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'We're Not Dead Yet!'

Fans of AM Stereo promote their favorite technology via the Web.

See Page 18

Birmingham Buildout

Troy Pennington moves three stations into a new complex and shares his experiences.

See Page 21



Radio World

The Newspaper for Radio Managers and Engineers

September 2, 1998

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Check out RW Online at www.rwonline.com

License Auction Rules Set

by Leslie Stimson

WASHINGTON The FCC has begun to spell out how it will auction broadcast spectrum in cases where there is more than one applicant for a license. The auctions could begin as soon as this fall.

While Congress required such auctions in the Balanced Budget Act of 1997, it's only now that the bulk of the rules are finalized. Commission observers say the auctions represent a sea change in how the federal government treats radio and TV licenses, and that this changing view may have implications in the future for all licenses, not just those in dispute.

See SPECTRUM, page 14 ►

TRANSITION TO DIGITAL

MPR Goes Digital In the Twin Cities

by Alan R. Peterson

ST. PAUL, Minn. While Minneapolis and St. Paul may be best known for the Twins, the Vikings and The Artist Formerly Known as Prince, the twin cities now can

also boast of a state-of-the-art digital radio facility in the heart of the action, courtesy of Minnesota Public Radio.

The four-story MPR building on East 7th Street in St. Paul is a short walk from the state capitol complex. The facility houses



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four on-air control rooms and five production rooms, all tied together in a unique combined digital-analog configuration.

The facility provides programming for public radio stations KSJN(FM) and KNOW(FM), both licensed to Minneapolis-St. Paul, as well as network programming to NPR-affiliated stations. Shows produced at MPR headquarters include the financial talk program "Sound Money," the national cooking show "Splendid Table" and "Radio Main Street."

Good timing

According to MPR Chief Engineer Ralph Hornberger, the move to digital was based on the decision that the time was right.

"The time was right for us," he said, "if we could find a system that would work the way we wanted it to work. The one we got filled all the basic requirements."

The new facility was built around the Australian-made D-CART, a digital storage and playback system that converts digital audio back to analog right at the server, sending it out to each studio as a conventional balanced line-level audio signal. D-CART also has found users at the Canadian Broadcasting Corporation and at the former Capital Cities/ABC network in New York.

See MPR, page 8 ►

◆ NEWSWATCH ◆

Cutbacks at Westwood One

ARLINGTON, Va. Westwood One said it would consolidate its news operation here by Sept. 1. About 40 news staffers were to be let go from Westwood-owned NBC Mutual news headquarters in Arlington, Va.

Westwood Vice President for News Bart Tessler said the Washington bureau would continue to be a news-gathering operation, but all anchoring would be done out of New York.

The brand names and the times for

the Westwood, Mutual and NBC news programming will not change, even though CBS Radio News will be providing the anchors. CBS Corp. has a 25 percent interest in Westwood. CBS President and Chief Operating Officer Mel Karmazin is also President and Chief Executive Officer of Westwood. Karmazin ordered the consolidation to reduce duplicative news efforts. Total news affiliates for Westwood, NBC Mutual networks was estimated at 1,500.

At press time, it was unclear how many staffers would be let go. About 10 news staffers would stay in the Washington bureau.

Tessler said some staffers might move to New York, but how many, who, and what types of positions they would hold remained unclear.

Staffers for the Westwood talk programs that originate in Washington would not be affected by the consolidation; neither would sports staffers nor affiliate relations personnel.

New Deadline For FM Proposals

WASHINGTON If you want to tell

the FCC what you think about proposals to streamline the FM technical rules, you have more time. The FCC has extended the public comment period on MM Docket 98-93 by 60 days. The commission agreed to a request by NAB, saying an ad hoc engineering group formed by NAB to study the proposals would give the commission better and more information on how the proposed changes could affect stations.

The proposed changes to Part 73 and Part 74 of the FCC technical rules include creating a new subclass of FM Class C stations, and allowing some

See NEWSWATCH, page 3 ►

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 **AUDIOARTS ENGINEERING**

Dunifer Vows to Continue His Fight

by Dara Colwell

BERKELEY, Calif. Despite the federal government's success in muting Free Radio Berkeley, founder Stephen Dunifer has not given up the fight.

"I don't consider it (the injunction) much of a setback because the issues are not resolved," he said. Opponents of Dunifer in the broadcast community disagreed, portraying a recent court decision as a major win over Dunifer.

Dunifer set up Free Radio Berkeley in 1993, he said, to push the federal government to accept community-led radio. Not long afterwards, the FCC fined him \$20,000 for broadcasting without a license. The fine is still outstanding in the legal battle between Dunifer and the FCC.

After years of struggling to slap an injunction on the station, the FCC

finally got its wish and in June of this year the station was shut down (RW, July 8). Dunifer, however, hasn't given up the fight.

Of the injunction, Dunifer said, "Once again, the FCC has dodged the bullet and the conclusion, based on a legal technicality, is ludicrous at best." The technicality: because Dunifer did not pay for a license, he had no right to challenge the constitutionality of the FCC's regulations.

Sitting barefoot in faded jeans and a T-shirt, the soft-spoken free-speech advocate doesn't look like a robust, modern-day David. But as founder of Free Radio Berkeley, Berkeley's low-power community radio station, Dunifer has gained national attention as one of the few brave activists to challenge the FCC and existing broadcasters.

"I have yet to receive a letter saying

and abetted by the FCC."

Approximately 100 volunteers worked at FRB before the injunction. Approximately half remain.



Stephen Dunifer

FCC, NAB Firm on Pirate Enforcement

Pirates Get Shut Down, But Low-Power Radio Remains an Issue at the FCC

by Leslie Stimson

WASHINGTON While Stephen Dunifer is determined to keep up his crusade, the government and existing broadcasters are just as firm in their position that unlicensed broadcasters are operating illegally and should be prosecuted. At the same time, the idea of a low-power service is gaining credibility at the FCC. Sources say the commission may soon take the next step toward a new low-power radio service.

Dunifer is fighting the injunction levied by the United States District Court for the Northern District of California. Of a court hearing on the case set for Aug. 7, NAB attorney Jack Goodman said, "We believe the government was right and his motion to amend or modify the injunction has no basis and should be denied."

When the court issued the permanent injunction against Dunifer, the 18-page decision reaffirmed the FCC's authority to require a license before a person can broadcast on the public airwaves, according to commission officials.

Sending a message

After the decision, FCC Chairman Bill Kennard said, "The permanent injunction in the Dunifer case, and the FCC's success in the last two years in shutting down over 200 pirate stations, should send a message to all pirate broadcasters: obey the law — join the FCC in our efforts to expand the legal uses of the public airwaves."

The 200 shutdowns Kennard referred to is the latest figure of the commission's enforcement actions, compiled

See POWER, page 6 ▶

"What you do is terrible, please leave the FCC alone," Dunifer said. "There has been widespread public acceptance."

Established to challenge what he perceived as corporate broadcast's stranglehold on the medium, Free Radio Berkeley was an exercise in civil disobedience. Dunifer said, "It was time to tell these corporations where to get off. For 64 some-odd years, they've been pumping out the same old schlock and making an obscene amount of profit, a theft aided

Dunifer, who has a background in electronic engineering and political activism, sees micropower broadcasting as a "procedure-be-damned" grassroots movement to enhance community empowerment.

"The airwaves belong in the hands of the people. Community radio has such potential as an outlet for expression. I think every high school, housing project and senior community should have its

See DUNIFER, page 7 ▶

NEWSWATCH

▶ NEWSWATCH, continued from page 2
FM station interference under limited circumstances (RW, July 8). Comments are now due Oct. 20 and reply comments by Nov. 20.

Jacor Closes Nationwide Deal

COVINGTON, Ky. Jacor Communications closed on the \$620 million purchase of Nationwide Communications Inc.'s radio properties. The transaction for Nationwide's 17 radio stations, announced last October, had been

pending regulatory approval.

The Department of Justice signed off on the deal provided that Jacor divest eight stations — two in San Diego, one in Cleveland and five in Columbus, Ohio. That will be accomplished by several swaps and sales to other companies.

The DOJ said without the spin-offs, Jacor would control 12 stations and 42 percent of the radio ad revenue in San Diego, six stations with 43 percent of the radio ad revenue in Cleveland and nine stations with 58 percent of the radio ad revenue in Columbus.

Including announced pending acquisitions, Jacor owns 204 stations, making it the third-largest radio group by station total.

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A Dinosaur Frets About Extinction

My friend Dave is an opinionated grouch. In fact I nicknamed him Dave the Dinosaur years ago. I suppose he's been around the business long enough to have earned his opinions. But I have to listen to him carp about radio more than I care to relate.

I must admit that sometimes I can't brush off his comments. They strike close to a nerve. They also serve to keep me from a tendency to unwarranted optimism. When he catches me in "radio booster" mode, he calls me on it.

Does this sound like conversations you've had with your radio friends? Dave's remarks are italicized:

Why are you so distracted lately?

We're getting ready for convention season again. The NAB Radio Show is in Seattle in October, and Radio World has a big preview issue planned.

Aren't you lucky! Another NAB show. Big yip.

Why are you being so sarcastic? Don't you think these shows are useful to radio people?

The radio industry is going to hell in a handbasket. It's all being run by big groups with no soul that only care about the latest stock prices on Wall Street. You even wrote about this recently.

Boring stuff

You mean the editorial "Are You Bored Yet?" I thought that item would be controversial, but most people who responded seem to think it has already happened. They say radio is boring.

Sure. All this equipment that lets you send audio from city to city, all these groups connecting up their stations, all this group ownership will inevitably lead to a bland product. It has already.

I dunno, Dave. I don't think it's that simple. There are lots of success stories out there on the local level. It's all in how you use the tools. The people who run broadcast groups aren't ignorant of that.

I have two words for you: Michael Eisner.

So what's your point?

These are business people, not radio people. They look at the medium as an asset to make money, not as an artistic or public service endeavor. That's why the

NAB comes in for such hard knocks. The little guy in radio doesn't think the NAB speaks for him at all.

That's pretty hard on some of the big broadcast owners. A lot of these people care deeply. And I know a lot of the NAB folks. They're not evil. The people I've met at NAB really do seem to want what's good for their members.

Anyway, radio has always been a business, even at the start. That didn't prevent creative programming.

Yes. But the battlefield is different now. We're competing with stuff that was

The battlefield is different now. We're competing with stuff that was unimaginable even 10 years ago.

— Dave

unimaginable even 10 years ago. Did you see that piece in the newspaper the other day, about new data systems that will customize traffic information and give it to you over the Internet or some other delivery system? Yet another radio niche going away. One guy in the article said, "Traffic reports on the radio are for everybody. This traffic is for you."

But radio is making money, big time. Business is good. As of June, we had 70 straight months of revenue increases.

So why do I have this bad feeling all the time? Maybe I don't own the right stocks. Look, with so much attention from the money boys, and with new systems like satellite radio coming along, radio is a sitting duck for new competitors to come pick us off. A boring, sitting duck.

Dave, we've got 18,000 readers whose lives revolve around radio every day. These people put pride and hard work and years of effort into making their stations sound fresh.

And hooking up satellite dishes, and laying off their staffs, and hiring a voice guy in New York to do all their liners.

That's simplistic. But so what if syndication is in? Sounds like the early network days to me.

Technology improvements mean nothing if the product isn't the best it can be. We need good, interesting programming, with localism. Don't ever lose sight of localism.

Free market forces are at work in radio, Dave. We can't turn the clock back. We've gotta fight with the tools we've got.

Don't lose sight of localism! It's about the only thing we've got left.

Your comments on Dave's comments are welcome at pmclane@imaspub.com

From the Editor



Paul J. McLane

audio, pro video and related markets.

When I walk down the hall in our office near Washington, I can overhear conversations in English, Spanish, Portuguese, Chinese, Japanese, French and German. The company has staff or offices in Paris, Milan, Cologne, Hong Kong, Tokyo, São Paulo and the suburbs of London. Only recently, IMAS has founded magazines in Brazil, Germany, France and Japan.

That helps explain how my face ended up in TV Technology Nihongo-ban, in a column intended to introduce IMAS staff to Japanese readers.

It was kind of a kick to see that, but I guess certain words don't translate easily. Many English phrases pop out of the Japanese text. Among them: FM, AM, DAB, in-band, on-channel, and Radio World.

On a lighter note:

It's easy to forget how global communications have become. I am reminded of this when I walk down the hall at IMAS Publishing, which was founded 23 years ago with the publication you hold in your hand. IMAS now has 15 publications serving almost a quarter-million readers around the world, covering radio, television, pro



Look Who's Talking
「Radio World」編集者 ポール・マクレーン

IMAS出版の13の放送業界誌のなかでも最も歴史があり、またおそらく最も知られているのが「Radio World」である。70年代に製播法音のリストとして始まったRadio Worldは、米国で最も広く読まれている雑誌に成長した。2週間ごとに、FM・AM局のオーナー、経営者、技術者18,000人が米国版を越え、新製品や最新技術について知り、業界で起こっている統合・合併の動きに追いつき、重要な事柄についての業界人の意見を学んでいる。編集スタッフ、フリーライター、コラムニスト、テクニカルアドバイザーは100人を超える。さらに「Radio World International」と「TV Technology」を含む姉妹誌との協力により、海外ニュースを米国の読者に提供している。

米国のラジオをとりまく環境はここ2年の間に大きく変化した。1996年に合衆国議会は放送業界と通信業界にかかわる法律の重大な改正を承認した。その結果、ラジオ局の大規模な買収・合併が生じた。現在1つの法人が全国の数々のFM・AM局を所有することも可能だ。機取引委員会、この傾向に注目し、現在では以前よりもラジオに注意を払うようになっている。「Radio World」はこれらのトレンドや業界人への影響をレポートしている。

TV Technology Nihongo-ban also covers radio and pro audio issues for readers in Japan.

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◆ READERS FORUM ◆

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Appreciates DAT

Dear RW,

I wanted to express my appreciation and interest in Jeff Johnson's articles regarding DAT repair. I have been working on primarily Panasonic SV-DATs for about three years, spending many hours repairing and calibrating them. We have about 22 Panasonic DATs, plus a few Tascam rack-mount and portable units and three Sony TCD-D10 units. We also have four DA-88 units, which we calibrate and repair in-house.

I have plenty of DAT war stories. However, our woes with the DAT format dramatically decreased once all DAT repairs were performed in-house, rather than at outside service centers. We have implemented a strict cross-play standard, under which a repaired unit cannot return to service until it cross-plays with other

units with error rates of 0000 to 0005; error rates must also cannot remain above 0000 for an extensive period of time.

*Eric Nordberg
Broadcast Engineer
"Focus on the Family"
Colorado Springs, Colo.*

Sine sympathy

Dear RW,

Like many fellow broadcasters, I was shocked and deeply saddened to learn of the death of Sine Systems founder and industry friend John Pate (RW, May 13). A loss such as this leaves us all to wonder, "If I had just spent a bit more time on the phone with him, maybe we could have prevented this tragic scenario."



John Pate

I had become a big fan of John's RFC-1 back in 1990 when I discovered this wonderful little remote control that was selling for about one-third the cost of the big guys — and the little thing had almost all the bells and whistles and it worked! Since that time, I have purchased systems for all of my stations.

Still, the biggest asset was John on the other end of the "help line." That low-keyed voice that never lost patience with the customer was a real plus for many of us. And to have him listen to suggestions and actually see those ideas come out in later updates was very heartwarming. It was always a hoot to get him talking about the system's development. Did you know that some of the codes are based on his personal social security number?

I also vividly recall a time when one of my stations suffered a severe lightning hit. The little RFC box and relay panel took much of the attack. Calling John, I felt that the system was beyond repair. I was all set to order a complete new system. John wouldn't hear of selling me a new system. He said, "Just send it to me. Our maximum charge is \$100 and we'll get it back out the door the same day we get it." I became a real big fan, real quick.

John was a fine business associate and the whole industry suffered a real loss. Even though I never met the man, I will miss him deeply.

After reading the article in **Radio World**, one might say that the sum of his problems didn't equal the final result. But in these high-pressure days, it is very easy to let our problems add up and up

Sold!

The sound of a gavel banging on wood is getting louder as license auctions creep closer into the world of radio.

In last year's budget legislation, Congress gave the FCC authority to auction radio licenses in the case of "mutually exclusive" applications, in which two or more applicants are trying to prove they are the most qualified licensee for that station. To encourage settlements, late last year the FCC waived rules that cap the amount of money applicants could pay each other to drop competing applications. After the settlements, about 500 applicants were left vying for 130 licenses.

The auctions give the commission an easy way to clear out the remaining backlog, built up when a court invalidated FCC criteria for deciding who should get a contested license. While these may not be the most desirable stations, the precedent is troubling.

The NAB successfully fought off spectrum auctions for TV's second channel, but did not formally oppose them for radio in the budget bill. Some industry insiders say privately that NAB used up a lot of political clout in the TV battle — remember Sens. Dole and McCain griping about the "spectrum giveaway"? — and chose not to fight this one.

Granted, the new auction rules don't affect existing licensees. But a door has been opened.

The FCC has decided to give bidding credits, or discounts, in the license auctions to those who don't own stations now or to those who own three or fewer media outlets in the same market as the license up for auction. That kind of arrangement can lead to fancy tricks. It remains to be seen how abuse of that process will be prevented.

Auctions also will be used to settle disputes for mutually exclusive major modification applications. Get ready for some dealing. Look for applicants to pay each other to withdraw their requests, or to negotiate interference and refile, to avoid interference between neighbors and allow the FCC to grant both. This, at least, is the commission's goal.

In its quest for revenue, the government has eyed broadcast spectrum greedily for some time. The FCC will be able to auction off TV's analog spectrum after stations make the transition to digital. It looks as if the government gets to make money off the radio spectrum sooner.

We doubt Uncle Sam will stop there. Will you be paying for the right to retain your radio license five years from now?

— RW

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**Next Issue of Radio World
September 16, 1998**

until something gives. If we learn nothing else from this tragedy, it is the need to not be ashamed to find somebody, a professional or just a good friend, to talk to when the problems get too great. Sometimes just sharing will make all the difference.

*Dick McGraw
Chief Executive Officer
The McGRAW GROUP
WELK(FM), WBTQ(FM), WEIR(AM),
WCDK(FM), WBUC(AM), WBRB(FM),
WVUC(FM), WBUC-TV
Elkins, W.V.*

FCC Q&A

Dear RW,

I really enjoyed FCC Inspector Ron Ramage's article in the June 24 issue. I look forward to future articles.

I was discussing modulation levels with a fellow engineer who told me that you should adjust your processing so that the peak light on negative modulation on your modulation monitor never lights up. Another engineer friend said it was okay if the peak flasher for negative peaks flashed on your modulation monitor so long as it does not stay lit.

Would you please tell me who is right? Thank you!

*Steve Tuzeneu
Station Manager, WVNE(AM)
Chief Engineer, WCW(FM),
WNEB(AM)
Worcester, Mass.*

Ron Ramage responds:

Thank you for your interest in the article. Your second friend was correct. The rules talk about "peaks of frequent recurrence" (Section 73.1570 of the FCC rules). This means that peaks can exceed the limits part of the time. I check to make certain the modulation peak indicator flasher is not lit up too frequently. Since too frequently is hard to define, use your best judgment. A single flash every second or two is fine. If the flasher consistently stays on for more than a single flash, then the modulation may need to be turned down slightly.

Please feel free to ask any other questions you may have.

Ed. Note — Readers who missed any of the articles about DAT service by Jeff Johnson or FCC visits by Ron Ramage can see them on the Web at www.rwonline.com

Kudos.com

Dear RW,

Just visited your RW Web site (www.rwonline.com) for the first time and wanted to let you know it's great!

Lots of useful info set up in a very easy-to-access format. Good job!

*Roger Karwoski
Assistant Mgr./Dir. of Engineering
KBIA(FM)
Columbia, Mo.*

Write to Us

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READERS FORUM**

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Groups Vow to Support EEO Rules

Meanwhile, Broadcast Executive Directors Association Looks at Web Recruitment

by Leslie Stimson

WASHINGTON FCC observers and Chairman Bill Kennard breathed a sigh of relief after 17 major broadcast groups, including several radio group owners, pledged to uphold the spirit of the commission's equal opportunity employment rules — no matter whether a court ultimately strikes down the rules.

Among the radio groups that made the pledge to the chairman were ABC, CBS, Capstar Broadcasting, Clear Channel Communications, Chancellor Media Corp. and Jacor Communications.

In announcing the pledges to attendees of the national convention of the National Association of Black Journalists, Kennard said, "How can anyone living in America today believe that race no longer matters in this society?"

Kennard praised the 17 broadcasting companies and urged others to uphold EEO principles.

David Honig, attorney for the National Association for the Advancement of Colored People, said it was too early to



Bill Kennard

encouraging. Nonetheless, I think even one discriminator is unacceptable. ... All broadcast companies should take the pledge."

Capstar officials said the company would continue to abide by EEO princi-

whether it is mandated or not."

The FCC has appealed a decision by a three-judge panel of the United States Court of Appeals for the District of Columbia, saying the FCC affirmative action rules did not serve a compelling interest. Basically, the rules require broadcasters to make good-faith efforts to recruit and hire minorities and women.

The decision stemmed from a case involving the Lutheran Church, which has opposed a rehearing of the case. The appeals court had not notified the FCC whether there would be a rehearing of the

case by press time. Pending a decision, the FCC EEO rules remain in place.

Meanwhile, as a concrete way of increasing minority recruitment, a task force of members of the Broadcast Executive Directors Association (BEDA) is discussing using a job clearinghouse on a Web site as a recruitment tool. Under discussion is a plan to have each state association's Web site linked to a central site, where broadcast job notices would be posted.

BEDA President Philip Roberts said, "We need to get more people interested in the broadcasting business. For example, if a kid was a techie 20 years ago, he went into radio or TV. That very same techie kid today goes into computers."

Low-Power Choices

► POWER, continued from page 3

state by state. The Compliance and Information Bureau handles enforcement actions of all kinds. Its leader, Bureau Chief Richard Lee, raised the commission's profile with unlicensed operators when Lee began attending federal raids on unlicensed operators last year. He also attended a self-proclaimed pirate convention in Philadelphia this spring. Lee said he talked to a few would-be unlicensed operators about the consequences of their planned actions before they occurred (RW, April 29).

While FCC officials have become more visible in crackdowns on unlicensed operators, the Kennard commission is considering whether to allow some sort of low-power stations on the air legally. The point is to diversify ownership and serve audiences that may not be served now. The public comment period has expired on three petitions that suggest various types of low-power service with a range of possible power levels and antenna heights: ranging from 1 watt or less, with antenna heights of just 50 feet; 1 to 50 watts, with antennas up to 150 feet HAAT; and 50 W to 3 kw, with a maximum HAAT of 328 feet (RW, July 22).

Dunifer and other supporters of a low-power service say it would allow access to the airwaves to a wider range of owners, not just those who have a lot of money. NAB and other opponents say such a new service would cause interference on the already-crowded FM band and the commission would not have enough enforcement personnel to police the new service.

Being an unlicensed operator, Goodman said, "is not the way to get yourself into the radio business."

Another argument against a new low-power service is that changing current FM allocations may affect the future in-band, on-channel digital audio broadcasting. In comments to the commission on the low-power issue, IBOC proponent USA Digital Radio took no position on the merits of the petitions but urged the commission to defer consideration of these or any proposals "which would affect the interference environment for existing AM and FM broadcasting" until the FCC has established rules and procedures to introduce IBOC DAB.

This is necessary, USADR argued, "because any changes to the interference environment in the AM and FM

bands resulting from the introduction of low-power radio may impair or eliminate the possibility of introducing digital AM and FM broadcasting in the United States."

USADR stated, "The petition RM-9242 explicitly calls for elimination of second-adjacent and third-adjacent interference restrictions in order to create a means to establish these new stations which would not comply with the full range of existing interference restrictions. The other two petitions seek access to dedicated AM and FM spectrum for this new service. These petitions do not address incumbent users."

The other two proponents of IBOC DAB, Lucent Technologies and Digital Radio Express, did not file comments on a low-power service. DRE President and CEO Norm Miller told RW, "If you let the pirates all come on, there will be interference into digital broadcasting."

What's next

FCC officials now have to decide what to do with the low-power proposals: whether to let them die quietly, or take the issue to the next level, which would be to begin a Notice of Inquiry. Sources inside and outside the FCC believe an NOI will be the next step. That would allow staffers to pose specific engineering questions about the feasibility of licensing such a new service without risking interference in the FM band. (Citing better quality than AM, most low-power proponents prefer the new service to be on the FM band.)

The commission would also have to decide how to allocate frequencies for a new service. The low-power petitions called for various approaches to this problem. One would allow anyone who wanted a frequency to be considered for a nominal fee. Another would require future owners to live within a certain distance from their station.

None of the low-power petitioners wanted frequencies to be auctioned. But auctions are exactly what Congress specified in the last balanced budget act for all pending and new mutually-exclusive applications for analog radio and TV stations, and for secondary broadcast services such as FM translators and low-power television (see page 1). The commission would have to determine whether the new service fell within the definition of a service that has to be auctioned.

We strongly believe in equality of opportunity whether it is mandated or not.

— Steve Hicks

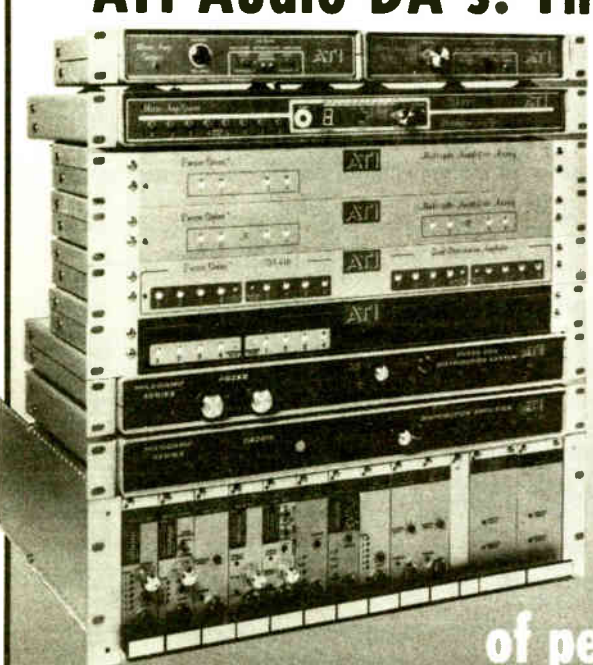
tell if the pledges would be symbolic or would really make a difference in increasing minority hires.

"The fact that a number of large companies have made EEO part of their corporate culture ... to the extent that they will observe procedures, is somewhat

ples last spring, as a U.S. Appeals Court overturned a lower court ruling and struck down the commission's EEO rules (RW, May 13).

Capstar President and Chief Operating Officer Steven Hicks stated, "We strongly believe in equality of opportunity

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Dunifer Moves to the Internet

► DUNIFER, continued from page 3
own radio station."

Fellow FRB member and political activist Sue Supriano said that selling the idea of the idea of community radio has not been hard.

"I've never heard anyone say it's a bad idea, I've seen nothing but support," she said. "People are excited hearing things they know about, hearing information or music that can't get out there any other way."

Paul Griffin, an FRB member who decided to set up his own station after

reading about Dunifer five years ago, said the general public is beginning to realize that commercial and corporate-sponsored radio has become mainstream and bland. "There are so many cookie-cutter stations out there. Everything gets formatted, categorized and it becomes deadly predictable."

The micropower radio movement has survived because it is not bland, Dunifer said.

"Community radio is consistent with the diverse community it reflects. Communication is radio's primary use. By promoting civic discourse, we create a vibrant community."

Arguments for and against Dunifer's

motion to reconsider the injunction were set for Aug. 7 in United States District Court for the Northern District of California in Oakland. Dunifer told RW he believed the injunction would stand and that if that happened, he would appeal.

Meanwhile, the FCC comment period has ended for three petitions to create a new class of low-power radio service (see related story, page 3). Dunifer said these petitions are flawed and that the FCC invitation for comments was a "mere accommodation at best. ... The FCC is looking for damage control because they don't have the resources to control the movement, and (looking) to string people along in a game of divide

and conquer. But we're not satisfied with the crumbs off a stale cake — we want the whole pie shop."

Dunifer continues to make and sell equipment for other micro stations from a workshop at the back of his apartment. Since the injunction was granted June 16, FRB volunteers now broadcast over the Internet. They have inspired a local group, calling itself Clandestine Broadcast Services, to broadcast on 104.1 MHz from the Berkeley hills.

Dunifer said he will continue to fight for legal access to the airwaves and is adamant that he will not apply for a license.

"The license is a violation of free-speech rights. The system is skewed in favor of corporate interests. It's all going to be a matter of direct action," he said. "Direct action gets the goods."

Studio Rules Relaxed

WASHINGTON Broadcasters now have more flexibility in where they can locate their main studios and public files. But they now must keep e-mail messages in those files.

The FCC has relaxed the main studio rule. Instead of being required to locate the main studio within its principal community contour, a licensee can place it within the principal community contour of any station, in any service, licensed to its community, or within 25 miles of the center of the community of license. This creates opportunities for licensees to operate multiple stations from a central location.

Broadcasters wanted the changes, and the FCC hoped they will reduce the waiver requests it receives. The FCC planned to dismiss all pending waiver requests for the main studio and public file rules unless applicants show why they still need relief.

The FCC hopes the changes will help small station owners. Principal community contours vary greatly. High-power stations, which have contours as great as 44 miles in radius, had more flexibility in locating their main studio than did low-power stations, which can have principal community contours as small as 10 miles.

Rules also have been relaxed to allow broadcasters to keep public inspection files at the main studio, wherever that may be. Broadcasters had been obliged to keep files within the community of license. For licensees with out-of-community studios, that meant keeping the file where the public could see it, such as a library or convenience store. This made it difficult to maintain the file.

One controversy was whether a new owner must keep old material in the public file. This was important, given the number of recent transactions. The commission is requiring that a file inherited from a previous owner must be retained for the rest of the eight-year license term.

Electronic messages via computer or e-mail now are part of the public file and must be retained. Many stations opposed this, saying it would be hard to determine exactly which messages to keep given the volume of e-mail. The FCC said e-mail is the same as a printed letter, but gave stations the option of either printing out e-mails or posting them on a Web site.

— Leslie Stimson

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MPR: Digital in the Twin Cities

► MPR, continued from page 1

Hornberger said the process avoids having to maintain a high-speed digital network to route digitized audio files to the labyrinth of studios in the MPR building.

"We actually use two different digital systems," said Hornberger, "Digidesign ProTools for production and the D-CART system for broadcast."

Earlier versions of many PC-based audio playback systems worked in the same manner, outputting analog streams to respective destinations. While many systems have evolved to using commercially available computer network hardware, the D-CART system retained its original operating concept but became more powerful.

With the number of domestic companies providing solutions for digital radio management, why did MPR gravitate toward an Australian product?

"I think the main selling point was that it was an *analog* audio server," said Hornberger. "It is digitally controlled, but audio leaves the server as an analog signal. We can use our existing infrastructure and run our audio around the building the way we've always done it."

Even though Hornberger was not on the original team that made the decision to go with D-CART, he still found the system attractive in its operation, mainly because the system was based around an audio server.

"It optimizes what it is using (digital audio) with the way it does it," he said. "The digital control is not high-speed so we don't worry about a high-speed network. It runs under OS-9 rather than Windows — similar to the IBM OS-2 operating system, but is more robust and is highly networkable, although the commands can be just as arcane at times." (See sidebar story about OS-9.)

MPR is running 50 computers through the D-CART server, all transferring audio to and from the server at any moment.

"A lot of it is due to the fact the sys-

tem is not choking up a high-speed data network," said Hornberger. "And OS-9 can handle it all."

The downside is the support available from D-CART, which at present still means

MPR engineers and board operators that the audio quality is better from an analog standpoint. Hornberger cites headroom and dynamic range as criteria.

Figure 2 shows a view of Studio 3D,



The MPR Building at 7th and Cedar in St. Paul

a phone call to the Land Down Under.

"They've been promising they would have support available from the United States," said Hornberger. "It hasn't come about yet, but it's getting there. Recently we had to buy spare parts from them just for stock and it took an incredible length of time."

Familiar look

Because studio operators handle audio as a conventional analog signal, studio components remain familiar favorites, including Wheatstone audio consoles. There are no digital consoles in place — at least not yet.

"To this point, we haven't seen a need," said Hornberger. "The ones we have seen are just a rehash of an analog console, for the most part. It hasn't reached a point where there is enough of a difference for us to look at them seriously, and we can still do everything we need to do with our present analog boards."

There is also a general feeling among

where the bulk of MPR news operations takes place. The room uses two PCs: one runs NewsPro, a newsroom text editing system that collects information from AP, UPI and Reuters; the second PC is running D-CART sessions.

