place for fuel deliveries if we find ourselves in a prolonged power outage," he said. "I would be surprised by any major difficulties, though."

One radio station with fewer Y2K concerns than most is KIIS(FM) in Los Angeles. Chief Engineer Michael

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Stations and groups of all sizes have implemented Y2K preparation programs.

antenna farm, where 15 FM transmitter sites are based.

"I think our visit helped convey the importance of keeping (radio stations) on the air in case of emergency," he said.

James Carollo, director of engineering for WGN(AM) in Chicago, said the Tribune Broadcasting Co.-owned station has 60 hours of fuel capacity on hand to

Callaghan said the station still does it the old-fashioned way, "with CD players and cart machines."

For most radio stations, problems should be few and far between, according to Butler.

"There will be some nuisance problems that crop up. But overall, I think the radio industry as a whole is in very good shape for 2000."

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Circle (4) On Reader Service Card

Y2K: Vendors Say They're Ready

by Carl Lindemann

Are broadcast system suppliers and manufacturers ready to support their clients as computer clocks roll over from '99 to '00?

Most say they are, but experts agree that any station engineer who has avoided the Y2K issue until now has missed the opportunity for careful planning.

Instead, the best strategy is to brace for things going wrong.

"With the most critical boundary date (New Year's Eve) at hand, everyone responsible for systems not already certi-

by taking a "hope for the best" attitude, Andrews said a pessimistic approach is more practical.

"Now is the time for prudent engineers to inform station management and staff that all untested electronic systems which use or even know about dates can be expected to fail," said Andrews. "Proprietary equipment, computers built before 1998, older operating systems and untested software applications should be considered especially suspect."

Rather than attempt to determine whether systems are non-compliant, responsible broadcast engineers should

For most stations, experts say, the issue is not having a Y2K program in place, but the degree of such preparations. They say managers should review individual products inside stations and double-check with vendors who provide systems or depend on potentially vulnerable systems.

Jim Woods, vice president of Radio Systems, Harris Corp., Broadcast Communications Division, listed three important areas to monitor:

- Proper operation of equipment and systems at the station;
- Service providers maintaining operations;
- Vendors being able to supply and support the station.

Identifying possible problem gear and systems in-house is straightforward, said Woods. "As far as individual products are concerned, the best red flag is 'Does the piece of equipment know what day it is?' If the answer is yes, then the station should be concerned about Y2K compliance."

Any piece of equipment that is operated with or by a PC is vulnerable.

"It is hard to guarantee, but generally anything purchased new in the last couple of years should be okay. It is the older systems — three to four years or older — that are the biggest concerns," said Woods.

PC-related equipment might include newsroom software, EAS equipment, anything that stores a date, including equipment not normally part of the broadcast chain.

Most large broadcast groups feel confident about their Y2K readiness.

CBS Corp. is an example. Gil Schwartz, senior VP, Corporate

Even a minor problem can cause widespread, unexpected consequences. CartWorks President George Thomas advises clients to begin with the basics.

"There are several types of Y2K bugs that can appear. The most common one is a 'rollover' problem. The system won't change date to Jan. 1, 2000, at midnight on Dec. 31, 1999. Lots of computers will

experience this," he said.

The "rollover" fix is simple.

"In some cases the date can be manually set that day, and the system will continue to operate normally from then on. It's pretty obvious how to test for this," Thomas said.

"But also advance the computer's date to the middle of 2000 and see if it operates there. If it does, then the simple one-time date re-setting on Jan. 1 may be all that's necessary."

The best way to be sure business partners are Y2K-ready is to ask them, or visit the company Web site.

"I would estimate that at least 80 percent of our customer base has already done so, and upgraded — or are in the process of upgrading — to prevent Y2K problems," Larry Lamoray, vice president of sales and marketing for Enco Systems Inc., said in mid-November.

Eileen Tuuri, marketing manager of Custom Business Systems Inc., suggests managers watch for differences in company claims.

"Though all responsible software suppliers are taking steps to address Y2K issues, we would be concerned — at this late date — about any supplier who is still 'working on it' or whose repair efforts seemed to begin fairly recently," she said.

"Whenever a change to software is attempted under time pressures, there is a

It is time for engineers to inform staff that all untested electronic systems which use or even know about dates can be expected to fail.

— Jan Andrews, NPR

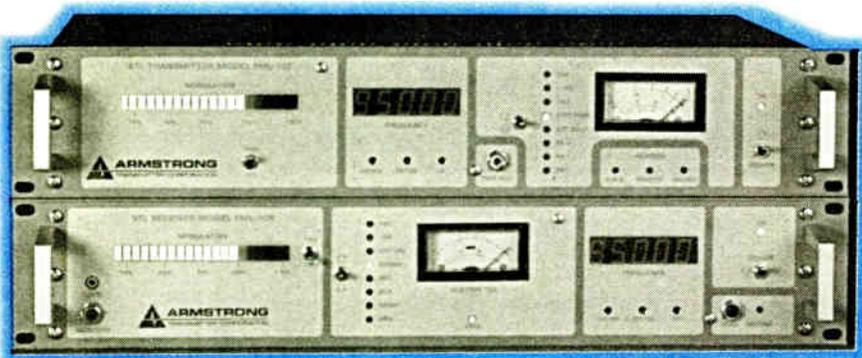
fied and thoroughly tested must acknowledge that it's far too late to start a meaningful evaluation and remediation effort," said Jan Andrews, National Public Radio senior engineer and technical advisor to the NPR Y2K Project Management Office.

Rather than engage in wishful thinking

develop strategies for handling imminent failures, he said.

"Manual systems need to be put in place that will allow for the continuation of broadcasting and related business activities should date-dependent electronic systems stop working," Andrews said.

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We would be concerned — at this late date — about any supplier who is still 'working on it.'

— Eileen Tuuri, CBSI

Communications, said, "All systems have been tested and checked out. We've been on top of this for years. There are 'Y2K compliant' stickers on equipment throughout our facilities."

Vendor Y2K compliance may be harder to track down. For Woods, "This is probably the greatest risk for Y2K compliance. A good example would be an old remote control system, which is being run on an old PC, which is operating an old version of Windows or DOS, which is operating the transmitter site. If the PC 'hiccups' on Y2K and shuts down the transmitter, then the system is not Y2K compliant, even though all but one small piece of the equation is compliant," he said.

One failure can trigger a cascading effect, said Woods.

"Imagine that there are multiple sites — translators — receiving the signal from that main site or a network operation which experiences a Y2K issue. Stations down line are left without a feed," Woods said.

greater likelihood of elements being overlooked. Quick-fixes may be far more likely to have non-Y2K-compliant threads remaining," she said.

Tuuri said that her company's products have been compliant since the early 1980s.

How many stations have actually contacted suppliers? Not many, according to vendors contacted for this story.

But suppliers have taken a proactive role in contacting clients, said David Gertmann, president of WireReady NSI, who estimated that fewer than 10 percent of his clients have called the company.

"It would have been much higher, we suspect, if we hadn't started doing mailings and providing information on our Web site some time ago," he said. "WireReady made its customers aware of which versions were Y2K certified and which were not. We also mailed free Y2K software upgrades to any customer who

See VENDORS, page 8 ►

FCC Opens DAB Rule Making

► DAB, continued from page 3
what is referred to as "Eureka-147" technology. Eureka-147 systems utilize a wide bandwidth, are capable of transmitting multiple audio channels, and can operate on various frequencies. Rather than the FM band, the services that have been introduced in Europe and Canada are using other frequencies, such as the "L-Band" (1452-1492 MHz) and "Band III" (around 221 MHz). In the United States, however, the L-Band is allocated for the purpose of flight test telemetry, and the spectrum around 221 MHz is allocated for the primary purposes of land mobile and amateur use. No proponent of a Eureka-147 or other non-IBOC DAB system has filed comments in response to USADR's *Petition*. We currently are unaware of any such proponents in the United States.

Tentative DAB selection criteria

We propose to apply the following evaluative criteria: (1) enhanced audio fidelity; (2) robustness to interference and other signal impairments; (3) compatibility with existing analog service; (4) spectrum efficiency; (5) flexibility; (6) auxiliary capacity; (7) extensibility; (8) accommodation for existing broadcasters; (9) coverage and (10) implementation costs/affordability of equipment.

Coverage

Broadcasters argue that any DAB system should be capable of replicating existing coverage areas. Such coverage areas tend to be greater than the "interference-free" areas protected under the commission's rules. We recognize that preserving existing coverage areas may be an important aspect of ensuring a non-disruptive transition to DAB. Nevertheless, we tentatively conclude that the public interest is best-served through the development of a digital radio assignment policy that adopts current analog protected service contours for DAB.

New spectrum model

In GEN Docket No. 90-357, we also considered the potential for allocating new spectrum for terrestrial digital audio broadcasting. We therefore request comment on whether the six megahertz of spectrum at 82-88 MHz, currently used for TV Channel 6, could be reallocated to DAB service at the end of the DTV transition. We also recognize, however, that a Channel 6 allocation could significantly delay the introduction of DAB. The earliest this spectrum will be available in many areas is 2007.

We seek comment on whether we may give preferences to LPFM licensees in assigning this Channel 6 spectrum, and if so, whether we should do so in the event we authorize an LPFM service.

DAB transmission standard

In its *Petition*, USADR asked the commission to adopt a DAB transmission standard, and submitted a report arguing both that there is a need for such a standard and that the radio broadcast industry is unlikely to be able to develop one on its own. Most commenters agreed that a single standard is necessary and that the commission has a critical role in establishing one.

We tentatively conclude, as we previously found in the DTV proceeding, that the public interest compels a commission role in the development of DAB transmission standards, "with the advice and involvement of all sectors of the industry." We lack sufficient information at this time, however, to conclude that

a commission-mandated DAB transmission standard is necessary.

System testing

USADR and Lucent have asserted in recent *ex parte* meetings with staff and in written submissions that the commission should establish certain procedures immediately. They disagree, however, as to the specifics of such procedures. USADR urges us to endorse the NRSC testing program and to request that proponents file their NRSC test reports with the commission on the NRSC deadline of Dec. 15. USADR contends that the reports will enable us to identify the field of proponents and address threshold performance questions such as

improved audio quality, compatibility with existing analog service and equal coverage.

Lucent, on the other hand, criticizes the NRSC testing program as potentially subject to manipulation because of the lack of a common testing platform, and argues that the data it yields will be insufficient to meaningfully evaluate the performance of different system designs. In short, rather than a multi-step process, Lucent envisions a single round of tests sufficient to enable us not only to determine the viability of IBOC systems but to select a superior system.

We applaud the recent efforts of these groups (NRSC and CEMA) to develop testing guidelines, and will continue to rely on

them to facilitate and evaluate the development of IBOC DAB systems.

We request each proponent to submit a copy of its test reports to the commission as part of the record in this proceeding. We also see merit in a second stage of comparative testing of IBOC systems on a common testing platform on comparative testing issues.

The NRSC brings substantial experience, expertise, and credibility to the testing process. Moreover, the commission would give great weight to any industry compromise the NRSC may achieve. We plan to monitor this testing process closely for fairness, thoroughness, and timeliness. While we are encouraged by the NRSC's efforts to date, we will act promptly to provide an alternative mechanism if subsequent events undermine our confidence in the current testing process.

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FCC Sets Up Y2K Emergency Team

by Leslie Stimson

WASHINGTON The FCC is confident that most stations are ready for Y2K, but the commission plans to have personnel representing each industry it regulates on hand throughout the New Year's holiday.



More than a dozen people will be working in the FCC's Operations Center, which will be staffed around-the-clock from Dec. 31, 1999, to Jan. 3, 2000, with personnel who can answer urgent Y2K questions.

The FCC personnel will be in touch with the White House, the Federal Emergency Management Agency and other federal agencies to gather or give out information about any stations or systems, such as telephone companies or power companies, that fail in different time zones.

"If they (stations) need any relief from any regulatory requirement in order to stay on the air, assuming it's in the public interest, we could grant it," said Mass Media Bureau Attorney Roger Holberg. For example, the FCC could verbally grant a temporary authorization over the phone, if needed.

The number for stations to reach the

FCC for Y2K emergencies was not known at press time.

The FCC planned to execute several dry runs of its Operations Center systems in December.

In a commission survey of 230 radio and TV licensees earlier this year, the owners of more than 2,500 stations told the FCC about their Y2K preparedness plans. Most said they expected to have plans complete by the fall.

When re-surveyed to see if the stations met their expected goals, "the medium-sized groups were slightly behind the small and large groups," said Holberg. But he said the difference was slight.

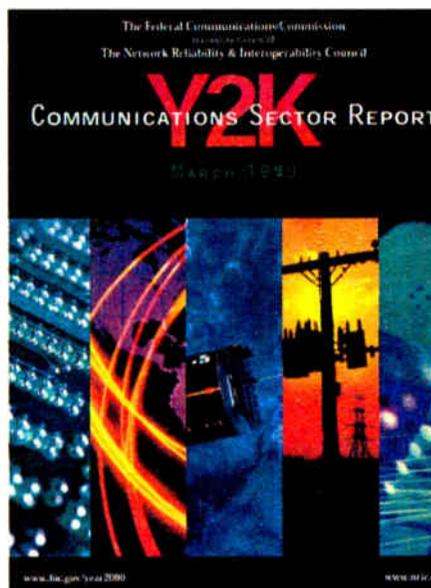
Contingency plans are important, said Bruce Romano, deputy chief of the Policy and Rules Division and the Mass Media Bureau coordinator for Y2K. For example, power outages could affect station security systems, he said.

"Stations should make sure people are not locked out of the building."

In October, contingency planning for "the average respondent" was 85-percent complete for the stations surveyed, the commission stated in a supplement to its "Communications Sector Report," which tracked the progress of all the industries regulated by the FCC.

While the commission realizes it does not know the Y2K readiness status of every station, the report states, "We rec-

ognize that the public's possible loss of service from an individual broadcaster due to its lack of Y2K readiness will be mitigated by the large number of broad-



cast signals available to most citizens."

Holberg and Romano said stations should be prepared to air information about neighboring towns in case of near-by station failures.

The FCC also expects stations to maintain tower lighting with back-up generators and batteries, even if there are power failures.

Karmazin: Be Ready ... Or Else

At least one major broadcast group reportedly has made top managers nervous about their jobs over Y2K compliance.

According to several sources, CBS Corp. President and CEO Mel Karmazin told managers at a programming meeting earlier this fall that anyone responsible for a CBS station going off the air because of Y2K could lose their jobs.

Other sources said Karmazin did not state that threat explicitly but that he intended to withhold final paychecks of the year until after Jan. 1, and that any manager whose station failed would be held accountable.

Asked about these reports by *RW*, CBS spokesman Gil Schwartz said, "Yes, there are 'Y2K compliant' stickers on equipment ... but as far as the hard-line edicts — that doesn't sound right."

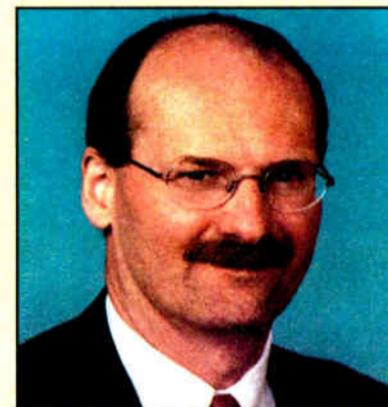
Karmazin's intentions may have had the desired effect: the sources said CBS managers have taken extraordinary steps to make sure their stations do not go off the air on Jan. 1.

NAB Hopes For 2000 Non-Event

If a station is not yet Y2K-ready, there is not much now that the NAB can do.

While the National Association of Broadcasters has been a major source of information on Y2K preparedness, it will not be open on New Year's Eve to advise broadcasters on technical problems.

"The NAB has no 'go teams,'" said Rick Ducey, senior vice president, NAB Research and Planning, and its in-house Y2K expert. "If a station has a problem, its first call should be to the vendor. If your transmitter goes out, the NAB can't help you."



NAB's Rick Ducey

That does not mean that NAB officials are taking the big night off. Ducey and his colleagues will be monitoring the nation's Y2K operations by keeping in close touch with selected large-group broadcasters — "ones with hundreds of stations that have common systems. If there's something happening out there, these stations will probably be the first to experience it," he said.

Should problems arise, the NAB will immediately notify the FCC (see story, left).

Consistent with other Y2K authorities, the NAB does not expect an eventful New Year's.

"It doesn't look like there will be any major glitches. Generally we think all groups have done a good job preparing. There will be warm bodies on duty, checking the systems. There may be problems with traffic or billing, but that's not critical. The number-one thing is to make sure the signal gets out," Ducey said.

His worst-case scenario for Y2K is a nationwide power failure. "The UPS power supplies will kick in, but only go for so long. But if the whole country is without power, there are worse things to worry about than broadcast operations."

Ducey also has a best-case scenario, one that seems to him more likely: "The only problem is that people wake up on New Year's Day with a slight hangover."

NAB has provided broadcasters with volumes of Y2K information at its conventions and through its Web site. See www.nab.org/year2000

— Leslie Peters

Vendors Prepped for Y2K

► **VENDORS**, continued from page 6 purchased or had a support plan after October 1997. So we are not experiencing many phone calls," Gertmann said.

For all the preparations, it is likely that some problems will occur. Many suppliers plan to have additional support in place to handle any contingency.

For global companies such as Radio Computing Services Inc., this plan offers additional challenges. Tom Zarecki, director of marketing for RCS, said the company is ready to work with customers wherever they are located.

"As a worldwide company with offices in a dozen countries, Jan. 1 arrives at different times. We will have support people on call in addition to the usual staff on that day around the world," Zarecki said.

Lee Perryman, deputy director of Broadcast Services and director of Broadcast Technology at Associated Press, is confident in his organization's ability to continue operating.

"AP's computer and delivery systems are Y2K-compliant. Support-wise, we'll be staffing the Broadcast News Center in

Washington, D.C., around the clock from Thursday night (Dec. 30) through Tuesday morning (Jan. 4), with additional people off-site on different phone systems and data networks for diversity," he said.

To make sure that such support is in easy reach, he said station managers should make sure support contact numbers are printed out in case computers containing that information go off-line.

In other industries, the fact that 2000 starts on a weekend gives a little buffer. Not so for broadcasters, said NPR's Andrews. In fact, this may cause additional issues.

"The first of January will be an important broadcast day even though it's not a business day. Listeners will expect stations to be on the air even though equipment manufacturers may be observing the holiday and weekend," he said.

"Station engineers should assume they'll be on their own should systems fail and that some manufacturers and vendors will be overwhelmed with support inquiries on the first business day of the year 2000."

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SDARS Alliance Concerns Stations

► PUBLIC, continued from page 1

When both NPR and PRI announced their respective CD Radio agreements in June, executives at both companies quelled managers' initial concerns by promising that their most-valued programs would stay exclusive to public radio stations.

But while NPR distributes "Car Talk," it does not own the show. The program is produced by the program's business arm, Boston-based Dewey, Cheetham & Howe, (its real name), which signed its own agreement with CD Radio. DC&H fronts all "Car Talk" business activities, including a syndicated newspaper column, book deals, merchandising and Web site. NPR helped broker the deal with CD Radio, including distribution of "Car Talk" on one of its CD Radio channels.

Underwriting dollars?

Once the satellite deal for the program was announced, station managers and fundraising professionals quickly posted their concerns on an industry listserv (pubradio@listserv.idbsu.edu).

"Does anyone hear a giant sucking sound of underwriting dollars and listen-

er dollars draining south?" wrote Yana Davis, development director at KRCU(FM), Cape Girardeau, Mo.

Regina Dean, station manager, WUOT(FM) Knoxville and former NPR board member, told *RW*, "I'm not against putting public radio programs in these new media markets. But public radio is non-profit. So all I'm asking is that we look at the actual cost of these programs and spread it around equitably.

"If CD Radio is investing in public radio programs, then that should reduce the pain for the rest of us. It wouldn't be fair if public radio listeners in Knoxville were subsidizing CD Radio or Internet users elsewhere."

The online comments and other remarks prompted NPR President and Chief Executive Officer Kevin Klose to e-mail a statement defending NPR's role in the "Car Talk"-CD Radio deal.

"In recent months, 'Car Talk' — an independent production — had been courted by all of the companies that will be providing direct satellite radio services," said Klose. "It became apparent that it was no longer a question of whether 'Car Talk' would be available

through a direct satellite provider, but rather with which company the program would sign an agreement."

Vital program

According to Klose, "NPR felt very strongly that it was important to all of us — member stations included — to keep 'Car Talk' as a vital part of the NPR system's presence on CD Radio, rather than allow it to become a programming cornerstone for a competing service."

Klose assured those concerned that the deal included "a time embargo to make sure stations always get (the new episode of) 'Car Talk' before anyone else does."



'Car Talk' Hosts Tom (right) and Ray (left) Magliozzi

Photo by Richard Howard

Buy, Sell Programs The Pubcaster Way

The public radio program marketplace operates much differently from most commercial radio syndication. The nation's approximately 500 non-commercial radio stations qualifying for funding from the Corporation for Public Broadcasting receive grants to purchase national programming. The grants are funded by congressional appropriations.

Similar to commercial radio barter deals, syndicated public radio programming usually contains national underwriting credits and local station availabilities. But only the stations are allowed to use the programs to raise money directly from public radio listeners. Producers and distributors are barred from appealing to individuals for support.

Though anyone can sell programming to public radio stations, most nationally broadcast shows come from National Public Radio in Washington and Public Radio International in Minneapolis.

A Prairie Home Companion®

NPR, a membership organization, is also the major public radio news producer as well as a distributor. Not-for-profit PRI is a private company that produces some programming, and mainly distributes material produced by others.

NPR and PRI sell stations scores of programs and specials each year. But just five of those shows have a significant impact on the fortunes of public radio stations: Daily news magazines

"Morning Edition" and "All Things Considered" and weekly "Car Talk," all from NPR, and the weekday business magazine "Marketplace" and Garrison



Keillor's weekly "A Prairie Home Companion," both distributed by PRI.

Together these five programs attract about three-quarters of public radio's weekly national cumme (the unduplicated number of listeners who tune in at least once during the week) of 22 million listeners, according to Spring 1999 Arbitron reports.

Together these five programs also generate 36 percent of all listener contributions and 63 percent of the local underwriting revenue at public radio stations, according to Audience 98, a CPB-funded study conducted by the Maryland-based firm Audience Research Analysis.

CPB grants rarely cover more than 15 percent of each station's bill for national programming. But because the net return is often half to double the cost, many stations managers spend as much as half of their annual operating budgets for these five powerhouse programs. Each station pays its own programming fees based on complicated formulas — different for each distributor — that take into account the station's budget, audience and market size.

— Leslie Peters

"We're still strongly committed to public radio," said "Car Talk" Executive Producer Doug Berman, referring to a new contract with NPR that assures "Car Talk" broadcasts on public radio stations through 2005. "But it's smart for public radio, as an industry, to get a foothold in these new distribution platforms. They could end up being the most important platforms, and someone else could take our niche."

Berman's perspective is shared by at least one other important independent public radio producer. Jim Russell, vice president of USC Productions in Los Angeles, is the founding producer of "Marketplace," a half-hour business magazine that draws about 2.5 million listeners Monday through Friday, according to Arbitron reports for the spring of 1999. He believes that new media distribution — whether satellite radio, Internet or something else — is inevitable for major national public radio programs.

New media struggle

Russell has little sympathy for either the public radio stations or national distributors in their struggle over new media.

"Public radio stations pay a fraction of the cost for producing a national program, then they expect exclusivity. (Producers and stations) may be in the same business and all have the same ideals and mission, but you can't change the laws of economics," he said.

"It has all happened before, with public TV and cable. PBS decided not to buy total exclusivity of its prized possessions because they said they couldn't afford it. Then they were surprised when cable channels started stealing their franchise," said Russell.



He said that "Marketplace" is "not now actively exploring" a satellite radio deal.

In contrast to the producers' views, the "Car Talk" satellite radio deal rattled the nerves of public radio managers. Some expressed concerns about the other hallmark NPR and PRI programming for which station exclusivity promises had been made.

"Now, I suppose, we will be told that that assurance was only in regard to the (NPR) newsmagazines. I view this as a camel's-nose-under-the-tent scenario," said Steve Spencer, general manager at WYSO(FM) in Yellow Springs, Ohio.

NPR does not deny that its prized daily newsmagazines, "Morning Edition" and "All Things Considered," may someday be heard on a satellite radio service — only that such distribution is imminent. "We will be working closely with our station advisory group to develop programs for CD Radio. At this time we have no plans to include 'All Things Considered' and 'Morning Edition,'" said NPR spokeswoman Siroil Evans.

Why CD Radio?

Despite the fresh controversy, NPR will press forward with its plan to create two 24-hour programming channels of news, information and entertainment for CD Radio. PRI will produce one such channel. All three channels are set for launch in fourth quarter 2000.

Why did both chose to ally with CDR rather than the other SDARS licenseholder, XM Satellite Radio? Evans said, "CD Radio seemed to be the company with the right fit for NPR."

PRI Senior Vice President for Operations Bruce Theriault said, "CD Radio seemed further down the road than XM and our conversations with them started earlier. It's a good relationship and a good contract. But it doesn't mean that we won't do anything with XM. We have a modified exclusivity arrangement with CD Radio, so we can do business with XM or other (satellite radio service) entities."

Both NPR and PRI are vague about the specific content of their CD Radio channels.

"We may distribute our newer or lesser-carried shows on this service, but we're not going to do anything to harm our stations. It's simply not good business to undercut your customers," said Dale Spear, PRI's director of programming and research. However he admitted that PRI — like NPR and "Car Talk" — does not control the satellite distribution rights for its most popular programs. Those rights belong to the producers.

NPR was slated to discuss its CD Radio channels at a meeting of its board of directors in late November.

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Radio World, December 8, 1999

Get Your Y2K Checklist in Order

John Bisset

Less than 30 days until Y2K. Are you ready with your contingency plans? Even if you don't have a large engi-

neering budget, certain low-cost procedures can guard against any New Year's headaches.

Chief Engineer Lew Graves at Goldsboro, N.C., station WGBR(AM)

put together an emergency procedures book and an emergency light. They are part of an inexpensive insurance policy. Keep a light in each studio — especially interior studios where there is no outside illumination — to reduce employee accidents if the lights go out.

tion. Dennis Sloatman of AM/FM Orlando can talk a less-technical operator through a board swap because the labeling eliminates confusion.

Are your UPS batteries fresh? Some UPS systems provide a way to check on battery condition. If the batteries have been in the system for awhile, new batteries might help add additional protection to that insurance policy you are building.

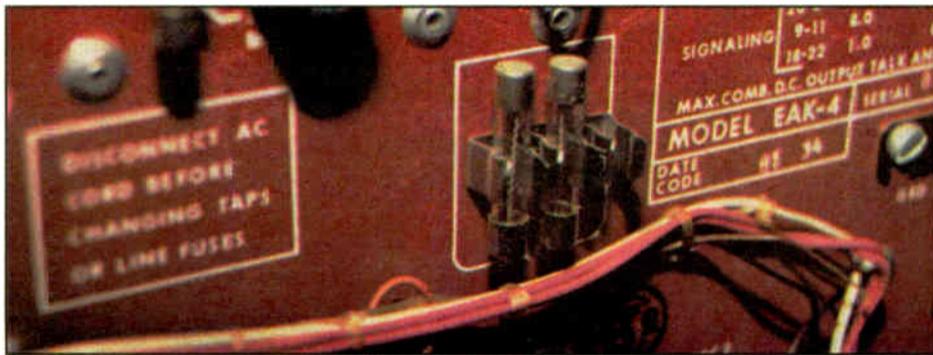


Figure 1: Check your supply of spare fuses.

