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Radio World®



Buyer's Guide
See Page 47

Vol 21, No 17

Radio's Best Read Newspaper

August 20, 1997

Radio Looks for Synergy

by Lynn Meadows

NEW YORK Welcome to phase two of radio consolidation. Hungry radio groups, which have feasted on a main course of radio stations for the past year, are increasingly looking for dessert in the auxiliary industries.

Clear Channel Communications announced in June that it had invested

millions of dollars in American Tower Corp. The group already is heavily involved in the outdoor advertising (billboard) business. In July, American Tower Systems, a subsidiary of American Radio Systems Corp., announced its plan to purchase Micronet Inc. The \$70.25 million purchase means ATS will own more than 600 tower sites nationwide.

The most astonishing announcement,

however, came when Chancellor Broadcasting and Evergreen Media announced plans to acquire the media representation firm, Katz Media. The buyers, soon to be merged into the Chancellor Media Corp., plan to complete the purchase this quarter with the help of Hicks, Muse, Tate & Furst Inc.

The sands have shifted again.

Details of the deal

Katz Media has a sales organization of approximately 1,500 people. In 1996, the firm generated \$183 million in revenues from representing radio and television stations, cable systems and a growing number of Internet websites. Under the terms of the deal, Katz Media will retain its name, organizational identity, management team, personnel, New York headquarters and 65 regional sales offices.

The transaction is valued at approximately \$373 million, based on an \$11-per-share price for each of the 14.1 million Katz Media shares, plus the assumption of \$218 million of Katz Media debt.

The price of Katz stock fluctuated from a \$13-per-share high to a low of \$4.50 per share this spring. At the time of the announcement, the stock sold for just

See SYNERGY, page 6 ▶

Alaska Tower/Plane Crash Claims Two Lives

by Lauren Rooney

NOME, Alaska The crash of a plane into a radio tower in Nome, Alaska took two lives and left KICY(AM) off the air.

The station was knocked off the air June 27, when a Cessna 207, belonging to charter service company Olson Air, hit its tower in dense fog. The crash occurred around 4:30 p.m. as the plane was heading for the Nome airport from Brevig Mission, Alaska.

"We don't know why the pilot was flying so low, other than to get below the fog as he approached the airport," said KICY General Manager John McBride. Witnesses said that as the plane approached the tower, the pilot gunned the engine. But the plane's right wing sliced into the tower about 35 - 40 feet from the top; both the plane and the tower came crashing to the ground. Just moments before, the plane had narrowly missed a tower belonging to KNOM(AM), a mile away.

The crashed killed the pilot — 33-year-old John Guimond — and his 7-year-old passenger David Adsuna.

McBride said that the fact that the station was knocked off the air was not his first concern. "My concern was for those on the plane. In a small community like Nome, where we know most everyone, the loss of life has a great impact on all of us. While going off the air immediately changed our lives, it took several days for me to begin mourning the loss of the tower."

Race against time

KICY is a 10 kW station that plays Adult Contemporary and Christian Contemporary music. It runs six hours of Eskimo music each week, and 90 minutes a day of Russian language programming.

The studios are about three miles from the tower, so when Chief Engineer Tom Guillian got the call that it was off the air, he had no idea what happened until he got to the site.

"The fog was so thick that I could not see the rescue and fire units until I was about to the site and saw the small

See KICY, page 7 ▶



Progressive Tries for Standard

by Frank Beacham

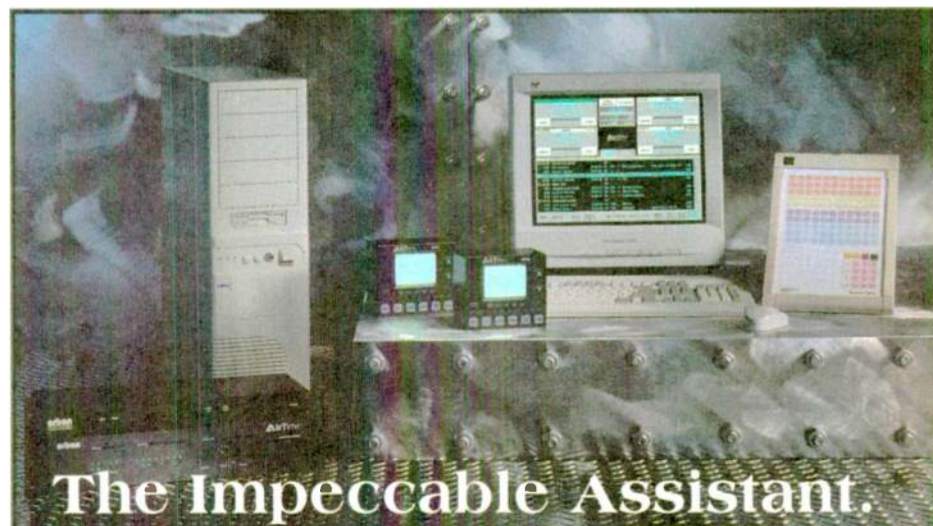
REDMOND, Wash. The two major competitors in Internet broadcasting technology — Microsoft Corp. and Progressive Networks — entered into an agreement that may eventually result in a single standard for streaming media over the Internet.

At first the agreement means that the two companies will bring interoperability between the currently incompatible NetShow and RealAudio/RealVideo client-server systems. In the future the two former competitors said they will work together to define industry standards and cooperate with third parties in developing new versions of Microsoft's Active Streaming Format (ASF).

RealAudio joins the show

For radio broadcasters, the deal means that audio programming made with either Progressive's RealAudio or Microsoft's Netshow will for the first time be playback-compatible

See PROGRESSIVE, page 8 ▶



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NEWSWATCH

White House Nominates Kennard for FCC Chairman

WASHINGTON The White House nominated Federal Communications Commission General Counsel William E. Kennard to replace outgoing Chairman Reed E. Hundt earlier this month.

The Clinton Administration is also expected to nominate Gloria Tristani, a commissioner with the New Mexico State Corporation Commission, which regulates telecommunications for the state, for one of the Democratic seats vacant at the FCC, according to Senate Commerce Committee Press Secretary Pia Pialorsi.

Tristani said that she has dealt mostly with telephony issues as a member of the New Mexico commission; she has not been involved in broadcast regulation.

Michael Powell, chief of staff for the U.S. Department of Justice Antitrust Division and son of retired Gen. Colin Powell, was nominated by the White House to fill one of the Republican slots.

Harold Furchgott-Roth, chief economist for the House Commerce Committee, has already been nominated for the other Republican seat. The other Democrat slots would be filled by Kennard and current Commissioner Susan Ness.

The Congressional Black Caucus has

asked the White House to nominate former House Commerce Chief Counsel Ralph Everett to the chairman post. Everett also has the support of Sen. Ernest F. Hollings, D-S.C., the ranking Democrat on the Commerce Committee.

Hollings spokesman Maury Lane said that he did not think the Senate would turn its attention to the nominees before the August recess.

Klein Confirmed by Senate

WASHINGTON The Senate confirmed Joel I. Klein as assistant attorney general of the Department of Justice's Antitrust Division by a vote of 88-12 on July 17.

His confirmation comes despite recent attempts by Sen. Conrad Burns, R-Mont., and Sen. Ernest Hollings, D-S.C., to put a hold on his nomination (RW, July 9). Burns was concerned that the Justice Department's review of telecommunications industry mergers might be too strict, while Hollings took issue with the department's review of telephone company mergers. Burns later stated that his concerns were allayed. Despite a meeting with Klein and Attorney General Janet Reno, Hollings was never satisfied with Klein, and voted against him, according to spokesman Maury Lane.

