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Radio World



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The RW
Interview
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Vol 21, No 25

Radio's Best Read Newspaper

December 10, 1997

NEWS MAKER

Tauzin on First Year As 'Chair'

Rep. W.J. "Billy" Tauzin, R-La., recently shared his thoughts on a number of topics with RW News Editor/Washington Bureau Chief



Rep. W.J. 'Billy' Tauzin, R-La.

Leslie Stimson as lawmakers adjourned the first session of the 105th Congress. Tauzin reflected on his first year as chairman of the House Telecommunications Subcommittee, and his soon-to-be 18th year in Congress.

Liquor ad quandary

"Before the administration goes around trying to regulate (broadcast) liquor advertisements, they had better face the fact that you can't do that without also regulating beer and wine advertisements, because they also contain alcohol. And if you are not prepared to do all of that,

See TAUZIN, page 6 ▶

CBS Musters for Olympics

by James Careless

NAGANO, Japan The 1998 Winter Olympic Games in Nagano, Japan, are two months away. But for Kyle Whitney, CBS Radio manager of broadcast services, the games have already begun.

CBS Radio is the official radio voice of the Nagano Olympics, and Whitney is charged with getting that voice on-air from Japan. To do so, he is scrambling to ensure that everything is in place when the Olympic torch is ignited on Feb. 6, 1998.

At the heart of Whitney's concerns are the CBS Radio on-site facilities in Nagano. "We'll have five broadcast studios in the International Broadcast Center (IBC), as well as a technical distribution area, and a common bullpen," he said. "In addition, we'll have a presence at 10 of the venues."

The five IBC studios will anchor the

CBS Radio Olympic coverage. "We'll be doing live newscasts, talk shows and updates from these studios," Whitney



Source: NAOC

said, "as well as servicing affiliates with one-on-one type coverage." The updates themselves will originate entirely in Nagano. However, both the stateside phone calls for the CBS talk shows and

one-on-one features for affiliates will be coordinated at network headquarters in New York. The announcers and guests in Nagano will hear the feeds; they will simply supply their responses.

Radio rooms

As for the studios themselves? "They're identical," Whitney said. All are 10 feet by 15 feet, which he said makes them "larger than an announce booth, but kind of small for a full-scale studio."

Due to space limitations, there will be no separate announce booths within each studio. However, three of the rooms will have windows between them, so that a number of guests can be handled at the same time.

Two studios are equipped with Pacific Research & Engineering Air Wave consoles, board-mounted mics for the talent,

See JAPAN, page 7 ▶

Toronto Moves Closer to DAB Launch

by James Careless

TORONTO Toronto radio is one step closer to implementing DAB.

Public and private broadcasters announced at the Canadian Association

of Broadcasters Convention, held here in late October, that they were requesting permission to begin DAB transmissions.

Four Eureka-147 transmission "pods" will be established at the CN Tower, pending government approval, which was expected to be forthcoming. A pod is the way Eureka describes a single transmitter, which carries a group of five stereo radio channels.

Three of the pods will be operated by Master FM, a consortium of 15 private AM and FM stations that already operates joint facilities for the city's FM stations.

The fourth pod will carry the two English- and two French-language services of the Canadian Broadcasting Corp. A fifth pod will be available as a fully operational spare.

See DAB, page 8 ▶



of Broadcasters Convention, held here in late October, that they were requesting permission to begin DAB transmissions.

Four Eureka-147 transmission "pods" will be established at the CN Tower, pending government approval, which was expected to be forthcoming. A pod is



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NEWSWATCH

Leahy, Jeffords Oppose Easier Tower Siting

WASHINGTON Comments were still coming in on the FCC proposal to preempt local and state tower siting laws when Sens. Patrick Leahy, D-Vt., and James Jeffords, R-Vt., introduced a bill to repeal such a tower zoning relaxation. The legislation (S 1350) would affect "telecommunications, radio or television" towers.

"I do not want Vermont turned into a giant pincushion with 200-foot towers indiscriminately sprouting on every mountain and in every valley," Leahy said. He said the proposed tower siting rule making would rob states and communities of the

authority to decide where to place "unsightly" telecommunications towers.

NAB, along with TV association MSTV, asked the FCC for the tower siting preemption, to allow TV stations to meet the construction schedule for the digital conversion. NAB is concerned about the Leahy legislation if it would adversely affect that target 2006 digital TV rollout date.

The FCC was taking reply comments to MM Docket 97-182 through Dec. 1.

'Radio Free Berkeley' Case Drags On

SAN FRANCISCO A U.S. District Court judge delayed action on the FCC's

request for action on the agency's previous request to shut down the operation of micropower broadcaster Stephen Dunifer's "Radio Free Berkeley." The judge required the FCC and Dunifer to submit proof of the constitutionality of their cases by Nov. 26.

NAB President/CEO Eddie Fritts was "extremely disappointed with yet another delay in a case that was argued 19 months ago. Pirate stations are illegal and should be put out of business."

The FCC shut down two pirate operations in recent weeks. The agency seized equipment of an unlicensed FM broadcaster in Kansas City on Nov. 6 and closed down two pirates whom the FCC said threatened air safety at airports in West

Palm Beach and Miami in October.

Hicks, Muse to Buy United Artists Theatre Group

DALLAS Hicks, Muse, Tate & Furst signed an agreement to purchase Oscar I Corp., the parent company of United Artists Theatre Group, for about \$850 million on Nov. 12. United Artists has 340 theaters in 26 states.

John Muse, COO of Hicks, Muse, said, "With U.A. as a platform, we intend to be a significant investor in the industry." He said Hicks, Muse would continue to "enhance our core markets through new builds, and potential asset swaps and acquisitions."

Both parties expected the deal to close in the first quarter of 1998. U.A. expected

See NEWSWATCH, page 3 ▶

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AUDIOARTS ENGINEERING

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► NEWSWATCH, continued from page 2
to retain all of its theater employees, its senior management team and its Englewood, Colo., headquarters. U.A. employs approximately 11,000 full- and part-time people.

Westinghouse to Be Pure Media Company

PITTSBURGH Westinghouse Electric has changed course and will sell its industrial units to focus on TV and radio. Westinghouse also said it would change its name to CBS Corp. by Dec. 1 and planned to change its stock symbol to CBS on that date.

The change in course would give Westinghouse shareholders more "overall value," Westinghouse Chairman/CEO Michael Jordan said. Westinghouse had intended to spin off the industrial units by year's end.

Westinghouse Electric signed an agreement to sell its power generation business unit to Siemens AG of Germany for \$1.5 billion in cash. The transaction, while subject to antitrust review, is expected to close by the end of the third quarter of 1998.

Westinghouse expected to spin off the rest of its industrial units by mid-1998.

FCC: Extend Attack/Editorial Rules

WASHINGTON The FCC told the United States Court of Appeals for the District of Columbia on Nov. 10 that the agency needs more time to decide whether to repeal the personal attack and political editorial rules. In its response to a petition by RTNDA, the FCC said the issue is a high priority, but with new commissioners on board, it simply needed more time to reach a decision.

The FCC told the court that the RTNDA failed to prove that any station "has been required by the commission's rules to air programming it otherwise would not have aired or has been 'chilled' from airing programming that it would have aired but for the rules."

The rules state that if a station airs a statement by a political candidate or an attack on a person or a group, the station must offer opposing candidates or person(s) attacked an opportunity to respond on the air.

RTNDA went to court to try to force the FCC to repeal the rules after commissioners deadlocked 2-2 in August on whether to repeal the vestiges of the Fairness Doctrine, which was abolished by the FCC in 1987 (RW, Sept. 17). The RTNDA was preparing to respond to the FCC comments by Nov. 24.

RTNDA Hails Vote To Open Hearings

WASHINGTON Subpoenaed witnesses appearing before House committees will no longer be allowed to request that cameras and tape recorders be banned from public hearings. The House of Representatives voted 241-164 on Nov. 13 to repeal the rule, which it adopted in 1970.

The Radio-Television News Directors Association called the vote a victory. RTNDA President Barbara Cochran said, "RTNDA is pleased to have had the opportunity to speak on behalf of the electronic media to restore this First Amendment right. Now the public will have direct access to coverage of important House hearings."

New Commissioners Speak Up

by Leslie Stimson

WASHINGTON The new era of a kinder, gentler FCC has begun. The new commissioners seem to be more polite to each other, at least in public, than the previous commissioners were.

A lot of things have changed. There is a



Photo by Alan Peterson

New FCC Chairman William Kennard

Democratic majority among the five commissioners and most of the commissioners are ethnic minorities. And the new chairman, William "Bill" Kennard, is the first African-American to hold that position.

Now that he's in command, Kennard can break away from his quieter role as the former FCC general counsel, and make the chairman's job his own. Given that he is a Democratic nominee of President Clinton, however, Kennard won't make a total departure from his predecessor, Reed Hundt.

Facing the press for the first time as chairman, Kennard came out of the box strongly for a broadcast liquor ad inquiry. He sounded like Hundt when he said he believes the FCC should go ahead with its pending inquiry on broadcast liquor ads.

"I believe we ought to have this debate," said Kennard. "It's too important an issue for America to put it in a closet and say that government can't do anything about it."

Kennard, and fellow Democrat Susan Ness, who supported Hundt's push for an inquiry, no doubt will persuade fellow Democrat Gloria Tristani to go their way in pursuing this issue.

Kennard wants to bolster minority media ownership. He has said he was "distressed" by the decline in minority-owned stations, and looking for ways to remedy the problem. Minority ownership is a concern to Commissioner Michael Powell, a fellow African-American, and Commissioner Gloria Tristani, a Puerto-Rican native who is part Cuban.

Looking ahead

Pending broadcast ownership issues are high on the new FCC agenda, including changing broadcast attribution (how much of a company stock you have to own before it "counts" under FCC ownership laws) and the radio-newspaper cross-ownership waiver policy. The FCC also is deciding whether to look at cross-ownership waivers for TV-newspaper combos. Kennard also has made it a priority to create new criteria for selecting radio and TV license winners from among competing applications.

The FCC has begun a comprehensive review of the telecommunications and broadcast ownership regulations as required by the 1996 Telecommunications Act.

Of the review, Kennard said, "The first biennial review is a key time for the com-

mission to take a serious top-to-bottom look at its rules. It gives us an opportunity to promote meaningful deregulation and streamlining where competition or other considerations warrant such action. It is also an occasion to develop legislative proposals that could lead to further deregulation and streamlining."

As FCC general counsel since December 1993, Kennard has been responsible for advising the commission on how the Telecommunications Act is applied, as well as representing the FCC in court.

The 40-year-old Kennard grew up in Los Angeles, the son of an architect and a school teacher. Supporters say he is a consensus-builder and good listener.

Michael Powell

At 34, Republican Michael Powell is the youngest commissioner. The son of retired General Colin Powell mostly recently worked in the antitrust division of the Department of Justice before coming to the FCC.

On broadcast liquor advertising, he said at his first press briefing that he didn't believe Congress had delegated authority to the FCC for a separate inquiry. He preferred to include it in a more comprehensive look at public interest obligations.

INSIDE

the BELTWAY
A Roundup of News and Comment Affecting Radio From the Nation's Capital

Holdover Commissioner Ness favors a separate investigation, but previously straddled the fence on whether the FCC should regulate broadcast liquor ads.

When asked by RW if federal regulators should further review radio ownership rules given the rapid consolidation since passage of the Telecommunications Act, Powell said that may depend, in part, on how the public views consolidation.

"There was enormous pent-up demand in radio. In some ways I don't believe it's too surprising to see a big surge towards consolidation. ... The real hard part is knowing when enough is enough." He said the antitrust reviewers at both the FCC and DOJ have their hands full because of the pace of the mergers since passage of the '96 Act.

But he said the public will judge the success of the Telecommunications Act, "rightly or wrongly," on whether the long-distance and local telephone markets become truly deregulated, and said the FCC really needs to focus on it.

Gloria Tristani

Gloria Tristani was a gubernatorial candidate in New Mexico when President Clinton nominated her as an FCC commissioner. She joked that she took the
See NEW FCC, page 10 ►

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5

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Grease Man Becomes Lawman in Real Life

PAGE FOUR

 By **LUCIA COBO**

WASHINGTON One of the more interesting news stories in this issue is the early 1998 launch of DAB projected for radio in Toronto. Both public and commercial broadcasters are requesting permission to begin DAB transmissions.

As the DAB "story" around the world is ramping up, so too is our coverage. We've always blanketed the DAB issue with the most complete analysis and news from around the world. Now, I am promising you even more DAB news, analysis and information in every issue. You saw it in the last **RW**, the colorful icon pictured here:



From now on, every issue of **RW** will tackle a different facet of the DAB story. In the next issue, we begin our expanded coverage with part 1 of a paper from Westinghouse Wireless: "Robust Modem and Coding Techniques for FM Hybrid IBOC DAB." Once the series is finished, look for the AM version to run. Concurrently, as we did in the last issue, we will also be interviewing key DAB players and spelling out the story for you as it unfolds. I, for one, am very excited about this. I hope you will be too and I welcome any comments, criticisms or suggestions at lcobo@imaspub.com

★★★

Just one more sign of how times really are changing is well explored in the story on page 12 about the new studio buildup for the new C-SPAN radio station, WCSP(FM) at 90.1 MHz. Just like C-SPAN television, WCSP was created by



the cable industry and is being offered as a public service. The first-on-radio format went on the air in October and was due to move into its new radio studios by the beginning of December.

I think the cable operator is well-poised to exploit the strength of narrowcasting, a strategy, I might add, that radio pioneered when television became a competitive threat in the 1950s.

★★★

Little tidbits of news are often the most entertaining. The Commonwealth of Virginia recently had an election. The biggest news to come out of the election was that Virginians are fed up with personal property tax and the conservative candidate, James Gilmore III, rode to victory on an "abolish the personal property tax" promise.

Less notorious was the sheriff's race in the small town of Falls Church, Va., (where incidentally, **RW** is headquartered). The incumbent, Sheriff S. Stephen Bittle, had recently hired one Doug

Tracht as a volunteer sheriff's deputy. That's right, the Grease Man is a *bona fide* law man. What makes this interesting is that Bittle's challengers tried to make an issue out of Doug Tracht being community-minded and helping this small community of 10,000 with duties such as court security, transport of prisoners and



Photo by Alan Peterson

Doug 'Grease Man' Tracht

tering. So we called CCA to find out what the scoop was and here it is: Art White, president of CCA Electronics, came on board several months ago to restructure the company. It currently employs 24 full-time employees and Art confirmed that CCA recently laid off about "half a dozen employees."

The reason: They did not want to go in

Danny Bonaduce (left), Jimmy de Castro, Scott Ginsburg, Paul Kagan, Tom Hicks and Randy Michaels (right), presided over the Twelfth Annual Bayliss Media Roast, held in late October at the Waldorf-Astoria in New York.

Several hundred of the most influential and active owners, brokers, bankers and advertisers in the broadcast industry were there to 'dishonor' Chancellor Media President, Scott Ginsburg. The event was a successful fund raiser for the Bayliss Foundation, which to date has awarded \$297,500 in scholarship awards since 1985. Youths from more than 30 colleges and universities have been encouraged to further a wide spectrum of careers in the radio industry with these scholarship awards.

service of legal documents.

Bittle stood his ground and claimed, in an Oct. 30 Washington Post article, that "I did not hire the Grease Man — I hired Doug Tracht." Kudos to Bittle who held his ground and kept his office.

Kudos to Doug Tracht for working in the community. Yeah, I know, he doesn't live in Falls Church. But, he lives in Washington, of which Falls Church is one part. You have to start effecting change somewhere.

★★★

There has been some talk lately about CCA Electronics. Some of it was not flat-

the new direction Art has mapped out for the company. Art is looking to replace those people now with new hires.

There are about 5,000 transmitters carrying the CCA brand out in the field and the company is ready to take care of any one of them ... call (770) 964-3530 if you have questions, concerns or problems.

Art also mentioned that the company has no plans to file any sort of Chapter 7 or 11 (so don't believe the rumor-mongers!). The company has added seven product lines in the past two years and plans to continue doing so in the future.

So there you have it.

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READERS FORUM

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Telling it like it was?

Dear RW,

I am writing this letter to correct some information contained in the article "Telling Like It Was, On Screen," (RW, Oct. 15).

Alan Freed never broadcast on WHK. When he moved from WAKR in nearby Akron, he worked at WJW, 850 on the dial. The studios at the time were in the Stouffer Building at 1375 Euclid, right in the heart of Playhouse Square. In those days, the DJs never touched equipment, and that included records. That was all run by studio engineers, and at times, Alan's studio engineers included Jerry Kowalski, Dick Agnes, Bill Primeau and Wally Scholz.

As a matter of fact, Scholz was

Freed's remote engineer when the first Moondog Ball was put on at the old



Arena. It also was the first riot ever to originate at a rock 'n' roll concert. Scholz told me of his harrowing experience at the Moondog Ball. He was lucky to have escaped with his life.

WJW, owned at the time by Storer Broadcasting, also spawned some top-notch DJs who made big names for themselves around the nation. These included Pete "MadDaddy" Myers, who went to New York City; Casey Kasem, who is still on the air around the nation each week in syndication; and Milton Hines, a pretty crazy disc jockey who moved over to TV in Detroit and became famous nationwide under the new name Soupy Sales.

The publicity photo showed Kevin Bacon behind a WHK microphone (RCA 44-BX). If that is supposed to depict Bacon as a DJ running his own board, I must question its authenticity. In that period, studio engineers ran the boards for DJs in major markets. The studio and transmitter engineers were members of the NABET union, and anyone attempting to invade their jurisdiction was dealt with in a forthright manner. Also, the WHK microphone would have been on a boom arm to make sure that the board operator had free hands to work the board.

How do I know all of this information? I was transferred by Storer Broadcasting from their Miami 50,000 watt to Cleveland in the fall of 1961. As a newsman, I was to help develop an operation in Cleveland exactly like we had in Miami.

As for Alan Freed memorabilia, I have only one thing — an RCA 44BX microphone with WJW call letters that hung in the only studio Alan ever worked.

Dean Griffin
Brunswick, Ohio

Ed. note: Jim Davison of the Radio Broadcast Museum in Ohio confirms that Mr. Griffin is correct; the story should have stated that Freed worked at WJW.

Radio's Smart Marketers

Radio is riding a bucking bronco of change, and all of us — engineers, owners, enthusiastic fans — must learn where the horse is headed. Among the best overviews we've heard came from Pierre Bouvard, the general manager for radio at Arbitron, in a recent speech on "The State of American Radio."

Surprisingly, he said, major radio advertisers don't know that much about our industry. Now

that radio is "front page news," thanks to deregulation, consolidation and stock market interest, the phones are ringing at the RAB and Arbitron as advertisers seek to learn.

Radio must preach its new marketing power. For example, he said, the combined net reach of six CBS radio stations in New York is greater than the population of Chicago. Total radio industry billings in 1998, according to Kagan numbers, will be \$14.8 billion, up from \$3.7 billion in 1980. Radio, he said, has been adding 1 billion dollars per year for the past five years — incredible growth.

Other trends:

- In 1994, the top 10 groups represented 17 percent of revenue; now it's 33 percent. Bouvard predicts it will rise to 60 percent, as in other industries. We think he's right.
- FM is growing again. The band had 44 percent of Arbitron shares in 1977; now it is 78 percent, and growing about 1 percent a year since 1993.
- There is a growing appetite for radio among ethnic listeners.
- Americans are spending 22 hours a week with radio. Black and Hispanic listeners tune in even more.
- Although the typical station gets its highest come from cars, radio is "the king of all media" at work, where listeners say radio actually makes them more productive — a major sales opportunity.
- Radio has protected itself as a medium through format fragmentation, making it harder for new technologies to attack its market share.
- Arbitron is beginning to see Internet listening on its diaries.

With all this diversity, Bouvard said, radio must emphasize that its people are smart marketers, and that advertisers should bring that power to work on their products.

We knew it all along.

— RW

Radio World

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Next Issue of Radio World
December 24, 1997

Write to Us

RADIO WORLD
READERS FORUM

P.O. Box 1214
Falls Church, VA 22041

radioworld@imaspub.com

Long-distance dollars debated

Dear RW,

Regarding John Montone's article about the LifeLine long-distance spots ("Long-Distance Radio Dollars," Oct. 1): Where does LifeLine get the services they are selling? Most of the big long-distance companies (the ones LifeLine is trashing) do have their own networks, but most of the smaller companies do not. They are reselling long-distance service purchased from the big companies.

Has LifeLine built its own network? It is certainly possible. But if they have not, and you subscribe to their service, your money is still going to the same big long-distance companies these ads are complaining about.

Doug Smith
Pleasant View, Tenn.

Retro radio rules!

Dear RW,

Great story from Rob Peyton about WYLI bringing life back to the AM dial ("Retro Radio: The New AM Wave?" Oct. 1). I've long believed if you make a

station worth listening to, the listeners will come.

In an era of flavorless programming from every market, congratulations Dave Strock! You are an innovator.

Tom Noller
Seattle

Blum is a peach

Dear RW,

Thank you for placing Morris Blum on the front page ("Blum Out After 50 Years," Sept. 17). It has been my pleasure to have known and worked with this fellow FCC SECC official since the beginning of the EBS. He is one of the few remaining of a shrinking breed of honorable, public-spirited radio leaders in our country.

Morris will always be on the front page of our mind. *Aloha and mahalo*, Morris, for a job well done and a career well lived.

Stan Harter
Executive Director, FCC SECC
California
Communications Coordinator
Governor's Office of Emergency Services

Correction

The article "Good Digital? Bad Digital?" by Jim Somich in the Oct. 29 issue was based primarily on an earlier article by author Bob Katz, of mastering house Digital Domain in Orlando, Fla., and should have identified him as the source. This was a writer error. RW regrets the error.

Katz is an authority on digital and analog audio. Visit his website at www.digido.com to learn more about the topic.

Tauzin's 'Extended Honeymoon'

► **TAUZIN**, continued from page 1
which I would suggest them not doing, then we need to use all of the offices of our government to encourage the beer and wine and liquor people to come together and create a code of good conduct, clearly one that is designed to prevent marketing to children, and then have the broadcasters and the cable companies, etc., to all agree to help enforce it. Voluntarily.

"We are on a very delicate First Amendment area. ... You are always better off if the parties themselves can come to consensus and agreement, and self-regulate, rather than having to fight over a constitutional question of free speech."

Forcing change

"The liquor people are (cooperating). The beer and wine people want the status quo. They're advertising now. They don't want to see a competitor advertising ... so they're not too interested in a compromise right now."

Public (stations) have to look more and more like commercial stations, and that's what they've done.

"Something's got happen to change that. The FCC threatening to regulate may be a catalyst for that to happen. The FCC can't threaten to regulate just hard liquor. Once it gets into it, they'll find out that you can't talk about regulating hard liquor without the Mother's Against Drunk Driving saying 'What about beer? What about wine? Our kids are drinking the dickens out of that stuff. And they're

not supposed to be, what are you going to do about that?"



"I think the FCC simply threatening to regulate, will bring the parties together. If it serves that purpose, then so be it. In the end I think the FCC is going to find if it tries to regulate it, it will run into constitutional objections, and it certainly can't regulate one without the other, so it's got a huge problem on its hands if it goes ahead and attempts to follow through on a threat of regulation."

Working with Kennard

"He's very bright. He's extremely gifted, I think. In telecommunications, he's experienced and knowledgeable ... much easier to deal with than Reed (Hundt). We're still going to do battle over issues, but we're going to have a much closer working relationship. He's called me just to keep me interested in what they (the FCC) were doing, and I find that very refreshing. And I've offered to do the same for him."

Radio and the Telecom Act

"There is a dispute as to how well radio came out. You talk to some radio stations owners, and they'll tell you that they're very concerned (that) ...

there is a consolidation of ownership in radio going on. Some radio operators are saying this is troublesome. On the other hand, I think it's increased radio station values. It's been a mixed bag, I'm hearing both sides of it now."

Revisiting ownership limits

"We always have to keep looking at that (the pace of consolidation). ... Either the marketplace has to work, so that there is diversity and choice and competition, or it isn't (working).

"If it's working, fine. If it isn't, then we always have to look to see how we can make sure it does. And if that requires us to step in and do something, then so be it! But our goal ought to be always to work ourselves out of a job when it comes to regulating in those areas."

Streamlining the FCC

"Next year, we are going to look at reorganizing the FCC, and if the FCC doesn't self-reorganize, we are probably going to propose a bill next year to do that. The FCC is currently organized around the old 1930 model of heavy federal regulation and monopolies to protect consumers. We don't have that model working anymore in the marketplace. We've opened the marketplace up to fierce competition, and in a competitive marketplace, the consumer is supposed to be in charge. How do we get there from here when the old agencies are thinking the old way? ...

"I've talked to the new commissioners about it. I want to continue talking to them to see whether they can't remodel it themselves. If they can't, we'll make some legislative proposals over the next year."

Trust fund for non-coms

"The Gore Commission is beginning to meet, and the signals from the Gore Commission are precisely what we thought they would be. It's about mandating more public government-sponsored,

government-preferred ... programming on commercial broadcasting, in return for their (TV's) use of the digital spectrum. They've even made signals that sounded like they were talking about whole channels of broadcasting being made available to public broadcasting.

"Radio theoretically could fill the same sort of requirements one day. What they (the Gore Commission) do for television is clearly possible for radio. If this is what we're going to be faced with, government trying to tell broadcasters what they must be broadcasting, we're in for a bloody war. ...

"Instead of requiring commercial broadcasters to do and look more like public broadcasters, maybe what we ought to do is reorganize public broadcasting to do what it was intended to do, give it the mandates the Gore Commission wants carried out, and ask commercial broadcasters to help make sure that happens, perhaps with money, in lieu of public (programming) mandates.

"They might have to put up money anyhow. The 1996 Act requires (TV) to put up money if they use that (digital) spectrum for anything other than a single channel of digital high-definition broadcast. ... Maybe they should make sure those money contributions go to public TV and radio, so that public TV and radio can do its job properly, and so you don't have to make public broadcasters out of commercial broadcasters.

"Congress is being schizophrenic about this. On one hand, it wants public broadcasting to be public broadcasting, and then it tells it to fund itself privately. To do that, public broadcasters have to look more and more like commercial stations, and that's what they've done. Because they have no choice. They have to sell their products to advertisers.

"My question is, if you're going to make public broadcasters act like commercial stations, and then turn around and tell commercial stations they have to become public broadcasting, I mean you've just walked through the looking glass."

What's to come

"We're moving on a bill that will protect the Internet from discriminatory taxation. We're also going to move on a bill to protect the Internet from unnecessary regulation, that is to keep it from getting regulated as it connects to the regulated wire line systems.

"We're processing Chairman (Thomas) Bliley's (R-Va.) bill on creating a competitive marketplace for the satellite services, and privatizing INTEL-SAT. There is competition in satellites right now. But they're competing against a government-sponsored agency. Now that other private companies are engaged in that business, it's important for us to, number one, privatize the businesses that the government agencies (do) so that they fairly compete against private enterprise companies, and give those private enterprise companies a fair chance against them."

Life as a party switcher

"I wouldn't be chairman (if he hadn't switched from the Democratic to Republican parties). More importantly, when I head into a room now, I am with friends philosophically. I'm accepted, respected, and I have a full role to play. Whereas as a Democrat I had pretty much hit the glass ceiling. I wasn't going anywhere. So, this has been like an extended honeymoon for me."

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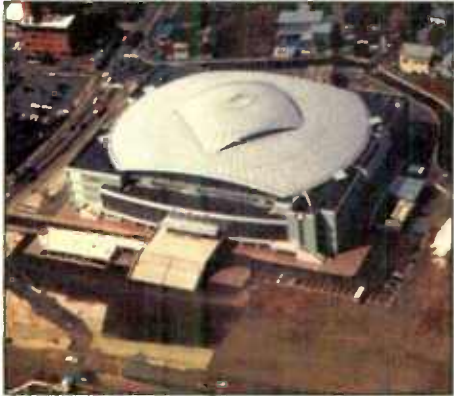
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Building Studios for Nagano

► JAPAN, continued from page 1
and stand mics with chairs for guests. One studio will be used for talk shows; another for live hockey coverage.

"The room is pretty much filled up with the console cabinetry, as you



Ice Hockey Venue

might imagine," said Whitney. "It's about the size of a full-sized desk, about 6 feet long and 30 inches deep."

Digital editing

Mixing in the other three studios is centered on the CBS Digital Editing System, which contains a digital mixer.

"This is the second generation of the CBS Digital Editing System, which we've launched in Washington, and we're introducing in New York as well," Whitney said. "It's a Windows NT desktop system based on Dell Dimension XPS Pentium II 266 MHz workstations."

Each workstation can store 16 hours of audio. They will be connected to a server that can provide another 120 hours.

"We have a 60-by-60 Grass Valley Group Horizon Routing Switcher on site, which will be integrated into this editing system as well."

The entire operation will be based in digital, he said. "We'll be automating the feeds and the formatic elements right from the site using an RCS Master Control automation system."

At the venues, CBS Radio will have access to the full commentator control unit facilities that are being provided to rights holders, Whitney said.

"This gives us the P.A. from the event itself, as well as facilities back and forth between there and our transmission point at the IBC," he said.

Site links

The facilities themselves essentially will be small stadium-style announce booths, with switching controlled back at the IBC. The links between the IBC and the venues will include two 7 kHz broadcast circuits, a four-wire coordination line and standard telephone lines as well.

"There will be a McCurdy internal intercom system that will allow communications between our studios as well as between venues," said Whitney. "There will be one path from the facility back to New York that will integrate with the Trilogy intercom system being installed there."

CBS reporters in the field will be equipped with cell phones, Sony MiniDisc recorders and AKG330 microphones. "The 330s are rugged,

but they also come through with a good quality sound," Whitney said.

To bring all of this back to New York, CBS Radio is using four 64 K channels on a dedicated CBS E1 circuit, a line capable of 2.048 Mb/sec.

"These will be backed up by four ISDN circuits, which are routed differently than the E1 channels. There will be a third level of protection provided to us on a spare audio channel of the television transmission feed."

Redundancy also is built into the CBS Digital Editing System and the RCS system.

Thus when it comes to operating remotely half-way around the globe

from home, Whitney said, "I feel confident about it."

Even with his technology in place, Whitney knows there will be a host of challenges to face during the game. Not least of these will be the 13-hour time difference between Nagano and New York. In addition to staying up all night, Nagano time, to supply the U.S. market, the CBS Radio crew also will have to work during the Nagano day, doing live coverage of hockey games. "So I'm not quite sure when we're going to be able to sleep," he said.

If you go ...

Kyle Whitney can be forgiven for

feeling like he's running an Olympic marathon himself. With the first CBS Radio broadcast scheduled to start on



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World Radio History



Congress Hikes Public Funding

by S. D. Yana Davis

WASHINGTON "It appears members of Congress got the message from the public broadcasting audience this year," said Joe Gwathmey, general manager at Texas Public Radio, which operates KPAC(FM) and KSTX(FM) in San Antonio.

Gwathmey was reacting to news in November that federal funding for public radio and television stations had been increased by Congress.

2000 of \$300 million for CPB, and agreed to \$21 million for PTFP for fiscal 1998. Both were increases over previous funding levels: CPB by \$50 million and PTFP by nearly \$5 million.

CPB funding, contained in the fiscal 1998 Labor/HHS bill, was approved by votes of 346-80 in the House and 92-8 in the Senate. President Clinton signed the measure into law on Nov. 13. That same day, Congress approved the PTFP appropriation.

Attempts by Rep. Joel Hefley, R-Colo.,

with the pack in fund raising," he said, referring to the CPB formula that awards grant money, in part, based on the success of local station fund-raising efforts.

"CPB funding represents about 15 percent of our budget," TPR's Gwathmey said. "And we've been consciously focusing on reducing our dependence on CPB. Our goal is to eliminate it entirely by 2001. Then, if the money is still available, it would be helpful for such things as program production." TPR syndicates the weekly jazz program "Riverwalk" to other public stations.

Both Anderson and Gwathmey thought that PTFP matching monies for equipment and facilities had been vital, however.

"We just got a PTFP grant last year," Anderson said. "This station has been using 1970s-era equipment, and without PTFP, we would have continued behind the technological curve." He said the PTFP money had allowed the station to upgrade to

state-of-the-art studio equipment, including a digital editing system.

Gwathmey said PTFP money had been vital in allowing TPR to sign on its second signal, KSTX(FM), in 1988.

"PTFP was essential. Without them, we couldn't have signed the second station on," he said. Looking ahead, he said PTFP monies may well be critical for public stations converting to digital audio broadcasting or DAB.



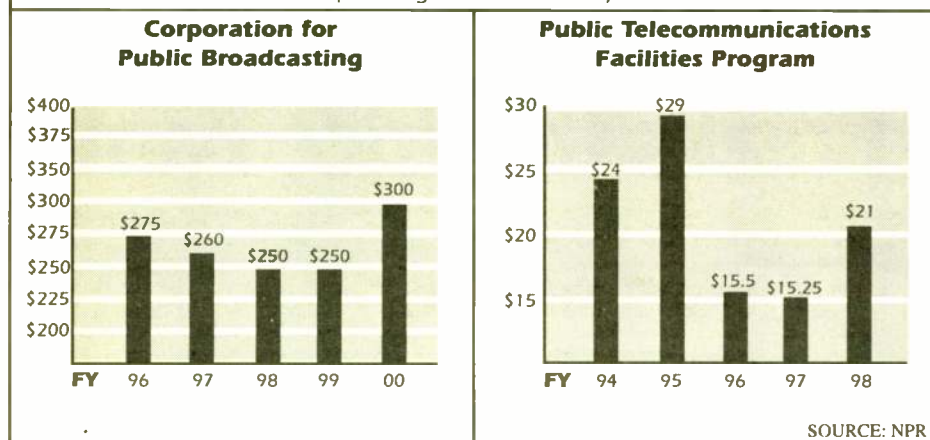
Summary

Although Congress has authorized increased funding for public radio stations, expenses for stations also have increased. Many stations still operate with transmitters and other equipment acquired 10 to 15 years ago. The possibility that the industry will convert at some point to DAB is another worry, with estimates of the cost to each station in the hundreds of thousands of dollars.

S. D. Yana Davis is a freelance writer and marketing consultant in Knoxville, Tenn. E-mail him at yanajune@usit.net

Recent Funding Levels

(Dollar figures are in millions)



While Gwathmey and several other station managers were pleased, Torey Malatia, general manager of WBEZ(FM), Chicago, sounded a note of caution.

"Instead of waiting with bated breath on what Congress does every year (with federal funding)," Malatia said, "I would like to see a period of encouraging stations to be increasingly self-sufficient. Otherwise, you have a cycle of dependency on federal funding that can't be broken."

Congress hears constituent call

But, at least for the next few years, federal funding for nonprofit broadcasting seems secure, even though this year's session of Congress began with doubts about the future of funding for the Corporation for Public Broadcasting and Public Telecommunications Facilities Program. Public radio and television stations receive annual operating grants through CPB and matching money for new equipment through PTFP.

Hearing loud support for public radio and television from constituents, by mid-November House and Senate members had passed an appropriation for fiscal year

to cut the appropriation by \$50 million and by Rep. Phil Crane, R-Ill., to eliminate CPB funding completely, were defeated on the House floor in September.

PTFP funding was approved by both houses at the \$21 million level by the middle of November, but differences not pertaining to PTFP in the legislation delayed final approval of that bill. NPR officials indicated the \$21 million was a firm figure for fiscal 1998.

Station managers who spoke to *RW* generally were pleased at the news from Capitol Hill in late fall, but they had doubts that the increases would actually mean additional funds for public radio stations.

Station reaction

"In my mind, (passage of the CPB funding bill) represents staying even," said Lloyd Wright, general manager of WFYI-FM in Indianapolis, Ind.

David Anderson, general manager at WUIS(FM), Springfield, Ill., agreed. "I don't see it as extra money. I see it as allowing us to stay even. I won't get the same dollars as last year if I don't stay up

DAB Launch in '98

► DAB, continued from page 1 radiated power of 8.3 kW each.

The broadcasters also announced at CAB the purchase orders for the transmitters and equipment needed for the DAB broadcasts. Itelco USA, the North American subsidiary of Itelco SpA of Orvieto, Italy, was chosen to supply the transmitters, audio encoders and DAB multiplexers.

Meanwhile, the antennas will be provided by Scala Electronic Corp., a member of the Kathrein-Werke KG group of Rosenheim, Germany.

"We are really pleased to see the Toronto broadcasters come along and make the final announcement that they are moving ahead," said CAB Executive Vice President Michel Tremblay. Tremblay and the CAB have played a major role in bringing digital radio to Canada.

Tremblay predicted that Toronto will have DAB transmissions on the air by early 1998.

"That is one of the landmarks, and we assume that this will trigger

movements in Vancouver and Montreal for 1998," he said.

Of course, offering digital radio transmissions to Canadians will mean nothing if they cannot receive them.

Thus the appearance at the show of seven receiver manufacturers — displaying both home and car digital radio sets — was noteworthy. On hand were Kenwood, Clarion, Technics, Fujitsu Ten, Grundig, Philips and Pioneer.