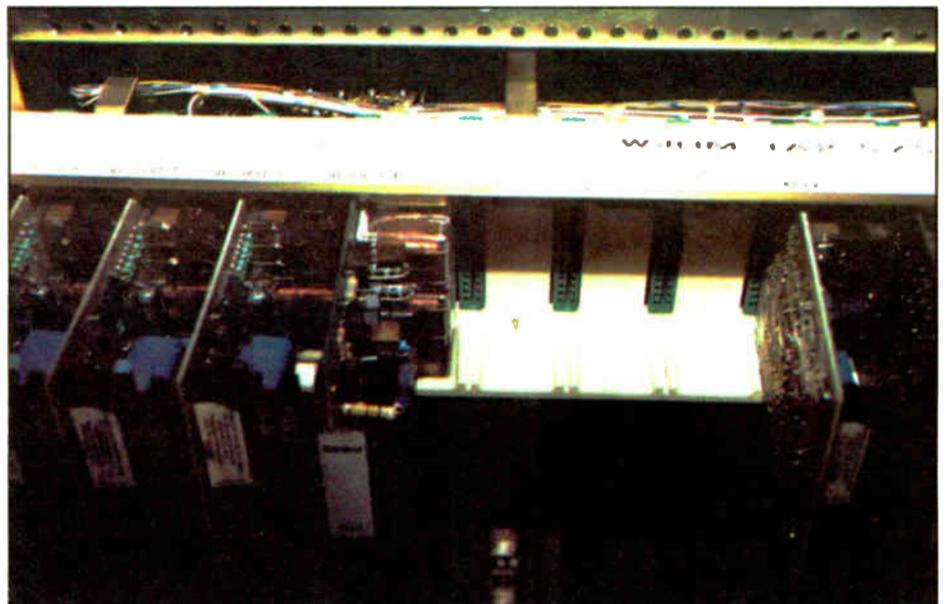


Figure 2: To speed troubleshooting, label your key system card frame.

If the studio uses an electronic phone system, why not wire up a standard touchtone phone to the hotline? The kind with a ringer on/off switch is preferred. Use a P-Touch to label the ringer on/off

Not sure whether the batteries need to be changed? Contact the UPS manufacturer. You will find the service departments of the major UPS manufacturers helpful in this regard. Next time you

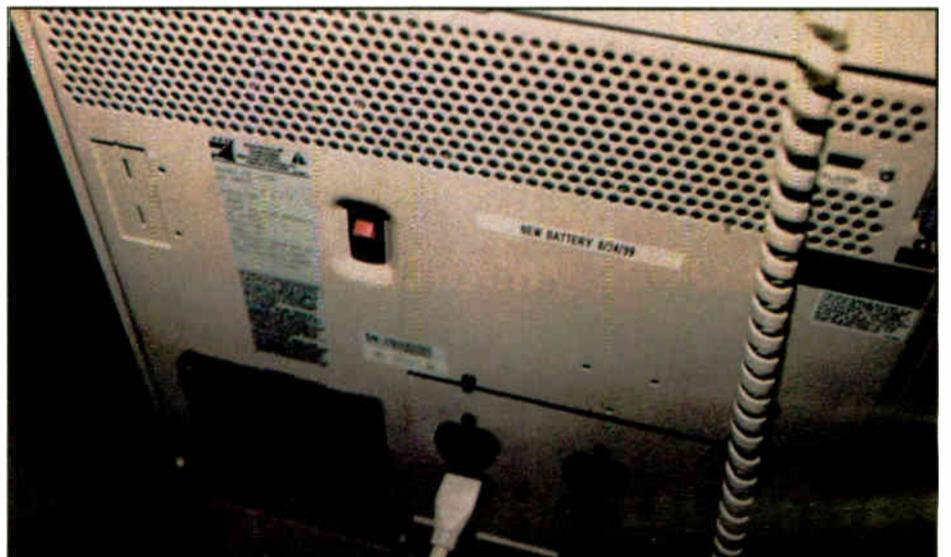


Figure 3: Keep track of new UPS batteries by noting the date on the case.

switch, so if the phone is used in the dark, the jock will remember to turn the ringer on.

If you have a key system, check your supply of fuses. Most of the key system power supplies have provisions for storing spare fuses (see Figure 1). Take advantage of them.

While we're on the subject of key systems, label the frame (Figure 2) so lines and control boards can be easily identified. It might save you a trip into the sta-

change the UPS batteries, stick a label on the UPS so you can monitor performance.

★★★

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See WORKBENCH, page 25 ▶

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PRODUCT EVALUATION

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Paul Kaminski

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The ARES-C is a digital audio recorder that uses PCMCIA Flash

edited track, you use the jog wheel to select an in point from the source, and an out point. When that's done, the selected snippet is copied to the new track.

If you don't like the edit, you can undo the edit point, shift it and even insert new sound in the just-completed edit. On the display, you see a visual representation of a tape as the target track. You can use the jog wheel to make even more precise edits of extraneous material.



The Front Panel

RAM linear cards to record and manipulate recorded audio. A 40-megabyte flash card will store 80 minutes of monaural audio, 40 minutes of stereo.

The machine uses two cards and has seamless transfer capability when one card fills up. Frequency response is a published 30 to 20 kHz.

Through the race paces

One might ask what that means for a typical radio reporter, who needs to record sound, edit snippets and send them back over an ISDN line or plain old telephone link.

Here's what we found after covering five major races in a three-week period, sending reports, features and actuality back to various clients, and recording material for our "Race-Talk" program.

The editing of audio on the ARES-C is nearly intuitive. Once you record a piece of audio, you'll see a small LCD display that gives you options for editing and playback. (Quality time with the instruction book is recommended before you take one in the field.)

You edit tracks by copying from the original to a target track, somewhat like editing for video. To make an

Once you get accustomed to the jog wheel and the sequence of switching between tracks, you can separate cuts from the original recording very quickly. One sequence of six cuts of actuality took what seemed like three minutes.

In fact you can record Max Headroom-style bumpers, and not destroy the original source recording.

When you are ready to send your sound back to the studio, you can do so with an optional ISDN connection (National-I and Euro protocols) through an NT-1. That's selectable through the panel where you select editing options. If you need to send audio back over a POTS connection, you will have to fabricate a banana plug-to-RJ-11 jack adapter.

The ARES-C has a DTMF dialpad, but no switchhook. So when you want to make a call, you plug the adapter into the line. You'll hear dial tone and then you dial. The mic inputs are active, so you can use the microphone for talkback or voicing a report. When you play a recording, the microphone inputs are muted.

The ARES-C has the familiar Nagra modulometer, phantom and T phantom power for any style microphone (we used

regular dynamic mics with good results). The limiter will keep even the most exuberant subject in check.

Nitty gritty

This is a high-performance machine, and has its own idiosyncrasies.

Mic inputs are dual XLR, so you can record in stereo. Auxiliary analog inputs are on a DB-15-style connector.

In a field situation, I would like something standard, if I needed to make a line-level dub. We solved that problem by using the manual record level on the ARES-C. A little adjusting, and we were able to make a dub of sound from our MiniDisc recorder with good fidelity. For all other recordings, we left the automatic gain control on. The AGC can also be adjusted through the top-panel controls.

The ARES-C has AC and Ni-Cad battery options. Our test machine came with a four D-cell battery pack, a

Product Capsule:

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Thumbs Up

- ✓ Intuitive fast editing
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Thumbs Down

- ✓ Aux line input on DB-15 connector instead of a standard audio connector
- ✓ Weight heavy for field work
- ✓ Velveteen backing on shoulder strap flaked off
- ✓ Battery box latches somewhat tricky to fix
- ✓ Price may be high for cost-conscious operations

For more information contact Nagra USA in Nashville at (615) 726-5191, send e-mail to mail@nagra.com, visit the Web at www.nagra.com or circle **Reader Service 51**.



Photo by Paul Kaminski

The ARES-C has the heft familiar to Nagra fans.

charger, and a four D-cell-size rechargeable battery stick. An eight D-cell box is available.

We tried the four D-cell box with alkaline batteries for one session. That was about as long as it would last.

Ni-Cad batteries are convenient, but not without their own dos and don'ts. We found that keeping the unit on when driving back to the hotel, and charging the fully discharged battery overnight would give us a couple of days of power, if we remembered to

turn the machine off when we weren't using it.

On our model, the latch that holds the battery box came loose. Thankfully, the top of the ARES-C was easy to open, and some manipulation with a Leatherman-style tool put the latch back in working order.

The ARES-C came with a sturdy, desert tan case, which had plenty of room for microphones, cables, adapters and flash-cards. The carry strap screwed into the

See NAGRA, page 23 ▶

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World Radio History

Multimedia Broadcasting

Whether
on the air or
on the Internet,
stations can
rely on Dalet



From production to programming to broadcast, Dalet5.1, the latest technology in digital audio, allows stations to increase efficiency, streamline operations, and reduce costs.

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Stations can easily and quickly establish their Internet presence. Dalet Web Publisher automatically publishes and updates information such as song titles, news stories, and broadcast history onto a web site. Stations wishing to simulcast their on-air program onto the Internet can use our integrated G2 Player.

Reliability

With thousands of stations around the world using our systems, Dalet has the proven expertise to keep your

station on the air. Dalet5.1 goes one step further with Netback2, a powerful utility that complements hardware redundancy (RAID arrays or mirrored servers) by backing up logs and sound files onto a secondary workstation. At a moment's notice, that workstation can be activated and broadcasting restored.

Superior Audio Quality

A variety of high quality sound formats designed to provide stations flexibility in managing their sound libraries is supported. Depending on a station's storage and audio needs, audio can be stored and edited in MPEG and/or LINEAR.



Group Connectivity

Many stations are now part of groups in which operations, production resources, sound files, and schedules must be shared. Stations that are co-located can use a single Dalet system while stations in different sites can easily and cost effectively exchange information and audio over the Internet or Wide Area Network.



Integrated Editors

Surfer and Mix Editor, tools for editing sound files and creating segues, are now easier to use and offer greater precision through the improved use of visual cues and an enhanced scrubbing tool. Additionally, Surfer has been refined with easier to use drag and drop editing, preset zooms, multi-track locators, and time stamping - all of which make editing a breeze. Because both tools are integrated with Dalet5.1, edits, once saved, are available for immediate broadcast.

Music Scheduling

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

On-Air Flexibility

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

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

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The Gentner TS612-6 Six-Line Telephone System Now on Sale at BSW!

The popular Gentner TS612 multi-line telephone system makes it easy to manage call-in broadcast programming. The TS612 contains two digital hybrids that provide a high-quality interface to six telephone lines (expandable to 12). The dual hybrids allow the TS612 to operate as a single-studio telephone system able to conference up to four callers simultaneously or as a two-studio system able to conference two callers to each studio. The TS612 supports a dedicated "phone-like" call-screening control surface.

An off-air screener takes incoming calls and places them in a screened-hold queue. The on-air talent or producer presses the NEXT button on the main control surface and the call is immediately on-the-air. The integrated mix-minus provides superior audio quality and simple installation. Automatic gain control (AGC) provides consistent audio levels on all calls. Act fast!

Through the end of the millennium, BSW is offering the TS612-6 six-line system for only \$2,869.00. Call today.

Gentner TS612-6 List \$3,149.00

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- Two-Button Off allows you to disconnect any line by pressing the OFF button
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LDR IBOC system testing continues; WPST-FM now live

LDR continues to test its IBOC system and has gone live on 97.5 WPST-FM in Princeton, New Jersey. The flagship station of Nassau Broadcasting Partners, licensed in Trenton, New Jersey, the 50,000 watt WPST-FM will test LDR's patented PAC Multi-Streaming technology, which will provide digital audio coverage

equal to existing FM coverage. The equipment being used for the testing is:

- Transmitter—Harris IBOC Z10
- STL—Moseley and Harris Intraplex, at 44.1 kHz and 48kHz
- Combiner—ERI
- Audio processing—Omnia
- Receiver—prototype receivers in the LDR test van, which has recently been named "Belle" (yes, she's named after Lucent's famed research lab)

"The tests of the Lucent Digital Radio Multi-Streaming PAC system on WPST-FM is not only a breakthrough for IBOC, but for the entire digital radio industry," said Suren Pai, president of Lucent Digital Radio. "Multi-Streaming effectively solves the problems asso-

ciated with digital terrestrial radio. We are pleased to work with such a progressive station as WPST-FM in these historic tests."

Announced in January 1999, the Multi-Streaming technology was the result of collaborative work between the LDR technical team, notably Deepen Sinha, co-inventor of PAC, and David Mansour, senior vice president.



Anthony Gervasi, Jr.
Nassau Broadcasting Partners

"We're confident that what we are doing at WPST-FM with Lucent Digital Radio will be the true 'ground zero' of digital radio," said Anthony Gervasi, Jr., senior vice president of engineering and technology for Nassau Broadcasting Partners. "IBOC represents a digital revolution for radio, and—

together with Lucent—we will demonstrate that we're in the vanguard."

The LDR IBOC digital audio broadcasting system is designed as an end-to-end solution that will enable broadcast stations to seamlessly convert to an all-digital AM or FM broadcast scheme, at their discretion, with no impact to adjacent channel stations. LDR's system will provide greatly enhanced sound quality for AM radio, CD-like quality for FM radio, as well as interference-free reception and innovative new data services. Our system has also been designed "with headroom" to allow incorporation of future technological advances. We are addressing the issue of digital radio, which we all know is a very difficult problem, with a systematic approach and technological advances that will solve this problem. IBOC is the answer for broadcasters and is the technology that will allow radio to transition to digital.

In this Issue

LDR IBOC system testing continues; WPST-FM now live

FCC Issues a Notice of Proposed Rulemaking on Digital Audio Broadcasting

LDR adds equipment partners

LDR receives investment from Pequot Capital

NAB Radio Show '99 wrap-up

FCC Issues a Notice of Proposed Rulemaking (NPRM) on Digital Audio Broadcasting

Industry Update

As we move forward with IBOC, LDR wants to make sure you have the latest information. On November 1, 1999, the FCC issued an NPRM for Digital Audio Broadcasting. This is good news for the broadcast industry because it starts to lay out the issues for selecting and implementing a digital system. The entire text of the NPRM can be found on our website at: www.lucent.com/ldr. We have also put together some highlights from the NPRM below:

The FCC has established DAB policy goals:

- Provide vastly improved radio service to the public.
- Create DAB opportunities for existing radio broadcasters.
- Establish a spectrally efficient DAB system.
- A rapid and non-disruptive transition to DAB for

broadcasters and listeners. This applies to both the hybrid and all-digital modes for IBOC.

- A tentative Selection criteria for a DAB system is as follows:
 1. enhanced audio fidelity
 2. robustness to interference and other signal impairments
 3. compatibility with existing analog service
 4. spectrum efficiency
 5. flexibility
 6. auxiliary capability
 7. extensibility - should be structured with 'headroom' to allow incorporation of future technological advances
 8. accommodation for existing broadcasters
 9. coverage
 10. implementation costs/affordability of equipment

- The FCC is looking for input on implementing DAB via IBOC, which utilizes the existing spectrum allocation for AM and FM broadcasters, and/or implementing DAB in new spectrum. The new spectrum proposed is TV6 [B2-BBMHz].

- The FCC tentatively concludes that the public interest compels a Commission role in the development of DAB transmission standards, "with the advice and involvement of all sectors of the industry." However, it is also looking for advice as to whether a standard is required, if there is a high degree of compatibility among the several DAB systems. It will look to the industry, including CEMA and the NASC, to supply initial testing results from the IBOC proponents, and the FCC sees merit in a second stage of comparative testing IBOC systems on a common testing platform.

- The FCC has also asked for comments on the all-digital design of the proponents. Lucent Digital Radio's design allows broadcasters to transition to an all-digital service at any time, whereas USADR's all-digital design will cause interference to analog and hybrid systems, so USADR's system requires a fixed analog "sunset" date in fostering a transition to an all-digital service.

Suren Pai, president of Lucent Digital Radio, said the FCC's proposal validates the priorities already established by the company. "This gives us a very clear framework in which to focus our efforts," Pai said.

As the NPRM process unfolds, we will continue to update you via our website and our newsletters.

Lucent Digital Radio

adds equipment partners

LDR has recently announced additional partners for developing and testing its IBOC system. During the NAB show '99 in Las Vegas, we talked to you about how we were focused on an end-to-end design, from studio hard drive to the car receiver. Over the last few months, we have been working to solidify these

relationships, so that we can ensure that LDR's IBOC system will do what the broadcasters need it to do: protect the integrity of their existing analog signal and offer an opportunity to transition to digital audio broadcasting. Below is the partners card that we handed out at NAB radio '99 in Orlando.

LDR receives investment from Pequot Capital; strengthens position in the digital radio industry

Lucent Digital Radio has announced an investment from Pequot Capital Management to create a new entity. Lucent Digital Radio, Inc. will be owned by investors Pequot Capital and Lucent Technologies, which will hold a

majority ownership stake in Lucent Digital Radio, Inc. Lucent will continue to support Lucent Digital Radio, Inc. and will provide ongoing access to state-of-the-art research from the company's Bell Labs research and development unit.

"As the radio industry begins its next major technical revolution, we are impressed with the Lucent Digital technology – both the IBOC and the PAC technology – to meet this demanding new digital broadcast environment," said Gerald Poch, a principal of Pequot Equity Funds and Pequot Venture Fund.

Lucent Digital Radio

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Fact, not fantasy. Lucent Digital Radio's In-Band On-Channel (IBOC) delivers digital quality audio that's interference free. Live, on-air tests prove it.

Learn more about Lucent Digital Radio's IBOC field test results.

Visit Booth 75!

www.lucent.com/ldr

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We make the things that make communications work.™

Partner cards for NAB Radio Show '99

NAB Radio Show '99

w r a p - u p

LDR had another successful NAB Radio Show. Orlando was hot, but our technology was hotter! The theme of our booth was LDR's IBDC end-to-end design. We are working with key partners in the studio audio, STL, combiner, transmitter, and receiver spaces.

With the help of Jim Loupas, audio guru, attendees had the opportunity to hear a live demonstration of our PAC Multi-streaming technology in action. *[See photo]*

"Hear it for yourself."
LDR offered live demos of PAC Multi-stream technology at the NAB Radio Show '99.

The demo took source music, ran it through either an Drban or Omnia audio processor, through the PAC encoder and then through the PAC decoder. Attendees could listen to the decoded audio through headphones. The live demo once again showed why LDR's PAC audio coder is the best in the business. Superior sound quality at 128kbps.

Superior sound quality at 128kbps.



We also showed a DVD video of our successful live testing at WBJB-FM in New Jersey. The video showed the LDR test van and attendees were able to hear both the

analog and digital hybrid music as it was being received from the station into the van.

We'd like to hear from you

Contact
Radio
Bits

Bill Casey, Director Marketing & Sales

Lucent Digital Radio, Inc.
20 Independence Blvd., Warren, NJ 07059

Phone: 908-580-7008 Fax: 908-580-7152

Email: williamcasey@lucent.com
LDR Web site: www.lucent.com/ldr

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Measurement, Test Setup Can Help Groups

A Reliable System of FM Quality Assurance Is Built on the Lessons of Gulfstar's Tech Trek

Frank McCoy

Last summer, the Gulfstar division of what was then Capstar, now a part of AMFM Inc., organized a technical tour of its stations. The mission of our Tech Treks was to "bring high-tech methods to the stations to help them deal with the threat of attack."

It meant sending the engineer (me) on a road trip through 22 markets and 87 stations.

This was a fact-finding and discovery tour, sponsored by the generous folks at Radio Systems and reported afterwards here in this column. Additional support came from several key strategic vendors: Audio Precision, Belar, Gentner, Gepco, Orban Radio Systems.

Chain lessons

I found an array of different air chains on the tour. Some were in good condition, some weren't. Some sounded good, some didn't.

Surprisingly, one of the best-sounding country stations we own was using some of the oldest processing gear. They had no full-time engineer.

This was interesting! I expected to find something really useful — perhaps a way to carve up the original CRL 800, because that's what they were using — but alas, this was not to be. Are you let out a cheer for what Arnie Gentner calls the "older equipment," the equipment that got to success at this station was 150-

Ideally, this should simulate the behavior under actual program conditions.

The test should check all the typical trouble parameters — response, noise



Packaged as two rack cases by Radio Systems, the Belar Wizard Mod Monitor and DAT for sample collection are a manageable set. Components can be used together or individually.

and distortion — for each channel. Checking separation and phase response would be nice, too, just to complete the package.

This test regimen must be easy. The perfect version would be automated, easi-

question, "What changed?"

Here's how it works for us.

When the original Gulfstar Uniform Numbering System, or GUNS, was set up, cart number 9999 was reserved for test signals. Up to 99 individual tones or other signals can be stored under this

files through the AES/EBU port of the Antex audio cards we use.

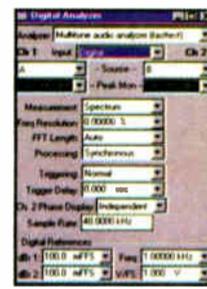
Measurable results

Our lab setup in Austin completes the process. With DAT playback into the AES/EBU port of an Audio Precision System 2 Dual Domain analyzer, we can transform the test tones and measure the results. Numeric output and easy-to-read graphic output are available right away.

Now we can answer the question "Why is it thin?" almost immediately. Our results can be compared to the last test done, creating a true histogram of station behavior and performance quality.

Perhaps best of all, the old-time annual proof of performance, long deleted from FCC rules for FM stations and almost gone for AMs, is back for us in a big way.

Coming from a major market, I always looked at the "proof" as a time to clean out the year's accumulation of audio performance cobwebs. I could take the station after midnight every night for a week or so, over the protests of the PD, because it was required by the FCC rules. No choice, no argument — it had to be done. It was Federal Law.



Part of the System 2 setup screen is shown.

Sine waves

Those tests were conducted from microphone input to transmitter output using the station's modulation monitor. My guess is these rules originated in the days of live music on the radio. The only audio processing was a board engineer with a hand on the pot. Broadcast audio was made up of sine waves back then.

Modulation monitors were designed

See MEASUREMENT, page 22 ▶

We found a quick, repeatable way to characterize the performance of the air chain and its parts.

number, available for use any time they are needed. For automated testing, they can even be added to the program log. Test signals are distributed as .WAV files on CD-R.

When testing is needed, the CE grabs a DAT machine, takes it to the location in the chain where he thinks there is trouble and hooks it up. With a 48-kilosample-per-second recording started, the needed tones are soaked up.

Then the CE drops the DAT in FedEx and we get it the following day in Austin. Any special tones or recorded samples can even be e-mailed, if required. DAT recordings can also be converted to .WAV

ent modulation. When modulation put back inside the legal limits, suddenly there was a loudness problem. arise.

After 3,500 miles and four months, I saw local testing was not the answer. We had to be a way to conduct remote testing, with a short turnaround, so that the time a quality question arose, an answer could be given quickly.

Repeatable and accurate

This is a challenge faced frequently by radio engineers. One morning the PD stuck his head in your office and says "Is the processing changed? We're hearing a little thin — at least compared to WXXX. Could you check it?" We've all been there.

Of equal concern, sometimes the CE or the PD begins a fiddling episode, possibly ignoring and partially masking a genuine air-chain equipment problem. Result: a leading indicator of real trouble ahead gets covered up with compression and dynamic equalization.

Once again, there is an imperative need for a quick, repeatable and accurate way to characterize the performance of the entire air chain or any individual part.

ly run and requiring little air time. It must be done at the first hint of trouble. It also needs to take as little out of the CE's busy schedule as possible.

Permanent test history

Audio Precision has been offering audio test sets with Fasttest arbitrary waveforms for several years. Designed for rapid, comprehensive device testing in production-line environments, this approach looked ideal for the radio chain, too.

These test multi-tones are a mathematical series chosen so that the harmonics of lower frequency tones fall in between the upper tones. Fourier analysis allows measurement of noise, frequency response and harmonic distortion from a two-second sample.

Fasttest had all the elements. It is quick, taking just a couple of seconds of airtime per test. It is comprehensive, allowing all the typical analog domain tests with just a few short bursts of the test signal. Finally, in conjunction with a custom package of up-to-date measurement equipment, it is repeatable.

The overall test system design allows us to maintain a permanent history of tests. We can affirmatively answer the

RDS/RBDS

"Mini-Encoder"

With this simple, "dirt cheap" encoder, your station can begin transmitting the more important radio-data IDs, service flags and text messages.

Use any PC to quickly and easily enter your station's call letters or "street name," format identifier, translator frequencies and scrolling ads or promos. Menu-driven software transfers this information to the encoder's own non-volatile memory.

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Touch Screen Control	yes	no	no
32 bit Floating Point Processor	yes	no	no
AES/EBU Rate Adaptive Digital Interface included	yes	no \$1,495 extra	yes
Hardware & Software upgrades included at no charge	1 year	no	no
Final Limiter Sample Rate	256 kHz	128 kHz	48 kHz (virtual 192 kHz)
# of Audio Processing Bands	5	5	4
Available in colors	yes	no	no
Warranty (parts & labor)	3 years	1 year	2 years
Base Price	\$10,950	\$9,595	\$10,700
Price with extras	\$10,950	\$11,090	\$10,700

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WIRED FOR SOUND

Cat 5 Connectors for Audio Folks

Steve Lampen

We left off in the Nov. 10 issue with a discussion about the RJ-45, the connector used for Category 5.

Appearing much like its cousin the RJ-11, found on the back of your phone, the RJ-45 accepts four pairs (eight conductors). These must be arranged in a specific format to meet the EIA/TIA 568A spec. Let's discuss that, and a whole lot more about RJ-45s.

The RJ-45 has gone through a lot of changes in the last few years. Where it was originally a low-frequency or low-data-rate connector, we are now asking it to carry 100 MHz on each pair of pins.

It is difficult to make an RJ-45 that is truly "impedance-specific." Category 5 cable is 100 ohms, but the connectors are not, or not close enough. This is not due to any laziness on the part of the manufacturers.

Remember that this connector was designed for low-frequency applications in the 1950s. In fact, connector manufacturers have pulled off a modern miracle even to get as close as they have to true Category 5 performance. Talk about a silk purse out of a sow's ear!

And the internal dimensions of an RJ-45 are made specifically for 24 AWG

performance. But these connectors are expensive and only work with Category 5 boxes already have RJ-45s much stuck.

The real surprise done with a single pair. Performance figure 5 are pretty amazing work with those 10 interesting questions souped-up wire affixes.

Crosstalk between pairs is remarkable. EIA/TIA 568A requires a crosstalk of over 50 dB at 100 MHz. Imagine

what it is at 20 kHz! In fact, one enhanced Cat 5 top of the line was tested in a 100-meter (328-foot) piece for crosstalk at 20 kHz, and it couldn't be read! It was in the noise floor of the test gear at -110 dB.

What it has been doing is red cable. Proprietary, but it's all those things. All those things are buying you're pretty good.

What it has been doing is red cable. Proprietary, but it's all those things. All those things are buying you're pretty good.

Worst-case noise

And if you think about it, crosstalk is the same thing as noise. In fact, it's the worst-case noise, coming from the pair right next to the signal pair. So these crosstalk numbers apply to external noise pickup as well. If you need CD noise-floor quality on the order of -90 dB, could you imagine getting this on an unshielded twisted pair?

So what about AES/EBU digital audio? It requires an impedance of 110 ohms +/- 20 percent, or between 88 and 132 ohms. Category 5 is 100 ohms, well within the passband.

One minor problem is that the impedance tolerance required by 568A is 100 ohms +/- 15 ohms, meaning the cable could range between 85 and 115 ohms. If it were on the low end, say 85 ohms, it would be an iffy proposition for digital audio, with its low end of 88 ohms. But most of the time, it would probably be OK.

If "most of the time" is not good enough for you, we come back to the cutting-edge enhanced cables, especially those using bonded pairs. This technology gives you guaranteed impedance variations of +/- 12 ohms, and typically even

See LAMPEN, page 25 ▶

Talk about a silk purse out of a sow's ear!

wire, so even if you used 22 AWG or 20 AWG pairs, you wouldn't be able to stuff them into an RJ-45. A few high-end cable manufacturers have pushed the connector dimensions to its limit (about 23.5 AWG) to squeeze out the lowest resistance and the maximum cable performance.