"(Hollings) is ranking minority member of the Commerce State, Justice Appropriations Subcommittee, which funds the Justice Department, and we'll continue to watch him very closely," said

See NEWSWATCH, page 3 ►

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Mic & Line, +4dBu	.004%
DIM	
Mic & Line, +16dBu	.005%
DYNAMIC RANGE	
Line	114dB
Mic	98dB
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 **AUDIOARTS ENGINEERING**

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Courts Look at Indecency

by Matt Spangler

WASHINGTON For Webcasters, there was a great First Amendment victory in Washington in June, but for a broadcaster in Boston, another free expression battle may be on the horizon.

On June 25, in *Reno vs. ACLU*, the Supreme Court struck down the Communications Decency Act (CDA). This section of the Telecommunications Act of 1996 was designed to protect minors from "indecent" and "patently offensive" communications on the Internet, by making violation of the act a federal crime punishable by fines or jail time.

In June, the highest court in the land upheld an injunction against CDA, agreeing that it "abridges the freedom of speech" protected by the First Amendment. The only provision of the statute that the Court did not touch was one banning obscene speech and child pornography.

The Alliance for Community Media hailed the decision as "a major victory for freedom of expression on all electronic media." Peggy Miles, president of Washington-based webcasting consulting firm Intervox Communications, said that for individuals and stations programming new audio for the 'net, the ruling was

important.

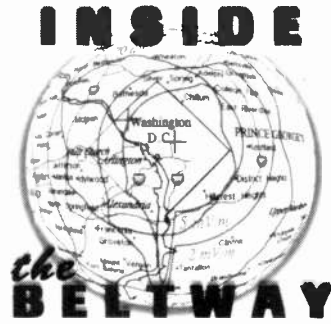
"The CDA decision allows them the freedom to program and broadcast on the 'net their thoughts and ideas," she said.

Part of the problem with the law, said the Court, was that it used two different indecency standards in different provisions. One of these is the broadcast standard, which bans in the words of CDA — depictions or descriptions of "sexual or excretory organs" deemed "patently offensive as measured by contemporary community standards." The Court held, though, that the "spectrum scarcity" argument used to regulate broadcasting doesn't apply to the Internet, which provides for "relatively unlimited, low-cost capacity for communications of all kinds."

Thus, a scenario might be produced in which broadcasting of material that it is deemed appropriate for an R-rated movie, for example, would result in criminal prosecution, according to Washington communications attorney Todd Gray.

Furthermore, by virtue of the way information is retrieved on the Internet, it is more difficult to access offensive material. "Unlike communications received by radio or television," the Court stated, "the receipt of information on the Internet requires a series of affirmative steps more deliberate and directed than merely turning a dial."

Miles also pointed out that many Webcasters may not be affected by the Supreme Court ruling at all, as they are



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

merely rebroadcasting their signals on the Internet — hence, they are governed by broadcast decency standards.

Smut or art?

A 1995 decision by the U.S. Court of Appeals in the District of Columbia ordered the Federal Communications Commission to enforce its regulation of "indecent" broadcast programming between the hours of 6 a.m. and 10 p.m. The commission does not independently monitor broadcasts for indecent material; a formal complaint must be filed. If it deems the broadcast to be in violation, then a stiff fine often is levied.

This process often can take years. For

example, it took the commission five years to issue a fine to KLSX(FM), Los Angeles, for airing allegedly indecent broadcasts of "The Howard Stern Show" (RW, April 30).

In July, WXRK(FM), New York, which also broadcasts Stern's show, was issued a notice of apparent liability by the FCC in the amount of \$6,000 "for repeated violations of the Commission's rule concerning indecency." The station would not comment on the notice.

Other than this recent case, talk show hosts have not been stirring up any trouble at the FCC for awhile, according to National Association of Radio Talk Show Hosts Vice President Carol Nashe.

"To be perfectly honest I don't think the public wants to hear this," she said. "If they're not listening and they're not responding, then why should (talk show hosts) bother to say it?"

That doesn't seem to be stopping a handful of jocks from trying to catch listeners' ears by being vulgar. WEBN(FM), Cincinnati, was recently fined \$4,000 by the FCC for two broadcasts of "Bubba, the Love Sponge" in February 1997. Program Director Jim Richards said that airing the regularly recurring show during the safe harbor hours was a mistake, and that Jacor Broadcasting Corp., owner of the station, would probably not contest the fine.

"While I do think it was rather thin," he said, "I do see specifically why it was actionable."

Some stations' challenges of the indecency standards are a bit more provocative, although equally attention-

See BELTWAY, page 6 ▶

NEWSWATCH

▶ NEWSWATCH, continued from page 2
Lane. "We'll continue to see if he acts in accordance with the law, and if not, we may take another stab at this thing."

In a written statement, Reno praised the confirmation. "Joel Klein has and will continue to make the right decisions on issues involving competition," she stated.

While the National Association of Broadcasters still does not agree that radio should be defined as a separate medium in antitrust reviews, the association has come to terms with Klein. "Mr. Klein has appeared at three NAB functions in the last year, and has been a reasonable and moderate voice on antitrust provisions affecting radio," said spokesman Dennis Wharton.

Viacom Settles With Rainbow/PUSH

WASHINGTON In late June, Evergreen Media Corp. and Chancellor Broadcasting Corp. reached a settlement with the FCC over the National Rainbow/PUSH Coalition's objections to the merger of the two companies.

As part of the merger, which would create the Chancellor Media Corp., the two companies entered into a joint purchase agreement to acquire Viacom Inc.'s 10 radio stations. Rainbow/PUSH, which is headed up by Rev. Jesse Jackson, opposed the deal, citing a 1993 agreement whereby Viacom allegedly would sell two of its four Washington stations to minority buyers (RW, June 25).

The settlement calls for the three

companies to make contributions totaling \$2 million towards various broadcast diversity programs: \$400,000 to underwrite the cost of three university research studies; \$600,000 to create a new entity in Washington that would promote broadcast ownership diversity; \$880,000 for two conferences, in Washington and New York, at which the research studies will be presented, and which will address the subject of minority broadcast financing; \$80,000 for scholarships at the African American Media Incubator, which is non-profit training school for minorities in Washington; and \$40,000 to defray some legal costs.

Neither Rainbow/PUSH nor Viacom would comment on the settlement.

VOA Fellowship Honors Kuralt

WASHINGTON The Voice of America is the joint sponsor of a new fellowship honoring veteran CBS journalist Charles Kuralt, who died last month.

The year-long fellowship in international broadcasting at the Voice of America is co-sponsored by the Broadcasting Board of Governors. The fellowship will be offered to a graduate of the School of Journalism and Mass Communications of the University of North Carolina, Chapel Hill, Kuralt's alma mater.

"The mission of the Voice of America has long sought to uphold the very journalistic values manifested in the work of Charles Kuralt," said BBG Chairman David Burke.

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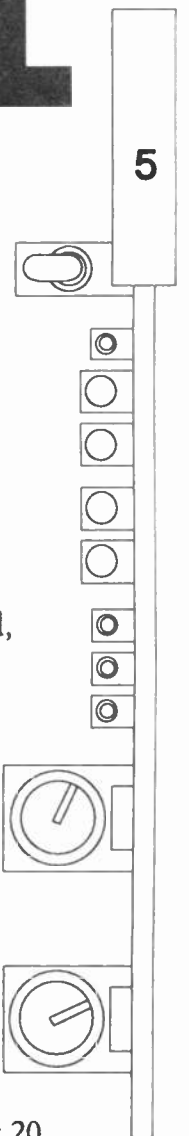
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Clinton Taps Kennard for FCC

WASHINGTON I hope you are ready for New Orleans. I, for one, am psyched about the show, the city and of course, spending time greeting folks I haven't seen in ages.

Interesting news from NAB: The Radio Show Exhibitor Advisory

Bill Kennard
has been ... one of
Washington's most
talented lawyers.

— Eddie Fritts

Committee was selected. Congratulate newly elected members Michael Rau of Radio Data Group, Jack Neff of Dataworld, Teresa Ziemenski-Myers of Orban, Dave Newton of Broadcast

Programming and Dave Burns from Harris Corp. The EAC will hold its first meeting on Friday, Sept. 19, from 8:30 to 10 a.m. in room No. 63 at the New Orleans Convention Center.