Using NewsPro, news staffers can cut and paste items from several sources and combine them into one document for easier editing. The software also enables staffers to access all documents created for any show or newscast in the KNOW and KSJN system.

Hornberger said, "The only thing we had the Wheatstone people do was install controllers into the console to operate a Sierra Automated Systems digital router. We have a 256-by-256 router and three faders on the consoles that have all router sources available."

Flat-screen digital displays are used in the studio, rather than bulky CRT displays normally associated with computer-assisted broadcast technology. According to Hornberger, "The screens are mounted on standard mic booms with heavier springs. Modified Omni Mount speaker brackets were used to attach the screens to the arms. Board operators and combo people have found them to be a vast improvement over standard monitors."

Hornberger said air talent can move the screens to any desired position, the screens take up no footprint on the desk-top surface and do not cause any acoustical, RF or EM interference.

The conversion to digital coincided with a full rebuilding of the MPR facility in 1995, and as construction proceeded, temporary studios were constantly rearranged on different floors.

Hornberger described the completed buildout: "The fourth floor is for on-air broadcast and has production studios on floating floors. The third floor has our newsroom, our classical music library, staff space for both and more on-air studios."

The fourth floor is also where MPR's Studio M is located — a large recording space independent from the D-CART infrastructure. Studio M is set up to run ProTools and can commit performance recordings to DAT.

The second floor of the MPR building is devoted to administration and membership, while the ground floor contains the engineering and information technology departments.

"We're running out of space," Hornberger joked. "The fourth floor is going to be rebuilt over the next six months or so, and we will be upgrading the production studios up there."

Because many early digital systems are now running up against their limits in terms of storage and versatility, the decision for MPR to move into digital technology was also based on its mandatory requirements of expansion and flexibility.

"I have the feeling our system is pretty well able to take care of most anything we will do in the next three to four years," said Hornberger. "There will be a point in time where we will decide whether we want to try to expand the D-CART system or look for an entirely new system."

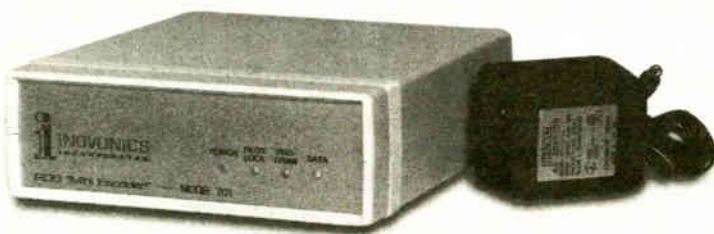
Besides Hornberger's concern that D-CART has no United States presence, he is also concerned about the size of the company. "I think they are a little too small yet," he said. "We had some problem getting parts from them because they were involved in another project. If they can get bigger or get a greater American presence, then there will not be any problems."

■ ■ ■

This is one in a series of articles on how radio facility managers are making the transition to digital.

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What on Earth Is OS-9?

MPR's D-CART system runs under OS-9, an operating system unfamiliar to many computer users. This may change.

OS-9 is an embedded, real-time, multi-user, multitasking operating system, developed as a joint venture between Microware Systems Corp. and Motorola for the latter's 6809 microprocessor. Over the years, OS-9 was ported over to function on the Tandy Color Computer III, the Commodore Amiga, Atari ST and some older home-style computers.

A variation called OS-9000 is available for Intel (386 and higher) and PowerPC processors. Another variation of OS-9 called DAVID is used to drive interactive TV set top boxes.

OS-9 can handle the demands of simultaneous multiple users, making it an appropriate choice as D-CART's

operating system. Today, most networked audio storage and playback devices for broadcast operate under Windows 95 or NT, with Windows 98 compatibility assured for the most part. Notable exceptions include the QNX-based AirTime digital delivery system from Orban and several DOS-based products such as Auto-Mate (RW, July 8).

Even though the OS-9 operating system is not as widespread or familiar as Windows, the Macintosh OS or UNIX, the DAVID variant of the operating system will increase awareness of OS-9 as digital TV continues its rollout. Several Web sites exist for OS-9 support and public domain software. Begin your search at <http://os9archive.rtsi.com/os9faq.html>

— Alan R. Peterson



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World Radio History

Circle (209) On Reader Service Card

Stephen McNamara Dead at Age 46

by Randy Stine

Little Rock, Ark. Susan McNamara planned to liquidate her husband's FM antenna pattern measurement business — Stephens Communications — following

the antenna. McNamara created vertical and horizontal coverage maps for FM stations using computer imaging and the AFMS program.

In 1989, after several stints with radio stations in Florida, McNamara moved to



Stephen McNamara

his sudden death in May.

Said Susan, "The company has ceased operating. He was really a one-man show."

The company specialized in airplane measurements of FM antenna patterns. Said Susan, "There is no one left to run the business. I certainly don't know enough about the software to make a go of it and (I) don't fly a plane."

Stephen J. McNamara, CEO and president of Stephens Communications, died of a brain aneurysm on May 19. He was 46.

McNamara suffered the aneurysm in his Little Rock home. He was found by his wife and rushed to the hospital, but he never regained consciousness. He is survived by his wife of 23 years, who assumed ownership of the communications company through "power of attorney."

Susan McNamara said her late husband was seemingly in good health. "This was a total shock. In fact, the night before we had been busy running around town. He gave no indication that anything was wrong."

Career

Born in Manchester, Conn., McNamara attended Duquesne University in Pittsburgh, where he studied business administration. His broadcast career started at a small AM station in Meriden, Conn., where he hosted a call-in talk show for teenagers.

"Radio was his first love," Susan McNamara said.

Close on the heels of radio was McNamara's love of flying. In 1986 he combined the two passions by creating Stephens Communications. Using a Cessna 210 and Automatic Field Strength Measurement System, McNamara was able to measure FM antenna patterns accurately from the sky. He also held a commercial pilot's license, and flew seaplanes and helicopters.

McNamara's antenna pattern measurement system included two custom-designed antennas mounted to the side of his plane. One received vertical radiation and the other horizontal radiation, measured at 360 points around

Little Rock to become general manager at SFX Broadcasting station KOLL(FM). He rose at SFX to become vice president of operations for the multistation chain. It wasn't until September 1997 that McNamara quit his position with SFX to dedicate himself fulltime to his namesake business.



KOLL Program Director Billy St. James said of his former boss. "He was a brilliant engineer, good businessman and caring human being. ... He was a very fair-minded person; tough when he had to be, but he was the type who would give people a second chance."

Taking off

According to Susan McNamara, business was booming for Stephens Communications. One of the last projects McNamara worked on was with Lee Granlund, director of engineering for Z-Spanish Radio Network in Sacramento, Calif. The project, in San Francisco, involved an antenna Granlund had built for KOIT-FM.

The new antenna is located on San Francisco's 978-foot Sutro Tower. It is one of four FM radio and 10 television antennas there.

Granlund said that Sutro is known for tearing up FM antenna patterns. "Steve came in and in an afternoon of flying had given us enough raw data on his laptop for us to see where we had nulls in the pattern," he said.

Granlund said McNamara had finetuned his system over the years. "He was very exact in every thing he did — a perfectionist, you could say, which is important in this kind of work. As a fellow engineer, he would have been someone I'd have loved to have had work for me," he said.

Jeryl Schooler, CEO for Antenna Concepts in Diamond Springs, Calif., also worked with McNamara on the San Francisco project. "There is only a small elite group of people who do the type of thing Steve did. He was certainly one of the best," said Schooler.

Schooler remembered McNamara as, "Technically gifted and oriented. Very precise with his work and measurements. The AFMS software he had developed really was terrific. And on top of all that, he was a true



San Francisco's Sutro Tower is home of KOIT-FM.

gentleman," she said.

McNamara also is survived by his mother, Louise McNamara of Wallingford, Conn., and sister Mary Viegas of Galveston, Texas.

EAS Code Patent Fight Continues to Heat Up

by Lynn Meadows

WASHINGTON In a continuing saga, the Department of Commerce Patent and Trademark Office confirmed claims made in a patent that presumes to cover technology used in the Emergency Alert System.

The news could affect makers of EAS equipment who had until now believed the technology for geographically specific alert codes was nonproprietary and have been using the technology royalty-free.

The impact of the decision on makers of EAS gear remains unclear.

Quad Dimension Inc., based in Kansas, received a patent for its Storm Alert for Emergencies in 1992. The patent describes a composite code string that includes a location code string component and an alert code string component.

In 1995, after the FCC mandated that EAS be structured around codes that included location and alert information, Quad Dimension sent letters to several EAS manufacturers informing them that they needed a licensing agreement to use technology covered by the patent. The manufacturers, noting that the technology had been in use by the National Weather Service for several years, balked.

The National Weather Service was using similar code strings in its Weather Radio Specific Area Message Encoder (WRSAME) in the 1980s, but it did not apply for a patent.

Last year, the PTO announced it would reexamine the Quad Dimension patent. Ordinarily, private companies spark patent re-examinations by paying a fee. In this case, after hearing from a number of companies concerned about the SAFE patent, the patent commissioner himself initiated the review.

To support its contention that the patent was predated by WRSAME, the office used a press release dated April 30, 1988 from HollyAnne in which the company announced it would use signals from WRSAME as one of the inputs into the Safety Alert Monitor.

According to one government official familiar with the process, the claims in the patent were initially rejected as being too broad. In response, Quad Dimension modified the claims in the patent to make them more specific to broadcast signals.

The Quad Dimension patent now covers those broadcast signals generated "on an existing broadcast frequency upon which is broadcast information which is unrelated to the location code signal component and the alert communication signal component."

All that remains of the re-examination process is for the PTO to send Quad Dimension a certificate confirming the validity of the patent with the changes in the claims. The patent owners had no comment and no word on how soon or even if they will seek licensing agreements from EAS manufacturers.



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World Radio History



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Sea Change for Spectrum Disputes

► SPECTRUM, continued from page 1

Although Congress required the FCC to use auctions for so-called "mutually exclusive" applications (when more than one applicant is vying for the same license) filed after July 1 of last year, lawmakers left it up to the FCC to decide whether to auction about 130 pending radio applications.

In the rules adopted Aug. 7, the commission decided auctions would be more fair and efficient than the comparative hearings used to decide such cases in the past.

Licenses as commodities

For the first time, one observer said, the FCC is treating analog broadcast

licenses as commodities.

"I don't think you'll have just one applicant for any given frequency. People are looking for opportunities to get something cheaply," said Erwin Krasnow, former NAB general counsel.

NAB had no comment for this story. Having successfully fought off spectrum auctions for digital TV licenses, the association did not oppose the budget legislation.

Industry observers point out that radio will need no new spectrum if it succeeds in developing an in-band, on-channel technology for digital audio broadcasting.

Although so far, auctions would be only to decide among competing appli-

cants, the idea could open the door to other broadcast auctions, analysts said.

Application backlog

Radio watchers said it is too soon to tell how the auction process will play out in solving the backlog of mutually exclusive applications and achieving the commission's goal of diversifying ownership.

Former FCC Chairman Richard Wiley said, "The comparative hearing process took too long. Auctions will at least provide an economic evaluation. We'll know (for example) what this AM station in Minnesota is really worth, because that's what people will bid."

The comparative hearing process often took years. The pending applications

were "frozen" in 1993 when a court invalidated the FCC criteria for deciding who among competing applicants should receive a license.

To encourage settlements, late last year the FCC waived rules that cap the amount of money applicants could pay each other to drop competing applications. After the settlements, about 500 applicants were left vying for 130 licenses.

Since July 1 of last year, about 383 applicants filed for 87 other licenses. But an FCC spokesman said the 87 includes commercial and noncommercial licenses. The initial auction rules only apply to commercial licenses.

Non-coms

The rules released in August address commercial licenses. The FCC invited further comments on whether noncommercial applicants competing for licenses on the commercial FM band should participate in auctions as well. That ongoing proceeding is MM Docket 95-31.

The auction rules also apply to secondary commercial broadcast services where mutually exclusive applications are filed: FM and TV translators and low-power TV.

Auctions of pending competing applications would be limited to current pending competing applicants. A filing window would be opened for additional applications in cases where the original filing period was incomplete.

Auctions would be used to resolve mutually exclusive major modification applications unless the parties resolve the conflict themselves. (This is for cases where, for example, station A and station B have both filed for power upgrades at the same time and the FCC cannot grant both modifications because of interference concerns.) Now, those cases go through a long hearing process.

Auctions would not be used to settle mutually exclusive applications for minor AM and FM station modifications.

More modifications are considered to be major for AM than for FM. Under changes proposed in its technical streamlining proceeding, fewer AM station changes would be considered "major" changes (RW, July 8).

Bidding credits

To encourage women and minorities to apply for stations, the commission adopted a "new entrant" bidding credit for applicants who own no stations (35 percent) or those who own no more than three media outlets (25 percent). None of the three media outlets may serve the same area as the license the applicant is bidding on. The commission may add other ownership bidding criteria in the future.

Industry lawyers told RW it is too early to tell if the bidding credits will accomplish the commission's goal of increasing ownership diversity.

"With the PCS (personal communications services) auctions, because everybody had discounts, it ended up being a non-factor," said Mike Senkowski of Wiley, Rein & Fielding. "The game is, everybody will show they're a new entrant, therefore the discount doesn't really advantage anybody. It levels the playing field and people bid up the dollar amounts."

Observers agree the type of broadcast properties being auctioned will largely determine the concept's success.

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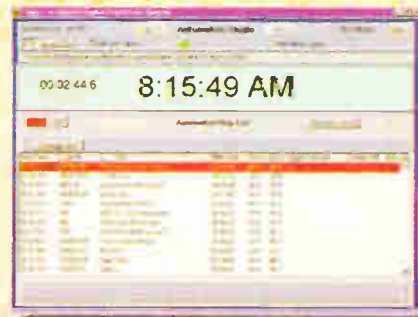
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ARMA Signs Up for '99 Show in New Jersey

The American Radio Manufacturers Association took a big step toward realizing its goals when it reached agreement to take part in an established regional radio convention next year.

ARMA will co-sponsor the 1999 Mid-Atlantic States Expo, which brings together members of the New Jersey Broadcasters Association and the Maryland, District of Columbia and Delaware Broadcasters Association. The event will be held June 7 and 8 at Trump's World Fair Casino resort in Atlantic City.



A.R.M.A

This year the show attracted 360 people.

ARMA formed earlier this year with the expressed aims of giving a voice to radio equipment manufacturers and bringing organized hardware exhibits to buyers in an affordable series of regional conventions.

ARMA's first show, which it held on its own, also took place in Atlantic City this

summer. Organizers blamed a low turnout on lack of time to promote the event, which was held just a few days after the Mid-Atlantic event in the same town. They expressed pleasure, though, in what they described as strong interest in ARMA among manufacturers (RW, July 8).

Top flight sessions

Of the 1999 event, ARMA steering committee member Elaine Jones of Davicom said, "ARMA has been asked to organize the Engineering Conference at the show. Although there is normally a mandatory registration fee to attend the conference, the NJBA has agreed to offer free admission to the Engineering Conference and exhibit hall. Engineers will have the option to buy tickets to meal functions on an 'a la carte' basis."

Jones said a call for papers will be issued this fall.

Phil Roberts, executive director of the NJBA and current president of the national Broadcast Executive Directors Association, said ARMA fits the Mid-Atlantic event well.

"We have four tracks: management, sales, production/programming and engineering," he said. "They bring an exhibit hall and some really top-flight engineering sessions to the table. We bring everything else."

Roberts said he expected ARMA's par-

ticipation would attract engineers from states outside of the traditional Mid-Atlantic drawing area, including Pennsylvania, New York and Connecticut.

Jones said ARMA also hopes to participate in a regional event this winter.

For information about ARMA, send e-

mail to ejones@davicom.com. For information about attending the show, contact the New Jersey Broadcasters Association at 888-NJBAFONE or go to the Web site at www.njba.com. Roberts said attendees would be able to register there shortly.

— Paul J. McLane

DAB Displayed at IBC98

AMSTERDAM, Netherlands U.S. broadcasters aren't the only ones who know how to put on a big convention.

The largest broadcasting event in Europe is set to get under way in Amsterdam. IBC98, dubbed as the "World's Electronic Media Event," will take place Sept. 11-15 at the RAI International Exhibition and Congress Center. Last year's event drew 29,500 people from 104 countries. Approximately 700 exhibitors are expected.

Many companies based in the United States or familiar to U.S. radio people will exhibit. The list of sessions reveals that broadcast managers abroad have many of the same concerns as those here in the United States.

Sessions include approximately 150 technical papers along with a number of workshops and panel sessions. Panels of particular interest to radio include "The Push for the

Internet — How Much and How Soon?" Chaired by Dianne Janssen of Radio Nederland, the session will look at developing creative content for a Web site, what attracts an audience and what impact full-motion video will have on Web browsing.

Another is "DAB — What Can Speed Up the Roll Out?" Mike McEwen of the WorldDAB Forum will chair the session, which will focus on the status of DAB in general and what can be done to quicken the pace of its uptake.

For information about the convention, contact IBC organizers in England via telephone at +44-171-240-3839; via fax at +44-171-240-3724; or e-mail: show@ibc.org.uk

Information is also available via the World Wide Web at www.ibc.org.uk/ibc/

— Marguerite Clark

The following is a sampling of companies exhibiting at IBC98 that are based in the United States or familiar to the radio industry here. More than 700 companies plan to exhibit at IBC this month.

360 Systems
ADC Telecommunications
Advent Communications
AEQ
Amek
AMS Neve
Andrew Ltd.
Audio Developments
AudioTechnica
Audix Broadcast
Barco
BBC
Belden Wire & Cable
beyerdynamic
Broadcast Electronics
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Calrec Audio
Canare Electric
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Doremi Labs Europe
Drake Automation Ltd.
EIMAC
Euphonix Inc.
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Harris Corp.
Hewlett Packard
HHB Communications
IBM Corp.
Intralex Inc.
Itelco
Jampro Antennas/RF Systems
Kintronic Laboratories
Larcan
Lexicon
Mackie Designs
Marantz Professional
Maxell
Mayah Communications
Maycom Automation Systems
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OMB
Orban
Otari
Penny + Giles
Pesa Switching Systems Inc.
Philips
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Rohde & Schwartz
Ryma
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Siemens AG
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Sonic Solutions
Sonifex
Sony
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Wegener Communications
Wohler Technologies Inc.
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Model	Bays	Power	Gain	Price
MP-1	1	600W	-3.3	\$250
MP-2	2	800W	0	\$680
MP-3	3	800W	1.4	\$980
MP-4	4	800W	3.3	\$1,280
MP-2-4	4	2,000W	3.3	\$1,820
MP-3-5	5	3,000W	4.1	\$2,270
MP-3-6	6	3,000W	5.2	\$2,740

LOW POWER CIRCULAR SERIES

Model	Bays	Power	Gain	Price
GP-1	1	2,000W	-3.1	\$350
GP-2	2	4,000W	0	\$1,350
GP-3	3	6,000W	1.5	\$1,900
GP-4	4	6,000W	3.4	\$2,600
GP-5	5	6,000W	4.3	\$3,150
GP-6	6	6,000W	5.5	\$3,700

MEDIUM POWER CIRCULAR SERIES

Model	Bays	Power	Gain	Price
SGP-1	1	4,000W	-3.3	\$690
SGP-2	2	8,000W	0	\$2,690
SGP-3	3	10,000W	1.4	\$3,595
SGP-4	4	10,000W	3.3	\$4,500
SGP-5	5	10,000W	4.1	\$5,300
SGP-6	6	10,000W	5.2	\$6,100

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DIGITAL RADIO

Brazil DAB Debate Simmers Slowly

by Carlos Eduardo Behrendorf

BRASÍLIA, Brazil When it comes to digital audio broadcasting, broadcasters in this huge South American nation are moving slowly.

While the debates surrounding differing standards and ancillary technologies are reaching broadcasters here, there is little enthusiasm for the major changes it will bring.

Joaquim Mendonça, president of ABERT, the Brazilian radio and TV association, said in a year-end speech that he had not heard any serious momentum toward DAB in Brazil.

Lack of attention

The lack of attention to digital radio is not the only problem, however. Mendonça also said he had not seen any attention being paid by the government to radio and the problems the industry faces.

The only move forward regarding DAB here is a discussion group consisting of technicians from ABERT, as well as the Brazilian Society of TV Engineers and the Brazilian Ministry of Communications, who are working on the issues surrounding DAB and digital television.

While Brazilian radio broadcasters may not be actively pursuing digital radio, its backers are trying to win support for the medium.

Last year, Wolfram Titze of Bosch, a German receiver manufacturer and Eureka-147 DAB backer, participated in a technical workshop sponsored by ABERT. During the workshop, Titze talked extensively about the Eureka-147 DAB system.

During the 12th São Paulo Radio Broadcasting Congress late last year, digital radio systems under development by USA Digital Radio and the Digital Radio Mondiale, as well as the Eureka-147 system, were presented and discussed.

Teresa Mondino, president of ComRad,



which oversees radio broadcasting at the Ministry of Communications, considers the commercial feasibility of the medium the most difficult issue facing the uptake of DAB here.

The switch to DAB involves major

changes in the present radio broadcasting system, according to technicians in the discussion group.

The president of the Brazilian Radio Industry Association, Eduardo Santos de Araújo, said the national radio industry has not decided if it wants DAB to come to Brazil.

"For people in the industry, this reality is so far from our situation that any study related to that now would be a waste of time," Araújo said.

He also said that the domestic radio industry is unlikely to be able to produce DAB equipment within the near future. "It is most probable that this industry will

end up importing and reselling equipment in Brazil."

Today, the domestic producers of radio equipment are building much of the same equipment they produced 10 years ago, with a few exceptions. It has been difficult for companies to invest in new technologies, which has led companies to rely on foreign partnerships to remain competitive.

Similarly, the decision about digital radio in Brazil may depend less upon domestic concerns but upon which system is adopted by other countries in the Mercosul trade alliance.

Brazilian digital radio plans should become clearer after the 1998 ABERT Congress, which convenes this month. At the congress, the issue of the suitability of DAB — and of the competing systems — for Brazil is scheduled to be debated.



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Such a question!

So now they're bringing me back—

to show you their new fancy Millennium model.

But I say, millennium schmillennium.

We should all live to be one hundred and twenty.

Me, I love the new soft bright buttons.

And the mahogany wooden sides.

And guess what?

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Better and cheaper.

So what are you waiting for already?

NEWSWATCH

Radio Is Part of AES in San Francisco

SAN FRANCISCO The 105th Audio Engineering Society convention is coming up Sept. 26-29 at the Moscone Convention Center.

Sessions of interest to radio include "Field Recording in the Wild," chaired by Amy Hunter of the Nature Sound Society, "Internet Audio Systems" and "Internet Audio Production" with representatives from RealNetworks and Liquid Audio, "Audio on DVD" and "Nuts and Bolts of Studio Design."

This year's keynote speaker is recording artist and engineer Alan Parsons.

Attendees can register online for the convention and locate hotel information at www.aes.org

Detailed show information will appear in the Sept. 16 issue of RW.

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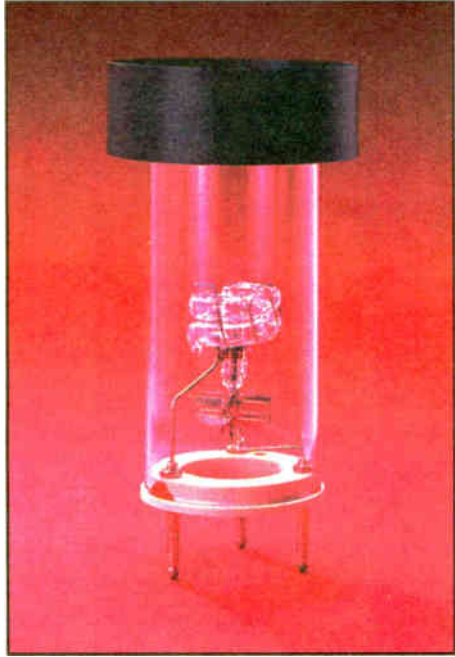
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Strobe Bulbs and Orange Paint

Troy Conner

I assembled this month's column in much the same manner your mother used to create a meal from the various leftovers of the previous ones. We'll take a look at a number of unrelated topics which by themselves have insufficient meat to fill an article.

Many readers with more "modern" towers are blessed with a high-intensity flash or strobe lighting system for aviation protection, as opposed to the older or traditional red code beacon. While arguments can be made that a marked (FAA for painted) and beacon-lit tower are ade-



Xenon Flash Lamps

quately visible, I have a personal bias.

Growing up, I spent a fair amount of time flying about in small aircraft. My father was a cautious private pilot with instrument, multi-engine, commercial, seaplane and even aerobatic ratings. Despite his experience, he

For a pilot, the strobe-type lighting systems are simply more visible during daylight hours.

always considered himself a fair-weather flyer. Nonetheless, I spent plenty of hours in the right seat, reading the map, looking for landmarks, other airplanes and radio towers.

Thanks for the strobe

If you are a pilot or have spent much time in small planes, you know exactly how dangerous cloud banks, fog, summer haze and many other minor meteorological phenomena can be. It is much like being on the sea in a small boat. Mother Nature is unforgiving at best.

I distinctly remember three close calls when we unknowingly approached large towers, only to be warned away at the last moment by the strobes. From a pilot's perspective, the strobe-type lighting systems are simply more visible during daylight hours. In a heavy

fog or haze, a painted lattice-type structure, like a tower, is not nearly as obvious at 150 mph. Even a single strobe is more obvious.

Not only do these eliminate the chore of tower painting, they also use less electricity, despite the fact that they run 24 hours a day. In addition, the bulbs tend to last two to three times as long as typical 620-watt incandescent beacon bulbs.

Enough sermon. If you don't have strobes, perhaps you should consider them.

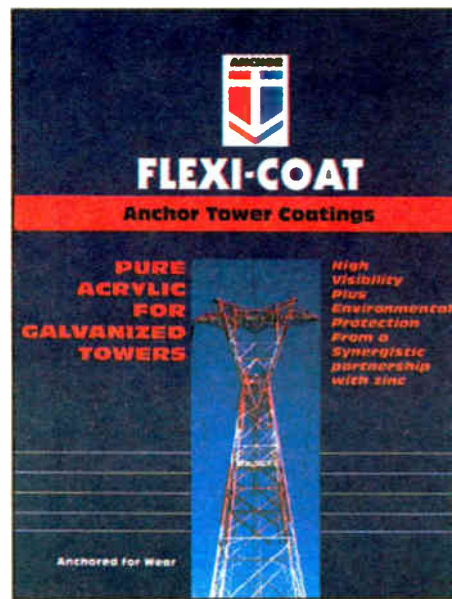
Reasonable price

Unfortunately, strobe bulbs are staggeringly expensive, often as high as \$300 to \$400 apiece. Just lately I ran across Xenon, a manufacturer of high-intensity flash lamps willing to sell directly to the customer. Typically, their prices run as much as a third less than flash tubes purchased from the strobe system manufacturers. This can amount to a considerable savings on a larger structure with strobes on each leg at a number of levels.

Xenon is located at 20 Commerce Way, Woburn, MA 01801. Xenon has been manufacturing high-intensity flash lamps for more than 30 years, and has been involved with the design and manufacture of custom lamps. It provides direct replacement bulbs for EG&G Inc., Flash Technology and Hughey-Phillips fixtures.

Call them at (800) XENON-XL or (781) 938-3594. The fax line is (781) 933-8804. Ask for Martha Ciulla. If you prefer, circle Reader Service 84 on your RW reply card.

For those who have traditional red incandescent lighting systems, and are therefore obliged to keep their structure freshly painted, do not despair. I have a money-saving tip for you as well.



Anchor makes high-visibility tower coatings.

In my travels across the country, I'm always looking for new suppliers, new tools and better technology. Truth be known, I'm always looking for a way to save a buck. After countless calls to paint manufacturers from Tijuana to Toledo, I finally discovered Anchor Paint. I believe they offer some of the best prices in the nation on tower paint. Anchor Paint is centrally located at P.O. Box 1305, Tulsa, OK 74101.



Anchor's "Flexi-Coat" Aviation Orange and Aviation White paint are available in UPS-shippable boxes with four cans to the box, or for those planning to get real messy, in five-gallon buckets. You can reach Anchor Paint at (918) 836-4626 or by fax at (918) 836-6421, or circle Reader Service 58.

As I write, the Aviation Orange is running \$96 per five-gallon bucket, and the Aviation White is \$65. That's F.O.B. Tulsa, but even with the shipping the price is right.

Keeler and Long Inc. in Watertown, Conn., is another paint manufacturer I recently found out about, but I have not had the chance to price or use the product. If you have, or if you have other suggestions that would interest our readers, give me a call.

■ ■ ■

Troy Conner is the owner of Tower Maintenance Specialists. Reach him by phone at (704) 837-3526 or via fax at (704) 837-1015.

AM Stereo and Its True Believers

A Crop of Die-Hard Fans Use the Internet To Promote the Benefits of AM Stereo

Thomas R. McGinley

Stereo AM in the United States is now a teenager of 16 years. It suffered through a difficult gestation period, complete with lawsuits and government bungling. After the FCC rendered its "marketplace decision," the infant technology never really grew or matured, handicapped by even more lawsuits and the chicken and egg dilemma of too few stereo stations broadcasting to a marketplace with little demand for AM stereo receivers.

Soon after stations started broadcasting and promoting AM stereo, listeners were largely confused about what it really was. Many radios labeled "AM-FM Stereo" left consumers and sales clerks with the impression the radio was stereo on both bands. It was, at the least, a mindless oversight by receiver manufacturers, if not a cruel hoax. Instead, the average listener heard lifeless and muddy mono AM compared to bright and spacious sounding stereo FM. Nothing has really changed on that front since C-Quam was delivered into the radio world in March of 1982.

The crippled mode has hobbled along through the 1980s and '90s as a substantial number of stereo stations have shut it off in recent years. Numerous C-Quam exciters and moni-

tors now are dark and dusty, with marginal resale values. At one time, AM stereo was hailed by some as something



Chuck Simpson

that might "save" AM radio. If anything, credit talk radio for doing that. Ironically, talk stations don't need stereo, which undoubtedly prompted many to turn it off, furthering the decline. Nevertheless, many AM stations persevere in stereo, perhaps as many as 300. And the FCC mandates that new AM expanded-band stations broadcast in stereo.

Many radio engineers have looked upon AM stereo as a technology that

could make a difference. Properly implemented, it can sound very good on real stereo receivers. But the biggest problem remains. The supply of AM stereo receivers available for consumers to buy is paltry.

Among AM stereo's group of never-say-die fans is 49-year-old Charles T. Simpson, who goes by Chuck. He has constructed an impressive Web site, complete with background stereo music, and has assembled a list of available receiver models and manufacturers, most of which he sells as an import agent.

"I started the Web site to see if anyone else knew of a source for AM stereo equipment, and share the information I had ... in an effort to educate and share my discovery of AM stereo," Simpson said.

He discovered how good AM stereo sounded while listening to a 1998 Cadillac AM stereo car radio owned by one of the owners of WKLN(AM) in St. Augustine, Fla., a nostalgia station where Simpson serves as chief engineer. Simpson spent considerable effort finding sources of AM stereo radios, and now uses WKLN as a sales outlet. The Web site lists almost 20 models, mostly high-end tuners in the \$270 to \$550 range. There also are a number of Walkman-style portables in the \$50 range. Car radios are not yet listed.

After finding a supply of SRF-42

See AM STEREO, page 20 ►

PRODUCT EVALUATION

Put Portamatch in Your Kit Bag

The Small, Popular Matchbox From Henry Goes Portable With a 9 V Version

Paul Kaminski

There are times when you need to connect equipment originally designed for the consumer market to professional broadcast equipment. You were out of luck if you needed to do this in the field without 110 VAC power. Thanks to Henry Engineering and its new Portamatch, that's no longer the case.

The Portamatch is the battery-operated version of the Henry Matchbox. Both units convert the consumer level (IHF -10 dB unbalanced) to industry standard level (+4 dB, 600 ohm balanced). The Portamatch does this with two 9 V alkaline or lithium cells.

We've seen Matchboxes and Twinmatches (Henry's dual unidirectional level matching amplifier) in lots of radio stations; they have helped many engineers to stay within an equipment budget and maintain professional sound standards. The two-pound Portamatch brings that same reliability to field and temporary equipment interface.

Henry at the track

So how did we test the box? We used the Portamatch to interface a Sony MZR-30 MiniDisc recorder/player to our studio console, a Mackie 1202 VLZ. We master our "Race-Talk" and "Radio-Road-Test" programs on MD, and record actuality for our "Race-Talk" program on the MZR-30. The MZR-30 posed a good test. Its line input is rated by Sony at 69-194 mV and its line output is rated at 194 mV.