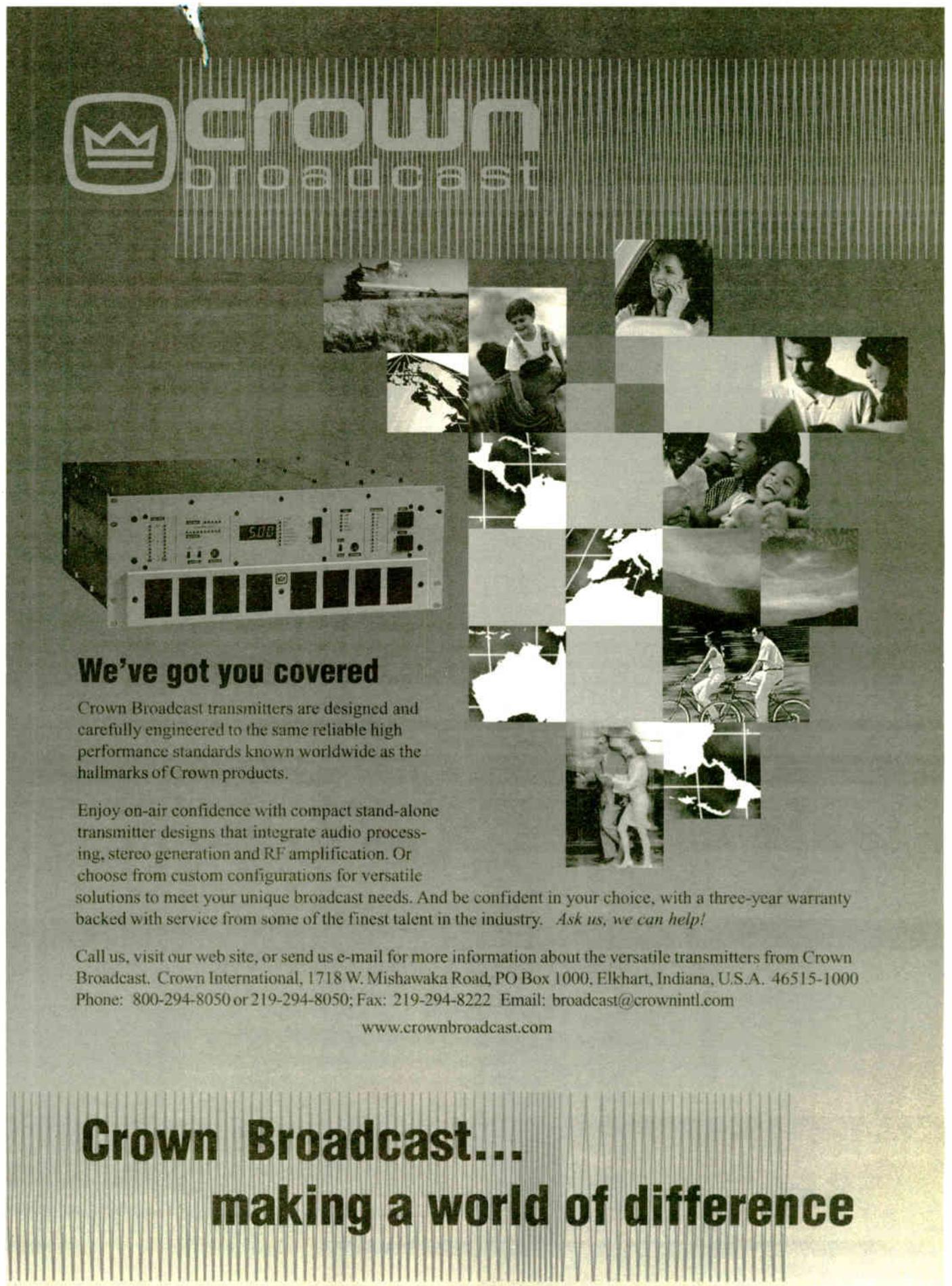
The RJ-45 connector, or at least the spec, has one other curve ball to throw: the order in which the wires are connected.

The RJ-45, when it started to take on new life as a data connector, needed to be compatible with existing systems. For that reason, the first pair is the center pair and the second pair is split on either side of that. This comes from the old RJ-11 wiring so that anytime you plugged in a phone, you automatically got the center pair.

That worked fine with slower-speed data wiring, until you get to 100 MHz. Old Mr. Wavelength says that the critical quarter-wave at 100 MHz is only 0.75 meters (2-1/2 feet). It doesn't take a lot of connectors in a row to get close to that, so most people avoided the RJ-45 except where necessary, such as in patch panels or wall plates.

But Category 6 will be asking these connectors to do 200 MHz (and there are some applications using them at 500 MHz or even higher). It is obvious that the RJ-45 is a key bottleneck to future system performance.

You can buy fancy connectors that are not RJ-45 and run rings around them in



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The License Can Tell You a Lot

Ed Montgomery

This is one in a series of articles about the basics of AM radio. The previous part appeared Oct. 13.

There are two documents that are essential to running and understanding an AM broadcasting station.

The first is the broadcast license. The license, posted at the transmitter site, is more than simply the authorization for legally radiating a signal into the air. It contains valuable information.

The license identifies the location of the station. A general description of the antenna system is presented along with the exact location coordinates, nominal and actual power of the station. Nominal power is the closest power to the power classifications established by the FCC.

Vital stats

The antenna input power is the actual power delivered to the antenna. The radio frequency current the transmitter delivers to the antenna is also published. If the station is directional, using two or more towers, the "common point" current is listed. This is the radio frequency current from the transmitter before it is divided up in the phasor/power divider

and sent to the towers.

Antenna resistance is also published. The assumption is that the resistance is accurate, when the antenna current is read. The direct method of calculating power is:

$$P=I^2R$$

In the formula, P indicates power in watts, I is current in amperes and R is antenna resistance in ohms.

It is important to check the resistance of the antenna periodically. It can vary slightly with the change of seasons. Long periods of dry and wet weather can affect it, but usually not to the point that it will go out of its tolerance.

Station power should not exceed 105 percent of licensed power or be less than 90 percent of it. However, as the system ages, the ground radials can erode, causing the antenna resistance to change. Even a small change in the antenna resistance can affect the output power. The antenna current may look correct but the radiating power may not be.

Changing conditions

As the antenna system ages and deteriorates, the ability to transmit power in the sidebands may be hampered, which can reduce the audio fidelity of the transmis-

sion. Performing the age-old audio proof of performance will reveal the frequency response that can be transmitted. It is important to have the antenna resistance checked periodically along with an antenna "sweep" with an operating impedance bridge.

This check, at least annually, assures the station management that the system is functioning as it was designed to do. Anyone considering purchasing an AM station should have a check of the antenna resistance on the top of their list.

Generally speaking, AM stations often have power restrictions on them because of the changing of atmospheric conditions. Most of us know that AM radio waves are reflected back to earth at night, permitting radio stations to be received from hundreds of miles away. The condition of the ionosphere changes throughout the nighttime hours.

The FCC has put limitations on stations' radiation characteristics. Stations that have been on the longest often have the best antenna patterns and protection. Stations that were granted licenses later were often given daytime authority, signing off at sunset as directed in the station license.

In addition, many stations have been granted "post-sunset" authority, permitting them to remain on the air but reducing power as the night hours advance. The times to return to pre-sunrise power and full power are also published in the license.

DA facts

Information regarding the operation of directional antennas is in the license. The proper readings of the antenna monitor are published.

It should be noted that the antenna monitor readings are not the true currents or phases being sent to the towers but the relative readings that are being sent back to the monitor. However, these readings do give an accurate indication of how the system is performing.

The license lists "theoretical" and "operating" parameters. You need to be concerned with the "operating" parameters.

Operations personnel should know how to read the antenna monitor and determine whether the antenna is operating properly. Normally there are no problems, but as the system ages, capacitors can fail, and lightning strikes can cause components or transmission lines to fail, altering the radiation pattern of the radio station.

It is important to know that the system is operating properly. If a problem is detected, contact the station engineer. Making adjustments on the antenna system without a knowledge of how it works can compound any existing problems.

Monitor point readings also are published in the license. Monitor points are locations where major lobes and nulls of the pattern are located. These "maximum field strengths" are at locations where the radio signal must be limited to avoid interfering with another radio station on the same frequency.

Older licenses include directions to these monitor points. Newer licenses indicate their location off true north and the distances from the transmitter site.

These measurements are read with a

field intensity meter. The monitor points give a good indication of how the radiation pattern is performing.

A decline in signal strength over the years may indicate growth in the area. Utility poles carrying electric and telephone lines next to the monitor point will absorb the signal. Large metal structures built between the antenna and the monitor point can also affect the measured signal. If the readings are not where they are supposed to be, contact the engineering department or a consulting engineer to see what can be done to restore the signal to its licensed value.

Proofs in the pudding

The other document is the "directional antenna proof of performance" or "full proof." If the station is several years old, it may also have "partial proofs" attached to it.

The "proof" contains the information the design engineer produced to explain just how the antenna system works. Some contain schematic diagrams of the antenna phasor/power divider adjacent to the transmitter, transmission line lengths, as well as the antenna tuning unit components at the base of the towers that couple the radio energy to the towers.

The ATUs have a meter measuring the specific amount of current they are feeding to the towers. These current values are found in the "proof."

It also includes the driving instructions to all of the monitor points as well as photographs of these locations. Sometimes these directions and photos are out of date because of growth in the area. It may be hard to locate the exact locations. Geodetic Survey quadrant maps will help you find these monitor points.

Transmitter sites usually are identified. True north can be located, and the radials with the monitor points on them found. The assistance of an engineer can be valuable if the driving instructions are no longer accurate.

If a copy of the document cannot be found in the station's files, contact the FCC for a copy. If you are considering purchasing a radio station, be sure to have an engineer examine the original design of the facility and make sure it is operating at its licensed parameters before any contract is signed.

A schematic diagram illustrating how the system operates is important to have. If the station management has lost their copy, one may be available from the engineer or company that originally built the facility.

If the station is not operating properly, someone is going to have to pay to make it do so. Figure out who is going to pay for the work. Will it be in the form of a rebate on the price of the station to cover the engineering work or an up-front payment by the present owner before the sale is consummated?

The information in the license and directional antenna proof of performance can determine just how well the antenna system is performing. Don't overlook it.

■ ■ ■

Ed Montgomery is the video technology and communications lab director at Thomas Jefferson High School for Science and Technology, Fairfax County, Va. He has worked as a broadcast engineer and college-level instructor. Reach him at emontgom@lan.tjhsst.edu

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Broadcast Data Writes the Ticket

Your traffic and billing processes will speed along when you have a Traffic C.O.P. along.

Broadcast Data Consultants introduced Traffic C.O.P. for Windows at the recent NAB Radio Show. The ease and intuitiveness of Windows make this software easy to learn.

"Almost anyone that has a good working knowledge with Windows can easily learn the program on their own," the company promises.

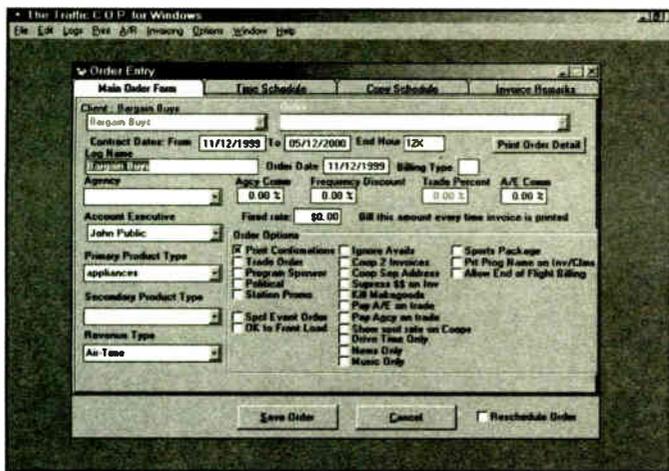
The software is priced for buy-out at under \$4,000 with generous small-market discounts. Broadcast Data also offers a quarterly payment plan with no interest.

The company is also seeking

beta testers for its Music Director II for Windows. Qualified beta testers will receive the software for free.



For information, contact Broadcast Data in Florida at (800) 275-6204, visit www.broadcastdata.com or circle Reader Service 54.



Studer V 3.0 Software for On-Air 2000

Version 3.0 Master Software is available for the Studer On-Air 2000 Digital Continuity Console. Designed for on-air radio use, the On-Air 2000 is

rated or together.

The update adds several other features, including configurable on/off buttons and customer codes for automated control of features.

New On-Air 2000s will ship with Version 3.0 Software. Current users



also suitable for production.

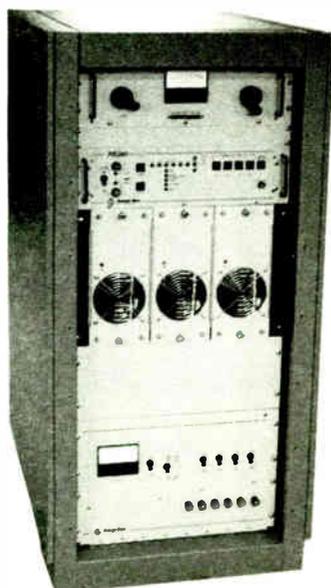
The software adds six clean-feed channels. Users can hold six telephone callers on the line ready for air, making it suitable for talk radio and promotional contests. The producer or show host can talk to any of the six, sepa-

wishing to upgrade should contact Studer.

For more information, contact Studer North America in California at (510) 297-2711, visit the Web site at www.studer.ch or circle Reader Service 55.

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System Helps With Regular Testing

► **MEASUREMENT**, continued from page 17 around a sine wave expectation. The metering circuits used detection and smoothing circuits that were adapted for the characteristics of a sine wave. Because the FCC rules for FM modulation basically define only peak deviation, a peak detection scheme had to be part of any modulation monitor.

The problem is that detectors integrate an AC waveform. The result is a DC voltage that is proportional to the area under the AC waveform. For sine waves, there is a definite relationship between average and peak. Under conditions of sine wave, these circuits produce accurate results.

Peak limiting and clipping functions make this relationship invalid. Clipped waveforms, with a traditional integrating network used to drive a meter movement or a comparator circuit, tend to indicate a higher peak value than is actually the

Match the peak level of the generator output with the oscilloscope.

A perfect modulation monitor would indicate the same peak modulation level no matter what the shape of the waveform. Every mod monitor I've seen in common use shows about 4 dB higher for square wave in this test.

The error is roughly the ratio of the area under the waveform curve for a sine wave and a square wave of equal peak amplitude.

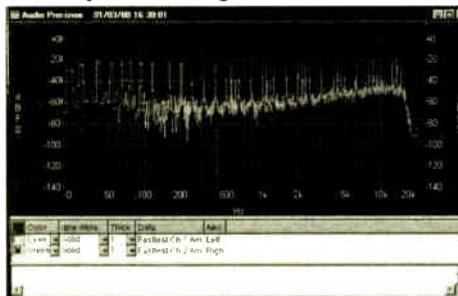
Modulation solution

For years, the FCC has used a Watkins-Johnson receiver, a generator that tunes the FM band, a frequency counter and an oscilloscope to measure modulation.

By using the generator and frequency counter to calibrate the oscilloscope scale for +/- 75 kHz, the FCC has a reliable peak deviation indicator. The results are

monitors with heavily processed audio.

The solution, if you don't want to scour the vintage and collector hi-fi stores, is a modulation monitor that does not rely on an integrator to run the mea-



A failing STL contributed significant noise, seen as 'grass' between the multitone.

surement indicators.

Where do you find such a device?

In this age of DSP, such a monitor is possible. Arno Meyer and his colleagues at Belar have incorporated these functions into the Wizard. By digitally sampling the incoming baseband at a very high rate, it is possible to accurately decode FM stereo. This is essentially the inverse function to the one used in digital FM stereo generators.

In the process, simple register arithmetic allows the monitor to store peak deviation values with a high order of precision. For the first time, it is possible to measure peak deviation of FM under conditions of non-sine wave modulation.

Best of all, the result is available as a 48-kilosample-per-second AES/EBU output. With the Wizard and a DAT recorder, the engineer now has a complete data gathering system.

By mounting the frequency-agile Wizard in a portable rack case along with the DAT recorder, the system now becomes portable. Dan Braverman of Radio Systems has integrated these systems with some custom panel work and interconnecting hardware, just to make it

This represents a simple, easy-to-use, reliable and repeatable measurement system for FM broadcast quality assurance.

case. The error increases with more aggressive processing.

An interesting experiment reveals just how significant this error is. Using a function generator, an FM exciter, an oscilloscope and a modulation monitor, connect the function generator to composite input of the exciter.

Set the function generator for 100 Hz sine wave and adjust the output for an indication of 100-percent modulation on the mod monitor. Then switch the function generator to square wave output.

accurate and repeatable.

I've been using an older McIntosh tuner with a buffered, DC-coupled discriminator output to set peak modulation in the same way. This has proved to be a competitive loudness strategy over the years.

On the Tech Trek tour, I found most competing stations in our markets to be undermodulated. The undermodulation typically was greater for stations with high-density processing.

This is exactly the result one would expect based on the behavior of mod

FM engineers on Mars will face special problems*

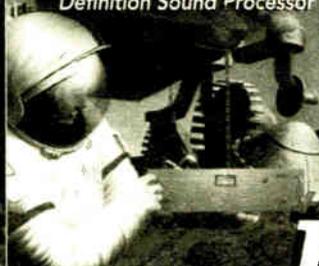
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Radio Systems agreed to do this for us because I twisted Dan's arm, but I wouldn't hesitate to contact him if you'd like to duplicate our setup.

Ease of use

Our effort was to make the package all-inclusive and ready to use. The engineer just puts the monitor in the car and takes it out to the transmitter in question.

Once there, a DAT is loaded and test tones are aired and recorded. Similar measurement recordings can be made anywhere else in the broadcast chain using the DAT alone. We designed the system packaging in two rack cases to allow the DAT to travel separately.

This represents a simple, easy-to-use, reliable and repeatable measurement system for FM broadcast quality assurance. Consolidated ownership groups can now implement a regimen of regular testing and product quality verification.

The results go far beyond what was envisioned by the old audio proof of performance. This system is a natural companion to remotely-controlled digital playback. Used as a package, the task of maintaining a pinnacle standard for audio reproduction and delivery just got a lot easier.

For a copy of the data CD that has the .WAV files on it, send me a stamped, self-addressed CD-sized envelope. The address is Frank McCoy, AMFM, 600 Congress Ave., Austin, TX 78701. I'll be happy to copy it for the first 50 readers who reply.

■ ■ ■

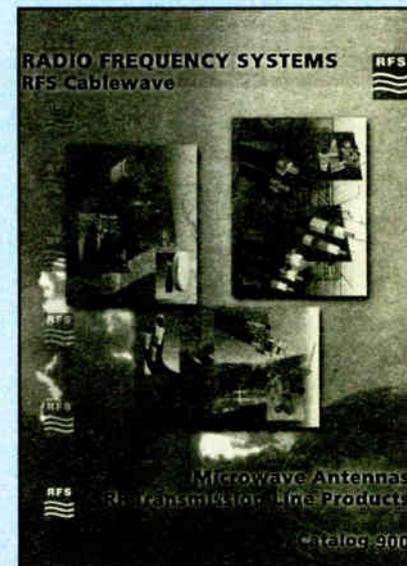
Frank McCoy is vice president, director of engineering at AMFM Inc. in Austin, Texas.

MARKET PLACE

Get Your RFS Catalog

Looking for transmission systems? Keep this book handy.

RFS Cablewave offers its Catalog 900, which includes coaxial



cables and connectors, microwave antenna systems and products, waveguide, connectors and accessories.

A second book, Broadcast Products and Services, describes the company's FM panels, sidemount antennas, yagis, dipoles, filters, combiners and special components. The pages of both include specifications and ordering information.

For information, call the company in Connecticut at (800) 437-3045, check out the Web sites at www.cablewave.com and www.rfs-group.com or circle Reader Service 52.

MARKET PLACE

Act on Impulse, Catch a Wave

Harris U.S. customers who order the new Impulse Digital Console before the end of the year will receive a free Bose Wave radio.

This is the radio that RW called "simply amazing ... a genuine breakthrough" when it was introduced. It remains a top seller and the subject of high-profile national advertising by Bose.



The Impulse is made by Pacific Research & Engineering, recently acquired by Harris. The console is targeted at on-air and production rooms, and is positioned as a lower-cost partner to the AirWave Digital and Integrity boards.



The Impulse is available in two frame sizes, with 12 or 20 faders and two telco input positions. Inputs accept digital or analog, and are configurable in the studio from A to D or D to A by swapping internal sub-modules.

Features include remote logic, three stereo program buses, each with D and A outputs, two automatic offline/program telco mix-minus outputs, a telco record split-feed and selectable monaural analog output. Four mic preamps with phantom power, two remote line selectors, slave-capable clock and digital timer are included.

Every order placed before Dec. 31 will include the popular Bose Wave radio.

For information, contact Harris Corp. in Ohio at (800) 622-0022, visit the Web site at www.harris.com or circle Reader Service 56.

Readers Forum is now found on page 62.

Nagra ARES-C Field Test

► NAGRA, continued from page 14
machine for a sturdy anchor. The velveteen cushioning on the strap started to shed.

We carried the six-and-a-half-pound ARES-C on our shoulders through garage areas, media centers and into team haulers for interviews. You'll feel it at the end of the day.

I was asked whether this machine was better than a MD or DAT. Sonically, they're about the same. For ease of editing, there are few options that are faster.

The one-box solution for ISDN and POTS helps keep the equipment bag a little lighter. You pay for that convenience and performance.

The Nagra ARES-C with battery box and carry case has a list price of \$5,995. With optional ISDN TA, battery stick, charger, power supply and two 20 MB PCMCIA cards, the price raises to \$8,900. Like those classic recorders from Nagra, this is a tool for a station, outlet or network that has a heavy commitment to field reporting and sound quality.

You can produce reports and features even more quickly than you can on MiniDisc. I really didn't want to send the unit back, for that reason.

Nagra makes a studio model of the ARES-C, and has introduced software

for Windows 95/NT which will allow instant download of the audio from the PCMCIA cards, and rapid conversion of audio formats.

I compare using the Nagra ARES-C to driving a high-performance car. Yes, there are less-expensive alternatives. Most equipment budgets for field news people wouldn't support the purchase of the machine on first examination.

But if part of the cost includes the time spent producing and editing material, and the cost of repair and replacement of machines, perhaps the cost curves will intersect.

■■■

Paul Kaminski is news director for the Motor Sports Radio Network and host of its "Race-Talk" program.

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BOOK REVIEW

On-Air Comedians, Warts and All

Read G. Burgan

They kept America laughing through the Great Depression, World War II, the Korean and Vietnam Wars, and cycles of recession and prosperity.

Their names are household words. Many people think of them as members of their extended family. They include Bob Hope, Jerry Lewis, Abbot and Costello, Groucho Marx, Fred Allen, Jack Benny and many, many more. They are the comedians of radio and television's Golden Age.

What were they really like? Were they as funny off mic and camera as they were on? Who were the genuinely nice guys and who were the stinkers?

Jordan R. Young inadvertently provides us with a look into the personal lives of the great radio and television comedians in his book "The Laugh Crafters: Comedy Writing in Radio and TV's Golden Age."

I say inadvertently, because the book's primary purpose is to chronicle the men — sorry, no women in this account — who wrote the material for comedy's greats.

Welcome tome

A book on radio's comedy writers is long overdue. With very few exceptions, no reference was made to these writers in the credits of the programs on which they toiled.

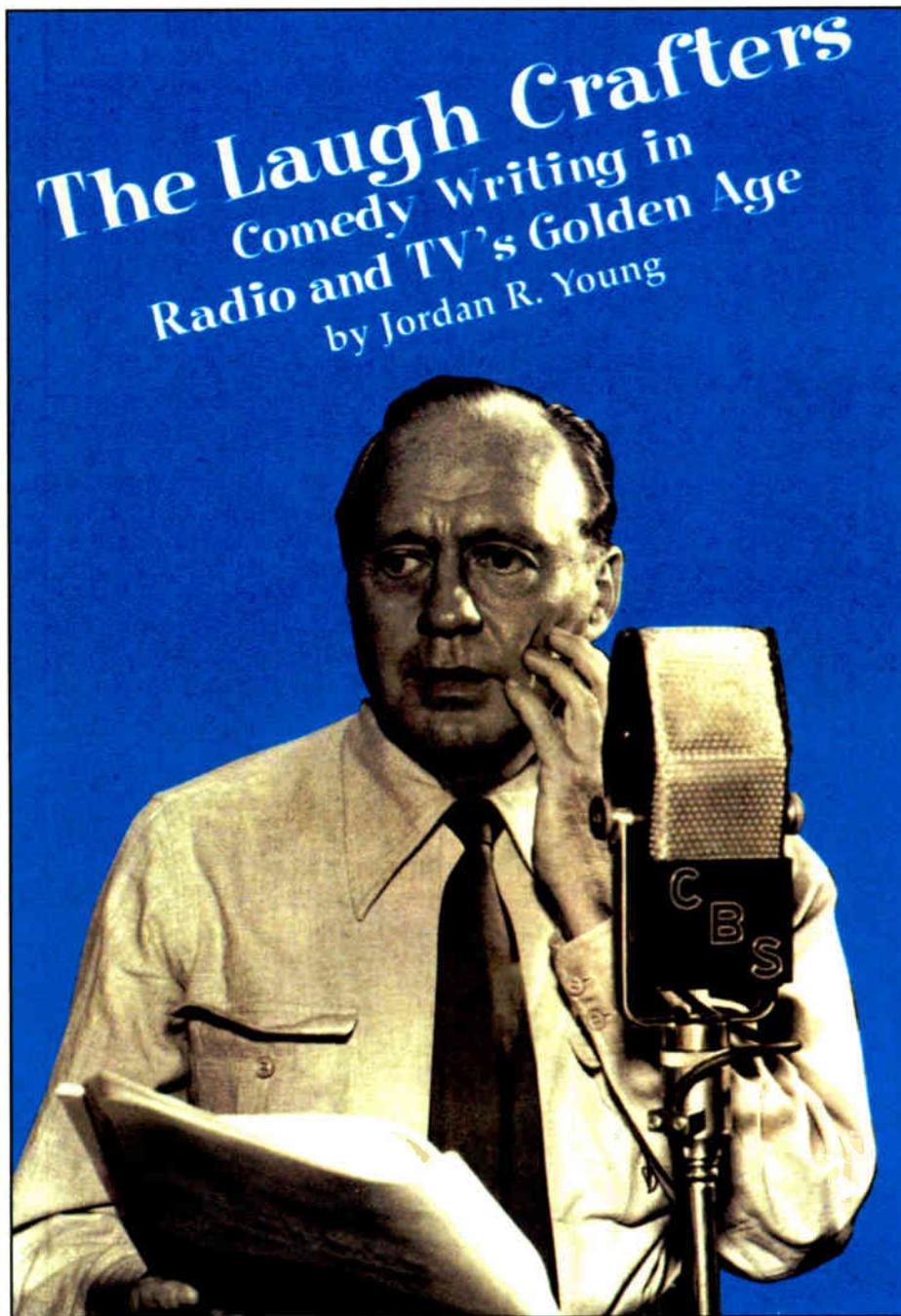
This was no accident. Writer after writer recalls that even great comedians like Bob Hope denied their writers on-air credit because they didn't want to spoil the illusion that the programs were spontaneous and the jokes were the creation of their own fertile minds.

Young's book is essentially an oral history. He interviewed 12 comedy writers, some in person, some by phone. How did Young select his interviewees?

"Anybody who worked for a major comedian was fair game. I chose Paul Henning because he wrote for Burns and Allen; George Balzer because he wrote for Jack Benny, and so forth," he explained in an e-mail interview for this story. "Some of the writers suggested others to me — Bob Schiller suggested I interview his old friend

Parke Levy, who was one of the original writers on 'Duffy's Tavern.' It turned out Parke had started with Jack Pearl and 'Baron von Munchhausen' in

reason, the book provides some remarkably candid accounts of the behind-the-scenes encounters between the writers and the men and women for whom they



1932, so I was able to go back to the beginnings of radio comedy with him."