Said Tremblay, "Things are really coming together when you see companies that are willing to get out there in a public place, put up their banners, and say, 'We are fully behind DAB.'"

Tremblay said he expects at least some of the companies to start selling consumer DAB receivers in Canada by next summer.

The combined presence of broadcasters committed to DAB and the display of DAB receivers was a substantial triumph for CAB 1997.

"We are not discussing it any more," Tremblay said. "We are just doing it."

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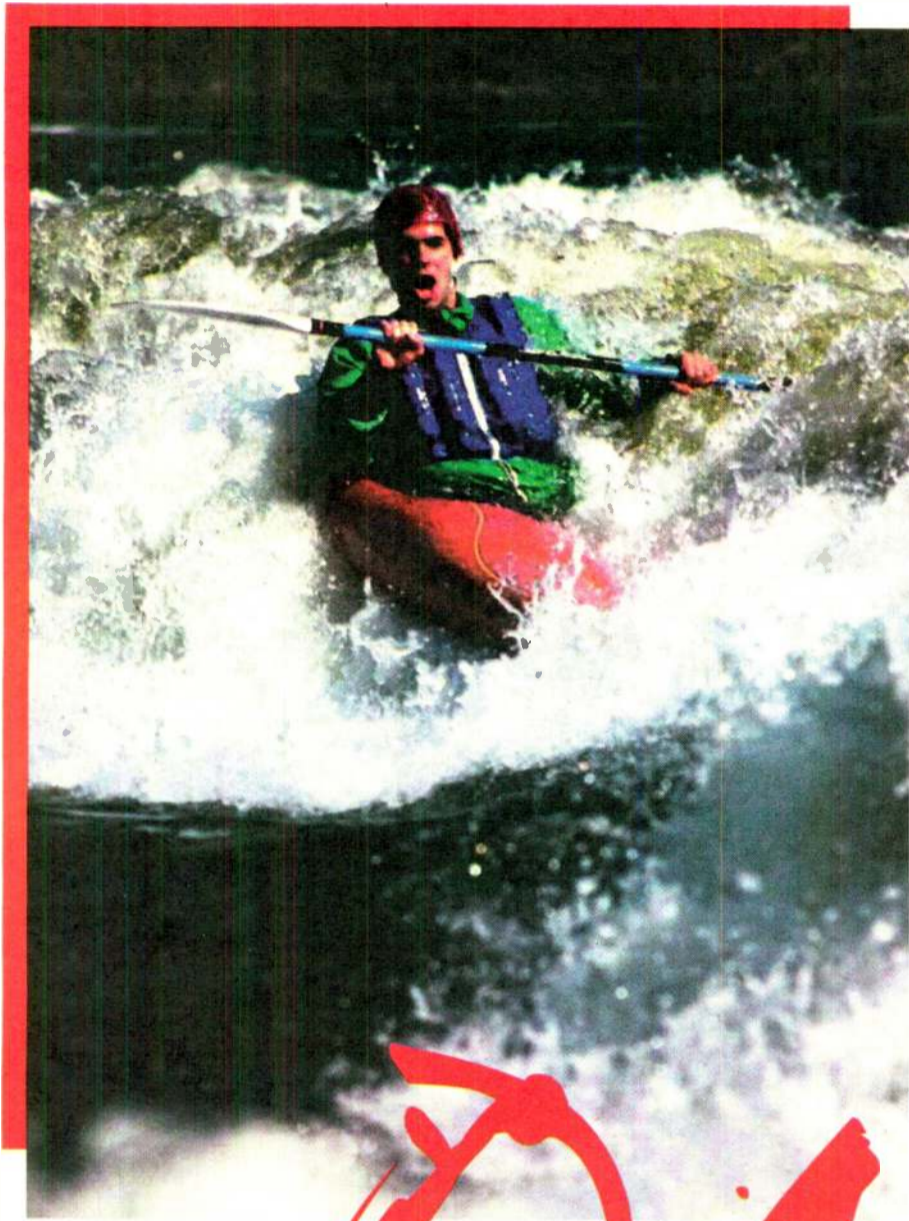
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DARE

TO GO THERE

ABG Signs Up With Nautel

by Paul J. McLane

GRAND RAPIDS, Mich. After 25 years of selling Broadcast Electronics transmitters in the Great Lakes area, dealer Audio Broadcast Group has terminated that relationship and signed on to sell Nautel RF products, ABG said. In the wake of that decision, BE announced that it would sell transmitters direct in the states formerly served by ABG, rather than select a new dealer.

Dave Howland, ABG vice president of sales and marketing, said his company, which is based in Grand Rapids, Mich., made the change to strengthen its offerings to customers in the southeastern

United States, where BE already has another RF dealer.

"We wanted to become a full-line distributor in the southeast, as we are in the Great Lakes," Howland said. He expressed enthusiasm with the Nautel line, including its AM and FM transmitters and digital exciters.

Under the old agreement with BE, ABG had been able to sell transmitters only to customers in Michigan, Wisconsin, Ohio, Kentucky, Indiana and northern Illinois. Howland said the new deal with Nautel allows ABG to offer RF products in North and South Carolina, Virginia, Kentucky, Tennessee, Wisconsin, Ohio, Michigan,

Illinois and Indiana.

In choosing ABG, Nautel replaced three dealers in those 10 states with one.

"We're expecting fantastic things" from ABG, said Gary Manteuffel, manager of broadcast sales for Nautel.

BE direct

Broadcast Electronics issued a statement by Michael Troje, director, domestic sales: "Broadcast Electronics, in a continuing effort to provide the best possible service to its customers, has decided to go direct with its representation in the states that were formerly represented by ABG. We feel this will better enable us to provide the best possible service to

our valued customers in that region.

"Although we have shared a 25-year relationship with ABG, we fully understand their need to take their company in a different direction in light of the way consolidation is changing the way we all do business today," he stated.

ABG hired John George as a sales engineer to serve customers in the southeast; he is based in the ABG office in Raleigh, N.C. George worked previously in RF sales for Continental, and has been a director of engineering and chief engineer at radio stations in the Carolinas, Howland said.

ABG will continue to offer audio products from Broadcast Electronics, he said.

In another development, ABG said it terminated its relationship with Pat and Bernice Medved. The company had just hired them in July to operate an ABG sales office in Tacoma, Wash. (RW, Aug. 6.) The decision, Howland said, was a financial one; he said expansion of staff and the cost of moving its Michigan headquarters this year made it necessary for ABG to reverse its decision to open an office in Tacoma. Howland said ABG had an amicable parting with the Medveds, whom he called "great people." The Medveds earlier had worked for many years for equipment supplier Broadcast Supply Worldwide.

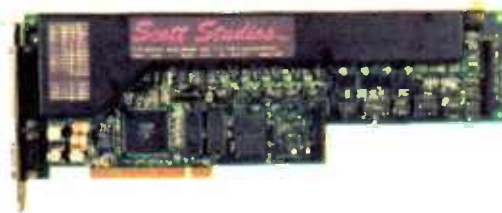
Pat Medved expressed disappointment that ABG was unable to give the Medveds time to show the results of their work.

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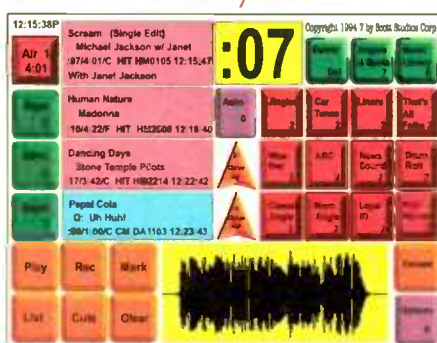


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Faces and Voices of The New FCC

► NEW FCC, continued from page 3

FCC job because "it was a sure thing." Tristani hopes to run again for office in New Mexico someday. Previously, she was elected to the New Mexico State Corporation Commission and advised the telecommunications (wired and wireless phones), utility and insurance industries on local compliance with the Telecommunications Act.

When asked about mass media issues decisions affecting the FCC, Tristani said she needed to study those issues. She said she favors diversity of broadcast ownership, and although she doesn't think consolidation "is a good thing, per se," she said she would have to study the issue more before commenting.

Harold Furchtgott-Roth

Republican Harold Furchtgott-Roth was the chief economist on the staff of the House Commerce Committee; he worked on the 1996 Telecommunications Act. Furchtgott-Roth seemed genuinely surprised by questions about why he has no TV at home when that is one of the industries he will be regulating. He said he watches the TV in his office when there is a particular program he needs to see.

When asked if he thinks TV programming is harmful, he said no. With five children at home, he said, his house doesn't lack for entertainment.

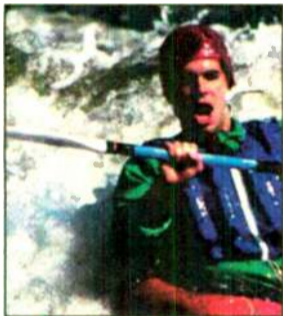
He has several radios.

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C-SPAN Creates a New Kind of Radio

by Lynn Meadows

WASHINGTON Where once there was jazz, now there is talk ... lots of talk. Where once there was a station owned by a university, now there is a station owned by the cable industry.

C-SPAN's new radio station, WCSP(FM) at 90.1 MHz, debuted its first-on-radio format Oct. 9 and was due to move into its new radio studios by the beginning of December. Just like C-SPAN television, WCSP was created by the cable industry and is being offered as a public service.

The former WDCU(FM) was sold this fall to C-SPAN by the University of the District of Columbia for \$13 million (RW, Oct. 15). It received new call letters, a new format and a full equipment makeover.

The new format is a political junkie's dream, 24 hours of House and Senate floor action and hearing coverage, with a mix of national events and talk shows thrown in.

Equipment from the WDCU studios will be used in a new production studio or as backup at the new facility. However, the new WCSP on-air studio and production room will cost the network roughly \$500,000. C-SPAN's total budget for this year, for TV and radio, was \$30 million.

"We had just gotten finished rebuilding all of our technical facilities over the last couple of years, so we were in the construction mode," said Roxane Kerr, vice president of engineering for

C-SPAN. One of the biggest challenges for WCSP, she said, was the time allowed to design the facility, order the equipment and actually construct the facility.



The New Main Studio for C-SPAN Radio

A temporary wall went up around the studio space on Sept. 9. The on-air studio was finished and was being tested by the end of October.

Industry help

Both Kerr and engineer Richard Freeson, chief operator for the radio side of C-SPAN, praised their vendors. "They really came through for us in getting all this equipment and the design complete," said Kerr. For instance, to get the signal to

the transmitter, they wanted two T-1 lines using the Moseley Starlink 9003T1.

"We ordered two of them, one as a primary and one as a backup," Fleson said,

said Kerr. Broadcast Supply Worldwide and Bradley Broadcast, the latter based in nearby Maryland, were both helpful, Kerr and Fleson said.

The new studio contains a Wheatstone A-6000 console, a CD player, a cassette deck and monitors for the video feed so operators can see whom they are identifying. A production room with similar equipment is under construction.

"We're looking to make both of those rooms very flexible so that we can be on the air in either one," said Kerr.

More power

At the time of the sale, WDCU was in the middle of a power upgrade, which C-SPAN is continuing. Kerr said she hopes it will be finished by early January.

"Right now, our effective radiated power is only 6.8 kW," said Fleson. The station has authorization for 36 kW at more than 500 feet.

Without the upgrade, the station can be heard in Baltimore, about an hour north of Washington, out on Skyline Drive in Virginia and about 20 miles past the Chesapeake Bay Bridge into Maryland.

"I think what we're going to get is better coverage, but not necessarily more distance," said Fleson.

A new Harris HT-10CD transmitter was installed by Multiphase Consulting. Both the transmitter and a new Shively

See C-SPAN, page 13 ▶

Photo by Alan R. Peterson

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► C-SPAN, continued from page 12
Labs antenna were purchased by WDCU prior to the sale. U.S. Towers was doing the tower work necessary to add the new antenna. Kerr said the tower would need approximately 65,000 pounds of steel to support the new antenna.

C-SPAN hired contractors to conduct an RF study before doing anything on the tower so it would know when it would have to turn the power down or off. The cost for upgrading the antenna is roughly \$400,000, which is being held in escrow and was included in the \$13 million paid for the station.

To give the new employees time to learn the equipment in the new studio, and the technical crew time to finish it, a temporary studio was set up in one of the television studios. That simple setup included a cart deck, a CD player, an intercom and a 16-channel Soundcraft audio board borrowed from the television field crews.

None of the former WDCU staffers remain. In all, eight full-time employees, including the general manager, will run the station. The new general manager, Bob Spence, was formerly manager of C-SPAN promotions. The new employees primarily are announcers who identify the voices on the radio and explain any visual aids. Initially, WCSP borrowed announcers from the television network for this work.

"It's required a little finagling to identify people without stepping on audio, but they are getting very good at it," said Richard Fahle, media relations manager. Problems occur when speakers refer to visuals or run videos.

"That's a problem because not all television obviously translates to radio. We don't think of it necessarily as translating television to radio. These are events. When we run into these problems, that's where our on-air announcers do their job. They'll explain to the listening audience what's happening," said Fahle.

The hourly on-air identification is a challenge the air talent is learning to work around.

"We're getting better at being very unobtrusive," said Fahle.

How many people will listen to this kind of format?

C-SPAN has "never been about ratings," Fahle said. Because the station does not advertise on radio or television, he said, it does not need a rating service. The format "fills a niche" in the Washington market, which contains more than 300,000 federal workers plus other political junkies. He said ratings are not as important as making sure the station offers a quality product.

According to one rumor, C-SPAN intended to syndicate its programming. Fahle said there are no plans to do that



Announcer Chinyere Sims in the Temporary Air Studio

now. C-SPAN is treating WCSP as a local station, he said.


"In this town, federal is local," he said.

But this station could be a model for something else, a public affairs channel designed to reach a national listening audience. C-SPAN is looking to take the entire package and offer it as one of the channels when satellite digital audio radio services (DARS) become a reality. The FCC has granted two licenses for DARS satellites. C-SPAN could strike a deal to offer its programming to a national audience.

"For the most part, C-SPAN is a product that translates very well into radio. C-SPAN is not a highly visual medium. C-SPAN is a medium of communicators, of speakers, and that works well for radio," said Fahle, adding that the format is "tailor-made for radio."

Photo by Alan R. Peterson

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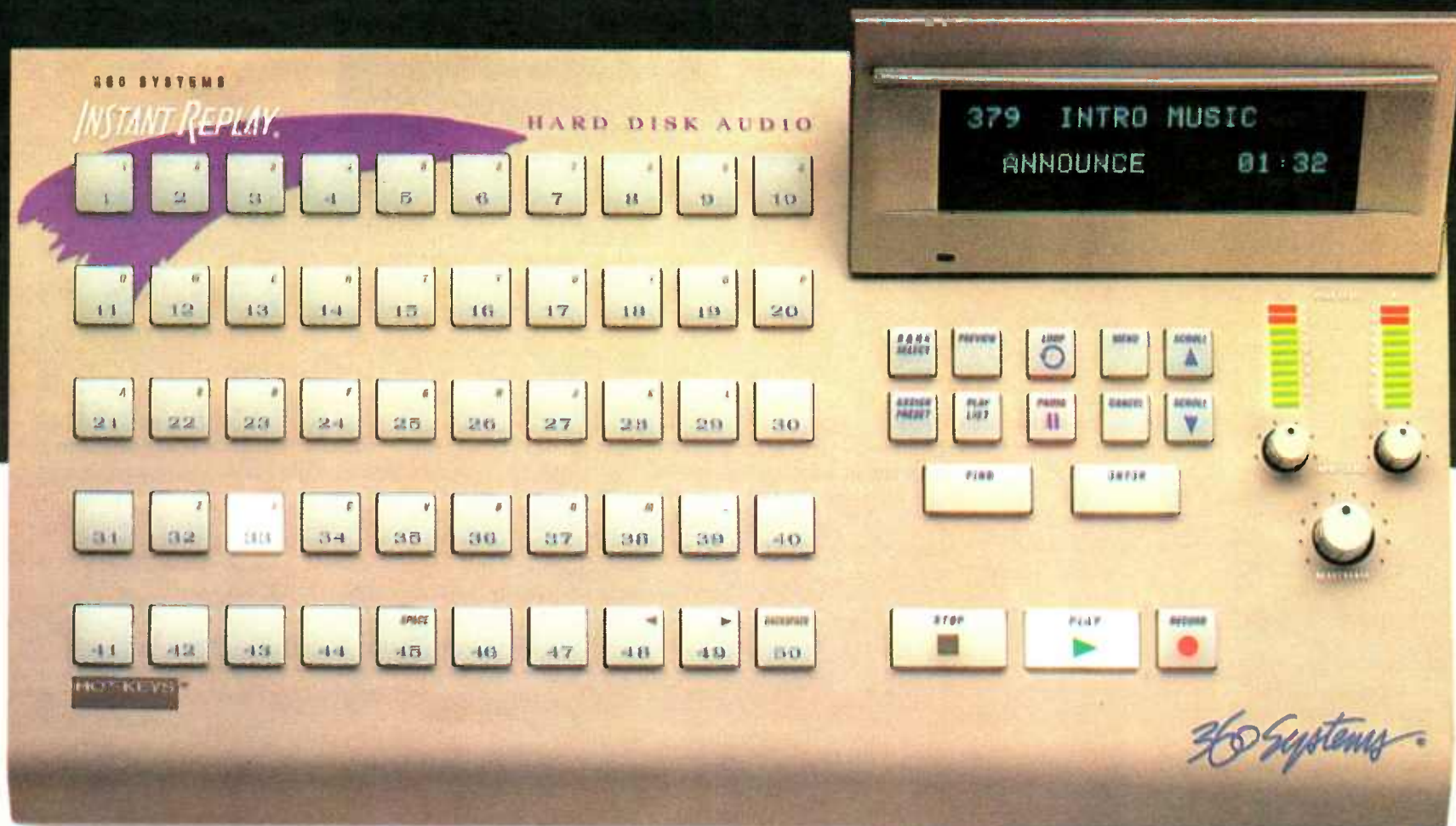
Among the equipment chosen by C-SPAN for its new radio station:

- Harris HT-10CD transmitter
- Harris DIGIT CD digital exciter
- Shively Labs antenna
- Moseley Starlink 9003T1 STL
- Wheatstone A-6000 audio console
- Broadcast Electronics AudioVAULT
- Panasonic DAT machines
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Woods of Harris on Deals, DAB

Jim Woods recently was named vice president of radio and studio product lines for Harris Corp. By virtue of its prominence as a dealer and manufacturer, Harris is watched closely when it buys a company or pursues a new technology. With worldwide responsibilities that now include both studio and RF products, Woods is in a position to comment on important trends in the radio business.

Lynn Meadows talked with Woods.

RW: What was the reason behind the purchase of Northeast Broadcast Labs this spring?

Woods: We were able to absorb their market share in the northeastern U.S. from basically eastern Pennsylvania north, an area where Northeast had a stronger presence and penetration. They had also carved out a segment of the market where they were a systems integrator and were designing and integrating primarily studio systems. That strategically for us was an area that we didn't do, other than in the very large systems. Northeast has provided us a platform to expand our business into systems integration and that really finishes the three-point triangle of manufacturing, distributing and integrating. With Northeast as a platform to expand that, we will compete in all three areas.

Harris, growing

RW: Is Harris in an acquisition mode?

Woods: The media and broadcasting markets are the number three industry for consolidation as far as the amount of transactions taking place. I'm talking primarily about our customer base, the broadcaster. If you are in a business where that's your customer base, common sense would dictate that if your customers are consolidating and consequently growing at the rate that our customers are, then we had better be growing at least the rate that they are. If you look at what we've done recently with both our acquisition of NEBL as well as a recent acquisition we did in France for a company called ITIS (Innovation Telecommunications Image Son), one of our strategies is to grow through external acquisitions. We are also growing our business internally.

RW: Was Harris was a suitor in the Broadcast Electronics purchase?

Woods: No comment.

RW: At NAB '97, Harris said it was willing to invest in overseas broadcast entrepreneurs. What is the status of that?

Woods: Since 1988, we've owned an interest in one of Moscow's first commercial radio stations. We took an equity position in it in exchange for an investment of the equipment to build the facility. That investment has proved to be a pretty good (one). With Harris, it's not that there is a pot of money over in the corner waiting for someone to walk in the door with a business plan, as much as that we are very well financed. If we chose to invest in an emerging commercial radio marketplace, then that is certainly something that we would look at.

RW: How has equipment buying changed for radio engineers over the past five years?

Woods: It's not so much who is buying,

it's how much.

This industry spent about 10 years chasing a lot of the technical talent out of the business and not necessarily attracting new technical talent. So we have a fairly small engineering pool in the radio industry taking care of larger and more facilities. We have the people that we interface directly with, from chief engineers to director of technical operations, VP of engineering. (They) are responsible for more and more.

RW: Are you gearing services more towards large companies because of consolidation?

Woods: We've changed how we track ownership and our customers' accounts. We are able to look at a group owner and keep track as best as possible of who owns what stations. We've worked with quite a few groups in putting programs together where it's easier for them to buy on account so that the various stations can simply buy without having to make down payments. We are trying to reduce the paperwork it takes to buy the ... equipment that a station needs just to keep operating that may need to be (sent) overnight. Most of the super-large groups are in a substantial state of flux. They haven't settled on an organizational structure and a clear demarcation of responsibilities and who makes what decisions.

RW: Have you sold a big order to one group, only to discover the group has been bought before the equipment gets there?

Woods: Yes, but we haven't had a situation where we've had a transaction canceled or derailed as a result of an acquisition. It's interesting, for those of us who sold to this customer base through the last round of consolidations, that the consolidations of our customers actually seem to be fueling investment in properties as opposed to before, where it seemed to dry it up.

RW: We had an article about SFX buying directly from manufacturers. Is this a trend?

Woods: There are very few cases where companies do both: sell direct and sell through distribution. It's a business decision that people have to make. There are some lessons to be learned once you start having to manage credit, inventory, customer inquiries, customer service and warranty issues. As manufacturers start to experiment with selling directly to an end user, they start to realize that it is more than accepting a purchase order and collecting a check. There's a very large expense associated with delivering a product to an end user.

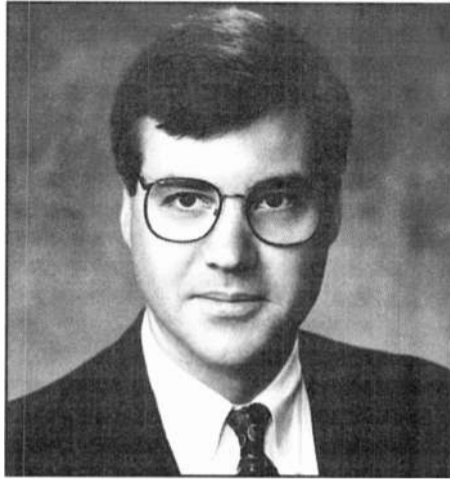
DAB, RDS and more

RW: Any predictions for when DAB may become available in the United States?

Woods: Harris has been involved in testing the in-band, on-channel (IBOC) system from the early days of its development, and we continue to be. We work closely with the proponents and we've recently acquired ITIS in France, one of the pioneers of the Eureka standard. So we now have a solution for what may ultimately be the IBOC standard as well as a Eureka solution.

It will probably be three to five years before we will see some sort of digital radio — other than satellite-delivered

digital radio — in the U.S. As the world adopts DAB and it appears as though the world is going to do Eureka, it's going to get harder for the U.S. to ignore a digital radio standard just north of us, just south of us and all over Europe.



Jim Woods

RW: Does RDS have a place in the U.S.?

Woods: Probably not on a large-scale basis. It will probably go the way of AM stereo. By that I mean, that in — pick a number — three years, five years, 10 years, RDS will be kind of the modern-day equivalent of the stereo pilot light. Everybody will have it. And it will be primarily to transmit call letters and possibly music titles or something like that.

RW: Are cascading algorithm problems still a concern and if not, why?

Woods: Cascading algorithms were and still are an engineering issue. Just like any other issue that comes up when you are designing a facility or designing a studio or laying out a network, what algorithms are going to be used at various stages of the facility or of the transmission path have to be taken into consideration.

Several things are working to limit it as being an issue. One, we've developed enough practical experience to understand the limits. Most people have experienced cascading different algorithms and cascading the same algorithm and fundamentally know what they can do and still maintain the quality standard that they want to maintain. Two, there's a move to uncompressed solutions and those are becoming economical for people who are purists and have maintained an audio broadcast that is pristine.

RW: What will be the biggest change in technology due to consolidation?

Woods: We are going to continue to see — certainly Harris' vision — is the application of digital audio for storage and transmission. I mean everything from Wide Area Networks, Local Area Networks, transmission in the broadest definition of the word in distribution of audio. We will continue to see those technologies evolve.

The biggest hurdle is probably going to be developing compatible file formats and interface standards.

Radio in the DTV age

RW: Digital TV will be a huge business opportunity. Harris has made a big commitment to it. At the same time, we notice that Harris has a booth in the NAB TV hall, but not in the radio side. What is your commitment to radio?

Woods: Digital TV is indeed a very large opportunity, probably the largest opportunity for equipment and service providers in the history of our industry.

That said, none of that attention or focus has diluted our commitment to the radio industry and the radio broadcaster. I can point to the introduction of our new Z line of FM transmitters, the introduction of the CD Link, the launch of our second-generation digital console (the DRC2000), the acquisition of Northeast Broadcast Labs and the acquisition of ITIS in France as significant investments in our radio business.

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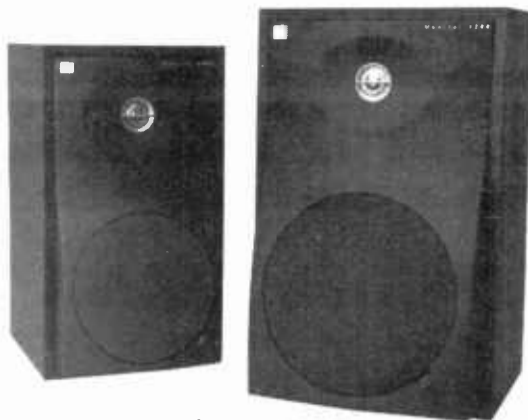
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Third Hands and Heat Sink Clips

Know These Common Connectors and Terms Before You Start the Soldering Process

Steve Lampen

We have discussed soldering irons, soldering stations and solder (*RW*, Nov. 12). There are a number of tools that can make your soldering life a whole lot easier.

First, there is what some people call a "third hand." This can be one of a number of devices. The simplest is two alligator clips attached to a wooden or plastic board. You can make this yourself in a few minutes.

The second is almost the same thing, but the clips are on swivels and the base is weighted. You can also use a small vice, such as a plastic "hobby" vice. This can be especially handy if you are going to solder PC boards or small project boxes because it can hold odd shapes securely without damage.

Grab hold

These can hold what you're working on, so you don't have to, especially when you're soldering, when you have the iron in one hand, the solder in the other. You need something to hold the connector or other device on which you are working.

The second essential tool is a selection of heat sink clips. These little clips can absorb heat. You squeeze them and they open up, not unlike an alligator clip. But the jaws are made to absorb heat, so you need to place them where you have to apply heat but don't want it to go past a certain point.

The real secret to good soldering is tinning.

You will find these little jewels to be worth their weight in gold when you solder connectors on which some of the connector pieces, or the plastic on the wires, have a tendency to melt off or disappear if overheated. Heat sink clips come in a variety of sizes. Be sure you get ones small enough to work on small connectors and similar parts.

The real secret to soldering is tinning.

This is where solder is applied to various parts to prepare them for connecting. Then, it takes very little heat (and time) to remelt what you have done, join the parts and remove the iron to let the solder cool. In this way, any connection can be accomplished with a minimum of damage to the surrounding components or innards of wire or cable.

In fact, many types of cable already come with tinned components. This is done for two reasons: to aid you in connectorizing and to help resist oxidation and corrosion, extending cable life. By pre-tinning wire, you are ready to go and can save a lot of time. Tinning often gets a bad rap from the "high-end" audio folks, but this is undeserved. We'll get into the effects of tinning on wire and cable *performance* in a future column. Suffice it to say that, when wiring for audio, tinned conductors can save you significant time and grief in the soldering process.

Good and bad

Each type of solderable connector has its own good and bad points. Although there are dozens of connectors you *might* use in an audio installation, the vast majority of applications use five types: the XLR (also called Canon) connector, the two- or three-circuit phone plug, the phono or RCA plug, the TRS (tip-ring-sleeve) or bantam patch panel connector, and the Sub-D connector. While many of these are available in crimp, clamp or insulation-displacement versions, we will concentrate for now on the soldered version and come back to the others later. These also can be divided by the type of signal they can carry, unbalanced or balanced.

Balanced signals use two wires to carry the signal. It is "balanced" because the signal is identical but opposite polarity on the two wires (and on two pins of the connector). Often, a third pin carries the "ground." Usually this ground connection is the connection to a braid or foil shield on the cable and is intended to intercept noise.

XLR, TRS, and bantam connectors are made specifically for this three-conductor balanced application. The Sub-D and stereo phone plugs can be adapted to carry balanced signals, but the RCA and two-conductor (mono) phone plugs can only be unbalanced.

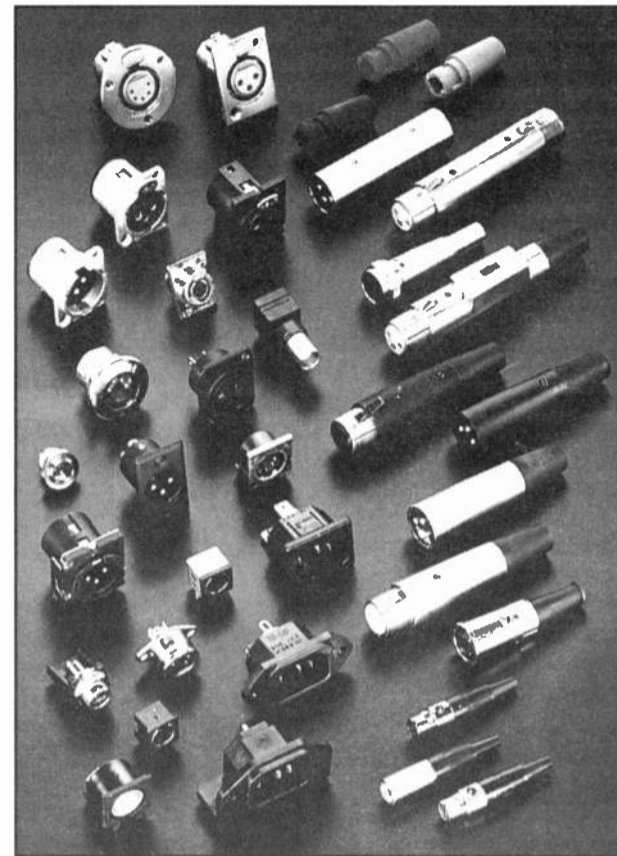
Unbalanced signals use one wire for the signal and another wire for both the other half of the signal and also for ground. Because of this, unbalanced circuits are more prone to noise. Home hi-fi and other nonprofessional applications use these connectors, most commonly the phono/RCA, to handle unbalanced signals.

Then there is the phone plug, distant cousin to the TRS, most commonly used for guitar connections or unbal-

anced microphones. It comes in a two- or three-connection version. The three-circuit version was intended for dual-channel applications, such as stereo headphones, where the "tip and ring" were the positive (+) signal from the two channels of a suitable amplifier and third "sleeve" was a common ground for both sides.

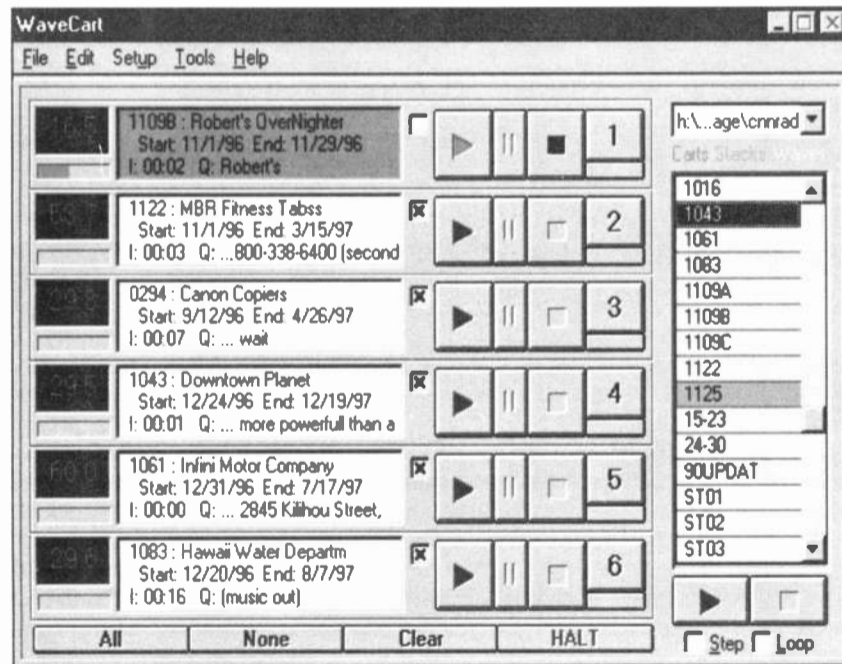
Stereo phone

The stereo phone plug has recently become more common as an inexpensive balanced connector. Use of a phone jack (the receptacle for a phone plug) on the back of a console saves considerable



Connector styles abound. These are made by Switchcraft.

On-Screen Cart Machine



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Circle (198) On Reader Service Card

World Radio History

space and money. In this application, the "tip and ring" are the balanced line signals, while the "sleeve" is the shield/ground.

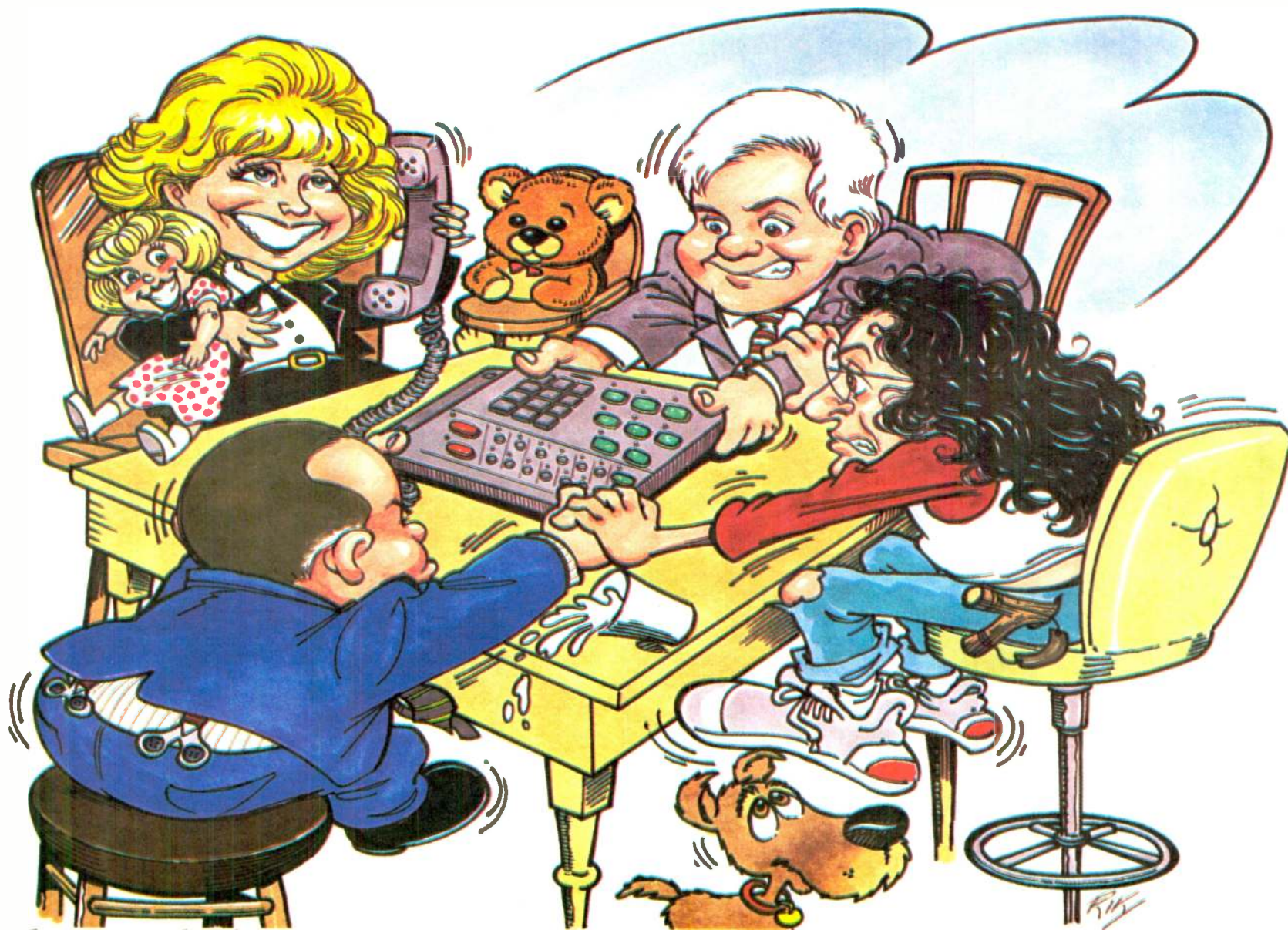
The Sub-D connector originally was intended as a low-speed data connector, and these days often is used for machine control; it also is evolving into an audio connector. It comes in a number of pins: DB-9, DB-15, DB-25, DB-37 and DB-50. There are also "high-density" versions. The Sub-D also can be wired unbalanced or balanced, based on the requirements of the equipment to which they are attached. In balanced circuits, they often are used in sets of three pins. An eight-pair snake, for instance, has a total of 24 connections (three wires times eight pairs) and would fit with a pin left over into a DB-25. Or you could put 12 unbalanced circuits (12 times two equals 24).