Connecting the Portamatch was simple; the directions were straightforward. The task that took the most time was fabricating XLR-to-TRS 1/4-inch connectors. We needed about 10 minutes to connect all the cords and set the levels. We

had to poke around with our screwdriver to find the trim pot; once found, there were no problems adjusting levels. We had plenty of gain for soft-spoken driver and newsmaker actuality, and on some occasions had to adjust the console pot back for louder recordings. Once the levels were set, we could tell no difference



The Consumer-Friendly Henry Portamatch

between discs recorded on our mastering recorder (Sony JE-510) and the MZR-30.

The Portamatch has a "hi-gain" feature, which makes connecting the outputs from a low-output IHF device (a computer sound card, perhaps) easier. This makes the following scenario now a reality: On a remote, spots, stingers, bits and songs can be loaded on a laptop computer and with a "lite" version of a station's live-assist software, can be played back with studio-quality fidelity (no more holding the mic to the speaker of a device). To make the scenario real, one removes the Portamatch from its case and moves two jumpers to the "hi-gain" mode. That gives another 10 dB gain. If a recording is desired, one lowers the "IHF Output" trim pots so the soundcard input is not overdriven (simultaneous record/play soundcards facilitate this).

The Portamatch can also make the following analog scenarios possible: You

can hook the line output of a Marantz PMD 200 series recorder to the Portamatch (pick a channel) and interface it without impedance mismatch on your professional broadcast mixer — again no more holding a mic to the speaker. You can also hook the "IHF Output" of the Portamatch (pick your channel) to the line input of a Marantz 200 — instant aircheck, highlights cassette with full fidelity.

20 hours

Because it has four independent amplifiers, the Portamatch will allow the connection of an IHF level play unit like a CD deck, and a IHF level record unit (that, we leave to your imagination) at the same time.

The Portamatch not only is a good addition to your remote kit addition; it might find a home in an engineering shop to bench-test equipment or as an emergency interface. If your studio computer crashes, or your studio is unusable, then you can hook a laptop loaded

with spots, liners and some music (if the hard drive is big enough) and the Portamatch to the studio computer input or directly to the transmitter input.

Hank Landsberg of Henry Engineering says battery life with two 9 V alkaline batteries is about 20 hours. With lithium 9V cells, he estimates 60 hours. If I were using the Portamatch as a backup piece, I'd opt for the lithium cells, which are available at Radio Shack, albeit more

Product Capsule:
Henry Portamatch

Thumbs Up

- ✓ Reliable, easy to install
- ✓ Transparent sound quality
- ✓ Portable version of an industry standard

Thumbs Down

- ✓ Trimpots awkward

For more information contact
Henry Engineering at
(626) 355-3656, visit
www.henryeng.com or circle
Reader Service 110.

expensive than alkaline batteries.

The Portamatch comes in the same familiar blue box as other Henry products, and is available through all Henry Engineering dealers.

The list price for the Portamatch is \$195. Dealers we talked to sell it for less.

If you have applications that call for portable high-end sound from an IHF device, a test box or perhaps an interface for a laptop computer soundcard, the Portamatch is the first such battery-powered box that will do it all.

■■■

Paul Kaminski is news director for the Motor Sports Radio Network and host of "Race-Talk" and "Radio-Road-Test." You can reach the author via e-mail at motorsportsradio@compuserve.com

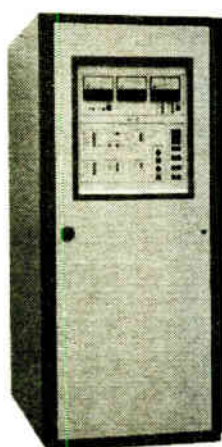
Tech Specs

Number of channels:	Four: 2 IHF to PRO and 2 PRO to IHF
Freq. Response:	DC to 20 kHz, +/- 0.25 dB
Distortion:	<0.01% IM/THD
Noise:	>80 dB below nominal output, typ
Physical:	6.25 x 3.75 x 2.25 inches

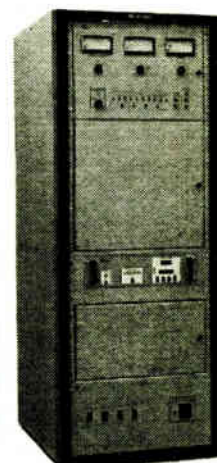


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They Still Believe in AM Stereo

► AM STEREO, continued from page 18

portables at a local Radio Shack, Simpson called Sony to inquire about more stereo models. A sales rep told him, "We have plenty of AM/FM stereo radios," only to be told later they had no AM stereo models. After asking about the SRF-42, Simpson said he "felt like a roach on a wedding cake" when he pointed out the model was still available for purchase. Further, he said, "I could not even get Motorola to tell me who they were selling the AM stereo decoder chips to."

Lists of receivers

Simpson's Web site, www.stereoam.com, includes links to other sites pro-

moting AM stereo. For example, Kevin Tekel, CEO of Kevtronics, sports a sizable listing of stations reported to be broadcasting in stereo, as well as extensive listings of stereo radio models and manufacturers, including car radios. Tekel also is an old DOS head, offering his fast-loading Web site without graphics. He provides interesting and little-known facts about DOS. His site can be dialed in at ourworld.compuserve.com/homepages/kevtronics

Another notable link will guide you to the "AM Stereo Page" at www3.ns.sympatico.ca/lettuce/home.htm. Webmaster Alex K. includes his own list of current and out-of-production

models of AM stereo receivers. He also offers late-breaking news regarding AM stereo and traces the evolution and changes in AM stereo broadcasting with clarity and detail. His list of stations includes those that have pulled it off, and those that choose to run only a 25 Hz pilot tone instead of real stereo. That practice at least turns on the decoders in AM stereo receivers and kicks in additional high-frequency response.

These gentlemen have passion for AM stereo and did not want to see it go unnoticed before digital AM stereo is introduced. When asked if attempts to promote conventional AM stereo were too little, too late in the face of the like-

ly adoption of digital audio broadcasting standards, Simpson quipped, "Anyone who thinks that digital radio is going to burst on the scene like a ripe tomato promptly for the Christmas season in 2002 with hundreds of stations ... has been operating under the influence of unprescribed medications, to say the least."

He is convinced that it will take many years for digital to take hold and make an impact. In the meantime, he will continue to import and sell AM stereo radios for those who want them.

■ ■ ■

Tom McGinley is chief engineer of WPGC in AM stereo, as well as WPGC-FM/WARW(FM) in Washington, D.C. and technical advisor to RW. Reach him via e-mail at k7qa@aol.com

RW welcomes other points of view.

Who Makes AM Stereo Receivers?

Here is a sampling of receivers capable of receiving AM Stereo and sold in the United States, as compiled by Kevin Tekel. A much more extensive list appears on his Web site at <http://ourworld.compuserve.com/homepages/kevtronics>, including past production models, a list of Hi-Fi AM Mono receivers and contact information for suppliers.



This Denon receiver is intended for sale abroad.

Audio Design Associates MT-3000 home tuner
Bose car radios since mid-1980s, some models
Carver 2000, TX-2 and TX-11a home tuners
Chris Cuff portable radios, "handcrafted in USA"
Chrysler Corp. car radios since 1984, some models
Delco/GM car radios since 1984, some models
Ford/Lincoln/Mercury car radios, some models
Potomac Instruments SMR-11R professional receiver
Sony CDPM-11C, CFS-6000 and HMDM-11 boom-boxes
Sony SRF-42 portable radio

A New Tower, in a Field and on the Web

Linda Sultan

Radio station WGCS(FM) in Goshen, Ind., transmits classical music during the day, folk music in the evening and Web site photos of their new tower all the time.

Broadcasting daily from the campus of Goshen College, the managers of student-run WGCS knew they had a problem. Its on-campus transmitter, feeding an antenna on a 98-foot tower,

directly across the street.

"We heard a number of stories, such as the expectant couple getting an ultrasound reading at the hospital and listening to the WGCS weather forecast," said Jon Kauffmann-Kennel, assistant professor of communications and general manager of WGCS. "There was an obvious need to find a different site for the transmitter."

The search for an alternative to the on-campus location was discussed for



The transmitter shack arrives (top), followed by sections of the new ERI tower.



interfered with equipment in the college's chemistry department. As a result, WGCS, which is at 91.1 MHz, went off the air weekdays from 10 a.m. to 5 p.m. to allow chemistry students to perform their experiments. Also affected by the station's signal was Goshen General Hospital, located

decades, and seriously explored for more than a year. After exploring existing towers and several sites for new towers, the station chose to lease the land in the middle of a cornfield about a half-mile from the nearest residence.

See WGCS, page 27 ►

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Putting It All Under One Roof

A Radio Veteran Provides Insights Into Your Next Facility Consolidation

Troy Pennington, CSRE

Six times a year, RW provides space to the Society of Broadcast Engineers as a service to the industry. Troy Pennington is vice president of the SBE.

We have read a number of articles lately pertaining to multistation operations within one building complex. Multiple-station operations under one roof is an ever-growing industry practice in many markets. Today's broadcast engineer will likely encounter the challenges associated with consolidating operations in a single facility.

Having recently completed a three-station move into a new complex and currently adding a fourth, I was asked to contribute an article on this topic. My first response to the request was, sure, I can share my experiences of building new studios from the ground up and relocating stations, but a much better article would address how to keep one's sanity while involved in a project of such magnitude!

Some helpful tips

The planning of a facility consolidation is a mammoth undertaking. You must be physically and mentally prepared to begin such a venture. Believe me, the project is a test of patience, but is also a good learning experience. Here are some thoughts to keep in mind when it comes your turn to place a number of stations

project, from initial planning to engaging subcontractors to project completion. You may wish to use them for all phases of the planning and construction or just for selected phases.

The initial phase deals with project scope: determining needs, setting a cost estimate and assisting with mapping out the facility. They can provide the proper guidance and due diligence you will need to formulate a good critical path, as well as serving as an effective resource in planning your project budget. You also should have a good idea with their help as to the maximum cost of the project, including what percentage to set aside for contingencies.

Talk to the staff

Months before even the first nail is hammered in, it is incumbent that you and your building consultant meet with department heads individually to assess their needs and wishes for their new home. Limit this to department heads and others you think will have crucial input into the planning. The more folks you include in this, the larger the number of "wishes" you will get. And not all wishes can be met. So, again, be selective in the number of participants.

Frequent follow-up meetings and updates with these individuals are suggested. Also, consider holding a number of group meetings so everyone will get a good picture of the physical organizational structure the new facility plan-

within the compound. The pod concept also helps establish individual station identities within the complex.

live studio can talk to every other studio including the News Center. Being able to communicate via console intercom from studio to studio and across the pods is important.

Building codes: You will learn a lot



Pennington's studios put everything close at hand.

The support areas common to all stations such as Traffic, Accounting, the News Center, Breakroom and Tech Center are strategically located for easy access by all. In the studio areas, good intercom capabilities are a must. Every

here! Again, a qualified contractor has a foot in the door at City Hall. There will be a few building code-related items that will be new to you. Solicit the help of those who deal day to day in issues

See BUILDOUT, page 30

A format change came down right in the middle of our project. We quickly set up the programming control point — in the construction trailer.

under one roof. I hope these ideas will help you keep your sanity as well as keep things rolling as smoothly as can be expected.

The basic guiding force during the entire course of the project is the critical path. A well-planned critical path for the project is a must. (There is some good critical-path software available on the market that will assist you in setting such a path for your project.) In a building project, always count on unexpected delays. They will happen. The critical path can help ease your encounters with these roadblocks. But for a critical path to be effective, it must be built on good information. This is done through careful planning and in-depth thought processes of many people in your stations. With the use of a well-planned critical path, completion dates can be more accurately forecast.

If your project involves new construction or renovation of an existing building, consider engaging the professional services of a competent architectural/construction firm, preferably one experienced in broadcast station buildouts. They can assist you in all phases of the

ning reveals. Everyone's time is important, so conduct a meeting by agenda in order to facilitate the meeting more prudently.

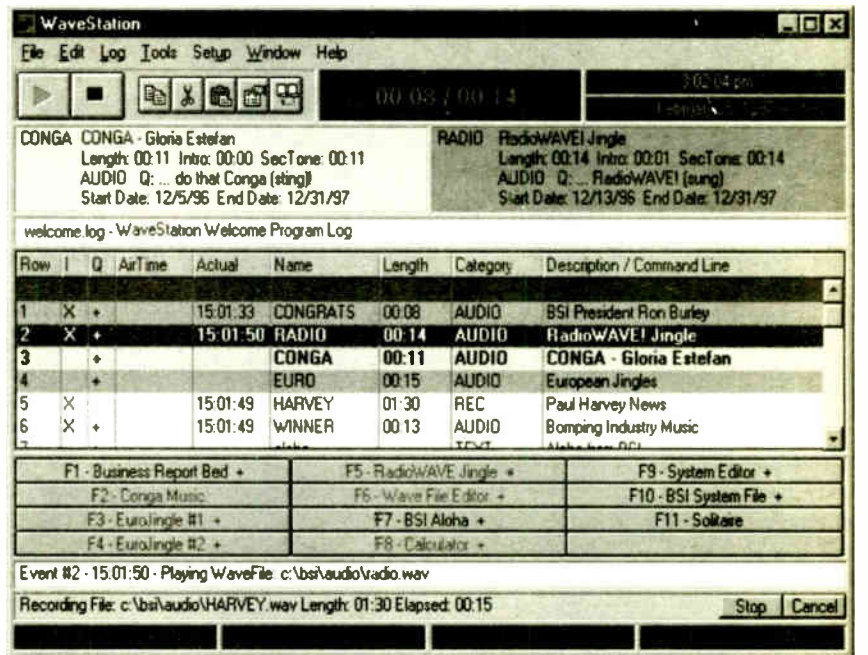
When talking with your department heads, focus the discussion on ways the new building could help them do their jobs in a more efficient manner. Have them list those individuals they interact with most in the station as a result of day-to-day responsibilities. Prioritize this list of contacts. Help them ascertain their department's space needs and discuss their future plans for expansion. Never plan a complex without including means for accommodating future possibilities of expansion.

The pod concept

With this well-laid information, you and the architect can begin with the basic layout of offices and studios.

At my Birmingham, Ala., facility, the studios and sales departments are laid out in the "pod concept." Each station's main studio, production rooms, DJ lounge/show prep rooms, marketing and promotions department, music director and operations manager are collocated

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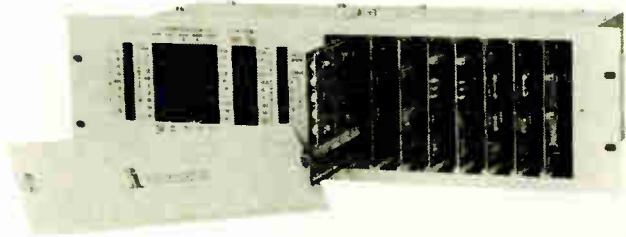
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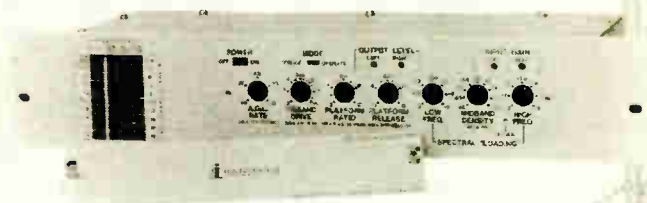
222 - Asymmetrical AM Processor

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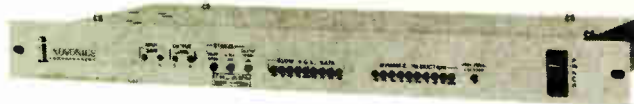
250 - Programmable 5-band Stereo Processor

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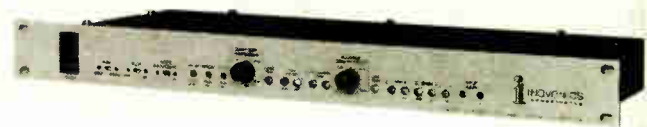
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260 - FM/TV "Utility" Processor

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708 - Digital Synthesis Stereo Generator

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630 - FM "Relay" Receiver

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GUEST COMMENTARY

Bay Area Broadcast Legends

In San Francisco, Industry Vets Gather to Celebrate the Best of the Radio Medium

Kelly Quinn

Have you every wondered what old retired broadcasters do for kicks when they no longer announce, read news, produce programs, engineer, host talk shows, sell spots, or function as the big honcho who runs the place?

Well, I can tell you what 277 of them in the San Francisco Bay Area do — they belong to Broadcast Legends, an organization that meets every three months for lunch and a program that relates to the industry. Much of the entertainment has to do with the golden era of radio, when it was fun. Call it nostalgia, but we members get a heck of a kick out of it.

Recreations

Ken Ackerman, a veteran broadcaster who spent 50 years at KCBS San Francisco, is our director of programming, and he has done yeoman's duty procuring actual scripts for us to re-create in the manner of real radio productions, just as they were done in the 1930s and '40s. He has even provided beloved old-time equipment from the era: 44BX and 77D microphones, as well as an organ and organist to introduce the theme of the show, enhance the bridges, and close out with a robust ending. An engineer presides over the mixer console to produce whatever sound effects are needed.

I tell you, it's a blast, folks. And the talent is remarkable.

Industry veterans

In 1992, a small group of bored retired radio pros got together for lunch and before you could say "Jack Armstrong," the Broadcast Legends organization was born. Eligibility? You must have 20 or more years of experience in a broadcast-related industry.

Whenever possible, Ackerman endeavors to harness someone from the original cast of the show we are presenting as a special guest performer. For instance, when we presented a segment from "Jack Armstrong, The All-American Boy," Charlie Flynn, the original Jack, came from Los Angeles to play him. And recently in the re-creation of a "Lone

Ranger" episode, Fred Foy, original announcer for the show in the '40s, made the trip from his home in New England to participate as the announcer in our production. One of San Francisco's own, Dave Parker, director and actor in the episode, was an actor in the original cast way back when.

Other notable participating guests include Art Gilmore, the first announcer hired by CBS Radio Coast to Coast Network, who will be remembered as the announcer for the Red Skelton

Show, among others; the late Paul West, a writer for "Father Knows Best," "The Walton Family" and the "Ozzie and Harriet" radio series; Ed Fleming, former Hollywood writer, actor, director and associate producer on the Jack Benny show; and Robert Pierpoint, CBS White House news correspondent who was very prominent in those early days.

Shirley Temple Black was a gracious and charming moderator for our program about "Women in Radio — the Early Days." June Lockhart, who regaled the audience with tales of working in the "Lassie" series, was another highlight. Pretty classy guest list, eh?

And that's only a partial list.

Beyond the great entertainment the club creates, our newsletter is an absolute smash: lots of news about members, amusing anecdotes from the past and present, great artwork and photos in living color.

The original group of retired broadcasters who had a dream and made it come true have seen the organization grow from 14 members to 277 since 1992. Hooray for you, gentlemen. You should feel right proud of your accomplishment.

■■■

Quinn is a retired radio and TV performer, now a free-lance writer and board officer in California Writers' Club, Redwood Branch, Santa Rosa, Calif.

E-mail Quinn at kellyquinn@juno.com

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SATELLITE NEWS

The Workings of Dish Elevation

Satellite Antenna Screw Jacks and Ball Assemblies Need Not Be a Mystery or Headache

Peter Zawistowski

Many of the antenna systems in use today use screw jack or ball assemblies for adjusting the elevation position.

Some smaller satellite dishes working on a polar mount use an actuator, a sealed screw jack, motor, position sensing and limit switches for siting across the domestic arc.

These devices have been around for many years, but many people are still

mystified by how they work.

The screw jack — better known as a machine screw jack — transfers rotational force or torque to linear force. The rotation can come from a hand-crank or a powered motor.

The worm

The machine screw jack incorporates an alloy-steel worm that drives a worm gear, which is usually made of bronze (see Figure 1). The worm gear, also

called a drive nut, is threaded on its inside to match the lifting machine screw, the part that actually moves up and down.

The lifting screw is constructed of heat-treated alloy steel and must be well-lubricated and kept free of dirt, grime and ice. A light film of oil on the lifting screw is sufficient for most applications.

Gortite fabric-type or special spring steel boots or shields are used to protect the exposed portion of the lifting screw. Check the manufacturer's recommendation for lubrication inside the gear box.

The ball screw jack was designed to produce its rated output force with a minimum amount of input torque. This type

of jack functions as a ball bearing with extremely hard balls rolling around the hardened surface of the lifting screw.

The rolling action reduces friction between the drive nut and the screw, allowing the same load to be moved with less torque than the machine screw jack.

Smaller motor

The input required with the ball screw is one-third to one-half the torque needed for a machine screw. Smaller motors can be used, or the lifting speeds can be increased by changing to a ball screw jack.

Both types of screw jacks need proper installation. Alignment in all planes without binding or unequal loading on the pivot pin or clevis (coupling bracket) is essential. The jack must have enough capacity so as not to be overloaded dynamically or statically.

Overload capacity for static loads usually is 30 percent above the dynamic rating. Remember the windloading on that reflector when calculating the static and

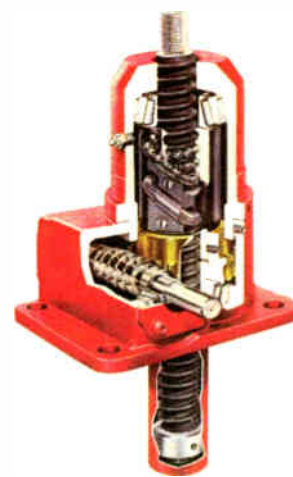


Figure 1

It's A Natural...

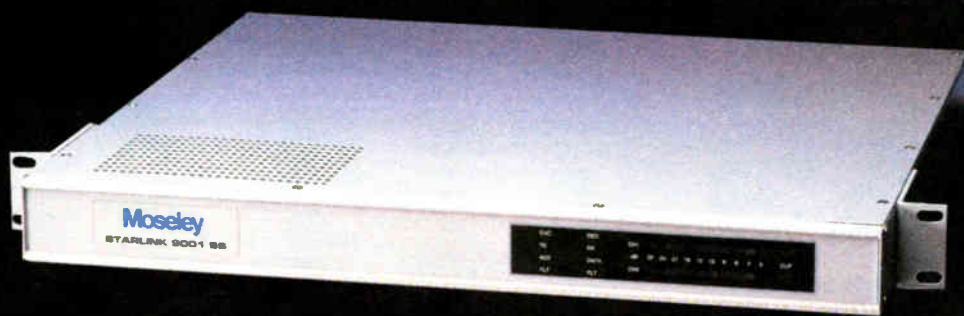
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AES/EBU input and output modes. A built-in sample rate converter keeps operation considerations to a minimum. **And the 2.4 GHz band doesn't require a license.** If you're looking for a conveyance product that is as flexible as it is reliable, check out the Moseley Starlink 9001SS — *it's a natural!*

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dynamic loads. It is common to find a 10-ton jack screw on a 2.4-meter antenna and one or two 20-ton jack screws on a 4.5-meter antenna.

External braking

Almost all ball screw jacks are self-lowering and require some means of holding the load, such as a brake. Machine screw jacks with a gear ratio of 20:1 or higher typically do not require external braking. Always check manufacturer specifications regarding holding and braking force.

Most antenna drive systems include a speed reducer. Machine screw jacks combined with reducers will bring the efficiency of the system down to less than 10 percent, and most of this inefficiency is lost in the form of heat.

Both types of screw jacks are designed for approximately three hours of intermittent operation per day. Overheating the gears and lubricants can occur if operation exceeds this typical amount.

Finally, make sure your machine screws are manufactured with 2-C centralizing thread form. Unlike the 2-G general purpose threads, the 2-C thread design eliminates wedging or binding between the screw and nut when radial loads are applied. The 2-C thread reduces friction and allows movement with less effort.

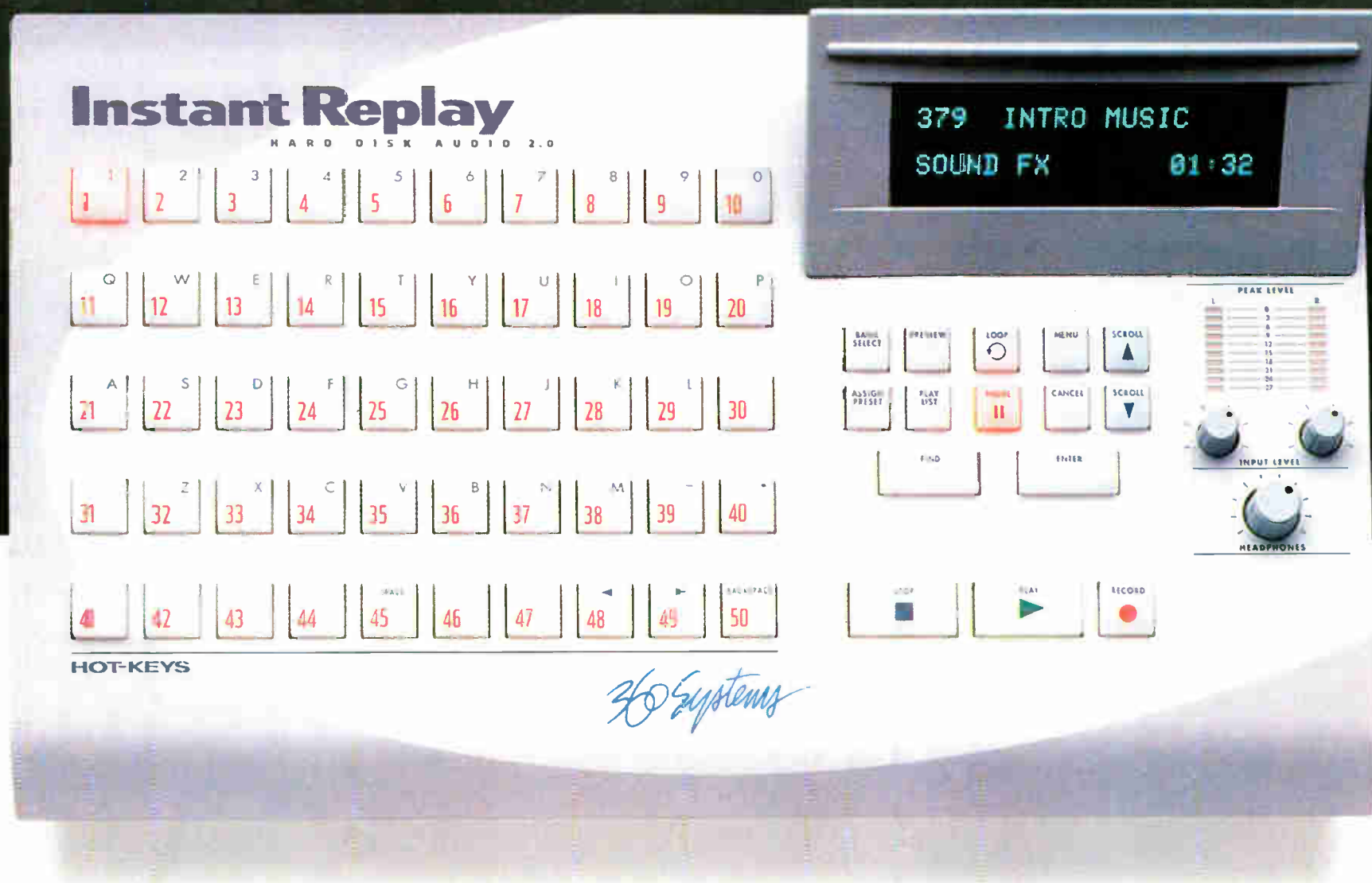
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Peter Zawistowski has been involved with the satellite industry since 1980.

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World Radio History

Circle (29) On Reader Service Card

Workbench

Radio World, September 2, 1998

Out! And Take Your Foam With You

John Bisset

In this day of consolidation, smaller-market stations seem to change their location on a more or less regular basis, depending on who's buying this week.

Dave Bowling of WPTG(FM) and WMBG(AM) in Williamsburg, Va., does not plan on moving any time soon, but when he and CE Joe Wetherbee built their new facility, they ensured that if they ever had to move, the sound-deadening foam placed on the walls would come with them.

Rather than using glue or adhesive, you may have heard of "screwing" the foam in place using drywall screws. This isn't a bad idea, especially if the color is charcoal, because the screw heads are better hidden. Dave put his carpentry skills together and formed some inexpensive wood boxes that he stained (see Figure 1). The wooden frames are sized for the sheets of

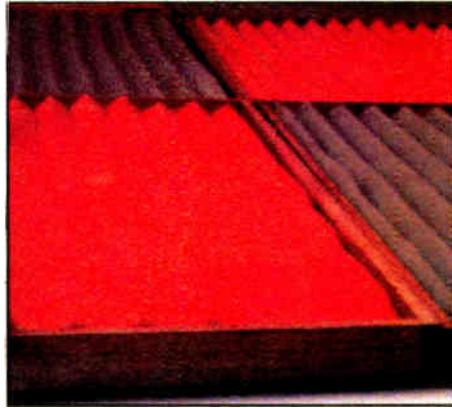


Figure 1: Inexpensive wooden frames ensure that sound-deadening foam can be reused at another site.

sound-deadening foam, and the foam is glued in place. Drywall screws placed in the corners of the boxes anchor them on the wall (Figure 2). Not only do the frames look nice — Dave chose a stain to match his studio furniture — but

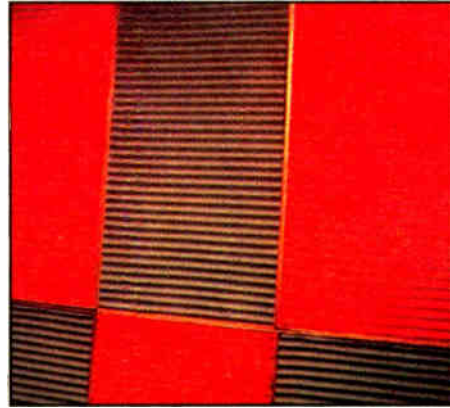


Figure 2: The finished boxes are stained and anchored to the wall, and can be quickly removed, if necessary.

should he ever need to relocate the studios, the sound-deadening frames go too.

★★★

I'm still running into folks who haven't bought EAS equipment — and they are not cable operators, either!

In some cases, with consolidation, there is only one EAS box but there is a need to feed several stations. One engineer showed me how he runs his auxiliary EAS output through a DA to get the feeds for several stations.

A home-brew relay switcher routes the audio to the various stations, so Required Weekly Tests don't have to be coordinated with all the stations. During times of unattended operation, an "all-call" relay triggers the alert to all the stations simultaneously. This all-call relay is triggered by the EAS box. The systems works well, and it's an inexpensive way to get the job done.

★★★

Radio Design Labs makes an audio switch that Eric Hoehn, CE at WETA(FM) in Washington, used to feed his Optimod audio into his talent's headphones when the mic was turned on. The switch alleviates any delay present in the announcers' headphones while they are talking. When the mic is off, the off-air feed is routed back into the headphones. It's a little nicety that keeps the talent from complaining!

★★★

Nowadays, a station engineer barely has time for lunch, much less routine maintenance. But those routine checks are important, and if you can't handle the duties personally, better schedule in some assistance.

Nothing could be more important than your transmitter site. If your site is air-conditioned, make sure you get a cooling check at least twice a year. When I was

doing contract work, we would schedule these visits just before the cold weather, and then again in the spring.

A clogged condensate drain can really spoil your day. If the water leaks into your transmitter, your week can be ruined. Ed Bukont, CE at Bonneville's WWZZ(FM) in Washington, passed on a tip shown by his air-conditioning mechanics. During the service, critical relays (or as the mechanics call them, contactors) are replaced depending on the contact condition.

It has been their experience that failed AC more often than not is related to failed contactors. Replacing contactors with pitted contacts reduces callbacks. If this strategy is too rich for your blood, try having your service person swap the wires to spare, unused contacts when you find the originals pitted. Many of these relays or contactors have several pair of contacts, though only one pair may be used at a time.

If you depend on exhaust fan cooling, make sure the louvers operate freely, and maybe invest the hundred bucks or so in a temperature sensor wired to the remote control. It's better to know about cooling or overheating problems before you encounter a major meltdown.

★★★

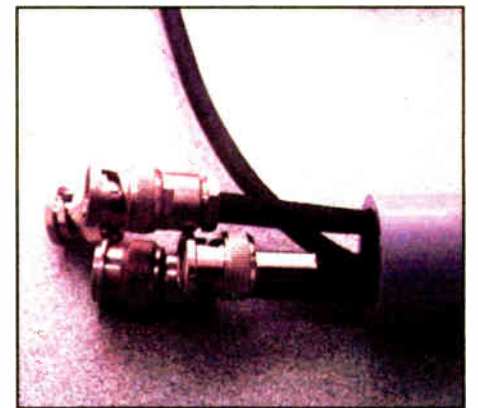


Figure 3: PVC couplings are an inexpensive way to keep cables bundled together.