The book's strength is its unabashed candor. By his own admission, Young did almost no editing of the material. For this

worked. The language includes four-letter words.

Some writers still seethe with anger at the low pay, long hours and anonymity under which they toiled. All-night writing

sessions were common.

At the same time, some comedians were wonderful to work for, paid well and generously, and extended credit to their writers readily.

Behind the scenes

Who were the most enjoyable of the writers he interviewed?

"Impossible to choose," he said. "But two of the most enjoyable would be Paul Henning, because he's such a sweet, modest, down-to-earth guy, and Bob Schiller, because he's a wickedly funny man who is almost incapable of uttering an unamusing sentence."

Who were the most difficult to interview?

"Norman Panama and Parke Levy were good interviews, but it was frustrating because they were both very ill, and had to be done by telephone. Parke was outrageously funny, but he was so ill we had to do the interview in short segments, 10 minutes here and 10 minutes there; he died not long afterwards."

Some writers surprised the author in what they revealed.

"Bob Weiskopf's recollections of writing for Eddie Cantor were certainly an eye-opener. But I've heard similar horror stories from other people who worked with Cantor, so I don't doubt them.

"Bob Schiller's comments about Red Skelton were also a revelation. I grew up worshipping Cantor and Skelton, but unfortunately they were not very nice to their writers. Paul Henning did not characterize George Burns as an ogre, but he revealed an eccentric little known side of him that surprised me."

Familiar tales

If the oral history's greatest strength is its candor, its greatest weakness is its repetition. After reading a few chapters you may feel that you have heard some of this before. Several of the writers interviewed by Young worked for the same entertainers, and in telling their stories, recount many of the same details and events.

However, it's a small price to pay for the kind of insight that only someone on the inside can provide. Part of Young's gift is his ability to ask the right questions, put the interviewee at ease and then just listen.

If you're interested in radio's Golden Age, if you wonder what it's like to be a comedy writer, or if you'd just like the inside scoop on some of America's greatest comedians, this book will prove a treasure trove of information.

■ ■ ■

Read Burgan is a free-lance writer and former public radio station manager.

Jordan R. Young is a show business historian who has written 12 books including "Spike Jones Off the Record" and "Reel Characters: Great Movie Character Actors." He has written more than 600 articles for the New York Times, Los Angeles Times, Washington Post and other publications, and original plays including "Hollywood Is a State of Mind."

"The Laugh Crafters: Comedy Writing in Radio and TV's Golden Age" is available from Past Times Publishing Co. in California. Retail price is \$17.95.

To order, call (800) 677-1927.

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MARKET PLACE

Columbine JDS Offers New Version Of Traffic System

Columbine JDS Systems Inc. is out with a new version of its JDS1000 traffic and billing system.

The company said new features of Version 16.1 include significant improvements for contract billing inputs, the ability to schedule two-for-one make-goods, and the ability to schedule nightly processing to start at a predetermined time.

The new version also interfaces to CJDS' Electronic Contracting (EC) system, allowing stations to exchange contract information electronically with national rep firms to streamline the buying/selling process.

A new feature allows not only the original contract to be transferred electronically between the rep and the station, but also subsequent changes, thus eliminating faxes and TWXs.

JDS1000 is an in-house media management system for AS/400 computers that integrates traffic, billing,

accounts receivable, and sales management applications.

The company also launched a new software system that provides management functions in the preparation of material for transmission in a broadcast operation.



Designed for multistation operation, Material Manager is an addition to CJDS' Paradigm integrated management information system. The company said it is the first product that oversees all material management functions of a station through one central database.

For information, contact the company in Colorado at (303) 237-4000, visit the Web site at www.cjds.com or circle Reader Service 53.

Organize Your Shop

► **WORKBENCH**, continued from page 12 at WOMX-FM in Winter Park, Fla., is shown in Figure 4.

If the plastic bins are too rich for your general manager's blood, the cardboard equivalents are inexpensive, and work just as well. You say your GM won't allow you to spend any money?

One engineer I knew traded records — I know, I'm dating myself — for the used cardboard boxes that the local TV repair

parts in his bins by type of equipment. If he lost his STL, he'd empty the STL bin to find the spare he needed.

If you are a contract engineer, and you have some down time, charge half your normal rate to organize the station's parts. Yes, it's mindless work, but you'll get paid something for your time. The investment will pay the owner back many times over the next time parts are needed.



Figure 4: Plastic or cardboard bins are cheap insurance and improve your efficiency.

shop or electronics supplier would throw away. There's no reason why you can't trade station T-shirts or CDs for the same.

At a packaging supplier, the engineer bought a can of cardboard-colored spray paint. (This paint comes in handy when you have to blank out old addresses or stickers on cardboard boxes being used to return equipment to the manufacturer, so it serves double duty!)

This engineer would spray the front of the cardboard parts bins, covering the description written on the box by the TV shop. He then wrote in his own, using a black marker. He had one of the neatest shops around, and could find a part in a matter of seconds. He grouped

Like it or not, an organized shop makes you look good. It shows you take pride in your job — it positions you to ask for more money, and get it. Knowing where parts are will speed repair time, increasing your efficiency.

John Bisset has worked as a chief engineer and contract engineer for more than 30 years. He is a district sales manager for Harris Corp. Reach him at (703) 323-8011.

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

The As and Bs of AES And Cat 5 Connectors

► **LAMPEN**, continued from page 19

lower, so you could stay well within the AES/EBU specs.

But AES requires more. It also says that crosstalk between pairs should be at least 30 dB. Digital is much more forgiving than analog in this respect. Well, we already talked about crosstalk in Category 5, which exceeds 45 dB at 10 MHz. And 48 kHz sampling gives you AES/EBU runs at 6.144 MHz.

There have been some recent changes in AES sampling and bandwidth which we'll discuss in a future column.

Crosstalk of 45 dB, compared to 30 dB, is dozens of times more crosstalk than you need! And some enhanced Category 5s are up to 55 dB, hundreds of times more crosstalk protection than you need.

There's only one big problem using Category 5 UTP or enhanced Cat 5 UTP for AES digital audio. The AES is specific in requiring shielded pairs.

So here's a quandary. We have a cable that meets all the specs but isn't built the way they say it should be.

Wire manufacturers have slowly come to realize that the reason we shielded pairs in the olden days was

because the pairs were imperfect. They either radiated their signals or picked up noise. So they put a shield around to reduce the effect. But it was the fact that the pair was improperly balanced, that it varied in capacitance and impedance, that caused these effects. So now we've fixed the pair instead, and no shield is needed!

What can we do? Why can't we use UTP for AES? Because AES says the cable must be shielded. But if you are the "keeper" of the spec (i.e. you answer to no one), then you can do whatever you please.

If you are required to meet the AES spec, well, then, sorry, you can't use any unshielded wire. And it's too bad, because Category 5 and enhanced Category 5 are pretty cost effective compared to AES/EBU cable.

Before you rush out and buy some Category 5 to run digital audio, there's more to the story — next month!

Steve Lampen is technology specialist, multimedia products for Belden Electronics Division in San Francisco. His book "Wire, Cable and Fiber Optics for Video and Audio Engineers" is published by McGraw-Hill.

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FOCUS ON DELIVERY SERVICES

Net Is the New Audio Pipeline

Alan R. Peterson

The Internet has become much more than the New Frontier. It is an efficient new pipeline for delivery of radio station content and traffic information.

Its relatively low operational cost and apparent ability to infiltrate every corner of the globe make it an appealing alternative to satellites and the FedEx truck to ship spots and music.

Big business

And the Net means big business. At least one new company gearing up for Internet-based delivery has the financial support of the Ackerley Group (owners of the New Century Media chain of radio stations), while one long-established delivery service already traffics lots of audio for the radio stations of Cumulus Media.

Intranets and WANs already are

used for delivery of audio and traffic material between group-owned stations. And as groups grow larger still, usage will likewise increase.

But even though the Net may be the new way to go, satellites will not be falling out of the sky for lack of use anytime soon.

"Satellite technology definitely has a future for information delivery. How that technology will be used may change," said Pete Lowenstein, vice president, distribution, NPR.

And it may be too early to pull your dedicated digital delivery box out in favor of a cheap computer and local Internet service.

Audio delivery to radio stations is a mix of efficient technologies, many of which are pressed into service simultaneously. For example, Prophet Systems Innovations (PSI) allows satellite delivery, WAN and localized

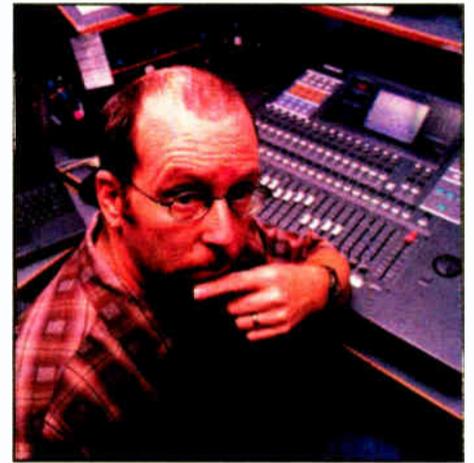
media in its systems. Users lean towards LAN and WAN to gain access to all prerecorded content

Benefits

Jim LaMarca, vice president of sales for broadcast programming, sees the benefit of WAN distribution.

"WAN is a reality for radio groups," he said. "The intranets are used for text and we use the Internet for voice tracking,

See FOCUS, page 27 ▶



Peter Barnes of SpotTaxi.com

Clear Channel's Net Deal Unlikely the Last

Steve Sullivan

It may not initially sound as impressive as its merger with AMFM, but Clear Channel has signed another deal that is resonating loudly throughout the media universe.

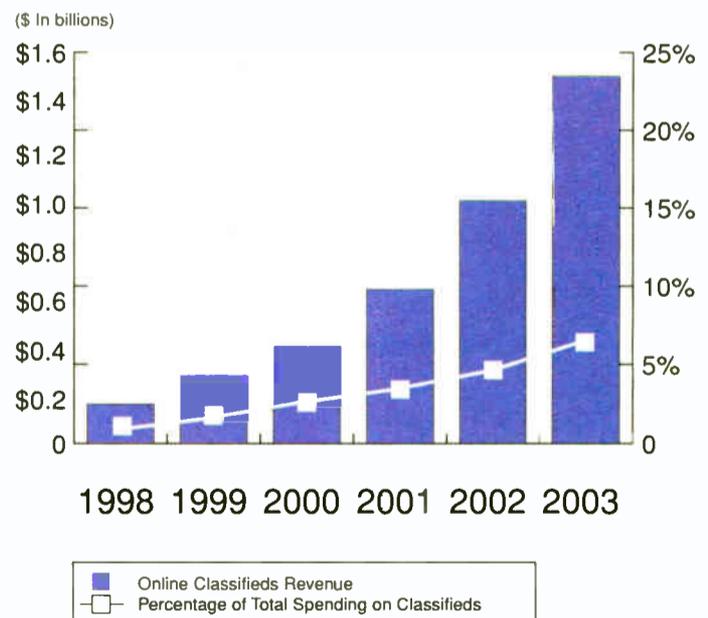
On Oct. 13, the company announced a three-year deal with Internet classified advertising company BuySellBid.com. The deal gives BuySellBid.com preferred-partner status on Clear Channel's Internet sites for the three big classified advertising categories — automotive,

arrangement as a "vertical partnership," meaning the relationship is based on the classifieds categories, also referred to as verticals.

"In these kinds of deals, we give our partners access to all our radio station sites in a fixed position," said Jenny Sue Rhodes, Clear Channel senior vice president of Internet operations. "And we charge a premium for it."

That premium amounts to a \$24 million payment from BuySellBid.com to Clear Channel, plus an equity stake for Clear Channel in BuySellBid.com.

Online Classifieds Revenue 1998-2003
(Projected)



Online classified revenue is expected to soar, according to a report from Jupiter Communications.

real estate and employment. In exchange, BuySellBid.com gets a combination of on-air and on-Web advertising and will share revenues generated by the classified ad sales.

The companies refer to the

BuySellBid.com executives believe they are getting a bargain.

Not only will it be the exclusive classified advertising vendor on 455 Clear Channel Web sites, it will also receive

See DEAL, page 28 ▶

radio systems millennium products

- CT-6 satellite receiver
- CT-6 desktop clock / timer
- CT-6 thin clock / timer
- DI-1000 telephone hybrid
- DI-2000 telephone hybrid
- DA-4X4a distribution amplifier
- CT-6 large clock / timer
- RS-12a millenium console
- MRS BRAVERMAN, company spokesmodel

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► FOCUS, continued from page 26
logs and bits."

Peter Barnes is a little less reserved on the topic. "The Internet is so right, it's such a great communications tool!"

Barnes is president of SpotTaxi.com, a new radio advertising distribution system poised to begin operations in the first quarter of 2000.

The company, an outgrowth of Central Media Inc. of Seattle, promises to use the Internet to distribute spots faster and more efficiently than is done by current distribution means. SpotTaxi.com has financial support from the Ackerley Group, which is also assisting with the planning and implementation of the system.

According to Barnes, this is how the system works: a production house completes a spot and uploads it to SpotTaxi. The agency can open the spot and review it, then direct it via the Internet to the stations that are part of the buy.

A low-resolution "thumbnail" copy of the spot also arrives at the stations for auditioning, similar to the low-resolution



graphics on Web pages that expand to their full-size counterparts when clicked.

If Internet delivery is so simple, it should be possible merely to send commercials and traffic instructions to all participating stations with common e-mail programs.

"But then, stations would need to keep hundreds of URLs on file," said Barnes. "There would be no system to track this. No responsibility."

In this regard, SpotTaxi becomes a warehouse and distributor, saddled with the responsibility for tracking spots that have been delivered, as well as acting as a repository for spots that must be re-sent or recovered.

SpotTaxi.com will not be the only player in this field. Digital delivery pioneer DG Systems has instituted iAudio, which accepts MP2 and MP3 audio files sent over the Net from studios, turning them around to more than 6,000 online sites and offline users.

Cumulus Media uses DG Systems extensively as a two-way audio delivery service. BSI, makers of cost-effective automation software, recently introduced WebConnect, which allows the transfer of audio files and traffic information over the Internet to other WebConnect users, with the simplicity of sending an e-mail message. But it only works with the company's own software products.

Role reversal

There are numerous Web enterprises that will happily place radio station audio on the Internet, but few seem interested in becoming couriers for audio delivery to the station. Likewise, long-form audio programming delivered over the Internet remains a somewhat impractical process.

John Brier is president of BroadcastMusic.com, one such company that is thinking one-way only.

"We put up stations and offer syndicated programming such as 'Good Day USA,' and the technology will move that way. But it's nothing we're looking at," he said.

Given the sometimes inadequate audio quality users have experienced in the past, it seems unlikely that an audio

stream delivered over the Internet can be considered airable. It seems unfathomable that a stream can be placed over an actual broadcast station in real time.

Enter Cyberradio2000.com, which is using the Internet as a pipeline to deliver weekend music programming — live as it happens — to a Phoenix radio station.

Sal Lepore, president of Cyberradio2000.com, explained the program "Cyberradio 2000 Dance Party" is produced in Chicago and is delivered over the Internet in real time and at CD audio quality to KRXS(FM) in Phoenix.

"We beta-tested it last year at WCKG(FM) in Chicago," said Lepore, "and it delivers CD quality at 56k." Lepore accomplishes this with a special encoder developed at Cyberradio2000, which he declined to describe in detail, but claimed can provide a sustained, high-quality data

stream throughout the entire broadcast.

This is an especially clever trick, given the congestion caused by millions of casual surfers on weekends that could bog down the Net in general.

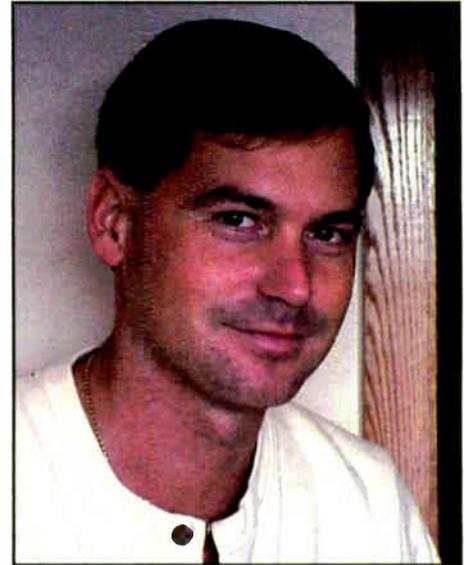
"I don't understand stations that spend \$10,000 for remotes using direct ISDN. Too expensive," he said. "You could do a show for \$1,500. What will that do for your bottom line?"

Will the Internet make satellite delivery go away? Internet and telephone connections depend on satellites to get the signal through, so in an indirect sense, the answer is no.

Art Constantine of Musicam USA is more to the point.

"You have got to get programming to the station in a quality that can be rebroadcast. To get a big fat file over the Net, you

See FOCUS, page 34 ►



John Brier of BroadcastMusic.com

PSi Academy—

worth its weight...



"John Marquis' (PSi Director of Training) PowerPoint presentation, and subsequent course materials, were unexpectedly clear, concise and totally professional. I was very impressed by the training facilities. A company that makes that much of a concerted effort to provide the highest level quality training, and who has committed the time, personnel and resources to do it right, speaks volumes about their commitment to their customers."

Jeff Hugabone, Chief Engineer, WTIC, CBS - Hartford, CN



"John was a great instructor. He knew what parts to slow down through and how to read his audience. Since the instruction is all hands-on, you really felt like you were retaining what you were learning. The grand slam though, was when he got to the system's voice tracking capabilities. He introduced it in such a manner, that an entire room full of radio guys were blown away! He knew just how to address the areas that were of importance to us."

Mark Williams, Production Director, WPOC, Clear Channel - Baltimore, MD



"I was completely impressed by the training offered by Prophet. Both the facilities and the course itself were absolutely first rate. I was able to return to the station and immediately utilize what I had learned. We are in a transition now with the AudioWizard™ handling 100% on the AM side, and about 50% on our FM - and PSi has been with us every step of the way. Even the PSi people regularly go through the in-depth training, to constantly stay on top of the latest features and functions. I really appreciated the attention to detail they put into the class, our comfort and the depth of the knowledge they imparted. It also enabled me to connect names and faces with customer service and tech support there in Nebraska - so now when I call, I know who I'm talking to - and they know me."

Ken Lovejoy, On-Air Personality, WIKX - Clear Channel - Punta Gorda, FL

PH: 800/658-4403
FX: 308/284-4181
sales@prophetsys.com
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For more information on the PSi Academy, visit our web site at www.prophetsys.com



Clear Channel Nets a New Deal

► DEAL, continued from page 26
an undisclosed cut of revenues generated by classified ad sales on the sites. Additionally, the deal could be extended to include AMFM stations when the merger with Clear Channel is complete.

"We have certain rights that will apply to (the AMFM stations) when they're added to the fold," said BuySellBid.com President Laurence Norjean. That merger would push Clear Channel's station holdings well past

800, even after the new entity sells off stations where required by federal law.

AMFM is paying close attention to the Net. In November, it named radio CEO Jimmy deCastro to head its Internet initiative, AMFMi, which had been led by Vice Chairman Steven Hicks. But the AMFM Web sites are inconsistent in their approach to advertising in general and classifieds in particular. That suggests to some observers that AMFM would want to ride the coat-

tails of Clear Channel's Internet strategy.

"I think the timing is good for BuySellBid.com," said Jordan Rohan, online media analyst for the New York investment firm Wit Capital Corp. "I expect the deal will be leveraged across the AMFM stations once that deal is completed."

Rohan said Clear Channel is making smart strategic investments in order to keep pace with CBS's Infinity Broadcast group, which he sees as the industry leader in Internet strategy.

Norjean said BuySellBid.com is in good shape to service the hundreds of stations involved in the deal, having to add staff only to its marketing department as a result.

The company, which recently changed its name from InXsys Broadcast Networks (RW, June 23), is headquartered in Longview, Wash. With technical offices in San Diego and marketing offices in Los Angeles, BuySellBid.com has several regional offices in operation and a few more will be added to facilitate the Clear Channel relationship.

"It takes us 20 minutes to turn on a station with their complete identity. Our technology is completely scalable, whether we're running 1,000 or 5,000 stations. We're adding people who will work with the local stations to help sell them in," Norjean said.

"They'll go into local markets and work with local sales and account executives to get the ball rolling for them, creating online shops and auto malls and things of that nature. And we'll be handling the national accounts as well."

The deal between BuySellBid.com and Clear Channel does not mark the first time the two organizations have worked together. They previously collaborated on two divergently different Web sites, one for KIISFMi in Los Angeles and the other for XTRA-FM in San Diego. The KIISFMi site, www.KIISFMi.com, is intended to be an Internet multimedia superstation, attracting a worldwide audience.

Conversely, XTRA's site at www.9IX.com is strictly local. While the superstation approach may be more ambitious, it is with the local approach that BuySellBid.com and Clear Channel hope to strike gold — and strike fear into traditional classified advertising kings.

"When a major radio station group makes a deal with a Web enterprise, often it's to leverage their sales contacts into a category that was traditionally dominated by newspapers," said Rohan. "Before this deal with BuySellBid.com, Clear Channel had not been able to take advantage of classifieds. Now they can."

Statistics show ...

And it's no wonder they want to. According to statistics from the Newspaper Association of America, automotive, real estate and employment classifieds brought in more than \$15 billion dollars to newspapers in 1998. In the first half of 1999, sales in those three main verticals totaled more than \$7 billion.

While sales are still robust, newspapers quickly are losing their once-exclusive grip on the franchise. Newspaper publishers are staggering from the double whammy of a decline in daily readership (down 0.7 percent from 1998 according to the NAA) and an increase of opportunistic competitors selling classified advertising online. Estimates of online classified revenue



Jenny Sue Rhodes of Clear Channel

growth vary, from \$2.85 billion by 2003 (Forrester Research) to \$1.4 billion (see Jupiter Communications chart, page 26). All predict significant growth for online classified revenue.

Norjean, whose pedigree includes more than 25 years as a broadcast marketing professional, said BuySellBid.com is now more aggressively competing against newspapers, a group his company once served.

"All the people who work for us are former broadcasters, and that's our business. We did have several newspaper clients in top-10 markets, but we decided it was better for us to stick to our own industry rather than help our competitors.

"The reality of this is that when a newspaper wants to promote its classifieds, it does so in its own medium," said Norjean. "Look at their attrition rate and the fact that they're not getting younger readers. The younger target audience is accustomed to going online or listening to the radio. Those are the ones who are buying the most cars, who are looking for apartments and who are looking for jobs.

"This is the right time with the right tools for radio stations to reach out to that audience and superservice it and take a big chunk of that market from the newspapers."

When Norjean mentions "the right time" and "the right tools," he is referring to the rapid penetration of broadband access to the Internet and the technological opportunities it brings. BuySellBid.com peppers its classified offerings with rich multimedia content — streaming audio and video, virtual tours of real estate.

Broadband Internet access will increase the quality and download times for those offerings. That also opens the door for one of BuySellBid.com's equity partners, NBC, to contribute to the relationship by supplying video at some point down the road, a possibility that Norjean does not rule out.

Norjean pointed to an upcoming initiative for BuySellBid.com to add more editorial content to its classifieds. Some will be created by the company, but more will come via partnerships with magazine publishers.

Included will be buying and selling guides, mortgage calculators, maintenance information and other informational and entertainment content.

"Two years down the road, when broadband is finally here, radio is going to have the greatest opportunity in its 75 to 80 years of existence," said Norjean. "And that's to metamorphose into a new medium — programming on demand, a two-way transactional cable. We always say, 'Radio brings more results.' Well, this offers advertisers the ultimate result — a final sale."

■ ■ ■

Steve Sullivan is a principal of the Advanced Interactive Media Group, LLC.

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The Story of the Season's Songs

Ken R.

When does the Christmas season start? In the 1960s, we might have said Dec. 1. Today, we might answer, "Anytime after Halloween."

But what hasn't grown is the list of holiday songs we play. And although new artists release Christmas songs, usually they are recordings of old songs.

While you and your listeners can sing along with the season's favorites at this time of year, many of the stories behind these classics are unfamiliar.

This article was written with the assistance of noted musicologist David A. Milberg, who has served as an authority on Christmas songs in broadcasts on WGN(AM) and National Public Radio in Chicago and KRLD(AM), Dallas. Milberg is marketing director for a large Chicago law firm.

White chestnut

The Christmas chestnut "White Christmas," as sung by Bing Crosby, was first recorded for the 1942 movie "Holiday Inn."

But the movie "White Christmas" was made 12 years later, in 1954. And that movie's version of "White Christmas," sung by Danny Kaye and Peggy Lee, stayed on the Billboard charts for at least three years.

The original opening line of the song set a wistful Christmas scene — in sunny California. Composer Irving Berlin revised his lyric to the familiar idyllic snowy scene just before "Holiday Inn" began filming. Crosby then made his first recording of the song with the revised lyrics for that movie.

The song 'White Christmas' originally opened with a description of sunny California.

Sharp listeners can still hear the California opener on recordings made by Darlene Love and Tiny Tim.

Most radio stations haul out Gene Autry singing "Rudolph, the Red-Nosed Reindeer" every year. Would you believe he recorded it three times?

The 1949 original was on the Columbia label, but Autry realized that if he started his own label — Challenge, named after his horse — he could keep more of the profits from his own recordings. Thus a second version was recorded in 1957 on the Challenge label. A third version was recorded in 1969 for another record company he owned, Republic, named after the movie studio where he made all those oat-burning serials.

Autry pulled the same moneymaking trick with his other Christmas novelty song "Here Comes Santa Claus." By creating a new version of the song for a label he owned, Autry was able to keep the "mechanical" rights fees from radio and TV stations that would have gone to Columbia.

Each time the new version was

played, the cash register would ring at Gene's house.

The version of "Blue Christmas" most people remember is the 1964 hit by Elvis Presley. But Ernest Tubbs, Russ Morgan and Hugo Winterhalter had hits with that tune in 1949. Elvis copied his arrangement almost exactly from the 1960 "Blue Christmas" by The Browns.

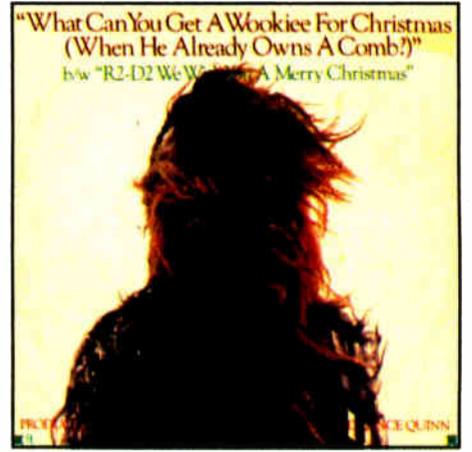
The story behind "The Christmas Song" ("Chestnuts roasting by an open fire..."), written in the middle of a steamy July summer day by Mel Tormé, really tells the story of a black artist's struggle for equality in the eyes of his record company.

Nat "King" Cole first recorded this

ballad in 1946 backed by a minimalist trio consisting of guitar, piano and bass. Cole recognized that the white artists always had bigger recording budgets than he received, allowing better arrangements and the addition of a string section. Cole stood up for his rights and was granted those privileges, re-recording this song in 1949, 1954 and 1956. Listeners are never told, and stations are never sure, which version they're hearing.

A rumpa tum-tum

No Christmas holiday would be complete without hearing "Little Drummer Boy" by the Harry Simeone Choral.



The first version was recorded in 1958 and stayed on the Top 40 charts an incredible 12 years through 1970.

If you don't like that recording See SONGS, page 31

Citadel Selects Scott Studios as "the Best" Digital System



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

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

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

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

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

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

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

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

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

Scott Studios is famous for our uncompressed digital systems at a compressed price, (but we work equally well in MPEG and MP3). Scott Studios' audio quality is the very best and plays on laptops or PCs with ordinary sound cards. We pre-dub your startup music library free. Your PD can auto-transfer songs digitally in seconds with a CD-ROM deck in his or her office.