It is impossible these days to talk exclusively about analog audio, simply because we're going headlong into digital. Therefore, a key question is whether these connectors can be used for digital audio. The simple answer is "yes." To understand that "yes" is to understand digital AES/EBU audio. To understand AES/EBU audio, and continue on our saga of soldering, tune in next time!

■■■

Stephen H. Lampen is the author of "Wire, Cable and Fiber Optics for Video and Audio Engineers" (McGraw-Hill) and is the technology development director at Belden Wire and Cable.

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 **HARRIS**

Workbench

Radio World, December 10, 1997

Nautel RF Care and Feeding

John Bisset

During our transmitter workshop at The NAB Radio Show, I learned that most of the transmitter manufacturers maintain a database of service calls, and catalog problems as they are identified in the field by their customers. Kevin Rodgers of Nautel provided a thorough list of the more common problems, which I'd like to share.

If you own a Nautel AMPFET-1, -5, or -10 be sure to check your Rectifier/Regulator modules to ensure they are providing -72 V. The matching of the PA modules is important below 700 kHz. Also test your standby modules, to make sure they are working. There is nothing like a bad spare when you are off the air!

After a year of operation, open the transmitter up and make sure all the hardware is tight. This is especially true for the AMPFET-10, in the filter section.

Loose hardware can cause major problems, because of the current passing through it.

On the top of the AMPFET-10 is a gap. Check it to make sure it hasn't blown during a lightning storm. As you perform your maintenance, make sure the Jones plug pins on the PA modules are clean.

AMPFET-50 owners should check the filter cabinet, checking both the front and back of the filter to make sure all hardware is tight. If your transmitter drops to quarter power, the problem is two 20A fuses that are located in the center cabinet. When these fuses open, the power drops.

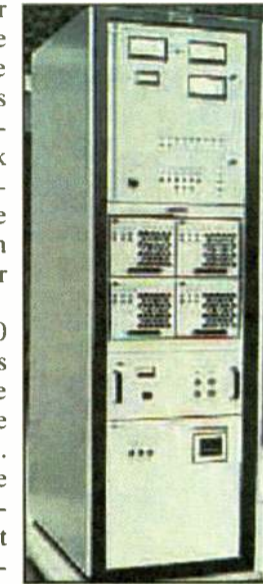
If you maintain any of the ND series of Nautel transmitters, check to see if the transmitter still uses an aluminum filter. These filters tend to pit and turn to white powder over time. Nautel has replaced the aluminum filters with a plastic filter, which doesn't suffer from these problems. ND-50 owners should check the

NAP-10 power cubes. These consist of three PA modules with wire terminals. Check each of the terminals to ensure they are tight on the transformer assembly.

The ND-10 has a fan that is located at the bottom of the filter assembly. Make sure the fan is still working. Because it is hidden, it easily can be overlooked.

On the low-power P-400, if you change frequency, and operate this transmitter over 1450 kHz, contact the factory for a field modification that will reduce the current drive.

Thanks to Kevin Rodgers for sharing this wealth of maintenance knowledge on the Nautel rigs. It's so much easier to spot problem areas and correct them before they turn into catastrophes!



A Nautel ND Series Transmitter

one end wired to your spare motor and the other end in the mating connector. Should your blower motor fail, replacement is simplified: Just plug and play!

★★★

The scuba-tank-for-cleaning-the-transmitter topic just won't die. Here are the latest comments.

If you aren't a scuba enthusiast, finding a "used" tank may be a problem. Scott Todd from the Skylight Satellite Network suggests shelling out the \$30 or so for an air tank, which you can get at a local building supply store. These tanks are good to 125 pounds of pressure and can be filled at your local gasoline station. Great idea, Scott! Thanks for the contribution.

★★★

Frequent RW contributor and long-time friend Jim Pinkham is a former scuba diver as well as an experienced broadcast engineer and consultant. Jim writes that he is familiar with the usefulness of a tank of compressed air to clean the interior of transmitter cabinets, phasors or rack-mounted equipment. Jim suggests that you add a snap-on tire filler attachment, to give you a quick tire refill if ever needed. Jim adds that if the scuba tanks are a problem, small compressed air tanks can be rented, just like the larger nitrogen tanks, from your local welding gas supply or medical supply company.

Jim's suggestion was particularly timely. Several years after he served as chief engineer, I followed in his footsteps at the old 730 kHz, WPIK. This is the station that John Mullaney used to develop the first folded unipole antennas. There is a lot of neat radio history at this transmitter site, including the FB-5000J Bauer 5 kW transmitter that looks like it just came off the assembly line last week!

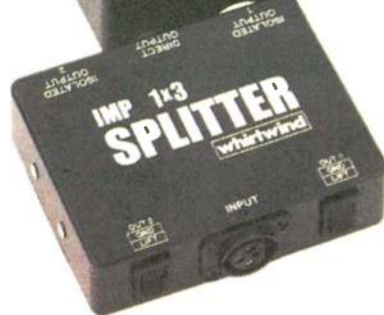
I experienced déjà vu when I was called back to the site to assist the chief recently. Lo and behold, while rummaging for parts in a storage cabinet, I came across a small air tank and hose. The tank was about the size of a large salami ... just the right size to be held in one hand while directing the cleaning nozzle with the other. I had forgotten it was there. How ironic that Jim's suggestion arrived a few days later.

Jim wrapped up his note with another unique suggestion that you may want to consider. If you have a dry-air compressor instead of nitrogen tanks on your line, you may want to add a valve to your gas manifold and buy a long hose to attach to it. The compressor will give you "free" air, without the hassles of filling empty cylinders.

■■■

John Bisset is a principal with Multiphase, a technical services company. Reach him at (703) 323-7180. Printed submissions qualify for SBE recertification credit. Fax submissions to (703) 764-0751, or send them via e-mail to wrwbench@aol.com

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★★★

Speaking of catastrophes, when was the last time you checked, cleaned or replaced the filter on the back of your rack-mounted exciter? For that matter, have you ordered a replacement fan?

Many of the exciters will not work without the fan operating. It is an easy-to-forget component until it dies. The fans are cheap, especially if you order a replacement from Granger at (800) 323-0620.

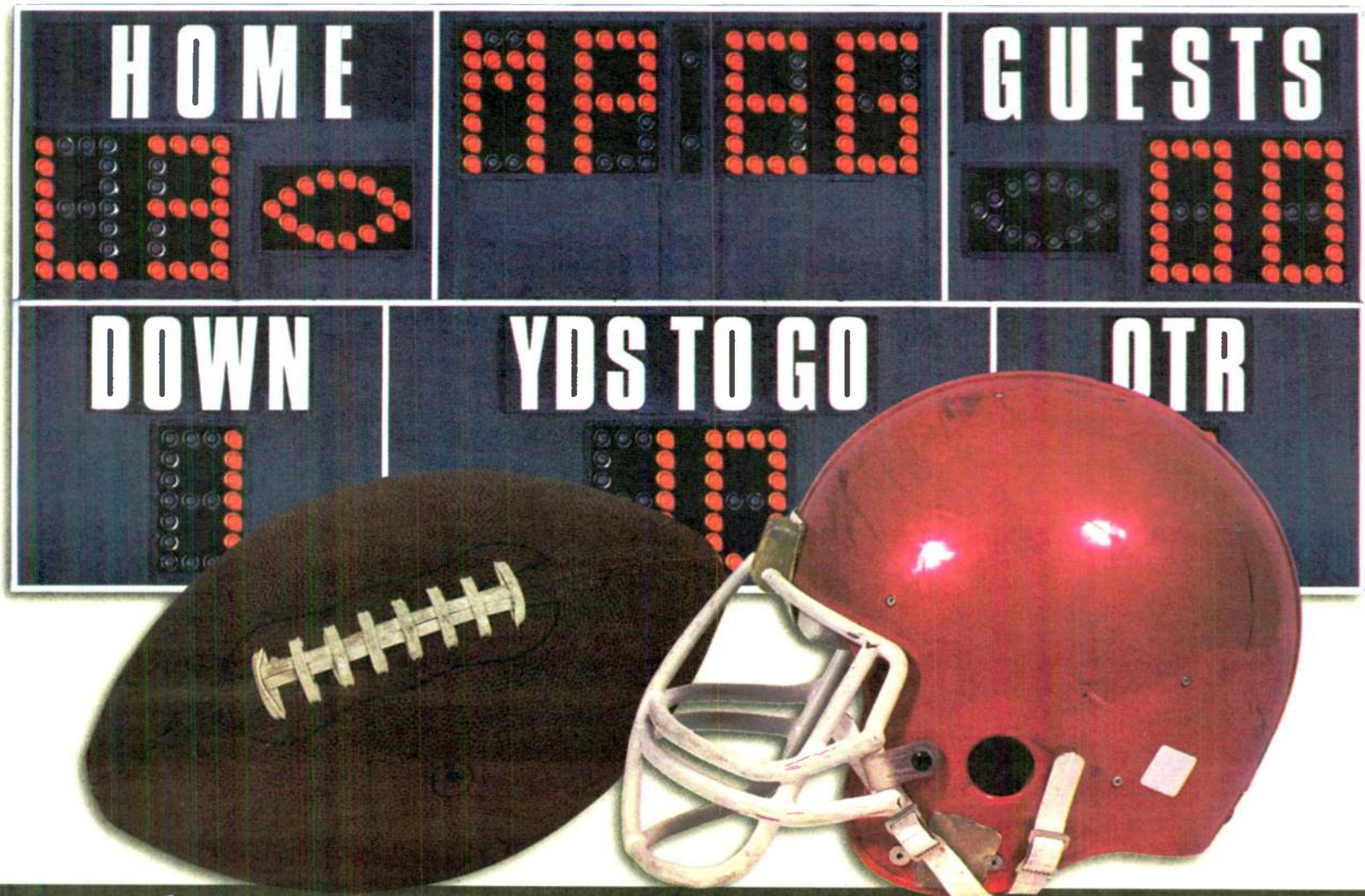
If you have not added W.W. Granger to your business card file, do so. They offer after-hours emergency service at (800) CALL-WWG. After placing your call and explaining your emergency, within 60 minutes your local W.W. Granger branch will call back, and make every effort to solve your problem.

Granger also maintains its catalog on CD-ROM. Drop by your local branch to get a copy, or send your request on station letterhead to: Granger, Office K126, 333 Knightsbridge Parkway, Lincolnshire, IL 60069-3639.

★★★

While on the subject of blowers and fans, here's a trick that will dramatically reduce your downtime when changing out blower motors. Break the wiring running to the motor and install a Molex-type connector. Make sure the connector is rated for the voltage and current the blower motor will draw. Now make up a second pigtail with

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World Radio History



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Circle (82) On Reader Service Card
World Radio History

Are You Ready to Move Up the AM Band?

W.C. Alexander

This is the first in a series of articles about constructing an expanded-band AM facility.

By the time this issue of *RW* hits the streets, just about all the construction permits for expanded-band stations will have been granted. As soon as a grant becomes final, the licensee has 18 months to build the expanded-band facilities. This should be a good year for transmitter manufacturers!

The engineers who build these new facilities have some unique challenges ahead of them. Many will have to deal with shared use of existing sites. Traps and filters will be needed to share the same vertical radiator as their existing regular-band stations. Those fortunate

Hoops of red tape

By the time the FCC construction permit application is filed, the decision of where to locate the new expanded-band station will already be made. The construction permit will spell this out, down to the exact geographic coordinates of the tower. You should also have FAA approval in hand by this point. If this is a new site, you can expect to be up against much preparation to get the site ready to build on.

One would hope that before the site is selected, some investigation is done to determine the zoning and permitted use of the site. If the site's current zoning definition includes use as a radio station transmitter site, or if the site is located in an area where no zon-

ing laws apply, much of the battle already has been won. If not, you will have to get the zoning changed or obtain a conditional use permit.

This process can be relatively easy, or it can be very hard. It all depends on the nature of the surrounding area, the neighbors and the moods of the planning commission and its governing body.

The attorney and civil engineer, having done this many times before, likely will know what questions the planning commission may raise. They can prepare you to answer them. Many planning commissions meet only once a month, and a postponement to give you time to gather information or prepare a response can be costly in terms of time.

Test borings

With proper zoning or a conditional use permit in hand, you are ready to plan the construction. You know where the tower will be located, so you can retain a geotechnical engineering firm to come to the site and make some test borings at the tower base and anchor locations to determine what kind of anchors will be required.

The information obtained from this investigation can also be used to design a foundation for the transmitter building. Have a surveyor come out and lay out the tower base and anchor locations before the geotechnical investigation begins.

The tower supplier generally will provide foundation design services as part of the cost of the tower, so a copy of the results of the geotechnical investigation should be sent to the

tower company. A foundation plan should be returned to you by the tower manufacturer. If the manufacturer has an engineer licensed in your state on staff, he should seal the design drawings with the appropriate state seal.

Otherwise, you will have to retain a local structural engineer to review the design and place his own seal on them. Most municipal and county building authorities will not accept an out-of-state seal on construction drawings.

We will continue our discussion of expanded-band planning in the next issue.



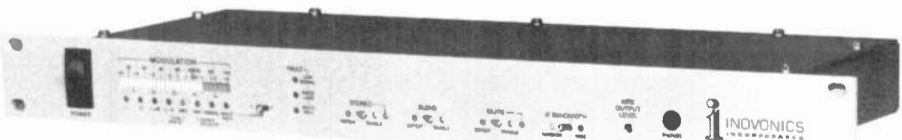
Cris Alexander is director of engineering for Crawford Broadcasting in Dallas. He recently concluded a year-long series of educational articles on the fundamentals of AM transmission systems.

We will target expanded-band facilities, but the principles will apply to any AM transmitter site construction.

enough to be building at new sites have the advantage of not worrying about the difficulties and challenges that shared use presents.

With this article, *RW* begins a new series on constructing an expanded-band station. While we will target expanded-band facilities, the principles discussed will apply to any AM station transmitter site construction. We will look at both new site and shared-use situations, and we will walk through all aspects of the project, from site preparation to program tests. In this first segment, we will consider what it takes to get a new site started.

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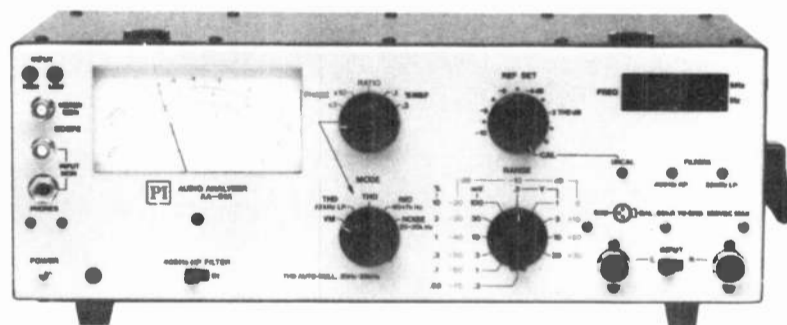
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PRODUCT EVALUATION

WaveStation: Automate for Less Than \$1,000

Alan R. Peterson

Many radio station automation and live-assist packages have price tags comparable to new cars. Enter the \$999 WaveStation 2.71 software package from Broadcast Software International.

WaveStation does most everything the "brand-name" systems do, but on a garden-variety computer that you provide; even a 486-66. For better performance, WaveStation should run on a minimum Pentium 100 (see below).

BSI will build a system for you if you prefer, but greater savings can be

derived from buying only the software and setting up the system yourself.

Shareware roots

BSI founder Ron Burley once authored shareware PC "cart machines." Today, BSI products turn PCs into loggers, phone editors and "instant playback" boxes.

WaveStation works with any soundcard, but performs best with an Antex SX-34. This card is capable of MPEG compression — which allows eight hours per 1 GB space — and can segue two WAV files for clean, live-sounding transitions.

Multiple inexpensive soundcards can

also perform segues, but that means more hardware that could go wrong.

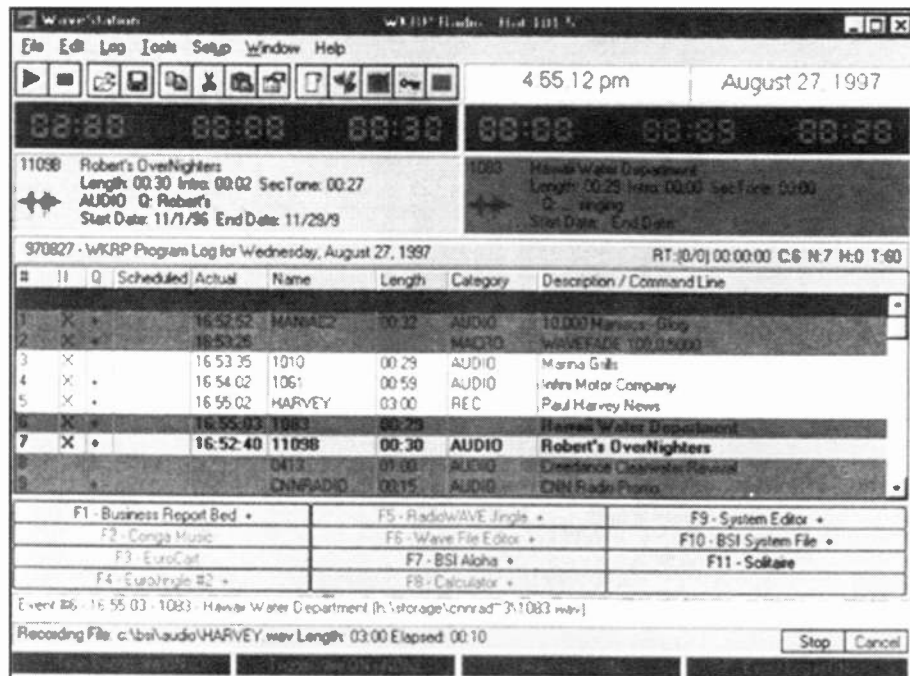
The program is a computer do-it-yourselfer's delight (or nightmare, as appropriate), as it lets you choose the system the way you want or can afford to.

Juke joint

Cable radio station WEBR-FM, Fairfax, Va., loaned me a 100 MHz PC to evaluate WaveStation for its own use.

as a clock for a time-sensitive event like an ID or a lightning bolt for a triggered event. More on triggers in a moment.

The Main screen also can display a hot-key legend. Each Function key on the PC keyboard (F1-F12) can play back an audio event or launch a separate application. The screen is less intuitive than most other automation programs, but this is a minor tradeoff given the \$999 sticker price and may change with later versions.



WaveStation 2.71

The station automates overnight with a 100-CD jukebox and is looking for alternate solutions.

After downloading the newest Antex drivers for Windows 95 from the BSI website, I loaded WaveStation and optional "Say Time" software with no problem. WaveStation booted and played back a sample log (see Figure 1) with a display of current and upcoming cuts. It worked and sounded good, but did not overlap segues.

A call to the BSI support phone number — BSI maintains 24-hour support — revealed I had to go into Setup/Hardware and configure the Antex card as two sound devices. The program then worked fine.

For the insecure, the prospect of opening a computer and tinkering with the forces of the universe inside is a fearful process. WaveStation insists you learn your machine inside and out.

The Main Screen shows the Program Log, topped by two Event Information windows — basically a two-slot cart machine for playback of all events. The active window is green, with the next event shown in gray. Small icons describe the event, such

Many automation systems include a simple Record screen to load material into the computer. WaveStation does this by launching a licensed copy of Syntrillium Software's "Cool Edit."

Learning two programs to accomplish one task may be awkward, but Cool Edit is a powerful audio editor and keeps the cost of WaveStation manageable. You will appreciate having it.

WaveStation exploits the PC's original design by using its built-in game port as an interface to implement specific events. Up to eight switches or closures can be assigned for playback, hot-keying or recording network feeds. An optional I/O card allows the triggering of 24 different events.

Say your station timeshifts Paul Harvey. Your existing network decoder trips a relay which starts WaveStation recording Harvey. At completion, the recording stops.

Triggering also lets you sync your system clock to a news network every hour. Assign a trigger to the TimeSync feature. When it senses a specific decoder closure inside a designated time window, it will

See SOFTWARE, page 25 ▶

Minimum System Requirements:

Windows 95 & NT
Pentium 100 or higher
16 MB RAM for Win 95, 32 MB for NT

Windows 3.1x
486DX2-66 or higher
8 MB RAM

BSI-recommended System:

- Intel Pentium 166 MHz motherboard
- Windows 95 (due to current lack of NT drivers for most peripherals)
- Quantum 6.5 GB "Big Foot" EIDE hard drives
- Two Antex SX-34 audio cards for triple overlap and dedicated record DSP.

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*Computer & monitor not included.

► **SOFTWARE**, continued from page 24
reset the clock to 59:50 and hit the ID and network every time.

When using WaveStation as a commercial-only storage system for a satellite format, pass the satellite audio through the soundcard. An auto-mute feature automatically cuts off satellite audio when a WAV is playing, making proprietary relay trees unnecessary.

What time is it?

Remember those huge automation time-announce carts? "Say Time" does the same thing by assembling individual WAV files, voiced by Burley himself.

These are only test files shipped with the software, to be replaced by local announcers. To his amusement, Burley has ended up as the "Voice of Time" at a number of stations using WaveStation.

Say Time can be reconfigured for "Fifteen past the hour," if you would rather not hear, "The time is ... 7 ... 15." Again: your computer, your call.

Should you lose power, WaveStation has a crash recovery option that looks back at the last event and continues where it left off. Time-sensitive events still are tracked.

WaveStation can be operated remotely by laptop and modem with "PC Anywhere" or similar communications program. Programmers can modify logs from home: jocks at remote broadcasts can control their breaks.

Finally, WaveStation imports logs from external machines. The manual includes a quick lesson that allowed me to create and export a text log from my ancient 386-40.

Thoughts

WaveStation fills a need for a feature-packed, yet inexpensive, automation system.

I see it as a cost-effective choice for mid- and small-size stations; especially lean-running AM properties. It earns points for working on less-powerful machines, but don't skimp: it runs on a 486 clunker, but runs better on a Pentium, and I have seen basic 150 MHz Pentiums selling for \$849.

The manual encourages tweaking, pointing out ways to alter the machine's

INI files and Virtual Memory SwapFile sizes. Outstanding tinker-tips are on the BSI homepage (www.bsiusa.com).

Burley and company respond well to wish-list items and frequently send out beta versions to users to see what they think. Here I add my own wishes to the next list:

Instant drag-and-drop editing: For request shows or during "train wreck" moments when nothing is on the air, I would like to pull down a list, grab a cart and slam it into the audio queue *now*.

Cue channel: A third soundcard and a little extra code means an event could be auditioned through a "cue channel" while the rest are lined up to play. This way I could rehearse an intro, test a segue or listen for an outro.

The manual: I must have received a copy printed between versions 2.70 and 2.71, because the page numbering scheme was a few pages off.

BSI has created an effective automation program with WaveStation 2.71 and it is constantly evolving. You provide the

PC and the sweat equity — it may be worth the price to you both financially and in understanding more about the heart of your station.



For information, contact Broadcast Software International in Arizona at (602) 572-8525 or circle Reader Service 89. Visit www.bsiusa.com for a functional 30-minute demo.

Alan Peterson is RW technical editor and technical advisor to WEBR-FM, Fairfax, Va.

Software Even Scrooge Would Love

If the \$999 price tag of WaveStation is still too steep for a station to handle — and that is hard to believe — there are a few programs available on the Internet you should know about.

All are less expensive than the BSI product, but be aware of the tradeoffs: You likely will end up with a record/playback package only, with little or no integration to your traffic or music scheduling systems.

If these conditions do not alarm you and you enjoy the pioneer spirit of "making do with what you have," then take a look at three ultra-budget alternative automation packages for your station. None of these programs have been tested or evaluated by RW, and are listed here solely for information and comparison.

Radio Wolf is a cartridge replacement and station automation package from Radio Wolf Software Pty. Ltd., Australia, and can be found at the Visitor Radio Victoria website home.vicnet.net.au/~visradio/wolf

The Radio Wolf page calls the product "revolutionary new software that manages your commercials, effects and music at an affordable price": a mere \$99.

Radio Wolf features uncomplicated drag-and-drop event scheduling, instant access to WAV files and CD tracks from one screen and automatic date and time

stamping for every commercial played. Playlists can be assembled and played immediately or programmed for overnight playback. Radio Wolf provides quick reports of actual air times for every advertiser, optional kill dates and fast event replacement.

An optional royalty-free library of 3,000 sound effects and music beds is available.

Radio Wolf uses a conventional home PC with stock sound card. The home page contains a full working demo of Radio Wolf that you can download and use for 15 minutes at any one time.

Raduga is a \$329 software package. The 32-bit application runs under Windows 95 or NT, so it supports long file names. You can create playlists by dragging audio files from the explorer into the Raduga window. Songs may be rearranged by clicking and dragging.

Raduga can segue between two events with configurable overlap time, can shuffle all playlist items or read from a log, has one-key shortcuts (such as P for Play) and features large indicators for Previous, Current Playing and Next Track.

Raduga runs on a 486 or higher with 16 MB RAM (20 MB for Windows NT). Any Windows-compatible sound-

card can be used, although to use the segue (overlap) feature, the sound hardware must be able to play two independent voices concurrently. The Turtle Beach Tahiti and Antex SX-34 are two such cards that support multiple voices.

Find the demo at www.themesearch.com/raduga

Finally, from Kennet Software comes **DigRad DJ**, a cartridge replacement program with an on-screen clock similar to the one found on the PR&E Integrity digital console.

While not an actual automation program, it can be programmed to play a sequence of audio events as an "auto run" list. Kennet Software is working on a product to be called DigRad Studio which may be worth watching for.

As in the other programs, DigRad DJ runs under Windows95 and NT and uses a conventional PC with soundcard. Up to 21 events can be prepared for instant start. All audio files are stored in a database for easy access. Choose the category, find the WAV file and drag it to a "cart slot" or to the auto run list. Start the event with the function keys (F1-F12) and 1-9 numerical keys on your keyboard.

DigRad DJ is \$99. The 5 MB demo can be found at www.kennet.se

— Alan R. Peterson

Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

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READER SERVICE NO. 112

SBE NEWS

EAS Now Moves Toward Cable

Gary Timm

Six times a year, *RW* provides space for the Society of Broadcast Engineers to inform our readers of activities at the society.

Radio engineers who want to know the latest developments on EAS technology and requirements should, for the time being, keep their eyes on cable TV and wireless cable operators.

The FCC finally has released the EAS rules for cable TV. All cable TV and wireless cable operators must participate; smaller systems have less stringent requirements. The new EAS mandate applies to wired cable, as well as wireless cable, which uses microwave channels in the MDS, MMDS and ITFS services to deliver video to subscribers. Exempted from the rules are SMATV, and Open Video Systems (formerly known as Video Dial Tone).

Cable EAS deadlines

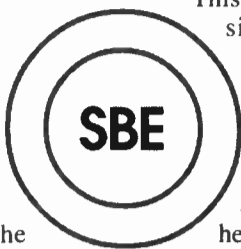
By Dec. 31, 1998, cable TV systems with more than 10,000 subscribers per headend must install equipment to provide an audio and video EAS message on all channels.

By Oct. 1, 2002, cable TV systems with 5,000 to 10,000 subscribers per headend, and wireless cable systems with more than 5,000 subscribers per single transmission site, must also comply with the above requirements.

Also by the latter date, cable TV and wireless cable systems with less than 5,000 subscribers either must provide the national EAS messages on all channels via their national video providers or provide a video interrupt and audio alert message on all channels to direct viewers to a single channel where the full EAS message is being presented; or these systems can comply with the full

requirements of the larger systems.

The option of presenting the EAS message on a single channel was offered as a cost-saving measure for smaller cable and wireless systems.



This all-channel interrupt with single-channel message is projected to cost \$6,000 to \$10,000 per headend. The all-channel message system is expected to cost the larger operators from \$15,000 to \$20,000 per headend.

Tougher cable rules

These final cable rules adopted by the commission are more demanding than those originally proposed. The less-expensive, single-channel-message option was to be offered to all cable systems, large and small. Further, cable systems choosing that option were to install in-home alerting devices for the hearing impaired.

The hearing-impaired community felt that this would not serve them adequately, particularly if they were not at home where the device was located. The FCC responded by mandating the all-channel, audio/video EAS message for large cable systems, but it dropped the requirement of the in-home device on the single-channel-message, small-system option. The hearing-impaired community felt this was a fair trade-off.

The FCC will consider, on a case-by-case basis, individual cable system requests for an exemption to the EAS rules, based on: justification for request, financial status for previous two years, number of other EAS services in the service area, and the likelihood of hazards in the area.

As with broadcasters, cable operators are required to carry only national EAS messages. The relaying of state and local EAS alerts is optional. The FCC does recognize that many cable franchise

agreements contain alerting requirements to allow local officials to access the cable system.

The commission will not preempt any local alerting requirements, unless they interfere with the delivery of the national EAS message. In fact, the FCC encourages the use of EAS at the local level, stating that the commission will "permit the use of EAS Header Codes in franchise agreements."

Interrupts by cable

Perhaps the item of most interest to broadcasters in this FCC Second Report and Order is the issue of cable TV systems interrupting the signal of local broadcasters to deliver a cable-system-generated EAS message.

First, the rules have been modified to clarify that a cable operator, upon written agreement with a broadcaster, may elect not to interrupt the programming of a broadcast station carrying news or weather-related information. The rules previously stated that the EAS message itself was the only thing that would not be interrupted.

Second, the FCC believes that the potential disruption of broadcast station emergency information by local EAS cable messages warrants further investigation.

"Therefore, the commission will promptly issue a Further Notice of Proposed Rulemaking focused on whether the commission's rules are adequate to permit broadcasters to provide their audiences with important local emergency information without interruption by EAS messages provided by cable systems."

Broadcasters concerned about cable TV interrupting their station's signal should file comments on the FCC FNPRM, which as of this writing was due out soon. Find it at: www.fcc.gov/cib/eas/document.htm

The EAS Second Report and Order on

cable TV also is located there; it is known as document "FCC 97-338."

■ ■ ■

Gary Timm is chairman of the Wisconsin State Emergency Communications Committee (EAS Committee) and a member of the SBE EAS Committee and FCC EAS National Advisory Committee.

65 Years Ago

Reprinted from Radio World (October 1, 1932).

Editor's note: The *RW* of old, printed for a time in the 1920s and 1930s, and today's *RW* are unrelated except in name.

NBC ELECTRIC CHIMES GIVEN AUDIENCE TRIAL

The National Broadcasting Company chimes, which for years have kept the networks in synchronous step, have changed their tone.

An automatic electrical device, sending out a modulated, even tone at a constant level, replaced the familiar hand-struck chimes on all programs emanating from the NBC New York studios.

Purpose of Chimes

The contrivance, invented by Captain Richard H. Ranger, designer of the pipeless organ and the bell-less carillon, has been installed in the main control room of the NBC Building in New York. If the trial period proves its operation practical and its precise notes pleasing to the public, it will be adopted as permanent equipment at the New York Studios and also installed in the main control rooms of NBC Studios in all other cities.

The purpose of the chimes, which previously have been rung by the announcer striking one of the small hand sets with which each studio is equipped, is to synchronize local station identification announcements, and to serve as a cue to engineers at relay points all over the country to switch various branches of the networks on or off as the programs change each fifteen minutes.

Automatic Adjustment

For some time technicians have been seeking some automatic instrument which would insure a more constant level than could be obtained when different announcers were required to produce the three notes on different instruments.

The device itself is based on the old-fashioned music box. Actually, there are no chimes, only electrically created tones. A revolving drum with properly spaced pins, striking against a series of metal reeds, tuned to the chime pitch, produces electric vibrations which are picked up and amplified.

7-Prong Tube Offers a Variety of Uses

W. L. Krahl, Chief Engineer of the Arcturus Radio Tube Company, Newark, N. J., said:

"We have developed a new seven-prong tube embodying a filament, cathode, control grid, suppressor grid, screen grid and plate. All of these elements within one bulb results in one of the most versatile tubes ever made. By various connections, this new tube can be used as a Class A amplifier, triode driver-output tube, Class B triode or a pentode output tube.

"Here is a definite example where a multi-element tube, involving difficult manufacturing processes, results in improved performance of a radio receiver."

From the FCC Second Report and Order:

"In response to these concerns, we have modified our rules to clarify that a cable operator (upon written agreement with the broadcaster) may elect not to interrupt the programming of a broadcast station carrying news or weather related information. (Our rules previously provided simply that the EAS message itself could not be interrupted.)

"In addition, we believe that the potential disruption of broadcast emergency information by voluntary local EAS cable messages warrants further investigation. (See letter dated Sept. 8, 1997, from Billy Tauzin, Chairman, Subcommittee on Telecommunications, Trade, and Consumer Protection to The Honorable Reed E. Hundt, Chairman, Federal Communications Commission.)

"We are particularly interested in comments addressing how best to encourage voluntary cable participation

in the local emergency system without diminishing or adversely affecting emergency coverage by broadcast stations. We will seek comment on issues such as the types of equipment that might selectively override equipment and its installation, and the appropriateness of the broadcast information in specific circumstances, e.g., cable systems remote from the center of broadcast service areas. We will also seek comment on the extent to which franchising authorities have imposed requirements for local cable emergency information, whether such franchise requirements would be inconsistent with a requirement that broadcast emergency information be made available, and whether such requirements enhance or diminish emergency information in those franchise areas."

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- Optional SMPTE Kit and FS Converter Kit
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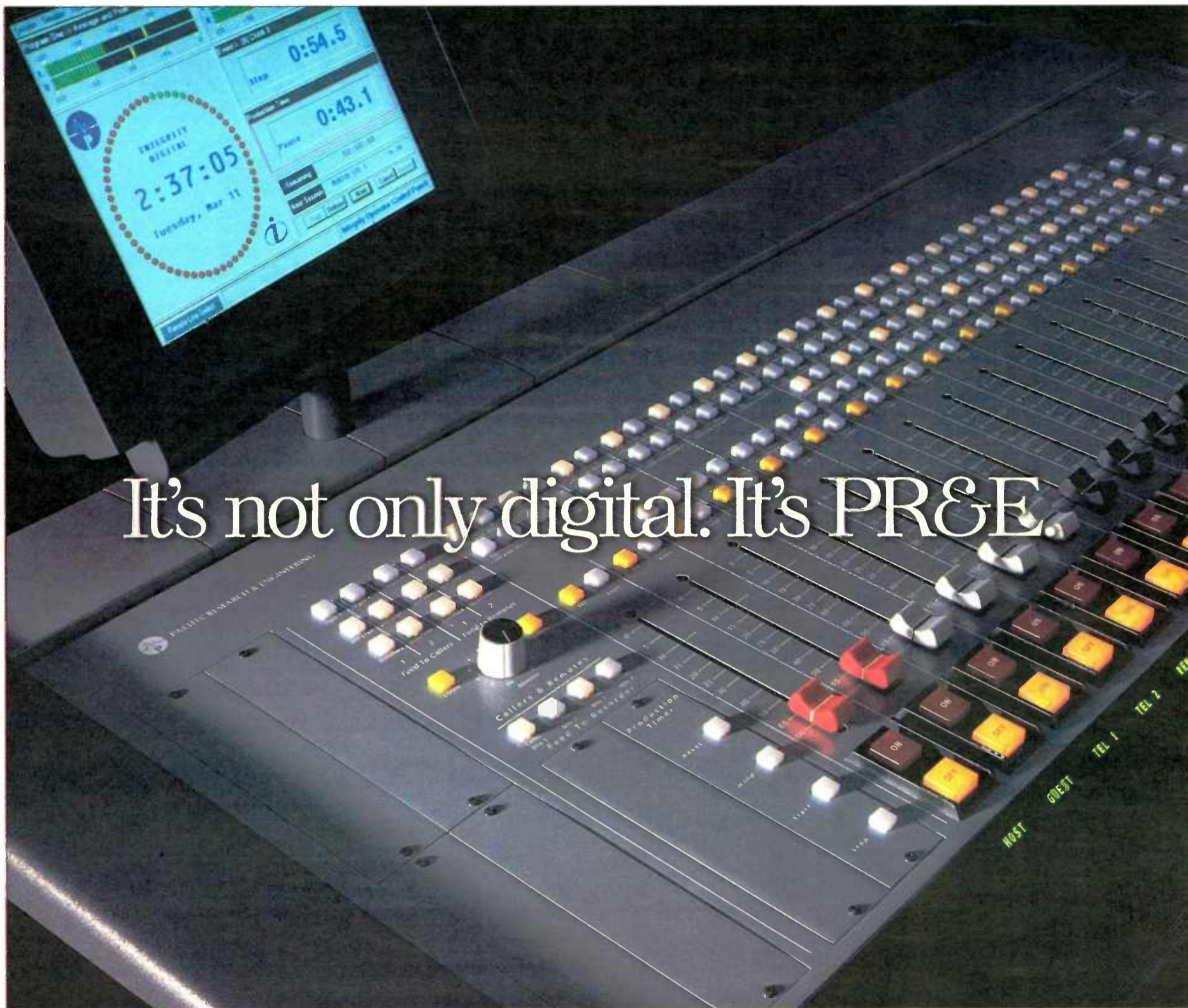
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PACIFIC RESEARCH & ENGINEERING

Circle (83) On Reader Service Card

World Radio History



KFMB-FM Chooses PR&E

Pacific Research & Engineering recently delivered its first two Integrity digital broadcast consoles, for use in the production and broadcast studios of KFMB-FM, San Diego.