Cable organization is a chore, and the solution provided by Larry Albert in Figure 3 is economical and efficient. Before the connectors are placed on the cable ends, slip several 1-inch or 3/4-inch PVC pipe fittings over the wires or cables. The fittings will help keep the cables together, but unlike wire ties, the fittings permit some movement of the cables, so the bundle behaves a little better, both as you coil it up or stretch it out.

■■■

John Bisset has worked as a chief engineer and contract engineer for more than 20 years. He is a district sales manager for Harris Corp.

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

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Goshen's New 300-Foot Tower

► WGCS, continued from page 20

"The process of finding a location was relatively problem-free," Kauffmann-Kennel said. The station, owned and run by Goshen College, began construction of a new tower Oct. 28 of last year.

Students and listeners alike watched via the Internet as the station's new transmitter site went from cornfield, to slab, to finished tower.



The new tower is three times as tall as the old one.

"I thought that listeners and the college community would be interested in seeing the progress of the tower," Kauffmann-Kennel said. Using a digital camera, he took photos, which student station manager Chrissy Kilmer posted to the Web site along with updates of the construction process.

WGCS no longer goes off the air to allow the chemistry department to run experiments.

Construction was completed just prior to Christmas. The new facility was installed the week before WGCS began broadcasting from there at the end of March.

Now WGCS no longer goes off the air to allow the chemistry department to run experiments. The new ERI tower stands 300 feet and the station's coverage area, Kauffmann-Kennel said, has expanded about 150 percent. The station is licensed for 7.4 kW.

The transmitter shack also is a beta site for Crown International in nearby Elkhart, Ind., which has used it to test several models of lower-power transmitters.

You Read It Here



Five Years Ago

Things are looking up for AM stereo growth in the coming year or two. The Japanese have selected Motorola's C-QUAM system as their national standard, which should increase the number of C-QUAM stereo-capable receivers on the market.

Now the FCC is also on the verge of adopting C-QUAM as the U.S. AM stereo standard and at the same time just about insisting that all expanded-band stations broadcast in stereo.

Five original proponent systems were pared down to just two: Motorola and Kahn. At Motorola's last count, about 700 stations in the U.S. are transmitting in C-QUAM stereo.

"Be Ready, AM Stereo Has Returned"
June 9, 1993

Ten Years Ago

Key suggestions from the FCC on how best to utilize a proposed AM band were struck down by organizations filing comments on the commission's Fourth Notice of Inquiry. Groups were

particularly opposed to the FCC's proposal to establish national licensing.

The rule making to establish 10 new commercial AM channels from 1605 to 1705 kHz is scheduled to take effect July 1, 1990.

"AM Band Plan Gets Failing Grade"
Sept. 1, 1988

Fifteen Years Ago

Satellite network radio is rapidly coming. Now is the time for all good stations that receive their network service via telephone circuits to prepare for the greatly improved audio that awaits them. By the time 1984 has come and gone, all the major networks will be "talking to the sky."

"Birds Replace Telco Network"
Sept. 1, 1983

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Paul Sanchez and Jim McGivern at Emmis New York
(Hot 97, Kiss FM, CD101.9)

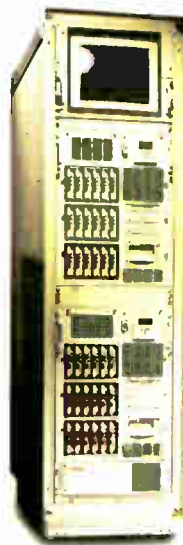
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Jim McGivern,
Chief Engineer, Emmis New York
(Hot 97, Kiss FM, CD 101.9)

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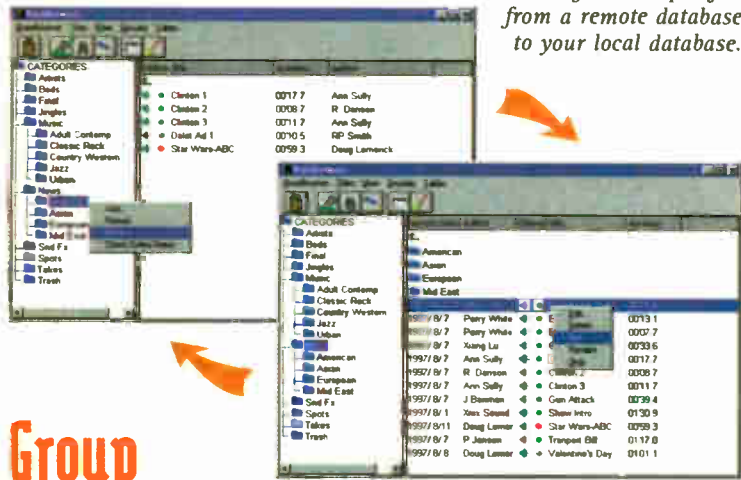
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Local Station



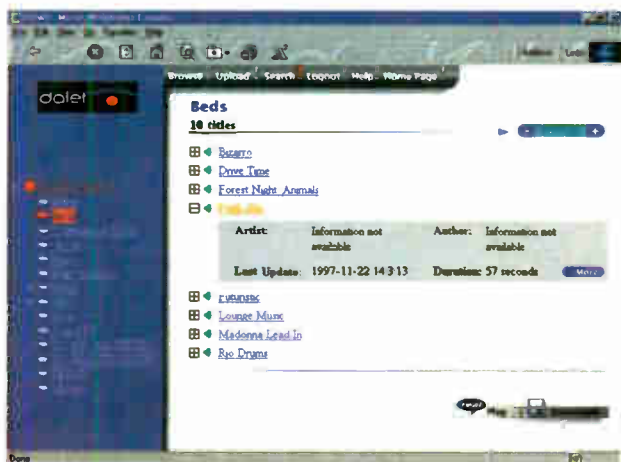
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"Support on any of these systems, I think, is imperative... Dalet support has been excellent."

Jim McGivern

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► **BUILDOUT**, continued from page 21 of codes. It is their job to know the codes.

One code that is becoming ever more prevalent pertains to low-voltage wiring. A number of local municipalities now require certified low-voltage cable technicians to run telephone and computer network cabling. ADA compliance will play a big part in the design of your facilities. Again, the services of a good architect will be invaluable here. There are also codes specifying the number of parking spaces the facility must have. You will find fire codes that will affect things such as studio windows if the studio borders a fire-designated escape corridor.

Check carefully all the codes that may be applicable to your proposed building, especially one designated for multitenant use. And don't forget the all-important issue of security.

Zoning

In many cases, the structure that holds the studio end of your STL may require a city permit before erection may begin. The city zoning board here instructed us to meet first with neighboring homeowners. Only upon their approval would the board consider our application. Our new facility borders property zoned as residential. We notified every homeowner of our plans and asked to be on their next association meeting

agenda. We then presented our case at the homeowners' regular business meeting. We got their approval and the next week got the city's approval.

While on the STL tower issue, don't forget FCC filings such as 313 in a time-



Troy Pennington

ly manner and give them a good six-month lead time if possible! And once you move in, of course, notify them of your new main studio location.

Another item that will have a direct bearing on the budget of a project is field change orders.

When you engage a general contractor,

his cost to you is based upon the final building plan. Although the final plans look perfect on paper, there will be some changes you will want to make during the construction phase. No matter how well you have planned your project, you will see an opportunity to change something once the construction phase is underway. But justify these changes! Don't finish the project and then find later that you really should have made the change. It costs more to alter something after it is finished than when it is being constructed.

Safety concerns

You must try to keep these changes to a minimum, especially if the alterations involve material changes. You can suddenly find yourself over budget with a gross amount of field change orders.

Once the construction phase is underway, limit site visits by general station employee and non-construction workers, for safety reasons. A competent contractor will have a good on-site safety program in place, with safety policies posted. During my project, I distributed a memo asking employees not to visit the site explaining potential safety concerns at a typical construction site. On those rare occasions when visits were permitted (usually on a weekend), the requirement of a hard hat, the temperatures in the 90s and the lack of air conditioning discouraged most visit requests. Employees were content to wait until completion of the construction before requesting a return visit.

emergency generator sizing, emergency load configuration and station grounding must be addressed properly in any well-planned project.

Keep in mind that while you are deeply involved in the project, you also must maintain the day-to-day technical needs of the present stations. Make allowances for emergency transmitter and studio problems that will come up while you are working on the new facility. Don't neglect the routine of regular maintenance.

Also, in this fast-track industry of ours, be prepared for unexpected changes. In the midst of the project, you may face a format change or an additional station coming into the family. You may have to make adaptations to the change quickly.

Here in Birmingham, right in the middle of our project, a decision came down to change formats on one of our existing stations. The change had to be accomplished over a weekend and involved setting up a new temporary studio and satellite receiving system. The new building was not yet completed, so we quickly had to set up the programming control point in the construction trailer!

This was a midstream decision that did affect the main construction project, especially with a two-person engineering department. Be prepared.

The deep breath

Finally, I really had to concentrate on my attitude control during the project. When you feel your patience is running out, take a break and a good deep breath! You are under a lot of stress in a project like this. Whenever a drywall worker, painter, electrician or even one

**Talk to your employees,
but be selective in the number of participants.
Create a sense of excitement among the staff.**

Encourage your employees to save the excitement by waiting to "unwrap the present" on move-in day!

Ensure you have plenty of ceiling space for conduit runs. One lesson we learned in the Birmingham project was that while the 8-foot, 3-inch executive-style doors look great, they certainly limit ceiling space for 3-inch conduit runs, especially when the ceiling is plenum. Be reminded you must use plenum-rated cable in plenum ceiling, unless the cables runs are within conduit. If you use open cable trays, weigh the costs of plenum-rated cable vs. non-plenum-rated cable for conduit or tray runs.

HVAC planning is critical. Studios, offices and the Tech Center require specialized air handling. And keep in mind the acoustical requirements for HVAC units in studios. You will need professional consultation in this area to avoid problems.

AC expertise

For electrical work, you must consider a contractor knowledgeable in the broadcast station's complex requirements, special needs and considerations. The uninterruptible power supply,

of my own employees did something that tested my temper, I would count to 10 or take a break, go to lunch or even call it a day before losing my temper and doing something I would later regret.

Believe me, a building project can certainly change your attitude if you let it. But also keep in mind that you are the one in charge, that you are ultimately responsible for the completion of the project. Be assertive in things you know must be done, but don't let anger redirect your main focus.

In the end it will be worth it. You will have a great facility, one in which you take great pride. The facility is a tool in which we can better do our job in this highly competitive industry.

Good luck on your project!

■ ■ ■

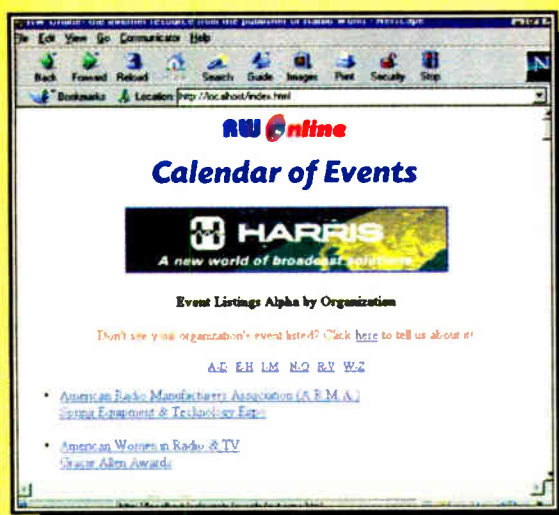
Troy Pennington is chief engineer of COX Stations WZZK-FM, WODL(FM) and WEZN(AM) in Birmingham, Ala. He is vice-president of the Society of Broadcast Engineers and has been in the broadcast engineering profession for more than 35 years.

For more photos of the COX project, visit www.rwonline.com

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STATION SNAPSHOT

Urban Gold Comes to Memphis

Jim Hanas

It started with Marvin Gaye's "Let's Get It On," played over and over again, in the early morning hours of June 10. Barnstable Broadcasting's new station, WRBO(FM) Soul Classics 103.5, was finally on the air, bringing 100 kW of urban gold to its Memphis listeners.

Even the signal was new to town —



MEMPHIS' BEST RHYTHM & BLUES OLDIES

the eighth 100 kW FM station in the nation's 45th-largest radio market, and Barnstable's third, alongside classic hits WSRR-FM and country-formatted WGKX(FM). More important, WRBO became the newest urban station in Memphis, a market with a 40 percent African American population in which urbans routinely grab the top three ratings slots among Arbitron listeners 12+, and a full half of the top 10.

Memphis lock

A year ago, Clear Channel Communications completed deals that gave it a virtual lock on the Memphis urban audience. Among its seven market properties, WHRK(FM), KJMS(FM) and WDIA(AM) finished one through three in the winter Arbitrons, respectively. With the introduction of WRBO, Barnstable is gambling that the African American community here remains underserved.

"We've felt for some time that the radio market targeting the African-American market was underdeveloped," said Barnstable President and COO

David Gingold, who directly oversees the Newton, Mass.-based company's Memphis Radio Group.

Of course, WRBO didn't really begin with Marvin Gaye. It actually started last fall when Barnstable agreed to purchase the station license and construction permit of WWKZ(FM), a CHR station serving the New Albany/Tupelo, Miss., market, from Broadcasters and Publishers Inc. for a reported \$6.75 million. The license was then transferred to

Como/Memphis and construction began on the tower in Como, Miss.

Parity

"This allowed us to bring a 100,000 W FM into the Memphis market with a signal that would be, for all practical purposes, at parity with any of the other Class Cs in terms of population," said Gingold.

As for the format, research conducted in the fall of 1996 turned up a few

See WRBO, page 40 ▶

PERSONALITY PROFILE

Hall and NASCAR: A Race to the Top

Paul Kaminski

The sanctioning body for America's most popular form of auto racing, NASCAR, the National Association for Stock Car Auto Racing, is celebrating its 50th anniversary in 1998. Its Winston Cup Series drew more than 6 million fans at the gates in 1997; the next most popular series was the Championship Auto Racing Teams open-wheel champ car series; CART attracted more than 2.8 million fans.

Since 1960, broadcaster Barney Hall has described racing action in this series for regional and national audiences. He started as a turn reporter for the old Daytona network and today, along with Allen Bestwick, anchors the broadcasts for Motor Racing Network Radio of Daytona Beach, Fla., the rights holder for the majority of the 33 regular-season Winston Cup events.

Hall is a folksy sort, known and respected in the garage area where the crews prepare the cars for practice, qualifying and racing. Racing historian

Bob Latford, editor of the newsletter Inside Line, said that approach helps the listener.

"They (drivers and crews) will tell Barney and the other MRN broadcast-



Barney Hall in the Booth

ers things they might not tell others. That gives the listener a better insight to what really happens."

See NASCAR, page 36 ▶

NEWS MAKER

Freedman Leads CBS News Radio

At the age of 46, Michael Freedman has moved his family from Washington, D.C. to New York and is realizing a childhood dream. In June, Freedman was named gen-



Michael Freedman

eral manager for CBS News Radio, a job he describes as "about as good as it gets for a broadcast journalist in management."

Freedman spoke with RW contributor Alison Oakley.

RW: When you started in radio, did you aspire to be GM of a radio network? Or taking into consideration the fickle climate of radio employment, did you ever think you'd get this far?

Freedman: If you would have asked me 25 years ago what I aspire to, it would be to the news director or general manager of CBS Radio

See CBS, page 32 ▶

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Freedman Reflects on CBS Radio

► CBS, continued from page 31

News. And people who have known me since I was a teenager would tell you the same thing. This has been a position that I have always wanted.

RW: Why did you aspire to CBS News Radio in particular?

Freedman: CBS represents all the traditional values of broadcast news. Broadcast news was invented by CBS, and over the course of the years through Edward R. Murrow, Douglas Edwards, Dallas Townsend, all of the wonderful people who have contributed to radio news broadcasting.

CBS has been the focal point of not

only creativity but excellence in broadcast journalism. It has always played to the intelligence of the listener. The "World News Roundup" recently celebrated its 60th anniversary on the air, and it is just as compelling and listenable and relateable today as it was in 1938 when Robert Trout opened the first newscast and threw it to Edward R. Murrow in London.

RW: You bring both local and network experience to CBS News Radio. In many markets, news radio consists of short headlines often taken from wire copy or literally lifted off the morning paper, with the exception of a handful of radio sta-

tions such as all-news or full-service. What would you say is the future of local-level news, especially as it relates to CBS?

Freedman: I think the pendulum is swinging back a little bit in terms of more substantive information on the radio. A lot of people, I think, don't even realize how much information they get from the radio. Certainly CBS Corp. believes in radio and radio journalism.

We see our mission as working with (affiliate) stations being complementary to what they are doing, because we are in essence borrowing their airtime every hour. We also see ourselves in a leadership position. We hope to be able to

guide them a little bit in their news coverage. In that vein, we are making our correspondents available on a regular basis now for one-on-one discussions with the anchors at local stations. We feel that that provides a little more depth and substance to what the station can offer as well. I would say that, particularly within the CBS group among our owned-and-operated-stations and our affiliates, there is a push to offer as much information as possible today.

We're beginning to offer a little bit more than the headlines. We're not under any delusion that radio news is going to supplant television news in terms of length of time people might watch, but we do also believe there's a particular place for news in people's lives. It may be becoming very subliminal, where people listen in the car, or in the shower, people may wake up to the alarm clock, and they often times get their first information today from radio and sometimes without even realizing it. So we see a very important role for radio news information. The dynamic has certainly changed. More attention is being paid to vital information and to people as they leave their homes in the morning — like traffic and weather.

RW: When you started developing news and you wanted to guide your news in a certain way, who did you look at as your target audience and how do you strike a balance between targeting say a GenXer, a Baby Boomer, or a person from the Silent Generation? How do you go about making that balance for CBS News Radio?

Freedman: A good newscast has always been a good combination of what people want to know and what people need to know. ... The best that you can do ... is to relate information that paints a compelling picture of what's going on, and you also try and help relate it to people's lives here. Relateable news has become very important to listeners and to local stations and to every demographic. So, whereas 10 years ago a radio station or a network might have reported the consumer price has gone up by X percent on a given month, today that story would be reported in terms of how it affect the price of tomatoes or cereal, things that are relateable to people.

In terms of drawing in different age demographics, I think that's where the compelling nature of the way you present news and the dynamics of it come into play. We consider every sentence of every story of every newscast to be an opportunity to either draw listeners in or a chance to that you are going to drive listeners away.

I do think that young people are sometimes underestimated in terms of their appetite for good information. There was a time when news was more or less written off of the radio. I think that had to do with deregulation, some of it had to do with the whole concept of FM radio reducing or eliminating news — the zoo formats, which reduced information to jokes in some shows. And I think that most surveys indicate that young people are interested in knowing what's going on in their world. The key is to try to relate what is going to them and show it affects them.

RW: What would you say to program directors and general managers of radio stations who are looking at getting rid of

See CBS, page 33 ►

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► CBS, continued from page 32
news altogether, because they feel their audience doesn't want a full-service radio station?

Freedman: I would say, "Don't underestimate the intelligence of your audience." People of every demographic want and need a certain amount of information. While it is more important in some formats than others, people appreciate the opportunity to be informed, today.

With talk stations in particular, there are a lot of opportunities provided for people to get some skewed information. The lines are becoming a little bit blurred between news and talk. It is important to differentiate what would be construed as a report on events taking place in the country or the world, and one person's view of what's taking place. We have a growing number of people in the country that take as the gospel the views of an individual talk show host, and I think that's where news complements what's happening the rest of the hour on these stations because it provides some balance.

RW: Tell me about the technology of news radio. How have recent technological developments changed the way news is gathered and distributed?

Freedman: Certainly newsroom computer systems have made it easier for people to gain access to the entire world of information. The Internet has opened up all kinds of opportunities to get information. Digital editing and digital transmission have had an impact on both the way news is put together on the radio and the quality of the dissemination of the product.

There is more information out there today than ever before. There are sharper ways of delivering it than ever before. It is a challenge for everybody involved in radio to deliver the best quality goods both technically as well as programmatically and editorially, because the fact is that it is very easy to lose a listener.

So, as a programmer, as a news director, as a person involved at the network level or at the local level, you want to provide the listeners with the kind of programming that makes them want to say tuned. And I say, that goes technically as well as programmatically.

RW: Mel Karmazin, CBS Corp. president and COO is also president and CEO of Westwood. Karmazin recently decided to consolidate the Westwood-owned NBC Mutual News out of Westwood's Washington bureau (see p. 2). What does that consolidation say about the future of radio?

Freedman: This is a dynamic industry. You have to walk a line in terms of the

have a role to play not just in broadcasting but in other industries as well. And I think those situations where unions and management can work together to make sure that everybody benefits as a result are the ideal relationships.

People have a right to feel secure in their jobs, and companies have the right to want to survive and be profitable. The best marriages of unions and manage-

stay better than the rest is to consider everybody formidable competition.

RW: What do you foresee as the future of radio?

Freedman: I think there is a bright future for radio. I think in terms of the variety of programming for listeners, radio will definitely be the survivor of the fittest in terms of entertainment and information. It is a very challenging industry and will continue to become more challenging. But I never would have accepted a position like this if I didn't think there was a very bright future for it and didn't believe in it 100 percent.

Radio is subliminal in American life. We all listen to the radio, but often times we don't think about that as a regular listening habit. Radio is as much of a habit as brushing our teeth in the morning or combing our hair. Most people, if you asked them how many times they combed their hair in any given day, they probably wouldn't know. I think it's similar with radio. It would always be nice if we could help people better understand the role that radio plays in their lives, but the fact of the matter is that it does play an important role, and I think it will continue to.

There are lots of new challenges for the industry. Radio remains the most intimate of all media ... there is familiarity and an intimacy about radio that you don't get with any other medium, and that's one of the beauties of radio that, I think, will continue to be there.

bottom line, your editorial integrity, your programming quality. You have to weigh a whole lot of factors into the decision making process about what survives, what continues in its present form, what has to be massaged into a new form.

I can only say at this juncture, and I am a new employee to CBS News and the CBS Corp., this company is in a very good position right now and it is growing its own business by making its own business decisions. It has both the traditions and creative spirit to forge successfully into the future, and it appears to be doing that. I hope to contribute to that success.

RW: What should the roles be of unions in radio be today?

Freedman: I think that every employee is entitled to fairness. I have worked in shops that are union shops and shops that don't have unions. I think that unions can be a protective vehicle for employees.

I come from Detroit, where the UAW arguably was the single most important entity in that community, because it was protecting the jobs of autoworkers and working on their behalf. I think that unions have gone through some peaks and some valleys the last few years. I have great respect for unions. I think they

ment are those of mutual respect, and I certainly have a lot of respect for unions.

RW: Who is your strongest competitor?

Freedman: I think we consider everyone out there who is providing information to be a competitor, whether it is ABC or CNN or ... AP Radio. There is competition all around, and I wouldn't discount anybody as a formidable competitor, and that's what's going to keep us on top of the game. We want to be better than the rest. I believe we are, but the only way to

The pendulum is swinging back a little bit in terms of more substantive information on the radio.

— Michael Freedman

The Making of a News Executive

CBS News Radio provides network news to approximately 600 affiliates and has journalists around the globe.

Michael Freedman's résumé includes extensive radio experience. He was managing editor of WWJ(AM) in Detroit, director of public affairs and executive producer of broadcast projects for George Washington University in Washington, D.C., and vice president and managing editor for United Press International Broadcast Division.

Freedman also served as leadership press secretary to Democratic Whip David E. Bonior in the U.S. House of Representatives.

Freedman received the Edward R. Murrow/RTNDA Award in 1984 for Overall Excellence. He has received

more than 60 awards for his contributions to broadcast journalism.

In his new position as general manager of CBS News Radio, Freedman handles affiliate relations and handles questions from listeners and affiliates. His boss is Harvey Nagler, vice president of CBS News Radio. Together,



they make decisions regarding the day-to-day workings of the CBS News Radio operation, including hiring.

Harvey Nagler reports to Andrew Heyward, president of CBS News Radio, and Mel Karmazin, president and COO of CBS Corp. All four are based in New York.

— Allison Oakley

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Cox Radio to Produce The Motley Fool'

Cox Radio, Inc. and The Motley Fool Inc. have combined to produce and syndicate a radio version of the popular online financial site. "The Motley Fool Radio Show" is a talk show about money,

investing, and building wealth.

The show debuted in L.A. on KFI(AM) in June and will be available for national syndication starting in the fall.

Tom Gardner, one of the founders of The Motley Fool Inc., stated "We can't wait to liven up financial talk radio. Too often, money and investing is given an

old-fashioned dull treatment. Over the past three years, we've been helping millions to thumb their noses at the financial industry by helping them dig their way

For more information, contact United Stations at (212) 869-1111; or circle Reader Service 214.

'World News Connection,' Online Information Resource

"World News Connection" is an online information resource which provides access to hard-to-find newspaper articles, speeches, TV and radio broadcasts, books, reports and journals. These materials provide an emphasis on political, socioeconomic, scientific, technical, and environmental information and are generally available within 48-72 hours from the time of original publication.

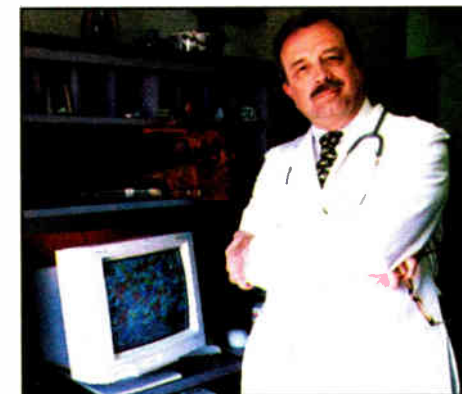


WNC is only accessible through the World Wide Web at <http://wnc.fedworld.gov> where you can download an order form to subscribe to this service.

For more information, contact WNC in Virginia at (703) 605-6575 or circle Reader Service 162.

'60 Second Housecall' Now Available on Radio

The "60 Second Housecall," hosted by Dr. Bob Lanier, is now available in a new format for radio. The 13-year-old program previously had been available only on television. It delivers daily medical tips and information. The program debuted on the radio June 1.



Dr. Bob Lanier

Lanier said he will tell stories featuring the newest medical research in a whimsical way.

For more information, contact The Clearance Group at (800) 797-1933; or circle Reader Service 85.

Gospel Hymns Through 'Sounds of Joy'

For those who enjoy listening to old gospel hymns, "Sounds of Joy," a half-hour weekly program, will be of interest.

According to show host Dave Freelan, See SERVICES, page 35 ►

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READER SERVICE 104



Brothers Tom and David Gardner

out of debt, building stock investment plans, and looking to the future."

For more information, contact Cox Radio at (404) 843-5281 or circle Reader Service 136.

United Stations Debuts 'Rock On!'

United Stations Radio Network has joined with Ben Manilla Productions to develop "Rock On!", a new weekly classic rock series.



Ray Manzarek

The program is hosted by Ray Manzarek of the Doors and debuted Memorial Day weekend. "Rock On!" provides a panorama of classic rock artists and their music.



"Rock On!" is available on CD on a market-exclusive, barter basis, only to affiliated stations. This program features artist interviews and special theme segments along with a current catalog of classic rock hits.

USRN's VP/Programming Andy Denmark stated, "Our research indicated that classic rock is an extremely consistent format which appeals to all types of radio listeners. However, no existing radio program treated classic rock as a thriving, living format. 'Rock On!' was created to fit that niche."

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► SERVICES, continued from page 34
 listener response proves that the selection of songs and artists is on the mark.

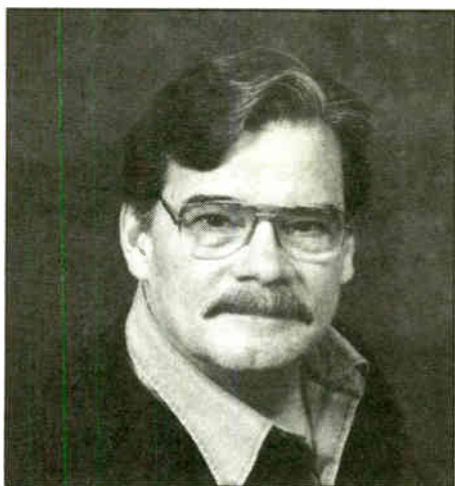
SOUNDS OF JOY

"Sounds of Joy" is now in its 30th year and draws from a library of LPs, most of them collectors' items.

For more information, contact "Sounds of Joy" in Indiana at (765) 628-3074 or circle Reader Service 188.

'Seems Like Old Times' Celebrates Seven Years

The radio program, "Seems Like Old Times" celebrated seven years of syndication this year.



Ed Z. Pell

"Seems like Old Times" provides music performed by original and contemporary artists and also provides information, trivia and insight into the music and its times. "Seems Like Old Times" includes special features like an occasional celebrity interview with performers and songwriters of yesterday and today.

Ed Z. Pell, host and general manager of the show's production company, Vintage Productions, stated, "Response to our program continues to grow so we are expanding to offer two-, three- or four-hour program length, customized to individual stations' needs. The 'seven-year itch' has prompted us to offer more."

For more information, contact Vintage Productions in New Jersey at (800) 851-2434 or circle Reader Service 7.

WFMT to Produce New York Philharmonic

The New York Philharmonic has chosen WFMT(FM) to produce and syndicate the orchestra live over the radio. This new series will begin the 1998-99 season this month.

The series, entitled "Time Warner Presents: The New York Philharmonic Live!," will expand from its previous nine broadcasts to 12.

Funding of this series will continue to come from Time Warner Inc.

The New York Philharmonic became the first major orchestra to broadcast a



Music Director Kurt Masur

live show in 1922. The orchestra continues to broadcast live today.

David Levin, WFMT Vice President for Network Syndication stated, "We're very much looking forward to working with (music director) Maestro Masur, the players of this world-renowned orchestra and its management, and to crafting for radio audiences a distinctive and innova-

tive broadcast series."

For more information, contact WFMT in Chicago at (773) 279-2000 or circle Reader Service 59.

Sports Byline USA Expands Programming

"America's Sports Talk Show," produced by Sports Byline USA, has added three hours of programming — from 6 to 9 a.m. (ET) seven days a week.

Sports Byline USA Chairman/Host Ron Barr said, "We've had overwhelming interest from our affiliated stations asking for these extended hours, especially in light of our recent acquisition of Prime Sports Radio."

For more information, contact Sports Byline USA in California at



Ron Barr

(415) 434-8300 or circle Reader Service 33.

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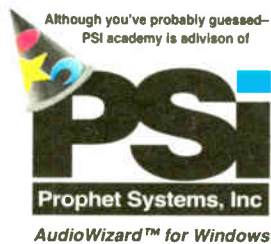


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NASCAR Appeals to Listeners

► NASCAR, continued from page 31

On almost any practice or qualifying day, you'll see Hall and Bestwick, DAT machine at the ready, talking with drivers and crew members, looking for extra insight for the Sunday race broadcast.

Hall said a dispute between track networks led Bill France Sr., the "founding father" of NASCAR and of the International Speedway Corp., MRN's owner, to start what was then called the Motor Racing Network in 1971.

"Darlington had its own network. The Universal Network did races at North Wilkesboro, N.C. Charlotte did their own

broadcasts. Some of these networks didn't want to let promoters from other tracks talk about the upcoming races. Bill Senior got sick and tired of that," Hall said.

"The promoters weren't really thrilled with the idea of broadcasting races in the first place, since they thought people wouldn't come to race-sif they could stay home and listen to them on the radio."

By the time the season is over, MRN will have broadcast 24 Winston Cup races. The Performance Racing Network covers eight races at tracks owned or controlled by Speedway Motorsports: Charlotte; Bristol, Tenn.;

Atlanta; Sears Point, Calif.; and Texas Motor Speedway outside Fort Worth. The Indianapolis Motor Speedway Network broadcasts August's Brickyard 400.

Hall has seen the series grow from one with regional appeal primarily in the South, to one that makes Madison Avenue salivate because of its ability to attract loyal fans with disposable income from across the country. The broadcasts themselves have changed from the early days.

"Technology has played a big part in how we do the broadcasts," said Hall. "In the early days, we were tied to telephone

lines. Now the reporters are completely mobile with wireless mics, so they can go in the pits right up to the crew chiefs or to the infield care center, if necessary. Again, it's like having four or five extra sets of eyes so the listener can get much more information."



Eliminate Carts for \$5,000

At last! A "cart" replacement system that *works like carts*, but with digital audio quality that *sounds like compact discs*.

It's Scott Studios' new Spot Box. It's the *easiest* hard disk digital system to use!

There are two parts: A triple-deck "cart" player on the left, and a "Wall of Carts" pick list on the right.

The triple-deck digital player has everything you would expect. Big green Play buttons, bright red Stop buttons, VU meters, large countdown timers, flashing End-of-Message signals, and large legible "cart" labels.