Scott gives you industrial quality 19" rack computers, but nothing is proprietary: functional equivalents are available at computer stores. You also get 24 hour toll-free tech support! Scott also lets you choose your operating system: Linux, Novell, NT, Windows, DOS or any combination. You also choose from three systems: Good, Better, Best. One's right for you!

The Scott System 32 (pictured at the upper right) is radio's most powerful digital system. Your log is on the left side of the LCD touch screen. Instant access Hot Keys or spur-of-the-moment "Cart Walls" are on the right with lightning-quick access to any recording. Phone calls record automatically and can be edited to air quickly. You can also record and edit spots or voice tracks in the air studio or go on the air from production.

Options include seamless redundancy, self-healing fail-safes, newsrooms, 16-track editors, time and temperature announce, and auto-transfer of spots and voices to distant stations over WAN or Internet. Check our web site and call us toll-free.



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

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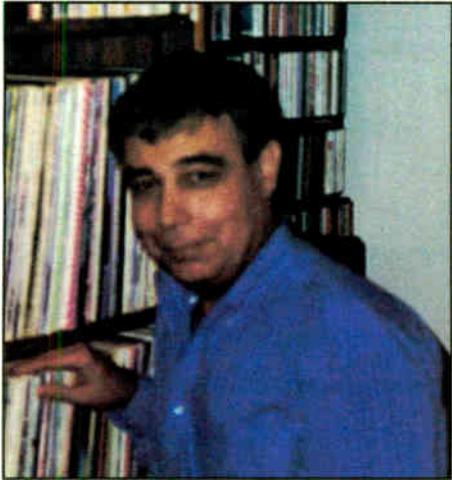
Telephone: 202 • 414 • 2626
www.nprss.org

Who Can Forget These 'Standards'?

► SONGS, continued from page 29

though, you might check out the other hit versions by Johnny Cash from 1959, Johnny Mathis from 1963 and 1964, Joan Baez from 1966 and Lou Rawls from 1967 and 1969. Oh, and please don't miss the disco version recorded in 1975 by Moonlion.

While Christmas itself is a Christian holiday, some of the biggest holiday hits were penned by men of the Jewish faith. Irving Berlin wrote *White Christmas* and Johnny Marks came up with both "Rockin' Around the Christmas Tree" and "Rudolph, the Red-Nosed Reindeer."



David A. Milberg

Some of the biggest-selling cover versions of Christmas hits are by Jewish artists such as Neil Diamond and Barbra Streisand. The 1960 hit "Last Month of the Year" by the Kingston Trio was actually borrowed from an ancient Passover song.

Novelties

Long before Snoop Doggy Dog and Dr. Dre came up with the idea of "sampling" older records and recombining them to make new hits, a group called Buchanan and Goodman started the trend in 1956 with a goofy song called "The Flying Saucer."

B&G used razor blades and tapes of current chart-toppers and "cut out" a line or two from several, around which they would build a humorous narrative. In 1957 they released "Santa and the Satellite, Parts I and II."

The use of other artists' material became controversial and several composers attempted to sue Buchanan and Goodman. In fact, B&G had a small hit with "Buchanan and Goodman on Trial." But in the real court of law, these paste-up artists won all their cases.

A later Christmas hit in 1961 was "Santa and the Touchables," a take-off on the then-popular "Untouchables" television series.

Ray Stevens was famous for his off-the-wall novelties such as "Ahab, the Arab" and "Guitarzan." His entry in the Christmas genre was the 1962 classic "Santa Claus Is Watching You." For radio play, Stevens released a shorter version, which is what most stations air today.

One of the oddest pairings in Christmas musical history has to be David Bowie and Bing Crosby singing "Little Drummer Boy/Peace on Earth," released in 1982. It was produced after Crosby's death by Bowie, who went into the studio and sang along with

some of Crosby's old tapes.

Most folks are pretty sick of hearing

know about this perennial favorite: the original version was the 1979 non-hit

While Christmas is generally considered a Christian holiday, some of the biggest holiday hits were penned by men of the Jewish faith.

"Grandma Got Run Over by a Reindeer." But here's what you don't

recorded on the Kim-Pat label. The version we hear was re-recorded and

simultaneously released on the Oink, Soundwaves and Epic labels — all in 1982. This little piece of holiday fluff managed to hit the charts in 1983, 1984 and 1987.

Follow-up non-hits, which mercifully are heard rarely, include "Grandma's Spending Christmas With the Superstars" which involves Elvis, "Grandma's Going to Sue the Pants Off Santa," "Grandma's Killer Fruitcake," and finally "Don't Make Me Play That Grandma Song Again."

My nomination for the worst Christmas novelty song? The 1980 masterpiece which we hope will die a slow and painful death: "What Can You Get a Wookiee for Christmas" by the Star Wars Intergalactic Droid Choir.

May the Christmas force be with you!

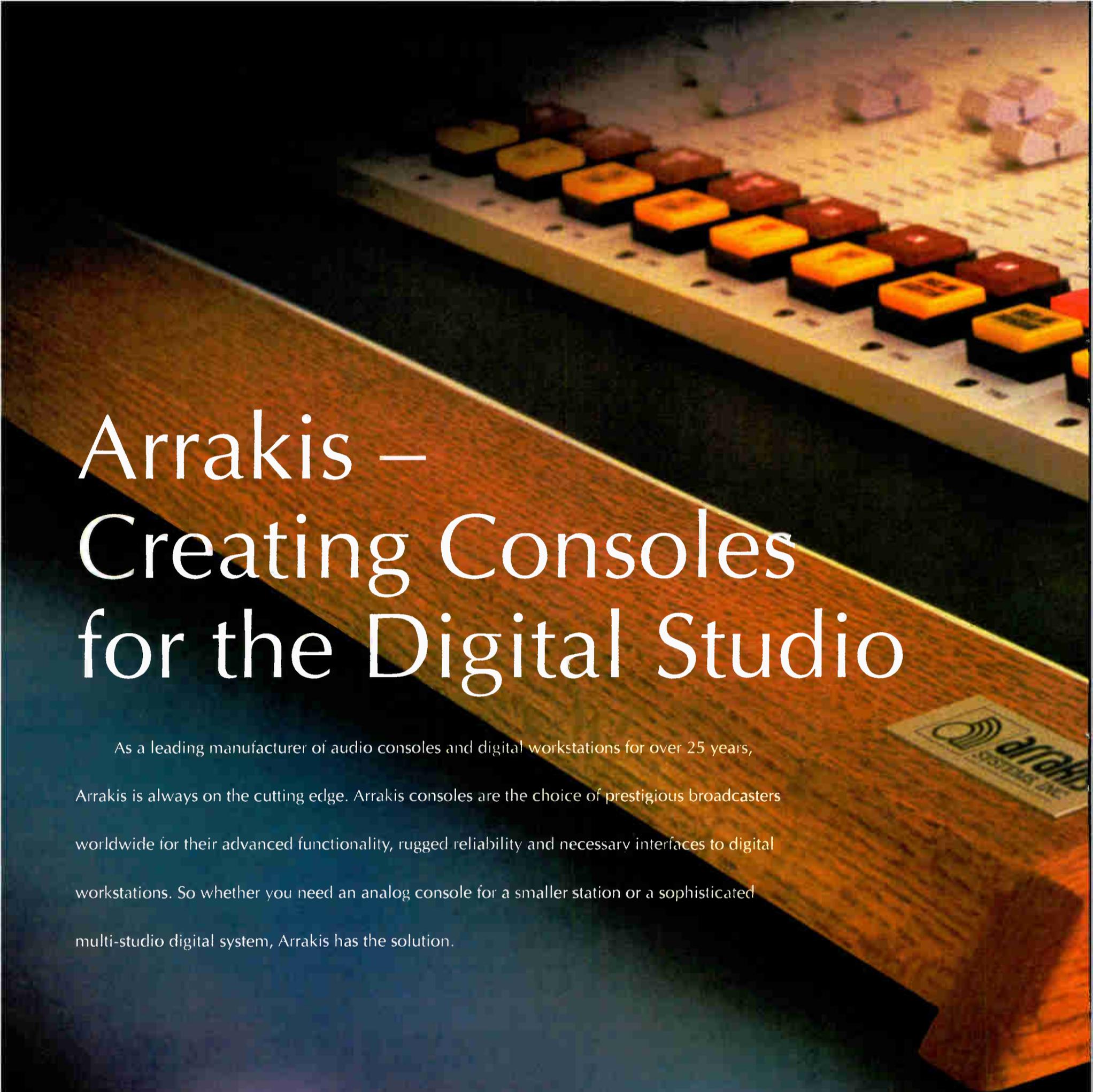
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Radio Makes Waves on The Internet

► FOCUS, continued from page 27

have to compress it, and there is a lot of misinformation about compression already. You have a low-bitrate MP3 that is barely airable, then in some cases will be recompressed to be sent over the STL."

For the time being, satellites can still move it faster. But whether by Net or by bird, Constantine's advice is, "Use the most benign compression, if used at all."

The Internet backbone is improving, but is still not yet fast enough or wide enough to support lots of these real-time streams all at once. More than one participant interviewed for this article said usage will increase, and, like any super-highway, the backbone will fill to capacity as soon as it is upgraded.

The Internet is not the end-all for delivery, at least not yet. Al Kozak, vice president of marketing for DG Systems, sees a continuing need for his company's services.

"There is a competitive advantage in terms of coverage," he said. "A station's Net connection is often used for other things, delaying the arrival of a spot to the station. And you can't sell an agency a commitment you cannot deliver on."

DG Systems has investigated using the Internet for at least two years and is planning a Net-based delivery service to augment its iAudio service. For now, Kozak said, maintaining dedicated terminals for commercial download and storage is the way to go.

"We deliver 2-1/2 million commercials a year," he said. "There is a definite advantage to dedicated connections where everybody's box is tuned in to us."

Nevertheless, that side of the market appears to be consolidating. Competing digital delivery service Digital Courier was acquired by DG Systems last year.

Even when the Internet will go that fast, not everyone is anxious to become a program provider. Barnes said SpotTaxi will likely stay on the sidelines.

"We are specialized for spots," he said. "We're not going to try to compete in that area," adding a moment later, "I suppose instead of 'SpotTaxi' we'd then be 'Program Limousine.'"

As has been seen, the Internet is capable of offering fast and inexpensive delivery of crucial audio and many companies are exploring the likelihood. So that copper pair and the satellite line are likely to coexist for a while to come.

Ironically, it was Dave Newton of Broadcast Programming who noted, "Telephone lines...that's what the radio networks started on."

■ ■ ■

Alan R. Peterson is technical adviser to *RW* and former editor of *Studio Sessions*.

WEB WATCH

Web Watch Items are collected and reported by Carl Lindemann.

Baseball Clarifies The Rules

Major League Baseball has notified TV and radio stations carrying their games to stop Webcasting games unless their contracts specifically entitle them to do so.

Ethan Orlinsky, vice president and general counsel for MLB, said the problem is not widespread, but highlights a possible misunderstanding.

"Our contracts grant specific rights to either broadcast on radio, telecast or satellite. To the extent that those rights (to Webcast) aren't explicitly granted, they are reserved," he said. Though broadcast rights are separate from Webcast rights, MLB does license clips and other material for station Web site use for fees to be negotiated.

Is Net Decimating Old Media?

New studies show that the Internet is not eroding audiences for other media as badly as earlier studies suggest. In fact, an Arbitron NewMedia report indicates that those spending a great deal of time online also consume large amounts of traditional media.

"Pathfinder results show no evidence that increasing Web use is usurping all the time spent with the traditional media," said Dr. Roberta McConochie, director of research, Arbitron NewMedia.

"Web marketers should continue to take advantage of the cross-market synergies to efficiently promote their sites, reinforce Internet brands and drive Web traffic. At the same time, the traditional media should continue to extend their brands and franchises into cyberspace," she said.

A study by Burke Information Communications and Entertainment Research using data from MTV Networks and Turner Entertainment Networks showed that television viewing has not been adversely affected by Net usage.

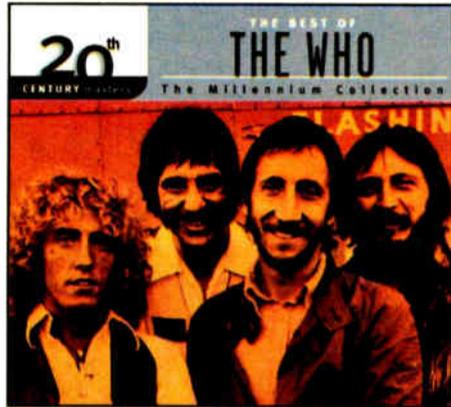
According to the study, less than 2 percent of Internet-enabled people traded time spent watching TV solely for Internet usage.

Other findings from the Burke study show that 66 percent of households with Web access have gone to a network's

Web site for more information about a program after watching the program; 42 percent watched a program based on information on a network's Web site.

New Online Broadcast Network

Pixelon.com, the first online broadcast network claiming to provide full-screen, TV-quality video and audio, began Webcasting on Halloween weekend.



Pixelon.com went for classic entertainment at its launch.

The company celebrated the launch with a \$10 million event at the MGM Grand Hotel and Casino in Las Vegas. The legendary rock band The Who, reuniting for the Pixelon.com launch party, provided the music. The company claimed it was the largest event ever held to launch an Internet company.

What sets pixelon.com apart from a standard Webcast is the ability to offer the audience a "unique personalized online experience, with each performance broadcast from multiple cameras so viewers have a choice of camera angles."

At press time, my own attempts to sample this "unique experience" of RW was more akin to an all-too-common online experience. My computer choked for the first three tries at downloading the huge file needed to access the Web site's content. After getting past this hurdle and onto the demo, Windows 98 crashed.

The resulting frustration nearly resulted in a personal tribute to Pete Townsend's guitar-smashing days directed at my computer.

Katz Targets NY Suburbs

According to Christal Radio, a division of Katz Radio Group, advertisers targeting their city neighbors overlook suburban

New York listeners. Christal Radio has designed a way for advertisers to reach the suburbs through Christal-suburban.com.

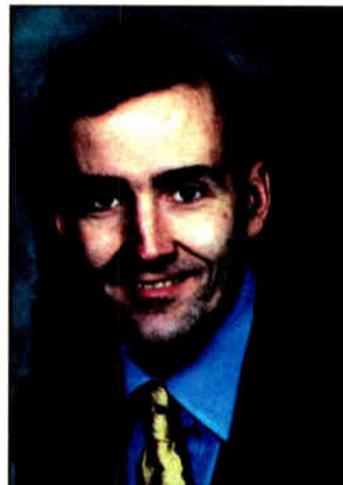
"Communities surrounding the New York metro area have been largely ignored over the years, when in reality, the suburbs offer enormous potential for most advertisers," said Steve Shaw, president of Christal Radio. "The Web site is a simple and accessible method to clarify many of the qualitative and quantitative questions that buyers, planners, supervisors and even clients have regarding suburban radio," Shaw said.

The site aims to bring balance to media plans that typically focus on the New York metro market.

"Most advertisers are looking for people with high incomes, computer users, homeowners, college education, and children in the home. Suburban radio remains the most efficient means for delivering to these customers," said Michael Blauner, director of suburban sales for Christal.

Kerbango to Release Net Radio Device

Kerbango Inc., a start-up company founded by former Apple and Power Computing executives, aims to increase the popularity of Internet radio by making it more reliable and easier to use.



Jim Gamble

The kerbango.com Web site aims to give Internet radio listeners a single, convenient Web site for finding, selecting and listening to Internet content. The company plans to bring the first stand-alone Internet radio to market in the first quarter of 2000.

The company Web site claims, "The Kerbango Internet radio will be more exotic, powerful and personal than any



radio before, but just as easy to use. It will deliver worldwide news, music, sports and educational material directly to you, requiring only the radio itself and an Internet connection."

"Internet radio is the next frontier for Internet appliances," said Jon Fitch, Kerbango's chief executive officer.

"By carefully managing the interplay of the Kerbango Web network and the Kerbango radio, we offer the listener a great new experience. Our goal is to make playing Internet radio as easy as playing AM/FM radio without requiring a PC," Fitch said.

Jim Gamble, Kerbango's president, said online listening can be like a new band for the radio audience.

"We know that millions of people have tried listening to Internet radio on their PCs. We are convinced that Internet radio will be as big for broadcasting as FM was in the 1960s. Someday new radios will routinely offer AM, FM and IM (Internet Music)," he said.

Pubcaster Teams With Retail Giant

Newark Public Radio station WBGO(FM) in New Jersey and New York City-based J & R Music World have come together to promote jazz music and sales online.

J & R Music World's homepage at www.jandr.com features a prominent link to WBGO's streamed signal. However, the WBGO site at www.wbgo.org does not have a reciprocal presence for J & R.

As a public radio station, WBGO cannot post advertising content on its Web site, or run more than minimal underwriting credits on the air.

Public radio observers assert that while commercial underwriting of public broadcasting is nothing new, the WBGO/J & R relationship sets a new model for symbiosis in such relationships. J & R enjoys the

See WEBWATCH, page 36 ▶

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WEB WATCH

► **WEBWATCH**, continued from page 35
e-commerce driven by WBGO's programming without becoming an overt part of their on-air programming.

Amy Reed, marketing manager for WBGO, said the agreement to cross-promote came after having the station signal streamed through CD Now.

"We'd been streaming our signal for two years with N2K. But when they were bought out by CD Now, we weren't getting nearly the exposure on their site that we had been," she said.

According to Reed, J & R Music World approached WBGO and offered to get them a better deal. This new arrangement follows J & R's ongoing support as an underwriter and source for electronics. "We've just been up with them for a

month, and so have just started to explore the cross-promotional opportunities. So far, they are in our programming guide



and we have also done some in-store appearances," said Reed.

Riverland Goes Online

In time, "College Radio" may be strictly a Web phenomenon. Take the example of KERC.

On Nov. 8, online station KERC "The Rock" Radio made its debut from the Riverland Community College studios in Austin, Minn. The student-run station is an "Active Rock" format, with a 24-hours-a-day, seven-days-a-week schedule.

The KERC "target demo" is 15 to 28. The station can be accessed at webradio.com/formats/format-alt.html

According to General Manager Eric Shoars, the station is an important part of the student experience.

"They'll get 'live' broadcast experience that includes every aspect of on-air performance and station operations,

including music scheduling, digital editing, voice tracking and the software packages used in stations across the country to perform these functions.

"In addition, it will provide them with the opportunity to audition — live — for potential employers." Shoars said the operation process will match that of any professional broadcasting facility.



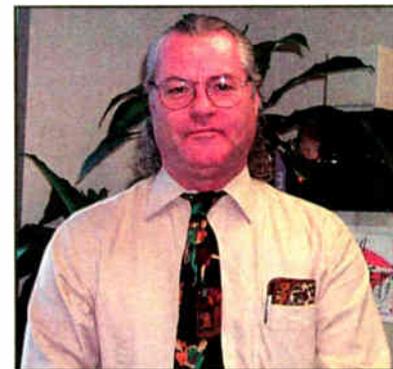
Shoars pointed to another important feature of the new station.

"Unlimited coverage area for KERC also means unlimited access, so if a student traveled from another state to attend Riverland's Broadcasting Program, friends and family back home can now listen to live performances. Students and families like that very much."

Tune in the Apocalypse?

What if every radio station were to broadcast the same signal, and every radio in existence blared it out at the same time, to celebrate 2000?

This is the millennial vision of one Robert L. Black, Ph.D., CPA and business professor at California State University San Marcos. Black has been taken by this vision since the 1960s.



Robert Black

To facilitate this cosmic convergence, Black is calling on towns, neighborhoods and stations to organize, and has established a Web site and chat group at www.planetparty2000.com. Beyond creating this online clearinghouse, he leaves it to destiny to decide the fate of his concept.

"Quite frankly, I hope my inspiration has its own legs and needs no more than this germ of an idea. As far as I'm concerned, it's up to all of you to do the rest," he said.

"The possibility of coordinating your local stations' efforts across cities and time zones would most likely produce a 'battle of the bands' — or at least a 'battle of radio stations' — for millennium-eve listeners," his site states.

What would a global, simultaneous radio broadcast accomplish?

"Besides the obvious creation of a lot of synchronized music, we could for the first time send some more coherent signals around the planet and into the cosmos."



Carl Lindemann has worked in radio as a field reporter and production director. He consults on radio/new media projects and writes extensively on these subjects. Reach him at carl@cyberscene.com

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STATION SERVICES

Patrick Does Radio

ESPN SportsCenter Anchor Dan Patrick has added a radio show to his duties at the sports network.

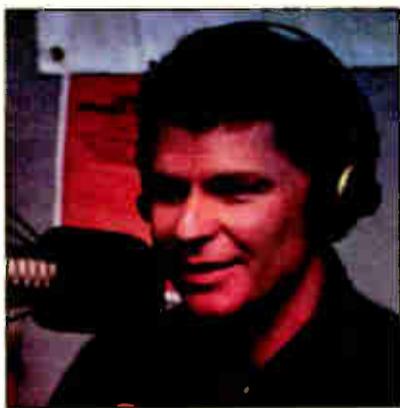
"The Dan Patrick Show" features interviews with newsmakers and celebrities, ESPN commentators, reporters and analysts and the day's top stories, all with a sports angle.

Patrick interviewed President Clinton on his afternoon radio show Nov. 4. The president told Patrick that he keeps all of the sports jerseys presented to him at the White House. Clinton said he even wears some of them at times.

"This is a great opportunity for me — particularly because I can still continue to do SportsCenter," Patrick said. "I love

radio. Now, instead of doing bite-sized portions of sports, I will be able to take a little bigger bite each day, have some fun, and express my opinions and feelings."

Patrick has been a frequent contributor



Dan Patrick

to ESPN Radio since the network's launch in 1992.

For more information call Jim Roberts at ESPN/ABC Radio Networks in Dallas at (972) 776-4613 or circle Reader Service 59.

Kids Earth and Sky Relaunch

Kids Earth and Sky, a science program geared for students in grades K through 5, revamped its online site to celebrate the show's one-year anniversary.

Twenty-six new segments of the 90-second radio show are now online at <http://earthsky.worldofscience.com/kids/>. In the new series, hosts Kathleen Couser and Ed Neal challenge listeners to tell the difference between moths and butterflies,

what a "sun-sneezzer" is and why we get goosebumps. They answer listeners' questions about what happens when lightning hits water and how mother dolphins recognize their children in a crowd.

Another new feature on the site combines electronic postcards with science quizzes, called "Science Quiz-o-Grams."



Kathleen Couser

Kids Earth and Sky is also available at no charge via CD from EarthTalk Inc., a non-profit corporation based in Austin, Texas.

Producer Marc Airhart said that Kids Earth and Sky developed out of the original, ongoing science program created for all ages by Byrd and Block Communications.

"We noticed that a lot of our best questions came from kids, and that's why we started Kids E & S — to build on their great thinking."

The all-ages E & S is heard by four million listeners on more than 900 commercial and public stations throughout the United States, Canada, the South Pacific, Armed Forces Radio and the World Radio Network.

For more information contact Marc Airhart in Austin, Texas at (512) 477-4441 or circle Reader Service 58.

Listener Wins Huge Prize

The largest prize in radio history, according to American Media & Special Promotions, was awarded to KIIS-FM listener Maureen Barinoff Oct. 21, 1999, in Los Angeles.



Roy Laughlin, Courtney Phillips Jones, Maureen Barinoff, Rick Dees and Ric Militi

Barinoff heard her birthday month (September) announced by morning host Rick Dees. For being the tenth caller at the time of the announcement, she won \$1,000. Next she was asked if she was born on Sept. 28, the predetermined correct day. She won \$2,000 more when she said her birthday was that day.

Finally she was asked if she was born in 1965, and when she said yes, AMSP stepped in with a \$2 million prize.

The Birthday Game promotion is available to other stations from AMSP in Atlanta. For information call (888) 323-2257.

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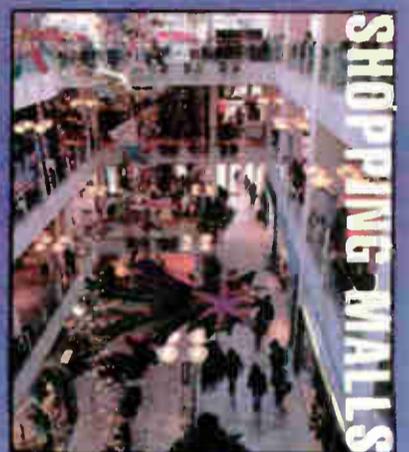
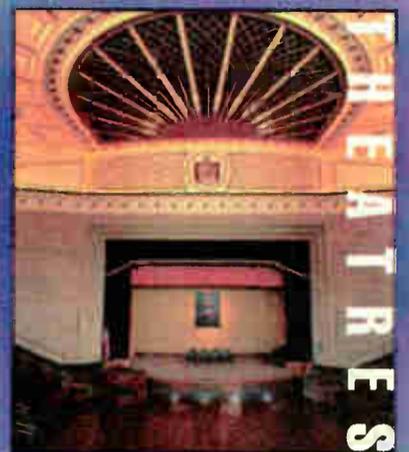
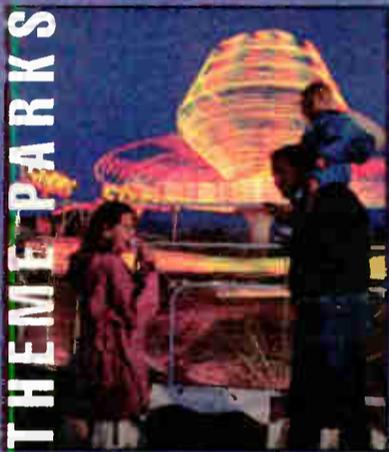
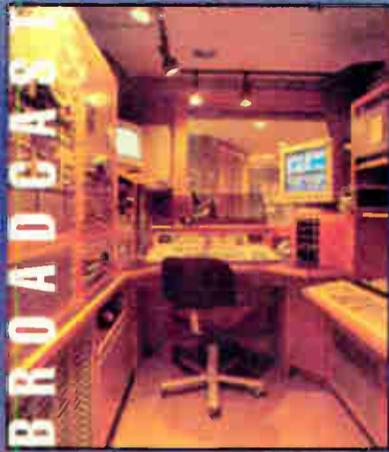
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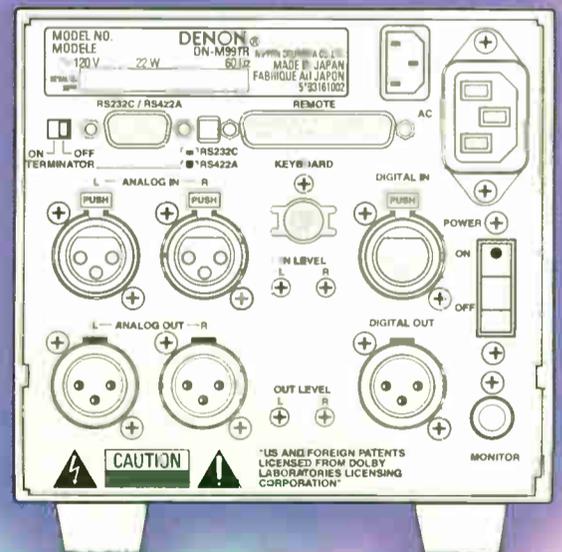
engineers have asked for, such as a large and easy-to-read florescent tube display with multiple readouts, Hot Start, keyboard entry, seamless Sleep mode, front-panel Program Play and a variety of control terminals including RS-232C, RS-422A, D-Sub 25 pin and PC-compatible Mini Din keyboard connector.



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PRODUCT EVALUATION

SF Makes Noise Reduction a Breeze

Read G. Burgan

Sonic Foundry's Noise Reduction 2.0 plug-in may be the most important digital restoration tool ever when digitally restoring vinyl recordings and other analog sources.

I use three criteria when evaluating digital noise reduction software: effectiveness, ease of use and efficiency. I give this product a high mark.

This is not the company's first entry into the noise reduction software field. I have been using the original NR software daily since it was introduced.