Michael Dosch, COO of the manufac-



turer, said the installation is "very important" to PR&E. He said it reflects the industry's continuing advancement into digital broadcasting.

The Integrity console is built around a computer, which allows the user to reconfigure and automate console settings and functions easily. The Integrity digital console features fully automatic, redundant backup systems for uninterrupted operation.

ERTU Orders 300 PORTADATs

The **Egyptian Radio and Television Union** purchased 300 PORTADAT PDR1000s from **HBB Communications**, the supplier said. The application is ENG and OB work.

HBB said ERTU chose to upgrade to digital audio tape because of the format's



quality, low media cost and long record times. The determining factor in favor of the PORTADAT, the company said, was the four-head transport design, which allows confidence monitoring. According to HBB, the PORTADAT PDR1000 is the sole four-head, non-timecode DAT portable on the market.

MUSICAM EXPRESS Serves 'Neon Nights,' AGT/SpotLink

"Neon Nights," a new, live country music program produced by **Broadcast Programming** and hosted by Scott Evans, recently debuted nationwide by utilizing satellite distribution services provided through the **MUSICAM EXPRESS/StarGuide Digital Network** as well as

MUSICAM compression technology.

Dave Newton, vice president of marketing for Broadcast Programming, said the company chose MUSICAM EXPRESS for its "high-quality audio (and) the option of automating seamlessly."

MUSICAM EXPRESS is providing real-time satellite distribution through an uplink to GE Satcom 5, while affiliates receive the program by means of the StarGuide II digital satellite receiver.

The audio delivery supplier also said it agreed to provide radio distribution services to AGT/SpotLink. That company offers volume reproduction and distribution of commercials for radio and TV. The subcontracting agreement with MUSICAM EXPRESS will benefit many of AGT/SpotLink's clients, including some of the world's largest automotive, entertainment and fast food companies.

Miami Stations Add Lightning Protection

Paxon Broadcasting stations **WINZ(AM)** and **WFTL(AM)** in Miami



have added structural lightning protection systems to their AM towers. The Streamer Retarding protection systems were designed and made by **LightningMaster Corp.** The linear dissipator consists of a central cable with dissipator wires inserted continuously within the wind of the cable.

The supplier, based in Clearwater, Fla., serves the broadcast and cellular industries. It offers integrated bonding and grounding, surge suppression and related products.

"Who's Buying What" is printed as a service to our readers who are interested in how their peers choose equipment and services. Information is provided by suppliers.

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machine, which means fully digital on-air delivery without all that staff training time. Sound Slate goes even further, putting a complete range of sound effects and audio at your talent's fingertips.

For commercial scheduling, AirTime's touch screens and easy schedule builder lets you create a commercial once, then access and reschedule it from one powerful database. The same huge, flexible database lets a program director store, organize, and play on-air resources at will.



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Radio Takes
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Page 39

Radio World

Resource for Business, Programming & Sales

December 10, 1997

Behind the Scenes at 'Companion'

S.D. Yana Davis

Live performance radio is increasingly rare, which makes the production of "A Prairie Home Companion" unusual.

Producer Chris Tschida said the staff is "pretty small," including herself, Technical Director Scott Rivard, Assistant Jeff Johnson and Sound Engineer Sam Hudson. Associate Producer Stevie Beck handles agents and talent; company manager Rob Knowles handles travel and accommodations for guests; Katie Reckdahl is in charge of liaison with affiliates; Kathy Mack is music librarian; and Joyce Besh is administrative assistant. At the theater are a stage manager, an assistant, an additional stage hand to do mic moves and get the acts on and off seamlessly, and a lighting person.

Backup plans

Mic placement depends on the number of performers. There are usually at least four mics, but there can be as many as 12 feeding house and broadcast mixes. Contingency plans include redundant equipment, generator and a taped "evergreen" show.

The work week starts on Tuesday, with Keillor coming to MPR to record promo spots for the show. Late details involving guests are made on Tuesday and Wednesday, and scripts by writers other than Keillor are reviewed.

By Friday, the crew is in the theater, whether the Fitzgerald in St. Paul or the road venue. "The set-up for the show takes place then, the music is assembled and parts books readied," Tschida said. "We have a band call. ... Then script rehearsal at 6 or 7." For road shows, the crew travels Thursday, strikes and loads the truck after the Saturday broadcast, and travels home Sunday.

Guests are handled with care. "We can't pay an awful lot, so we treat them well," Tschida said. "We do research for the tour cities: Who is interesting from this area? Who might be in town? What says 'this city' to the listener?"

There are occasional problems. Tschida says her "worst nightmare" occurred before a broadcast from Yellowstone National Park.

"About 10 minutes to broadcast, a huge bison came wandering out near the uplink truck, and sat down just inches from the (satellite) transmitter. If the big beast had rolled over, we would have been off the air, and some pretty expensive equipment crushed, too. Luckily he was a docile animal."

RW INTERVIEW

Keillor: 'It's All Writing'

S.D. Yana Davis

Assigned to write a story about the "Grand Ole Opry" by The New Yorker in 1974, Garrison Keillor started wondering how he could do a similar program, but with a different twist. Keillor's radio show would feature an eclectic blend of music, humor and comedy, and the all-important live audience.

'Prairie' is born

A native of Anoka, Minn., Keillor began his radio career during college and ended up as a classical music host on the then-fledgling Minnesota Public Radio network in the early 1970s. Keillor took his program idea to MPR founder and president Bill Kling, who gave it the green light.

The result was "A Prairie Home Companion," first broadcast in 1974 to a studio audience of 12, and probably not too many more at home. However, the program gained popularity with regular weekly broadcasts during the 1970s on Minnesota Public Radio. When MPR began to syndicate the program nationally in 1980, "Companion" immediately assumed the 800-pound gorilla status among public radio programs.

"PHC," as it is known to many of its fans and most of the public radio system, has never been a National Public Radio program. NPR turned down the program prior to its independent syndication by MPR.

Now, 25 years later, "PHC" is still the 800-pound gorilla of the public radio system. And, without any question, Keillor is "PHC." He is the only host the program has ever had, and does most of the writing himself. Keillor also makes final decisions on guests.

The weekly "PHC" audience usually exceeds 2 million adults, mostly age 35 to 54. The strength of the program is its skillful mix of music and humor.

Although most broadcasts originate live Saturdays 6 to 8 p.m. (EST) from the Fitzgerald, Keillor and his crew go on the road several times each year. A few repeat broadcasts round out the schedule. Many of the 500 or more stations that carry "PHC" repeat the Saturday evening broadcast the following day.

A successful author of humorous fiction, including the recently released book "Wobegon Boy," Keillor writes "The News from Lake Wobegon" as well as the show's "commercials" and ongoing skits, such as ones that feature the luckless and usually clueless private detective "Guy Noir." He's backed up by several regulars, including sound-effects genius Tom Keith, actors Tim Russell and Sue Scott, and a five-piece house band.

In an interview with RW, Keillor offered his own views about "PHC," himself and his writing.

RW: A "Prairie Home Companion" began in 1974, went into national distrib-



Garrison Keillor

tion in 1980, and was reborn after a lapse of a few years in 1989. What do you see as the differences, if any, in the first run of the program and the second?

Keillor: The second run, which is now almost as long as the first run, is a lot more fun, for one thing, perhaps because the "PHC" staff is so capable and professional. It really helps to have good people running things for you. The show is less

reverential about the Midwest, less self-conscious, and (I think) funnier. We throw guys in suits off cliffs, we blow up stacks of books, we have two cowboys on the run from the law, we have elk and orangutans running around, Maurice the maitre d' is as snooty as ever, Guy Noir is still trying to find the answers to life's persistent questions, and a good time is had by all. Lutherans come to our show and actually laugh out loud, that's how funny it is.

RW: What makes "PHC" so appealing to such a large audience?

Keillor: It's on at a bad time, Saturday afternoon, the worst time to draw an audience, and so there isn't much else on at that time. We have the slot all to ourselves.

RW: Briefly, how is the show put together each week?

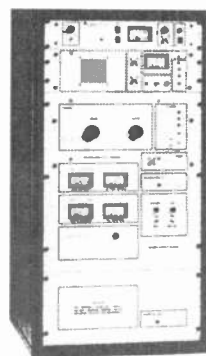
Keillor: That's just it, it's put together briefly. On Thursday morning I sit down and start writing and I finish by Friday evening, and then we have a read-through with the actors. Then I rewrite on Friday night, and on Saturday morning I think about "The News from Lake Wobegon," and at 3 p.m. (CST), we do a sound check, and at 5 p.m., the show goes on the air.

RW: How much of the writing, other than "The News from Lake Wobegon," do you personally handle?

See KEILLOR, page 32 ▶

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Behind the Scenes at 'Companion'

► KEILLOR, continued from page 31

Keillor: I have been doing all the writing this season. Did almost all of it last season. I seem to be the only writer old enough to remember what radio is supposed to sound like.

RW: How long do you think "PHC" will continue? Is there any time limit in your mind to the life of the show?

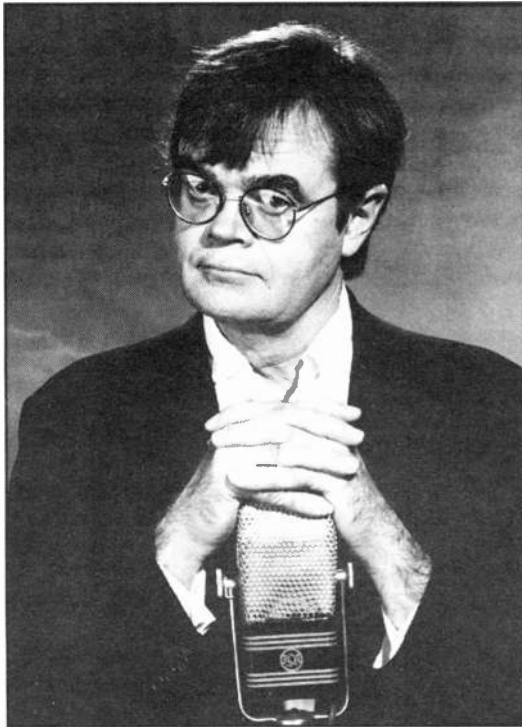
Keillor: I think it has a good long life left. I get a big kick out of doing the show, and it's the only social life I have. If it weren't for "PHC," I'd never see people at all. And it's a flexible show, so it can change a lot, or seem to change, and that helps sustain people's interest, which of course is the real determining factor. If people want to listen to it, it'll keep playing.

RW: Recently, you were critical of NPR's "All Things Considered." What is your assessment, generally, of the major programs offered today in the public radio system? Which are the jewels, and why? Which are lemons, and why?

Keillor: Radio is a daily operation, like writing love letters in the sand, and so today's lemon can be tomorrow's jewel. My criticism of NPR is that it's executive-heavy, run by people who are out of touch with radio, and the direction of "All Things Considered" over the past many years has been away from hard news and toward a magazine format with a lot of "soft" material — commentary, artsy interviews, audio "essays," a lot of yuppie thumb-sucking. At a time when newspapers are in precipitous decline, when a majority of Americans don't have a decent newspaper available to them, public radio needs to become a serious news medium again. Otherwise, it's hard to justify it. Our future is not as the Lifestyles of the Left and Stylish network.

RW: There has been an intense debate, especially during the last 10 years, over

the direction public radio should take. Some elements of the debate include programming for as wide an audience as possible versus mission programming, and the fund-raising role, i.e., how far toward commercialism noncommercial radio should go. What makes good programming, and is public radio becoming commercially oriented? Is that good or bad?



Keillor: Public radio programming is tied to the notion of quality, which has mostly disappeared from commercial radio, where people would eat live cockroaches on the air if that's what the audience wanted. Our audience wants something else. They aren't all college grads, aren't all white, aren't all liberals, aren't all anything, but they do have high standards, have a sense of history and an appreciation of the classics, are intellectually curious, and they're fun to second guess, but they do expect something high-grade, and if we lose those people, then we lose everything.

As for commercials, I think you can expand the underwriting announcement

to include a little sell, but that's it. Public radio has a sustained sound, another thing that distinguishes us from commercial radio, and you can't afford to chop it up with commercials.

RW: You're on tour now for "Wobegon Boy," your most recent book. What are the best things you've written and why?

Keillor: I like ... some of the letters in "We Are Still Married," and "Zeus the Lutheran" and "Lonesome Shorty" in "The Book of Guys," but I think this book is my best. And the one after this one will be better.

RW: "Wobegon Boy" is about a fictional public radio station manager. What prompted you to write the book? Is this a message book, and if so, what is it?

Keillor: "Wobegon Boy" is a work of fiction, written because I wanted to write a funny book, and the message is that romance lends magnificence to a man's life and that down deep life is comical.

RW: What kind of person is Garrison Keillor? Private? Shy? Outgoing? What made you want to get into the radio business? What keeps you there? What's the relative value to you of your career as a writer versus your career in radio?

Keillor: He works hard, for one thing, and plugs ahead on all sorts of projects, some promising, some dubious, and still enjoys sitting alone in a room and looking at blank paper, which is where writing begins. He's private, of course, like all writers, but he gets around, and what made him get into the radio business is what keeps him there: He is fond of the little box and likes his work. He no longer weighs the relative value of radio and writing: It's all writing.

Equipment Used to Mix 'Companion'

Microphones: AKG C460, C452, D1200 and D112; Audio-Technica 4031; Beyer M88; Sennheiser MKE2; Shure SM57, SM78, SM98 and Beta87.

"Companion" provides its own stage cabling, microphone snakes, splitter using Jensen transformers, and snake and fantails to the house sound console.

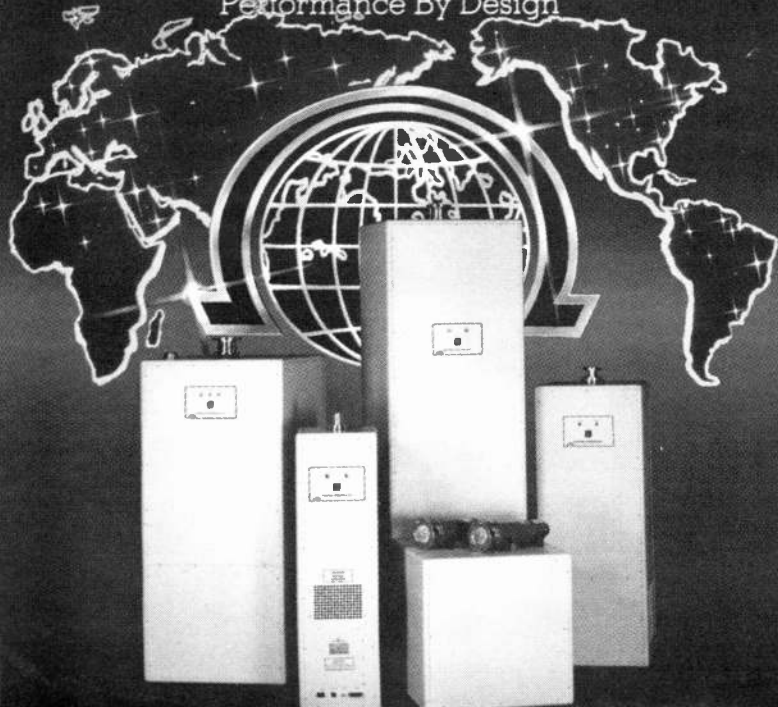
Broadcast Mix Console: Crest/Gamble EX56 56-channel console; modified with 12-position talkback; separate 12-position monitor select for both technical director and assistant engineer with mono comparability sum switch; 12-position test oscillator routing; upgraded bus mix amps.

Peripheral Equipment: (2) each

Lexicon LXP1 and LXP5, MIDI controlled by MRC; (2) Behringer Composers; Klark-Technic DN780; Aphex Compellor; Drawmer Gate; DBX900 rack with expanders and parametric EQ; Sony 2800 DAT machines; Tascam DA30 MKII DAT machine; Revox PR99 two-track; Denon CD player; ESE countdown master timer with two slave displays; Gentner Digital Hybrid III.

House Sound & Stage Monitor: This equipment is mostly rented. A typical system would be either a Soundcraft Europa or Yamaha PM4000 console; a main speaker system of EAW KF850s or equivalent; monitor wedges (8) EAW 200; (8) hot spot stage monitors are brought near the field monitor as needed.

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Aim for the Powerful P1 Listener

Who listens to your radio station? A new study shows the diverse, format-specific listening patterns of Arbitron diarykeepers.

"With this information, station managers and program directors will be better able to assess the effectiveness of their programming and branding strategies by comparing the behavior of their ... listeners to national benchmarks for their formats," said Customer Communications Senior Analyst Claudine Knisley.

Eight core programming consultants helped design the prototype study, which focused on "the most solid-performing and successful stations within each format." An additional 55 programming consultants provided input on the prototype study.

"America's Top Stations" aims to give programmers format-specific information about diarykeepers. "With the increase of niche format programming and marketing, the need to understand more about diarykeeper listening patterns within the various formats and with their most preferred (P1) station is of the essence," the study states.

P1s Drive TSL

Chief among the findings of "America's Top Stations: A Format Profile," a nationwide study, is that listeners spend large amounts of time with P1 stations. P1 listeners provide more than 70 percent of all AQH listening, even though they account for slightly more than one third of all diarykeepers for a typical station.

Formats with more than 40 percent P1 listenership include soft AC (41 percent), country (43 percent), MOR (46 percent), CHR/rhythmic (41 percent), Spanish contemporary (41 percent), Spanish regional (43 percent), Talk (42 percent) and Urban (47 percent). Sports, talk and rock registered below-average P1 listenership (13, 19 and 19 percent, respectively).

The racial make-up of P1 listeners confirmed the preference among black listeners for Urban and Urban AC formats (80 and 87 percent, respectively) and near unanimity of preference for Spanish formats among Hispanics. Regional and tropical Spanish formats scored 100 percent listenership among Hispanics, with contemporary and Tejano formats both pulling 98 percent of Hispanic listeners.

"Black," "Hispanic," and "Other" were the only possible answers to the question of race/ethnicity.

"Other" P1 listenership is strongest for MOR and adult alternative (96 percent), country (93 percent), classical (92 percent) and alternative (89 percent).

P1 listening at work is strong for '70s/classic rock (56 percent). MOR (75 percent) scores well in at-home listening among P1 listeners, while sports has the strongest P1 listening in the car (37 percent).

— Chris Hamaker



During RAB Client Day in October, Judy Carlough, executive vice president of the Radio Advertising Bureau, and Gary Fries, president and CEO of the RAB, presented a recognition plaque to Tony Ponturo, vice president of corporate media and sports marketing for Anheuser-Busch Inc.

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Syndicated Southern Gospel

"'Music City Reunion' will become for southern gospel music what 'Crook and Chase' has become for country music," said Jim Black, vice president of Network Development for Reach Radio Network. The weekly hour-long program is delivered on CD.



"It has been years since anyone introduced a syndicated gospel radio show, so we know that

this show is long overdue," Black said.

Gary McSpadden and Tanya Goodman-Sykes host the program, which contains 45 minutes of music and talk and five minutes of syndicated advertising, leaving 10 minutes for local advertising.

Black said his company has been "overwhelmed" by the initial affiliate interest.

For information contact Jim Cumbee or Jim Black in Tennessee, (800) 742-3969; or circle Reader Service 93.

Play It Safe

With the cold winter weather come treacherous conditions and increased risks



for accidents.

That's why Grace Broadcast Sales has launched its Winter Safety Campaign, a series of 25 one-minute safety features with an additional :20 slot for sponsorship. To hear a demo, dial (509) 229-1427 anytime.

GBS encourages stations to purchase the complete package of announcements for \$199, and approach community electricians, plumbers, auto parts stores and towing services as potential sponsors.

For more information contact Rod Schwartz at Grace Broadcast Sales in Washington, (888) 472-2388; or circle Reader Service 132.

Funny Material

The news is always changing, and with those changes come new opportunities to make light of the latest headlines. Your morning host or afternoon drive personality could use fresh material each day, as long as it's funny, right?

Newsjoke Inc. provides "up-to-the-minute" comic material for use on the radio, or during your next meeting with company fuss-buckets. Three pages of edgy, topical humor from New York's hottest young comedians will be faxed to you for a mere \$10.

But don't think "bawdy." The humor might be "edgy," but it's also clean. If you want proof, check out a free sample of some older material by logging onto www.newsjoke.com.

For information contact Mark Spiegel in New York at (718) 461-9600; or circle Reader Service 171.

Against Abuse

Male artists representing different musical genres join for a new series of PSAs condemning domestic violence.

Clint Black, Richard Marx and Coolio are some of the participants in the campaign, commissioned by Liz Claiborne Inc. Women's Work program. The goal of the announcements is "to help reposition relationship violence as a men's issue."

Distribution is targeted to top 40, R&B and country stations.

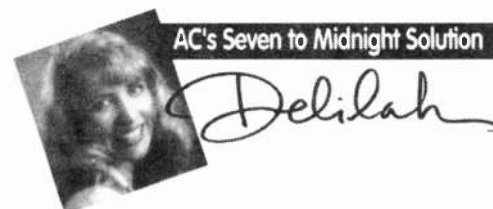
"If you think someone who abuses his girlfriend or wife is weak, than what do you think of someone who stands by and lets it happen?" asks the celebrity musician in one spot. "You can be the buddy, the teammate, the brother who finally stands up and says something. Get involved. Say something, anything, but whatever you do, don't be silent. To help or get help, call the National Domestic Violence Hotline at (800) 799-SAFE."

For information contact Tracy Garfinkel at Patrice Tanake & Company, Inc., (212) 229-0500; or circle Reader Service 210.

100 and Counting

What a year it has been for the "Delilah" show. "Delilah," from Broadcast Programming, debuted Jan. 1 on 11 stations, and signed its 100th affiliate in late October.

Broadcast Programming sells "Delilah" as "AC's 7 to midnight solution."



For information contact Leslie Cohan at Broadcast Programming in Washington, (800) 426-9082 or circle Reader Service 16.

Auto Answers Here

A new traveler on the information highway is "America on the Road."

The syndicated automotive program has a new website at www.talkcity.com/autoo/ramp/aotr

The site includes links to RealAudio broadcasts of the radio series, chat rooms, links to program advertisers



and sponsors, contests and message boards.

The site was established with the help of Internet company Talk City.

For information contact "America on the Road" in Maine, (207) 781-5036; or circle Reader Service 55.

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READER SERVICE 39

Radio Proves Effective At Reaching Teens

We've all heard of the Generation X crowd, but Generation Y? According to a study by Interep Research, this Generation Y group, otherwise known as today's teenagers, make up a market worth some \$108 billion. That translates into a potentially huge revenue source for radio.

"Teens are one of radio's best lifestyle fits," said Marla Pirner, Interep vice president/director of research. "Teens now have more personal money to spend at a younger age and are also increasingly responsible for influencing family purchase decisions."

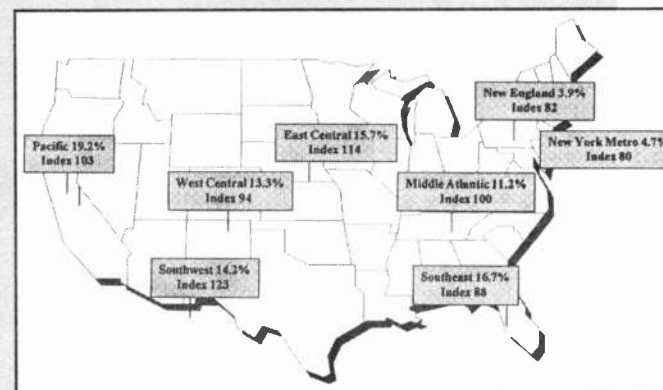
The study found that radio was earmarked as the medium of choice to be the most effective in reaching teens.

- Radio listening is ranked as the second most popular leisure activity, at 10.1 hours per week

- Formats with the highest concentration of teen listeners include CHR, urban contemporary and alternative/modern rock

- In the average weekday, teens spend 33 percent of their media time with radio.

What does this mean for radio clients? Plenty, especially to the top three spending categories for teens: clothing manufacturers, entertainment advertisers and fast-food



restaurants.

"Using radio to speak to teens is a logical choice, and we almost always pique the interest of teen marketers," said Rick Berger, director of youth marketing for Next Generation Radio and Interep. "Initially, most advertisers equate teens with television ... we can show them from past experience how adding radio to the media mix will increase the effectiveness of their campaign tremendously."

— Sharon Rae

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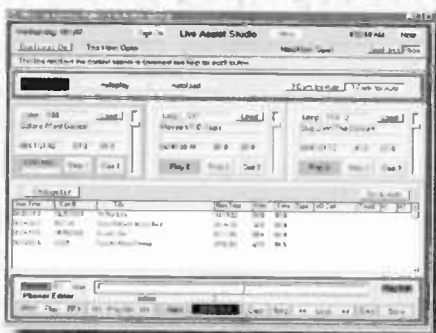
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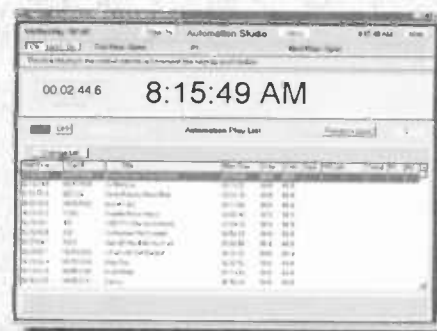
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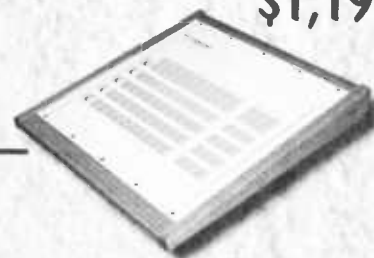
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World Radio History



One-Man Cable Station in Tucson

D.C. Culbertson

At an age when many people normally think of retiring, Nat Williams has his work cut out for him. In addition to his full-time job, Williams also is the owner and chief operator of Tucson's only cable radio station, KPPM(FM).

The station, which has been on the air for 16 months, broadcasts 24 hours a day, seven days a week, and primarily plays music its owner describes as "inspirational." (The call letters, incidentally, stand for "Kable Prayer Partners Ministry.")

Several talk programs also air on KPPM: "Inspirations Across America," a

two-hour weekly program hosted by Burke Johnson, and "What a Fellowship Hour," with the Rev. Clay Evans. Short features range from 60 seconds to 15 minutes, and include "Focus on Women," "Inside Gospel," "Billy Graham," "Christian Working Woman," "Workaday World" and "Power Minute." When possible, the station also airs an hourly newscast from the American Urban Radio Network.

About 10 years ago, Williams learned that the city of Tucson was negotiating for an FM channel. But at the time he was on his way to a job at WTJZ(AM) in Hampton Roads, Va., where he would work as operations director for nine

years. When Williams returned to Tucson in 1993, he learned that the frequency was still available.

He originally had to share the frequency with another format and was granted only eight on-air hours for his programming, but after the other format "went down the drain," as he put it, he was given permission to expand his broadcasting to 24 hours.

Unlike that of a broadcast radio station, the signal for a cable radio station is fed from the cable host company's public access unit instead of a transmitter. Anyone who wants to hear the station not only must subscribe to that particular cable system, but also may be required to

install additional pieces of equipment. (In the case of KPPM, this equipment includes a transformer and an extra cable splitter.)

Out of pocket

The equipment in the KPPM studio, located in the Access Tucson building in downtown Tucson, includes a BE 250 broadcast board, an EFT 900 console, an MDX 2100 mixer, two ITC



Nat and Barbara Williams

cart machines, and a turntable. The main audio sources are the CD players: a JVC 100 with two slave units, and two Sony 200s, each capable of programming up to 200 discs apiece. The studio also has two single-CD players.

Because the station is considered public access, Williams is not allowed to sell commercial air time. Some of the monthly operating costs, which he estimates at about \$600 a month, come from underwriters, one of which is VanTram, the transportation company for the disabled where Williams works full-time.

Williams said he has not applied for a grant through Access Tucson. However, most of the expenses to date have come out of his own pocket. Williams paid for most of the studio equipment.

Military training

Williams started his radio career in Birmingham, Ala., on pop station WENN-FM. He went on to serve in the Air Force, where he worked for Armed Forces Radio affiliates, particularly in the Far East. After returning to the States, he worked for WCNU(AM) in Florida.

He came to Arizona in 1966 and for the next 13 years worked at three stations and produced syndicated gospel programs. In 1979, he left for Virginia, where he worked at a 24-hour black gospel station. After briefly returning to Arizona, Williams left again for WTJZ(AM) in Virginia in 1986. Although most of the stations where he worked played pop and jazz, Williams has a long-standing interest in gospel music. He has sung in several gospel groups, including Arizona's Celestial Gospel Ministry.

Nat Williams is a small player in a big radio industry. Many people would not even consider his station to be "radio." But he is proud of what he does.

"People are my most important product," Williams said. "And I want to give something back ... in a way that would make a positive effect."

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Festival Draws Radio Royalty

John Montone

Norman Corwin was there when radio was king. Barry Farber arrived when radio was fighting for its life.

They were both in New York recently at the third annual Radio Festival, presented by The Museum of Television and Radio.

Farber, who hosts a two-hour daily talk show on The United Stations Talk Radio Network, got his start as a radio talker on WINS(AM) in New York in 1960. Although "payola" wrecked many a radio career, Farber happily admits it opened the door for him.

In the late 1950s, when record company executives were showering DJs with money, sex and drugs to play their songs, the Federal Communications Commission stepped in.

"WINS put a talk show on the air," said Farber, "to throw a piece of meat to the FCC lions." It was a time when the prevailing wisdom said radio was through. And, Farber said, "The first casualty of big-deal television was network radio."

Radio, transforming itself

The subject of Farber's seminar, in which he was joined by other early New York radio legends such as Joe Franklin and John A. Gambling, was how radio survived the early days of television by transforming itself into a local medium.

The question, said Farber, was, "How can we save our lives locally in Des Moines and Greensboro, North Carolina, with this new television monster rolling over us?"

Rock 'n' roll was one answer. With the first baby boomers entering their teens, AM stations fought for a share of the growing teenage audience. That led to some innova-

tive programming ideas. In one case, a radical concept for the times, Farber remembered the program director at WINS trying to figure out how to lure listeners from arch-rival rocker WMGM(AM).

"We went to news at 25 after the hour. They went at 55. When our news came on, all our listeners switched over to 'MGM and didn't come back until they went to news."

The WINS program director read the FCC regulations carefully and found that, contrary to what everyone seemed to believe, stations did not have to provide a five-minute newscast each hour, just an average of three minutes of news per hour. So, in an extraordinary move for the times, WINS eliminated hourly newscasts, but made sure to break in with news bulletins an average of three times each hour, "and we promoted ourselves as the station that never makes you wait for news," Farber said.

Seven-piece orchestra

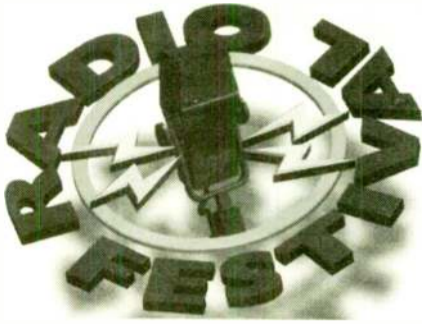
Farber said the quality of programming on a local level rarely approximated the great network broadcasts during radio's Golden Age, but he recalled that John Gambling employed a seven-piece orchestra on his morning show on WOR(AM), and Long John Neville ruled the nighttime airwaves on WOR with people claiming they had seen or been abducted by flying saucers burning up the phone lines. "It was every station for itself," he said.

Although Farber said he thinks much of modern radio is "trash," he proved himself to be the great master of analogies when asked if he regretted the death of network radio. Without pausing he said, "No more regret than if I lived in India instead of China. ... China is disciplined and the economy is booming. In India they are

inching along, but they are free."

Farber said he believes the level of network radio in the 1940s was "artificially high ... higher than the culture warranted."

Recalling that on a recent show, his own phone lines were flooded with people responding to the subject of Albanian education, Farber said, "I think we're headed for the last laugh. We are interesting, we deal in facts and we are nice to those with



Norman Corwin

opposing opinions. As long as our kind of radio is allowed, I don't care about the trash. There is always going to be trash."

Works of Corwin

But "trash radio" was not part of the Golden Age when Norman Corwin was producing his masterpieces for CBS. Among other accomplishments, he was given the task of producing a radio play to commemorate the end of World War II. It was called "On a Note of Triumph," and included such memorable lines as, "Take a bow, G.I. Take a bow, little guy. The superman of tomorrow lies at the feet of you common men of this afternoon."

At the age of 87, Corwin continues to write original plays for radio. His latest work, "The Secretariat," was to air on more than 100 National Public Radio affiliates over the Thanksgiving weekend.

Corwin, who spoke at the Radio Expo, said "The Secretariat" deals with the phenomenon of prayer.

"Along with hunger and self-defense," said Corwin, "prayer is among the most primitive and most universal of all human activities from the cavemen to the Pope."

The great master

Corwin's drama begins to unfold when a young boy asks his father how God keeps track of the prayers of 6 billion people. The father answers that God has a Secretariat that files the prayers and passes onto Him the ones they like. Corwin presented this information to the listener in the form of a dream that takes us into Heaven.

"Heaven is equipped with the latest state-of-the-art communications," said Corwin, the great master of radio special effects.

Corwin said he knows the nation no longer gathers around its radios listening to plays. But he is encouraged that he receives so many requests for transcripts when a program airs.

"Radio is a mere shadow of what it was," he said. But he talked excitedly about writing for radio.

"In the best sense, radio is a medium that enlists the participation of the audience. In radio there was never a term 'couch potato' or 'boob tube,' an indication of how passive television can get. The eye is very literal, and too much of what we see on television is mental chewing gum, whereas the radio listener has to furnish the set, dress the actors, has to imagine them and cast them."

More than half a century ago in "On a Note of Triumph," Norman Corwin wrote, "Take a bow G.I. It looks like free men have done it again."

With "The Secretariat," it looks like Norman Corwin has done it again.

■■■

John Montone is a radio reporter for 1010 WJMS(AM), New York. Send him e-mail at jfmontone@worldnet.att.net

You Must Remember This



How about this for a concept? A radio that fits in your pocket. Shirt pocket, that is.

The Lafayette FS-91 came with two diodes, one thermistor and the kind of descriptive copy that you might find in a contemporary press release.

The 1961 Lafayette catalog calls the unit "the radio that has taken the country by storm ... an engineer's dream," with a "separate mixer and oscillator, diode detector and diode bias stabilizer, 2 IF stages, AVC amplifier, (and) 4 audio stages including push-pull audio output."

Priced at \$26.95, the radio came with a leather carrying case, batteries and earphones for private listening.

This attractive radio features a clear plastic upper front painted from the back side, with a gold grille below and a rear fold-



out stand.

Collector Bill Overbeck provided RW with this picture and description. Overbeck, president of the Delaware Valley Historic Radio Club, has made every effort to ensure accuracy. Contact him via e-mail at billoradio@aol.com or through RW.

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Another Fine Radio Program From Dick Brescia Associates

NEWS ANALYSIS

FM Translators Are Liberated

Howard L. Enstrom

RW informed readers about the amended FM agreement between the United States and Canada when the news broke ("Border Stations Get Boost," Sept. 3). The agreement is meaningful for stations and translators within 320 kilometers, or 199 miles, of the border. This agreement allows some stations to increase effective radiated power from 3 to 6 kW and liberates FM translators from sometimes-ridiculous low-power limits.

So FCC rules get more complex, and more time and money is spent for research of spectrum use, engineering and preparation of an application. No doubt, some who felt reluctant about a translator are encouraged, and owners of existing systems are rushing to upgrade their systems.