Once again, be sure to catch Alan Haber and me in the opening day session, "Hot Off the Radio Show Floor." We will summarize for you what's hot and what's not. Come by on Wednesday, Sept. 17, from 3:30 to 4:45 p.m. in the convention center (please come by!!!).

In more headline-grabbing news, the White House officially nominated William E. Kennard (as anticipated) for the position of FCC chairman. The move was met with approval on all fronts, with NAB President & CEO Edward O. Fritts summing it up nicely: "Bill Kennard has been an outstanding general counsel at the FCC and one of Washington's most talented lawyers. He is a first-rate intellect, a public servant with uncommon integrity, and a gentleman in the finest sense of the word. We look forward to working with him in his new role at the FCC."

Outgoing FCC Chairman Reed Hundt was equally laudatory: "I am delighted the president has designated Bill Kennard to serve as chairman of the Federal Communications Commission. As the FCC's General Counsel, Bill has managed successfully, the most difficult and complex cases this agency has ever encountered.

"At the same time, Bill has dramatically improved the agency's win record in the Court of Appeals. Bill has a well-deserved reputation throughout the communications and public interest

community for fairness and impartiality. I know that this agency and the country will be well served by his leadership."

The White House also has nominated Michael Powell, chief of staff for the U.S. Department of Justice Antitrust division and son of retired General Colin Powell for a slot on the commission.

The IEEE will hold its 47th annual Broadcast Symposium Sept. 25-26 at the Sheraton City Centre Hotel here in town. Thursday morning looks to be packed with radio technology, with a preliminary schedule that includes: "Advanced Radio Broadcasting," chaired by Robert Surette of Shively Labs at 9:15 a.m.; "USA Digital Radio's AM In-Band, On-Channel (IBOC) Broadcasting System" by

BSW Streamlines Operations, Promotes New Management Team

Tacoma, Wash.-based Broadcast Supply Worldwide, BSW, implemented operational improvements designed to make it easier for manufacturers and customers to do business.

Recently appointed President Tim Schwieger and newly appointed Vice President for Operations Kathy Thatcher announced the company has made "substantial" investments in the infrastructure and personnel at the company during the last three months.

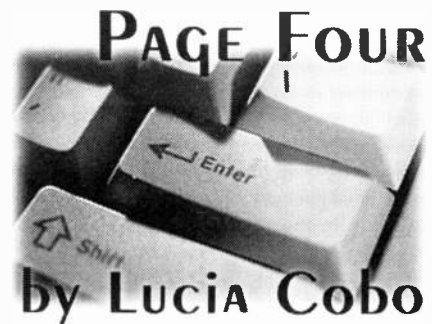
Among the improvements implemented:

- substantial expansion of the depth and breadth of inventory
- warehouse redesign including the addition of loading docks
- purchase of a new computer system

to enhance inventory control and boost order speed, tracking and accuracy

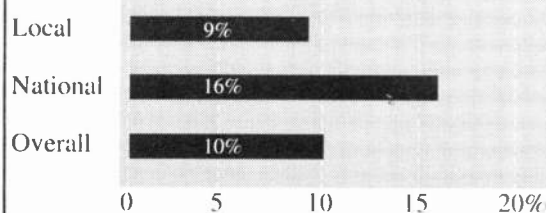
- doubling of the telephone capacity by upgrading the phone system to streamline transactions and improve response time
- purchase of a new building to allow for future expansion

"As a result of these improvements," Schwieger said, "I am delighted to report ... we've seen a 14 percent increase in sales. Like our industry, we've changed our approach to doing business from 'analog' to 'digital.' And to make purchasing even more convenient, BSW customers can now order over our new World Wide Web site <http://www.bswusa.com>."



David Hartup fo the Zetron Corp.; "Design of a Robust IBOC System for FM Digital Audio Broadcasting" by Brian W. Kroger and Denise Cammarata; "An All Digital AM and FM Solution for Digital Audio Broadcasting" by M.H. Zarrabizadeh & M. Shariat of Lucent Technologies Bell Labs; "Progress in Short-Wave Digital Broadcasting" by Dr. Robert Everett of the International Broadcasting Bureau, and "L-Band Terrestrial Digital Broadcasting" by Gerald Chouinard of the Communications Research Centre in Ottawa.

RADIO REVENUE : YEAR TO DATE



Lookin' good

If your general manager has been smiling a lot lately, take a look at the chart above for one possible explanation.

By all accounts, this has been a fine year for radio ad sales. The Radio Advertising Bureau reports that radio revenue for the first six months of 1997 was up 10 percent over the same period in 1996. All regions of the country reported consistent gains.

RAB President Gary Fries said the double-digit performance should provide "great momentum" into 1998.

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Old-time is brand-new

Dear RW,

As one of many broadcasters of vintage radio, I was particularly pleased to see that The New York Times has given its blessing to the return of old-time radio (RW editorial, June 25), albeit somewhat altered in its presentation now, with the largest number of listeners receiving signals from places like the Internet, DSS, affiliated AM/FM stations and even cable TV audio.

Our own network, Yesterday-USA Satellite Radio Network, soon will add a very large shortwave transmitter, which will serve the world as the World Wide Web is already doing. The love of OTR is understandable, since the wonderful treasures from the 1930s, '40s and '50s bring back "the good old days" for the oldsters in the country who remember actually hearing the shows. As Chester Lauk (Lum. of Lum and

Abner) pointed out when the revival of OTR started back in the '70s, younger listeners "think they've discovered something brand-new."

CBS Radio runs old shows on its website, and many new networks have formed to service the appetite of those who love to listen to a time — an era — captured on radio!

Tom Heathwood
Heritage Radio Theatre
Yesterday-USA Radio Network
Richardson, Texas

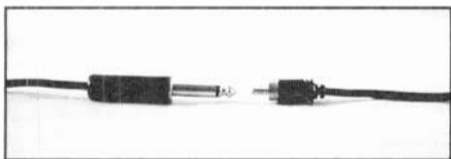
Phono or phone?

Dear RW,

I am astounded at Ed Montgomery's remark in the June 25 article "How to Manage With Nobody Home," where he recommends phone jacks and plugs as being "far more reliable than ... RCA 'phono' plugs." In reality the opposite is true.

The "phono" plug was created in the 1930s for RCA, mainly for use in the connection of a phonograph pickup to an RCA amplifier or radio, hence the names "phono" and "RCA." It is the soul of reliability when used in permanent and semi-permanent connections, showing little, if any, problems with corrosion. Today Switchcraft and others make phono plugs with reliability for frequencies in the many megaHertz. And phono plugs make many contacts with the jacks; phone plugs only one.

On the other hand, the quarter-inch phone plug (named because of its early use in temporary telephone connections) is extremely unreliable for permanent connections due to its susceptibility to corrosion of both plug and jack as well as the weakening contact of the jack-spring over time. (That's why phone plugs and jacks must be burished frequently.) So all of the bad characteristics Mr. Montgomery attributes to the



Face-off: Phone or phono?

phono plug/jack should have been attributed to the phone plug/jack. And because broadcasters' connections are, for the most part, permanent, the phono plug/jack is by far the most desirable and should be used.

Oliver Berliner
telaudio centre
Beverly Hills, Calif.

Ed Montgomery responds:

The passage reads: "The balanced line inputs on an audio console often are on terminal strips, but can also be XLR plugs or quarter-inch tip-sleeve-ring (TRS) jacks and plugs or amphenol/molex receptacles. These connections are far more reliable than unbalanced RCA 'phono' plugs, friction-fit connectors which can corrode over time, compromising the connection."

Mr. Berliner speaks of the RCA plug and jack being used by Switchcraft to reliably transfer a signal up into the megaHertz range, and this is true. The home VCR uses

Low Power, High Hassle

Pirates are on the prowl.