You can start each spot manually from the screen, from remote Start buttons (and run lights) on the console, or touch the Auto-Manual button to have Spot Box smoothly start the next deck itself.

Spot Box is really easy to use. There's only the one screen, so jocks never get confused. Even though Scott Studios uses Windows 98, 95 or NT, Spot Box works like carts, *not* a computer.

If you use a paper log, load any cut quickly with the blue number keys at the bottom of the touchscreen, or type them in with a 10-key pad. Or, pick and play any recording by number or name from the scrolling "Wall of Carts" showing all your spots, promos and jingles in ABC or 123 order.

As an option, Spot Box can import logs from your traffic computer by diskette or Local Area Network.

You get detailed printouts showing exactly which spots played and when. With the traffic import option, you see at a glance the comparison of schedule and air times.

If you have several stations under one roof, record a spot only once. There's no limit to the number of Spot Boxes or hard drives you can connect by LAN for additional studios and redundancy. Every spot can be instantly played in

8:13:24 Sat AM Aug 1, '98

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Pepsi-Cola 7327 :00/0:30/C CM Q: & Diet Pepsi!	1034 Both of You - Maternity :00/0:30/C CM	Spots
	1035 Bright Truck Leasing :01/1:00/C CM	Jingle
	1036 Burns Security Syst :00/0:30/C CM	Promo
	1038 Car Nation - Tuesday :00/1:00/C CM	Songs
	1039 Car Nation - Wed :00/1:00/C CM	ABC
	1040 Central Bank & Trust :00/0:30/C CM	Record
	1041 Cinema 12 :00/1:00/C CM	Dn
	1043 Charley Horse Saloon :00/0:30/C CM	

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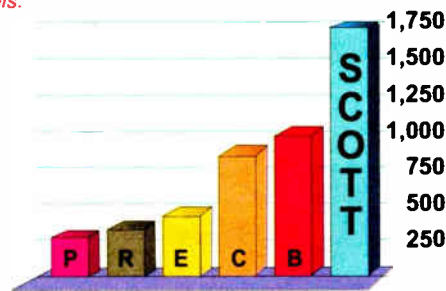
every studios' Spot Box. Recordings can be locked so they only play on designated stations, days and times.

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It's a fact: over 1,750 radio stations have 3,950 Scott digital workstations, including *major* groups like CBS, Chancellor, Disney/ABC, Clear Channel, Emmis, Citadel and many more.



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At each of the 24 races it covers, MRN brings in its own state-of-the-art radio production facility, a full-size trailer with digital editing capability, sound mixing and the business end for the wireless RF microphones. Also accompanying the MRN trailer and broadcast team is an audio satellite uplink truck. That technology is supervised by MRN Chief Engineer Harry Howard.

Hall is still having fun when he does the broadcasts.

"With television, you have to talk about what's on the screen. I can just look out the window and describe the strategy that goes on. I try to tell that story as simply as I can. People come up to me and tell me that they watch the TV pictures, and listen to MRN's sound during a race."

Latford describes Winston Cup racing as "very much a visual sport. The sound, the competition — with television, people have a chance to see it. Barney (and other racing broadcasters, past and present) described that with word pictures over these many years."

CBS Television broadcast the first live Winston Cup in February 1979 when it covered the Daytona 500. That was one of Hall's most memorable races.

"It was one of those races that was so good that you got caught up in it. They had just finished repaving Daytona and the track was so good that a car could come from 28th or so and lead a lap. On the other hand, if the leader made a mistake, he could find himself back to 25th."

Hall said there will be a place for radio in NASCAR's next 50 years.

"Our audience, for whatever reason, can't sit by the tube." That translates to fans actively seeking the MRN, PRN or Indy Network affiliate on race day. The sport's pre-eminent weekly, NASCAR Winston Cup Scene, publishes regular affiliate listings for MRN and PRN.

Radio and people like Barney Hall played a part in helping NASCAR succeed. They brought the story of a young sport to people who had to struggle to hear distant stations for news of their favorite driver. Today, with 450 to 500 affiliates for a typical race broadcast, MRN Radio and Barney Hall carry on that tradition.

Paul Kaminski is the news director for the Motor Sports Radio Network. Reach him via e-mail at motorsportsradio@compuserve.com

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World Radio History

ONLINE RADIO

Unofficial Radio Station Web Sites

Kim Komando

No doubt, the World Wide Web has changed the broadcast and print industries. Radio stations, national radio programs, television stations, magazines and newspapers can interact with their audiences in ways that were once thought impossible.

The Web also provides an open forum where people with various motives can present their opinions to a local and global audience instantly.

The problem is that anyone can come along and post a Web site targeting a radio station with remarks that are at best inflammatory and at worse libelous or

slanderous. Such people also are often prone to various trademark infringements. Perhaps worst of all is that these sites typically enjoy relative anonymity.

Snooping is easy

If you run a station or host a program, check for unofficial sites periodically, say at least once a month. You'll have to search deeper than category listings at Yahoo!, though.

For starters, point your Web browser to Dogpile (www.dogpile.com) where you can search not only Yahoo!, but other search engines including AltaVista, Excite, Lycos and Webcrawler simultaneously. Next, head

over to Hotbot (www.hotbot.com) to identify those sites that are linked to your home page.

If you do find anything that appears out of line, printing (along with date-stamping) the site's content for legal purposes is obvious. What you may not think of is saving the pages as computer files on later. You can save Web pages using your Web browser's File Save command, but you won't get the pictures that way.

Instead, use tools specifically designed to save Web sites

— text, pictures and all. Two such programs available online that you can try and then buy are Catch the Web (www.catchtheweb.com), good for small sites, and Grab-a-Site (www.bluesquirrel.com), geared more for larger sites.

After you find a site, the next step in combating this sort of activity is to determine exactly who is causing the trouble. Sometimes this can be easy. Consider the case of KNAC(FM) in Los Angeles. From 1985 to 1995, KNAC was one of the nation's leading and most well-known hard rock stations. In 1995, the station closed its doors.

Fast forward to 1998. The owners of the station decided to regroup and offer KNAC



Kim Komando

as an Internet-only station. Among the many hurdles the station faced was the fact that a fellow named Radi Todorov and his company, Flagship Broadcasting, had already laid claim to the *knac.com* domain name and had launched a Web site that would appear to the casual user to be the official KNAC Web site.

While praising the station's format, Todorov's site was highly critical of the station's previous management and also made considerable use of the KNAC logo and other intellectual property.

A legal Ping-Pong match ensued. In March of this year, Todorov filed a lawsuit against KNAC claiming ownership of the KNAC trade name and associated properties. However, he lost his initial bid to have a temporary restraining order issued against KNAC. In May, a judge granted a preliminary injunction that prevents Todorov and Flagship from maintaining their KNAC Web site, manufacturing KNAC merchandise, or otherwise infringing on the rights associated with the radio station. A trial date was set for September.

In this case, it was easy for KNAC to determine who was causing the trouble; Todorov made no effort to conceal his identity. However, even if he had, he wouldn't have been too hard to track down.

Check InterNIC

That's because InterNIC, the agency that handles domain name registrations, maintains a record of an administrative contact, a billing contact and a technical contact for every registered domain name. This information includes address and phone numbers. Most important, this information is available to the public free at the InterNIC Web site, located at www.internic.net

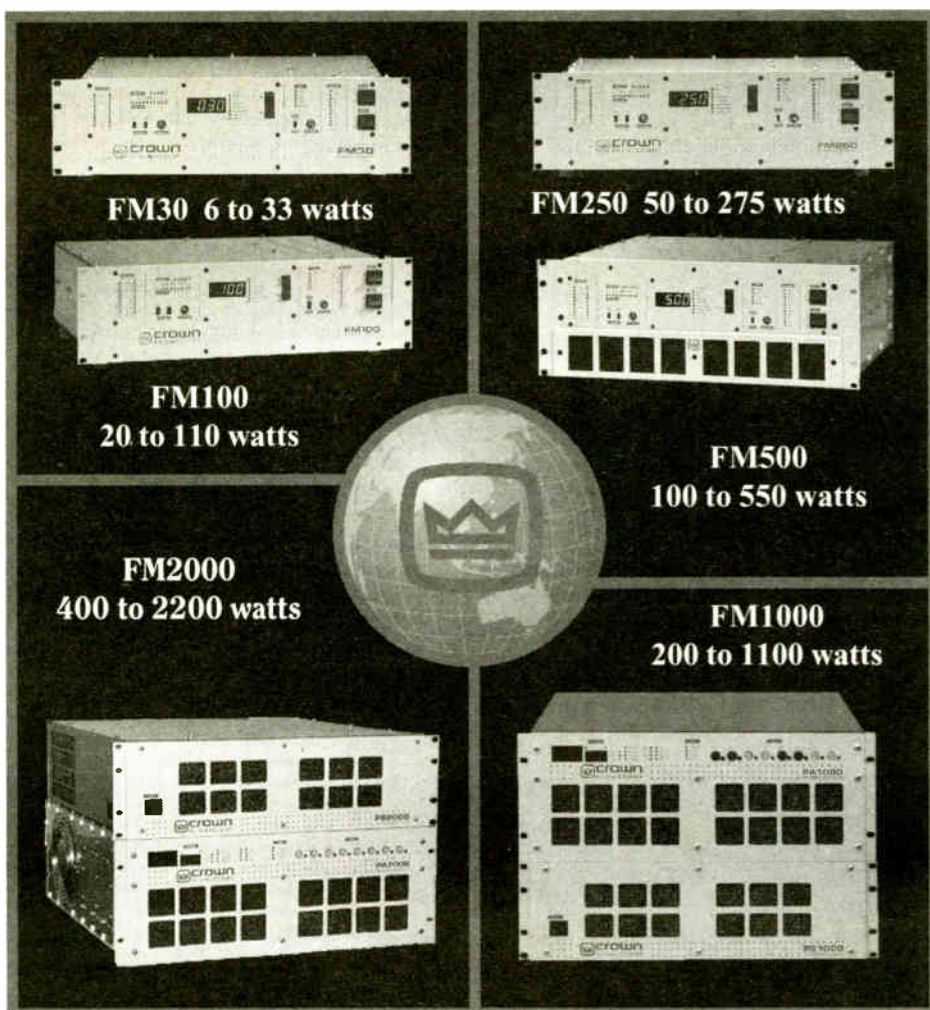
Subscribers to public services, such as America Online or any of the numerous Internet service providers around the country, present a greater challenge to sleuthing stations. Unless the user voluntarily makes his or her identity known to the public, these services generally will not disclose any information about them.

The Orange County Register, a newspaper in southern California, recently experienced such a situation. An America Online customer with some dislike for the newspaper going only by the name Slave4OCR decided to devote the free Web space provided him by AOL to criticizing the newspaper. The Register alleges that the site violated trademark law and included false and highly inflammatory remarks about the newspaper.

To learn the identity of the perpetrator, the Register's parent company was forced to obtain a court order compelling America

See KIM, page 39 ►

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► KIM, continued from page 38

Online to divulge the information. Once this individual's identity was known and he was made aware by the Register's parent company of the possible legal implications of his actions, he agreed to discontinue the site.

While this may seem like a reasonable assertion of the newspaper's rights, not everyone was cheering the victory — not even some of the Register's employees. Support among other media outlets was mixed; many free speech advocates saw this as a blatant attack on Slave4OCR's First Amendment rights. Among those to rally behind Slave4OCR were the American Civil Liberties Union and the Electronic Frontier Foundation.

"A newspaper that fights to the death to protect the names of sources — it is hypocrisy in the worst sense," said ACLU attorney Peter Eliasberg. "I am outraged that they did that, and I am disappointed that AOL did not fight harder once it was subpoenaed." Even Register columnists have written of their dislike of the actions taken by their employer.

Hence, what appeared on the surface to be the simple assertion of a media outlet's intellectual property rights and protection from libelous statements has turned, at least in part, into a public relations nightmare. One could argue that the Register might have been better off simply ignoring Slave4OCR's Web site, rather than draw attention to it.

There are limited hours in a day, and many stations are understaffed. We all have loyal fans, some of whom possess computer skills and want to assist their favorite station. You may be tempted to take them up on their offers. It's not a bad idea, as long as you and they know the rules up-front.

Happy ending

Tom Parker, operations manager for WGY(AM) in Schenectady, N.Y., recently had an experience that turned out fine but it could have very well likely been bad. The station knew about good station-related materials online, but as it turned out, it was not made clear in the beginning who owned the rights to the materials.

"We weren't taking about 'the' home page. It was a small portion of content, but we liked what they did. I learned then it's important that if anyone does any free-lance Web work for you, you must make it clear in writing who owns it before the work begins. Just get a small letter of agreement. They agree to do X, Y and Z and the station owns all rights, title and interest to X, Y and Z."

Know what's happening on the Web as it relates to your business, copyrights and trademarks. And before you pursue an online dissenter, make sure you consider all the consequences. Your station may find itself with considerable expense just to find out who is causing the trouble and getting a cease and desist order, if necessary.

If the station is successful in curtailing the efforts of the cyber critic, it may still face a backlash from free speech activists around the country. Only you can decide what's right for your station and whether any actions are worth the expense and headache. Granted, our company policy may be stronger than you deem necessary, but at WestStar, we pursue any online site that uses the network's copyrights and trademarks without prior expressed written approval.



Kim Komando hosts a weekend and daily feature computer talk radio show syndicated by WestStar TalkRadio Network. For more information, call (602) 381-8200.



Air Chains Use Apex in Texas, Virginia

In the competitive radio processing market, Apex Systems has two more happy users of its Model 2020 FM Pro broadcast processor.

KSJL-FM in San Antonio airs urban music to a large area from Austin to beyond Corpus Christi. Chief Engineer Tom Sittner credited the Model 2020



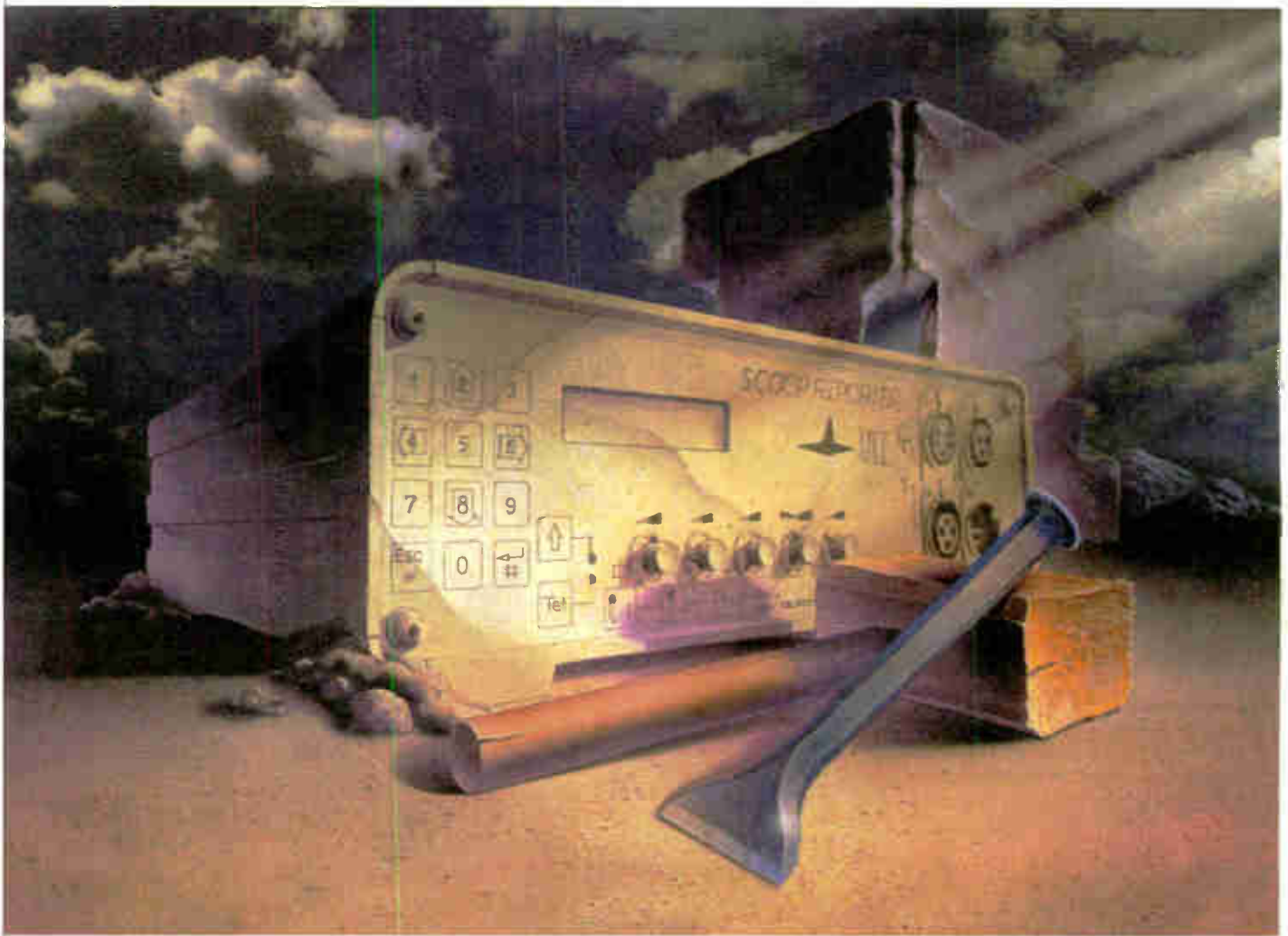
with fixing problems of dead spots and multipath his station had experienced. He said he was able to use one of the eight factory presets, plus a bit of bass tweak and marginal increases in the high frequencies. The unit also has 16 user-definable presets.

Apex also has a hit in Harrisonburg, Va., where station WOPO-FM recently changed format and installed a Model

2020 FM Pro. Consultant Robert Mallery cited front-panel controls, the computer program in the unit, and its loudness and clarity. The station program director, he said, wanted "much punchier" bass, and was pleased with the results.

For information, contact Apex Systems in California at (818) 767-2929, on the Web at www.apexsys.com, or circle Reader Service 137.

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A new world of broadcast solutions

WRBO Expects a Strong Showing

► WRBO, continued from page 31 possibilities: soft urban AC and urban gold. In early 1997, Clear Channel brought the former to Memphis after it acquired KJMS from the Florida-based Rivers Group as part of a deal with U.S. Radio. KJMS went from "Magic 101" to "Smooth 101" — and for higher demographic ground — in order to take it out of competition with the younger urban format of WHRK, which Clear Channel had acquired from U.S. Radio a year earlier. Last fall, however, urban gold still looked viable.

"By the time it became clear that we were going to get this third signal, in the

fall of '97 we commissioned another study," said Gingold. "And that was basically to take another look at the market, and again the R & B oldies format came to the top as a terrific choice."

While there are two stations in Memphis offering up urban oldies, both are on the AM dial. Sinclair's WJCE(AM) has an urban gold format, but is not locally researched. Clear Channel's WDIA(AM), on the other hand, is a local institution but does not

"You don't have to have the biggest ratings share in Memphis for this to be successful," he said. "But I do think it'll be a market leading station in the ratings. It'll be what we think of as a first-tier player. I do think its ratings will be competitive with WHRK and WDIA and KJMS."

Bruce Demps, vice president and general manager of Clear Channel Metroplex, which operates Clear Channel's Memphis urbans, agreed that

challenge, and that's for all stations."

In particular, Demps thinks WRBO will tighten the leader pack in the market, but not necessarily at the expense of WDIA. "All of our research said that (WDIA) is a personality-driven radio station," he said.



WRBO PD Henry Nelson

I don't think people go, 'That's Motown, that's Stax.' But they know it when they hear it.

— Henry Nelson

have a purely musical format. It also provides substantial news, talk and public affairs programming.

"This particular format opportunity was quite substantial. There did not exist on the FM band an oldies station for the black community," said Gingold.

Research aside, Gingold said he thinks the community will appreciate an urban station focused on the hits of the '60s and '70s. Memphis' famed Stax recording studio turned out many of them, including hits from artists like Otis Redding and Issac Hayes.

City-wide pride

"I really do think that there's something a little bit more magical about this kind of format playing the music of the '60s and '70s that's going to be different than in other markets elsewhere in the country," he said. "There's a lot of the music that you hear on the station that might be something that was recorded at Stax studios. People here know that, and it makes them feel good. It makes them proud of their city."

The station's program director, Henry Nelson, agrees. "It's important, especially in Memphis, that it has that Stax flavor, that Mid-South, that Delta feeling that people really, I think, expect," said Nelson, who returned to his hometown from WCFB(FM) in Orlando to become PD at WRBO. "I don't think in general people go like, 'That's Motown, that's Stax.' I don't think they think like that. But they know it when they hear it."

In fact, the format resonated so well with the musical history of Memphis, Gingold said he toyed with the idea of naming it Stax 103.5, with the call letters — available at the time — WSTX.

"It was kind of a working name even as late as February of this year," he said. "I was ready to open a Stax Cafe on Beale Street and on and on and on." Testing, however, won out, when "Soul Classics" rose to the top from a list that included "Stax," as well as "Otis" and "Gladys" 103.5.

WRBO went on the air too late to have much impact in the spring book, but Gingold said he hoped to see a strong showing in the summer, when he expected it to draw share not only from local urbans but from AC formats as well.

WRBO will have an impact.

"I certainly expect them to be a player in the marketplace," said Demps. "We just don't think any of our stations will suffer disproportionately to other stations in the market." Demps said Memphis is going through a period when signals are proliferating while total audience remains the same.

"It's making our market more competitive from a programming standpoint and increasing our sales chal-

Not to mention the fact that even Gingold gives WDIA's heritage its due when projecting the future of his new station. "If we can achieve just half the success that a station like WDIA has over the years in its relationship with Memphis' black community ...," he said. "If we can do half as well, it'll be tremendous."

■ ■ ■

Jim Hanas covers radio and television for *The Memphis Flyer*, the Mid-South's largest news and entertainment weekly. He can be reached via e-mail at jhanas@adadmedia.com

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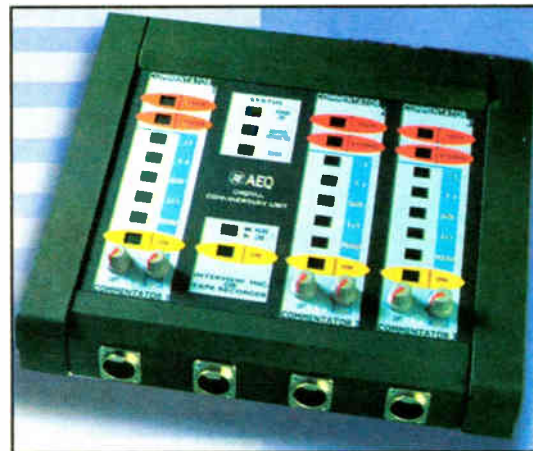
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AEQ, which offers products for sale in the United States and abroad, is enjoying high-profile international uses of its equipment for sports coverage.



Radiotelevisione Italiana acquired 100 mixers from AEQ. RAI used the units to cover the Formula One World Championships in Italy.

For World Cup 98 coverage, LV3 Radio Córdoba, part of Radiodifusora del Centro of Argentina, acquired AEQ

equipment, which the supplier installed in Paris. Radio Córdoba used it to feed football coverage back to Argentina.

Among the AEQ equipment was a BC-500 console, MPAC-02 portable audio codecs, TH-02 digital telephone hybrids, and DA-16 distribution amplifiers.

AEQ also announced that Canal Sur Radio of Andalucía purchased several MMPAC-02 portable audio codecs. The codec can operate over ISDN lines or standard analog circuits.

For information from AEQ in Florida, call (954) 424-0902, send e-mail to aeqamerica@aol.com, or circle Reader Service III.

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ment and services. Information is provided by suppliers.

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PRODUCT EVALUATION

Sonifex Digital Disk Recorder

*Hard Disk Editing Takes to the Field in Miniature,
Courtesy of England's Sonifex Courier*

Lawrence Hallet

Like me, you have worked with traditional analog portable recording gear in the course of your radio career. The increasing range of portable digital units is certainly a breath of fresh air.

Although the earlier analog equipment was successful, it was technologically restricted in terms of performance and reliability.



The Sonifex Courier

Portable quarter-inch tape machines had limited recording times and cassette designs tended to yield poorer signal-to-noise ratios. With so many moving parts, springs, flywheels and belts, there was also an inevitable tendency toward failure in the field and high-maintenance demands.

An improvement

Everybody does the same thing when they get a new piece of electronic equipment — they try and make it work without reading the manual, so what better way to begin testing a new portable hard disk recorder?

The Sonifex Courier arrived direct from the manufacturer, complete with carrying case, a NiCad battery, PCMCIA hard disk card, a power adapter/charger and an instruction manual.

To make a small understatement, the Courier is distinctive. It has a

modern-looking design of tough, molded ABS plastic and measures roughly 9 by 10 by 2.5 inches.

At first glance, there seems to be a

great number of switches and buttons on the top and front panel of the unit, supplemented by connector ports on both sides. This may seem a little overwhelming, but Sonifex has put a great deal of forethought and planning into the ergonomics of the design.

Even without the aid of the well-written manual, basic operation of the unit is fairly clear. In essence, the front panel is used for recording and playback via traditional cassette-style pushbuttons.

Easy operation

There is also an LCD display with associated menu selection buttons, and additional buttons for such functions as status monitoring of power and back-lighting.

See SONIFEX, page 49 ▶

'Dead Radio' Spot Is Alive and Well

All radio production people have at least one great spot in their files, rejected by a client for one reason or another.

This is what prompted the people at Oink Ink Radio in Philadelphia and New York (RW, Dec. 10, 1997) to hold their company's first annual "Dead Radio" contest, soliciting scripts that never made it off the page to see the inside of a studio.

"Every copywriter we've ever worked with has a drawer or computer full of great radio scripts that never got off the ground," said Oink Ink President Dan Price. The contest was open to professional copywriters at advertising agencies, but several radio stations also sent in entries. The winner would have his or her entry produced by professional talent under the direction of Oink Ink brothers Dan and Jim Price.

The winning entry — "Love Letters" — was written for Prego brand frozen entrees by Nat Gutwirth of Weightman Advertising, Philadelphia. The one-minute tableau features an elderly mother and her grown-up son simultaneously writing letters to the Prego company, both berating and praising the product in the same one-minute script:

Mother (angry, on manual typewriter): Dear Prego ...

Son (pleased, on computer keyboard): Dear Prego ...

Mother: I'm writing to tell you what misery ...

Son: ... what happiness ...

Mother: ... your stupid product ...

Son: ... your delicious frozen entrees ...

Mother: ... has brought to my life (typewriter bell).

Son: Your fettucini alfredo ...

Mother: ... has caused my son to abandon his family ...

Son: ... has given me the freedom to enjoy fine Italian cooking ...

Mother: ... and never to show his ungrateful face ...

Son: ... without having to burden my parents.

Mother: (typewriter carriage return) Your chicken cacciatore ...

Son: ... Perfect for two ...

Mother: ... has destroyed our family life ...



From left: Dan Price of Oink Ink Radio; actor Harry Prichett; Jim Price of Oink Ink Radio; actress Peggy Shay and winning copywriter Nat Gutwirth at Prego "Love Letters" recording session in New York.

Son: ... has done wonders for my love life ...

Mother: ... and made my husband ashamed of his philandering son (typewriter bell).

Son: ... and has made my poppa proud! Well, Prego ...

Mother: Well, Prego ...

Son: ... I could go on forever.

Mother: That's all I have to say.

Son: So thanks a lot.

Mother: So thanks a lot!

Announcer: Prego frozen entrees. Now you don't have to go home to get homemade Italian taste.

Son and Mother: P.S. ...

Son: Your primavera is better than my momma's.

Mother: ... drop ... dead! ...

(Used with permission, Oink Ink Radio)

Reach Oink Ink Radio at (800) 776-OINK or at www.oinkradio.com

— Alan R. Peterson



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PRODUCT EVALUATION

ACP-22 Unit Has Surprising Specs

Tom Vernon

When the PreSonus Blue Max compressor passed through my reviewer's workbench recently, I was impressed with its practical design and rugged construction. Labeling its compression curves in terms of applications rather than technical-ese was a simple but inspired idea.

I recently checked out the company's ACP-22 (\$399.95), a rackmount two-channel compressor/limiter/gate equally at home in broadcast, multitrack recording, or live-sound reinforcement environments. Unlike some other inexpensive rackmount limiters I have recently reviewed, this one has separate limiter controls for each channel, making it much more useful in live recording applications than those without.

While the Blue Max was clearly designed for musicians and other non-technical types, the ACP-22 definitely is an engineer's tool.

Sections

The front panel of this 1 RU box is divided into two identical sections. There are two 8-LED displays for each channel: one for input/output, the other for gain reduction. Each channel contains a compressor/limiter, noise gate, gain, and link and bypass controls.

The compressor controls include Threshold, which sets the level at which the onset of compression begins; Ratio, which determines the compression slope; Attack, which sets the speed at which the compressor acts on the input signal; and Release, which determines the amount of time the compressor takes to return the gain reduction back to zero.

A button labeled "soft" selects between a soft-knee curve and a hard-knee compression curve. With the hard-knee setting, compression takes place the instant the threshold level is exceeded. With the soft-knee setting, gain reduction occurs gradually and gently after the threshold level is surpassed. When the Auto button is pressed in, the attack and release knobs are disabled, and program-dependent attack and release curves are employed.

Gate controls include the traditional Threshold, Attack and Release knobs. A Gate Range button sets the amount of gain reduction when the gate closes. Therefore, if the range button is depressed, the signal will be gated (or reduced) by 60 dB as it crosses below the threshold. With the button out, the signal will be gated by 6 dB. An LED marked "Close" above the threshold knob indicates gate status.

A 12 dB-per-octave filter may be switch-selected so that the gate is less sensitive to higher frequencies. This is a useful feature for applications such as recording drums, where you would not want the cymbals gating the rest of the mix.

Bypass and link switches are included, enabling the user to disable processing and operate the limiter with unity gain. With the link button depressed, Channel One becomes the master controller for both channels while the Channel Two controls are disabled.

Around back, each channel has balanced XLR input and output connectors, and unbalanced quarter-inch tip/sleeve connectors. The inputs can handle up to

+24 dBu unbalanced or +18 dBu balanced signal levels. The output will deliver up to 24 dBu, balanced or unbalanced.

A +/-10 dB switch adjusts the operating level and allows the ACP-22 to be



The PreSonus ACP-22 Compressor/Limiter/Gate

operated with either pro-grade or semi-pro gear. Sidechain and gate connectors are on quarter-inch TRS jacks. The power supply of the ACP-22 is internal. Wall warts need not apply.

On the surface

Inside, this limiter is a marvel of surface-mount technology. All components are on two circuit boards: one board contains the display LEDs and switches, the other board has everything else. The limiting factors in the size of this limiter are connectors and knobs, as the circuitry could easily fit in a box much smaller. The paint job and mechanical construction are very good.

Our review unit had what could proba-

bly be called assembly defects. Four LEDs on the front board had their leads pinched together and were shorting out. PreSonus is aware of this problem, and has changed their assembly procedure to rectify the situation. Fortunately, I did my

mechanical inspection before plugging the unit in.

Disassembly for service looks fairly easy. Just remove the four screws on the front panel and the connector hardware from the back, and the boards slide out.

Just about everything you would need to know to install and operate the ACP-22 is included in the 13-page users guide. Controls and connectors are explained and illustrated, and basic setup and applications are discussed. Included are diagrams showing how to patch into your mixer's unbalanced insert points or after your mixer's balanced outputs, and how to insert an equalizer into the sidechain of the ACP-22 for de-essing or other special effects. An appendix about compres-

sion and a list of specifications round out the documentation.

My bench tests showed that PreSonus was quite modest when they spec'd the ACP-22.

Under the hot lights

THD+noise are specified as less than 0.02 percent. Our unit measured 0.00085 percent at 1 kHz. While the stated frequency response was 10 Hz to 50 kHz, our unit was flat from 10 Hz to beyond 200 kHz. Remember, this is a \$400 box.

Note that if you run the ACP-22 into older 600-ohm gear, you will lose some of the low end. Our demo box was down 3 dB at 45 Hz when so terminated. Signal-to-noise ratio measured 115 dB, while the manual stated greater than 95 dB.

PreSonus has other audio processors you may wish to find out more about, such as the ACP-8 eight-channel compressor/limiter and the Blue Max we looked at only recently. Direct your Web browser to www.presonus.com to find out more.

■ ■ ■

For information, contact PreSonus Audio in Louisiana at (504) 344-7887 or circle Reader Service 189.

Tom Vernon is a multimedia consultant based in Philadelphia and a frequent contributor to RW.

ISDN II: Is Anybody Out There?