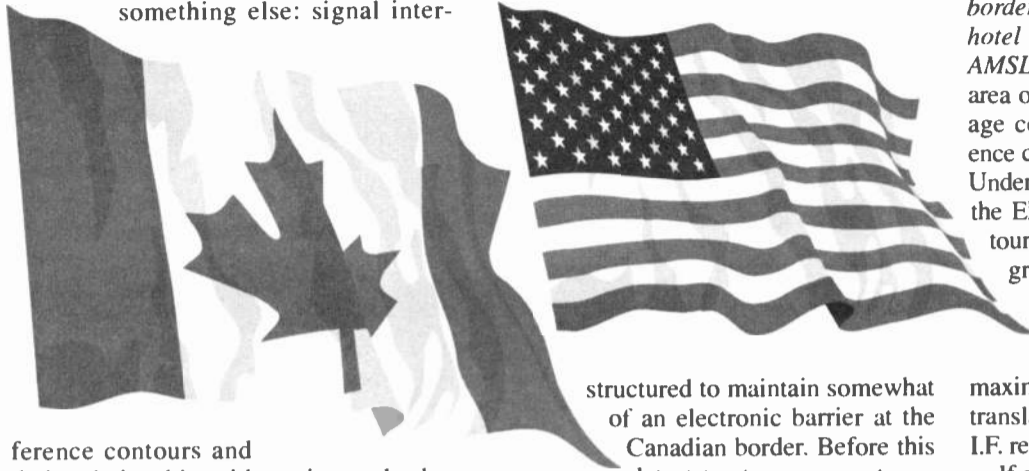
Station owners and managers need to understand some of the technical and regulatory matters of the agreement.

Accepting applications

At this writing, the commission has yet to amend applicable rules, and probably will not for months. However, the agency is accepting applications for new and upgraded systems. Such proposals must comply with existing rules, plus terms of the newer FM agreement with Canada.

Higher ERP means greater cover-

age, and this permitted ERP depends on antenna height above average terrain (HAAT). If translator principals are concerned with operating power and coverage, engineers who strive to meet objectives are concerned with something else: signal inter-



ference contours and their relationship with station and other translator-protected contours.

In search studies, we examine a candidate channel called co-channel, plus its three pairs of upper and lower adjacency frequencies. So there are seven interference considerations for each channel, or four interference contours with different values to work with. None of them may overlap the protected contour of other translators and stations. There are other rules for different types of interference, all addressed under Part 74 rules. The FM agreement with Canada does not negate

any of these rules, regardless of location.

For translators within 320 kilometers of the border, the former and present FM Agreement considers an interference contour to have a value of 34 dBu, 50 mV per meter. In a sense, the agreement terms are

structured to maintain somewhat of an electronic barrier at the Canadian border. Before this latest treaty agreement was ratified, interference contours were limited to a distance of 32 kilometers in any direction while the maximum ERP was 50 W. The distance was changed to 60 km in any direction. And, this contour may not overlap the Canadian border. That's why it may be necessary to use a directional antenna oriented toward the community of service, with suppressed radiation toward the border.

Hard numbers

This may still seem pretty restrictive, but it is not so bad. A strategically located site, or one with high surrounding terrain that shields a signal in the right direction, can be an advantage. Here are two examples, before and after upgrading.

• *K213CA, Omak, Wash., 61 km to border, nondirectional CP antenna atop Omak Mountain at 776 M HAAT, or 1,769 M AMSL. The interference contour distance was limited to 32 kilometers, so ERP had to be only 110 mW, about 0.1 W. No big deal, but this is an extremely*

high antenna. The area of the 60 dBu coverage contour is 16.1 sq. km. Under the new agreement terms, the ERP is increased to 1.3 W, maximum distance for the interference contour is now 59.1 km and the 60 dBu coverage contour area is increased by more than nine times, from 16.1 sq. km. to 146 sq. km. And K213CA can put a more solid signal field over Omak, 17 kilometers to the west.

• *K259AF, Bismarck, N.D. 244 km. to border, nondirectional CP antenna atop a hotel building at 14 M HAAT, or 549 M AMSL. The ERP limit of 50 W produces an area of 74.7 km. within the 60 dBu coverage contour and distance to the interference contour is 28.3 km., limited to 32 km. Under the amended FM Agreement terms, the ERP is 250 W and the coverage contour area becomes 169 sq. km.; 2.3 times greater. (Multiply km. by .6212 to get miles.)*

In all cases, translators must comply with Part 74 rules pertaining to maximum ERP, protection of stations and translators, TV Channel 6 protection and I.F. relationships.

If a site is rather remote from the principal community of service, and a needed higher ERP violates the agreement terms, an applicant can request that his proposal be referred to Canadian authority for approval. Such is possible if the translator will not cause interference or the interference contour is over an unpopulated area in Canada. For that matter, the same holds true in the United States.

Low-power translators are amazingly cost-effective and make efficient use of the spectrum. But finding a useful frequency in highly populated areas is getting to be a real problem. That's when a sleuth-like consultant with patient tenacity and creativeness is needed. If no frequency appears useful for a given site, the solution may be to use a different site with a specially designed directional antenna. The consultant should help in pointing to a possibly useful site location.

Howard L. Enstrom heads FM Technology Associates in Mt. Dora, Fla. Reach him via e-mail at xltrs@aol.com

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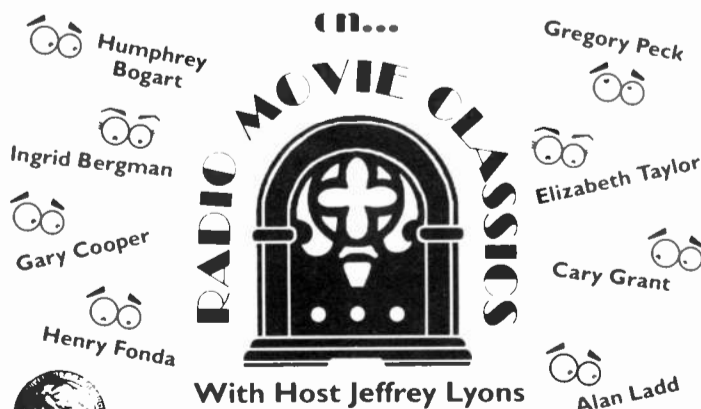
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December 10, 1997

Would You Buy a Headset From This Man?
Page 47

Prices Pig Out at Oink Ink Radio

Sallie Schneider Sauber

If brothers Dan and Jim Price of Oink Ink Radio had their way, Pat Sajak would be hosting a game show called "Hey, Spin That Thing!"

Okay, a name change may not be in order, but "Wheel of Fortune" is striving for a newer, fresher image with a little help from their friends at Oink Ink Radio.

King World Productions of Los Angeles chose Oink Ink Radio of New York and Philadelphia to create and produce a series of radio campaigns for the TV game shows "Wheel of Fortune" and "Jeopardy."

In one spot, Sajak, in an attempt to acquire bigger and better prizes, calls NASA to inquire about purchasing the

space shuttle. In another spot promoting Halloween Week, a contestant spins the wheel and lands on "Death."

The idea, according to Dan and Jim, is to appeal to everybody with a younger, more fun approach to the shows.

"We're younger anyway," said 36-year-old brother Dan, "so I think King World wanted to get away from using guys that have been doing this for 25 years." Jim is 30.

Youthful approach

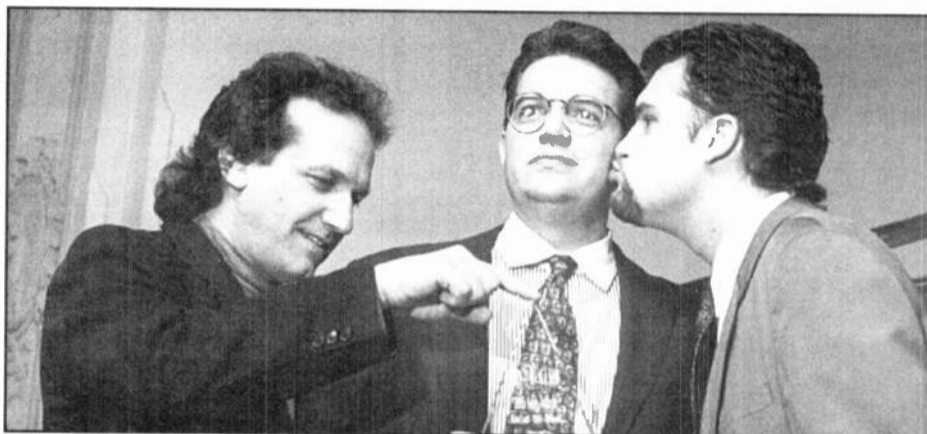
Because Oink Ink's brand of humor is written by younger people, it is easily understood by younger demos, or so goes the thinking. It must work; Oink Ink Radio has won many awards, including the Mobius, the London International and the Addy.

According to Dan, "All our competitors

had an average age of about 80. I don't mean that as a slight, but there was no new generation that was starting companies like ours. We all grew up in the TV world and they had grown up in the radio world. Guys like Dick Orkin and Joey Golden are at least 25 years older than me and there

together easy. According to executive producer Dan, "There are certain things I'm able to say to Jim that I'd never in a million years say to somebody not related. We'll yell at each other over certain issues but it's all constructive."

Creative director Jim said, "When I'm looking at a stone face, what I've written is not funny. Pride is always going to take a hit but it's easy to deal with."



Jim Price, right, congratulates brother Dan, center, on Oink Ink's Addy Award. Gary Moskowitz of Baker Sound, left, gets the point.

SHORT TAKE

Roland Expands the VS-880 Workstation

In 1996, Roland Corp. released the portable VS-880 Digital Studio Workstation. The self-contained DAW offered 64 virtual tracks of digital recording, mixing and editing in a table-top-size case.

Now out is the VS-880 "V-Xpanded" workstation, with new effect algorithms, EQ and Effect Insert capabilities, better synchronization performance and faster editing. Owners of the original VS-880 can get a software upgrade — the VS-880-S1 — to provide these enhancements without obsoleting their current unit.

With the addition of the VS8F-1 Effects Expansion Board, the new VS-880 now includes a Mic Simulator; a 19-band Vocoder for impressing vocal qualities on other audio sources; graphic and parametric EQs; and the Roland/Boss Voice Transformer.

The Mixer section of the VS-880 has been enhanced with dynamic Auto Mixing Functions. All mix parameters — including level, pan, effect send and pan — now are automated.

New editing features include point memorization of all "start," "end," "to" and "from" locations. Once these points are set, the VS-880 can access them all from the track editing page. A new Shift

Lock mode allows one-handed access to all of the shift functions of the DAW. The "Remaining Time" display now includes the remaining size of the hard-drive capacity and recordable number of events.

Disk drive diagnostics include a read/write test for error-checking. Should an error be detected on the hard disk, the defective cluster is registered and never used. A built-in disk repair system maintains drive integrity.

Recording to the VS-880 is made simpler when previous tracks can be monitored in sync with the new track.

Where the original VS-880 could play back four tracks from the Master playback mode, the V-Xpanded VS-880 is capable of six tracks. Optional copy-protection now is offered as well, prohibiting second-generation digital copies of audio material from a VS-880. This is identical to the SCMS technology found on DAT machines.

Roland maintains a website at www.rolandus.com

For information on the new VS-880 or the software upgrade VS-880-S1, contact Roland Corp. U.S. in California at (213) 685-5141 or circle Reader Service 128.

— Alan R. Peterson



The Enhanced Roland VS-880

was no one in between."

Why the name "Oink Ink?" Nobody is talking. When asked where the name came from, older brother Dan said, "Everyone always expects a funny explanation for the name and there simply isn't one. I'll tell you after a couple of drinks."

In high school, Dan cut grass at the old WIFI(FM) transmitter site in Philadelphia, then began hanging around the production studio. That experience inspired him to start a high-school radio station.

He attended the University of Scranton, then Temple University's radio/TV/film program for a year. "Then I decided I didn't need a degree and instead got a jump on everyone my age by just working," he said.

He worked as a production director in Wilmington, Del., then as an engineer at Baker Sound in Philadelphia. During a stint at Radio Band of America in New York, Price began writing commercials on the side and realized it was time to fly solo.

While Dan began thinking about forming Oink Ink Radio five years ago, brother Jim was just out of the University of Delaware and at a dead-end agency job.

The brothers Price found working

The brothers say large, multifaceted ad agencies tend to be indifferent toward radio, creating commercials around what they have already done for television.

"(They are) two totally separate mediums," said the elder Price. "Driving your car at 6 a.m. is different from sitting with your feet up at night watching Seinfeld."

Jim said, "Radio gets piggybacked with the main medium (TV) in that agencies will say, 'Let's take the information that wouldn't fit in the 30-second TV spot and put it in the 60-second radio commercial. People don't drive around with a notepad on their lap.'"

When you're hot, you're hot ...

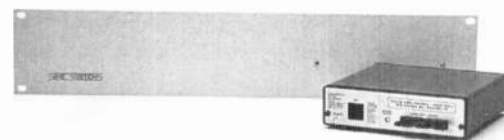
Dan talked about a successful campaign consisting of parodies of movie promos and trailers done for the Texaco gasoline convenience store chain, Starmart.

The series consisted of highly produced knock-offs of different movie genres, with genuine movie trailer announcers Hal Douglas and Don LaFontaine delivering

See OINK, page 43 ▶

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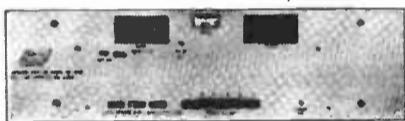
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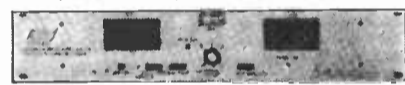
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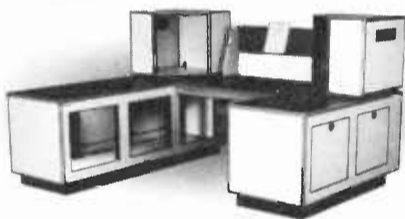
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Humor Runs Hog Wild

► OINK, continued from page 41

copy as if it were legitimate movie material. The rest of the copy read, "There's your money, now hand over the Cheetos," or, "Your eyes are blue like Starmart windshield washer fluid." Two years later, the campaign still runs.

Three months after the campaign began, the brothers began hearing copycat campaigns on other stations. Calling it bothersome, Dan said, "Sometimes I'll hear a spot and wish we had thought of it first. Once in a while something will happen out of coincidence, but ultimately you can tell the difference between coincidence and plagiarism."

... When you're not, you're not

One Oink Ink flop was for a liquor company that let them perform their magic at first, but then began adding so much hard-sell information that the spot simply did not work.

Jim said, "The agency was a client mouthpiece rather than a brand advocate. The agency rep said, 'I like ideas two and four but the client will never go for it.' And they are a big agency."

Dan said, "It wasn't like it was a big idea and the result certainly wasn't memorable. They could have produced the commercial in-house. The best stuff we — or anybody else — does is image stuff. Latch on to something about the product and create a personality. When a person hears the spot, they link the personality with the product. You can't get The Big Idea with information that doesn't matter to the guy driving down the street."

Oink Ink has two in-house writers but relies more on a select group of freelancers. Dan said, "We don't sit around a table to brainstorm. We say 'Here's the assignment, now go away and do whatever you want to do.'"

"Nothing we've ever put on the air hasn't been looked at by at least four different sets of eyes once or twice each," said Jim.

The Oink Ink voice talent database is 1,100 people deep, with notes like "35-year-old-big-deep-pleasant-friendly-approachable-announcer-type." From this

This is a sample 30-second "Wheel of Fortune/Halloween" spot written and produced by Oink Ink Radio:

Pat Sajak: Welcome back to Halloween Week on Wheel of Fortune. So Lee, are you ready to give it a spin?

Lee: You bet, Pat.

Sajak: All right, let 'er rip.

SFX: (Spin, crowd oohs and ahhs, wheel slows down, crowd grows excited.)

Sajak: Nine hundred ... Jackpot ... five hundred ... Oh-h no-o-o! It's "Death."

Lee: What?

SFX: (Chainsaw starting)

Sajak: Yep, I'm afraid it's death. And you were so close to the jackpot!

SFX: (Chainsaw revving up, Wheel theme & applause.)

Annrc: Join "Wheel of Fortune" for Halloween Week. This could be scary.

pool, Oink Ink consistently calls about 120, including Gary Owens, movie voice LaFontaine, Fox Network NFL voice Burt Pence and "Budweiser Lizard" Paul Christie.

"We want the very best person for the part," Dan said. "I have a problem with hearing (voice talents) Tom Poston, Tom Sharp and Jack Riley all in the same spots over and over. In one commercial they may be the best for the job, but not on the next."

According to the Price brothers, the industry has been on the "what-celebrity-is-not-doing-a-commercial-and-can-we-get-him" bandwagon for awhile.

"Clients want something that is going to break through, but then bring us the same

voices already on every other commercial," said Dan. "The way to break through is to do something good."

The Oink Ink studio uses Digidesign ProTools 4.0 for production and relies on ISDN to link to Los Angeles or wherever one of their regular talents may be based or on vacation (Note: See Part II of Dave Foxx's ProTools review on page 44).

"Humor is the hardest thing to do well," Jim said. "It's all about performance, timing and especially good writing. We have done straight stuff like 'Partnership For A Drug-Free America,' but prefer humor because there is so much bad humor on the air."

Jim and Dan agreed that any spot supposed to be funny — but is not —

becomes annoying and a negative reflection on the personality of the product.

Oink Ink Radio finds that the common ingredient in successful campaigns like "Wheel of Fortune," "Jeopardy" and Starmart is time. With a month to be creative, the writers can come up with as many as 30 scripts.

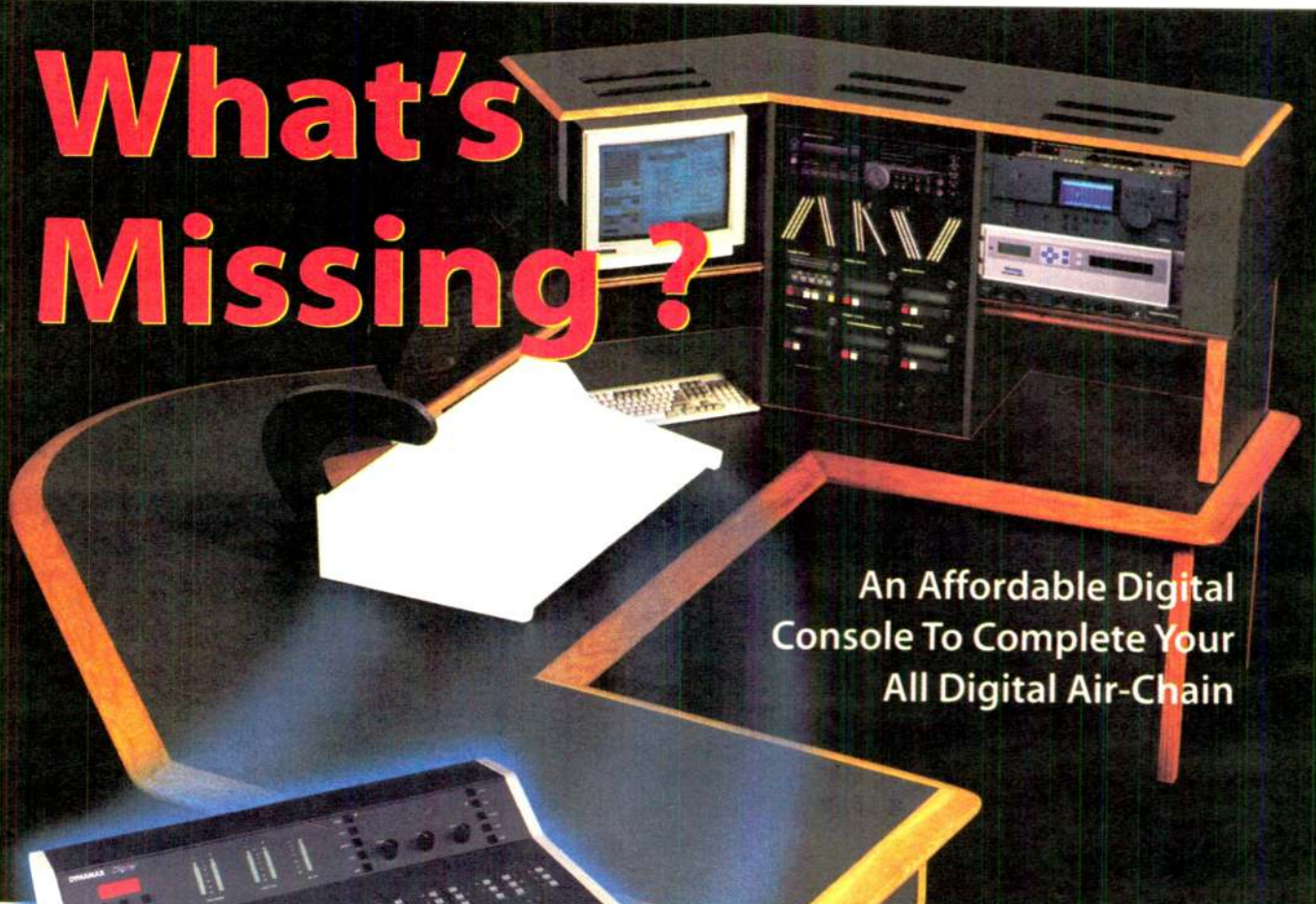
Contrasting this to radio's reputation as a "right-now" medium, brother Dan believes the time needed for the creative

thought process should be the same as television, "if you want a commercial to be the best it can be."

Oink Ink has offices on Madison Avenue in New York and in the Baker Sound Building in Philadelphia. For information call (800) 776-OINK.



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PRODUCT EVALUATION

ProTools Popular in N.Y. Market

Part II of II

Dave Foxx

In the Nov. 26 RW, I told you I have been familiar with Digidesign ProTools — the Mac-based digital audio editor — since the days when it was two different pieces of software. If that was also the last time you saw ProTools, the changes made in Version 4 will please you.

Do you feel 16-bit "CD quality" is now somewhat inadequate? The latest version of ProTools offers 24-bit technology, opening a new world of possibilities. And the basic configuration is not eight tracks, but 24.

Simplicity is another issue. You can have a fully loaded ProTools 48-track system with dual I/O, three extra DSP cards and plug-ins on a new Mac up and ready to annoy the other stations in your market about an hour after the boxes arrive from UPS. I know; I have done it on four occasions.

On the screen

Take a look at the screenshot: All of the tools you need are right there at the top of the Edit page. The magnifying glass allows you to zoom down to a single sample, or 1/44,100th of a second. Once you are down to 1/100th of a

second or less, the little pencil tool allows you actually to redraw the amplitude of the waveform. This is pretty handy if your source material contains a pop or crack.

Other tools include a scrubber (shown as a speaker icon) which allows you to "rock the reels" back and forth across one or all tracks to find a glitch or edit point. You'll find a Marker tool (the capital I icon), which basically is a virtual grease pencil; a Cutter tool (the bracket icon), roughly equivalent to a razor blade; and a Grabber tool (the hand icon), which allows you to grasp and move audio around on the Edit page.

I should point out one thing about the Cutter tool: When you make an edit, the sound you cut off of the file disappears from the page, but does not go away. All editing is nondestructive unless you tell the computer specifically to *make* it destructive.

Rather than call it a Cutter, Digidesign should call it a Windowshade tool because it slides parts of the audio file open or closed.

Patches, I'm depending on you

TDM (Time Domain Multiplexing) bussing was a major improvement that came with Version 3. This put a 255-point patchbay inside your Mac computer, allowing you to set up a virtual console with all the frills.

Each track has five inserts and five sends/receives. You can set up submasters for effects and submixes that offer interesting possibilities, limited only by the amount of DSP available on board.

Radio production people accustomed to this level of versatility in ProTools Versions 3 will find a few other nice gizmos in Version 4, like AudioSuite plug-ins (notice AudioSuite on the menu bar).

If you ever overhear a conversation between me and one of my production buddies in another major market, you will hear all about the latest plug-ins from Waves or Focusrite.

Plug-ins can be used in real or *nonreal* time, depending on whether the plug-ins are AudioSuite-compliant. Most of them now are.

For instance, if I want some serious compression on a voice track, I can use an AudioSuite plug-in like Waves C1 to compress the track before I actually start the mixing process. The advantage is in saving processing power on my DSP chips for other real-time plug-ins, like reverb or flange.

ProTools 4 also offers the ability to continue working while the session is playing back, much like the "sync" feature on multitrack reels. Once I have some tracks in place, I will start playback and add more vocal tracks as it moves along. This is a big timesaver as it allows me to work in real time or nonreal time, depending on the project or personal whim.

Get in a group

Notice the new bins on the left side of both pages. These are all about Track Groupings.

A stereo signal actually comprises two tracks. As on a high-end console, grouping allows you to tie those two tracks together, so by lowering the gain on one, the gain on the other drops as well. This has been a feature of ProTools almost from the beginning.

With Version 4, groupings become much more dynamic. Now you can hide or show any track or group of tracks with a click. This is handy, particularly if you are working on a 15-inch monitor screen.

You are able to name your groupings anything you like, and you can cause all tracks to be grouped together at once. Thus you can move entire sessions without disturbing the track's original place in relation to others. And it is done with a simple click.

Another new feature is Loop recording. Say you have a voice talent coming in who can never get the copy right the first time. Simply highlight the In and Out insertion points, give the computer a

See PROTOOLS, page 45 ▶

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► PROTOOLS, continued from page 44
few seconds of pre- and post-roll, and begin recording.

ProTools will keep recording over the same spot, looping around each time until your talent nails it just right. Hit stop, the insert is placed perfectly and you can move on to the next item of business.

Do the wave

If you are a real stickler for precise editing, you cannot beat visual waveform editing. Sometimes I really wonder how in the world I ever made music edits without being able to see the beat.

A new feature of ProTools 4 is the ability to make any individual track appear in one of five sizes, from Mini up to Jumbo. Version 3 users could only display tracks in one of two sizes. Now each track can be whatever size you want, and what was formerly called "Large" is now considered "Medium" in ProTools 4. Blow up a track to Jumbo for extremely precise edits and see how that single track will pretty much fill a 15-inch monitor.

I told you last time about my oohing and aahing over the control surface of a RAM-based editor I saw in Boston. At the New York AES show, ProTools showed the new Mackie HUI (Human User Interface) console, which goes far beyond what I saw in Beantown.

The HUI is an actual dynamic control surface with moving faders, a scrub wheel and LED displays that really make ProTools a snap for beginners. It puts a real console — not just a little MIDI controller or a mouse — in front of ProTools users.

One aside, if I may, regarding the proliferation of PC-based workstations

and the "demise" of Apple.

True, the company has been hurting,

and yes, new PCs have been outselling new Macs by better than nine to one,

but much of the increase in sales for PCs has come because Windows 95 does not work on older DOS machines. Apple actually has huge cash reserves and the Mac enjoys dominance in the audio design field. The picture improves.

Digidesign, the company that makes ProTools, owns more than 80 percent of the digital audio workstation market

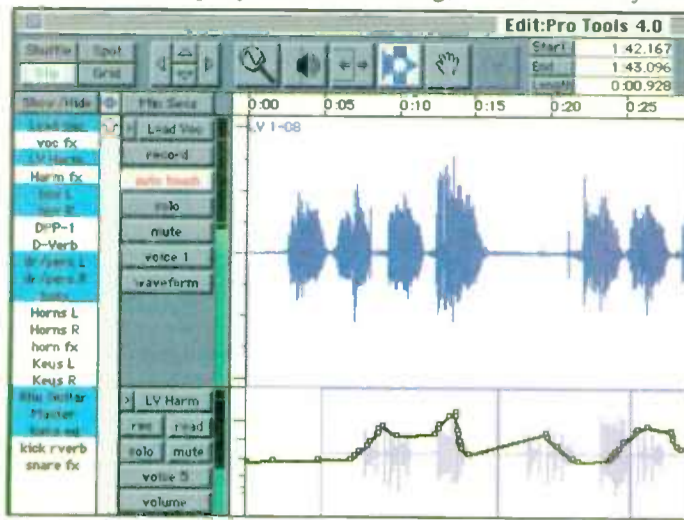
for professional audio. If you walk into just about any major recording studio in New York, you will see the orange and blue ProTools logo on a computer screen.

With the increasing complexity of radio production and the need to stay ahead of the other guy, you need power in the production room. Before you automatically go with the first workstation you see, sit down and try out ProTools 4.

■ ■ ■

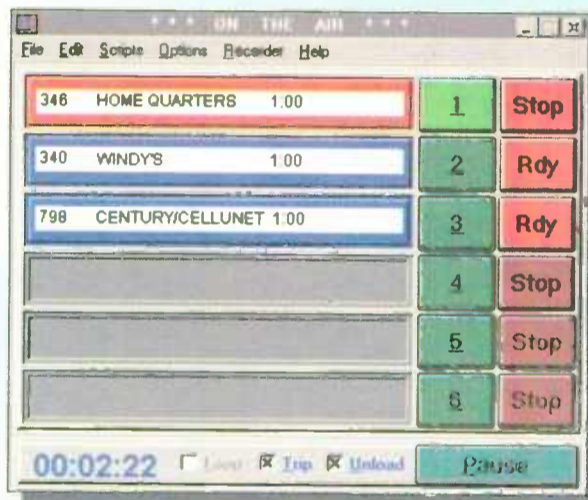
For information on ProTools products, including plug-ins and new Version 4.1 software, contact Digidesign in California at (650) 842-7900 or circle Reader Service 167.

Dave Foxx is creative services director for WHTZ(FM), "Z100," New York. To talk about ProTools, audio design or radio in general, e-mail him at foxx@z100.com, or send your comments to RW.



Closeup of the ProTools Edit Window

The Easy Choice !



Time	Cart	Title	Artist	Length	Intro	End	Type
16:33:43							
16:33:48	DALIVE			03:00			COM
16:38:48	J007	Longer Sets		03:11			
16:38:59	M12	Armageddon II	Def Leppard	04:54	:22	F	MUS
16:41:53	V001	Voice Track 1		00:05			VTR
16:41:58	M17	Party Town	Glenn Fry	02:48	:06	C	MUS
16:44:46	J001	Today's Best Music		03:00			JIN
16:44:54	M09	Listen To Heart	Tom Petty	02:48	:11	C	MUS
16:47:42	DALIVE			03:00			COM
16:50:42	J005	TBM/Best		00:06			JIN
16:50:48	M04	Dance The Night	Van Halen	02:47	:13	F	MUS
16:53:35	V005	Voice Track 5		00:05			VTR

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What's It Like?

So what is using ProTools 4 like? Every week here at Z100, we produce what we call "Power Jingles," special versions of every song in our Power category. JAM jingle singers, talent Lisa Taylor and I are mixed into the actual intro of the song.

This puts a "stamp of ownership" on the song that makes our station calls come to mind every time a listener hears it, whether or not that song airs on Z100. This would be painfully difficult without ProTools.

The precise placement of the talent is important, to be sure; but more important still, the production value must match the original song or it will sound like a train wreck every time it is played. Compression, EQ and filtering play a role in making the finished Power Jingle sound as if it were produced by the actual band.

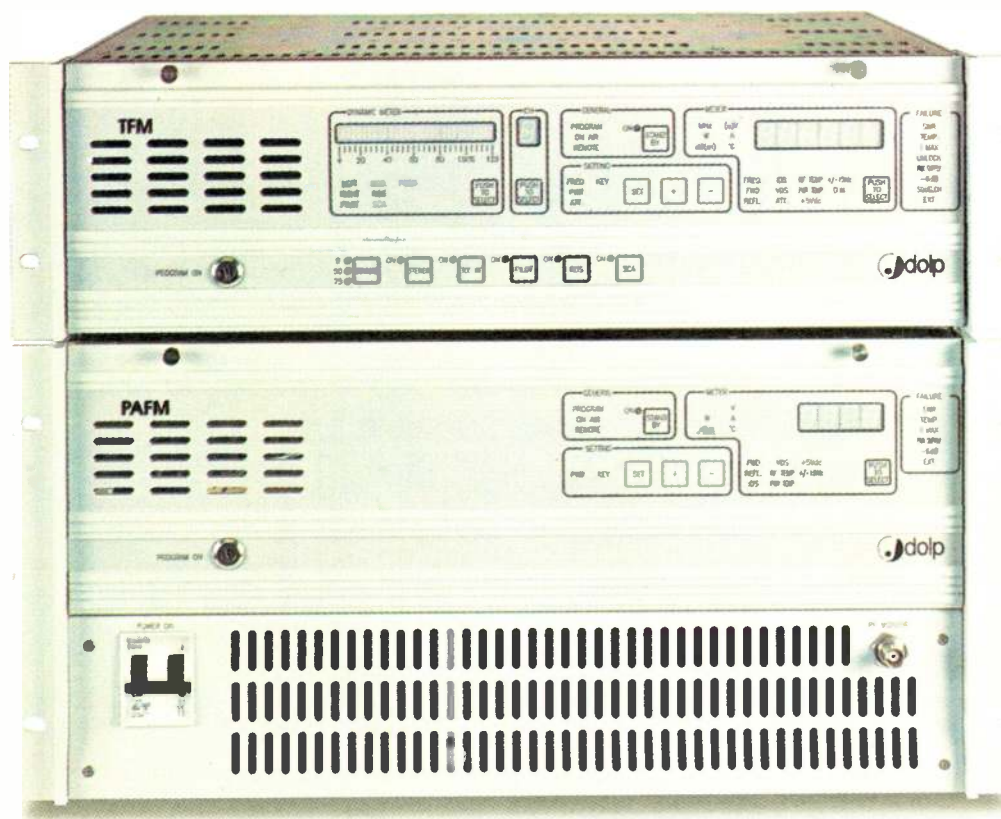
The original song and Power Jingle version gets burned to a CD, which goes in the control room. There, the air talent can dial up the appropriate cut depending on the current format clock, and play it as if it were any other CD in the library.

A song produced in this manner is the perfect station sweeper, as it flows on the beat and lets Z100 really own the song, even though it might be played by several other stations in the market.

— Dave Foxx

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Sublime Moments in Jerusalem

Rich Rarey

In the previous installment of *Public Domain* (RW, Oct. 29), we had successfully negotiated the small stresses of international travel and shepherding our remote equipment to Tel Aviv, Israel.

After a wait in line to assure Israeli customs that we intended to stay only for a few weeks and were there on business, we traveled by car for about an hour on the freeway to Jerusalem.

The car trip always takes on the flavor of the surreal. This is the ancient land that one reads about in the Bible and in newspapers, yet the view is more reminiscent of southern California; the air is dry with low scrub, sandy soil and a beaming sun.

On this particular trip, we had an evening to rest up before the recordings began, and thankfully too, because whatever anti-jet lag regimen one practices, the travel is wearing.

Morning's first light

On the first morning, we opened our equipment cases to begin assembling our recording kits.

A Sony D-8 DAT recorder was paired with a Sonosax SX-M2 mic preamp and mated with Sennheiser MKH30 and MKH40 mics, configured in an M-S rig and placed into a Zeppelin windscreen.

An HHB PORTADAT recorder was connected to a pair of Neumann KMR81 microphones, each mic in its own Zeppelin. The PORTADAT was slung in a videographer's vest, the power cable snaking around the back to a Panasonic battery that was nestled in a convenient pocket.

Being inventive

With this setup, the weight of the PORTADAT and battery was distributed about our shoulders, and that gave us a more comfortable leverage in which to hold a Zeppelin on a fish pole. As we were fitting the second KMR81 into its shock-mounted mic grip (which slides into the Zeppelin) we found to our horror that we had packed a mic grip designed for the slimmer AT831 microphone.

The mic could not fit into the grip mounts and we were only 15 minutes away from departing the hotel for the first in a series of interviews.

After the initial flashes of

deep concern for career and reputation, we decided to make a field modification to the grip and proceeded to carve out the mic mount section with a Swiss Army knife. Black plastic shavings littered the floor as one of the two ring mounts was sufficiently enlarged to fit the KMR81.



PUBLIC DOMAIN

As we were testing the fit of the second mount, the mic capsule's screw top caught on the mount and was sickeningly forced out, along with a quantity of acoustic material from the inside of the mic's shotgun body.

We had officially moved from bad to worse, as we couldn't properly stuff the material back into the mic body. Fortunately, the capsule

still worked, but we heard a distinct pattern difference and noticed a lower output difference as well.

Of all the recording and sound gathering during this trip, three places were special: the Church of the Holy Sepulchre, the Dome of the Rock (also known as the

Mosque of Omar) and the Mount of Olives.

According to a Jerusalem Web guide, The Church of the Holy Sepulchre "was built in the fourth century by Emperor Constantine's mother, Helena, over the site of a Roman temple of Venus. The entire site encloses the last five Stations of the Cross. The church, which is cared for by six denominations simultaneously, marks what many believe to be the sites of the crucifixion, burial and resurrection of Jesus."

Although plainer in structure and decoration than, say, the Notre Dame in Paris, its interior dimensions are large, and sound has a long hang time from intermixing reflections from the massive stone walls and arched ceilings.