The careful reader of RW knows that unlicensed radio stations, apparently operating with power levels in excess of those allowed by law, are bothering legitimate stations and their listeners more often these days. The NAB Radio Board has adopted a resolution urging the FCC to take whatever enforcement or judicial steps are necessary to terminate these broadcasts. According to the NAB, the FCC recently referred 10 new cases of pirate operations to federal authorities around the country for enforcement.

Meanwhile, as reported in this issue, all 20 member stations of the Milwaukee Area Radio Broadcasters Association recently complained to the FCC field office in Chicago about problems of interference caused by low-power pirates in their area. ("Low-power," indeed; at least some of those unlicensed operators apparently had threatened to crank it up to 500 W by the end of the summer.)

Also, in a recent newsletter faxed to member stations, the NAB cited three articles in RW as evidence of "the latest skirmish in a war on pirate radio that has seen its fronts expand over the past six months."

Observers believe much of this activity stems from public awareness of the ongoing case of the FCC and Stephen Dunifer, the unlicensed radio operator in Berkeley, Calif., and poster boy for the micro-power movement. But concerned broadcasters should not dismiss this as a temporary trend. The movement seems more organized, more visible. In June, about 120 people attended the West Coast Micro-Power Radio Conference, and set up an Internet network for exchanging audio files. Former radio ship operator Allan Weiner has written a new book and was on the Howard Stern show recently to promote it. Letters to RW prove that this movement has many adherents.

The legal limits of unlicensed operation are set too low. The radio band can accommodate more low-power operators than it does. But if pirates and their supporters want to ease those limits, they should work within the system to do so. We agree that the FCC should take all steps to protect the signals of licensed radio stations from illegal operators.

— RW

them to transfer base-band video. They work; but in a broadcast studio environment, where there is no engineer, it is risky to use this connection.

Many TV engineers feel a BNC connection would be far more reliable. It won't disconnect easily; an RCA will. Also, if the connection corrodes in a radio station, where the equipment often is just a few feet from the transmitter, the connection may begin to detect the transmitted signal and create noise or distortion. The result: audio or background hiss. I don't believe most broadcast engineers would recommend the RCA connector for permanent or semi-permanent studio use.

The quarter-inch tip-sleeve-ring is still around. You can find them on consoles and in patch bays all over the place, especially in smaller markets. True, they can corrode and do need cleaning, but there are a lot of them in use.

Take micro-power seriously

Dear RW,

This letter is in response to the Guest Commentary by Kent Waterman ("Peanuts or Pirates, Make 'Em Legal," May 28). Finally! A "real" broadcaster who supports low-power radio getting some ink!

There is no question that broadcasters understand the power and value of being "local"; his own personal experience was a perfect example. People live in neighborhoods, not "contours." If neighborhoods are given voices, issues can be addressed that are usually ignored by the large media, which ultimately makes for stronger communities. These neighborhoods also offer marketing opportunities which are now dominated by "shopper" newspapers, into which microbroadcasters could tap.

What are the full-power broadcasters afraid of? There is no way 10 W could realistically compete with 50 kW or even 6 kW. The NAB and the FCC must address and regulate low-power broadcasters, and let the market decide who survives.

The FCC ruled that stations licensed with less than 100 W are an "inefficient" use of the spectrum. If this is measured by signal strength alone, what is the justification for translators? And imagine the composition (and dues revenue) of NAB membership if the 2,769 or so translators suddenly were independent low-power stand-alone stations.

The FCC claims that processing applications for all of the possible "Class D" stations would clog the system, especially with all of the cutbacks, but I will bet it takes no longer to process a "stand-alone" transmitter than it does a translator. Besides, isn't that what taxes and processing fees are for? If it takes a little longer, hey I can wait.

The return of a Class D-type license would eliminate probably 90 percent of the "pirate" activity and make the entire industry stronger by allowing regulated access, as well as opportunities for equipment manufacturers, engineers and talent.

Todd Ciske
Zendar Communications Engineering
Milwaukee

Corrections

Advanced Furniture Systems was omitted from our Furniture Supplier Guide on July 23. Reach the Colorado-based company at (970) 663-4123.

Also in that issue, comments by Dr. Peter D'Antonio, owner of RPG, in "Sound Absorbed by Diffusion" were misquoted. The story stated that the broadcast studio designer his company works with does not limit itself to the use of foam exclusively.

Dr. D'Antonio's printed statement read, "We are fortunate to deal on a regular basis with the world's most talented broadcast studio designers ... no broadcast studio designer we work with uses foam exclusively."

Radio World

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—PRINTED IN THE USA—

Next Issue of Radio World
September 3, 1997

Chancellor and Katz Synergize

► SYNERGY, continued from page 1 under \$11 per share. The deal is a good example of the ripple effect of radio consolidation.

"In radio, it was wonderful news," said Ellen Strahs Fader, vice president of Investor Relations. The company represents seven of the top 10 largest radio groups. As those groups acquired more stations, Katz did too, and it now has exclusive agreements with more than 2,000 radio stations.

"In television, unfortunately, (consolidation) wasn't such good news," said Fader. The television companies Katz reps for were not buyers this year, but the company hopes that will turn around in the coming year.

Synergy, synergy, synergy

Readers will remember the hype over "economies of scale" that would be realized when one radio group could own multiple stations in one town. Today, the magic word, when it comes to purchases of auxiliary companies, is "synergy."

As Evergreen Media CEO Scott Ginsburg noted, the soon-to-be-formed Chancellor Media Corp. will be the largest client of Katz Media. The decision to buy was both strategic and financial.

Explained New York-based radio broker Gary Stevens, "They can guarantee a flow of business into the firm." This way, he said, the money stays in the firm rather than going to a third party rep firm.

Also, Fader said, "We're known for having a superb sales training group, and from what I understand, so is Chancellor."

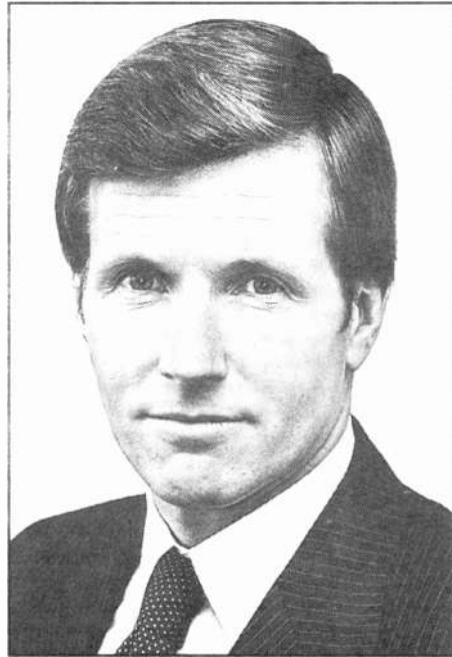
Katz Media will certainly benefit from this new relationship. The 109-year-old company began partnering with investment firms back in 1990. Fader said the partnerships were short term and the company had been looking for a long-term partner. With its long history, Fader said, Katz Media wanted a long-term view of the future.

Explained Thomas O. Hicks of Hicks, Muse, Tate & Furst Inc., "This transaction will provide Katz Media with the financial resources and operating autonomy

necessary to retain and attract the most talented personnel and invest in the most advanced technology."

Reaction

"For us the acid test ... was to determine way up front whether our client base would accept this," said Fader.



Tom Olson, President and CEO of Katz Media

"I think that only time will tell," said Ralph Guild of Interep, Katz's biggest competitor, when asked how the sale will affect his company. "I don't think too many of their (Katz's) clients are happy about it." He compared the purchase of Katz Media by Chancellor/Evergreen to Proctor and Gamble buying a supermarket chain. The question is how the other supermarkets will feel.

One of those "supermarkets" is ABC Radio. Katz Media had created something called Amcast, which is specifically dedicated to repping for ABC. Robert Callahan, president of ABC Radio and the ABC Radio Network said, "We have a terrific relationship with Katz and Amcast. Things could

continue to work well. We'll wait and see."