Ty Ford

The road rash caused by my first experiences on the ISDN "information superhighway" has almost healed. If you are thinking about ISDN codecs for audio, dig around for my last article in the Aug. 5 RW to find out how much fun you can have with your local phone company and long distance carrier.

If you do not want this fun, there are consultants that can expedite the service and sell or lease you a codec. Choosing the right codec can provide additional fun.

Separate camps

Three years ago the audio codec scene was split down the middle. Audio production facilities mostly used the APT-X algorithm boxes, while broadcast favored MPEG boxes. DolbyFax is a player, but mostly with west coast film and video producers. All three algorithms are incompatible.

Although APT has been taunting the market for almost two years with its BCF256 codec, purportedly containing both APT-X and MPEG on paper, a working model with both algorithms has yet to make it to market.

The market, however, is changing. Audio production facilities with the APT-X boxes are throwing down cash for MPEG boxes so they can forward produced audio directly to radio and TV stations.

This is good news for voice-over folks like myself because, while I still enjoy traveling from studio to studio to do the work, the hectic "political season" will soon be here. Video and audio production markets get quite a boost during elections. Deadlines are tight, issues swing back and forth and the

only constant is change. With a codec in my studio, I can write more articles for RW while I wait for the phone and fax to ring.

Having received a MUSICAM RoadRunner (\$2,800) for review, I jumped into Phase Two of ISDN-codec mania.

Sam Agin of MUSICAM USA

channel mixer with two front-panel XLRs for mic-level inputs and a third switchable mic/line XLR on the back panel. There are two front panel headphone jacks, each with separate volume controls for Local and Return audio. The back panel has another set of quarter-inch unbalanced Return and Local



The MUSICAM USA RoadRunner ISDN Codec

knows more about ISDN codecs than anyone I have met to date. I greatly appreciated his phone support, and were it not for him, I would probably still be unconnected.

I did, however, have difficulty with the RoadRunner manual. A few phone calls later and with a bit of time for it all to sink in, I became fairly conversant. I still think the menu is not particularly easy to navigate at great depths, but once you get a set of phone numbers and parameters logged into the speed dial memory, a connection is only three button-pushes away.

The RoadRunner is an exceptionally versatile codec. It includes a three-

output jacks, a 9-pin control port for connection to a PC, a DB25 connector for opto inputs and relay outputs, and an external power jack (12 to 14.5 V, 3.5 A DC).

As the term "returning audio" implies, the RoadRunner operates bidirectionally. A back-panel XLR splits audio from the incoming codec for routing to the console or recorder.

The RoadRunner has a fan in the back of the unit. It is noisy enough to cause concern if kept in the same room as an open mic. Agin suggested the cover can be removed for one-room inside operations. I left it on and found that few people on the

See ISDN, page 43 ▶

► ISDN, continued from page 42
receive end made any comments about the fan noise. I was using a Gefell UM 70 cardioid and Sennheiser 416 shotgun mic. The codec was about two feet off on the backside of the mics.

The RoadRunner's flexibility extends to its collection of algorithms: MPEG Layer 2, Layer 3, G.722, and old and new CCS algorithms. The decoder can be set independently from the encoder. For example, you might set the decoder (return audio) for G.722. This lacks some frequency response but has less delay. As long as both ends of the connection know how to configure the boxes, it is off to work.

I found the default MPEG Layer 2 settings worked with no alterations. There are, in fact, 48 presets that vary by bit rate, sample rate, algorithm, line format and decoder independent status. These presets will be even more helpful when stored so they cannot be inadvertently erased.

Yep, I did, and so have others. If you have a PC, you can download the settings from the web and reinstall them.

Delay ... lay

ISDN codec and long distance phone lines create minor timing problems, depending on the MPEG algorithm in use and the distance in miles of wire separating the codecs.

Layer 2 performed with less delay than Layer 3. I called Norb Gallery, master control supervisor at National Public Radio in Washington, where they use a fleet of RoadRunners and other MPEG boxes. After connecting, I sent a mono signal from one track of my DAW in Baltimore across a two bearer channel (128kbps) connection.

Gallery received it in a RoadRunner, sent it through a router and down the line right back into my DAW. The total delay — encoding, decoding, re-encoding, my final decoding and long distance line delay — was 9/30 of a second. Maybe a bit sloppy for long distance close dialogue spots, but that is what workstations are for.

Most audio professionals are wary of codecs because of data compression: A 44.1 kHz mono signal requires a throughput of 750 kbps. Two bearer channels provide only 128 kbps, or a compression ratio of 5.85 to 1.

The multigenerational tests were pretty amazing. After several bounces, the only real audible difference was some hiss; about as much as on a well-recorded 15 ips analog machine.

To be fair, the workstation had been set to run at 32 kHz sampling for 15 kHz bandwidth. At 44.1 or 48 kHz, the difference would probably have been more noticeable. I also noticed that, while the first transfer resulted in a 9/30 second delay, subsequent delays were closer to 5/30 second. The slimmer, twice-compressed (one time at each end) audio stream seemed to result in shorter codec delay.

According to Gallery, Layer 2 at 128 kbps is preferred over Layer 3 because of its audio quality. MPEG Layer 3 is sometimes used over long distances to save money, partly due to the fact that acceptable mono audio bandwidths for radio and TV can be sent on one bearer channel (ISDN phone lines have two bearer channels). More savings are realized from not racking up local and long distance charges for two bearer channels. Although prices may vary, I was quoted long distance charges of 20 to 35 cents per minute, per bearer channel.

We switched to Layer 3, 128 kbps and tried a similar transfer. There was slightly

more hiss than with Layer 2 and the top sounded slightly rolled off. I have heard over-processed FM rock stations sound worse than this with no data compression at all. I would not consider MPEG Layer 3 of contribution quality for production, but I can see why people use it when they can save a dime.

Next test

On a call to television voice-over heavy-weight Chris Clausen in Boston, I connected the MUSICAM RoadRunner to his Telos Zephyr at 48 kHz, 128 kbps mono.

I tweaked the gain knob on my preamp and realized when nothing happened that I was still connected to an unnamed high-end tube mic preamp I received for evaluation. Part of this preamp's claim is its warm and colorful sound.

I switched to my more neutral-sound-

ing GML microphone preamp and Clausen said the difference was very noticeable. The GML produced a cleaner, sharper voice track. In this case, the warmer, tubey sound did not translate well over the data-compressed codec.

Next I connected with a Zephyr at Waveworks, just outside Washington. Engineer Jim Bloch reported that the connection was solid and quiet. He also mentioned that data compression can affect how material is equalized. He has found that reaching for familiar EQ solutions during mixing do not always have the same effect if the audio has been data-compressed.

Another connection with nearby Dave Bartley Sound resulted in the same ease of operation, once the phone numbers were programmed in.

After surviving the moderately intense

headaches (think wisdom tooth extraction) of getting the ISDN service installed and configured and getting a grip on the RoadRunner, piping my audio and voicetracks around the country has become pretty easy.

I also admit to some amazement every time I hear the quality of the audio coming in on the codec. Like all MUSICAM gear, the RoadRunner manual includes vital information that you can fax to the phone company to help them get you up and running quickly. The MUSICAM phone support is also great.

■ ■ ■

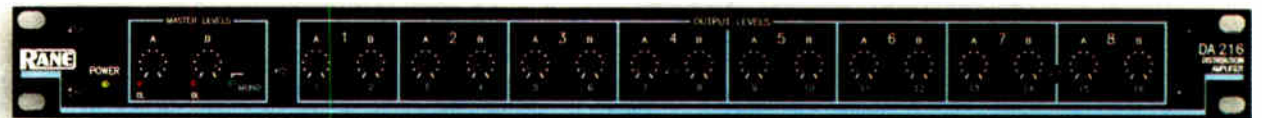
Find contact information for MUSICAM USA and other remote broadcast equipment in our Buyer's Guide, starting on page 50.

Ty Ford can be reached at www.jagunet.com/~tford

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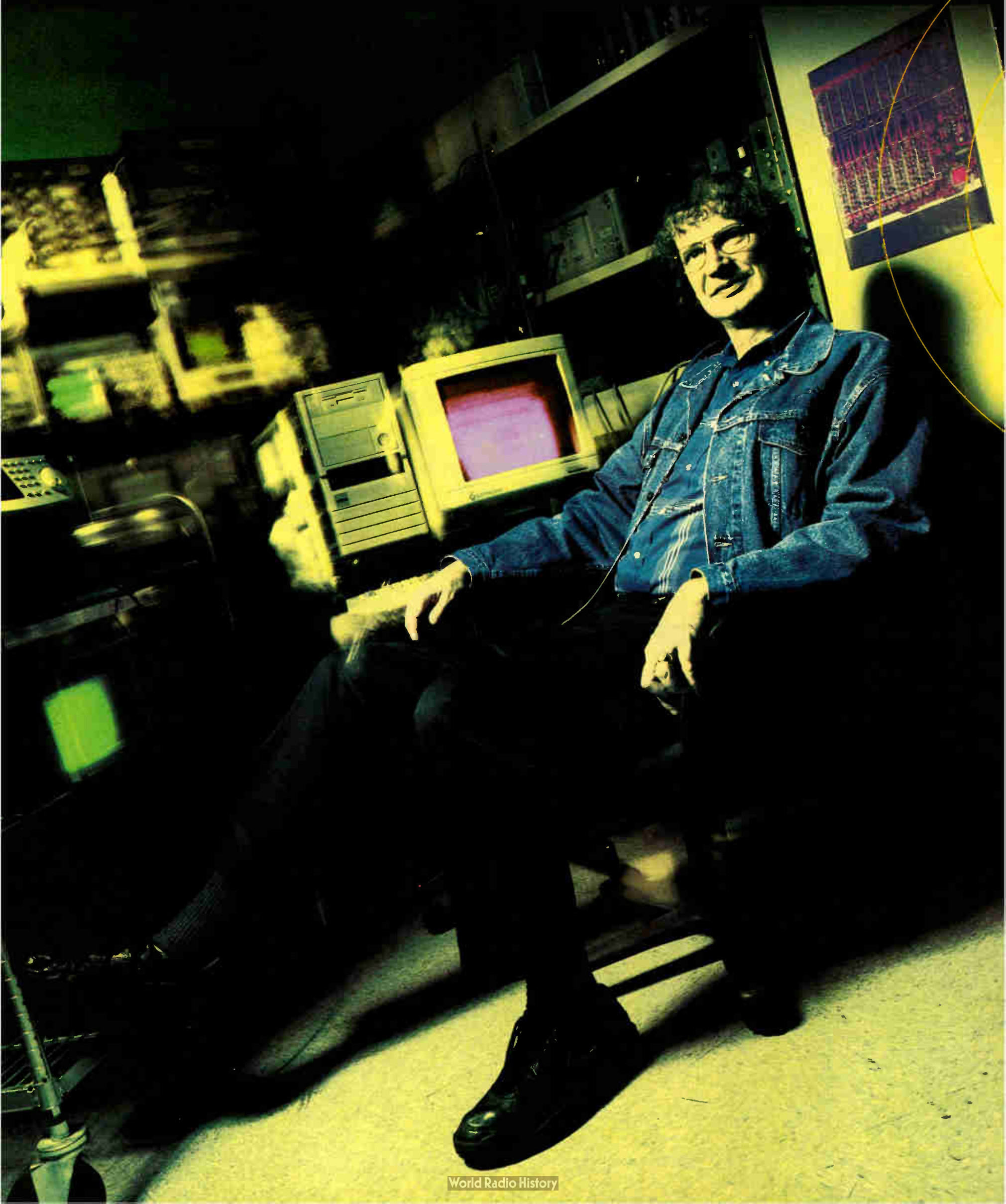
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"Version 3.0 is more than an upgrade. It can take your station's signature to the next level of competitive sound. Listen to it side by side with any audio processor in existence; then, let me know what you think. Good or bad, every e-mail sent to me will be answered by me, personally. bob@orban.com."

orban®

H A Harman International Company

BOB ORBAN is known for his critical ears. In the seven years since we introduced OPTIMOD FM



8200, perhaps no one has logged more hours listening to the best and worst in digital audio processing. Even critics have called his knack for creating louder, punchier, artifact-free sound "a gift." But make no mistake. With 30 years of experience in audio, it's Bob Orban's expertise that is written into every layer of the new Version 3.0 software. It gives you a level of audio technology that no other processor in existence can match.

NOTHING IS NEWER.

Version 3.0 software adds five new features to OPTIMOD 8200's proven digital platform. With thousands of users and millions of on-air hours to draw on, Orban's team knew exactly how to take your station's audio to the next level. 21 new presets dramatically expand your options to create a superior competitive sound. Sonic "color" controls now allow you to fine-tune tonal balance to precisely target your desired audience. Tweak the band output mix controls to add sizzle, bring vocals up front, or mellow out instrumentals. Raise the bass clipper threshold to create a more solid bass punch for urban and dance formats. Toggle Phase Rotation on/off to minimize distortion or improve music transparency. Open up the highs to effectively remove any hint of what has erroneously been called "digital grunge."

NOTHING SOUNDS BETTER.

Cut to cut, spot to spot, announcer after announcer, nothing delivers a more consistent sound than the new Version 3.0 software. Which means that hour

after hour your station's signature sound remains true to your audience's preference. The dynamic,

musical presentation never fatigues listeners. Every minute you're on the air, you achieve a unique sound that brands your station with a distinct presence in the market. Loud. Clean. Clear and Punchy. Side by side, no other processor delivers higher quality sound or requires fewer hassles to achieve it.

DIGITAL PROCESSING DONE RIGHT.

After seven years of listening, tweaking and non-stop critiquing, we've confirmed what you've known all along: the biggest



news in FM digital processing is still OPTIMOD-FM 8200. OPTIMOD integrates perfectly into any industry-standard

STL and transmitter environment—no exciter modifications or non-standard connections are necessary. It achieves tight peak control without composite clipping that trashes subcarriers. In short, it delivers elegant, professional engineering—not junk science or marketing spin. In the words of one of the most critical ears in radio, "don't believe everything you hear." Listen for yourself.

UPGRADE NOW.

In a matter of minutes you can upgrade the 8200 to the newest, best-sounding, best-performing audio processor in radio. Call your Orban dealer for details. Visit our website for more information. And e-mail Bob to let him know what you think.



Careful, He Has a Soldering Gun!

Alan R. Peterson

A sizable number of engineers reading *RW* have already endured the headaches of new studio construction, some more than once. With consolidation leading the charge, unprecedented new studio build-outs have occurred in the past two years, as multiple stations pile into shared facilities like so many '50s college students into phone booths.

For many engineers, once is enough. "I hope we stay here at least for five years," I hear, "because I'd hate to have to go through that again anytime soon."

To repeat a phrase, ah feel yer pain. Six years ago, I took part in new studio construction, documenting the tale in these pages. I had hoped that would keep me satisfied for a while, but lately I have been getting the itch to dive back in with Weller gun in hand and do another job.

Little construction projects in the home studio just were not doing it for me. Even after four major changes in three years and the loss of my dining room to an equipment rack, I still was not satisfied. Like a cop taken off the streets and put on a desk job, I itched for just one more slice of the action.

So when Fairfax Community Access Corporation (FCAC) of Fairfax, Va., wanted me to help build — for free — an entirely new studio for its cable FM radio station, "WEBR Internet Radio," guess how long it took me to say "yes."

You're nuts

Why would anyone want to give up their evenings and weekends to construct a studio for a radio station one does not even work for? Why devote leisure hours to a project with strict timetables and deadlines? And do it for free? And why

bring in an *editor* instead of an engineer to do it?

To begin with, FCAC is primarily a volunteer organization, one that I have worked with for two years. Because it is a community access organization, most participants creating radio and TV con-

by the paid staff.

So why me? Well, I may be an editor *now*, but I do have that SBE certificate hung at home and can still sling 60/40 rosin-core with the best of them. The station appointed me as "volunteer technical advisor" last July, and as it turns out, I



The author is shown inside the future home of cable station WEBR. The unusual perspective is caused by a wide-angle lens.

tent are not professional broadcasters, but "folks next door," helped along by those of us who have taken our share of lumps in the business. Volunteerism can be fun. Try it sometime.

The paid FCAC engineering staff already has its hands full keeping three TV studios and a computer network in shape. If the job of building a new radio studio can be handed off to somebody else, train wrecks elsewhere in the facility can receive full attention

am in good company: *RW* "Cyber House" columnist Alan Haber has his own show on WEBR and is part of our construction crew.

Then why do it for free? Pushing aside for a moment the spirit of volunteerism and my mad desire to build a studio, I really don't know. Maybe a breeze went

Maybe a breeze went through my ear one day and blew out my pilot light.

through my ear one day and blew out my pilot light.

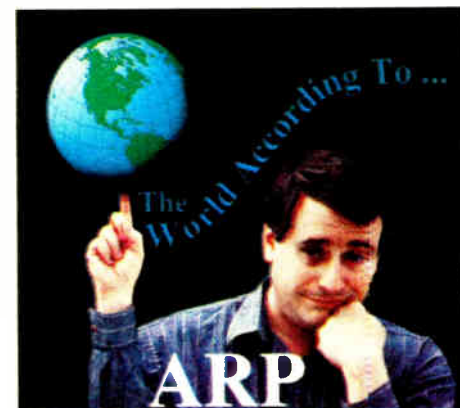
FCAC is inside a two-level brick building in a small industrial/office park, a few doors down from the Media General Cable headend facility where the WEBR signal enters the cable system.

The new WEBR studio is displacing the former audio production room deep inside the building. Because this is a cable operation, it lacks any high-power transmitters directly in its backyard. However, one mile down the road is a monster tower with two FMs, a TV and a dozen other transmitters, so RF is a concern.

The old WEBR studio has been trucking along for about six years on a used Arrakis analog console, a handful of Denon CD players and Sony DAT recorders, some consumer cassette decks and an ITC triple-deck stereo cart machine.

The cart recorder in production had been down for months. Numerous rewiring jobs over the years had left yards of semi-detached cable under the console, causing numerous ground loops and buckets of RFI.

Because the host cable company is evolving toward a digital fiber-optic system, the decision was made not to do a rip-and-refit job on the existing studio,



but build a new radio facility in anticipation of WEBR going digital as well.

The first thought: consider a digital console.

The gear

The total amount we could spend to build WEBR *and* relocate the audio production room was \$20,000. That forced a few creative decisions.

I could make recommendations but could not finalize the list, nor sign the checks for equipment actually purchased by WEBR. Lists would be faxed to me, I'd make my suggestions and fax them back. The rest was up to the radio coordinator employed by WEBR.

When I looked at the final list, I was pleased to see we had made budget with some change left over for the candy machine. WEBR was to receive Spacewise Broadcast Furniture, a Logitek ROC-10 digital console, four new Shure mics and preamps, three Tascam CD players and two DAT decks, a pair of Denon cassette recorders and two Pentium computers for running BSI's WaveCart software and, eventually, WaveStation software for overnights.

'Wire' You Using That?

In early planning stages, the WEBR studio was to have been completely wired with AES/EBU digital twisted-pair cable, including any components with coaxial S/PDIF ports. After all, we have all substituted shielded pairs in place of coax in analog installations before, right?

Everything has changed. Digital audio follows new rules, so the choice of cabling becomes very important. To begin with, digital audio rolls along at 3 MHz, not 20 kHz like analog, nor at 44.1 kHz like a CD. The common misconception made by digital newbies is: if the sample rate is at 44.1 kHz, we should also see 44.1 kHz coming out of the port.

The 3 MHz figure is arrived at by multiplying the sample rate by 64 to give us the bandwidth:

$$\begin{aligned} 38 \text{ kHz} \times 64 &= 2.432 \text{ MHz} \\ 44.1 \text{ kHz} \times 64 &= 2.822 \text{ MHz} \\ 48 \text{ kHz} \times 64 &= 3.072 \text{ MHz} \end{aligned}$$

The latter is the one I always quote, as it refers to AES tracks on digital video machines and represents the highest bandwidth. If they ever approve a 96 kHz standard, which looks quite probable, that will be 6.144 MHz bandwidth.

As to why can't we continue to

swap coax and twisted pairs in the digital realm: There are two standards in the digital audio (AES/EBU) world. One is the original standard twisted pair. The twisted pair must have an impedance of 110 ohms and low capacitance to match the standard.

If you decide to use coaxial cable — the second cable choice recently added to the standard — the coax *must be 75 ohms*. Fortunately, any high-quality baseband all-copper 75-ohm coax will work just fine.

Even if you own a large coil of the stuff, resist the urge to use CATV cable, the type that drops into your house from the pole outside. CATV cable has a copper-clad steel center with a low-coverage aluminum braid, and is intended to work at 50 MHz. Because AES/EBU digital audio is at 3 MHz, CATV cable will not work for digital audio.

There is a way to use twisted pair where coaxial cable is called for, or vice versa. Baluns are available that convert between 110 and 75 ohms and from a balanced XLR to an unbalanced BNC. A number of companies make these, most notably ETS at (800) 752-8208.

— Steve Lampen, Belden Wire and Cable, with Alan R. Peterson



It's not only digital. It's PR&E.

Now you can get digital technology and PR&E reliability in the same console. Integrity.[™] It's the first digital on-air board that also speaks fluent analog. All 16 inputs can handle analog signals. Ten can also accept digital inputs at any sample rate. So you can deal with the hodge-podge of equipment in real-world studios. A unique architecture also guarantees a level of reliability other digital consoles can't match. So you can rest assured your signal will stay on the air.

What's more, you get on-board DSP voice processing, remote or local configuration controls, and channel-specific remote control connections. And you can set, save and recall each board configuration at the touch of a button for seamless transitions from show to show.

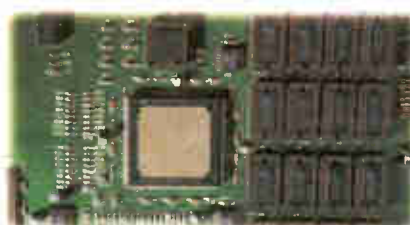
For a brochure, call us at 760-438-3911, visit www.pre.com or e-mail sales@pre.com



The LCD displays audio levels, time-of-day clocks, session status and event timers with a Windows[®] interface to powerful configuration management and session-based features.



Integrity's difference is more than just digital. It also offers four special-purpose buses to provide automated mix-minus for telephone and remote feeds, each with IFB.



Integrity uses an array of state-of-the-art floating-point digital signal processors to perform its mixing, routing and other functions.



Each fader has a 10-character alphanumeric display. The display changes when another audio source is assigned, which can happen either manually or at a preassigned time.



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World Radio History

◆ PRODUCT GUIDE ◆

Products for Radio Production

Mail info and photos to: RW Product Guide, P.O. Box 1214, Falls Church, VA 22041

Gefen Systems Sound Exchange

Gefen Systems, along with computer software developer mSoft, have created M&E Pro Intranet, a computer-based sound effect and music management system.

M&E Pro Intranet offers on-line sound effect and music searching, auditioning and transfer using conventional Internet browsers. The client-server software/hardware package is based on Microsoft NT server technology and supports Ethernet network connection and Netscape Navigator or Microsoft Explorer browsers. The system saves time and labor by avoiding catalog searches and eliminates the need to load and audition effect CDs.

M&E Pro Intranet can work cross-platform on PC, Mac or UNIX worksta-

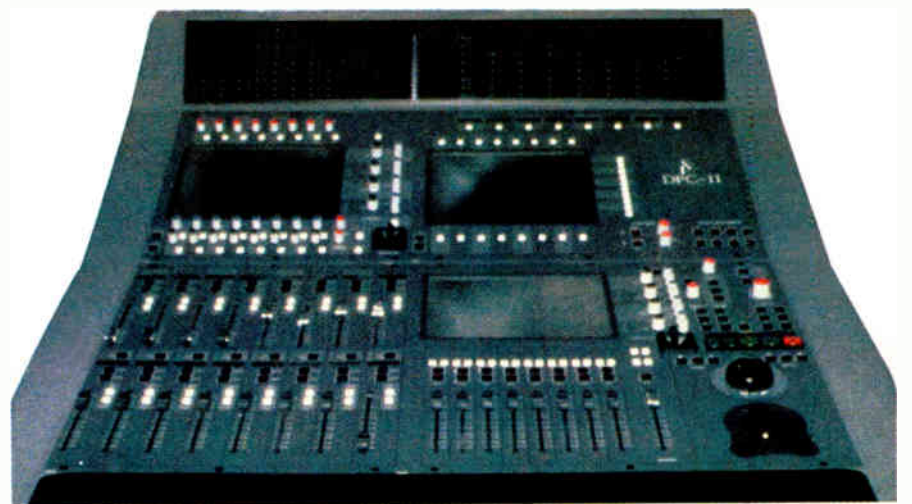
tions (Mac screenshot shown), provides audio in low-resolution mode for auditioning and high-res mode for downloading, uploads audio directly into DAWs and can automatically record to hard disk in different file formats.

For information, contact Gefen Systems in California at (818) 884-6294 or circle Reader Service 60.

Soundtracs High-End Digital Console

Soundtracs of New York launched a new model digital console for medium-to high-end broadcast production facilities.

The Soundtracs DPC-II consists of two components: a modular worksurface



and racks of dedicated equipment for analog-to-digital conversion. Frames are available to provide up to 96 100mm moving fader controls and all console sizes support 160 channels and up to 224 audio interfaces. Each block of 16 channels can have its own touch-sensitive LCD color display.

Soundtracs describes the DPC-II as "a

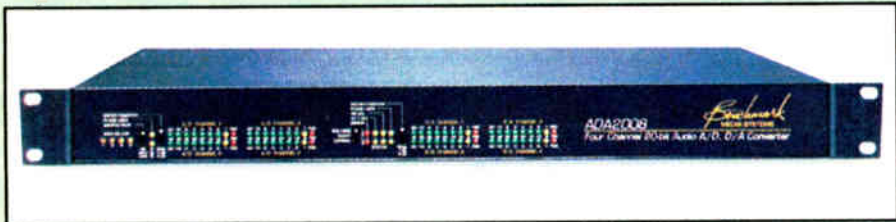
total digital system designed for applications in broadcast, audio dubbing, post and music production, as well as all areas of recording and/or mixing." The price range is \$150,000 to \$350,000, depending on configuration.

For information, contact Soundtracs in New York at (516) 333-9100 or circle Reader Service 34.

Benchmark Digital Converter

Benchmark Media Systems has an eight-channel digital conversion system for high-quality, high-resolution audio.

The system consists of the AD2008 eight-channel analog-to-digital converter, the DAC2008 digital-to-analog converter, and (shown) the ADA2008 four-channel A-to-D/D-to-A combo unit.



All units come with internal power supplies and the PS-202D external redundant power supply is available as an option. The converters have a THD+N measurement of -108 dBFS (0.0008 percent) and intermodulation distortion of 0.00004 percent. The converters come standard with both 44.1 and 48 kHz sample rates, plus a varispeed mode.

Suggested prices of the components in the series range from \$3,950 to \$4,200, or approximately \$500 cost per channel.

For information, contact Benchmark Media Systems in New York at (315) 437-6300 or circle Reader Service 8.

Acoustic-X Design Software

Acoustic-X is a software package to help in the acoustic design of small studios and recording spaces. Acoustic-X, developed by Pilchner Schoustal Architectural Acoustics and distributed by Acoustic-X Software Corp., is suitable for optimizing the response of new or existing rooms intended for radio broadcast and production.



Each on-screen "module" guides the user through the process of room design. Modules include Modal Response, Speaker Boundary Interference, Ray Tracing, Reverb Time and Acoustic Calculator. Each module can display information in Room View Mode, Chart View or Data View.

Modal Response examines room dimensions and displays the distribution of resonant frequencies. Ray Tracing shows the effects of direct energy and first through third reflections in the room. Speaker Boundary displays the best locations for studio monitors. Depending on the module selected, specific data can be calculated and exported to spreadsheet or word processing programs.

Acoustic-X requires a minimum 486 processor running Windows 95 or NT.

For information, contact Acoustic-X Software in Ontario, Canada at (416) 868-0809 or circle Reader Service 38.

Telephone Line "Eliminator"



7 DIAL-UP DEVICES CAN SHARE ONE CENTRAL-OFFICE LINE

Inovonics' PBX is a cost-saving alternative to the multiple telephone lines otherwise needed for modems, alarms and other dial-up apparatus installed at remote equipment sites. The PBX allows as many as seven devices to share a single central-office line, for outgoing calls and with selective incoming access as well.

The PBX finds immediate application with the expanding use of unattended remote equipment:

- Broadcast Transmitters/Translators
- Cellular/2-Way Radio Facilities
- Microwave Relays
- Geophysical Monitors
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Circle (212) On Reader Service Card

Dual Tube Preamp from dbx

dbx Professional Products is shipping the 586 dual-channel tube microphone preamplifier.

The brushed aluminum face and all-metal chassis contains matched 12AU7 vacuum tubes for tonal versatility and tube "warmth." Large switchable VU meters



monitor drive level, gain reduction or output levels. The 586 has +48 V phantom power, 20 dB pads, phase inverter switches and low-cut filters. XLR and quarter-inch inputs are gold-plated Neutrik connectors, and the on-board three-band EQ features sweepable mids and a hardware bypass switch.

Options for the 586 include the dbx Type IV digital conversion card, which allow the unit to communicate with other digital devices in AES/EBU or S/DPIF, in 16- or 20-bit words.

For information, contact dbx Professional Products in Utah at (801) 568-7660 or circle Reader Service 112.

Field Recorder Uses PCM Media

► SONIFEX, continued from page 41

On top of the machine are the editing controls, including a jog/shuttle knob. Also on the top surface are setup switches controlling the mic and line input parameters and a 48 V phantom power switch. There also is a small, reasonable-quality internal speaker for monitoring right from the machine.

Ports and slots abound on one side of the case. Here is where you would find a slot for a Type III PCMCIA hard disk, an XLR-4 connection for an external power supply and digital connection ports (RS-232 and optional ISDN). Stereo microphone and line I/O together with headphone and AES/EBU outputs are on the other side of the case.

Double-duty dial

The volume control for the headphone jack also controls the internal speaker level. The Courier can be internally powered by a standard 6 V NiCad or NiMH camcorder battery pack. The battery fits into the rear of the case and provides up to four hours of recording time using a 3,600 Milliamp/hour battery.

In an emergency, six disposable AA cells will provide more than four hours of recording time via an optional adapter pack. It is possible to power the machine and to recharge the standard battery with an optional car cigarette lighter lead.

All the controls are low-profile types to prevent accidental operation, and the

case has thick rubber feet for additional protection. Although it might look heavy, the unit actually weighs only about 3 pounds, even with the battery and hard disk in place.

Broadcast WAV recording

Depending upon recording quality — data rate, mono or stereo, use of compression — the Courier can record up to 18 hours of audio. Recordings can be

recording formats are also supported, such as DAVE2000, raw compressed ISO/MPEG Layer II and Microsoft WAV audio.

Sonifex also plans to include additional formats for Dalet, Sound Designer II for Pro-Tools as well as AIFF for Apple Mac users in later software versions.

On-board editing is non-destructive with a graphical display of the audio

Sonifex is planning formats for Dalet, Sound Designer II for ProTools and for Apple Mac users in later software versions.

made in the industry standard Broadcast WAV format, and edited on any standard WAV-compatible editor. (*Editor's note: The Broadcast WAV version of the format includes additional information stored at the head of the file, such as date, flight information, recording format and other pertinent data. See "BWF: New PC Audio Standard," RW, Oct. 1, 1997.*)

In addition, a number of alternative

waveform viewable on the front-panel LCD display. Audio can be heard via headphones or the built-in speaker. Alternatively, as audio is recorded to a removable PCMCIA card, this can simply be removed and inserted into a PC for editing with other software.

Desired recording formats, such as data rate and compression, can be labeled as a "recording style," which can then be selected to ensure that the

correct format is used for external editing and compatibility with other material. Recorded files are MS-DOS and Windows-compatible.

It is easy to record with the Courier. A built-in limiter helps cope with unexpected peaks. The limiter action point can be set via menu controls from +2 to +10 dB, and it can be linked for stereo to ISDN.

This software also is expected to provide more advanced internal editing options, such as Cut, Paste and Playlist editing. Sonifex operates a Web site where the latest software versions can be downloaded free of charge.

The company is working on further software upgrades, which will allow the Courier to provide live feeds back to a remote studio over ISDN or a standard telephone line.

Using ISDN and ISO/MPEG Layer II compression, it will be possible to provide 11 kHz bandwidth audio over a single 64 kbps ISDN B channel. Over a standard analog telephone circuit compression should provide a 7 kHz audio bandwidth.