We made interior recordings there on two late evenings. The first visit was to capture the

ambiance of the great structure. Using a pair of spaced Shoeps MK2S Omnis on a stereo bar mounted on a fish pole, we carefully walked within the church, the fish pole held out like a crozier (the staff a bishop carries) and recorded all sounds onto the PORTADAT.

Each of the six Christian denominations can perform whatever rituals they please in their designated areas of the church. It is likely one would find at least one service in progress at any given time.

Polytonality

During our pass with the recording gear through the church, we found an area where the singing of different hymns by different denominations in different parts of the church mixed together. The hair on the backs of our necks tingled when we found this spot, because the different holy melodies combined into tonalities that were dark, foreboding and ethereal.

Once we moved closer to one singing group, the effect faded. But that moment, hearing those clashing tonalities late at night in a huge darkened church built around the site where Christ was said to have been crucified and buried, was exhilarating and disturbing.

The second visit captured the sound of the church's two-story tall iron doors closing at midnight Saturday. A small number of the religious are sealed inside until dawn Sunday. A group of the faithful watches the keymaster bid the monks a good evening, swing the doors shut and lock them.

We used the Zeppelined MKH30/40 M-S mics and the PORTADAT with the limiter

See TRIP, page 49 ▶

SHORT TAKE

Headphone Humor Abundant In HeadRoom Product Catalog

When a jock blows out a personal set of headphones, his or her expression is usually the same as our friend Todd pictured here.

The replacement pair normally is obtained from the nearest electronics superstore, but maybe a call to HeadRoom of Bozeman, Mont., would be in order. The mail-order company deals in good-quality headphones from Grado, Sennheiser, beyerdynamic and Koss, to name a handful. You can also find ultra high-end headsets from Stax, with prices up to \$2,150 for its SRM-T1S headset/tube amp combination.

The company teams up many headphones with its own brand of power amplifier and portable carrying cases. The amplifiers contain a nifty compensation circuit which crossfeeds tiny amounts of signal from each channel, then adds delay and EQ to form a "surround" effect inside the phones.

The catalog has several pages devoted to headphone evaluation, specifications and technical explanations of why some headphones sound "airy" or "liquid." To the company's credit, the catalog also includes a large red box, warning about high levels and ear damage.

But what makes this catalog a must-have are its laugh-out-loud photographs of HeadRoom employees, who obviously had a ball putting it together. Todd, shown here, answers e-mail and technical questions for the company. Imagine this poor guy at work, having to endure both those bulletproof glasses and that vintage TRS-80 color computer; I cannot decide for which the guy deserves more of my sympathy.

The product prices in the HeadRoom catalog generally are in line with other distributors, but the catalog is worth having for its free technical explanations and the pictures of folks we all somehow know from somewhere. While you are busy picking out a headphone to buy, somebody else will be photocopying one or more of the characters in the catalog and pinning them up in the studio with a tag reading, "Our typical listener."

Few product catalogs will end up as well-worn.

HeadRoom Corp. is at P.O. Box 6549, Bozeman, Montana, 59771-6549. Send e-mail to heydude@headphone.com or circle Reader Service 11.

— Alan R. Peterson



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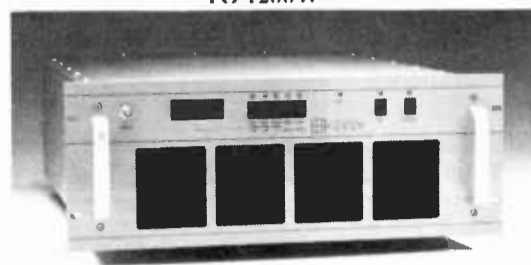
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Audio Quest to the Holy Land

► TRIP, continued from page 47

switched in; the dynamic range between the murmuring crowd and the definitive bang of the doors was great.

Our attempts to record the noon call to prayer from the Dome of the Rock, Islam's third-holiest shrine, took several



Photo by Israel Ministry of Tourism

Mount of Olives

tries. On the first attempt we could not enter with recording equipment without the proper written authorization from Islamic authorities.

On the second attempt, we had the written permission, but the Israelis had to give their permission too. On the third day, all parties agreed that NPR would be allowed within the walls of the Temple Mount and approach the exquisitely beautiful, gold-topped Dome of the Rock.

This structure is built on the spot where Mohammed is believed to have ascended to Heaven, as well as where Abraham is said to have prepared to sacrifice his son Isaac. The structure is finished in the most elaborate tile mosaic around its circumference. No photograph we have ever seen does justice to its beauty. To see it is to be awed by its splendor.

On the plaza outside the structure are

smaller circular stubby enclosures and PA-type horn speakers pointing away from the Plaza. We were led into one of these to record the gentleman who sings the call to prayer five times a day. Inside, we found a sparsely furnished, spotlessly clean room with a single Shure microphone on a floor stand.

We set up the MKH30/40 rig outside with the Sony D-8 and Sonosax mic preamp, the rig pointing to the most open space away from the PA speakers. Inside, we held the Shoepps omni mics on their stereo bar fish pole combination.

At the appointed time, the gentleman walked to a wall switch, tapped the microphone once to check it, closed his eyes and began to sing the call to prayer. The stereo image in this small room was extremely pleasurable, the singer's voice clear and sure.

Third stop

Our third memorable spot was on the Mount of Olives, the burial ground for generations of Jews. According to legend, the Messiah will resurrect the dead who lie here first.

The Mount really is a moderately high hill that overlooks Jerusalem; the view is especially good in the late afternoon when the sun cuts silhouettes of the mosque spires, ancient buildings and the wall surrounding the city.

On our first visit to the Mount, a local historian recounted on tape for us the changes that Jerusalem had experienced in the last 3,000 years. We used the MKH30/40 securely mounted in a Zeppelin, wrapped in its fake fur covering.

To our dismay, the winds whipped up the side of the hill at more than 20 knots. By shielding the Zeppelin with our body, we were able to reduce but not eliminate the wind noise. The resultant decoded interview captured the essence of the Mount, without having to mix in-the-clear ambiance to create a stereo perspective.

On our second visit, again in the evening, we wanted to capture the sound of each different Islamic call to prayer, sung from the five or so Mosques visible from the Mount of Olives.

We set the furred Zeppelin on a stand in a crook of the wall, next to the graves. From here we had more wind protection, but still had a clear aural shot to the city. We powered up the Sonosax preamps and started the D-8 into record and waited. And waited.

The Moment

Fifty minutes went by, and just as we were ready to adjust the microphone

had converged right upon our spot; undulating, swelling strong, then weak, mixing tonalities, and then each slowly fading to silence. It was *The Moment*.



Photo by Israel Ministry of Tourism

Dome of the Rock, Jerusalem

It seemed as if all the songs had converged right upon our spot; it was *The Moment*.

With the evening sun bathing the city in a russet glow, *The Moment* was most sublime.

Hours and hours of work go into any remote, but it seemed to us that this time, in this place, every second of work yielded rewards far above the effort expended planning, packing and traveling.

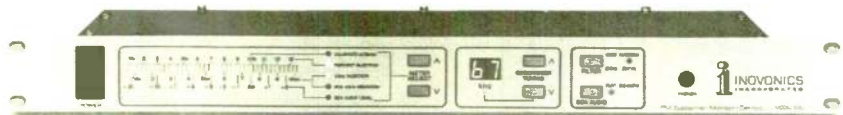
We would like to hear your remote gig stories too, and welcome them at rrarey@npr.org

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■ ■ ■

Rich Rarey is technical director of NPR's "Talk of the Nation" and a regular contributor and reviewer for RW.

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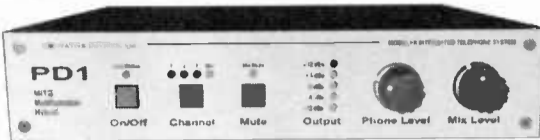
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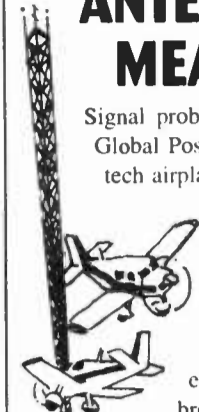
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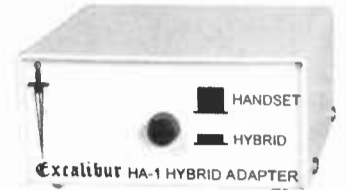
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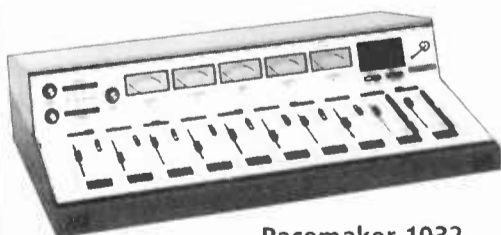
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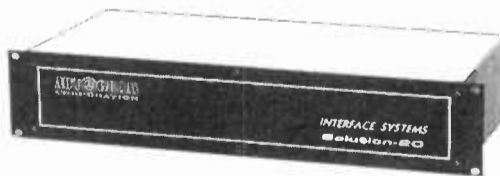
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Buyer's Guide

Radio World

Delivery & Broadcast Services

December 10, 1997



**Bird Language
See Page 55**

Satellites Fly High in Radio

S.D. Yana Davis

Over the last five years, engineers have developed new satellite technology that has opened a wide range of options for networks, syndicators and stations.

Unused capacity and equipment choices have increased. But in conversations with *RW*, industry insiders said the array of products and services is not yet

Serving Broadcasters Everywhere

This month, *Buyer's Guide* ventures into the Delivery and Broadcast Services realms of the radio industry. "Delivery" centers on companies that move audio and other information from one place to another. "Broadcast Services" includes suppliers of databases and data analysis.

S.D. Yana Davis spoke with industry leaders about new technology and old problems in satellite delivery. Although there is no standard, companies are competing to set one.

Is your satellite equipment prepared for a digital future?

Davis also presents two schools of thought on satellite dishes and band preferences, and spoke with Jerry Kline, chief engineer for the Southern Illinois University-Carbondale Broadcasting Service, who provided a maintenance checklist for satellite dishes.

In previous issues, *RW* Technical Editor Alan R. Peterson presented a three-part series on digital delivery services. Here he updates that series and examines changes and upgrades wrought by digital delivery companies.

Bill Sepmeier, satellite engineer and the founder of NSN, talks a little "bird talk" in a glossary packed with terms, explanations and clarifications.

Thinking about installing or upgrading satellite equipment? Lauren Rooney discovered that success is in the details. She spoke with several engineers who offer some helpful advice.

And as always in *Buyer's Guide*, we list the major players, their latest offerings and important contact information.

We'd like to hear from you. If you have any story ideas or product information for *Buyer's Guide* topics in 1998, let us know by e-mail at sgary@imaspub.com

— Susan Gary
Buyer's Guide Editor

grounded to a standard.

Satellite delivery faces other obstacles. For instance, the ever-present problem of solar outages is not likely to be solved soon, according to Bob Donnelly, vice president for engineering for ABC Radio Networks — unless, that is, a station spends a lot of money.

"There's no magic bullet for solar outages," Donnelly said. "The only way to get around solar outages is to have two antennas at widely separated locations and move reception back and forth. That's simply too expensive for most stations."

Because solar outages don't happen simultaneously throughout the United States and occur only for short durations, he said, radio people have learned to live with the inconvenience.

Transmitting and receiving

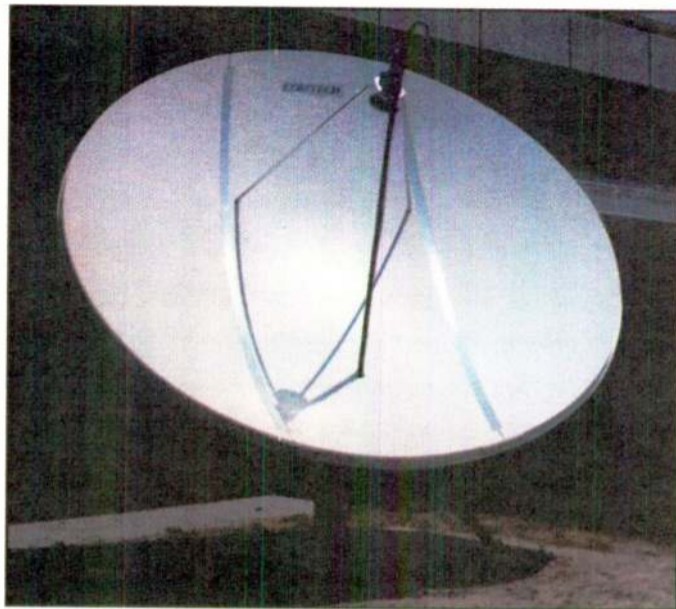
As Cain noted, several competing systems are offered in the marketplace. The ultimate winner may end up being the company getting the largest network contracts.

Starguide Digital, which manufactures and installs transmitting and receiving equipment, already has CBS/Infinity and its 3,000-station network as a client. Starguide purchased the satellite division of Scientific Atlanta in February of 1996.

"We're rolling out more of the Starguide product and replacing CDAT product," Brian Peabody, the company's marketing vice president, said.

New equipment includes the Starguide 2

receiver, which incorporates audio storage and replay and offers advertisers and record companies the possibility of making web-based audio/video presentations.



ComTech Satellite Dish at WSCL(FM), Salisbury, Md.

Satellite-delivered promotional vignettes for new CDs benefit stations, Peabody said.

"Program directors can look at a (promotional web) program and decide which new releases to schedule."

The service also will help record companies in speeding clearance of new CDs, he said.

One receiver, the Crown Satellite SpectraCast, serves a dual function,

according to Ben Dorsey, manager of marketing. He said it allows stations to record, store and program local advertiser's spots, as well as store and play satellite-fed audio.

Dorsey said the Crown DTMX 1000, intended for headend satellite distribution, gives networks and syndicators

additional capacity to upstream data along with audio. This service is critical both in running stations remotely and in providing text information to affiliates.

Mike Odneal, director of marketing at SpaceCom Systems, said his company provides transmission technology such as FM Square One to networks including ABC, Jones and about 15 religious networks.

What is important to networks and stations now, Odneal said, is "store and forward" technology and making the most efficient use of available capacity.

In with the old

"We buy, sell and repair satellite equipment," said Cristy Bryan, president of Satellite Services in Colorado Springs, Colo.

While many stations move to newer equipment, Bryan said her company has

See SATELLITE, page 58 ▶

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The Upgrade: All in the Details

Lauren Rooney

Take it from a trio of Pennsylvania engineers who have recently performed satellite upgrades: Planning an upgrade or installation is like planning a wedding. It's all in the details.

In October of 1996, WPWA(AM) in Chester, Pa., contracted David Skalish to upgrade its system to enable it to receive Radio AAHS.

A lotta work

"That was a big project because it meant repointing an existing dish, installing a new receiver and then interfacing the receiver to a digital audio system that also served as a network controller," said Skalish, a technician for KYW(AM), Philadelphia.

Radio AAHS provided the receiver and computers, Skalish performed the installation on a part-time basis, working nights and weekends to get the format on the air.

"It took about three weeks," he said. "I got the station up and running about a month ahead of time."

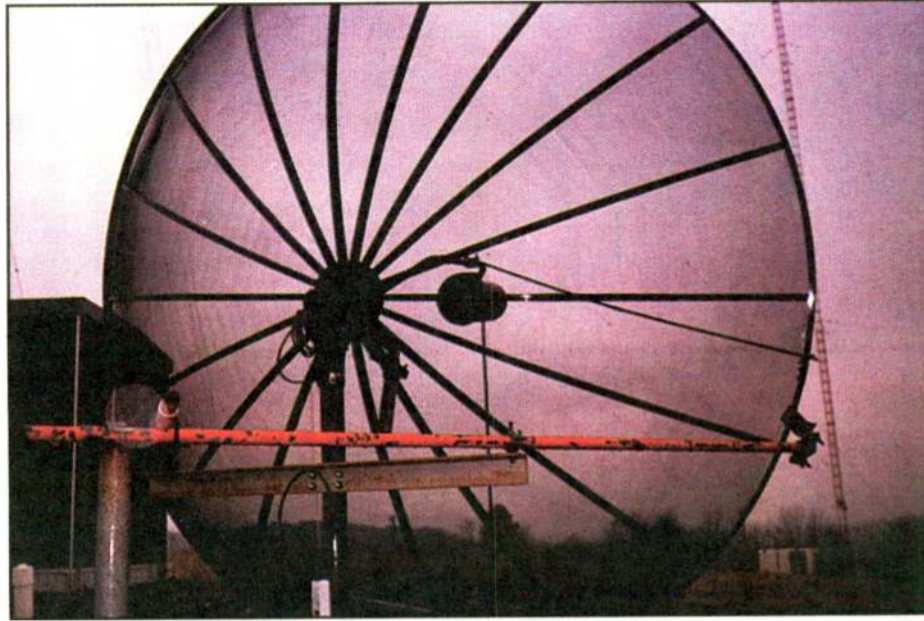
A DCS digital audio system runs the station's automation.

"That's a DOS-based computer that controls the playing of local commercials, rejoining the network and recording network feeds," Skalish said. The station chose this system because of its relative low cost and good reputation.

Skalish said having computer knowledge helped him accomplish the job. Because he did not have the right tools to move the dish, he improvised. The satellite receiver had computer diagnostics capabilities that allowed

meter. Computer diagnostics helped in pointing the dish. I used a laptop that helped move the Radio AAHS dish. Even a piece of equipment as simple as a volt meter ... helped.

"Bone up on your networking



Satcom C5 dish for WPWA(AM) is supported by a 'stiff' arm system that was designed to protect the dish from high winds.

him to use his laptop computer.

"It was a lot of hit-and-miss," he said. "Normally a technician would use a spectrum analyzer to aim a satellite dish, but I used a laptop and volt

skills," Skalish recommended. "You'll be linking computers together. At WPWA, a second computer was networked with the DCS so a traffic person can do program logs and make

affidavit forms for clients while the programming is running."

Recently, Clear Channel made some programming changes to WLAN(AM) in Lancaster and WRAW(AM) in Reading. Both stations began broadcasting the syndicated "Music of Your Life" format. The network provided the Vertex Communications Corp. receivers for the stations.

John Arndt, director of engineering for Pennsylvania Clear Channel stations, said WLAN had to add automation to interface with the satellite signal.

Next step: automation

Automation software from BSI was chosen, then loaded on a standard PC. Arndt went with BSI because he found the software inexpensive, he was pleased with the technical support and he noticed that BSI offers free upgrades to the software on its website (Note: See our review of the BSI WaveStation on page 24).

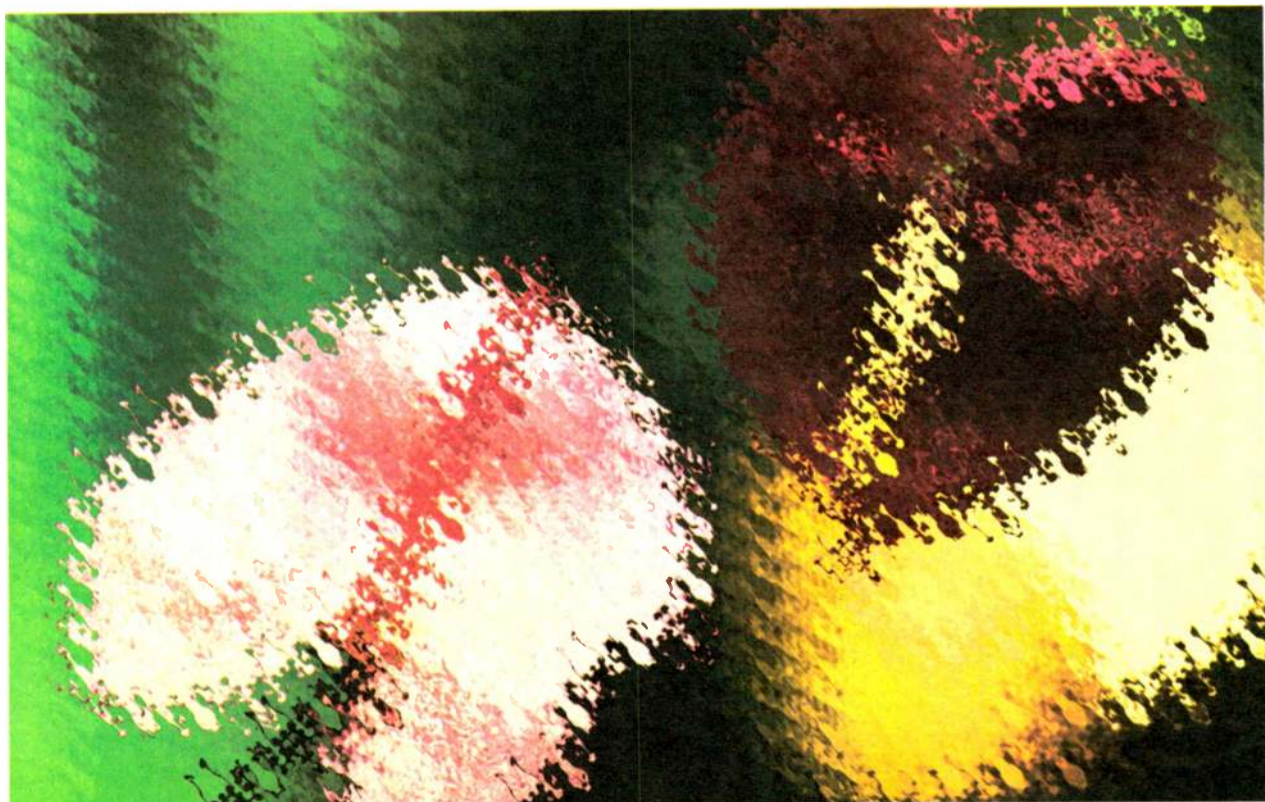
For WRAW, Arndt followed the recommendation of the network and bought a Wegener receiver for the Jones Digital Audio Receiver.

Arndt's biggest challenge was the same at both stations: how to get a clear shot from the dish to the sky. WLAN is located in a downtown area where trees and buildings can obstruct the sightlines between dish and satellite. But, Arndt said, the dish sits on top of their three-story building and is able to receive a clear signal.

At WRAW, terrestrial interference

See UPGRADE, page 53 ►

Impressionist Art.



► UPGRADE, continued from page 52 from other microwave signals in the market forced him to relocate the dish. Moving the dish and navigating through buildings and trees to find the best signal took Arndt several days.

"It was almost like finding a needle in the haystack," Arndt said. "Satellites are only two degrees apart in the sky, so it's hard to find your spot."

He advised engineers to locate the receivers in equipment racks close to the satellite dish and keep the cabling as simple as possible.

"If the need arises to pick up the dish and move," said Arndt, "give yourself time if you have to relocate, because it takes time to get it oriented and aligned. It's definitely not a two-hour process."

Send that satellite signal

In the summer of 1996, public station WITF(FM) in Harrisburg upgraded its equipment to allow news and sports programming originating there to be sent to affiliates.

Senior engineer Randy Miller said the station chose digital equipment for better utilization of satellite space and to keep the signal clean. The upgrade involved installing a digital satellite delivery system that cost between \$250,000 and \$500,000. The station bought two International Datacasting Flexroute Systems and 100 International Datacasting SR-260 receivers for their affiliates.

The system digitizes the audio signal and turns it into a low-power signal. It is fed into a high-power amplifier and then uplinked.

Miller said he chose International Datacasting equipment because it was one of the least expensive, and easy to work with. He also said IDC was the only company he found that could provide the needed equipment within his time frame.

"We have four audio channels, two

data channels and a control system," Miller said. "The system gives us four high-quality channels and also lets us reconfigure the signals in the field."



Contract Engineer Dave Skalish stands in the WPWA(AM) analog/digital production studio.

Miller said it took approximately one month to complete the upgrade. Because a major goal was to keep WITF affiliates happy, Miller spent two weeks checking out 115 receivers dispersed to 60 affiliates.

"I had to hook them up, write down serial numbers, make sure everything was there for the affiliate, repack them, and ship them out," Miller said.

"You have to have a lot of patience and a willingness to deal with people because you get all types," said Miller. "Sometimes at a small AM station, the owner is chief engineer, or a TV repairman down the street is doing that job, so you have to speak the language but explain it to the layman."

Miller recommends having plenty of extra equipment. "If an affiliate has a problem, you want to be able to ship off the necessary equipment to get up and running as quickly as possible."

Sometimes during an upgrade, the best plans go awry. An engineer may have the time and the equipment, but if he lacks proper knowledge, he should not be afraid to ask for help.

"There aren't that many people who can do this kind of work," Skalish said. "The industry doesn't foster the growth of engineers well enough."

■ ■ ■

Lauren Rooney is a newscaster for WHP(AM), Harrisburg, Pa., and a freelance writer for RW.



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 **HARRIS**

Hitch a Ride on a New Satellite

The following list, compiled for **RW** by James E. Hollansworth of NASA Lewis Research Center, shows some of the many satellites in use by radio networks and stations for programming to affiliates, or for re-sale.

Hollansworth consulted the North American Satellite Guide, published by GlobeCast; NASA satellite databases; FCC filing data on satellites; FCC satellite monitoring data; and other sources. While the list is not intended to be exhaustive and may change, it demonstrates how radio relies on satellite delivery.

C-Band

139 degrees W Long
ABC Network Feeds; GlobeCast Audio Services; Audio S.C.P.C.; RFD Illinois Radio Network; Kansas Info Network/Kansas Agnet; Nebraska Ag and Sports networks; Missouri Net/Cardinals Baseball; Radio Iowa; Capital Radio Network; United Broadcasting Network; Virginia News Network; Unistar Radio; CNN Radio Network

137 degrees W Long
People Radio; Talk Radio Network; Reading-Rockies Blind Bookreading;

LDS Radio; Fox Sports; NBC East

135 degrees W Long
Business Radio; WUSF(FM); WQXR-FM; WSM(AM); In touch Network

133 degrees W Long
Z-Music; Worldwide Catholic; EWTN Spanish; EWTN S.A.P.; Inspirational Network; WMAQ(FM)

131 degrees W Long
BBC World Service; C-SPAN Music; N.E. Sports Net; Cable Radio Net

125 degrees W Long
KLON(FM); Trinity Broadcasting; CNN Radio; World Radio Net. 2; World Radio Net.; WFMT(FM); Y-USA Radio Net.; MOR Music; ESPN; Virginia News Svc.; CBN; WWTN(FM)



A SpaceCom transmit antenna located at the Chicago International Teleport.

103 degrees W Long
Radio Tropical; WCNJ(FM); USA Patriot; Christian Music Radio

101 degrees W Long
Antenna Satellite; Calif State

99 degrees W Long
KBVA(FM); WHME(FM); Pulse 96.9 FM; World Harvest; KWHR; Audio S.C.P.C.; KBLA(AM) Santa Monica/Radio Korea; WWRV(AM); West Virginia Metro News; KGIL(AM); Illinois News Network; KTLK(AM); Tribune Radio Networks/Wisconsin Radio Network; Minnesota Talking Book Network; Clemson Sports Network; Michigan News Network; Talk America Radio Network; Minnesota Public Radio; WJR(AM) Tigers Baseball/Michigan News Network; Motor Racing Network; United Broadcasting Network; Soldiers Radio Network; Georgia News Network; Tennessee Radio Network; United Broadcast Network

91 degrees W Long
Action PPV; RAI-UNO; WTSO(AM); CBS-West; WCBS(AM); FXM

87 degrees W. Long
WROL(AM); Talk America; CNN Radio Atlanta; Unistar Country; American Urban; CNNSI; USA Radio Network; USA Radio News; Ambassador Net. 2; Ambassador Radio; Salem Radio; Salem Radio 2; Prime Sports Radio; MBC; WOKI-FM; Much Music Radio; WCCO(AM); Audio S.C.P.C.; WVCY(FM); VCY America; Good News Radio Network

69 degrees W Long
Audio S.C.P.C.; Radio Marti

Ku-Band

123 degrees W Long
Audio S.C.P.C.; Wal-Mart In-store Network; Sam's Club In-store Network; Russian-American Radio Network

103 degrees W Long
Cyclesat; KAZN(AM)

89 degrees W. Long
PBS Programming; Digital Music

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TECHNICAL TERMS

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Satellite services provide live concerts, daily and weekly syndicated programming, spot delivery, network news and full 24-hour programming to radio stations across the country.

Because engineers need to know more about satellites than programmers do, Bill Sepmeier, founder and vice president, satellite engineering for NSN, composed this glossary of satellite technical terms for RW readers.

Keep this list tacked up on your bulletin board.

Aperture: The area of an antenna that is exposed to the satellite signal.

Attenuation: The loss in power of signals between transmission and reception

A bit error rate of 10⁻⁶ means that there is an average of one error per million bits.

Block Downconverter: A device used to convert a C Band signal of 3.7 to 4.2 GHz or Ku Band (11.7 to 12.2 GHz) signal down to UHF or lower frequencies (1 GHz and lower).

C-Band: The band between 4 and 8 GHz with the 6 and 4 GHz band being used for satellite communications. Specifically, the 3.7 to 4.2 GHz satellite communication band is used as the down link frequencies in tandem with the 5.925 to 6.425 GHz band that serves as the uplink.

Carrier to Noise Ratio (C/N): The ratio of the received carrier power and the noise power in a given bandwidth, expressed in dB. This figure is directly related to G/T and S/N.

Cassegrain Antenna: The antenna prin-

Dual Spin: Spacecraft design whereby the main body of the satellite is spun to provide altitude stabilization, and the antenna assembly is despun by means of a motor and bearing system in order to continually direct the antenna earthward. The dual-spin configuration serves to create a spin-stabilized satellite.

Earth Station: Describes the combination of antenna, low-noise amplifier (LNA), up- and downconverter, and other electronics used to transmit and/or receive a signal transmitted by satellite. Earth Station antennas vary in size from one-fifth-foot to as large as 100 feet (30 meters) in diameter; sometimes used for international communications.

EIRP (Effective Isotropic Radiated Power): This term describes the strength of the signal leaving the satellite antenna or the transmitting earth station antenna, and is used in determining the C/N and S/N. The transmit power value in units of dBW is expressed by the product of the transponder output power and the gain of the satellite transmit antenna.

Elevation: The required measurement of the upward tilt of a satellite antenna aimed at the communications satellite.

F/D: Ratio of antenna focal length to antenna diameter. A higher ratio means a shallower dish.

FDMA (Frequency division multiple access): Refers to the use of multiple carriers within the same transponder where each uplink has been assigned frequency slot and bandwidth; usually employed in conjunction with Frequency Modulation.

Feed: At least two key meanings within the field of satellite communications: It describes the transmission of programming from a distribution center, or the



KLVM(FM) engineers install the station's digital audio network uplink.

actual physical feed system of an antenna. The feed system may consist of a subreflector plus a feedhorn or a feedhorn only.

Feedhorn: A satellite receiving antenna component that collects the signal reflected from the main surface reflector and channels this signal into the low-noise amplifier (LNA).

Focal Length: Distance from the center feed to the center of the dish.

Focal Point: The area toward which the primary reflector directs and concentrates the signal received.

Footprint: A map of the signal strength showing the EIRP contours of equal signal strengths as they cover the earth's surface. Different satellite transponders on the same satellite often will have different footprints of the signal strength. The accuracy of EIRP footprints or
See GLOSSARY, page 57 ▶



Satellite Design Engineer Steve Rubin stands atop the roof of an earth station uplink.

points. The most common problem in satellite communications is attenuation due to atmospheric precipitation.

AZ/EL Mount: An antenna mount that requires two separate adjustments — azimuth and elevation — to move from one satellite to another.

Azimuth: The angle of rotation (horizontal) through which a ground-based parabolic antenna must be rotated to point to a specific satellite in a geosynchronous orbit.

Backhaul: A terrestrial communications channel linking an earth station to a local switching network or population center.

Backoff: The process of reducing the input and output power levels of a power amplifier to obtain more linear operation.

Beamwidth: The angle or conical shape of the beam the antenna projects. Large antennas have more narrow beamwidths and can accurately pinpoint satellites in space or dense traffic areas on the earth. Tighter beamwidths deliver higher power levels and greater communications performance.

Bird: Slang term for a communications satellite.

Bit Error Rate: The fraction of a sequence of message bits that are in error.

iple that utilizes a sub-reflector at the focal point which reflects energy to or from a feed located at the apex of the main reflector.

Circular Polarization: Unlike many domestic satellites that utilize vertical or horizontal polarization, the international Intelsat satellite fleet transmits their signals in a rotating corkscrew-like pattern as they are downlinked to earth. On some satellites, both right-hand rotating and left-hand rotating signals can be transmitted simultaneously on the same frequency, thereby doubling the capacity of the satellite to carry communications channels. See *Polarization*.

C/N₀: Carrier-to-noise ratio measured either at the Radio Frequency (RF) or Intermediate Frequency (IF).

Companding: Compressing-Expanding. An analog noise-reduction technique that applies signal compression at the transmitter and complementary expansion at the receiver.

DAMA (Demand-Assigned Multiple Access): A highly efficient means of instantaneously assigning telephony channels in a transponder according to immediate traffic demands.

Demodulator: A satellite receiver circuit which demodulates or extracts the "wanted" signals from the received carrier.

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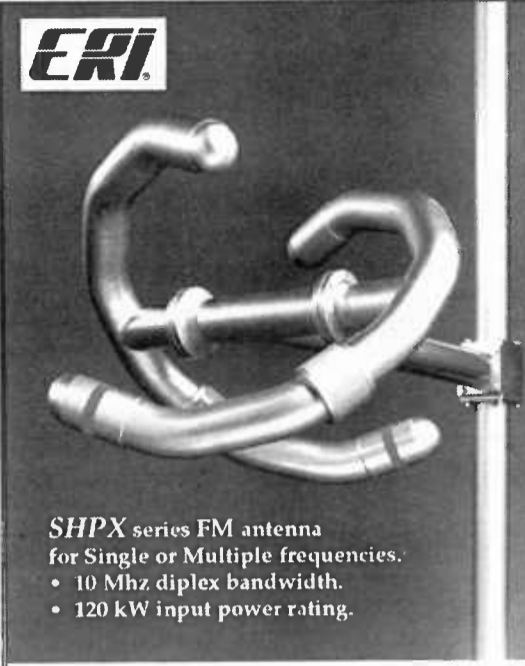
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Bird Is the Word

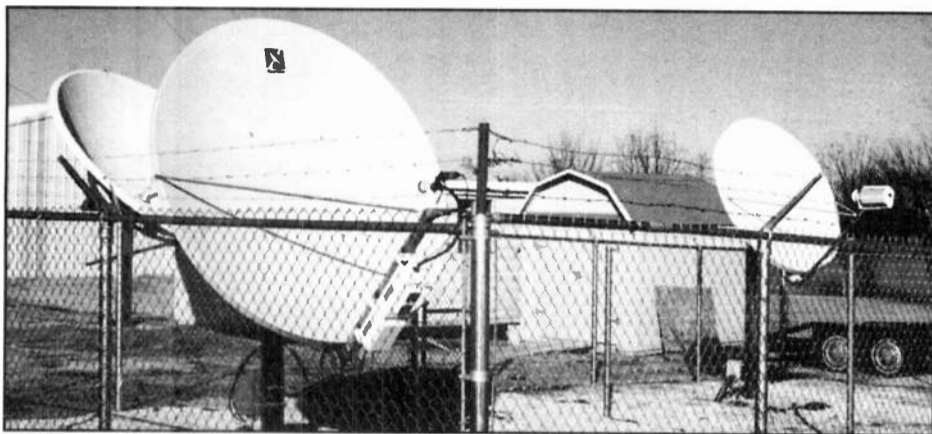
► GLOSSARY, continued from page 55

contour data can improve with the operational age of the satellite.

Forward Error Correction (FEC): Adds unique codes to the digital signal at the source, or retransmits application data multiple times, so errors can be detected and corrected at the receiver.

Noise: Any unwanted and unmodulated energy that is always present to some extent.

Noise Figure (NF): A term which is a figure of merit of a device, such as an LNA or receiver, expressed in dB, which compares the device to a perfect device.



Protect your dish. Oasis Radio Network keeps its VSAT dishes away from unwanted visitors.

Geostationary: Refers to a geosynchronous satellite angle with zero inclination.

Geosynchronous: The Clarke circular orbit directly above the equator; for the earth, this point is 22,237 miles above the surface.

Global Beam: An antenna down-link pattern used by the Intelsat satellites, which effectively covers one-third of the globe.

G/T: A figure of merit of an antenna and low noise amplifier combination expressed in dB. "G" is the net gain of the system and "T" is the noise temperature of the system. The higher the number, the better the system.

Kelvin (K): A temperature measurement scale where zero degrees K represents absolute zero, and corresponds to minus 459 degrees Fahrenheit or minus 273 Celsius. Thermal noise characteristics of LNAs are measured in degrees Kelvin as well as in dB above zero K.

Low Noise Amplifier (LNA): This is the preamplifier between the antenna and the earth station receiver. For maximum effectiveness, it must be located as near the antenna as possible, and usually is attached directly to the antenna receive port. The LNA is designed to contribute the least amount of thermal noise to the received signal.

Low Noise Block Downconverter (LNB): A combination Low Noise Amplifier and downconverter built into one device attached to the feed.

Margin: The amount of signal in dB by which the satellite system exceeds the minimum levels required for operation.