Broker Richard Foreman said that "being in bed" with one of the top broadcasters in the country will be a positive for many groups as it gives them the leverage to attract national advertisers. Because Chancellor will want to increase the level of money coming in, he said, Katz Media is likely to be "very sensitive" to their concerns.

Meanwhile, only time will tell if

Decency Standards Challenged by WFNX

► BELTWAY, continued from page 3

getting. WFNX(FM), Lynn, Mass., Program Director Bill Glasser was hoping the outcry against the station's broadcast of the classic underground poem "Howl," which has garnered some press in Boston, would be minimal.

"We would hope that the majority of our audience is pretty understanding of what we do," he said. The station has one of the nation's only gay and lesbian talk shows, so its listenership is generally open-minded, he said.

The station aired the poem July 18, from 6 p.m.-7 p.m., at the instigation of a photographer friend of poet Allen Ginsberg, who died in April. WFNX CEO and Chairman Stephen Mindich said that the drive time slot was chosen in order to maximize the audience reached for the broadcast.

"I don't believe that issues or assessments of indecency should be applied to what are clear works of art, and I don't believe children should be protected from works of art," Mindich said.

Will conservative listeners with an ax to grind be offended by the often

other radio groups will branch out into companies. Foreman suggested that such related companies as equipment manufacturers, electronics, marketing or engineering, could be next. The trouble, he said, is that there are not many auxiliary companies that have the huge revenues that would appeal to a large group like Chancellor.

One industry observer noted that now that radio groups have grown, they are obliged to prove to the marketplace that they can continue to grow, and diversification is part of that. One thing is certain: The privately held Interep, according to Guild "absolutely, categorically ... is not for sale."

graphic language of the poem ("I saw the best minds of my generation destroyed by madness, starving hysterical naked ... who balled in the morning in the evenings in rosegardens and the grass of public parks and cemeteries scattering their semen freely to whomever come who may"), and report the station's violation to the FCC? "I wouldn't be surprised," said Mindich. He said that the station's lawyers had advised him, and he was willing to take the risk.

One California organization has pledged to fight indecency on the radio. ERASE (End Radio Air Smut Effectively), a non-profit group led by Rev. Samuel Fosu-Mensah, has begun a campaign asking listeners to boycott stations that air "smut."

Ginsberg, who himself was embroiled in a number of court cases in which he fought for the right to have his works broadcast, often pointed out the irony in the FCC regulation. "Ginsberg had said that it always amazed him that his poem could be read on the airwaves in countries behind the Iron Curtain, but not in his own homeland," Glasser said.

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World Radio History

July Brings More Station Deals

by Matt Spangler

AUSTIN, Texas If in life there are only two certainties, death and taxes, then in the radio industry the one additional truth is: On any given day you will wake up to find that a large station transaction has been announced or completed. In addition to Chancellor-Katz (see story, page 1), three major deals were in motion in the first half of July.

On July 9, Capstar Broadcasting completed its acquisition of GulfStar Communications, which has a substantial presence in the Southwestern United States. GulfStar's 54 stations in Texas, Oklahoma, Arkansas, Louisiana and New Mexico give Capstar a grand total of 241 stations.

This number includes 56 stations owned by Atlantic Star and Southern Star, which are wholly owned subsidiaries of Capstar, and 15 LMAs or JSAs. Estimated 1996 revenue for Capstar, minus the Atlantic Star and

Southern Star stations and the LMAs/JSAs, is \$216,925,000 — eighth among all station groups.

Capstar spokeswoman Lisa Dollinger said that the company was not anticipating the divestiture of any stations in order to satisfy the merger requirements of the Department of Justice and the Federal Communications Commission.

A week later, Sinclair Broadcast Group announced its intent to purchase the seven TV and 24 radio stations of Heritage Media Group, upon closure of its merger with Rupert Murdoch's NewsCorp. This deal is still being reviewed by DOJ and the FCC. Sinclair expects to close the acquisition in the

first quarter of 1998.

On completion of the Heritage deal, Sinclair will own, have LMAs with or have options to acquire, 58 stations. The 54 stations it will own give the company an estimated 1996 revenue of \$125,500,000 — twelfth among all groups.

Sinclair Chief Financial Officer David Amy said that the company is not anticipating any problems with DOJ or FCC approval of the acquisition, and that there were no plans to divest any of the radio stations.

On the same day, Children's Broadcasting Corp. announced that it had signed a definitive purchase agreement to

sell its 14 owned-and-operated AM stations to Global Broadcasting Co. for \$72.5 million.

The sale of its O&Os was due partially to CBC's lawsuit with ABC over Radio Disney, according to CBC President and CEO Christopher T. Dahl (RW, July 23). The suit alleges that ABC used its position as a former partner with CBC to develop the idea for a competing children's network.

CBC stated that it intends to continue to provide and develop its "Radio Aahs" children's programming. After the sale of the O&Os, "Radio Aahs" will be available on 20 affiliates across the nation. Global would not comment on what it plans to do with the stations.

The Global deal is subject to approval by the DOJ and FCC, but it is expected to close the deal in September.

Crash Downs Radio Tower In Alaska

► KICY, continued from page 1

plane lying in the tundra," he said. The base insulator wasn't hurt, but Guilliam said the tower has to be replaced — and time is of the essence.

"We have to have the tower erected by mid-September, before the winter weather comes in," he said. "If the tower's not up by then, it can't go up 'til Memorial Day." Weather is not friendly in Nome. September is traditionally rainy, and the first snowfall often hits in October. The city is accessible by plane or barge in the summer, but only by plane in the wintertime.

KICY has an estimate of \$48,000 to get the new tower delivered and erected, and McBride said he believes Olson's insurance company will pay the bill. Guilliam is talking with several tower companies, including South Central Communications in Soldotna, Alaska, and Nett Antennas in New Mexico.

KICY-FM's antenna is on a different tower and was not affected by the accident, so Guilliam is putting up a "long wire" to get the AM back on the air. Coverage will be limited, but McBride noted that at least the station will be able to serve some of the listeners who really miss it.

"Each day we receive calls from the people of Nome or the 40 villages we serve in western Alaska wondering when we will be back on the air," he said. "Several have offered assistance, and even the other radio station in Nome (KNOM) has been very supportive."

Near the crash site is a memorial: two crosses mark the loss of a pilot and his young passenger.

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AVS Protects Music Licenses

by Lauren Rooney

LOS ANGELES A new technology helps music licensing organizations nab the information superhighway's "carjackers."

Peggy Miles, president of Intervox Communications, a consulting firm that helps put radio on-line, said hundreds of stations are broadcasting on the Internet. "It's only natural that radio stations would want to place their signal anywhere people can listen to it," she said.

There are pitfalls to broadcasting on the

Web, however. One of these is licensing of the music that's played. David Wittenstein, a lawyer for the Washington firm Dow, Lohnes and Albertson, which specializes in media and information technology, said anyone broadcasting on the Web should recheck their current ASCAP (American Society of Composers and Performers) and BMI (Broadcast Music Inc.) contracts.

"I would be very surprised if a station's current contract covers the Internet," he said. The fines for not paying the fees could be as high as \$100,000 — an easy-to-make but costly, oversight. Many Web

designers are not aware of the regulations of ASCAP and BMI, said Wittenstein. "Even if your site just has background music, you must pay licensing fees."

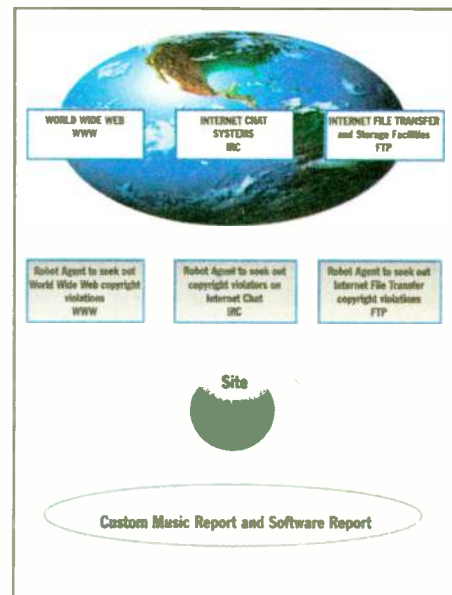
Probably the biggest offenders of licensing laws are radio pirates, who are now setting sail in cyberspace. They set up "pirate trading posts" where visitors can download pirated music for free.