■ ■ ■

For information, contact Julian Speed or Marcus Brooke at Sonifex; telephone 011-44-1933-650700; fax 011-44-1933-650726; e-mail sales@sonifex.co.uk or circle Reader Service 163. Information is also available via the World Wide Web at <http://www.sonifex.co.uk/>

Lawrence Hallett reports for *RW International* from Norwich, England. Contact him via e-mail at lawrie@dial.pipex.com

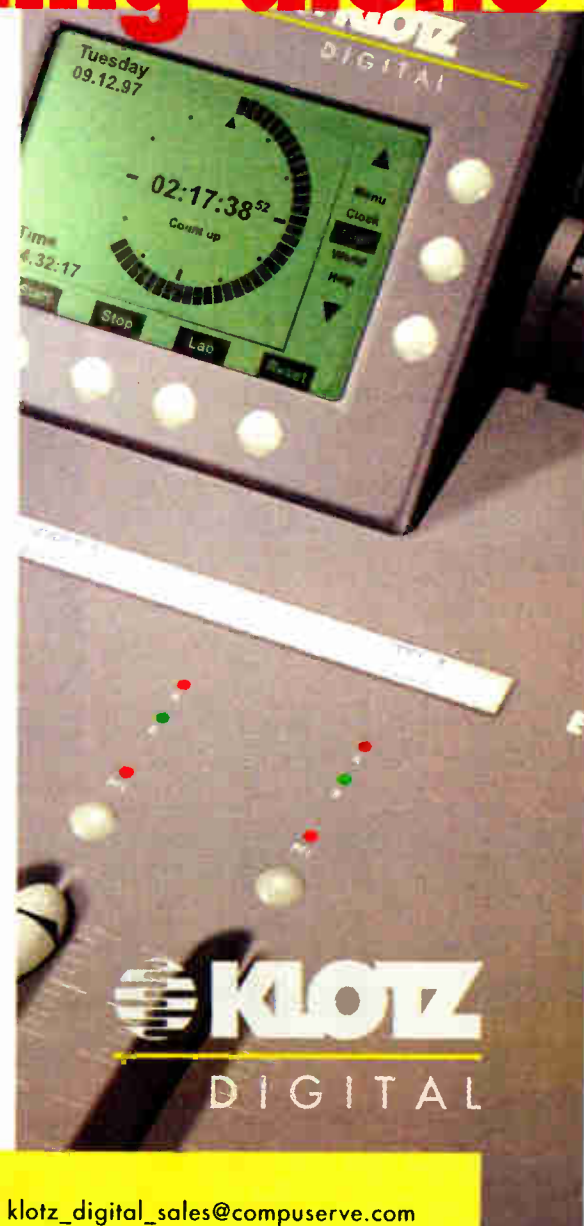
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**Tech Updates
In This Section**

Radio World

Remote Audio & Codecs

September 2, 1998

SPECIAL REPORT

Better Gear Unleashes Remote Power

by Gary Kline

LAFAYETTE, Ind. Remote broadcasts have been a radio staple since the early days. Through all the twists and turns, the quality has steadily improved.

Early remotes required dedicated loops provided by the local telephone company. These were expensive and required weeks of setup time if a new location was needed. For last-minute remotes, stations relied on conventional telephone service with its notoriously poor fidelity.

With the breakup of the Bell System in the 1980s, equalized service across phone company boundaries became even more difficult. About the same time, Comrex developed a frequency extender that used two POTS lines concurrently, providing audio response up to 5 kHz.

Extended quality

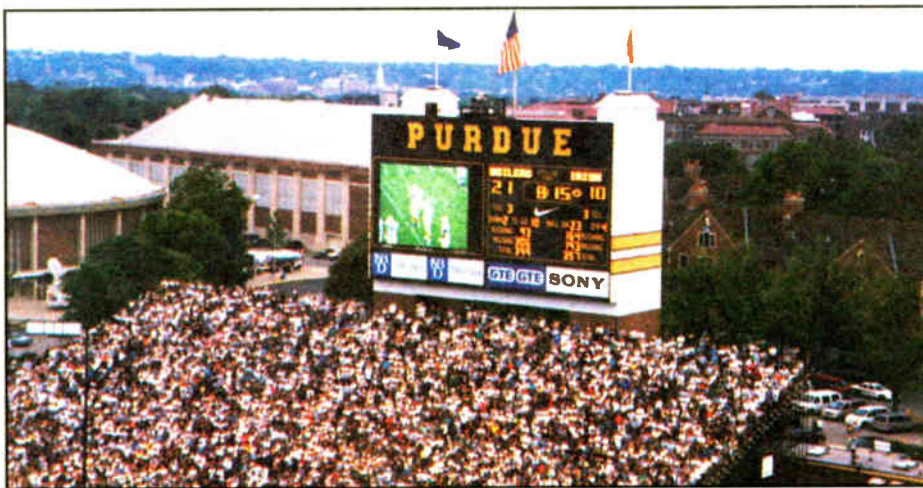
This was a dramatic improvement over a single telephone line, but listeners and broadcasters alike knew the audio quality

was not as good as on broadcasts originating from the studio.

In the early 1990s, several companies introduced three-line extenders, offering response to 7.5 kHz. The three-line equipment never gained wide acceptance, as stations balked at paying for three

lines at every remote. Fortunately, ISDN was in its introductory phase.

ISDN is now available in most areas and is a widely accepted means for sending remote audio back to the studio. However, ISDN is still not universal: On a recent Alaskan remote, I discovered the



For fans with Walkmans, your remote audio had better sound clear.

ISDN service in Anchorage was good only for local calls — not to any points out-of-state.

Today, stations have a choice. Equipment that sends digital data over conventional POTS lines is capable of excellent fidelity. These "POTS codecs" are slightly inferior in audio quality to ISDN, but differences are fewer. Manufacturers of such equipment claim typical bandwidths of 7.5 kHz to 15 kHz. Comrex recently introduced the Vector, with a claimed bandwidth of up to 15 kHz at a connect rate of 24 kbps.

Regardless of the local situation, stations have a variety of choices in equipment to make high-quality remotes possible, whether ISDN or POTS. While manufacturers continue to improve audio quality and minimize transmission delay, these are beginning to approach optimal levels, especially for ISDN equipment.

"The trend seems to be toward more compatibility, integration, and ease of use," said Doreen Arleth, marketing communications manager at MUSICAM USA. "We have been continually working toward those ends by integrating our terminal adapters, mixing functions, and POTS interface cards into one unit."

MUSICAM offers the RoadRunner portable ISDN unit with 20 kHz bandwidth; as well as the FieldFone II, a POTS unit with a maximum bandwidth of 10 kHz. Now in development, the new RoadRunner Plus will offer both ISDN and POTS capability in a single box. This would require a RoadRunner and an add-on POTS card. No other equipment currently on the market offers this dual capability.

With all current equipment, bi-directional verbal communication and data transmission are possible, eliminating separate talent/studio talkback lines. Most units provide at least two (sometimes four) contact closures to remotely trigger studio devices. Both ISDN and POTS units provide duplex data connections, allowing computers to be linked.

Multiple feeds

Such a device is the Telos ZephyrExpress ISDN unit, providing 9,600 bps bi-directional data connectivity for communication and control. This is transmitted in the same data stream as the audio.

The ZephyrExpress allows an ISDN terminal adapter to be attached, so simultaneous high-speed data or fax connections can be made while feeding audio back to the studio. The unit can also place a regular telephone call over the second ISDN B-channel while transmitting audio.

Audio mixing capabilities of today's codec units are better than remote units of the past. The Comrex Vector offers three line and one auxiliary inputs as well as three headphone feeds. The Broadcast Electronics Smarti RKS-411 offers four switchable mic/line inputs. The Comrex HotLine has one mic/line input, but can

See TRENDS, page 52 ▶

USER REPORT

HotLine a Winner at Cincy's WKCR

by Doug Walker

CINCINNATI The Comrex HotLine POTS codec is a compact, easy-to-use device to transport full duplex, relatively high-quality audio over a dial-up telephone circuit.

The portable HotLine is a little red box with a few simple jacks and controls, a keypad, a display that tells you what it's doing, and an external power supply to make it go. We ship ours around in a little road case a RØDE microphone came in.

The learning curve is short and sweet; the manual is cogent and well-written. I highly suggest reading it thoroughly.

You need a box that is simple to operate? Take the HotLine to your remote, plug a mic or mixer into the input jack and set the level switch appropriately. Plug your headphones into the phone jack or your IFB return into the output jack. Plug the phone line into the line jack and the wall-wart into an AC power source. Dial the studio HotLine unit, then have your board operator put you on-air. That's all.

By the way, the power supply is a switching supply and can digest pretty much any utility company's juice up to 220 volts.

HotLine uses some sophisticated number-crunching to squeeze up to 10

kHz audio down a POTS line in both directions. The coding scheme relies upon a certain amount of bandwidth on the line in use.



The HotLine POTS codec has proved reliable on remotes.

For 10 kHz audio, the line must pass 33.6 kbps. For 7 kHz response, line capacity must be 24 kbps. This is a reliable data rate from most places. Rates lower than 19.2 kbps indicate the connection is bad and you should try dialing from the other end or using another line.

With average telco drops, the HotLine will do the equivalent of G.722/ISDN performance. The coding delay is 128 milliseconds, short enough

to keep your talent from sounding awkward during two-way talk segments.

Our subjective impressions of HotLine audio quality are based on lis-

tening comparisons against other RPU systems. Generally, 24 kbps audio seems a little cleaner than G.722. The HotLine handles voices and the typical crowd as well as remote background sounds gracefully, but does not perform as well on music, which is not an intended use for the HotLine.

When setting up at the remote location, establish a connection with the Maxrate feature (the maximum data

See HOTLINE, page 55 ▶

USER REPORT

Smarti Delivers Country Sounds

by Larry Timmons

CARROLTON, Mo. Our four-station group in Northwest Missouri broadcasts to a listening audience of approximately 60,000 people. When we began looking for a portable dial-up POTS remote broadcast product, we carefully surveyed all the options on the market.

Several had good features, but none had the versatility of the RKS-111, the newest offering from Broadcast Electronics' Marti division. The field-portable Smarti unit provides the ease of operation and quality of sound we were looking for in the field.

With RPUs, we were limited to line-of-sight constraints, tower requirements and the necessary license fees. With the ability of the Smarti to adapt to constantly changing phone line conditions, we are able to send the signal back to the studio from wherever we choose to originate, without regard to distance.

Share the wealth

We do a weekly live program of old-time favorite songs, originating from Turner Music Company Inc. of Independence, Mo. The quality of audio we were able to achieve from the Smarti feed exceeded our expectations. In addition, the unit's five-pound weight and compact size made the practice of carrying mass amounts of equipment a thing of the past.

As word spread through the staff about

the Field Smarti's ease of operation, the frequency of remotes by our sales staff and sports staff increased dramatically.

As with any station today, our goal is to stay competitive in sound and product while utilizing our resources in the most economical way possible. Our new Field



Marti equipment is shown in use at Branson's Cowboy Café. At right is station Farm Director Rich Hawkins, with members of the Beefmasters Association.

Smarti has favorably affected the bottom line of our remotes by making it possible to set up quickly and broadcast anywhere we can use a phone. With the optional built-in battery pack, we really do mean *anywhere*. The audio quality has pleased both our staff and sponsors as well — each a tough group of critics.

The features offered in the device include intercom, count up/down timer,

pre-programmed speed dial numbers, remote control and data transfer to and from the event to handle any situation or locale.

This fall, the Field Smarti will earn its keep covering area sporting events at more than 50 schools. "The operation of

the Smarti unit is as easy as plug in and talk," said Mike Smith, sports director for our stations. "The Smarti unit saves me at least 30 minutes of setup time before a game and an hour afterward. You can't beat the Smarti for ease of setup and operation."

By the time you read this, our stations

will have completed a remote broadcast from the country music mecca of Branson, Mo. Plans were made for us to participate in "Cruisin' Branson Lights," a major summer promotion in conjunction with performer Mickey Gilley, who was scheduled to be on our live show. Headliner Mel Tillis was lined up to host the opening ceremonies.

Branson workout

This is one of America's premiere automotive events, held at the Shepherd of the Hills Outdoor Theater, with more than 1,000 classic cars and trucks participating.

A full 400 miles from our listening audience, Branson is a major tourist destination and the base of operations for a number of country stars as well. The Marti Smarti unit allowed us to be able to broadcast "Cruisin' Branson Lights" live to our listeners who could not be there in person.

During our first Smarti remote in Branson in April, a Kansas City listener came up and told us he could not believe WHB's signal was coming in so clearly. He swore it was from our studio in Kansas City.

So the question is: Is it live from our studio or is it a Smarti remote? It is hard to tell; it is simply that good.

For more information, contact Broadcast Electronics in Illinois at (217) 224-9600; fax (217) 224-9607; or circle Reader Service 164.

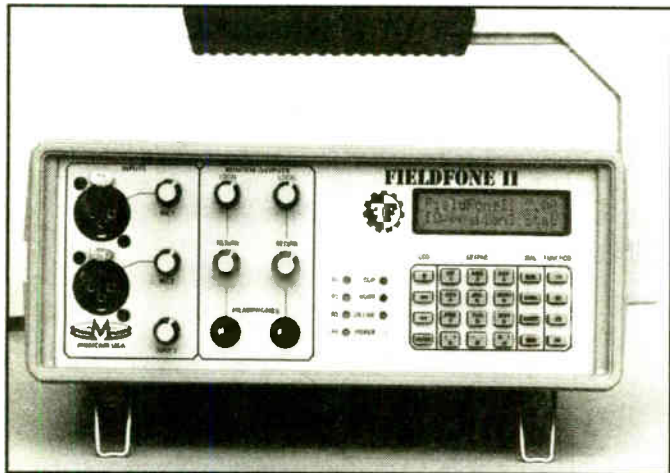
Larry Timmons is the chief engineer at KMZU(FM)-WHB(AM), KAOL(AM)-KRLI(FM).

USER REPORT

FieldFone II Codec: Certainly Not Plain

by Jeff Johnson

CINCINNATI It was bound to happen: POTS codecs have come to replace the older generation of frequency extender technology.



The FieldFone II POTS Codec from MUSICAM USA

able embodying this technology. Our network owns and uses two of them. When the best audio quality is desired, we utilize our MUSICAM FieldFones.

Much has been made of the audio bandwidth improvements available with this technology. More important in my view is consideration of the compromises made to achieve that bandwidth.

The FieldFone II utilizes an enhanced MPEG Layer III encoding algorithm. Important: The algorithm can be changed on-the-fly to best suit the program material. This is the Sound-Shaper feature of the FieldFone II.

These settings are changed at the receiving end while monitoring the sound quality without dropping the connection. There are five settings from a more muted effect to a brighter sound. A speaker with a thin, bright voice is best served with

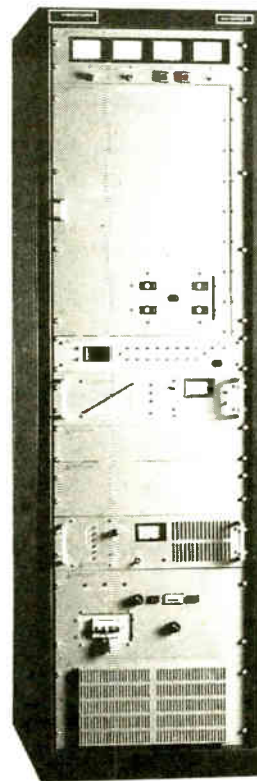
On one Plain Old Telephone Service line, it is now possible to transfer audio in two directions simultaneously at a bandwidth extending to 10 kHz. A good-sounding remote broadcast is possible from locations unreachable by RPU or impractical with a broadcast loop or ISDN.

There are a number of products avail-

See FIELDPHONE, page 58 ▶

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USER REPORT

Sony MZ-B3 MD: Almost Perfect

by Bruce Rogow

SAN DIEGO Has the MiniDisc format finally caught on? Or is it still "poised" to replace cassettes or DATs? The question has been bandied about in **RW** and around the industry in the past few years.

The Sony MZ-B3 portable MiniDisc recorder may have taken another hill in that battle.

At KPBS-FM, our news reporters and feature producers traditionally have used the Sony TC-D5 Pro II cassette recorder to bring home the sound. Now the bar

mic jack. In the operating instructions, the jack is referred to as a "MIC PLUG IN POWER" jack. It probably is set up for the optional Sony mics listed in the directions.

In order to use our RE-50 mics, we had to install 10 μ F capacitors in the connector to block the voltage and eliminate the noise. After the installation, the recording sounded great.

Using the Sony MZ-B3 is easy, but a thorough reading of the operating instructions will save headaches. The unit has the familiar Rec, Play, FF and Rew

avoided — especially during recording — we found that carrying the unit while walking did not pose any problems.

Jumping the hurdles

Another difference between cassettes and MDs is the fragmentation that can result from repeated recording and erasing.

Because each fragment is counted as a "track," the 254-track limit can quickly be reached. This renders any further recording impossible, even if the disc's total time is unused. Fragmented tracks may have dropouts during search operations while normal playback is fine.

These limitations are inherent to the MiniDisc format itself and are not the fault of the unit. Once these limitations are understood, the user can take precautions to try and avoid the pitfalls.

Unit maintenance is the same as any

compact consumer machine: factory service for all but the most routine problems. Our unit has been in continuous use — two to three times a week for three months — and has had no problems. A brief survey of other users conducted before we purchased the unit also proved strong reliability. We have encountered only one defective disc.

Overall, the Sony MZ-B3 is lightweight and our staff loves the sound it brings back. The problems are easy enough to overcome and well worth the quality recording delivered.

We would someday like to see more rugged MiniDisc recorders, optimized for broadcast with balanced XLR mic connectors and larger controls. If Sony can change the transport of the Sony TC-D5 Pro II cassette machine to MiniDisc, they will have a winner.

For information, contact Sony in New Jersey at (201) 930-1000 or circle Reader Service 216.

Bruce Rogow is assistant chief engineer at KPBS-FM.



The MZ-B3 from Sony is making a good name for MiniDisc recorders.

has been raised for all station equipment to meet the CD-quality sound produced by the new digital equipment. The Sony MZ-B3 MiniDisc recorder meets the sound quality standard with ease, but there is more to being a rugged field recorder than frequency response.

We bought our unit from Harris Broadcast for \$680, plus \$22 for the optional AC power adapter. The recorder included a wired remote controller for track-marking and pause; a soft carrying case; a 60-minute blank MiniDisc, and a detachable battery case for the optional Sony LIP-12 Lithium ion rechargeable battery. The unit has a built-in mic and speaker.

Our intention was to evaluate the MD format for a variety of uses at KPBS, starting with field recording.

We first observed that the built-in mic was not adequate for air-quality audio. The MZ-B3 has an external mic input jack that accepts a mono or stereo 1/8-inch mini plug. This feature had two drawbacks for KPBS. First, the mini jack is less rugged than the XLR connector found on most broadcast field equipment. Second, we noticed a sizable amount of noise when the mini plug was touched or twisted.

The Sony MZ-B3 supplies 2.5 VDC to the tip and ring contacts of the external

buttons found on cassette recorders; however, the MiniDisc format does have some important differences.

Like other drives, it is a data storage device and can mark individual tracks and access them instantly — unlike cassettes, which must be fast-wound to locate a cut. Timestamps can be added to the tracks as well.

The MZ-B3 can display "time remaining" information, a system that is superior to the mechanical tape counters found on cassette machines. Programmed playback is included for repeat of a single track, random track playback or the entire disc.

One feature we enjoy is the Hold button. This function locks out the control buttons to prevent accidental stops during a recording.

The LCD display also contains a VU and battery meter. Operating time with three AA alkaline batteries is approximately three hours for recording and six hours for playback. The optional lithium rechargeable battery allows two hours for recording and three hours for playback. We liked the feature that allows the batteries to be combined for six recording and 10 playback hours.

Although mechanical shock should be

Taking It to the Streets

► TRENDS, continued from page 50
be expanded to two mic and one mic/line inputs using an add-on unit called the Vortex MixPak, available through Harris Broadcast.

Trending smaller

One major trend all users will notice: While equipment of the past was bulky and difficult to move, modern codecs are small and portable. The Comrex HotLine is smaller than a telephone and weighs less than three

pounds. Other manufacturer's products are not much larger.

Another trend is in the reduction of transmission delay found in POTS equipment. Tom Hartnett, vice-president of engineering at Comrex, said, "Because we wrote the algorithm specifically with a frame length that was reasonable for POTS coding for 24 kbps instead of 64 kbps, we get a reasonably shorter delay." With the Comrex HotLine, the transmission is approximately 250 milliseconds round trip. Some units, such as the A.E.T.A. Scoop Reporter MKII, also boast very low delays — as low as 100 milliseconds round-trip using one of three user-selectable protection modes.

protection is inherent in POTS codec equipment because line quality can vary during a call. "Depending on what you are doing in the application, you want the highest quality audio possible," said Jim Hauptsteck, digital products manager for Harris Broadcast. "A lot of times, the POTS lines themselves can change their characteristics in the middle of your call." Products like the Scoop Reporter, Hotline, Smarti and FieldFone II offer various forms of error protection and the ability to automatically renegotiate a connection during a broadcast.

Future trends are promising. Tom Hartnett of Comrex said the ability to use a POTS codec and cellular phone is "the one thing that everybody who comes to me wants. If there is anything I am going to be working on in the next couple of years, it's that."

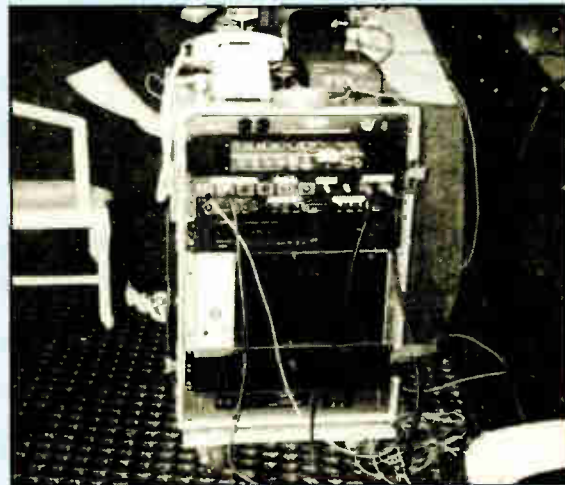
For ISDN, Rolf Taylor, customer support manager for Telos Systems, said, "In terms of compression technologies, the next generation will be AAC

(Advanced Audio Compression) which is MPEG but is distinctly different than Layer II or III." Taylor said, "At 128 kbps for stereo, rather than being near CD-quality, it's undetectable from CD."

Holding off on a codec purchase in anticipation of future advances may be an option for stations with newer, fairly advanced equipment already. But for a station with aging equipment and a current need for high-quality remotes, there is no need to wait. Today's equipment provides excellent fidelity at a very reasonable price.

■ ■ ■

Gary Alan Kline is chief engineer for WAZY-AM-FM and WGBD(FM), Lafayette, Ind., and a consulting engineer for other stations in the Midwest. He can be reached at (765) 426-4279 or by e-mail at gary@cleanaudio.com



Marti Transmitter and Comrex HotLine at WAZY-FM Remote in San Antonio

Other manufacturer's products are not much larger.

Another trend is in the reduction of transmission delay found in POTS equipment. Tom Hartnett, vice-president of engineering at Comrex, said, "Because we wrote the algorithm specifically with a frame length that was reasonable for POTS coding for 24 kbps instead of 64 kbps, we get a reasonably shorter delay." With the Comrex HotLine, the transmission is approximately 250 milliseconds round trip. Some units, such as the A.E.T.A. Scoop Reporter MKII, also boast very low delays — as low as 100 milliseconds round-trip using one of three user-selectable protection modes.

A.E.T.A. re-released the Scoop Reporter (POTS) — now called the Scoop Reporter MKII — with three different error protection modes. Error

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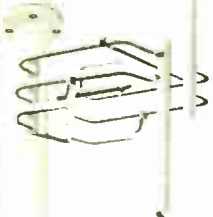
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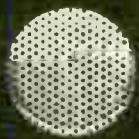
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HotLine Helps Out WKRC(AM)

► **HOTLINE**, continued from page 50
 speed at which the units communicate) switched out. Listen for a few minutes to detect any ratty audio. If the unit initially connects at 28.8 kbps, hang up, set Maxrate to 24 kbps and redial. This ensures against a re-negotiation while you are on the air.

Re-negotiation

The units operate with high-speed modems and must negotiate the data rate they run at. Audio will not pass through the system during a re-negotiation.

When ordering the phone lines for a HotLine remote broadcast, get data conditioning at both ends if available. If doing a store remote, do not tie up the client's credit card reader for three hours. If you must use someone else's line, make sure no phones or modems are hooked to it.

If someone or something comes on the line during the remote, the HotLine will try to re-negotiate and drop your audio. Even an installer's diagnostic handset in monitor mode can cause such an event. Get a real telco dial line if possible, as

some PBXs can give the HotLine modem trouble.

When using HotLine for broadcasts of longer duration, digital errors can creep into the audio after the units have been connected for a while. We prevent this by redialing every hour or so. Apparently, coding errors can be cumulative and this avoids them.

Comrex also makes a rackmount HotLine for neat studio installation. The level controls on the rackmount unit are around back — safe from an operator's wandering fingers, but bad if operators cannot reach easily around the rack. Unfortunately, the red-level LED is out front, which is my only real complaint.

Our station prefers ISDN or loops for long-format broadcasts because these connections are more robust, but we do use the

Get data conditioning at both ends if available.

HotLine in a variety of applications.

We have used it for talk shows and sports broadcasts from venues where the

phone company could not give us anything but a dial-up line. We assign a HotLine portable as a backup to ISDN for Xavier University basketball, and it is ideal for press conferences.

It is simple enough to give to technical neophytes and to attain good results from the far end. And it is the No. 1 save-your-behind tool when they tell you at 8:45 a.m. about the remote scheduled in 15 minutes.

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For more information, contact Comrex in Massachusetts at (978) 263-1800; fax (978) 635-0401 or circle Reader Service 138.

Doug Walker is the chief engineer at Jacor station WKRC(AM).

Vector POTS Codec

Comrex has received plenty of attention for its new Vector, a second-generation POTS codec capable of delivering 15 kHz two-way audio on a dial phone line at a connect rate of 24 kbps or higher. The codec earned a Cool Stuff Award



Comrex Vector

from the editors of RW at the latest NAB show. At press time, the Vector was expected to ship soon.

Compatible with the popular HotLine POTS codec, the Comrex Vector incorporates a higher-level coding algorithm that permits wide-bandwidth audio at lower data speeds. Several mixing and monitoring facilities simplify remote needs. Included is a three-channel mixer with headphone feeds and an extra input for producer cues plus an output for PA feeds.

The Vector features quick-dial memory for one-button dialing and a redial function. Two contact closures are available at each end. One is automatically enabled upon connection; the other is a momentary contact closure that is initiated by pushing a button.

Other features include an internal peak limiter, automatic or manual call answering and the ability to dial the Vector from an external telephone. The unit also is available in a 2 RU rackmount version.

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Clear Sounds With FieldFone II

► **FIELDPHONE**, continued from page 51
Sound-Shaper 1 or 2. For full male voices, Sound-Shaper 4 or 5 are best.

Sound-Shaper alone is a strong reason to consider the FieldFone II. Also important is that when the optimum setting is made, I feel the sound quality of these units is superior to the other POTS codecs. We also use a well-known competing product side by side with the FieldFone, and prefer the audio from the FieldFone. Music sounds particularly preferable.

The FieldFone provides a real-world, end-to-end S/N of >65 dB at any connect rate, amplifiers included.

Whatever noise exists is a slight hiss and is mostly amplifier noise. It is easy to forget that a plain old dial-up line is in use.

It is important to note that no POTS codec has uncolored audio characteristics. Extreme data compression must take place to enable transport on a dial-up line. The sound of POTS codecs are noticeably differentiated from the original. It is the nature of that differentiation that is important.

Two characteristics might be described as "phasey" and "echoey." It is in the minimization of these effects by use of sophisticated MUSICAM

encoding algorithms — especially Sound-Shaper — where the FieldFone shines.

Strong build

In view of the fact that the FieldFone will be used for just that — field work — the design of the case is important. It is in a tough all-in-one instrumentation case with a built-in power supply. There is no wall-wart supply to forget or contribute to a rat's nest of cabling.

The case is big and tough, enclosing a mixer with two mic inputs and a mic/line input. There are two headphone amps. Plug some headphones and mics in the front and a power cable and phone line in the back. Local and return audio output jacks for PA feed are included.

There are 256 phone number presets available. Each can be labeled with an identifying name. Punch a button to dial and you are quickly on the air.

The FieldFone can monitor line connection quality and display the information on the readout panel. It is valuable to monitor line quality in real time as a confidence reference. The window displays the connect rate, Sound-Shaper setting, a line quality data bar and a dropout counter. A glance will inform you of your status.

Features include 12 VDC or 120 VAC operation, and four relay closures.

Keeping up

An important feature of the unit is the ability to upload new firmware, including improved encoding algorithms, into all existing models. Your equipment may not have the latest physical features, but its functionality can be kept up to date.

Connect the unit's RS-232 port to the COM port of any computer on which you have downloaded the latest firmware from the MUSICAM Web site. The upgrade takes place without chip swaps or a return to the factory. I did it in less than a half-hour for two units and it was no trouble at all.

I believe the case could be improved were it to have snap-on protective covers

which could hold the cables. Another shortcoming is the keyboard, which has small rubbery buttons. They are hard to push without concentration and healthy fingernails.

For more information, contact MUSICAM USA in New Jersey at (732) 739-5600; fax (732) 739-1818 or circle Reader Service 190.

Jeff Johnson is a network engineer at WVXU(FM), X-Star Radio Network.

MUSICAM USA

The RoadRunner portable codec from MUSICAM USA is a portable ISDN codec/mixer which sends and receives 15 kHz mono audio over one ISDN "B" channel.

The unit comes with three mixing inputs; two are dedicated to mics and one is selectable for mic or line levels. Two separate headphone monitoring circuits are provided with separate send-and-receive level controls.

The controls make the RoadRunner easy to use. When beginning a program, the remote operator picks up the microphone, dials and talks.

The RoadRunner is bi-directional, has a built-in terminal adapter with on-board NT1 (where required) and provides high-quality digital audio at efficient data rates. It also features automatic detection of incoming algorithm and bit rates; four relay contact closures to activate far-end relays; 256 speed-dial addresses; and 30 SPID, ID and Switch Profile memories. The RoadRunner can receive software upgrades directly from the factory over ISDN lines.

The RoadRunner is housed in a rugged, portable enclosure. A lockable airline-shippable travel case with room for headphones, mics, cables and accessories is available for users. The unit is flexible enough for fast-paced remotes and affordable for both broadcast and professional audio applications. For more info, see page 42.

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The Master Control Studio, shown right, is one of seven Arrakis studios in Sony's Manhattan network origination center for SW Networks.



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TECH UPDATE

AEQ

The MPAC-02 from AEQ is a portable dual-channel audio codec for ISDN remotes. The unit can be used with analog lines as well, as it includes a digital hybrid with built-in frequency extender.



With independent full-duplex Program and Cue channels, the user can be on-air wherever desired. The

built-in terminal adapters are also independent and the autostart system makes the reporter's work even easier. The reporter turns the system on and it automatically dials, calls and synchronizes with the audio codec at the other end of the line, connecting Program and Cue lines using the stored configuration.

The MPAC-02 is easily upgradeable and features communications ports for an auxiliary data channel and remote control from the studio. The mixer can handle up to three announcers and a guest. Each mic has an independent mix level control.

An LCD main interface screen displays all necessary information such as phone lists, VU meter, status and menu options.

For more information, contact AEQ in Florida at (954) 424-0203 or circle Reader Service 9.

TECH UPDATES

Telos Systems

The ZephyrExpress from **Telos Systems** is an all-in-one mixer, ISDN codec and terminal adapter for remote broadcast.

The portable unit connects directly to an ISDN line, sending high-quality mono or stereo audio to a compatible studio unit. Most of the ZephyrExpress is controlled through screens and menus. The user can select an item on any menu or screen by turning the Edit knob to highlight the desired choice, followed by pressing the knob into the panel to confirm.



There are three mixers included in the ZephyrExpress: two separate stereo monitor mixers and a Send mixer. The Send mixer relays signals to a distant studio, while the monitor mixers combine the received signal with the output of the send mixer.

With the send mixer, the user can send mono signals over ISDN lines 1 and 2 to different studios at the same time, or can

send Layer 2 mono or Layer 2 and 3 stereo using both ISDN lines simultaneously. The two separate monitor mixers allow the user to create mix-minuses or feeds to a local PA system while listening for studio cues in headphones. Each monitor mixer has separate stereo send and receive inputs, each routable from only the A or B channel.