Much of my work consists of digitally restoring electrical transcriptions. I tested

click and crackle removal. The interface contains three sliders: sensitivity, click shape and maximum click size. The program provides several presets to get a user started, including basic settings for 78 rpm and vinyl recordings.

Snap, crackle, pop

Because the results can be previewed in real time, it is easy to maximize the settings by selecting a sample of the material to be declicked and then adjusting the sliders while listening in the preview mode. My experience has been that once I find a setting that works, it will work pretty well on all similar material.

hearing what the software is removing during the preview mode. This assures that only pops and clicks are removed.

The click-and-crackle removal plug-in is incredible. Declicking may be the most difficult and frustrating of the vinyl restoration chores. It does the work quickly, leaving a minimal amount of artifacts, particularly on material containing spoken voice.

Other declick software distorts the spoken voice if set too aggressively and leaves in pops and clicks if set too conservatively. SF's new algorithm removes a maximum number of pops and clicks without creating unwanted distortion and other artifacts. It is the best I have used to date.

I find that by running the declick twice, each time with different settings, I am able to remove all but a handful of pops and clicks and related noise from a transcript. What is left can usually be removed by rerunning the declick software with different settings on the offending portions of the .WAV file.

Rice krispy treats

The other key ingredient is a tool for broadband noise reduction. The latest version is better by a country mile. The onscreen interface has not changed much, but it has added the reduction type and noise bias features that make all the difference.

The problem using broadband noise reduction occurs when extracting a low-volume program. As the software removes the noise, it often chips away at the program material itself, creating unwanted artifacts.

The original software could compensate for this by taking several small bites of noise and using new noise prints with different attack and release settings, but it took a lot of time and the results were not always predictable.

SF created three additional algorithms to solve this problem, each one working differently than the original. This allows applying the noise reduction much more

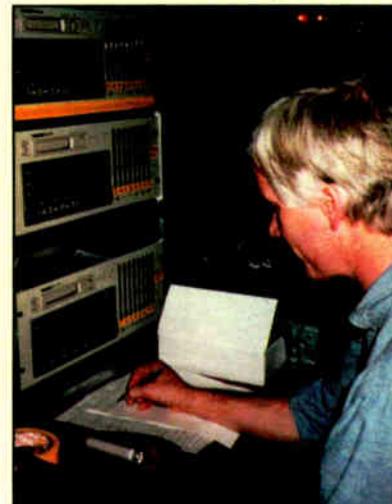
See NR, page 52 ▶

Broadcasting A Worship Service

Bruce Bartlett

Your assignment is to do a remote broadcast from a house of worship, in stereo, and make it sound great.

Unless you take a feed off the PA, a remote broadcast is a big job. You will have many sources to mix: the pastor, choir, soloists, organ, cassette



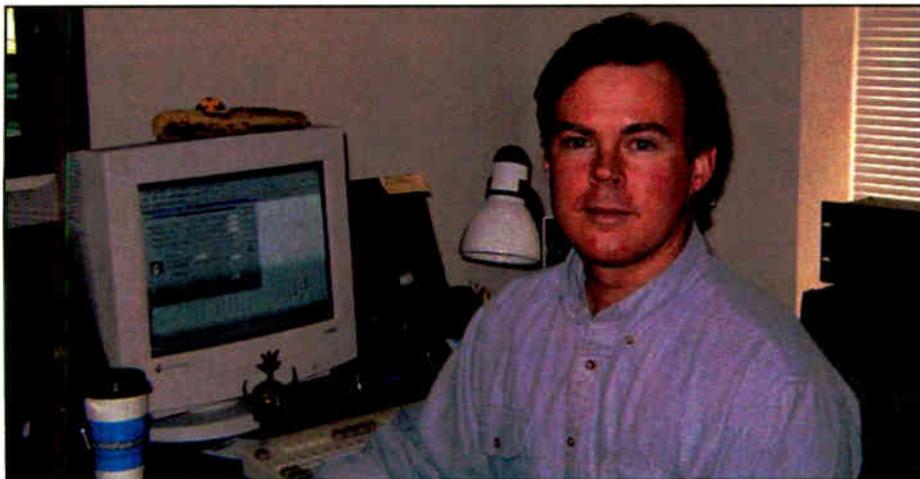
The author contemplates organization of an event.

deck for background music, altar table, congregation, and sometimes an entire musical ensemble.

Let's consider three effective ways to approach this situation, which we'll look at in detail.

The first and easiest way to capture the service is to plug in to the church's reinforcement mixer. Look for a jack that is before the graphic equalizer used for the house speakers. If the church has a sound technician, you can ask him or her

See WORSHIP, page 50 ▶



Sonic Foundry Product Manager Keith Bieneman plays with the software.

the software on Pentium II class computers with processors ranging from 300 MHz to 400 MHz and with a minimum of 64 MB of RAM.

This latest entry is way above the previous noise reduction software in removing pops, clicks and other impulsive noise. Also, SF completely redesigned its declick algorithm.

The previous version was effective in removing larger pops and clicks, but not very effective in removing smaller clicks and the "crackle" so often associated with shellac records and transcriptions.

The pop/click tool has been renamed

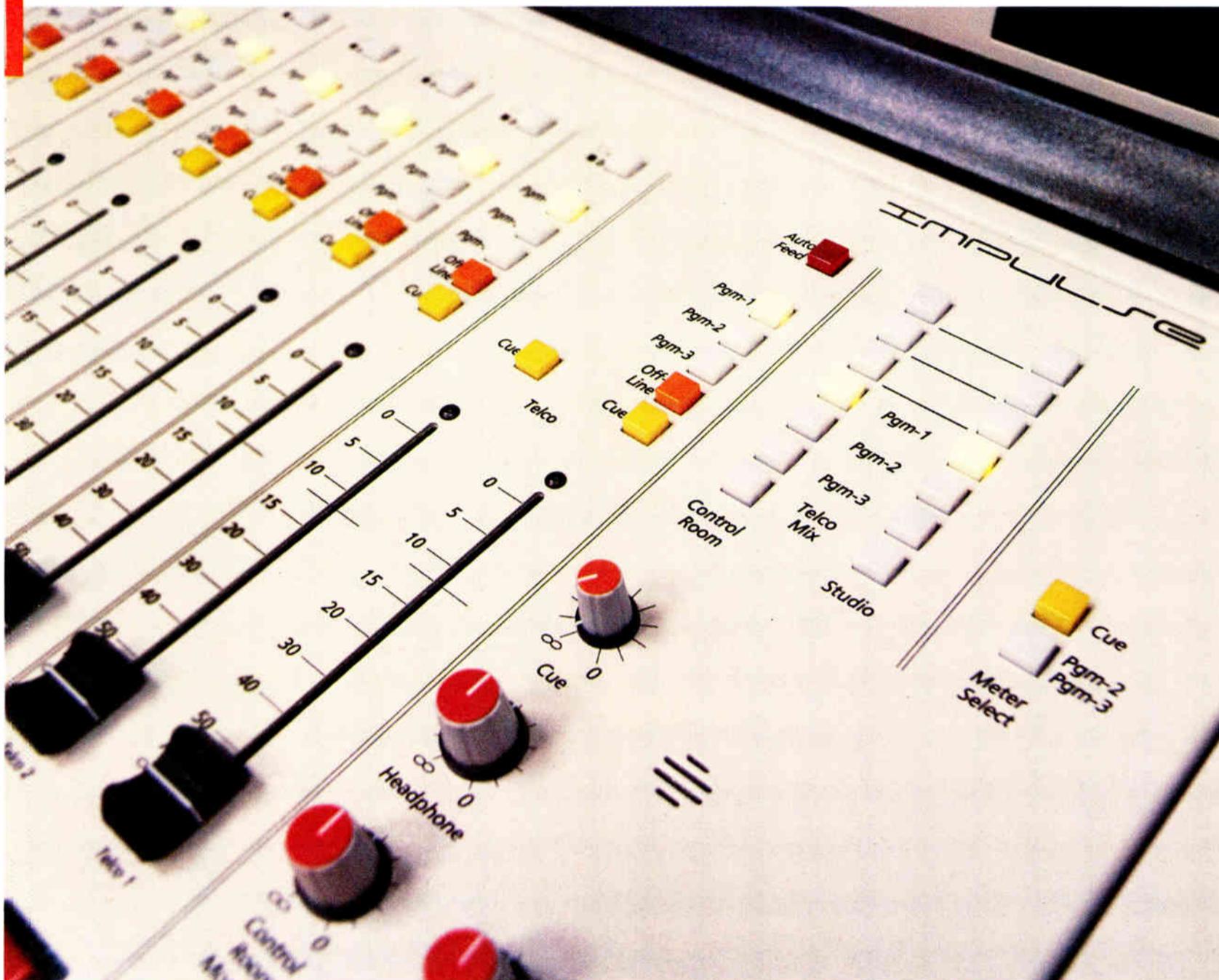
SF has added a noise level click box with low, medium and high settings. In the low and medium settings, the software separates the music into noise and non-noise portions, which makes the software better able to discriminate between noise and program material.

The interface also has a low-level rumble box which, when checked, removes low-frequency material below 30 Hz. Some old recordings contain a lot of low-frequency energy that could conceivably confuse the declick algorithm.

SF also added a keep-residual-output box which, when checked, allows for

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PRODUCT EVALUATION

Nomad's All-in-One Listening

Carl Lindemann

Creative Labs' Nomad is one of the first products in a new category of consumer electronics: the digital audio player. Issues have arisen with these new devices.

There is a good side to urban sprawl and the traffic congestion that goes with it. Increased commutes mean increased in-car listening. However, this traditional preserve for radio is getting chipped away on several fronts.

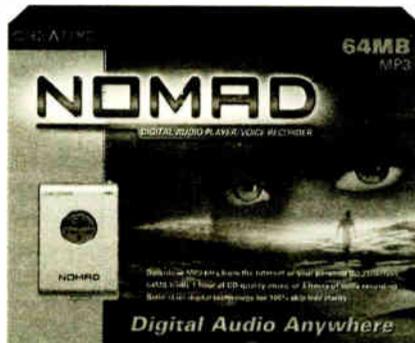
time. PDE units can offer in-car listeners something akin to being able to read the morning papers on the way to work.

The Nomad costs \$299 retail for the 64 MB version, and Nomad II is on the way.

With similar features to Diamond Multimedia's Rio, Nomad adds a radio receiver and voice recording capabilities. Such PDE units are designed primarily to meet the growing demand for portable MP3 or other downloadable audio formats.

The Secure Digital Music Initiative is

online gained notoriety due to the potential for piracy. SDMI-compliant devices will allow the record labels to begin



releasing their catalogs in online formats without risking their assets.

For the end user, the copy protection features need to be invisible, unless you try to play bootlegged audio. Soon, Nomad will be modified to meet the recently released SDMI portable-device specifications.

Nomad is tiny and light, about halfway between the size of a DAT tape and an audiocassette. It holds the audio in a base 32 MB memory with a flash expansion slot of another 32 MB.

I tested it with the full 64 MB of memory. Nomad can carry just over an hour of music recorded at 128 kilobits per second. At this 10:1 compression ratio, a minute of near CD-quality audio takes up just over a megabyte.

The unit comes with a docking station that links to your PC through the parallel port. Data is transferred at a rate of about one megabyte per second, so you can drop in an hour of programming in about a minute.

This is not as fast as popping in removable media, but this PC-centric arrangement has added advantages. The docking station is also the charger for the AAA Ni-MH batteries, which are included. A charging time of 45 minutes yields about five hours of play.

Creative Insights

Creative Labs, the subject of two stories in this issue of *RW*, has roots dating to 1981.

Creative Technology was founded that year in Singapore. Its U.S. subsidiary, Creative Labs Inc., was established in Milpitas, Calif., in 1988. Its technical support center is in Stillwater, Okla. Creative employs more than 4,000 people worldwide.

The company has since increased its R&D strength with acquisitions of several U.S.-based companies, including Ensoniq, E-mu Systems and Cambridge Soundworks.

Creative provides audio solutions that support the Sound Blaster PCI audio standard, and is working on a new audio standard, Environmental Audio. The company says this takes a systems approach to delivering audio, from the processor and Environmental Modeling algorithms, to the speaker systems and the API for developers.

Environmental Audio Extensions API is a sound design tool that allows developers to create audio environments in games, Internet audio applications and interactive entertainment titles.

Creative is expanding into other sectors of the multimedia industry, including graphics, PC-DVD, portable digital audio players, computer telephony integration, communications and videoconferencing. The company also promises to continue to develop tools for the PC.

— Paul Cogan

At this 10:1 compression ratio, a minute of near CD-quality audio takes up just over a megabyte.

Until recently, the Internet had been locked out because of bandwidth issues. The rise of compressed audio and the tiny portable players for the audio will make it possible to "space shift" online audio away from the computer and into the car.

These Personal Digital Entertainment units do not deliver programs in real

a cooperative effort among record labels and electronics manufacturers to create technology and standards addressing intellectual property issues raised by digital audio players. Nomad is likely to be among the last of the non-SDMI-compliant devices in this class.

At first, the availability of MP3 audio

PRODUCT EVALUATION

Sound Blaster Eases Workstation Overload

Carl Lindemann

The Sound Blaster Live! from Creative Labs is a high-end consumer card targeted to the MIDI market and computer game fanatics.

Consumer digital audio cards have

ing, the MIS department reigned supreme. When accessing information, the MIS department was the go-between.

In the last 15 years, the rise of client-server computing dissolved the centralized structure. Employees can access information with a desktop PC



Sound Blaster Live! Platinum

improved, but they are not a replacement for high-quality professional workstations.

Though this card will not do for a primary DAW, changes in handling audio production give it a place in radio production. This is part of an overall trend in the way information management is handled within companies and radio.

In the heyday of mainframe comput-

networked into the system. The MIS role changed from gatekeeper to end-user support.

This arrangement has transformed the world by allowing information to be the lifeblood of corporations and organizations, leading to incredible efficiencies in manufacturing and shipping.

Where does radio fall in these trends? On the business side, broadcast

See LIVE!, page 55 ▶

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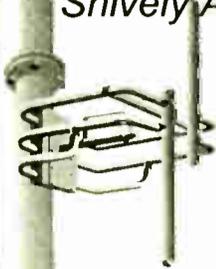
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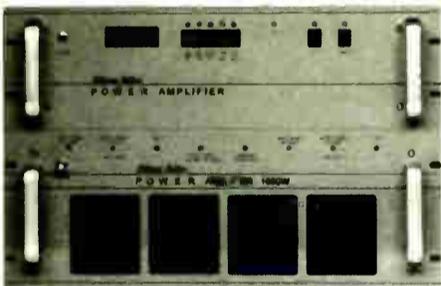


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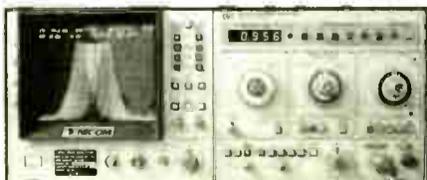
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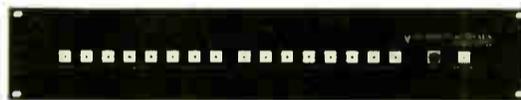
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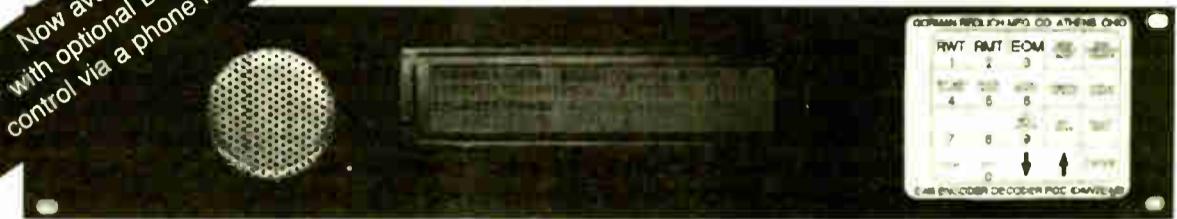
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GUEST COMMENTARY

Why I Hate My DAT Machines

Ken R.

I have used DAT machines for about 10 years in my jingle studio, and I cannot remember a piece of equipment I have spent this much energy loathing.

Out of the four beasts clogging up the place, each one tempts me daily to use it as a boat anchor. Of course, I can't ditch them, as we have archived thousands of projects on them, having more than 700 little DAT tapes neatly indexed, computer-printed and stored in wood-grain racks.

We have found *some* benefit in these machines from hell, but the horror stories by far outweigh the joys.

Ken's hit list

Here are my gripes:

1) You just know that some day — and you never know when — that little door will jam, eating an important tape which has not been backed up.

2) Intermittent problems are the rule. The little numerical readouts begin to flicker and the rewind motor begins to sound like a '65 Corvair. The next step is those wonderful loud pops, clicks and glitches in play/fast forward mode. When the tech gets the machine on the bench, everything works flawlessly.

3) Has one of your machines ever gotten

Alzheimer's disease? After years of knowing exactly how to renumber a DAT tape, the machine suddenly forgets and starts missing some write codes or it numbers inconsistently. Then every time the tape rewinds, the numbering comes out differently. Let me state that we have four different brands of DAT machines, and they all act goofy after a while.

4) Only one of our DAT machines has an error message indicator, and none of the machines has confidence monitoring. Engineers are never quite sure that what is being recorded is really there. I realize some of the newer and even more expensive machines have improved in this area.

5) An old analog tape, even one from the 1960s, usually plays pretty well. Even those annoying squeaky tapes manufactured in the mid-'70s with the back-coating problem will play when properly baked.

Ever try to play a DAT tape that has gone south? It is nothing but annoying grunge, and I am not talking about the band Nirvana. I am talking about your beautiful audio gone forever.

Sampling errors

6) What is the deal with 44.1 and 48 kHz? If CD manufacturers can all agree on one sampling rate, then why can't the DAT guys?

Most people cannot tell the difference between music recorded at 44.1 and 48. Show me a person who claims to be able to tell the difference in a blind test and I will show you someone who is probably from Pluto.

Of course, all DATs recorded at 48 will have to be converted or they will really confuse our editing software. From 1988 through 1992, I mastered everything at 48, thinking it would result in better fidelity. What a sap I was.

7) DAT is the least robust storage medium ever invented. Leave a CD in your trunk on a hot summer afternoon and it still plays. Leave a DAT in there, and it is bye-bye to the project.

8) Let us talk about price.

Remember when CD burners were more than \$20,000? Then they plummeted to \$10,000 and then \$2,500, which was when we bought ours. Now burners are routinely priced under \$1,500 because people actually *like* the format, so manufacturers support it.

Consumers know

9) DAT has never made it as a consumer format because the general population knows a turkey when they see it.

Now, studio folks are the only ones to use DATs, which makes a smaller user base. Manufacturers are not able to lower the cost much based on mass production,

so they will not waste a lot of resources improving the design. If the user base continues to shrink, eventually the manufacturers will discontinue making players. The next step is that you will not be able to get parts or even get your DAT machine serviced.

In other words, behold the next Betamax!

DAT machines are not sturdy. All those moving parts are big trouble. The electronics are not very reliable, and the tapes themselves are the worst. Engineers handle DATs as gently as anyone, but in the hands of jocks banging on them all day, there is no chance for survival.

With four DAT machines in our studio, I can count on one being in the shop at all times, and we have qualified DAT specialists servicing our machines.

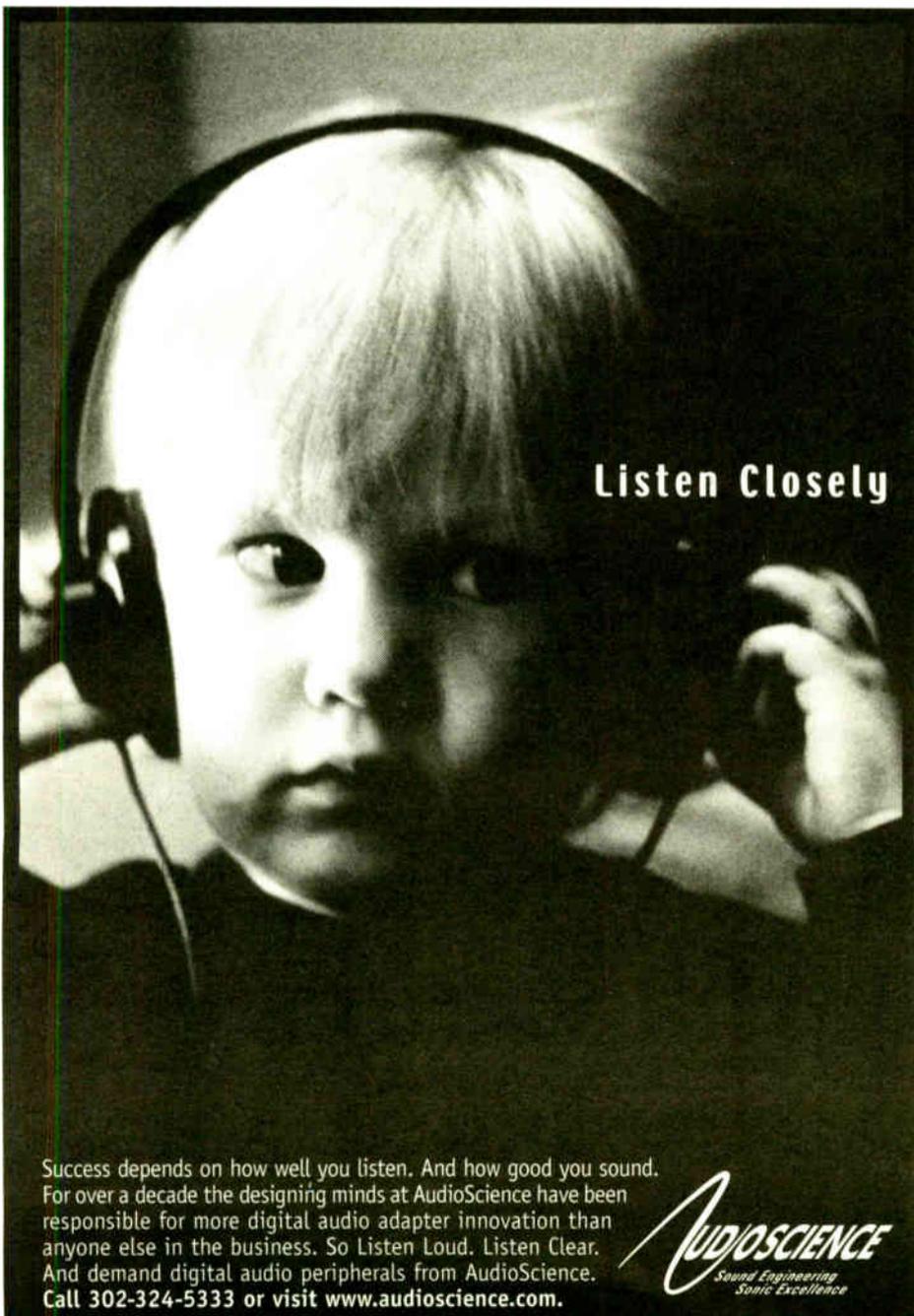
DAT machines started out with a pretty high price tag, and they have not come down all that much. Recently I have seen ads for \$5,000 DAT machines with shuttle wheels and other fancy features. Why spend *more* money on this bogus and useless format?

Are DAT machines 100 percent worthless? No, one of my "out-of-service" machines makes an excellent doorstop.

■ ■ ■

Ken R. is a longtime radio professional and jingle business owner.

Got a different opinion about DAT? RW welcomes other points of view. Send e-mail to radioworld@imaspub.com or write to the address on page 62.



Listen Closely

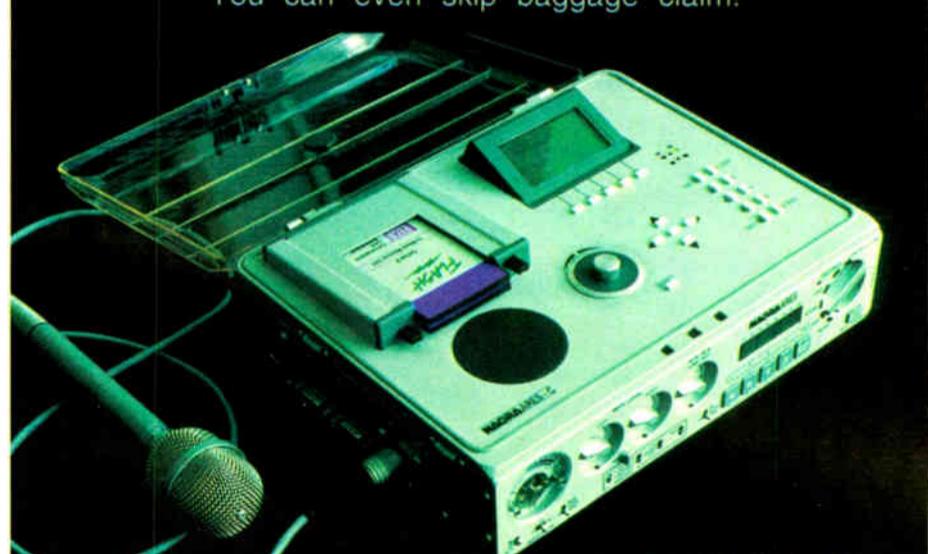
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Avoid Outdated Station Web Pages

Alan R. Peterson

Off in the corner sits the poor soul given the task of resuscitating the radio station Web site. The one that has been neglected for too long because the program director that implemented it two years ago left last Thanksgiving and nobody has touched it.

Oh, the work that pitiful creature has ahead. The list of station owners since 1997 reads like a roster of movie extras from Ben Hur. All promised to "reposition" or "reinforce" the Web page, but spun off the station to new owners faster than one could blink.

Faithful listeners have become fair-weather surfers. All are tired of reading that release that still touts Sheryl Crow as the next big breakout artist, as well as the outdated icon compelling visitors to "Download Netscape 3 Now," and the dead links that return dreaded 404 messages.

Tommy can you hear me?

Then there is the live audio connection to let folks listen to the station from anywhere in the world. Let's see, what version of RealAudio was it again? Or was it Xing? Or Windows Streaming Media?

Oh wait, it isn't any one of them. It's some mutant wannabe format that the former program director's cousin convinced him two years ago was going to bury all the other streaming formats.

It contains bad links, crummy content,

outdated material and an audio format with documentation that is not worth wallpapering the bathroom. In an industry where heads roll if an outdated PSA is aired the morning after the flight ends, two-year-old Web content is sniffed at and shrugged off.

Is there any wonder why our poor friend in the corner is not looking forward to this task?

I wonder how this happened. The Web is, at the same time, the current big thing as well as remaining the next big thing. This is

If the Web site has not been freshened up, the station may as well be pumping 'Sweet City Woman' or an ABBA B-side.

where all the action is. How can so much money and effort be poured into a station site and then be neglected so quickly?

I have been to sites that are still promoting air talent that are either long gone or on a new air shift. One in particular opens with an audio greeting, but takes an eternity to load said greeting when accessed with a simple dial-up modem.

There are sites that rip off entire pages from other stations. They lift images off other station sites using the "save image as ..."

command and plunk their calls in place.

I am also familiar with several operations that boast global listenership, based on the ability to stream audio over the Net. What the site doesn't mention is that it is streaming only a tiny handful of streams, making that "global" listenership remarkably feeble. That's what happens when the station obtains the free demo version of the encoder software only.

Have you ever driven through some rural area, picking up a station, usually a local AM, that sounds as if it is stuck in a

time warp? The music generally is '70s-intensive, with titles like, "All By Myself," "Dream Weaver," "The Night Chicago Died," and an occasional Manilow cut or Frank Mills' "Music Box Dancer" to assuage the owner's spouse.

Unless programmed strictly as a '70s oldies operation, such a station generally had its heyday some 25 years ago, driven by a program director who knew how to get a record service and how to make a small station sound big-time.

Unfortunately, when said programmer took off for that dream gig in Newburgh, N.Y., the family pizza recipe and all its secrets went with him or her. The next few programmers could not keep the momentum up, record service fizzled, and the automated FM down the street frankly began sounding better and better. With nowhere else to go, our little station stayed right where it is.