Dennis Smith, a computer hacker who is very familiar with cyber piracy, said these sites are usually run by young, inexperienced webcasters.

Users can get software off the Internet

that allows them to listen to and download the songs — all without paying a single licensing fee. But Smith said passing around free music on the Internet isn't completely out of tune with the music business.

"The hottest titles sold in the record stores are traditionally the most pirated," he said.



The Intersect Website

Music licensing organizations BMI and ASCAP are going after music pirates on the Internet.

"Composers compose for a living; that's their job. And the way they get paid is when organizations like ASCAP license public performances of their music," said ASCAP attorney Bennet Lincoff. ASCAP finds the unlicensed users and offers them contracts.

Treasure hunters

But finding unlicensed music on the Web is a huge undertaking. So in comes a pirate bounty hunter: Intersect. This Los Angeles-based company scans the 'net for music, and then lets licensing companies know who's playing what.

President Richard Ford said his company developed the Audio Video Scan (AVS) technology while working on the book "Best of the Web." Ford said they had to find a way to scan thousands of websites: "We looked at things like content and navigability of each site we visited."

Intersect then began using AVS to scan the 'Net for unlicensed music. "We use a spider technology," he explained. "(W)e have a Web crawler that can search 54-million Web pages." Technicians then check the sites to find out what's being played, and compile a report.

It takes Intersect about two weeks to scan those millions of websites.

"We saw that the Internet was becoming the next broadcast medium," Ford said, "and we saw a lack of tools to keep track of music.

"I was a performer," he said, "so I feel very strongly about an artist not being paid for his or her work."

AVS can keep track of the music for publishers or recording companies. "We put a type of watermark on music that will identify the artist, publisher and owner," Ford said.

The technology can also help radio stations and record companies know what's hot and what's not, as it can track how many times a song was listened to or downloaded. Ford said the company is also looking forward to helping manage the Internet and set up standards for the use of music on websites.

"We see a real need to get pirates off the Internet," he said.

Microsoft Deal Brings Convergence

► PROGRESSIVE, continued from page 1 with either company's products.

In 1995, Progressive Networks introduced the concept of real-time audio playback over the Internet. The Seattle-based company now dominates the market, with 20 million RealAudio players in distribution, and an estimated 10 to 12 million RealAudio and RealVideo players in regular use. In recent months, Microsoft has aggressively pursued the Internet broadcasting market with its own incompatible NetShow streaming technology, a product it includes with its Windows NT server product.

"By agreeing to provide compatibility based on RealAudio and RealVideo, Progressive Networks and Microsoft will accelerate the availability of compelling audio and video content on the Internet," said Rob Glaser, founder of Progressive Networks and a former Microsoft multimedia executive.

Under the agreement, Microsoft will license Progressive's RealAudio and RealVideo technology for incorporation into NetShow, which will become part of the Microsoft Site Server. Progressive, in turn, will support Microsoft technologies in its products, including the use of Microsoft DirectShow and DirectDraw APIs in the next versions of its Windows-based clients.

Both companies will use ASF as the native format for the next version of their streaming media products. Microsoft agreed to include the Progressive RealPlayer 4.0 and Netshow clients with its Internet Explorer Web browser. The company will distribute Progressive's EasyStart Server with NetShow 2.0 until it can release an upgraded product that is compatible with RealAudio and RealVideo.

The Microsoft/Progressive deal is being viewed by industry experts as part of a continuing effort by the computer software manufacturer to merge broadcasting with the personal computer. Microsoft Chairman Bill Gates is engaged in a strategy to create a new high-bandwidth interactive broadcast network using advanced cable television technology. Last April, Microsoft purchased WebTV Networks, and, in June, made a \$1 billion investment in Comcast Corp., the cable television operator.

"We think this is a very clear win

It is a thumbs up from us. It hastens the move toward a standard player and platform.

— Steve Church
Telos Systems

for the market. It's going to make it easier to create content, then to deploy it and view it," said Peter Zaballos, vice president of marketing at Vivo Software. Vivo manufactures VivoActive Producer, a server-independent package of content creation tools for Internet broadcasting.

The long-term implications of the deal, said Zaballos, is that we are now much closer to a single Internet broadcasting standard. "You have to read between the lines and take a leap of faith," he said in predicting the eventual results of the deal. "Having these two companies come together turns

two competitors into two partners."

A key part of the agreement, said Zaballos, is that Progressive Networks is going to adopt the ASF file format. "You've got Microsoft, who is best positioned to deliver the complete solution in the market, and Progressive Networks, who has the clear lead in the media server space. They'll start standardizing on the file format first and eventually this will show up in a universal player. That lays the foundation for standardizing on a codec. These are important steps toward eventually getting a universal standard."

The agreement is good news for Telos Systems, manufacturer of the AudioActive streaming system, said Telos President Steve Church. "It's a thumbs up from us," Church said. "It hastens the move toward a standard player and platform."

AudioActive is currently playback-compatible with Microsoft's NetShow but not with RealAudio. If all goes as expected, that will soon change, said Church. "Progressive's next player should be able to play back audio encoded with our tools."

Xing Technology, manufacturer of the StreamWorks system, issued a statement calling the agreement "very interesting, but not entirely relevant to us." Xing has backed away from the Internet market, noting that the target of its StreamWorks 3.0 product is intranet/enterprise networks.

"While we still support low-bit-rate access, we're really focused on delivering a TV-quality experience to the desktop," the company said. "We're successfully attracting corporate communications and distance training applications developers to our platform, which is our goal."

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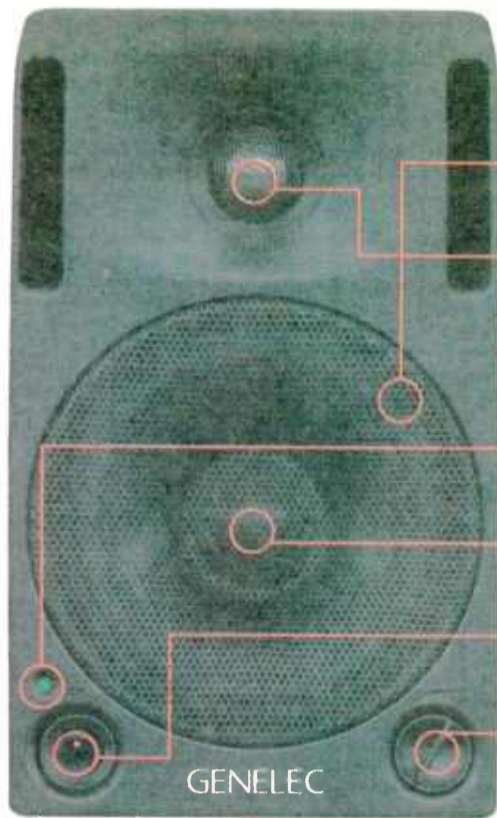
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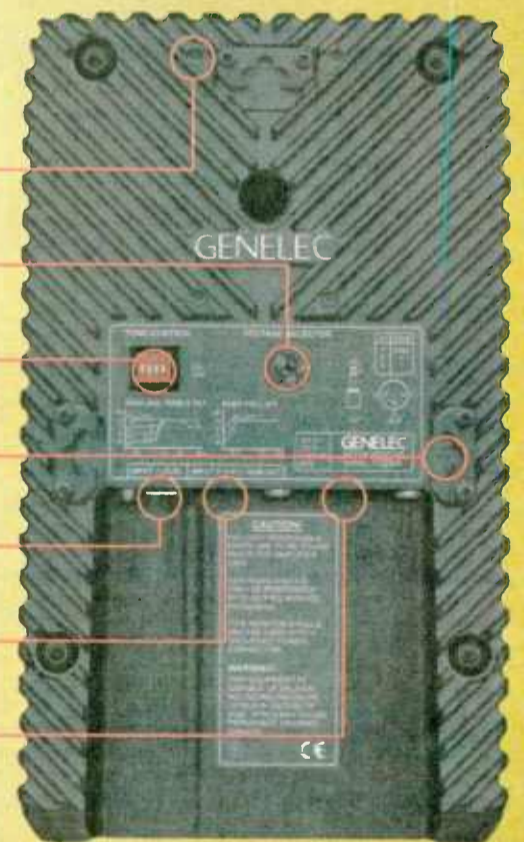
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GROUNDING IN SOUND BROADCASTING

Association Nabs Radio Pirates

by Lauren Rooney

MILWAUKEE This city appears to be one place where pirates are not welcome to anchor.