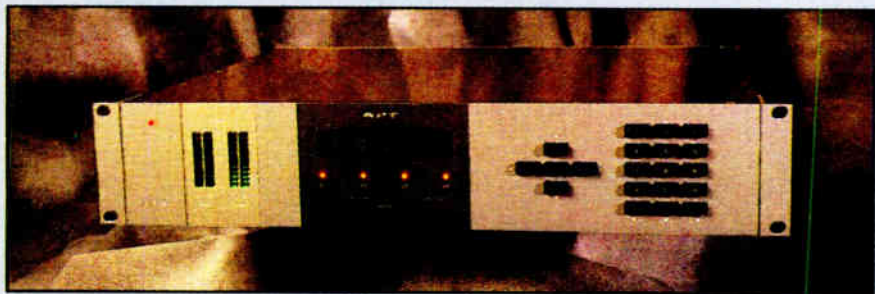
Four end-to-end parallel contact closures can be used for controlling recorders and other devices, or signaling between the remote site and the studio. A fifth closure output serves as an in-use indicator when an ISDN line is connected and as an alarm when the line is disconnected.

ZephyrExpress uses a separate, self-adjusting modular power supply. Two monaural microphone-level inputs are provided on XLR connectors with selectable 48V phantom power, and two XLR/TRS connectors are used for line-level inputs or as extra microphone input channels.

For more information, contact **Telos Systems in Ohio** at (216) 241-7225; fax (216) 241-4103 or circle **Reader Service 35**.

Audio Processing Technology

The BCF256 broadcast communications frame from **Audio Processing Technology** is an apt-X based codec designed for the ISDN, direct-dial broadcast environment and permanent



links such as T1, E1, satellite and microwave.

A full-duplex codec, the BCF256 advances transmission bandwidths from 56 to 256 kbps with corresponding audio bandwidths from 6.8 kHz mono to 15 kHz stereo. Inherent resistance to multiple coding errors and the

low coding delay make the BCF256 ideal for live transmission.

Primarily an ISDN codec, the unit also features an integral X.21 DTE interface. Capable of operating up to four ISDN B channels with an integral terminal adapter, the BCF256 has both

analog and AES/EBU I/Os as well as a sample rate converter.

For more information on **Audio Processing Technology**, contact **Broadcast Supply Worldwide in Washington** at (253) 565-2301; visit their Web site at www.aptx.com; or circle **Reader Service 63**.

JK Audio

The RemoteMix 3x4 multi-line hybrid/mixer from **JK Audio** is ideal for remote radio broadcasts.

The unit provides three microphone inputs for sports broadcasts or live remotes. Use the microphone mixer XLR output directly to a codec or ISDN converter. Headphone switches allow for selection between the mixer, main phone line, or monitor phone line. The four-line hybrid can also be used as a quick talk show setup for

call-in guests, while the monitor is used for screening calls.

RemoteMix 3x4 features a VU meter capable of monitoring the microphone mixer output, signal to main phone line, signal from main phone line, and battery level. Two nine volt alkaline batteries should last ten hours, and an AC adapter is included with the unit.

For more information, contact **JK Audio in Illinois** at (815) 786-2929; fax (815) 786-8502; or circle **Reader Service 12**.

Harris

The A.E.T.A. Scoop Reporter Mark II from **Harris** is a codec that allows users to send and receive 7.5 kHz quality audio over a single analog POTS line. It can be used as a portable unit.

The Scoop Reporter offers quality



similar to G.722 level digital communication with the convenience and low-cost operation of 3 kHz telephone service. News reports, sportscasts and on-site promotional broadcasts can be executed from anywhere there is a telephone. The Scoop Reporter has low delay for live-broadcast situations.

A built-in worldwide Motorola Premier 33.6 modem allows a data range of 12 to 24 kbps to adapt to transmission rates on any analog telephone network. There are two special connection features for reliable data rate: two low-delay error protections for 150 or 250 ms user-selectable/disable delay, and automatic rate adaptation disable during the studio transmission.

The pop-up menu structure of the Scoop Reporter includes auto redialing, automatic answering, line-level adjustment, country code selection, optimal rate negotiation, maximum error protection and memorized user configuration. The codec is compatible with POTS or a dedicated line.

For more information, contact **Harris in Illinois** at (800) 622-0022; fax (765) 966-0623 or circle **Reader Service 61**.

Warner Electric

WHR Series STABILINE voltage regulators eliminate costly power fluctuations that regularly occur and which are forecast to increase as the



demand for clean power outpaces utility capacity.

Model WHR11NSD11R5U is a single-phase, 120 VAC fast-response electromechanical voltage regulator, using a solid-state control module and a power module incorporating a POWERSTAT variable transformer.

The self-contained unit can be used in standalone or rackmount applications. It is used widely in ENG and other remote vehicles.

The unit is five rack units high and has a typical efficiency of 99 percent. This voltage regulator can be used with any type of load — even those with high inrush current, high crest factor, or unusual load power factor.

For more information, contact **Warner Electric in Connecticut** at (860) 585-4500; fax (860) 582-3784 or circle **Reader Service 87**.

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TECH UPDATES

ATI

Models MXS100 and MX200 are two remote audio units in the extensive



Nanoamp Series from ATI.

The MXS100 stereo field mixer is a three-channel, switchable microphone/line mixer. The unit features low Z balanced inputs, phantom power, panpots, switched low-cut filters, a built-in slate microphone and a test tone oscillator. Metered, low-distortion

Denon

The DN-80R from Denon is a portable MiniDisc player/recorder for use in field audio applications for broadcast radio.

Both stereo and mono recordings



are possible with the DN-80R. Mono allows a maximum recording time of 148 minutes, ideal for interviews and other applications where stereo is not necessary. A maximum of 74 stereo minutes is possible.

Whirlwind

The Q-Box from Whirlwind is an all-in-one audio line tester that can be used onsite at remotes for checking cables and mics.

The battery-powered unit features a microphone, speaker, test-tone generator and outputs for standard headphones. A quarter-inch jack for line-in or a 2 kohm telephone earpiece out is included, as are voltage presence LEDs for confirming phantom or intercom power.

The unit can be used as a monitor

tion servo balanced line outputs feature switchable peak limiting and a stereo program/cue headphone output. Output connectors are selectable for +4 line or -50 mic level into balanced or unbalanced loads.

The MX200 is a stereo output studio mixer. The unit offers three panned mic/line inputs with independent gain and phantom power selection. Bright LED bargraph VU meters and independent headphone monitoring also are featured. Outputs

connectors are universal two-piece pluggable screw types. Like the MXS100, these connectors are selectable for +4/-50 into balanced or unbalanced loads.

For more information, contact ATI in Pennsylvania at (800) 959-0307; fax (215) 443-0394 or circle Reader Service 113.

A 16 MB RAM buffer prevents dropouts. This feature is equivalent to a 40-second stereo signal. Also featured is a vibration-absorbing design with pick-up mechanism suspension dampers.

The Denon Pre-UTOC system provided in the unit can write a tentative table of contents (TOC) at the inception of recording, and devise a normal U-TOC again at its conclusion. A disc can be loaded or ejected regardless of whether the power is on or off, precluding any problems during emergencies such as a power failure. The eject lock

feature works during recording and playback to prevent accidental unloading of the cart by closing the loading slot's lid.

For more information, contact Denon in New Jersey at (201) 575-7810 or circle Reader Service 139.

for a standard intercom feed or talk-back from a main audio console. The user can talk, listen or observe levels through the Q-Box, and it can be hooked easily onto a belt or equipment rack. Dynamic mics can be checked without turning on the entire system. The test tones are provided for quick level setting or identification of cables. The unit is powered by a single 9V alkaline battery.

For more information, contact Whirlwind in New York at (800) 733-9473; fax (716) 865-8930 or circle Reader Service 10.

Shure

The FP33 from Shure is a three-input, two-output portable stereo mixer specifically designed for remote audio recording, electronic field production and electronic news gathering.



The FP33 weighs 3.5 pounds and is about the size of a couple of video cassettes. The FP33 will operate for about eight hours with two 9V alkaline batteries. The unit can also be powered by any 12-to-30 VDC power supply such as an automotive battery, rechargeable belt pack, or an AC-to-DC converter.

Dynamic and condenser microphones may be used with the FP33. The mixer provides 12 and 48 V phantom power for operating condenser microphones. Wide dynamic range and a low-noise design make the FP33 ideal for use with digital transmission links or digital audio recording media such as DAT.

Other features of the FP33 include sealed, conductive plastic input potentiometers; dynamic range better than 100 dB; LED indicators of input levels, output peaks, limiter action and low battery; pop-up pan pots; a link switch to couple Inputs No. 2 and 3 into a stereo pair and a mix bus to connect an additional FP33 or Shure FP32A portable mixer.

For more information, contact Shure in Illinois at (800) 25-SHURE; fax (847) 866-2279 or circle Reader Service 191.

Sonifex

The Sonifex Courier hard-disk portable recorder is a compact, battery-powered digital audio recorder designed for remote field applications and digital news gathering.

The unit relies on PCMCIA hard disks (PC cards) for storing high-quality digital audio. Courier is operable in severe environmental conditions and can be used while in motion. The PC cards can be changed quickly and are capable of storing between 11 minutes and 18 hours of audio. Recordings can be either uncompressed WAV files or MPEG Layer II files (BWF or MP2).

The Courier features a monitor which is able to replay material from recorder to disk while still recording. Once the user is recording, the Autolock function is activated, disabling all other controls with the exception of record levels so recording is not accidentally halted.

The unit is powered using standard camcorder batteries. There is an audible warning when the battery begins to lose power; it can be changed without interrupting the recording process. An AC adapter/charger, included with the Courier, simultaneously charges the battery and powers the unit. An optional automotive lighter adapter charges the battery while in a car.

Courier performs nondestructive graphical editing, utilizing a jog/shuttle wheel for accurate edits. The audio waveform appears automatically on the display and the built-in loudspeaker or headphones can be used to monitor the audio during editing.

See the RW review of the Sonifex Courier on page 41 of this issue.

For more information, contact Sonifex in England at 011-44-1933-650700; fax 011-44-1933-650726; visit their Web site at www.sonifex.co.uk or circle Reader Service 36.

HHB

The PORTADAT from HHB is available in two versions: the PDR1000 and the PDR1000TC.

The PDR1000 is designed to handle location use in harsh conditions. The unit features a four-head direct-drive DDS-type transport mechanism. The deck can be powered from battery, AC

ble to the memory effect associated with Ni-Cads and can run at full capacity with a longer life. Other features of the PDR1000 include 48V phantom powering, balanced XLR inputs, selectable sampling rates (32, 44.1 and 48 kHz), on-board limiting and comprehensive indexing facilities.

The more recent PDR1000TC offers all of the features of the PDR1000, along with the ability to record, generate and reference to time code in all existing international standards. It can also convert absolute time to linear timecode. Frame rate is selectable between 24, 25 (PAL), 29.97 drop frame (NTSC) and 30 frames per second. Timecode can be recorded as time of day, preset free run or record run, and can be generated internally or read from an external source.

For more information, contact HHB in California at (310) 319-1111; fax (310) 318-1911 or circle Reader Service 165.



or a vehicle. A two-bay charger is supplied as a standard component, with a four-bay charger available as an option.

With Nickel Metal Hydride (Ni-MH) technology, batteries are less suscepti-

TECH UPDATES

Gentner

The Microtel portable telephone interface from **Gentner** is a small, battery-operated "mini-mixer" that connects to the handset jack of your telephone for easy connection to the phone line.

Microtel is ideal for remote broad-

casts and field news reports and for IFB via telephone. Its two-way, hands-free communication path allows producers to talk easily with remote site personnel.

A variety of connectors and controls is featured on Microtel. A standard microphone is connected via the XLR connector; Microtel acts as a mic-to-line driver. The user can control the mic level with the Send knob on top of the box.



The Auxiliary input is a mini jack that connects to the output of the user's tape recorder for feeding audio down the line. The Aux Out mini jack connects to the input of the recorder to capture audio from the telephone line. The quarter-inch headset phone jack accommodates high-impedance headphones.

Microtel also has connections for two 9V batteries inside the unit. Only one battery is used at a time. The toggle switch on top allows the user to switch to the backup battery without interrupting the feed.

For more information, contact **Gentner in Utah** at (801) 975-7200; fax (801) 977-0087 or circle **Reader Service 62**.

Marantz

The PMD201 and PMD221 portable cassette recorders from **Marantz** have several features designed specifically for in-field recording.

The Ambient Noise Control feature is ideal for conducting interviews or other programming in a noisy outdoor environment. Combined with a cardioid-pattern microphone, ANC enables the unit to record the subject's voice clearly while substantially reduc-

provides up to 5-1/2 hours of running time. A low battery indicator guards against loss of power.

Another feature of the PMD cassette recorder line is the ability to record at half-speed — handy when field interviews run longer than the time available on a cassette. The PMD recorders can record at half the normal speed with no significant loss of fidelity for voice recording applications. Recording time on a 90-minute tape can be extended to 180 minutes. There



ing the majority of background noise.

Both recorders are light in weight (2.9 pounds) and have long battery life. Three D batteries provide 7-1/2 hours of running time while an optional rechargeable Ni-Cad battery pack

is also a built-in speaker for reviewing the recording.

For more information, contact **Marantz in Illinois** at (630) 820-4800; fax (630) 820-8103 or circle **Reader Service 88**.

Crystal Partners

Parabolic Reflectors from **Crystal Partners** come in two models: Big Ears and Li'l Ears.



The Big Ears Parabolic Reflector has ergonomic padded handles which are acoustically isolated, and a tunable listening capacity of over 500 feet. Constructed from a specially developed patented plastic material made of a Kevlar, buterate and acrylic combination, it allows remarkable audio clarity over a wide frequency range.

The modified parabolic design was

calculated to ensure that the contours would provide the most ideal reflective pattern, resulting in a "sweet spot" that can be fine-tuned. The five-pound, 23-inch diameter dish is molded to extremely tight tolerances using laser equipment. The result ensures that the integrity of the shape is maintained as well as the thickness, which produces sonic consistency and visual clarity for the operator.

The two-pound, 13-inch diameter Li'l Ears Parabolic Reflector is constructed in the same manner as the Big Ears with a tunable listening capacity of 350 feet. This smaller dish can be mounted on an ENG bracket or a handle. Both dishes accept Sennheiser, Beyerdynamic and Audio-Technica microphones as well as other standard mics.

For more information, contact **Crystal Partners in Illinois** at (800) 244-3277; fax (630) 653-0637 or circle **Reader Service 114**.

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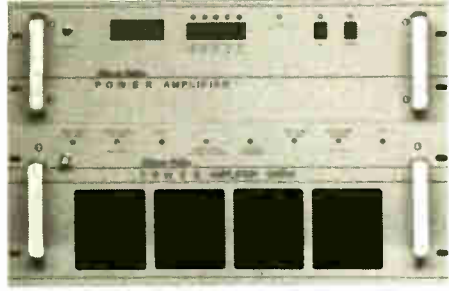
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TECH UPDATES

Digigram

The PCXpocket and PCXpocketAD from Digigram are PCMCIA-style soundcards intended for professional recording and editing applications on a laptop PC.



Either card, when used with editing software, adds a full digital audio

workstation to the other capabilities of the laptop. In addition to analog inputs and outputs, PCXpocketAD offers a S/PDIF digital audio input for direct dubbing from DAT, MiniDisc or other digital field recording devices.

Features on both models include two balanced mic/line inputs and two high-quality unbalanced outputs at line or headphone level. Both are operable in PCM-linear and MPEG audio compressed modes for coding, processing and decoding in real-time. Audio segments are transferable with a modem, ISDN terminal card or a network connection.

For more information, contact Digigram in Virginia at (703) 875-9100; fax (703) 875-9161 or circle Reader Service 115.

Conex

The CellJack II from Conex is the newest addition to the company's line of telephone interface products.

Like the original CellJack, the CellJack II cell phone interface mixer is designed to



work with Motorola-brand bag-type cellular phones. The unit incorporates a three-input mixer with an LED level indicator. Two inputs are either mic or line level and the third is an auxiliary line-level input. Two headphone jacks are provided, each

with its own level control.

The CellJack II also provides transformer-isolated and balanced XLR inputs, as well as a transformer-isolated balanced line output. The XLR input with switchable high/low gain allows for connection to either an external line level device or a standard broadcast dynamic microphone.

The stereo headset jacks allow monitoring of the cell-phone audio or an off-air signal via an external tuner input. The two mic inputs and two headphone jacks eliminate the need for an external mixer in most applications.

For more information, contact Conex in Washington at (360) 734-4323; fax (360) 676-4822 or circle Reader Service 141.

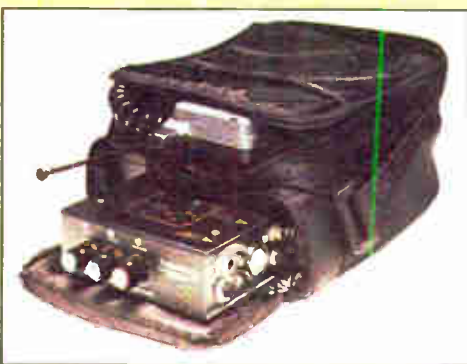
Marti

The TalkPort from Marti is a micro-cellular remote link for radio broadcast reporters, allowing instant audio feeds from virtually any location by means of the cellular telephone network or standard dial telephone lines.

Weighing only four pounds, the TalkPort can be carried with a shoulder strap or can snap onto the user's belt. A Motorola TeleTac 250 micro-cellular phone is included with the TalkPort. A special cable interfaces the TalkPort Send/Receive audio signals with the Data jack on the bottom of the TeleTac 250. The cellular phone keypad provides touch tone "bursts" for cellular and land-line dialing. An optional pocket dialer is available for use of a standard telephone line.

Other features of the TalkPort include a three-channel audio mixer, an audio limiter, a phone line inter-

face, a battery-pack fast-charger and AC adapter, and a padded nylon carrying case. There are two active balanced XLR mic input connectors and an audio level indicator to adjust for



proper levels. The user can mix tape playback through Channel 3 on the audio mixer, which is preset for high-level inputs.

For more information, contact Marti in Texas at (817) 645-9163; fax (817) 641-3869; or circle Reader Service 193.

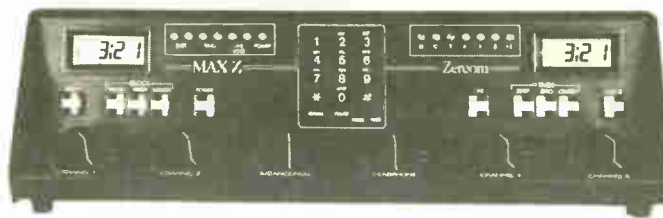
Zercom

The MAX-Z from Zercom is a four-channel remote broadcast console. Standard features include a carrying case for easy portability, built-in rechargeable batteries and a charger, a clock/stopwatch/timer and a VU meter. Audio inputs that can accommodate most any source, phone line alarms, a cue channel and memory dialing (tone

or pulse) make the unit easy to use.

All inputs are continuously adjustable between mic and line level. Standard XLR connectors are included for each of the four main-channel inputs. The four inputs each have a pre-amp circuit with input level knob that adjusts optimum gain for any level from -50 mic to +24 line level. This has the advantage of allowing the user to set up the mixer so each front panel knob can be set at 12 o'clock during normal use.

For more information, contact Zercom in Minnesota at (218) 765-3151; fax (218) 765-3900 or circle Reader Service 167.



And You Thought You Knew Us.....



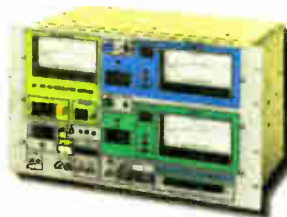
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Products & Services Showcase

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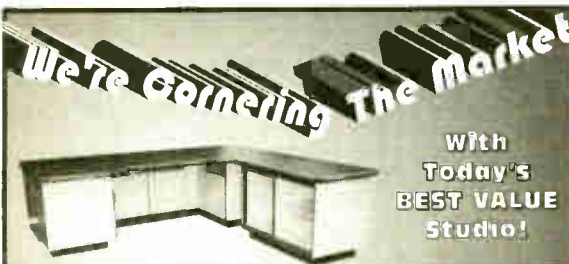
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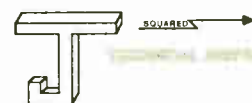
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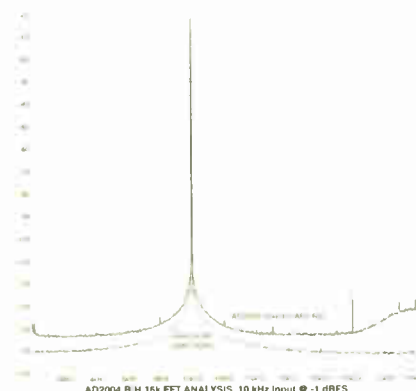
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Frequency Agile RPU

The frequency agile line of MARTI transmitters and receivers distributed by **Broadcast Electronics** are now available for U.S. customers in the VHF band, complementing the existing UHF frequency agile RPU products from MARTI.

The transmitter and receiver offer 16 factory-programmed channels within a 4 MHz band with as frequency step separation of 12.5 kHz. Channel selection is made from a front-panel push button. For relay and repeater operation, the channel selection can be done remotely. Both units can be operated with a battery as well as 110 or 220 VAC.

Standard features of the SRPT-40E transmitter include four mic inputs, a power output of 40 watts, a monitor jack, and a sub-audible encoder. The SR-10E receiver features a monitor speaker, a double balanced mixer, and a sub-audible decoder.

For more information, contact **Broadcast Electronics in Illinois** at (217) 224-9600; fax (217) 224-9607 or circle **Reader Service 140**.

RF-Microwave Probes

Holiday Industries announces the latest additions to its HI-4000 series of RF/Microwave Hazard Measurement Systems: the HI-4455 Electric Field probe and the HI-4457 Magnetic Field probe.



Both products in this line are useful for protection against radio frequency and microwave radiation. The HI-4455 provides electric field detection and measurement between 200 kHz and 40 GHz, while the HI-4457 provides magnetic field detection and measurement between 10 MHz and 1 GHz.

The new probes provide more versatility within the HI-4000 line and complement the company's probes and sensors for EMF detection and monitoring.

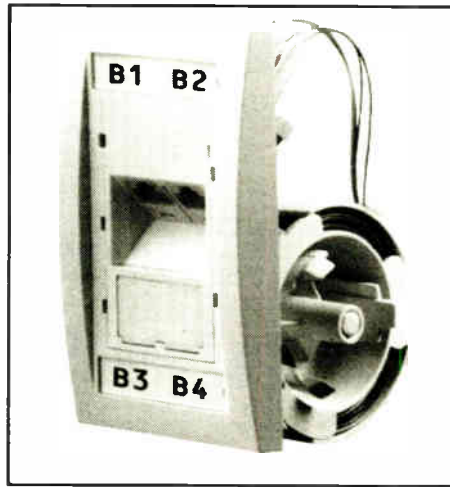
For more information, contact **Holiday Industries in Minnesota** at (612) 934-4920; fax (612) 934-3604 or circle **Reader Service 166**.

In-Wall Fiber Spool

Panduit offers the MINI-COM in-wall fiber spool for storage of excess and slack fiber in flush, sloped and sloped recessed outlet applications.

This new product provides a solution for the TIA/EIA 568-A standard requiring

a minimum one-meter slack and a fiber spool for in-wall installations. The spool snaps into a variety of MINI-COM faceplates and bezels for high-flexibility and



modularity in multimedia environments.

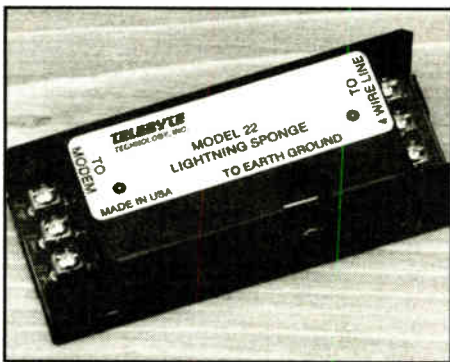
The MINI-COM in-wall fiber spool features a 1-inch internal bend radius, with cable entry and exit from rear, top and bottom to help maintain external bend radius. It stores up to 12 meters of unjacketed fiber cable or two meters of jacketed fiber cable. The new fiber spool is available in six colors and can be mounted onto several different faceplate configurations for custom-fit capabilities.

For more information, contact **Panduit in Illinois** at (630) 990-0220; fax (630) 990-2556 or circle **Reader Service 218**.

Lightning Diversion Tool

Telebyte Technology introduces the Model 22-64 Lightning Sponge for use on 64 kpbs communications circuits. This device diverts lightning strikes to a low-impedance path toward ground, avoiding any damage to network computer equipment.

A transient caused by a direct lightning strike or by induced ground currents in the area of data lines can pro-



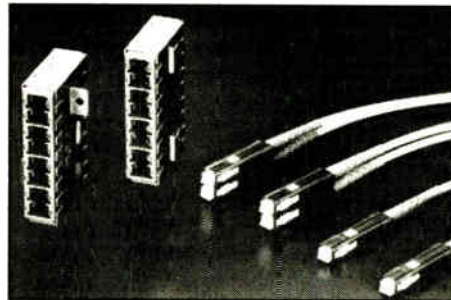
duce a leading edge wavefront rising at approximately 1 kV per microsecond. The Model 22-64 is designed to absorb these transients, slow them, limit them and redirect them to a low-impedance path to earth ground.

The Model 22-64 comes in a small aluminum enclosure. The Lightning Sponge provides low-cost assurance from damage for systems susceptible to damage from atmospheric or other high voltage disturbances.

For more information, contact **Telebyte Technology in New York** at (800) 835-3298; fax (516) 385-8184 or circle **Reader Service 192**.

Miniature SC Connectors

The HMU Series of MU-type high-density plug-in connectors from



Hirose is the most recent addition to this company's line of optical fiber connectors.

MU connectors meet the same requirements but are only half the size of SC connectors. The HMU connectors are similar to SC-type connectors, using the same fastening mechanism with secure "push-pull" locking and providing the same tight insertion loss specifications.

For more information, contact **Hirose in California** at (818) 990-9370; fax (818) 990-0456 or circle **Reader Service 11**.

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Yamaha RM-804 compact 8 chnl mixing board, 4 chnl output, gd cond, \$500; Yamaha MR-1642 16 input, 8 output mixing board, gd cond, needs some clean up, \$950. J Taddeo, 217-367-1195.

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Stanton 310 & 310B (2), stereo in gd cond, \$75 ea +shpg. G Gibbs, 712-258-5595.

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Orban 8100A/1, excel cond, \$3900. C Harris, 719-593-9355.
Want to Buy

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Mic flag for RCA 44BX, need old original iron 3-D heavy curve on top block letter mic flag to reverse engineer for new mic flag. W Cox, 912-638-1100.

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RCA 77-DX's, 44-BX's, WE KU-3A's On-Air lights, recording lights. Top price paid. Fast response. Bill Bryant Mgmt, 2601 Hillsboro Rd, G12, Nashville TN 37212. 615-269-6131, FAX: 615-292-3434.

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Microphase MP-2030S demodulator, cond unknown, BO; Advanced IP-8 interface, cond unknown, BO; Tellabs 4425 repeat coil, cond unknown, BO. J Francis, 352-732-2010.

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Niche ACM, \$189; JK Audio That-1, \$109. L Glenis, 520-722-9544.

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1 Type of Firm (check one)

- D. Combo AM/FM stations
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- B. Commercial FM station
- C. Educational AM/FM station
- E. Network/group owner
- F. Recording Studio
- K. Syndicators/Radio Station Service Providers
- G. Audio For Video (TV Station/ Teleprod Facility)
- H. Consultant/Ind Engineer
- I. Mfg, Distributor, or Dealer
- J. Other

2 Job Function (check one)

- A. Owner/President
- B. General Management
- C. Engineering
- G. Sales
- H. Programming/News
- J. Promotion
- F. Other

3 Purchasing Authority

- A. Authorize/Make Final Decision
- B. Evaluate/Specify/Recommend
- C. No Purchasing Authority

4 Equipment/Services Purchases in the Next 12 Months (Check all that apply)

- A. Transmission, STL/RPU
- B. Antennas, Towers, Cable
- C. Audio Processing Delays
- D. Telco, Codecs, Remote, Field, Audio
- E. RDS/RBDS & Subcarrier Equipment
- F. Delivery Systems & Satellite Equipment
- G. Digital Editing & Production
- H. Live Assist, Automation
- J. Consoles, Mixers, Cabinetry
- K. Headphones
- L. Microphones
- M. Monitors/Speakers
- N. Studio Audio Sources & Switching
- O. Syndicated Programming
- P. Test, Monitoring & Remote Control

5 Equipment Budget For Next 12 Months

- A. Less than \$25,000
- B. \$ 25,000 - 99,999
- C. \$100,000 - 249,999
- D. \$ 250,000 - \$499,999
- E. Over \$500,000

X08
September 2, 1998 Issue
Use Until December 2, 1998

001	036	071	106	141	176	211
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020	055	090	125	160	195	230
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023	058	093	128	163	198	233
024	059	094	129	164	199	234
025	060	095	130	165	200	-
026	061	096	131	166	201	-
027	062	097	132	167	202	-
028	063	098	133	168	203	-
029	064	099	134	169	204	-
030	065	100	135	170	205	-
031	066	101	136	171	206	-
032	067	102	137	172	207	-
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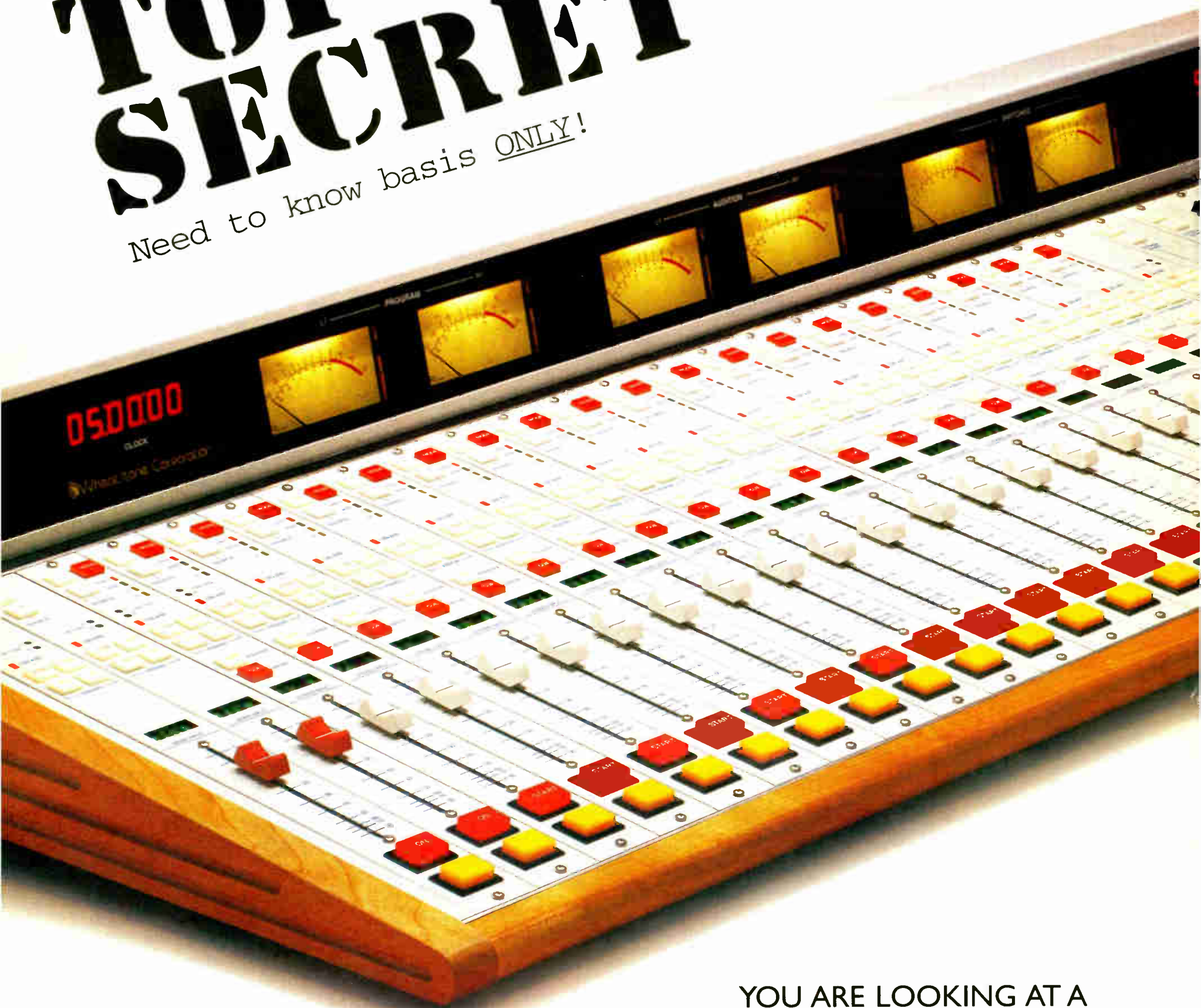
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