Modulation: The process of manipulating the frequency or amplitude of a carrier wave.

Modulator: A device that modulates a carrier. Modulators are found as components in broadcasting transmitters and in satellite transponders.

Packet Switching: Data transmission method that divides messages into standard-sized packets for greater efficiency of routing and transport through a network.

Parabolic Antenna: The most frequently found satellite TV antenna, it takes its name from the shape of the dish described mathematically as a parabola. The function of the parabolic shape is to focus the weak microwave signal hitting the surface of the dish into a single focal point in front of the dish, where the feed-horn usually is located.

Polarization: A technique to increase the capacity of the satellite transmission channels by reusing the satellite transponder frequencies. In linear cross polarization schemes, half of the transponders beam their signals to earth in a *vertically* polarized mode; the other half *horizontally* polarize their downlinks. Although the two sets of frequencies overlap, they are 90 degrees out of phase and do not interfere with each other.

Polar Mount: Antenna mechanism permitting steering in both elevation and azimuth through rotation about a single axis. While an astronomer's polar mount has its axis parallel to that of the earth, satellite earth stations utilize a modified polar mount geometry that incorporates a declination offset.

Polar Orbit: An orbit with its plane aligned in parallel with the polar axis of the earth.

Pulse Code Modulation: A time division modulation technique in which analog signals are sampled and quantized at periodic intervals into digital signals. The values observed typically are represented by a coded arrangement of eight bits, one of which may be for parity.

QPSK, Quadrature Phase Shift Keying: A spectrally efficient means of modulating a satellite signal.

Satellite-GEO: An electronic communications relay station orbiting 22,237 miles above the equator moving in a fixed orbit at the same speed and

direction of the earth. LEO satellites operate in low orbits, 150 to 200 miles above the earth, typically in polar orbits.

Single-Channel-Per-Carrier (SCPC): A method used to transmit a large number of signals over a single satellite transponder.

Slant Range: The length of the path between a communications satellite and an associated earth station.

Slot: A longitudinal position in geosynchronous orbit into which a communications satellite is "parked." Above the United States, communications satellites typically are positioned in slots that are based at two to three degree intervals.

Solar Outage: Solar outages occur when an antenna is looking at a satellite, and the sun passes behind or near the satellite and within the field of view of the antenna. This field of view usually is wider than the beamwidth. Solar outages can be exactly predicted as to the timing for each site.

Spin Stabilization: A form of satellite stabilization and attitude control achieved through spinning the exterior of the spacecraft about its axis at a fixed rate.

Spot Beam: A focused antenna pattern sent to a limited geographical area. Spot beams are used by domestic satellites to deliver certain transponder signals to geographically well-defined areas such as Hawaii, Alaska and Puerto Rico.

Spread Spectrum: The transmission of a signal using a much wider bandwidth and power than would normally be required. Spread spectrum also involves the use of narrower signals that are frequency hopped through various parts of the transponder. Both techniques produce low levels of interference between the users. They also provide security in that the signals appear as though they were random noise to unauthorized earth stations. Both military and civil satellite applications have been developed for spread spectrum transmissions.

SSPA (Solid-state power amplifier): A solid-state device that gradually is replacing Traveling Wave Tubes in satellite communications systems because they are lighter in weight and more reliable.

Stationkeeping: Minor orbital adjustments that are conducted to maintain the satellite's orbital assignment within the geostationary arc.

T3 Channel (DS-3): In North America, a digital channel that communicates at 45.304 Mbps.

TDMA (Time division multiple access): Refers to a form of multiple access where a single carrier is shared by many users. Signals from earth stations reaching the satellite consecutively are processed in time segments without overlapping.

TI (Terrestrial Interference): Interference of satellite reception caused by ground-based microwave transmitting stations, radar detectors, microwave motion detectors and other noise sources.

Transponder: A combination receiver, frequency converter and transmitter package, physically part of a communications satellite.

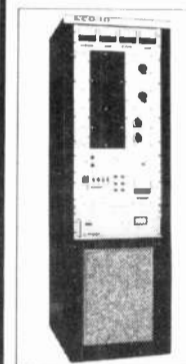
Uplink: The earth station used to transmit signals to a satellite.

VSAT: Very small aperture terminal. Refers to small earth stations, usually in the 1.2 to 3.8 meter range. Small aperture terminals under 0.5 meters are sometimes referred to Ultra Small Aperture Terminals (USATs).

Waveguide: A metallic microwave conductor, typically rectangular in shape, used to carry microwave signals to and from microwave antennas.

■■■
Bill Sepmeier is an entrepreneur and broadcast and satellite engineer. He founded the National Supervisory Network, now known as NSN Network Services Ltd. He can be reached via e-mail at bill@nsn.net, or by phone in Colorado at (970) 949-7774.

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Circle (48) On Reader Service Card

Satellites Gain in Popularity

► SATELLITE, continued from page 51

been successful at being "user-friendly" to stations who prefer older systems. Satellite Services offers one proprietary system, the Ariel receiver.

"Many of the newer systems do not have removable DBX boards," Bryan said. Station engineers can troubleshoot older systems with removable boards, but "now they can't do it with the new receivers. Stations miss the flexibility of older style systems where the audio cards could be moved."

Bryan said her company began four years ago when she was in radio sales and kept hearing about troubleshooting problems from engineers. They told her if someone would rebuild older equipment, they would buy it.

Many have chosen to use the Satellite Service "late-model used car" approach to satellite receivers, Bryan said, with as many as 5,000 stations purchasing equipment or services from her company since it began in 1993.

NPR satellite services

Alone among the major networks, National Public Radio operates its own independent satellite distribution system. NPR was among the first networks to begin satellite program distribution in 1979.

Besides distributing several hundred hours of NPR, PRI and other syndicated programs to public stations, NPR Satellite Services also distributes programs for commercial networks and syndicators.

George Jimergenis, director of business services for NPR Satellite Services, saw new technology moving toward the new DVB (standard), with applications of wideband audio, data and video all in one receiver.

He said new technology has allowed much more sophisticated command and control segmentation for the networks, and that NPR makes use of ComStream product and proprietary software developed for the network by IBM.

In the next three to five years,

Jimergenis said he foresees an increased trend toward multimedia distribution, including access to the Internet by satellite. He said NPR is moving to take advantage of these developments in offering services to commercial customers.

Public stations already benefit from the NPR system. Coded data fed with digital transmissions can control tape machines and computerized audio storage systems at stations, and can interface with station automation systems to run programs and breaks without operator assistance.

With the advances in computerized automation and digital compression, Jimergenis said, NPR can handle more clients than they currently have. He said the network is interested in compression technology for distance learning, one of the missions of the non-profit network.

Public radio system managers are intrigued by the ancillary income possibilities of pager service and Internet access by satellite.

Too many birds

With more satellites launched and planned, Donnelly and other industry leaders said "parking problems" could begin soon, perhaps within five years. The predicament increases as the space between "birds" decreases below three degrees.

Companies park satellites in slots based on the originating and terminating directions of the signal and the coverage area. If satellites get too close, they could interfere with each others' signals.

However, the advantage of having more satellites and using advances in digitized compressing, transmitting and storing audio and other data, increases the attraction of satellite.

Soon, as terrestrial and satellite-based stations are able to access hundreds of audio sources and dozens of digitized broadcast channels, extremely small market niches not profitable now as distinct program formats may

well become so. Much of the technology to bring about such a system is in place.

Additionally, expanded transmission capacity may soon allow networks and

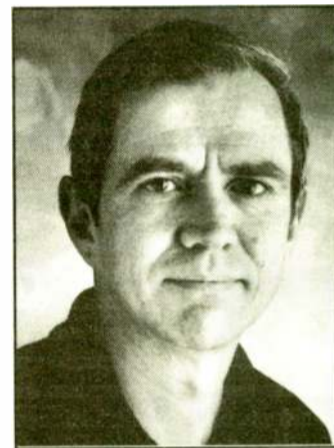
stations to tap a huge pool of new ancillary income in proprietary data and audio transmission services. Radio networks and stations would then become truly "multimedia" in product offered.

■ ■ ■

S. D. Yana Davis is a freelance writer and marketing consultant in Knoxville, Tenn. E-mail him at yanajune@usit.net

Kline's Satellite Dish Maintenance Checklist

Jerry Kline, chief engineer for the Southern Illinois University-Carbondale Broadcasting Service, offered the following checklist for satellite dish maintenance. SIUC Broadcasting operates W S I U (F M) , Carbondale, Ill., and WUSI(FM), Olney, Ill.



Jerry Kline, Chief Engineer for Southern Illinois University - Carbondale Broadcasting Service

- Check alignment at least once a year. To make sure that satellite dishes are lined up correctly, know when the center of the window is occurring.

- Preventive maintenance is important and should be done on a regular basis. Look the dishes over while doing repointing and other changes as required. The boots on the struts seem to need the most attention; they weather and tear when the dish is moved.

- Check for damage done by animals and birds. Seal up all openings. Check each year for wasp and bird nests before the weather gets cold. A woodpecker pecked holes in the plastic cover for the LNBS at the WUSI station twice before it was finally replaced with a harder material. A bird nest found inside the back cover of the de-icers would have posed a fire hazard when the de-icers came on.

- Look for tears or cracks in any rubber weatherseal boots and lubricate the screws if the dish has them. Check all covers for leaks or holes that might let in insects, birds or water. All electrical connections and other hardware need to be checked for corrosion and tightness.

- The station engineers usually do all of the maintenance required after the dish is installed. Outside help may be required if there is structural damage, or possibly for de-icer repairs.

- Winter presents its own set of problems. Pay close attention to weather and dish conditions. Some satellite dishes have de-icers; they should experience few problems with weather. Snow can be cleaned off the dish surface with a broom. Snow on a 10-meter dish is difficult to sweep; you may actually have to climb into the dish to sweep it. If you must use the broom method, use a safety rope to prevent falling; Kline does not recommend this method. A "cherry picker" used by power or tree trimming companies would be a better way to go on big dishes. Ice does not seem to be as problematic as snow.

—S.D. Yana Davis

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Dishes And the Band War

There are two schools of thought concerning satellite dishes. The first is that cheaper is better. The second is that you get what you pay for.

Most radio audio — about 80 percent — is distributed via C-band satellites, requiring large reception dishes and specialized uplink sites.

Bob Donnelly, vice president for engineering for ABC Radio Networks, is a member of the second school. His network is invested heavily in C-band transmission, requiring reliable larger dishes for the best results.

"We want our affiliates to invest wisely," Donnelly said. He mentioned "good, smooth parabolic reflectors" as desirable, with stable mounts that are easily adjusted and that can be easily maintained.

Performance will pay back your investment, Donnelly said.

But there is movement toward smaller, less expensive — and some think less reliable — dishes, as newer networks opt for Ku-band distribution, according to Don Filmer, vice president of engineering at NII Norsat. Filmer said as many as 1,000 stations are now using Ku-band. NII Norsat provides satellite components, antennas and related equipment to networks and stations.

Filmer said the less-expensive Ku-band dishes and equipment allow the formation of new, smaller radio networks with affiliates that could not previously afford the more-expensive C-band based systems.

"The next generation of satellites — Ku-band — are also bringing a whole new wave of technology," Filmer said. "The technology operates much like cellular telephone platforms so you can transfer information between cells," Filmer said.

It allows two-way transmissions with all Ku-band dishes, which is unique to that spectrum. C-band satellites require special uplink equipment.

Two-way capability enhances program distribution, Filmer said.

"Local programs can be distributed to other stations at a much more economical price, local advertisers can get wider coverage, and stations can do things like resell local news in other markets," he said. Ku-band systems offer other possibilities for networks and station groups. Radio groups could use Ku-band-based VSAT systems for "data communications needs," said Steve d'Adolf, assistant vice president at Hughes Network Systems, which provides data transmission services for retail stores and banks.

"It depends on the economics of scale," d'Adolf said. "If you're Target and you have 12,000 stores, it makes sense. A radio group or network would need a lot of affiliates or distribution points" for a dedicated data-only satellite distribution system.

But d'Adolf also said he foresees the day when dedicated data-transmission systems may be critical for networks and groups as demand for audio capacity on existing systems increases.

— S.D. Yana Davis

Satellites and the Digital Age

The move to digital transmission of programming began in the 1980s but got underway in earnest early in this decade as major networks such as ABC, CBS/Infinity, NPR, Westwood One and others chose digital.

"Everyone is going to digital," said Fred Cain, director of satellite services for GE American Communications (GE Americom), whose satellites service most of the major networks.

Digital transmission,



Bob Donnelly, Vice President, Engineering ABC Radio Networks

Cain said, provides several benefits both to distributors and stations.

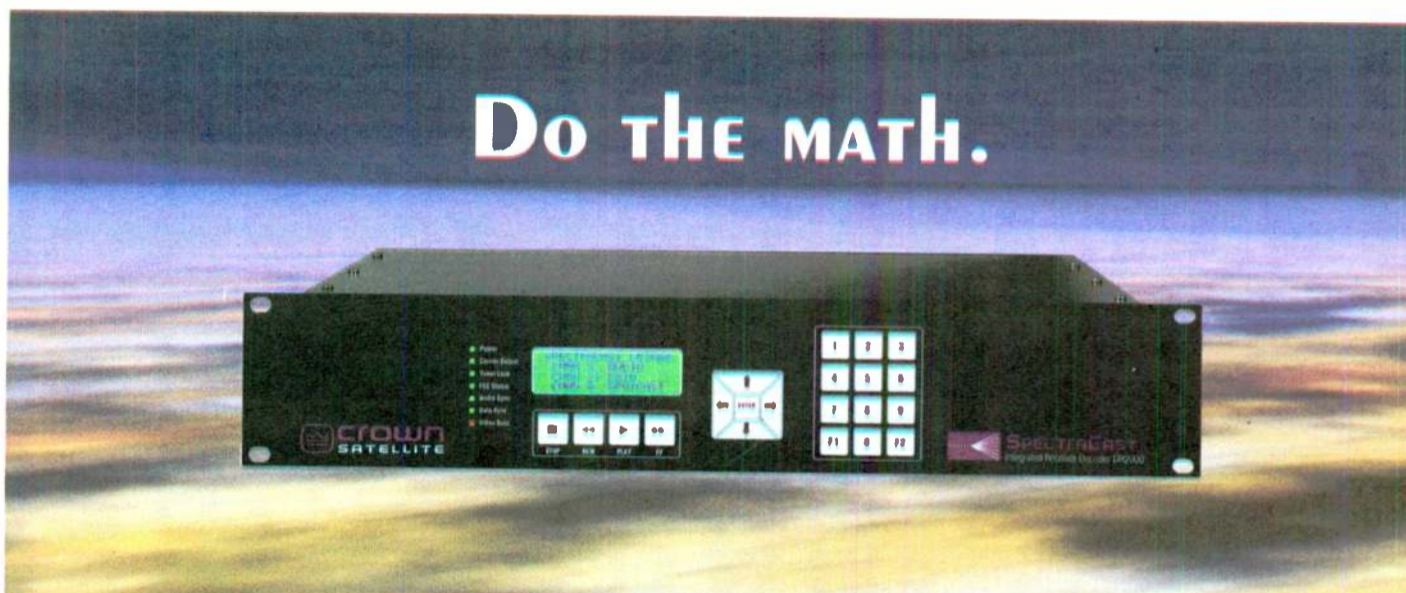
"A network has greater flexibility. For instance, instead of providing one channel of talk radio audio as they did five years ago, they can now split a 128 kb channel into two 65 kb channels and provide two talk services," he said.

Bob Donnelly, vice president for engineering for ABC Radio Networks, agreed. Digital delivery using MPEG provides the opportunity for greater control both at network headend and at stations, especially in view of the new receivers available, Donnelly said.

Two functions

New receivers have two functions: to capture satellite transmissions, and to store them on hard drives for replay as time-coded, by either the network or the station.

See DIGITAL, page 60 ►



SATellite RECEIVER + Digital CART RECORDER/PLAYER = SPECTRACAST

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No Standard ... Yet

► DIGITAL, continued from page 59

"We run our stations' automation systems using satellite-fed data signals, remotely control receivers and breaks as well as providing newswire service to ABC stations," Donnelly said.

Cain said although no digital platform has achieved the status of being the standard, "the race is on" between companies such as Starguide Digital, ComStream, Wegener and Crown Satellite, among others.

Networks and stations are looking for transmit and receive systems

that "will give the best flexibility, the best quality and won't be out of date next month," Cain said.

Donnelly said broadcasters now more frequently demand the ability to "download large audio files into computers and audio servers," and that the industry is responding with several new receiver products with that capability. Donnelly said Starguide, Wegener, ComStream, ICP and IDC systems offer expanded digital download and storage capacity.

— S.D. Yana Davis

Delivery Providers Expand Their Services

Alan R. Peterson

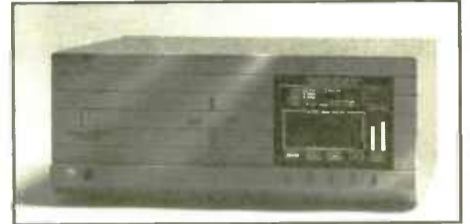
It is not always necessary to point a dish up to the sky to receive commercial audio and long-form programming. Digital delivery systems have been doing it for several years with POTS landlines and ISDN connections.

Rather than wait for a reel, DAT or CD to arrive by land courier, a radio station can receive important commercial content moments after the order is taken and the audio enters the system.

In a process familiar to those that

use such a service, audio is digitized and transmitted over a conventional phone line or digital ISDN connection to the radio station, where it is converted to analog audio and dubbed to cart.

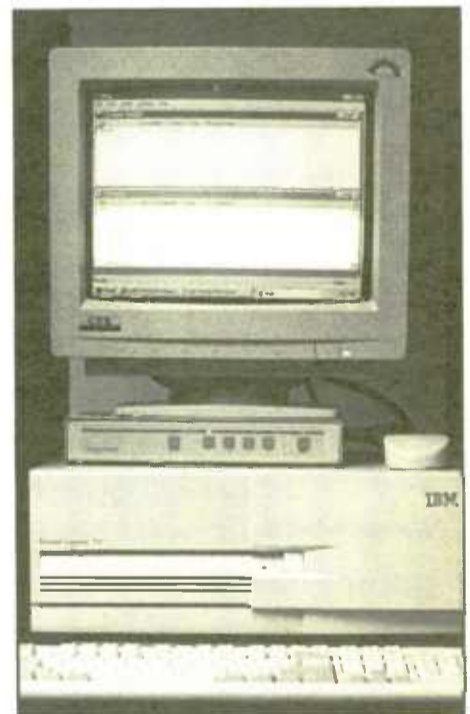
Or the audio can stay in digital form and be routed automatically to a station's storage/playback system. Flight information and rotation instructions can be sent along with the audio, making the job easy for both production and



DG System Receiver

Earlier this year, RW ran a three-part series on the major delivery services: MUSICAM EXPRESS, Digital Courier International and DG Systems. Since the printing of the original articles, some companies have made improvements and enhancements in the way their systems operate. All find themselves busy.

Although some radio professionals are using the Internet as an information



MUSICAM EXPRESS hooked up in WJFK(FM), Fairfax, Va.

delivery structure, none of the three suppliers named has fully embraced audio over the Internet. But that could change.

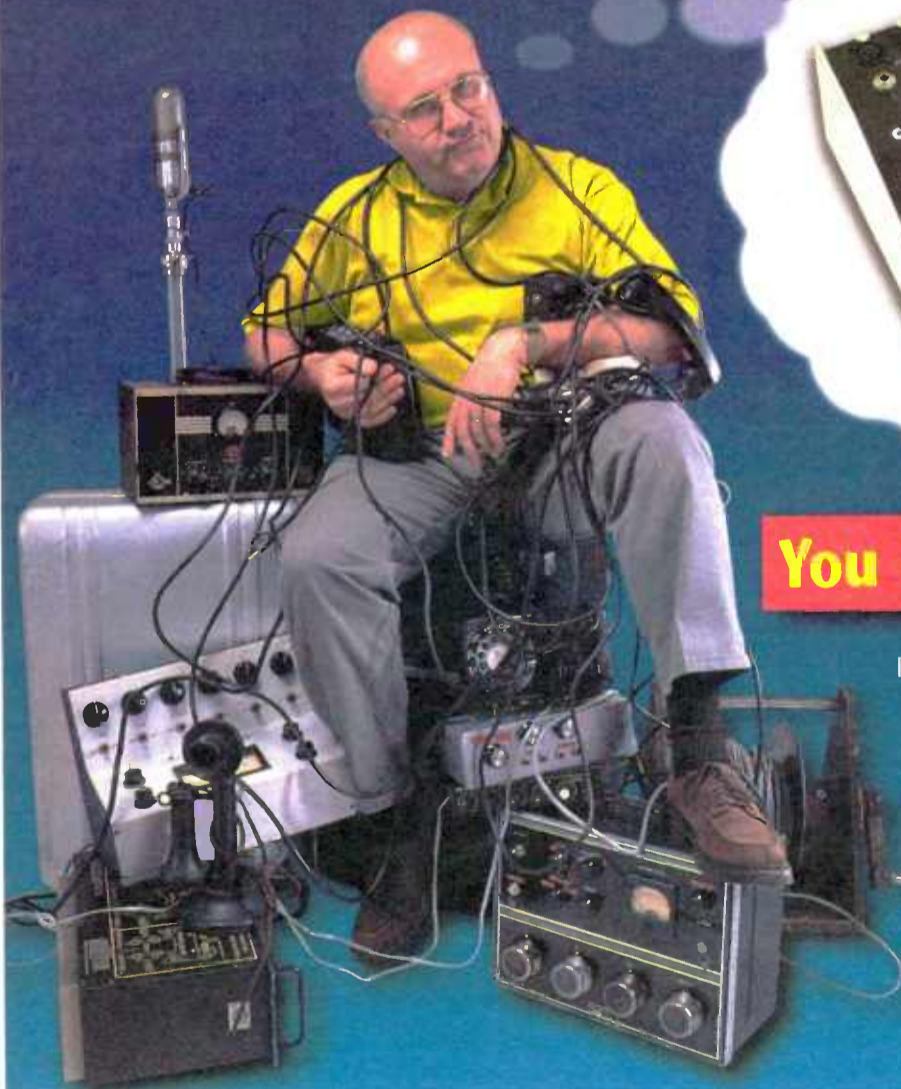
Why not use it?

At first impression the Internet appears to be a solid structure, so it seems unusual that delivery systems would not exploit its presence. The snags are the same things that make home downloads such a chore: line availability, speed and quality.

Remy Kozak, vice president of marketing for DCI, has said of the Internet, "There is a lot more to delivering advertising material than simply

See SERVICE, page 61 ►

Is your remote gear weighing you down?



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If you're tired of lugging half a studio out to your remote broadcasts, lighten your load by taking a Buddy instead. The Buddy handles your program mix, headphone feeds, communications, codec return and PA feed. It works well with any ISDN codec, POTS codec, RPU, cellphone or telephone line—and even has a built-in frequency extender.

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▶ SERVICE, continued from page 60 streaming audio. There is the timeliness, if you have to get an ad and the lines are all full.

"There is securing the audio, because I don't think an advertiser would want their ads generally accessible by their competitors. It is also not unheard of on



orders. The browser — which is Windows- and Mac-compatible — was released in May.

It is possible to transfer audio over the Internet. Systems such as Audioactive from Telos Systems and RealAudio from RealNetworks provide the ability to stream audio to end users. Numerous compression algorithms such as Dolby and MPEG assure CD quality, or close to it.

In fact, a service called Liquid Audio demonstrated a music delivery system at this year's AES show in New York. This service can transfer a three-minute song over the Internet in approximately 12 minutes, using a simple 28.8 kbps modem.

While this endeavor is designed for music marketing, it does show that non-real-time, high-quality spot delivery over the Internet may be close.

What's new

Otherwise, the "big three" delivery services have enjoyed successes and are responding to changing times with new services and technology.

Tracey Beschell, business manager for distribution of DCI, spoke of the company's new "Collect Sending" plan.

"Users can now reverse charges with this service," she said. "Normally when Site A sends audio to Site B, Site A is the one that pays. But when Site B asks for a certain piece it wants, then Site B pays."

Other developments include audio import/export, which allows MPEG files to be transferred in digital form between workstation and DCI system, without the need to convert to analog first.

Beschell reported that "traffic is up" for the year, with an increase in spots delivered as well as mass deliveries of music. "The latest Garth Brooks release was sent to 130 stations in Canada in one shot," she said.

DG Systems went for a technical upgrade for its receivers located at high-volume radio stations. According to DG Systems public relations representative Dana Deason of the Le Grand

the Internet not to be able to log in or get the audio downloaded in the time and the quality you need."

Still, companies are exploring the Internet as an ancillary route for data, information and instructions. Some are investigating its ability to "shop around" for the needed audio.

IMAKE 'melting pot'

IMAKE Software and Services in Bethesda, Md., makes the Digital Broadcast Studio, a high-end media service system that incorporates analog and digital technology and uses both ISDN and the Internet.

Steve Sanders of IMAKE said, "The Internet is used as a 'control channel.' We can play audio across an ISDN network and transit files from an FTP site across the 'net. You can sample the audio you want over one source and download it from the other."

DG Systems also is using the Internet, not for audio but order verification and tracking. "DG Online version 2" is a browser-based interface that checks the status of advertising delivery

RDS/RBDS "Mini-Encoder"

With this simple, "dirt cheap" encoder, your station can begin transmitting



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Group, "One thousand five hundred DG audio receive/playback terminals have been retrofit with U.S. Robotics X2 modems. The upgrade has improved distribution throughput by 40 percent, increasing the potential number of ads that can be transmitted in a given period of time."

Like DCI, DG also does mass deliveries of music releases. In September, the first single release from the Rolling Stones' "Bridges to Babylon" album was delivered electronically to 1,780 radio stations, making it the largest delivery DG Systems has made to date.

MUSICAM EXPRESS has made it through another "sweeps" period, during which TV stations advertise heavily on radio. The "hub" method of directing audio over local models allowed spots to enter

the system and arrive at their destinations quickly.

In Los Angeles, the local NBC TV affiliate was distributing spots that were mixed from audio produced in both Los Angeles and Atlanta. The mix was completed and entered into the system via the ProducerDaX within 10 minutes. This turn-on-a-dime advertising strategy is necessary in such a competitive marketplace.

The user interface — the MUSICAM EXPRESS WinDaX — is undergoing a facelift. Affiliate DaX version 3.0 is the next release.

Digital delivery to radio stations continues to thrive. When supplemented by satellite service, many of the audio needs at the station level are met, with high-quality audio delivered in a timely manner.

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TARGET: DELIVERY

Special Delivery: Signals and Satellites

It is fairly common these days to hear "live via satellite" or "let's 'ISDN' it to our affiliate." Radio stations rely on satellite and digital delivery for vital programming.

ABC/GlobeCast Satellite Services

ABC/GlobeCast Satellite Services specializes in digital audio and commercial radio distribution, and offers transmission operators for support 24 hours a day, seven days a week.

The partnership offers several solutions for network radio, including the GE-Satcom C5 satellite for U.S. commercial radio. ABC/GlobeCast has capacity available on Satcom C5 transponders 15, 19 and 23, and offers 20 kHz SEDAT, mono and stereo; 15 kHz DATS, mono and stereo and 7.5 kHz DATS, mono.



ABC/GlobeCast also uses GE-3 for radio distribution of digital and analog audio for stereo and mono transmissions,

which supports automation control tones. ABC/GlobeCast provides two ways to access the New York uplink: T1 backhaul from New York, Los Angeles, Washington and Dallas, and V-SAT delivery from Los Angeles, San Francisco, New York and Dallas.

Talk radio-ready studios are also available in New York, Los Angeles and Washington.

ABC/GlobeCast distributes talk shows, sporting events, live concerts, record premiers, PSAs and press releases.

For more information, contact Sean Tietjen, sales manager in New York at (212) 456-0134, or Eric Hansen, account executive in New York at (212) 456-0133 or circle Reader Service 12.

ComStream

ComStream provides digital transmission solutions for voice, data, audio and video applications and designs and manufactures satellite communications equipment, such as full-mesh VSATs, satellite modems and earth stations; and broadcast systems for private business and public networks. ComStream also produces satellite broadband PC/server receiver cards and digital set-top boxes.

With a technical focus on hardware, software and network management, ComStream has designed and installed

digital satellite-based communications networks for customers around the world.

ComStream's corporate structure includes a Satellite Global Access division, which supplies fixed satellite-based communications systems, such as VSAT Plus II, for markets requiring four or more voice-channel equivalents at multiple remote sites; satellite products division, which supplies modems and earth stations for closed, specific-vendor networks and open interoperable INTELSAT-compliant networks, plus offers audio and data distri-



bution products and specialty products; broadband products division, which provides the MediaCast satellite PC/server receiver card and its digital audio receiver for commercial environments such as restaurants and stores.

For more information, contact ComStream in California at (619) 458-1800; fax: (619) 657-5400, visit the website: www.comstream.com or circle Reader Service 51.

Crown Satellite

Crown International recently added a new division: Crown Satellite, which features a new product line, the SpectraCast. SpectraCast includes hardware and software tools for the satellite network delivery of audio and data.



For radio networks, Crown offers headend and affiliate products. For the headend, SpectraCast consists of a DVB-compliant MPEG data transport multiplexer. For affiliates, SpectraCast consists of integrated receiver decoders.

The Crown IRDs offer built-in flash memory for store-and-forward applications. They also feature multiple MPEG decoders as well as audio mixer/faders. These receivers can simultaneously receive network feeds while recording and playing local spots, IDs, liners, PSAs and short-format programming. Crown has designed the SpectraCast IRD model, such as the DR2000, so that it can replace a satellite receiver as well as some digital audio workstations.

The SpectraCast DR2000 offers multiple channel per carrier capability and use of full or partial transponder bandwidth. It features forward error correction, dedicated data ports that include an RS-422 synchronous data port and RS-232 asynchronous ports.

For information, contact Crown Satellite in Indiana at (219) 294-8143; fax: (219) 294-8120, e-mail: SpectraCast@crowintl.com visit the website: www.crownbroadcast.com or circle Reader Service 90.

DG Systems

The DG Systems network is an integrated, multimedia electronic network that delivers CD-quality audio files such as radio commercials, first-release music singles and news actualities to radio stations.

DG Systems offers same-day, late-night, next-day or two-day digital delivery. DG Express delivers spots in less than four hours and DG Priority delivers spots within an hour.

DG Systems bases the service on a store-and-forward network that features a PC-based server, located in production studios and advertising agencies. Audio files are loaded into the servers and transmitted via phone lines to DG Systems headquarters in San Francisco. DG Systems then sends the audio to each of the radio stations scheduled to receive the file.

For more information, contact DG Systems in California at (415) 276-6600; fax: (415) 276-6601 or circle Reader Service 168.

Flash Comm

Flash Comm took HF radio technology originally developed for the military and created a hybrid HF/FM RDS two-way nationwide truck tracking and messaging network to compete with satellite-based systems.

With this system, trucks can transmit more than 1,000 miles at 10 MHz with 10 watts, by bouncing the signal off the ionosphere. Few receive sites are needed to cover the whole country.

Messages are sent to the trucks using a network of FM stations that broadcast the RDS subcarrier, providing the added advantage of allowing alphanumeric pages over the same signal.

Data is sent via landline from the hub in Florida to the Spacecom satellite uplink in Chicago where it is upped to G4 using the Hypercube protocol. This allows the ability to change the system data rate remotely to increase satellite bandwidth as the network grows. Each affiliate picks up the data with a small dish.

At the station, the data is filtered for the correct location and fed into the RDS encoder. Data transmission capability is part of the RDS and data does not affect the station's use of any RDS features. The listener sees just the station's RDS information — station name, format and more.

For information, contact FlashComm in Florida at (407) 752 3015, via e-mail: bmarriott@flashcomm.com or circle Reader Service 129.

International Datacasting

The FlexRoute SR260jr from International Datacasting is a new addition to the FlexRoute satellite digital audio system, designed for program syndicators, radio network operators and background music providers.

The FlexRoute SR260jr features ISO/MPEG Layer II/IIa digital audio compression; selectable 133.5/267 kbps carrier data rate from the headend; full network control and addressability; audio

See DELIVERY, page 63 ►

AM Transmitters

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► DELIVERY, continued from page 62
threshold settings that determine audio performance before muting; variable data rate partitioning, which allows as many as four channels per carrier; and secondary channel data output.

Other functions of the FlexRoute SR260jr include the ability to support

INTERNATIONAL DATACASTING

mono, dual mono, stereo and joint stereo audio modes, and the capability to support multiple audio sampling rates and audio data rates.

For more information, contact International Datacasting in Georgia at (770) 446-9684; fax: (770) 446-6396, e-mail: us-sales@intldata.ca or circle Reader Service 207.

MUSICAM EXPRESS

MUSICAM EXPRESS began in 1995 as a joint venture between CBS, Westwood One and StarGuide Digital Networks to deliver CD-quality audio to radio stations. MUSICAM EXPRESS offers several services, including local, regional or national commercial spots, short- and long-form programming, show prep, actualities, music, satellite services and dub/ship services.

The main part of the system is the WinDaX, a digital store-and-forward system that sends the audio from a producer's unit to an affiliate unit using satellite or digital ISDN lines. The system allows users to send CD-quality spots, music and programming point-to-point with one digital conversion.

MUSICAM compression technology (12:1) is used on all audio material with a transfer rate ranging from 64 kbps to 512 kbps and is flexible to allow the bandwidth to be reallocated.

The WinDaX digital system uses Windows 95 software and MUSICAM digital audio to receive, transmit or store the audio at the station.

For more information, contact MUSICAM EXPRESS in California at (888) 366-4869; fax: (415) 249-4728 or circle Reader Service 13.

NII Norsat

Norsat supplies components and equipment to the satellite industry and provides commercial LNBS. Norsat LNBS are used in point-of-sale VSAT delivery systems, business TV applications, satellite radio, distant learning networks, and more.

Customer service is available and Norsat provides off-the-shelf LNBS as well as semi-customized designs. The LNBS are compatible with traditional analog systems and digital systems.

For more information, contact Norsat in British Columbia, Canada at (604) 597-6200; fax: (604) 597-6214, via e-mail: www.norsat.com or circle Reader Service 52.

NSN Network Services Ltd.

NSN Network Services Ltd. is an integrator of satellite communications equipment and specializes in global Internet connectivity with its InSAT systems, CD Quality MPEG digital audio

networks, global digital telephone, data and FAX networks, ISDN AnyWhere networks and other satellite worldwide connectivity.

NSN also researches the global communications markets and develops connectivity solutions.

The NSN Consulting Group engineers study the NSN product lines, as well as lines and technology not carried by NSN on a "full-time" basis. NSN develops solutions for broadcast, general business, medical and educational network applications.

NSN has installed and supports more than 200 satellite networks. It is a division of the Jacor Communications Company.

For more information, contact NSN in Colorado at (970) 949-7774; fax: (970) 949-9620 or circle Reader Service 91.

SpaceCom Systems

SpaceCom Systems owns and operates the Chicago International Teleport, which offers redundant uplinking, two independent uninterruptible power supplies, diverse telecommunications routing and additional back-up systems.

SpaceCom introduced C-band FM Squared for point-to-multipoint satellite transmission of audio and data. The reliability and low-cost receive equipment of FM Squared technology attracted broadcasters of Christian and secular radio programming, background music and weather information. SpaceCom provides C-band FM Squared services on two transponders on the GE-3 satellite through the year 2000.

FM Squared technology also is available via one of SpaceCom's two Ku-band transponders on the Galaxy IV satellite. FM Squared is available in analog and digital formats.

FM Cubed Technology was introduced in 1991 and utilizes a time-division multiplexed modulation scheme for transmission and was developed as a service for customers who need enhanced reliability, addressability, flexibility and security. The FM Cubed receiver can be remotely upgraded or reconfigured, which eliminates hardware changes and field-site visits.

SpaceCom also offers the HyperCubed service, which enables customers to receive as many as eight satellite data channels simultaneously.

For more information, contact SpaceCom in Oklahoma at (800) 950-6690; fax: (918) 488-4848, visit the website: www.spacecom.com or circle Reader Service 130.

StarGuide Digital Networks

StarGuide Digital Networks offers the StarGuide III Receiver for receiving satellite signals. It can operate as a single channel per carrier (SCPC) receiver or as a multiple channel per carrier (MCPC) receiver based on patented StarGuide MX3 technology. The StarGuide III supports rates 128 kbps to 15 Mbps operating on C or Ku-Band satellites. It was designed with five slots for field replaceable option service modules. The StarGuide II and StarGuide III Receivers are compatible and can coexist in the same network using the StarGuide MX3 Multiplexer/Uplink system.

The StarGuide MX3 digital multime-

dia satellite multiplexer supports simultaneous digital audio, video and data services. MX3 transport technology features include: multi-channel, multi-carrier operation; ability to uplink as many as 120 simultaneous digital audio, video and data services; the acceptance of MPEG II digital audio and MPEG 2 digital video input streams; and the ability to support aggregate bandwidth from 512 kbps to 15 Mbps in N x 64 kbps increments. The 21-slot modular design of the MX3 Multiplexer allows for network expansion and multimedia service flexibility.