Discovering such a gem when driving through an unfamiliar town is always a gas. "Hey, I haven't heard 'My Baby Loves Loving' in years ..." It is only after reasoning how they got there that the pity sets in.

If a station Web site has not been freshened up in some time — let's say *two years!* — the station may as well be pumping "Sweet City Woman" or an ABBA B-side down the line, because that is the perception.

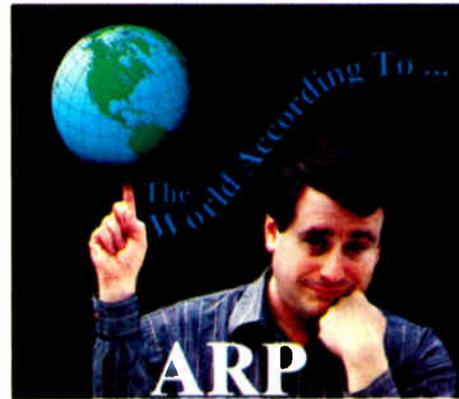
Again, I turn your attention to the poor schlub in the cubicle, staring straight ahead at the monitor, wondering what kind of CPR to apply to the CRT in an effort to pull the station Web site back from the brink.

Step back and figure out what is and is not important.

At the Seattle NAB Radio Show in 1998, studies were presented that surfers mostly visit station Web sites for an interactive experience, and it is that experience that brings them back. In the parlance of Webbers, it makes the site "sticky." The streaming audio is fun, but it is not the overwhelming reason Web surfers visit a site.

Concert news, links to CD retailers to instantly buy the album being heard, local area weather and news headlines, a game room or even free stuff to win, just like in real radio, are all great eye candy for a station site.

Many companies now offer software that places album cover art and artist bio



information on the listener/surfer's screen. Look into it as it resolves the age-old issue of the audience griping, "Why don't they ever say the titles of the songs?"

Jocks change, so keep a \$400 digital camera nearby for headshots of new jocks and for promotional pictures of station events. A weekend concert event that shows up in pictures on the site Monday morning is a winner.

As we have found out here in Fairfax, Va., on cable FM station WEBR, don't lose sight of the local audience. It is fun to believe the station is playing to the world, but the days of millions of people tuning in to a single trillion-watt transmitter high on a mountain are long past. A delegation from Pago Pago will not be showing up at the station's club night anytime soon, so play it to the hometown audience — they are the ones spending money at clients' businesses.

Beast of burden

"But we tried doing a home page two years ago and it didn't last," some will object. "Who is going to maintain it now?"

Don't most college communications interns know more about the Internet than you do? Don't the *sales* people talk with the *promotions* people?

This winter or spring, rather than trundling the intern into the station mascot suit and dancing around at the mall, put him or her in charge of the Web page. It gets the job done for the station and gives them some real experience they can show off to prospective employers — maybe even you. Just make sure they can spell. A site filled with typos is like a jock that mispronounces local landmarks.

The station can always pay an outside company, but Web page developers can come and go faster than those two-year consultants I alluded to earlier. The station could drop up to thousands of dollars on a group that may not be there to keep things rolling six months from now, so shop carefully.

Above all, visit other pages to get some ideas, but don't steal. Radio has a tendency to be "highly imitative" when it comes to good ideas, but just as in elementary school, neatness and originality count. Be inspired, but be original.

A station Web page is a living, breathing entity. It cannot be glued together and then thrust out into the cold. When changes happen on the air, the changes must also be reflected very quickly on that *other* side of the station that can be so easily forgotten.

The folks that rushed to be on the Web two years ago have enjoyed their little advantage over the latecomers, but that is all changing. If the station's sound is fresh, the visual content also must be.

■■■

Alan Peterson keeps things glued together at Fairfax Public Access Corp., Fairfax, Va.

He can be reached via e-mail at peterston@fcac.org



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

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



See for yourself.
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From the Church to the Radio

► WORSHIP, continued from page 41 where this output exists.

To avoid ground loops between your audio system and the church's audio system, you might need to isolate the grounds. One way is to float or disconnect the shield from pin 1 of one of your cable's XLR connectors. Another way is to connect a 1:1 isolation transformer between the two mixers. This is necessary if either mixer is unbalanced.

A second way is to supplement the PA feed with your own mics. The PA usually lacks the sound of the organ and the congregation. So, you mic these and mix their signals with the PA feed using a

separate broadcast mixer.

Although the PA tap is fast and easy, the sound quality might be poor. You are stuck with the mics the church uses, which might be of mediocre quality. You are also at the mercy of the church audio person, who might do a bad mix or set gain staging improperly.

Even if the PA mix is good, it does not guarantee a good broadcast mix, because the PA mix is set up to *augment* the sound coming from the stage, not to sound good by itself.

The third and most effective way to control the audio quality is to mic everything, then mix with your own mixer.

If you put two mics on each source — one for PA and one for broadcast — it will look cluttered. It is better to use one mic on each source and split each mic signal by using a mic splitter. Connect one split to the house mixer and connect the other split to your broadcast mixer. Splitters can be rented from most pro-audio rental facilities.

Most splitters have a ground-lift switch on each input to prevent ground loops between multiple audio systems.

If you are using condenser mics, remember to supply phantom power from only one mixer.

Now let us tackle the actual miking

techniques for each sound source. Here are some methods that have worked well.

Pastor, minister: If the pastor stays at the pulpit, use either the gooseneck mic mounted on the pulpit, or a cardioid mic on a boom stand about eight inches away. Be sure to put a foam pop filter on the microphone.

If the pastor wanders, use a clip-on lavalier mic, either hard-wired or plugged into a transmitter. Be sure to use a belt clip or place the mic connector in the pocket to act as a cable strain relief. Wireless lavs are also available from most pro-audio rental shops.

With certain types of preaching, the preacher gets louder as the sermon progresses. To prevent overload, you will need to patch a compressor and set a pad.

Choir: For permanent installations, you can hang two mics about 10 feet apart and about 12 feet in front of the choir. Several mic manufacturers offer miniature mics, almost invisible in use, that are designed for choir miking.

If the mics also are used for sound reinforcement, place them close to minimize feedback, about 1-1/2 feet in front of the first row of singers and about 1-1/2 feet above the head height of the back row. If the mics are used only for recording or broadcast, they can be placed several feet farther back to pick up room reverberation.

Soloist or reader: These can be covered with a stand-mounted handheld cardioid mic. You might want to compress the signal and roll off some lows to compensate for proximity effect. Be sure to place a foam pop filter on the mic to prevent breath pops.

Organ: Try one or two condenser mics several feet from the organ pipes or organ loudspeaker. The mics should have an extended low-frequency response.

Cassette deck: This provides background music that is mixed with the vocal mics. The cassette deck outputs connect to mixer line inputs. To split the signals to the PA and broadcast mixers, you will need a Y-adaptor and possibly an isolation transformer.

Altar table: Place a unidirectional boundary mic on the table. Some models come in white to blend with a white tablecloth.

Congregation: Ideally, hang a stereo mic or stereo pair over the front row of the congregation, aiming toward the rear of the sanctuary. You could also tape boundary mics to the sidewalls. Make sure that the congregation mics feed only the broadcast mixer.

The congregation mics might pick up the house PA speakers with a delay.

To prevent this, assign all the mics except the congregation mics to busses 1 and 2 and insert a delay line. Assign just the congregation mics to busses 3 and 4 and mix all busses to stereo. Gradually increase the delay time until you no longer hear an echo.

With some careful mic placement and mixer artistry, your broadcast of a worship service can be a blessing instead of a curse.

If you would like to know more about on-location recording and broadcast practices, check out the book, "On-Location Recording Techniques" published by Focal Press. It's available at www.musicbook-plus.com and www.focalpress.com

Other topics in the book include planning remote sessions, mixing and editing a live gig tape, building a recording truck, stereo mic techniques, binaural recording, and surround miking.

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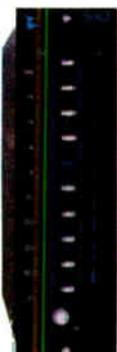
MUSICAM USA is the d/b/a of Corporate Computer Systems, Inc., Holmdel, NJ, USA

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World Radio History

PRODUCT GUIDE

API Updates Lineup



API has re-issued its 560 10-band graphic EQ with a suggested retail price of \$795. Frequency centers start at 31 Hz and span 10 octaves up to 16 kHz, having 12 dB of boost/cut per band.

The API 2520 opamp is responsible for the trademark sound of the entire product line.

Other new re-issues in the

500 Series include the 525 compressor limiter, the 512C mic pre and the 550b EQ.

Each processor fits into small, outboard, modular frames: the 500H two-slot rack, 500b4 four-slot "lunchbox," or 500V 10-slot rack, all with power supplies.

API also introduced the 2500 rack-mounted linkable dual-channel compressor for a suggested retail price of \$2,495.

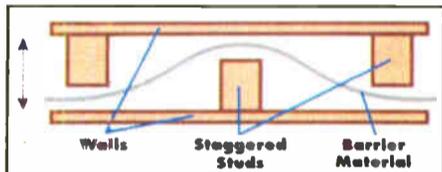
The patented "Thrust" circuit before the RMS detector delivers a low end punch. It can be bypassed or moderated with a 2 dB/oct high-pass filter, or left fully in at 4 dB/oct. Other features include feedback/feed forward compression and auto-makeup gain, which allows a single control for threshold and output.

For more information, call the company in Maryland at (410) 381-7879, check out the Web site at www.apiaudio.com or circle Reader Service 63.



Prospec Barrier Isolates Rooms

The Prospec Barrier from **illbruck inc.** isolates studio and listening rooms when woven between walls or laid above drop ceilings.



The vinyl barrier improves acoustics by stopping noise traveling

from adjacent rooms as well as building noise caused by HVAC systems. It can stop up to 42 decibels of noise.

Ideally applied during new construction or remodeling, Prospec is woven between staggered 2 x 4 inch studs in a six-inch wall cavity. Made from 1/8-inch high-density vinyl, it is available in 54-inch by 20-foot or 60-foot rolls.

For information about illbruck products, call the company in Minnesota at (800) 662-0032, visit the Web site at www.illbruck-sonex.com or circle Reader Service 64.

Hot Tubes From Aphex

Aphex is out with the Model 1100 dual-channel microphone tube preamplifier. With up to a 96/24 digital out, it can sync to an external word clock, and has phantom power, polarity reverse, a 20 dB pad and a mute.



The D/A converter is scaled to clip at the same point as the mic preamp delivering an equivalent input noise (EIN) of -135 dB. The gain is adjusted in 4 dB steps from 21 to 65 dB.

The MicLim circuit adds 20 dB of headroom by detecting the signal before the preamp to prevent clipping. The low-frequency cancellation filter allows up to 20 dB of cut, tunable in 11 steps from 30 Hz to 195 Hz without using any headroom or triggering the MicLim.

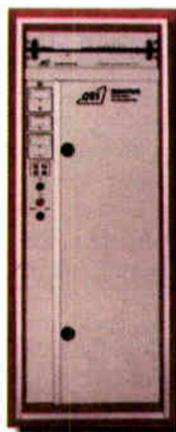
The "reflective plate amplifier" tube circuit comes at the second stage as a single-triode differential opamp and third output stage as a low-distortion triode buffer.

It occupies one RU and has a suggested retail price of \$1,995. The unit consumes 35 watts.

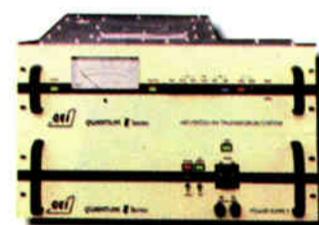
For more information, call the company in California at (818) 767-2929, check out the Web site at www.aphex.com or circle Reader Service 69.



And You Thought You Knew Us.....



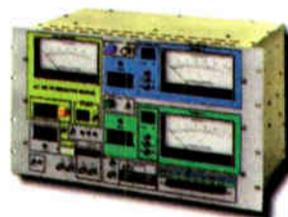
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Updated Algorithms for SF NR

► NR, continued from page 41
aggressively with little or no adverse effects on the low-level program material.

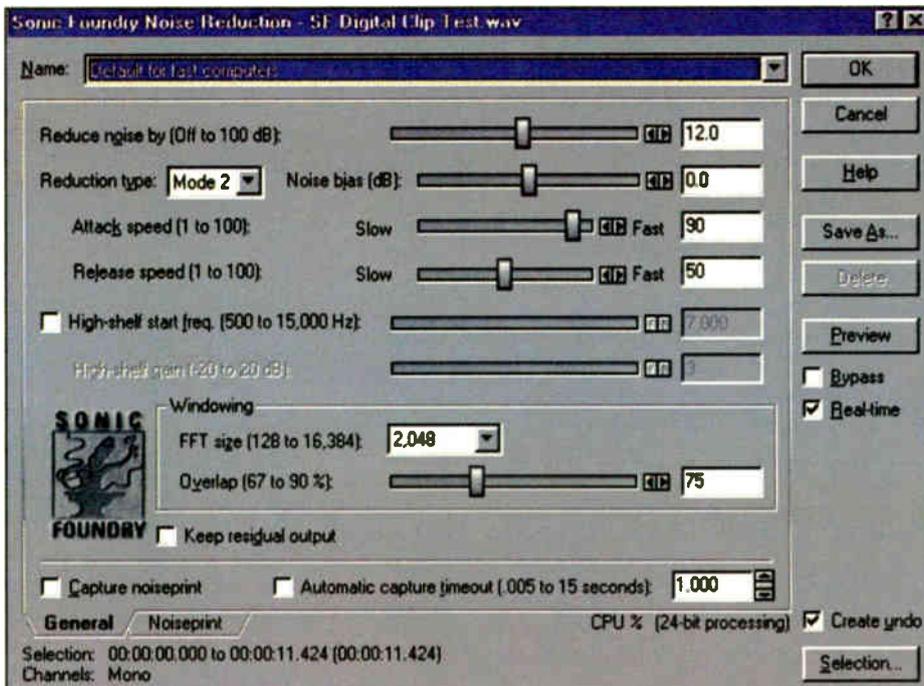
The noise bias slider allows for fine-tuning the relationship of the noise print to the program material. Its effect is similar to manually moving the noise print envelope up or down, but the effect is more subtle and the result more pleasing.

The new noise reduction plug-in works astonishingly well. I used to apply the NR plug-in three times to an average electrical transcription .WAV file. I can now set the noise reduction to 70 dB or higher in a single pass. The result is a noise-free recording with virtually no artifacts.

SF has added a click peak restoration

function that is designed to restore digital material recorded at levels high enough to produce clipping. SF gives the caveat that

software can be installed. If you back up your hard drive and use the backup for reinstall, the software has to be reinstalled.



it should only be applied to material with minimal clipping and my tests confirm that. In cases where the clipping is moderate, it may make the difference between a useable and unusable recording.

I do have one criticism of SF and that concerns its aggressive copy protection.

In the past, SF required users to enter their own unique serial number before the

I considered that an unnecessary but acceptable nuisance.

A unique serial number is still needed for installation, but now the software will only run for seven days unless you register it at SF's Web site. SF creates a unique identity for your computer and you have to input that ID number into the onscreen registration box to stop the cut-off.

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Product Capsule: Sonic Foundry's Noise Reduction 2.0



Thumbs Up

✓ Greatly improved click and crackle remover

✓ Three new algorithms enhance broadband noise removal.



Thumbs Down

✓ Complicated copy protection system

For more information contact the company in Wisconsin at (800) 57-SONIC, visit the Web site at www.sonicfoundry.com or circle Reader Service 61.

If the motherboard or OS is changed or upgraded, the identity changes. Then the SF user has to go back to the Web site for a new authorization code. It is also impossible to run the software on any other computers without obtaining additional authorization codes.

One only wonders what will happen if SF goes out of business or decides to no longer support this product, leaving a product having a seven-day life. There must be a better way to protect intellectual property rights without affecting the needs and convenience of users.

I understand the factors for copy protection, but SF is moving in a direction contrary to the majority of software manufacturers.

With a retail price of \$399, SF Noise Reduction 2.0 is the finest noise reduction software available for the PC. The version I tested was downloaded from the site with the accompanying 67-page manual. It is a Direct-X compatible plug-in that should work on any PC-based digital editor that uses Direct-X plug-ins.

PRODUCT GUIDE

HBB Produces Longer Discs

New from HBB is the CDR80 Silver and CDRW80 80-minute discs that comply with Orange Book specifications. The extended time is accomplished through a reduction in track pitch.

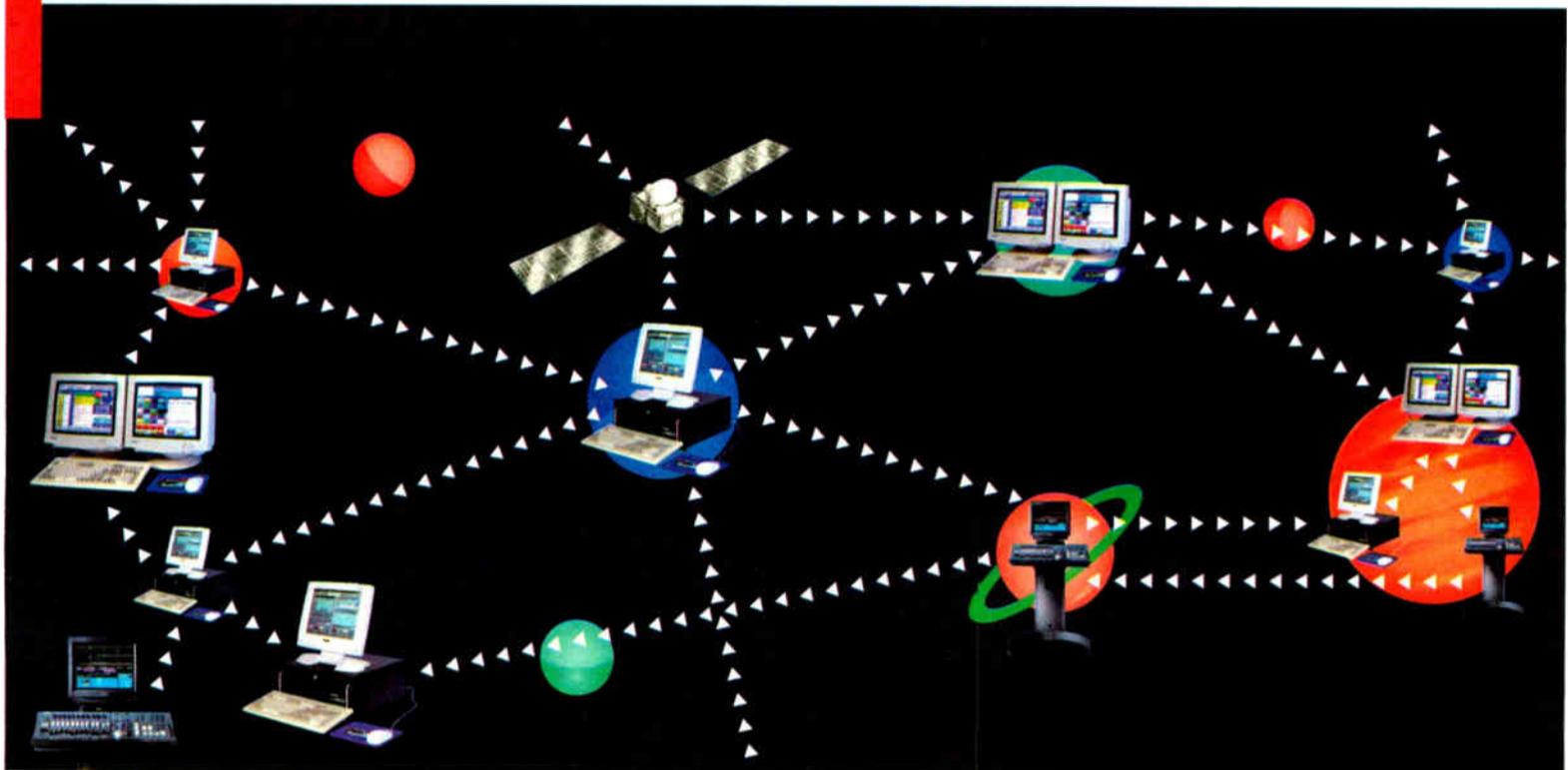
The advanced silver-indium-antimony-tellurium phase change



recording material in the CD-RW delivers more than 1,000 erase record cycles, securing an archival life in excess of 100 years.

For more information, call the company in California at (310) 319-1111, check out the Web site at www.hbb.co.uk or circle Reader Service 65.

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GUEST COMMENTARY

A Second Opinion on DartPro98

Read G. Burgan

Carl Lindemann reviewed DartPro98 in the Nov. 10 issue of RW. I have a different opinion about the product.

DartPro98 is indeed a "good" piece of digital restoration software, but when compared to other currently available PC-based software, it is not the "best" — particularly in the two most important areas: declipping and broadband noise reduction.

When Dart was first released in 1995, I was one of the first to use it and review it (RW, Sept. 6, 1995). Since then, I have followed Dart's upgrades with interest — DartPro, DartPro32 and DartPro98. Each

has brought new features that have improved the product.

Many more choices

The heart and soul of the original Dart was Declick, an algorithm that removed impulsive disturbances. Dart was one of the first companies with a declick program for the PC. Until then such programs were the provinces of the MAC world.

I immediately incorporated Dart into my digital production work, and was grateful for a tool that could remove more pops and clicks in a few minutes than I could manually remove in a more than a week.

Now, a number of companies have produced declick software. The current algorithm(s) used by DartPro98 are not nearly as effective for some types of digital restoration. I work with electrical transcriptions from the 1930s, '40s and '50s, each with a variety of music and voice.

When working with programs that feature talk, DP98's declick algorithm can produce distortion unless set for minimum declipping. Unfortunately it leaves an unacceptable number of pops and clicks. Other declick software applied to the same material removes a substantially larger number of impulsive disturbances without adding distortion.

DartPro added a broadband noise reduction tool, and DartPro98 has refined the tool by adding a means of graphically displaying and adjusting the noise print.

Even with these improvements DP98 lags the competition.

Weakest link

The newest versions of other broadband noise reduction software that I have tested consistently remove a greater amount of noise from the same material with fewer artifacts in less time to achieve the results.

Since declick and broadband noise reduction tools are at the core of any digital audio restoration software, this presents a serious lack. Other tools add to the program's versatility, but for anyone involved in vinyl restoration, the final results are only as good as the declick and noise reduction algorithms.

DP98 adds support for Direct-X plug-ins for the first time, but even here the program falls short. DP98 could not access any of the presets of the plug-ins I tested, requiring the manual resetting of the various parameters for each plug-in.

A clumsy Graphical User Interface is another problem has characterized Dart from its inception. I have used a number of PC-based digital audio editors over the years, and Dart is by far the most difficult to use.

Other noise reduction products I have tested consistently remove a greater amount of noise.

Cursor movement is controlled by a menu that includes Play all, Play window, Play from cursor, play local, etc. Zooming in or out requires clicking up and down on two parameters — Resolution and multiplier.

The interface is workable, but serious digital audio work requires the ability to zoom in and out rapidly and to move quickly from one place in the .WAV file to another. Time is money and DP98 requires far more time and energy to navigate than do other comparable digital audio editors.

My recommendation is that the producers of DP98 update their declick and noise reduction algorithms to match or exceed those available in comparable software and then repackage them as Direct-X plug-ins that can be used with any PC-based digital audio editor.

If they want to continue offering an entire digital audio restoration package, the company should give serious consideration to completely revamping its onscreen display.

As it stands, it is probably sufficient for those who want to casually restore LPs that are in fairly decent condition and do not require a lot of attention. For professional restoration of very noisy recordings, there are better programs available that can do a better job.

Read Burgan is a free-lance writer and a former public radio station manager. RW welcomes other points of view.

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Sound Blaster Live! Shares Work

► LIVE!, continued from page 43
groups are using information tools to improve sales.

What about audio production? The production director enjoys a similar role as the old-style MIS director. Computer tools are making tasks more efficient.

A major part of a production director's job is managing and controlling access to tools, which can be an inefficient arrangement. If a field reporter returns with a DAT full of audio, why tie up a DAW and studio time to dump the bits into the system? But this scenario is changing.



Networks allow any connected desktop or laptop to tap into and manipulate sound files on the system's hard drives.

To add workstations, more soundcards are needed. Every PC does not need a pricey soundcard to be useful.

That is where Sound Blaster Live! steps in. It is an inexpensive way to add analog monitoring and excellent digital I/O capabilities.

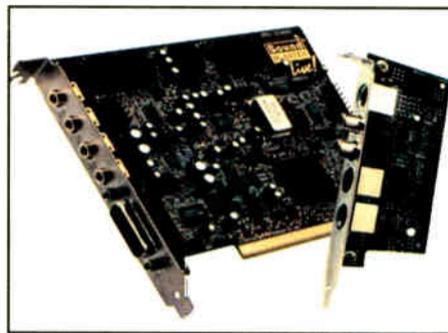
Distributing the mundane production

tasks throughout the operation frees up the recording studios, giving the production director more time to lend expertise to important tasks.

For \$200, the SB Live! adds an RCA S/PDIF connection. The PCI slot card comes with the usual 1/8-inch analog jacks and a joystick controller port. The digital connectors are on a separate strip that is linked to the card by ribbon cable, which is not a "daughter card" setup that takes up an additional slot.

The quality of the digital I/O is impressive, but it varies. The RCA is unbalanced, so cable runs need to be kept short. Within those limitations, digital transfers from DAT and MiniDisc through a digital coaxial cable was excellent. However, please do not try to cut costs by using inexpensive analog cables.

As it turns out, the SB Live! shares a heritage with E-Mu's Audio Production Studio professional audio card. As a wholly owned subsidiary, E-Mu does most of



Sound Blaster Live! Card

Bryan Lanser, director of marketing at E-MU and Ensoniq, said, "This makes the SB Live! a great bargain, but it is important to realize that digital I/O are not all equal. Some I/O configurations reclock the data and remove jitter, some do minimal or no re-clocking.

"On the SB Live! and APS, the digital inputs go through a sample rate converter which dramatically reduces incoming jitter

The digital inputs go through an SRC, which dramatically reduces incoming jitter.

the R&D and writes the software drivers, but the relationship extends elsewhere.

The SB Live! and APS use the same digital chip sets.

and accepts anything from 32 to 48 kHz."

The APS card justifies its \$799 suggested retail price because it can work with two S/PDIF streams at the same time and can route these digital stream to various places like signal processing.

The SB Live! has hard-wired routing, so it is limited to serving as a way to feed digital audio in. A bigger difference is in the converters.

Lanser said, "The effect of the A/D and D/A converters sets the lower cost cards apart. You definitely get what you pay for in the low end."

The SB Live! analog out is decent for monitoring. The analog input is not broadcast quality, though it is far better than previous hum-ridden game cards.

Product Capsule: Creative Labs Sound Blaster Live!

Thumbs Up

- ✓ Inexpensive way to add digital I/O to PCs
- ✓ Good analog playback

Thumbs Down

- ✓ So-so analog recording quality

For more information contact the company in Oklahoma at 800-998-5227, check out the Web site at www.soundblaster.com or circle Reader Service 66.

The SB Live! card comes in various bundles to suit different consumer audio interests. All share the same card but have different software and/or hardware connectors.

The SB LIVE! Platinum includes a breakout box that mounts in a PC drive bay. This gives front-panel access to the SP/DIF I/O as well as 1/4-inch connector that toggles between line and mic levels for analog input. A MIDI I/O is also included, and an Optical Digital I/O card will be available soon.

The LIVE! MP3+ lacks the digital input but adds a hardware encoder for creating MP3 files.

The X-Gamer is geared more to computer games and there is a value card, but neither have the digital I/O.

— Carl Lindemann

A user can probably get away with simple "rip 'n' read" voiceover work, for spec spots or for pre-production.

Again, the SB Live! is not a replacement for a DAW-based professional audio card. It is appropriate for setting up satellite systems where the digital I/Os can offload work from overused production studios.