When seven pirate stations were discovered here recently, Milwaukee's radio stations banded together to clear the airwaves of the low-power radio broadcasters.

In June, the Milwaukee Area Radio Broadcasters Association, or MARS, issued a complaint about the pirates to the Federal Communications Commission field office in Chicago. There are 20 stations in MARS, and each signed the letter — a real eye-catching complaint according to Mike Moffitt, FCC district director in Chicago.

"A group letter is very unusual," he said. "I haven't seen that before."

Moffitt was struck by the number of stations MARS claimed to have identified. "Milwaukee isn't that big of a city to have that level of activity," he said. "That caught my attention."

The FCC sent investigators to the area in July. They identified some of the pirates, and the agency is now sending warning letters to those broadcasters.

MARS attacks

The situation came to light this past spring when Carey Merz, general manager and president of Heritage Media Corp. Milwaukee stations, received a few calls complaining of interference. She

mentioned it at a MARS meeting and found that other stations were getting similar calls.

She asked her chief engineer to find out what was going on. "And frankly it mushroomed from there," she said.

The seven pirates were all broadcasting from the same neighborhood on the south side of Milwaukee, placing their programming from 93.0 to 99.9 on the FM dial. The power of the signals ranged from 1 to 100 W, with some threatening to go to 500 W by the end of the summer. They usually broadcast late at night, and seemed to know one another, because when one would sign off, he would tell his listeners where to go for more pirate programming.

Merz said the programming ranged the gamut from soft-core pornography to mini-radio stations complete with music, news and contests. "One even has a website, for heaven's sake," she added. "He puts up his playlist and claims to have thousands of listeners."

Heritage Chief Engineer LeRoy Wolniakowski tracked down the seven pirates with the help of a south side Milwaukee resident who wanted the pirate operations shut down.

"He told me that he'd notified the FCC and his state senator, but got no response," said Wolniakowski. With this man's help Wolniakowski was able to locate some of the pirates' refuges. "You could drive

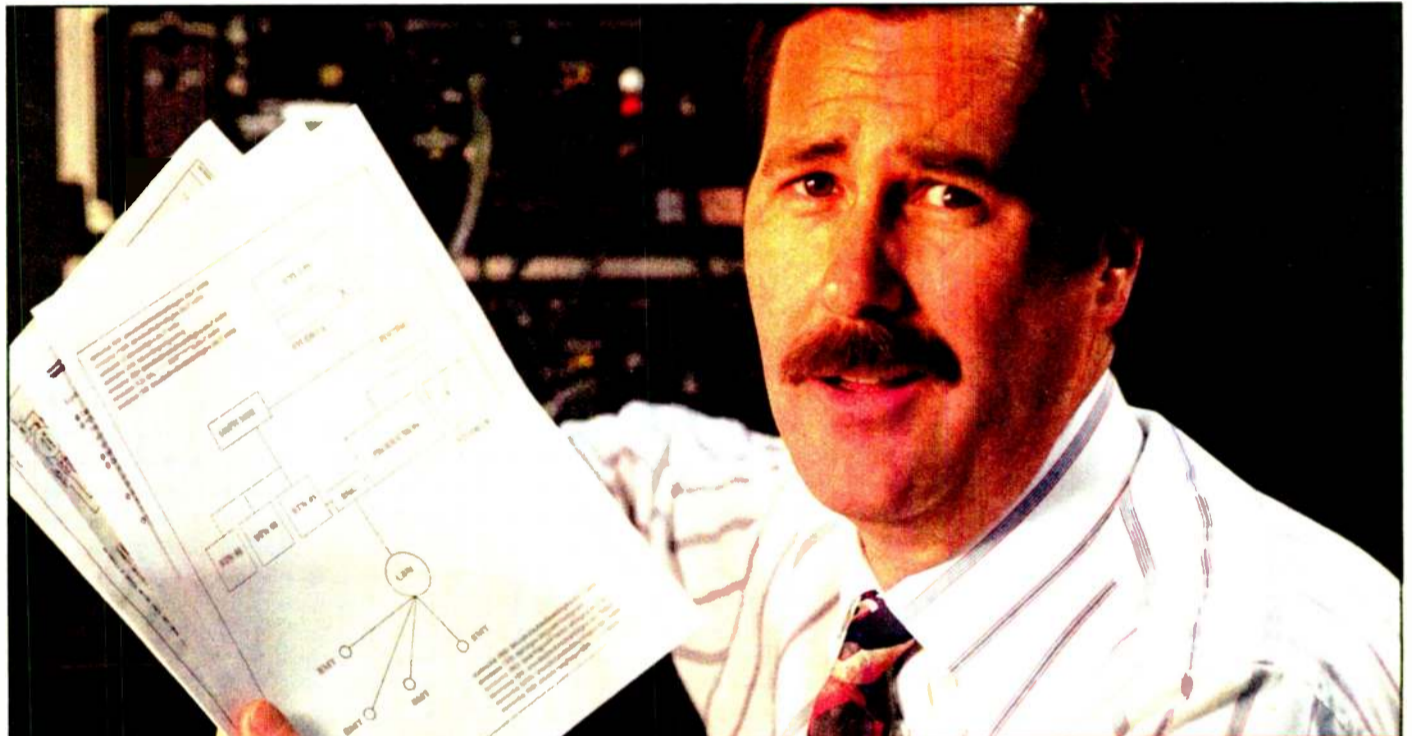
down the street and see their antennas on their rooftops. One had an FM dipole; another had a whip antenna."

Since the FCC sent investigators to the area and warning letters to the pirates, all but two had stopped broadcasting at press time. However, Merz said pirates have a habit of migrating.

"It's that guerrilla activity that makes them hard to find," she said.

But when they are found, they can face some hefty fines. Moffitt said the FCC usually starts with a warning letter, and if that doesn't work, the culprits could be fined \$100,000 or, in the rare case, even be sent to jail.

One of the Milwaukee pirates could be a heartbeat away from such extreme punishment. Merz said the pirate who has the website has been issued warnings in the past by the FCC for pirate broadcasting.



Tierney and Gore Want Airtime

by Matt Spangler

WASHINGTON While the Democrats and Republicans dredged up campaign funding dirt on one another during July hearings, lawmakers and the executive branch were busily drafting and pushing for more campaign finance reform.

Rep. John Tierney, D-Mass., introduced the "Clean Money, Clean Elections Act" in the House last month. This bill, which was drafted at the request of special-interest group Public Campaign, would enable political candidates to shun "soft money" contributions and at the same time not resort to using personal funds by instead receiving campaign allowances from publicly financed "Clean Money" funds.

One provision of the legislation gives "CM" candidates 30 minutes of free broadcast time during the primary election (and runoff) period, and 75 minutes of free airtime during the general election (and runoff) cycle. Television broadcasters must offer the airtime during prime time, and radio broadcasters must give it up during drive time.