The StarGuide VBNMS software allows users to operate and control their multimedia satellite network from a central location. The software operates on Windows 95/NT computer platform and allows for bandwidth allocation of net-



work services as well as individual remote receiver addressing. Additional features include: the ability to configure multiple audio, video or data channels per satellite carrier; the capability to address as many as 16 million individual receivers in a single network; and the opportunity to address remote receivers individually, in defined groups, or as an entire population.

For more information, contact StarGuide Digital Network at (619) 452-4920; fax: (619) 452-3095; e-mail to www.starguidedigital.com or circle Reader Service 169.

Buyer's Guide is looking great for '98. In January, we'll feature Test, Monitoring and Remote Control.

Send your information now!

TARGET: DATABASES

Providers Offer Wealth Of Data

For radio stations to succeed, market analysis is important. For instance, stations undergoing format changes would need demographic information, while broadcasters looking for FCC approval to start a station would need coverage area information.

With satellite and digital transmission of data, compiling and sending the information is easier than ever.

Communication Data Services

Communication Data Services recently announced the activation of Web Online, an upgrade of the remote-access Online Engineering Tools. The new service simplifies data transfer for RF engineering departments and consultants and adds new features and capabilities to the selection of available services.

The service was designed to provide RF engineers with remote access to pertinent engineering databases. According to Communication Data Services, Online is tailored to provide timely and efficient access to RF Engineering data.

Web Online is at <http://query.comm-data.com>

For more information, contact Communication Data Services in Virginia at (703) 558-0510; fax: (703) 558-0524, visit the website: www.comm-data.com or circle Reader Service 131.

See DATABASE, page 64 ►

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SIDEKICK AUDIO SUBCARRIER GENERATOR

The SCA-186 Sidekick® is the industry standard for subcarrier services. When stations lease their SCAs to foreign language and reading services and need a reliable generator, the Sidekick is the only place to turn.

Here's why:

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► DATABASE, continued from page 63

DataWorld

DataWorld is an information services company founded in 1971. It provides

Feedback

Services



Maps

Links

customized maps, electronic data products, printed reports, chart and graphs to companies in the communications and other industries.

Mapping services are provided from global perspectives down to zip code and census block group levels. Topographic, geographic, ethnic and demographic data are employed to produce maps and overlays. DataWorld markets its demographic shading maps as an innovative approach to data display.

Various data products are available, including customized geographic and demographic data extractions. One option is the ability to retrieve data within predicted or real-world broadcast coverage areas.

A variety of frequency allocation services are available to assist industry

professionals in selection of a new frequency or evaluation of possible facility upgrades. Comparative coverage analysis and LMA/duopoly studies are provided on demand.

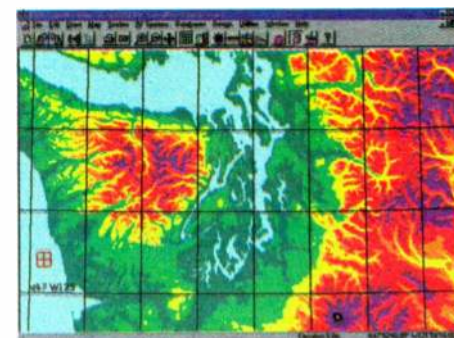
For more information, contact DataWorld in Maryland at (301) 652-8822; fax: (301) 656-5341; via e-mail: info@dataworld.com. The DataWorld website is: www.dataworld.com or circle Reader Service 170.

EDX Engineering

EDX Engineering maintains an expanding selection of database products. Off-the-shelf databases are available for international and U.S. terrain data and U.S. geographic data.

EDX offers a catalog of maps,

images and aerial photographs that can be imported into the EDX wireless system design software to enhance interpretation of system studies. According



to EDX, the user can scan his or her own maps or photos and geo-reference them with the geocoder built into EDX software.

The software uses an open ASCII database format and allows importation of terrain, groundcover and demographic databases, including international databases.

EDX can create custom databases for radio stations and other users that can be used with the EDX wireless communication system design software and for general GIS purposes.

For more information, contact EDX Engineering in Oregon at (541) 345-0019; fax: (541) 345-8145, via e-mail: jlk@edx.com or circle Reader Service 209.

SoftWright LLC

SoftWright LLC offers the Terrain Analysis Package (TAP) version 4 for Windows, which consists of 11 modules that can be combined to allow RF system design on a personal computer, and the Intermodulation Study module, which can be used as a stand-alone package or integrated with other programs in the TAP software system.

The foundation module in TAP for Windows is the Basic Mapping Module, which allows the user to display geographic coordinates, select distance and bearing between reference points and draw path profiles.

The RF Facilities Module allows the user to build a database of fixed and mobile facilities and view a library of directional antenna patterns and transmission line types.

For specified transmit and receive antenna heights, plot the shadowed areas around a site with the Area Shadowing Map Module.

Other modules include the Pattern Distortion Module, the Bullington Propagation Module, the Okumura Propagation Module, the Longley-Rice Propagation Module, Broadcast/SMR (Part 73) Propagation Module, the Carey Propagation Module, the Microwave Reliability Module and the VHF/UHF Reliability Module.

Minimum requirements are Windows 95/NT with 16 MB RAM.

The Intermodulation Study Software provides programs that help the user establish and maintain multi-user radio communications sites.

For more information, contact SoftWright LLC in Colorado at (303) 344-5486; fax: (303) 344-2811, via e-mail: sales@softwright.com, visit the website: www.softwright.com or circle Reader Service 15.

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QSC A2300 150 W/ch @70V, 125 W/ch @8 ohm output, balanced or unbalanced inputs, vgc, \$275. R Branske, Southwest Comm, POB 952, New Lenox IL 60451. 708-399-5444.

Crown D150 amplifier, excel cond, \$300. D Kocher, Digital Sound Makers, 1919 Hanover Ave, Allentown PA 18103. 610-776-1455.

FM amplifier, 60W, excel cond, \$1500/BO. L Brent Oliphant, KMXE, POB 1678, Red Lodge MT 59068. 406-446-1199.

Fostex PH-5 headphone amp, excel cond, \$95; Rolls RA62HA headphone amp, perfect, \$80. J Coursolle, WPKR 2401 W Waukau Ave, Oshkosh WI 54903. 920-236-4242.

Fostex PH-5 headphone amp, excel cond, \$95; Rolls RA62HA headphone amp, perfect, \$80. J Coursolle, WPKR 2401 W Waukau Ave, Oshkosh WI 54903. 920-236-4242.

Fostex PH-5 headphone amp, excel cond, \$95; Rolls RA62HA headphone amp, perfect, \$80. J Coursolle, WPKR 2401 W Waukau Ave, Oshkosh WI 54903. 920-236-4242.

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Gates M6244 phono preamp, \$20; Sparta TEP 35 phono preamp, \$10. E Swanson, WPKR, POB 3450, Oshkosh WI 54903. 920-236-4243.

McIntosh stereo pwr amps (6), mint cond, in dbl rack mounts, sold in pairs or all, \$1100 ea +shpg; (3) dbl amp racks w/spk inputs & audio outputs built into rear rack w/cooling fans, \$100 ea. F Baranowski, 25-27 Lee St, Johnston RI 02919. 401-274-1999.


Spectro Acoustics 200W audio power amps, \$200/BO. L Brent Oliphant, KMXE, POB 1678, Red Lodge MT 59068. 406-446-1199.

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AM guyed tower approx 150', dismantled, BO. S Anderson, KSGT, Box 100, Jackson WY 83001. 307-733-2100.

ERI 1105 7-bay FM antenna, CP, tuned to 92.7, \$3500/BO; Comark/Cablewave CFM-LP 3-bay FM antenna w/radomes, CP, tuned to 94.3, used as backup, \$1750/BO. L Fuss, WDTL, POB 1438, Cleveland MS 38732. 601-846-0929.

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ERI Isocoupler, 1-5/8" line, \$350; tower lightning dissipator, \$300; 5' 3" rigid xmission line, \$200; Hughey-Phillips tower flashers, \$50 ea. D Rose, KDUC, POB 432, Barstow CA 92312. 760-256-2068.

Harris/ERI FML-2 circ pol 2-bay antenna in perfect cond, tuned to 105.5 mHz, just removed from service, \$2300/BO. D Palmer, WXTQ, 300 Columbus Rd, Athens OH 45701. 614-593-6651.

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Allen Dick 6 bay, 99.5 MHz, 10 kW, \$400; RCA/Dielectric 6 bay, 99.3 MHz, 20 kW, \$1000. E Swanson, WPKR, POB 3450, Oshkosh WI 54903. 920-236-4243.

WILKINSON 1000 W AM (CURRENTLY LDL COMM/FOMERLY TTC) LOW PWR CUT BACK TO 500, ON 1340, NEW IN '77, REMOVED WORKING '95. CALL DAVID aka RALPH (973) 361-8783 OR FAX (973) 361-8783. \$1500
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ERI FMXH 3AE high pwr 3 bay rototiller antenna w/radomes, 1.5588 gain, tuned to 104.7 MHz, \$4900/BO. M Osborne, WKSQ, POB 9494, Ellsworth ME 04605. 207-667-7573.

ERI LP-6C 6 bay half wave spaced antenna, 12 kW input,

tuned to 99.1 MHz, \$4900/BO. M Osborne, WKSQ, POB 9494, Ellsworth ME 04605. 207-667-7573.

Shively 6810 5 bay high pwr antenna, tuned to 94.5 MHz, \$4900/BO. M Osborne, WKSQ, POB 9494, Ellsworth ME 04605. 207-667-7573.

Want to Buy

Non-profit Christian radio station needs a tower donated. Gary, WMDR/WWWA, 160 Bangor St, Augusta ME 04330. 207-622-1340.

AUDIO PRODUCTION

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dbx 165A compressor, excel cond, \$850 +shpg/COD. R Ruskin, Lion Dog Music, 1414 21st Ave, Seattle WA 98122. 206-322-1601.

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JBL 4410A studio monitor speaker, like new in orig box w/papers, right only but left avail from JBL, \$230 +shpg. R Evans, WPFJ, 625 Laurel Lake Dr, Franklin NC 28734. 704-369-9196.

Omnicaft SP-1 cue tone gen, 50 Hz & 1 kHz, variable duration, excel cond, \$80. R Branske, Southwest Comm, POB 952, New Lenox IL 60451. 708-399-5444.

Peavy XR-1200 12 chnl mixer w/built-in pwr amp, w/4 36" cabinets w/2 12" speakers per cabinet, \$1600/all; portable Roland piano in blk leather case w/portable steel stool & pwr amp, \$1300/firm. N Williams, KPPM, 1726 S Pebble Beach Ave, Tucson AZ 85710. 520-617-0579.

Simpson single VU speaker meters (6), \$150/lot; Yamaha PM-180 6 chnl mixer, \$150; 4-bay cassette CU-400 mono, auto reverse, \$400; Realistic mono public address, 95 amp, \$75. N Williams, KPPM, 1726 S Pebble Beach Ave, Tucson AZ 85710. 520-617-0579.

Advantage One 8 chnl bi amp mixer, \$375; Voice-Over booth, \$950; audio rack mount patch bay, \$150. J Baltar, New Musik Directions, 67 Green St, Augusta ME 04330. 207-623-1941.

Digitech studio vocalist, new, \$500. D Kocher, Digital Sound Makers, 1919 Hanover Ave, Allentown PA 18103. 610-776-1455.

ESE up/down rack mounted timer, \$150. P Cibley, Cibley Music, 166 E 35th St, NYNY 10016. 212-532-2980.

Roland VS880 digital workstation w/VS8F-1 effects board, 540HD, mint, \$1495; Tascam DA30 MKII DAT, less than 50 hrs, \$775. M Buccini, The Michael Thomas Group, 407 Society Hill Blvd, Cherry Hill NJ 08003. 609-489-9866.

Studer 2706 monitor speaker, ported 3 way w/built-in protection, \$750/pr +shpg. M Halleck, KSTP, 2792 Maplewood Dr, Maplewood MN 55109. 612-481-9333.

Texar/Gentner Audio Prism w/phase rotator card & manuals. J Bahr, POB 6556, San Juan PR 00914. 787-756-5914.

Yamaha BP-2 bass pedals in portable case, BO. B Meuse, Muse Audio Arts, 191 E El Camino Real #209, Mtn View CA 94040. 650-969-2433.

Tannoy 15" speaker pair, newly recond, \$1450; vintage recond tube mic pre's & mixers, \$300-\$700; new ADC patch bays 1/4" 52 points, \$169; ADC TT bays, \$129 up; new ADC TT or 1/4" TRS cords, \$9; Furman 1/4" to 1/4" patchbays, \$95 ea; like new tape, 1/2"x2500' 456, \$15 ea; 1" 456, 226, 250, \$25 ea; Digitech 3.6 sec delay, \$150; new pwr dist/filter rack mt, \$75. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

Want to Buy

Non-profit Christian radio station needs a S.A.W. or similar digital prod software donated. Gary, WMDR/WWWA, 160 Bangor St, Augusta ME 04330. 207-622-1340.

Compressors & EQs, tube and solid state. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

AUTOMATION EQUIPMENT

Want to Sell

CSP 5 kW AM dummy load, air cooled, you pick up, \$300/BO. L Fuss, WDTL, POB 1438, Cleveland MS 38732. 601-846-0929.

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AUTOMATION EQUIPMENT continued...

Air Century automation controller, \$700. E Swanson, WPKR, POB 3450, Oshkosh WI 54903. 920-236-4243.

Arrakis Digilink GEM-600 Gemini System w/1.2 gig + network board & software, w/cart wall; Arrakis TS-8C Trak Star workstation w/270 MG w/network board & software, units are 1 yr old, currently on air & working, \$9,500/BO. L Zeve, WHYL, Box WHYL, Carlisle PA 17013. 717-249-1717.

THE AUTO-MATE: Low cost digital automation for your P.C. Interface with existing automation or use stand-alone. Proven DOS reliability. Easy to use. More info/demo: 503-769-2886. Website: www.wvl.com/~automate

Schafer 800T automation controller, \$600/BO. J Bahr, POB 6556, San Juan PR 00914. 787-756-5914.

CD machine automation system, cash or non-profit tax credit. B Lacy, Florida Outdoor, 6910 NW 2nd Terr, Boca Raton FL 33487. 561-912-9002.

CART MACHINES

Want to Sell

ITC 3D triple deck, working cond, \$350. R Coleman, WHHK, 937 SE 2nd St, Galva IL 61434. 309-932-2288

Tapecaster 701, 900, many parts, belts, pinch rollers, heads, BO. S Tupid, KSWW, POB 628, Raymond WA 98577. 360-942-5533.

ITC triple deck, \$900; ITC Delta, \$875; (3) SMC 712, \$200 ea. E Swanson, WPKR, POB 3450, Oshkosh WI 54903. 920-236-4243.

ITC upgrade PB to record, amps only-no deck, 3 tone, stereo, \$175. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

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HE HALL Electronics

CD PLAYERS

Want to Sell

Denon 950 single PB, tracking module needs work, BO. J Randolph, New River Media, 604 N 3rd, Danville KY 40422. 606-236-9447.

Denon 950FA (3), \$500 ea; (18) Technics SL-PG-300, \$50 ea. E Swanson, WPKR, POB 3450, Oshkosh WI 54903. 920-236-4243.

COMPUTERS

Want to Sell

Computer Concepts DCS control room & prod room & server, assume payment. G Wilkes, KTBO, 422 E Main #124, Nacogdoches TX 75961. 409-564-4559.

CONSOLES

Want to Sell

Arrakis 500 control board, \$2000. T Obey, WHCF, POB 5000, Bangor ME 04402. 207-947-2751.

Cetec 2007 8 chnl, \$1200; Harris Stereo 80 8 chnl, \$900; Tascam 246 portastudio, \$400. D Rose, KDUC, POB 432, Barstow CA 92312. 760-256-2068.

Continental Mark 8 stereo console, 26 inputs, 8 chnls w/manual, gd cond; McMartin 1081, 8 chnls, 18 inputs, mono, gd cond. T St James, KFLP, POB 658, Floydada TX 79235. 806-983-5704.

Soundcraft 1624 18x16x24, P&G faders, patch bay, gd cond, \$5000/BO. R Fuelle, Hit Single Recdg, 1935C Friendship Dr, El Cajon CA 92020. 619-258-1080.

Howe 12 pots, \$1500. J Arzuaga, WLAZ, Curry Ford

Rd, Orlando FL 32812. 787-895-0000.

Panasonic Ramsa WR8112 12 chnl mixing board w/road case, \$800 +shpg. F Baranowski, 25-27 Lee St, Johnston RI 02919. 401-274-1999.

Cetec 10CH stereo, Gateway II, RCA BA1A, Collins 212 (no amplifiers), McMartin monitors, Ampex 300 cabinets, more. R. Robinson 860-276-8763.

Soundcraft 600 32x16 w/patchbay, mint, \$4950; Tascam 512 12x8 mixer, \$750; Tascam 520 20x8x16 mixer, \$1750; Tascam 30 8x4, \$450; Allen & Heath Syncon 28x24, great sounding, \$5000. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

Want to Buy

RCA consolette modules, BA-71/72, BA-73, BA-74, BX-71 pwr supply. J Ballard, NBC, 30 Rockefeller Plaza Rm 1101W, NYNY 10112. 212-664-3033.

DISCO-PRO SOUND EQUIP

Want to Sell

Portable DJ outfit, \$800. D Rose, KDUC, POB 432,

Barstow CA 92312. 760-256-2068.

Outdoor fiberglass 70V horns (22) w/xtra drivers, Columbia, EV & Corbraflex, \$1100 +shpg. F Baranowski, 25-27 Lee St, Johnston RI 02919. 401-274-1999.

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LIMITERS

Want to Sell

Moseley TFL 280B limiter, \$150; Harris MSP 90 AM limiter, \$400; dbx compressor-limiter, \$50. D Rose, KDUC, POB 432, Barstow CA 92312. 760-256-2068.

Optimod 8100A, clean, works well, \$3100. T Burns, WDKR,

2950 N Water St #230, Decatur IL 62526. 217-875-9357.

Optimod 8000 audio processor, excel cond, \$1200/BO. L Brent Oliphant, KMXE, POB 1678, Red Lodge MT 59068. 406-446-1199.

Orban 8000A stereo gen, \$1000; Microcon Flexmod composite processor, \$750; (2) Dorrrough 610 3 band processors, \$300 ea. E Swanson, WPKR, POB 3450, Oshkosh WI 54903. 920-236-4243.

Orban XT-2, 6 band limiter for the Orban 8100-A1 unit. J Bahr, POB 6556, San Juan PR 00914. 787-756-5914.

Want to Buy

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

MICROPHONES

Want to Sell

AKG H-17 shock mount for 414 series (2), \$150 ea. P Cibley, Cibley Music, 166 E 35 St, NYNY 10016. 212-532-2980.

Shure 556S (pro) (2), no switch w/XLR outs, mint in original cartons, packaging, specs & registration card. P Paquin, Sound Dynamics Assoc, POB 608, Dennis MA 02638. 508-385-0805.

Symetrix 528 mic processor, \$350. T Obey, WHCF, POB 5000, Bangor ME 04402. 207-947-2751.

AKG M17A shock mount for 414 Series (2), \$150 ea. P Cibley, Cibley Music, 166 E 35th St, NYNY 10016. 212-532-2980.

EV RW20, perfect, \$295; EV 309A mic shockmount, perfect, \$65; Telex V220 sports-caster headset w/cord, XLR plug, excel, \$145; OC White M2MDUR mic arm/R, excel cond, \$65; Symetrix 528E mic processor, perfect, \$285. J Coursolle, WPKR, 2401 W Waukau Ave, Oshkosh WI 54903. 920-236-4242.

Neumann U87A, \$1500. J Arzuaga, WLAZ, Curry Ford Rd, Orlando FL 32812. 787-895-0000.

RCA BK53, \$50; (2) Mike crane light duty, \$20 ea. E Swanson, WPKR, POB 3450, Oshkosh WI 54903. 920-236-4243.

Shure SM59, \$125; Sennheiser ECM 10, \$120; EV 635A, \$140. J Baltar, New Musik Directions, 67 Green St, Augusta ME 04330. 207-623-1941.

Sony ECM 377 condenser w/papers, mint cond, \$450. D Kocher, Digital Sound Makers, 1919 Hanover Ave, Allentown PA 18103. 610-776-1455.

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MICROPHONES continued...

RCA 77DX, BK1A, \$395; vintage PA mics, Shure 51 Elvis, \$75, EV731, \$95, EV 630 or 635, \$75, RCA mini 77" shaped, \$295. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

Want to Buy

Broken E-V RE-20/PL-20 mics for parts. D Rumble, Toursound, 2918 N 47th Dr, Phoenix AZ 85031. 602-272-4724.

Neumann, Sennheiser, AKG, many models. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 972-271-7625.

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.

MISCELLANEOUS

Want to Sell

1929-1945 vintage radio collection, \$800; Henry mix-minus, \$100; CS100 DTMF decoder, \$150; Pioneer CTF 1250 cassette, \$75; Delta Labs DL4 effects box, \$100; 12" B/W monitors, \$50 ea. D Rose, KDUC, POB 432, Barstow CA 92312. 760-256-2068.

Burwen DNF-1500 dynamic NR units (2), \$250/both;

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Rapid Cue mono record decks (2), \$250/both; KLH transient noise eliminator, \$60. N Williams, KPPM, 1726 S Pebble Beach Ave, Tucson AZ 85710. 520-617-0579.

CSP 5 kW AM dummy load, air cooled, you pick up, \$300/BO. L Fuss, WDTL, POB 1438, Cleveland MS 38732. 601-846-0929.

ESC ES10 timer, \$600/BO; CRL SMC600A stereo mod control, \$350/BO +shpg. B Knight, WAQQ, POB 344, Chillicothe OH 45601. 614-775-2600.

Magnecord PT-6, 2 amps, 1 transport w/manual, \$500. Mid West Bible Radio, 1534 Buchanan Ave, Sioux City IA 51106. 712-252-4621.

Realistic PRO-47 VHF/UHF scanner w/manual, gd cond. T St James, KFLP, POB 658, Floydada TX 79235. 806-983-5704.

Tapecaster rec/delay, \$275; (2) cart tape PB (answer machines), \$30; open air, free standing 80" equip rack, \$90; enclosed equip rack w/rear door on rollers, \$140; Tabletop 12" equip rack, mount equip either side, \$40; KLH transient noise eliminator, \$150; Optimus DCC compact cassette, new w/3 blanks, \$200; Circuit Werkes AC-12 w/3 cards, new, \$500; Telos 6x6 keypad & control unit, new,

\$750. N Williams, KPPM, 1726 S Pebble Beach Ave, Tucson AZ 85710. 520-617-0579.

Andrew 78ARF female connector for Andrew 3" Heliac cable w/new hardware & re-attachment kit, gd cond, \$125. D Payne, WZPL, 9245 N Meridian St #300, Indianapolis IN 46260. 317-816-4000.

David Clark H7041 behind the head style headset w/boom mic, new in box, \$100. P Russell, Boudoin College, Sills Hall, Brunswick ME 04011. 207-725-3066.

Devry electronics training course, 11 vol w/test equipment, \$700/BO. R Chrysafis, C&M Comm, 809-1/2 Mulberry St, #1, Williamsport WV 25661. 304-235-2292.

Eventide BD500, perfect, \$1795; ESE ES185 GPS/master clock, perfect, \$1575; ESE ES161A slave clock, perfect, \$140; ESE ES166A slave clock, perfect, \$198; Gentner TS612 6 line/exp, w/screenware pkg, excel, \$2000; Gentner TS 612 network interface, excel, \$275; Gentner TS612 control surface, excel, \$275; Telos One 120-1 hybrid w/rack mount, excel, \$410; Best UPS L1 3KL, \$1275. J Coursolle, WPKR, 2401 W Waukau Ave, Oshkosh WI 54903. 920-236-4242.

Modulation Sciences CLD 2501/2502, 2 pair, composite line drivers, \$900 ea pair/\$1700 both. B Landry, WLMG, 1450 Poydias St #440, New Orleans LA 70112. 504-593-2107.

RCA rack 7' x 19-1/2" deep brown, tapped equip, \$175; Gates rack 78" x 17" deep gray, tapped equip, \$150; Gray rack, 28" x 15", deep gray, tapped equip, \$50; rack, telephone relay, tapped, gold, \$20; Thunder Bay effects library LP's, \$50; Gorman Redlich CD EBS decoder, \$25; (2) Symetrix SX-203 telephone hybrid, rack mtd, \$150 ea. E Swanson, WPKR, POB 3450, Oshkosh WI 54903. 920-236-4243.

Want to Buy

RCA mics; 15" speakers; any WE tubes, amps, speakers & xmtrs. L Drago, 383 Lincoln Dr, Cheshire CT 06410. 203-230-5255.

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, NYNY 10003. 212-674-3060.

MONITORS

Want to Sell

Belar AMM3 AM monitor, \$650. T Obey, WHCF, POB 5000, Bangor ME 04402. 207-947-2751.

Belar FMM-1 mod mon tuned to 92.7 & Belar FMS-1 stereo mon, \$950/BO; Belar RFA-1 FM RF amp, tuned to 92.7, cracked meter, otherwise OK, \$250/BO or all for \$1100. L Fuss, WDTL, POB 1438, Cleveland MS 38732. 601-846-0929.

General Radio AM mod-mon type 1931B, \$100. D Rose, KDUC, POB 432, Barstow CA 92312. 760-256-2068.

Used Mod Monitors, McMartin & Belar, many to choose from, tuned and calibrated on your frequency, fully guaranteed. Goodrich Ent. Inc., 402-493-1886.

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Ampex 350 4 chnl, 1/2" transport in excel cond, low-z heads like new, \$50. M Stosich, Esoteric Sound, 4813 Wallbang Ave, Downers Grove IL 60515. 630-960-9137.

Ampex 601 stereo w/tan leather case; (2) Ampex 620 speaker/amp w/tan leather case; (3) 6240 NAB cassette machines. P Paquin, Sound Dynamics Assoc, POB 608, Dennis MA 02638. 508-385-0805.

Ampex 601 tube-type mono recorder, case & unit very clean, \$250 +shpg. M Crosby, Sequoia Electr, 422 Avenida Abetos, San Jose CA 95123. 408-363-1646.

BE Phase Track 90 stereo cart players (3), \$500 ea; Phase Track 90 stereo cart

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P/R, \$700. T Obey, WHCF, POB 5000, Bangor ME 04402. 207-947-2751.

ITC 850 r-r P/R 7.5-15.5, \$300/BO +shpg. B Knight, WAQQ, POB 344, Chillicothe OH 45601. 614-775-2600.

ITC PD II cart players (2) R/PB, 3 ea, \$800/lot or \$285 ea. N Williams, KPPM, 1726 S Pebble Beach Ave, Tucson AZ 85710. 520-617-0579.

Metrotech 554A 2 chnl 2 pass 10" r-r magnetic audio tape logging rcd in gd cond, can record up to 307 hrs on one .5 mil reel, \$200. D Palmer, WXTQ, 300 Columbus Rd, Athens OH 45701. 614-593-6651.

Otari MTR 90 MK III 2" 24 trk w/remote, excel cond, heads perfect, \$17,000. P King, X-Ten Prod, 11440 Valley Dr, Rogers MN 55374. 612-428-3821.

Otari MX5050B 2 trk in excel cond, \$1250. Jerry, Earmark Audio, 206-463-1980.

Revox B-77 stereo r-r, gd cond; Akai 4000DB r-r stereo, needs work. T St James, KFLP, POB 658, Floydada TX 79235. 806-983-5704.

Technics 1500 2 trk 10" r-r w/many tapes, 7.5 & 15 ips, \$400/BO. C Collins, Grunert Sound, 1977 S 74, West Allis WI 53219. 414-327-4141.

Uher Universal 5000 r-r (3), 5" reels, 3 speeds, 1/2 trk mono, mic & line inputs, internal speaker, AGC, records over 6 hrs per 900' reel, \$150/all. EG Dyett Jr, The Sound of Skating, 59 Prince St, W Newton MA 02165. 617-527-7923.

Ampex 601 stereo TR, needs electr work, also have (2) 620 speakers & amp, \$400/all +shpg; Ampex 620 & speaker amp, \$100 +shpg. P Paquin, Sound Dynamics Assoc, 41 Scargo Hill Rd, Dennis MA 02638. 508-385-0805.

Harris stereo PB, new motor & heads, BO. J Randolph, New River Media, 604 N 3rd, Danville KY 40422. 606-236-9447.

Marantz PMD 220 prof 3 head mono 2 speed portable cassette rcd, excel cond, \$175. S Barker, KAK Prod, 1994 Sillick Terr, Santa Rosa CA 95404. 707-528-4055.

Nakimichi cassette rcd, \$160; Otari 5050, \$1400; ITC decks, BO. J Baltar, New Musik Directions, 67 Green St, Augusta ME 04330. 207-623-1941.

Otari ARS-1006-L (3) automation PB decks, \$1500/all +shpg. J Bahr, POB 6556, San Juan PR 00914. 787-756-5914.

Tascam 32 r-r, perfect, \$1375; Panasonic DAT SV-3700, excel cond, \$600; Marantz PMD-222, R/P XLR, 2 sp, in/out, perfect, \$300; Telex ACC-4000 duplicator, perfect, \$1800. J Coursolle, WPKR, 2401 W Waukau Ave, Oshkosh WI 54903. 920-236-4242.

Tascam 38 r-r 1/2" 8 trk, \$1950; Otari MX-5050 r-r 1/4" 2 trk, \$700; (2) Ampex 1/2" 499 tape on 10" reel, \$30 ea; JVC TDW 201 cassette deck, \$50. E Swanson, WPKR, POB 3450, Oshkosh WI 54903. 920-236-4243.

Tascam DA-88 hi 8, 8 trk digital rcd, low hrs, \$2000. A Brooks, Procomm Studios, 3 Whiteoak Rd, Arden NC 28704. 704-684-1461.

MX70 video playback system, \$900; Gd used "x2500" 456 tape, \$20, 1"x2500" 996 & 250, \$35; new MRL short test tapes, \$229 for 2", save \$400. Save on all other formats too. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

New & used Ampex 350 style tape transports, motors & parts, various prices. M Crosby, 408-363-1646.

Tascam ATR60-2, in stand, \$1200; Tascam 58, 8 trk, \$1950; Tascam 38 8 trk, \$1650; Otari 5050-8 Mk III, \$1900; Ampex 1200 PURC cards (5), \$125 ea; Custom locator for any deck, \$495; Sony 2 trks, \$195 ea. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

Want to Buy

MCI JH-110 A, B, C 1/2" 2 trk heads, new or used. J Borden, Handbasket Prod, 2909 S Logan Ave, Milwaukee WI 53207. 414-482-8954.

Stellavox rcds & parts. C King, King Audio, POB 116, East Bevelin CT 06023. 860-665-2881.

Ampex ATR100 taperecorders for parts. Circuit cards, heads, motors, machine parts, or electronic parts. Call 818-907-5161.

Ampex machines, recorder electronics, mixers. W Gunn, Box 2902, Palm Springs CA 92262. 760-320-0728.

REMOTE & MICROWAVE

Want to Sell

Comrex Nexus digital ISDN codec, new cond, \$1795. J Rense, POB 764, Goleta CA 93116. 805-967-2821.

Gentner SPM3 phone hybrid, \$300; Marti STL10 & Marti R10, \$1750. T Obey, WHCF, POB 5000, Bangor ME 04402. 207-947-2751.

Marti CR-10 450 MHz receivers (2) w/cavity filters, 4 chnl wideband audio filter, 6 450 MHz yagi antennas, \$2250. J Banks, KSPN, 809 Grand Ave S, Glenwood Springs CO 81601. 970-945-8564.

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Moseley MRC-1600 w/manual, gd cond. T St James, KFLP, POB 658, Floydada TX 79235. 806-983-5704.

Rush RC1000 remote control units (2), \$350/BO +shpg; CCA TC 1AR A68 remote relays, BO +shpg. B Knight, WAQQ, POB 344, Chillicothe OH 45601. 614-775-2600.

Scala 8000 STL amp, \$250; Sine Systems DAI-1 remote, \$500. D Rose, KDOC, POB 432, Barstow CA 92312. 760-256-2068.

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Comrex LTX/R (2) \$700 ea; US Audio Whirlwind Mix-5S stereo mixer \$225; SKB rack-mount case-4 unit \$120, excel cond. The Voice Box. 313-480-9981.

Comrex Nexus ISDN, perfect, \$1350; **Comrex Codec Buddy**, perfect, \$1200; **Comrex DXP.1 G.722**, excel, \$950; **Comrex TCB-1A** telephone coupler, excel, \$95. J Coursolle, WPKR, 2401 W Waukau Ave, Oshkosh WI 54903. 920-236-4242.

Gentner DH1 digital telephone hybrid w/manual, new in box, \$875, KTBO, 422 E Main #124, Nacogdoches TX 75961. 409-564-4559.

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Marti STL-8, 2 rcvrs, 2 xmtrs, 946.875 MHz, 947.125 MHz, excel cond, \$2000. A Fairchild, 2250 Holly Hall #115, Houston TX 77054. 713-797-6173.

Marti subcarrier gen STL data SCG-10, \$400; **Marti subcarrier demod** STL data SCD-10, \$400; **Marti subcarrier gen** 67 kHz SGC-10, \$400; **Marti subcarrier demod** 67 kHz SCD-10, \$400; **Moseley subcarrier demod** 110 kHz, \$200; **Marti 67 kHz** amp in

mini box, \$20; **Marti RMC** remote control, \$500; **Marti RR30/45D/30000** rcvr, 450.02 MHz, \$750; **Racom 1300AP** Morse identifier, \$50. E Swanson, WPKR, POB 3450, Oshkosh WI 54903. 920-236-4243.

Moseley DSP-6000 digital STL transmission system, \$3500/BO. M Osborne, WKSQ, POB 9494, Ellsworth ME 04605. 207-667-7573.

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Moseley SCG9 stereo gen, excel cond, \$300/BO; **Moseley SCG8** SCA gen, excel cond, \$500. L Brent Oliphant, KMXE, POB 1678, Red Lodge MT 59068. 406-446-1199.

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Dynamax ESD-10 splice locator, \$500; cart rack Carousel holds 200 carts, \$150; cart rack wall blk plastic 36 slot, \$10; (2) cart rack, wall, wood, 84 slot, \$50 ea; (3) cart rack, wall, wood, 108 slot, \$50 ea; AA-3 tape cartridges, \$1 ea. E Swanson, WPKR, POB 3450, Oshkosh WI 54903. 920-236-4243.

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Microtran table top tape degasser, handles 1"-2" tapes, \$150/BO; mechanical tape timers, Lyrec & Seike/Spotmaster, new & used. M Crosby, 408-363-1646.

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HP 8444A tracking gen, \$1000; **Tektronix DC502**, FG501, 508 counter, \$600/all;

Wavetek spectrum analyzer 512FFTS, \$650. J Baitar, New Musik Directions, 67 Green St, Augusta ME 04330. 207-623-1941.

Sencor SC-61 waveform analyzer, like new, \$500. P Russell, Boudoin College, Sills Hall, Brunswick ME 04011. 207-725-3066.

Tektronix 585A w/202-1 scope cart, all manuals, lots of plug-ins & probes in excel cond, \$6000/BO. R Chrysalis, C&M Comm, 809-1/2 Mulberry St, #1, Williamson WV 25661. 304-235-2292.

Want to Buy

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TUBES

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Harris Stereo 80 solid state control board, ERI 3 bay antenna tuned to 92.1, 250' coax cable, Andrew 1-5/8 air dielectric. Deb Hoeflicker, KREP, 2307 W Frontage Rd, Belleville KS 66935. 785-527-2266.

RCA BTL 15W FM exciter w/stereo GEX1, \$400/BO +shpg. B Knight, WAQQ, POB 344, Chillicothe OH 45601. 614-775-2600.

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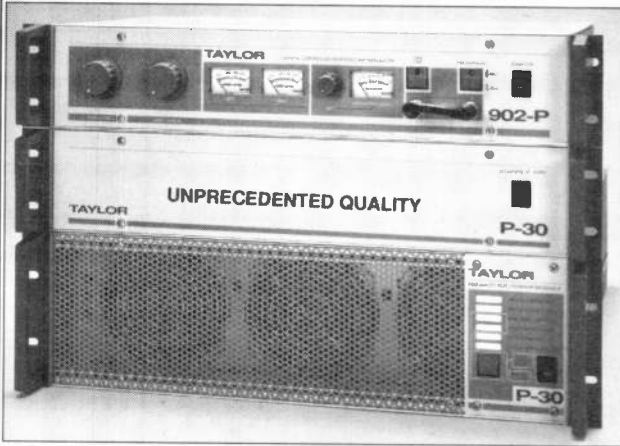
RCA or Gates 1 kW AM or old Gates or RCA tube type. R Dumont, WSME, 243 Main St, Sanford ME 04073. 207-324-7271.

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