For the price of one pro card, several PCs can be enabled to take on the mundane tasks that the SB Live! can handle well.

Radio's Most Wanted

PROFILE: David Hood

Chief Engineer / Audio/AVLT Supervisor
Emmis Communications / WTLC AM & FM
Indianapolis, Indiana
Radio World reader since its inception (1977)

- Hometown: Elwood, Indiana
- School: Purdue University, BS/EET
- Favorite radio format: Old radio mystery programs and Imagination Theatre
- Favorite radio stations: All the Emmis Stations in Indy
- Favorite color: Blue & green
- Favorite piece of equipment: My good ole Tektronics scope!
- Hobbies: Reading tech mags, World War II history, and Sherlock Holmes
- Coffee: With Sweet & Low
- Proudest moment: Getting my first class radiotelephone while a sophomore in high school
- Favorite Section in Radio World: Workbench, everything else - I even like the ads!
- Reads RW because: Radio World is my main source for broadcasting information, especially news about DAB!



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Circle (48) On Reader Service Card

Nomad Space-Shifts the Internet

► NOMAD, continued from page 43

high-quality FM radio tuner and a voice recorder. Portable Audio Program Manager Chris Smith sees these additions as just the beginning.

"You're definitely going to see a fast evolution in functionality given how hot the PDE product area is," said Smith.

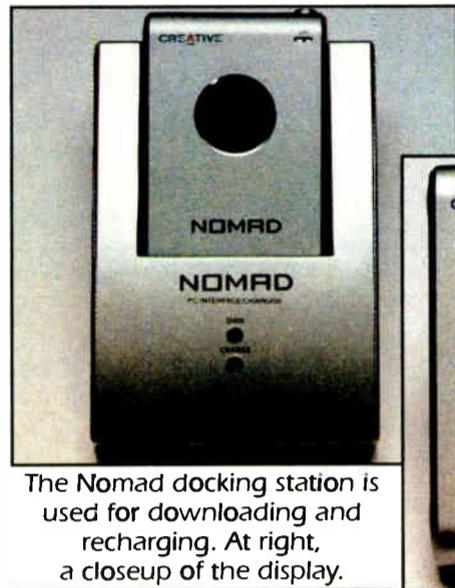
Low quality

The sound quality of MP3 on Nomad was excellent, but the recordings made with the unit were low quality. There is no microphone jack to augment the tiny integrated microphone and the recording codec ADPCM is not even near "broadcast quality."

"ADPCM is a simple codec," Smith said. "Your voice is band limited, so it takes advantage of that to get four hours of record time. You wouldn't take it to a concert to record it, but would use it to record a lecture." Recordings can be uploaded into the PC for safekeeping.

The shortcomings of Nomad's recording capabilities are by design. Though it was designed prior to the publication of the SDMI specifications, it anticipates some of the requirements.

was that we'd make it mono and band-limited, so recordings would have basically no value in terms of recording music."



The Nomad docking station is used for downloading and recharging. At right, a closeup of the display.

Creative Labs might produce a top-end static RAM recorder eventually.

Smith said, "Our SDMI-compliant devices will not be designed to be high-quality field audio recorders, but I would-

provide "books on tape" for these devices. Just download the files for the morning commute.

The future

Savvy corporate managers might provide employees with training material in this way. Imagine the PC loading the

Nomad overnight for the day's driving. Also, news and information can be delivered this way. It cannot do justice to breaking stories the way radio can, but is able to communicate news that is as fresh as the morning papers.

The real barrier for the Nomad

and PDE units is consumer resistance to hassles with a PC. Though accurate statistics are hard to come by, only a small percentage of the public is willing to go through these extra steps.

This will change rapidly as the PC-to-PDE unit interface becomes nearly invisible and mainstream programming becomes widely available. Even limited to a small percentage of early adopters, this prime audience could reach from 5 to 10 million sophisticated, affluent listeners.

Creative Labs Nomad probably will not make a major dent in the radio audience, but this is early on in the evolution of PDE units. The Nomad is where the Sony Walkman was before it took off in the early 1980s, for those comfortable with PCs.

It will not work with Macs, but the next generation is likely to be cross-platform through the USB interface.

Nomad is a landmark in portable listening. As good as it is, and it is terrific,

The record companies don't want these devices used to pirate material via analog recording.

Smith said, "SDMI puts limitations on analog input for such devices. The record companies don't want these devices used to pirate material via analog recording."

"In our development process, we agreed that recording was an important function. The compromise we arrived at

n't rule out other devices utilizing much the same technology. We believe that is an excellent use of this technology, though it wouldn't be an SDMI-compliant device."

Nomad comes into its own with music and the explosive growth of other material for download from the Web. Subscription sites like audible.com can

Product Capsule:

Creative Labs' Nomad

Thumbs Up

- ✓ Tiny size
- ✓ High-quality audio playback
- ✓ Brings "Internet audio" to in-car listeners

Thumbs Down

- ✓ Poor quality "field" recorder
- ✓ Only records mono through built-in mic
- ✓ PC-only software

For more information contact the company in Oklahoma at (800) 998-1000, check out the Web site at www.nomadworld.com or circle **Reader Service 67**.

this is just the start of the digital revolution that is certain to transform the way we gather and listen to audio.

Update

At press time, Creative Labs announced the upgraded Nomad II would be available on retailer shelves as early as January 2000 and will be under \$400.

The unit will play compressed formats other than MP3 and will be SDMI-ready. Windows Media Support is built in and other support can be available by downloadable firmware. Also, the upgraded unit connects to PCs by USB for faster data transfers.

As the aspects of the initial specs for SDMI are defined, Nomad II will be able to implement those features.

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For more information contact CD Associates in California at (949) 588-3800, or visit the Web site at www.cdassociates.com or circle **Reader Service 68**.

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College FM radio station near Nashville is looking for company that refurbishes/tunes up ITC Delta Triple stack cart machines, Contact Howard Espravnik, 615-230-3618 or mre885@aol.com.

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Optimod 8100A in excel cond w/2 spare cards, \$2995 +shpg; Optimod 8100A SIT sub-chassis for discrete stereo studio-xmtr link, \$495 +shpg. T Burns, 815-625-2100.

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Orban Optimod XT2 or 8100/XT2 combo. alinton@esatclear.ie.

Collins 26U-1; Gates Sta-Level. M Schackow, 605-374-3424.

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

Sennheiser 441 mic, mint cond, \$350/firm; Altec 175A-M30 system, matched pair of tube lipstick mics, 29A capsules w/525A power supply & stainless steel 169-A shock-mounts, very nice, \$900/complete system; (5) Shure 27001 omnidirectional mics, dynamic-XLR, blk & gold, \$75 ea. W Dougherty Jr, 573-998-3117.

EV 664 w/shockmount, less cable, \$80; EV 634 chrome & gray hognose w/H1-Z cable & table top stand, \$75; Astatic Mdl D-10C w/tabletop stand, \$65; Webster/Chicago very old mic, BO; Shure Mdl 27001 omni dynamics 12-1/2" x 1-1/8" (5 matched mics @\$55 ea). W Dougherty Jr, 573-998-3117.

Symetrics 528E voice processor, \$300. C Harpen, 606-484-9393.

EV 635L mics, \$95; Altec salt shaker mics, \$295/ea. W Gunn, 760-320-0728.

WANT TO BUY

RCA 1929 box camera style, 6"x6" cube mic, will pay top price. L Drago, 203-230-5255.

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RCA ribbon mics. W Gunn, 760-320-0728.

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ARRL handbooks, 1928, 1933, 1934, 11th & 12th editions; 1949 edition, fair cond; Radio Handbook 1949, vgc; 1924 booklets: Radio Tinkers Library #4 & \$5, famous 1 knob set & Neutrodyne receiver, fair cond, BO/all. M Kuehl, 715-369-4007.

Audiometrics voice over booth on wheels w/XLR/phono inputs, \$975 +shpg. J Baltar, 207-623-1941.

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Nems Clarke Type 108E phase monitor; Tektronix Type 122 low level pre-amp; Marti RMC-2AXS, RMC-2AXT (A) remote control system; Heathkit G1 signal generator. W Dougherty Jr, 573-998-3117.

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Spectra Sonics 601 compressor, MONO, complete w/outboard controls & VU meter, schematic, brand new, \$200; Allen & Heath "Mini-Limiter/Pro-Limiter" \$50/BO. M Crosby, 408-363-1646.

WANT TO BUY

Audio, Highfidelity & similar magazines from the 1950's. M Stosich, 630-960-9137.

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, N.Y.N.Y. 10003. 212-674-3060.

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TFT 765 FM mod mon W/763 pre selector; TFT 730 SCA mon; TFT 724 FM mod mon. B Dunnavant, 256-830-8300.

Collins 900C-3 stereo mod mon still type accepted, \$500. J Parker Jr, 828-966-9518.

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Otari MX 5050 BII. J Phillips, 419-782-8591.

Various r-r R/PB, part of inventory of purchased radio station, call for details & deal. M Casey, 803-275-4444.

Ampex 440 2 trk, gd cond, one meter needs new glass, lines up, sounds great, \$750/BO. Chuck, 972-772-9354.

Ampex 440B 2 trk, 15 & 30 ips, \$1000/BO; Studer A80 24 trk wide-body, \$20K/BO. A Polhemus, 212-302-9010.

Magnecord 1022 r-r, works, \$100. C Harpen, 606-484-9393.

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Otari MX5050BII-2 (4), great cond, 2 speed, 2 trk, 2 chnl, 1/4" tape, \$1100. D Watson, 508-752-0700.

Sony RM-16 remote control unit for Sony TC-650, TC-850 & TC-880 r-r decks, \$65. D Meyer, 805-962-8273.

Akai M7 Cross-Field head recorder, \$100; Roberts portable recorder, mono, tube-type, take-off on Ampex 600 Series, \$100; (3) Ampex 440/450 tube type PB electr w/o tubes, \$200 ea; Ampex early recording monitor amp w/S-31A output xfmr & 5" Utah speaker, tube type, rack mount, \$150/BO; AMPEX RESTORATION FREAKS!! - VIF tube replacements & adapters, VIG 1006-JFET replacement for 12SJ7, 12AX7 or 6F5 tubes, spec sheet avail, \$16 ea. M Crosby, 408-363-1646.

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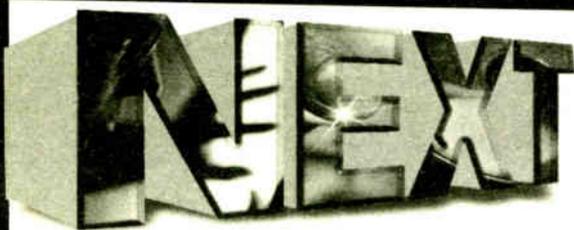
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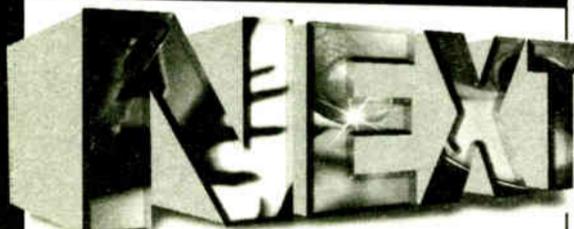
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is looking for computer specialists with great people skills. Team up with the #1 manufacturer of digital music systems! Must be willing to relocate to Dallas, TX. Experience must include:

- Knowledge of overall broadcast operations
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- Network installations (Windows/95/NT, Novell, Linux, Lantastic).

Send resume to: **Brian A. Chase, GM, 13375 Stemmons Fwy, Ste 400, Dallas TX 75234. Fax: 972-620-2707, E-mail: brian@scottstudios.com.**

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Leading National and International broadcast trade magazine publisher seeks Sales Manager for New York, New Jersey, New England territory. Work from your home office. Minimum 5 years sales experience. Strong selling skills, aggressive self starter, excellent written/verbal skills.

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Fax resume, letter describing strengths and salary requirements in confidence to:

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732-591-1170



CHIEF ENGINEER needed for station group in Southwest resort area. CE will be responsible for maintenance of AM/FM transmitters, studios, FCC rules & regs, have good computer skills & automation experience. Applicant should be self-motivated & a good troubleshooter. Position could be full or part-time depending on applicant.

Reply to:
Engineer Ad
H&R Broadcasting
1615 Orange Tree Ln #102
Redlands, CA 92374

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OF KANSAS

HAS AN OPENING FOR CORPORATE TECHNICAL DIRECTOR. Applicants should have a minimum of ten years experience & be knowledgeable in the repair, maintenance & installation of transmitters, studio equipment, microwave systems & broadcast computer technology. Salary commensurate with experience plus automobile & expenses. Travel is required. Qualified applicants should send resume to: **President & CEO, Goodstar Broadcasting, 1660 N Tyler, Wichita KS 67212.** Goodstar is an equal opportunity employer.

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MANAGER, BROADCAST ENGINEERING: KCUR-FM has an immediate opening for a Manager, Broadcast Engineering/Chief Engineer. Qualifications include an Associate's degree in Electronics, Engineering or a related area; at least 7 years experience working with transmitters and associated transmitting equipment; knowledge of STL systems and remote control satellite systems; etc. Responsibilities will include maintaining, and installing broadcast equipment, recommending new equipment. A complete application will include UMKC application, cover letter and resume. To request an application call the UMKC Job Hotline, (816) 235-1627, print an application from our Web site, www.umkc.edu/depts/hres or apply in person, Human Resources, 5115 Oak St., Suite 226, Administrative Center, KCMO. An EOE.

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For new radio/internet venture. Live in paradise in South Florida. Must be experienced broadcast engineer with deep computer & streaming knowledge. Build a brand new state of the art facility YOUR way. This is a non-corporate entrepreneurial company. Leave the corporate suits behind & really do radio right! Unbelievable pay for the right person. Fax resumes to 305-667-0178. Voice phone 305-667-6800.

POSITIONS WANTED

CE position wanted: exper w/computers, xmtrs, automations, DCS, UDS, digital studios, 22 yrs exper. R King, 541-269-9109.

Hard working, friendly CE seeks employment, FT/PT/Contract work, NE. Looking for Radio/TV/AM/Cable or similar. FCC/CET licensed. Available immediately. Mitchell Rakoff, 718-969-5224.

Average Joe trained & looking for on-air, prod, sports, and/or sales position. Recent graduate, call 405-224-5615.

Broadcasting school grad w/exper in a live studio seeking position at your station. Multi-task oriented, any position sought, Victoria, 405-681-9538.

Bryan Thompson, recent broadcasting school grad with live on-air experience. Enthusiastic & hard-working. OKC located & ready to work for you. 405-350-5658.

Creative, energetic, fun, professional, ambitious, dependable, team player, goal-oriented, ready to impress, mature, 2 voices, ready to make an impact at your station. Reggie, 405-741-8565.

Enthusiastic broadcasting school grad w/experience looking for position as announcer or newscaster. Have experience in production, fast edit & cool edit pro. Billy, 405-670-7734.

Hard working, friendly CE seeks employment, FTPT/contract work, NE. Looking for Radio/TV/AM/cable or similar. FCC/CET licensed. Available immediately. M Rakoff, 718-969-5224.

Middays, Afternoon drive or nights. Any of those need filling? 9 year vet relocating to work for you. Andy, 330-633-5323.

Veteran broadcaster, retired from Voice of America could do part-time gig as news anchor or in production. Alex Kuhn, 864-595-7092.

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ACTION-GRAM

EQUIPMENT LISTINGS

Radio World's Broadcast Equipment Exchange provides a FREE listing service for radio stations and recording studios only. All other end users will be charged. This FREE service does not apply to Employment Help Wanted ads or Stations For Sale ads. These are published on a paid basis only. Send your listings to us by filling out the form below. Please be aware that it takes one month for listings to appear. The listings run for two consecutive issues and must be resubmitted in order to run again. Thank you.

Please print and include all information:

Contact Name _____
 Title _____
 Company/Station _____
 Address _____
 City/State _____
 Zip Code _____
 Telephone _____

Are you currently a subscriber to Radio World?
 Yes No

Signature _____ Date _____
 Please check only one entry for each category:

- I. Type of Firm**
- D. Combination AM/FM station
 - A. Commercial AM station
 - B. Commercial FM station
 - C. Educational FM station
 - E. Network/group owner
 - L. Consultant
 - N. Delivery Service (Internet/Cable/Satellite)
 - F. Recording Studio
 - K. Syndicators/Service Providers
 - M. Ind. Engineer
 - G. Audio for Video/TV Station
 - H. Consultant/ind engineer
 - I. Mfg. distributor or dealer
 - J. Other

- II. Job Function**
- A. Ownership
 - B. General management
 - C. Engineering
 - J. Promotion
 - H. Programming/production
 - G. Sales
 - E. News operations
 - F. Other (specify)
 - K. Production Mgt or Staff

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 Make: _____ Model: _____
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*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.
Broadcast Equipment Exchange
 PO BOX 1214, Falls Church, VA 22041 • Tel: 800-336-3045 • Fax: 703-998-2966

ADVERTISER INDEX

This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

PAGE	ADVERTISER	WEBSITE URL	READER SERVICE
11	AETA Audio Corp	www.aetausa.com	16
37	Aphex	www.aphex.com	34
6	Armstrong Transmitters	www.armstrongtx.com	13
32, 33	Arrakis	sales@arrakis-systems.com	30
8	ATI	www.atiguys.com	5
5	Audio Broadcast Group	www.abg.com	4
14	Audio Precision	www.audioprecision.com	8
47	Audio Science	www.audioscience.com	40
2	Auditronics/Wheatstone	sales@wheatstone.com	2
45	Autogram Corporation	www.autogramcorp.com	191
3	Belar	www.belar.com	11
22	Bext	www.bext.com	22
44	Broadcast Data	www.broadcastdata.com	201
44	Broadcast Devices, Inc.	www.broadcast-devices.com	211
36	Broadcast Electronics	www.bdcast.com	33
25	Broadcast Richmond	www.broadcast-richmond.com	-
12	Broadcast Software Int'l (BSI)	www.bsiusa.com	7
44	Broadcast Tools	www.broadcasttools.com	221
49	Broadcaster's General Store/Audioarts	www.bgsfl.com	43
34	Broadcastspots.com	www.broadcastspots.com	31
16	BSW	www.bswusa.com	9
4	Burk Technology	www.burk.com	12
35	Buysellbid.com Inc.	www.buysellbid.com	32
38	CBSI	www.cbsi.org	35
18	Circuit Research Labs (CRL)	www.crlsystems.com	19
44	Circuit Werkes	www.circuitwerkes.com	231
7	Comrex	www.comrex.com	14
23	Comrex	www.comrex.com	23
24	Conex	www.conex-eletr.com	162
31	Continental Electronics	www.contelec.com	29
19	Crown Broadcast	www.crownbroadcast.com	10
13	Cutting Edge	www.nogrunge.com	17
15	Dalet	www.dalet.com	18
39	Denon America	www.del.denon.com	36
45	Econco	www.econco.com	241
59	Econco	www.econco.com	227
46	Electronic Research Inc.	www.eriinc.com	251
21	Energy-Onix	www.energy-onix.com	21
45	Excalibur Electronics	Not Available	261
44	Gorman-Redlich Mfg. Co.	www.gorman-redlich.com	262
28	Grace Broadcasting Service	www.gracebroadcast.com	-
57	Hall Electronics	www.halls.com	200
45	Halland Broadcast Services	www.h-b-s.com	252
1	Harris	www.harris.com	1
53	Harris/ENCO	www.harris.com/communications	46
42	Harris/PR&E	www.harris.com	39
46	Henry Engineering	www.henryeng.com	242
28	IBN Radio	www.ibnradio.com	81
17	Inovonics	www.inovon.com	57
43	Inovonics	www.inovon.com	62
45	J Squared Technical Service	jsquared@cdsnet.net	232
28	La Palma Broadcasting	lapalma@pacbell.net	-
28	LBA Technology	www.lbagroup.com	-
41	Mackie Design	www.mackie.com	60
55	Modulation Sciences	www.modsci.com	48
50	Musicam USA	www.musicamusa.com	44
47	Nagra USA	www.nagra.com	41
30	National Public Radio (NPR)	www.nprss.org	28
46	NICOM	www.nicomusa.com	222
46	Nott Ltd.	www.tjantenna.com	212
58	Pike's Peak Satcom	NOT AVAILABLE	220
54	Pristine Systems	www.pristinesys.com	163
27	Prophet Systems Innovations	www.prophetsys.com	26
46	PTEK	ptekpower.com	202
51	QEI	www.qei-broadcast.com	45
46	Radio Design Labs	www.rdlnet.com	192
26	Radio Systems	www.radiosystems.com	25
46	RDA Systems	www.rdasystems.com	193
51	Register Data Systems	www.registerdata.com	15
59	RF Parts	www.rfparts.com	245
45	River Communications	sales@riverc.com	203
28	RR Productions	www.radioinfo.com	75
20	Satellite Systems	www.satsyst.com	20
29	Scott Studios	www.scottstudios.com	27
46	Shively Labs	www.shively.com	213
46	Silicon Valley Power	www.svpa.com	223
3	Sine Systems	www.sinesystems.com	3
59	Svetlana Electron Devices	www.svetlana.com	267
48	Syntrillium Software	www.syntrillium.com	42
9	Telos Systems	www.telos-systems.com	6
40	Telos Systems	www.telos-systems.com	37
28	The Radio Mall	www.radio-mall.com	70
59	Transcom Corp.	transcom@trcorp.com	163
45	Videoquip Research	www.videoquip.com	243
63	Wheatstone	sales@wheatstone.com	49
64	Wheatstone	sales@wheatstone.com	50

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◆ READERS FORUM ◆

Phasitron site

Dear RW,

At the risk of being declared an advocate of technological anachronism, I have created the beginnings of a Web page celebrating the obsolete but brilliantly conceived Phasitron tube.

The Phasitron is a most-unusual vacuum tube that was used to produce frequency modulation over 50 years ago.

The Phasitron was placed inside a coil driven with pre-emphasized audio, and the magnetic field produced FM in the tube.

There are pictures, some background information, and inventor Robert Adler's classic paper, converted to PDF format. The GE tube manual pages provided by Bill Gillman are also on the page. The URL is www.w9gr.com/phasitron.html

Dave Hershberger
Principal Engineer
Continental Electronics,
Grass Valley Design Center
Grass Valley, Calif.

Here's your license

Dear RW,

In response to the "Here's Your License" programming challenge in the Sept. 15 RW, the City of Santa Monica, Calif., is more than ready for that low-power FM license you have graciously granted. We're also ready for a real one from the FCC.

I'm a former major-market radio station GM. The very evening I took my

"Radio is supposed to serve the ends and purposes of the First Amendment: to protect public discourse, which is essential to our form of democratic self-government."

We in Santa Monica have a rich tradition of participatory government, with a large number of boards, commissions, hearings and workshops. There is some public meeting in progress almost every afternoon and every evening, even weekend mornings. Often there are two or three competing events of general interest.

We are prepared to install digital signal lines linking our city meeting spaces, to

Write to Us

RADIO WORLD
READERS FORUMP.O. Box 1214
Falls Church, VA 22041radioworld@imaspub.com

broadcast live, or record for later airing, as much of this public process as possible. We already use local NPR, our own CityTV cable station and the World Wide Web (www.santa-monica.org for live streaming video) to carry city council meetings. With our own Santa Monica LPFM station, we can put the full spectrum of participatory democracy on the air.

'The City of Santa Monica is more than ready for that low-power FM license you have graciously granted.'

Santa Monica City Council seat, Dec. 8, 1998, we passed a resolution in support of LPFM as a community resource. Since then, besides filing a comprehensive comment on FCC Docket MM 99-25, Santa Monica has budgeted for start-up and maintenance of a 10- or 100-watt station serving our 8.3 square miles.

You asked, though, about programming.

As Ralph Nader wrote in a July 9 "Commercial Alert" op-ed about LPFM,

This will include our school board, our planning commission, other boards and commissions, neighborhood groups, public workshops on local issues, and hearings of other county or state governmental bodies that are held in Santa Monica.

We also look forward to bringing our listeners live high school sports broadcasts, an excellent opportunity to give our students experience in play-by-play announcing and broadcast production.

RU Ready 4 Y2K?

So, are ya ready? No excuses, now.

Dec. 31 is weeks away. Lucky you. You get to work that night. The public has known about the infamous Y2K bug for months. We've printed scads of articles about it for two years. So you're ready.

By now, your station management team has met to prepare a checklist of remaining steps and set up a list of emergency procedures.

You've been in touch with your power utility to make sure you can reach them even if their public phone lines are busy.

You have a big, fat generator topped off and ready to go, and lots of fuel on hand. If your transmitter is in a spot where a generator won't fit, you have a battery-operated backup transmitter.

You know exactly what systems in your facility are reliant on date-sensitive computers, and you know which of those are mission-critical.

You taped a list of emergency phone numbers somewhere prominent, you are in touch with other engineers in your group, and you are part of a phone chain with fellow engineers in your market, to share gear in case of a failure. You know how to reach someone at the vendors who sold you your computer-based systems.

Automation system is Y2K-compliant? Check. EAS? Check. Transmitter remote software good to go? Check.

Critical staffers are ready to work that night, or available quickly? Check and check. Elevators? Hmmm, don't forget.

We actually don't expect big problems that night. Radio groups and stations seem to have their computer answers sorted out, at least regarding critical systems. The industry has done a good job getting ready.

So go ahead and enjoy New Year's, with your fingers crossed. We will, too, because we've done a thorough, top-to-bottom check of all critical systems at Radio World.

— RW

School plays, concerts and other educational programs will follow. Santa Monica is proudly developing a lifelong learning community, and our LPFM radio station will be an indispensable tool.

Once the events themselves are on the air, we will host panels and talk shows to analyze and interpret the results from a Santa Monica perspective. News programming from CityTV, limited now by cable penetration, will have a sister radio outlet with more universal access. We'll be able to share truly local traffic reports, and talk about Santa Monica weather (always perfect, our convention and visitors bureau wants you to know).

Our aim every step of the way will be to involve more residents in a more participatory way. Radio will bring Santa Monica government and community life to drivers in their cars and seniors in their homes. Rebroadcasts of important events will make them even more accessible.

Ambitious? You bet. When can we start?

Kevin McKeown
Councilmember
Santa Monica, Calif.

CD-R distortion

Dear RW,

I just read Bruce Bartlett's interesting article about distortion on CD-Rs.

We have observed the exact same situation with a two-minute program, "Light the Window," (Words of Hope Ministries, Grand Rapids, Mich.) which was delivered to us on CD.

Our air studio has two Denon DN-950-FAs. The distortion was very obvious on the one deck. It sounded like analog distortion. I have never heard anything like it in the digital realm. After it finished, we tried it on the second deck and it played just fine. Other CDs seem to play normally in both decks.

I spoke to a technician at the production house and verified the disk is a CR-R. The program is produced "end-to-end" in a computer and then burned on a computer CD-RW drive.

John L. Stortz
Chief Engineer
WKES(FM)
Lakeland, Fla.

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 Wheatstone Corporation

600 Industrial Drive, New Bern, North Carolina 28562 (tel 252-638-7000/fax 252-637-1285/email: sales@wheatstone.com)

A Word to the Competition



Wheatstone
Direct



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OdB

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AND A WORD TO THEIR CUSTOMERS

WE KNOW loyalty is a good thing, but the broadcast industry has changed dramatically in recent years, with some winners and some losers.

If you haven't looked at Wheatstone lately, it's time you checked out our new product line. Wheatstone has grown with the industry; in the last 3 years alone we've developed 5 digital and 9 analog consoles, plus a digital AES router that can integrate smoothly with our consoles and your automation system. We've constructed a brand new high-tech manufacturing facility

in New Bern, North Carolina, taking full advantage of the latest robotics and laser fabricating machinery.

All this self-funded—25 years of continual growth, profitable every single year; a responsibly managed company with a long term view.

Isn't it time to re-assess your suppliers?

SO... While our competition has been busy cashing in their chips, Wheatstone's been getting bigger and better, developing the **products** you need today, and the **support** you can count on tomorrow.

CALL WHEATSTONE—DIRECT.



Wheatstone

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