"This initiative will give elected

See AIRTIME, page 12 ▶

TRYING TO MAKE SENSE OUT OF DIGITAL AUDIO SYSTEMS?

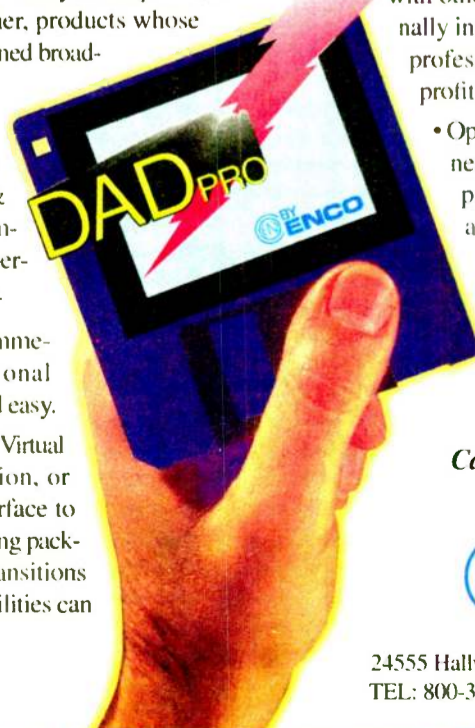
There is a better way!

It's not easy trying to understand the conflicting claims made by different manufacturers when you're buying a Digital Audio On-Air & Production System, whether a single, multipurpose Workstation or an integrated, multiple studio setup. At one end of the spectrum, you're faced with a wide variety of simple "Cart Machine Replacements," and on the other, products whose complexity confounds even the most seasoned broadcast engineer.

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BUSINESS DIGEST

Report business news to: Radio World
P.O. Box 1214, Falls Church, VA 22041
or FAX: (703) 998-2966

DAL Opens Office Here: DAL, the U.K. multi-channel automation company, recently acquired McCurdy Radio Industries and has opened a U.S. office. DAL North America, located in New Jersey, will spearhead the expansion of DAL through sales and support, led by George Elsaesser, formerly with NewsMaker Systems Inc.

RE Group Sold: BARCO Group announced the purchase of RE Group, a Danish developer and manufacturer of digital codecs and RDS encoders. RE America is part of the deal.

BARCO is a distributor and RE is a manufacturer. Executives hope to expand BARCO's reach into the telecom market and RE's market in Latin America. A BARCO statement cited the opportunities created by "converging broadcast, cable TV and telecom markets." It said research and development will focus on products for the digital transport of video and audio via cable TV or telecom networks.

"RE will now have the resources necessary to support its continued growth, and gain access to a complementary line of distribution products and technological

innovations," said John Hestehave, CEO of the RE Group.

Cathy Huth of RE America said the change of ownership should be transparent to customers, and that RE America "will continue to provide service to customers, sell its products and broaden its horizons."

SFX Achievement: SFX Broadcasting announced that the second quarter of 1997 produced record quarterly results as measured by revenue and cash flow. Net revenue was up 221 percent, from \$27.8 million to \$89.1 million, cash flow up 244 percent and operating cash flow up 291 percent over 1996, from \$7.1 million to \$27.6 million.

With the anticipated consummation of previously announced transactions, SFX will own, operate or provide ser-

vices to 72 stations in 20 markets.

Salem to Sell Boston Station: Though the terms were undisclosed and subject to FCC approval, Salem Communications Corp. plans to sell WPZE(AM) Boston to Hibernia Communications Inc. WPZE airs a religious format at 1260 kHz with 5 kW.

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Your station can make the quantum leap to *uncompressed* digital music from hard drives! *You'll hear the difference* in quality from this superior system!

Best of all, Scott Studios' *killer* new linear audio *costs no more* than compressed systems! Scott Studios is the *only* company playing *four* great sounding *uncompressed* digital stereo streams at 24kHz, 32kHz, 44.1kHz, 48kHz or any mix *with overlap* and *while recording!* No other system uses the sizzling hot new Motorola 56301 DSP chip and *32-bit PCI bus* audio cards! *Only* Scott Studios' system prevents dueling algorithms and eliminates compression artifacts with linear audio *at no extra charge!*

You also get a fail-safe watchdog for *unequaled* reliability, a 6x6 preview switcher that lets you hear ends of spots or songs while the middle is on-the-air, superior headroom, General Purpose Interface, digital ins and outs, optional timing stretch & squeeze, optional MPEG or APT, and more.



Scott Studios exclusive new 32-bit PCI audio card plays up to four CD quality uncompressed stereo channels while recording!

Good Spot Box



Scott's new digital Spot Box triple-deck "cart" replacement delivers awesome *linear* CD quality sound.

Spot Box is the *easiest* digital system to use! There's only one screen, so your jocks always know what's happening. At the left, three players give you legible labels, countdowns and End-of-Spot signals, with big well-lit buttons that show what's playing. Even though it uses Windows 95 or NT, Spot Box works like carts, *not* a computer. At right, there's a "rotary cart rack" that lets you pick and play any recording by number or name. Or, number keys at the bottom load your cut quickly.

As options, Spot Box can automatically load logs from traffic by diskette or LAN. You can record spots and edit phone calls at the right of the screen. Starting at \$5,000, Scott's Spot Box is so affordable many stations can even put two in an air studio for redundancy.

Better AXS



AXS' (pronounced ax'-cess) is radio's premier digital audio system for satellite or news/talk formats, CD automation and cart replacement for live jocks. AXS' gives you instant play Hot Keys, log editing, music on hard drive, Power Fill, satellite jock substitution, link to NPR's SOSS, an easy-to-use Real Time Scheduler, the industry's simplest and best net catcher, and an optional production or phone recorder and editor in the air studio.

Scott Studios offers AXS' satellite systems as low as \$7,500 complete. With Spot Box, AXS' or a Scott System, you can get 24 hour, 7 day support from Scott's 45 person staff—the biggest (and best) in digital audio! With several of these systems, any can record a spot once for all! Also, for spot or music on hard drive with typical playlists, you choose whether to get *uncompressed*, MPEG or APT digital audio cards at no difference in price.

Best Scott System



The Scott System is radio's top-of-the-line for digital music on hard drive. You get instant play Hot Keys, touch screen music libraries for instant requests, log editing, built-in phone recorder, pre-recording Voice Trax in context, and production that imports from any WAV digital multi-track.

Scott also offers an *invincible* seamless redundancy option. It's self-healing, so regardless what happens, your spots and hits just keep on comin'!

Good. Better. Best. Scott Studios' three digital systems can be tailored to *your* needs and budget. Call or E-Mail info@scottstudios.com for details.

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Circle (2) On Reader Service Card

World Radio History

Gore Wants Broadcast Airtime

► AIRTIME, continued from page 11

officials time to do the job they were elected to instead of spending inordinate amounts of time chasing the funds necessary to run for election or re-election," said Tierney in a written statement.

The National Association of Broadcasters, which has long opposed such measures, disagreed. "This legislation — like many other bills this Congress — targets our industry unfairly," stated NAB Executive Vice President Jim May.

Advisory committee

Meanwhile, Vice President Gore selected Norman Ornstein, resident scholar at the American Enterprise Institute, and an advocate of free airtime for politicians, to be co-chairman of the "Advisory Committee on the Public Interest Obligations of Digital Television Broadcasters," which was set up to examine the public interest obligations of broadcasters in the digital era.

"While (Ornstein) has a substantial record as a political analyst," wrote NAB President Edward O. Fritts to the vice president, "he also was both an architect of and an advocate for a high-profile proposal to provide free airtime for political candidates. ...

"Certainly Mr. Ornstein's actions make clear that he has intention of restraining his own bias, nor the capacity to lead the commission through a balanced examination of broadcasters' record and responsibilities."

Ornstein told RW that he is more concerned with TV broadcasters, but he is "open" when it comes to giving away radio time. He said that he is willing to negotiate with broadcasters as well. "I'm open to, for example," he said, "repealing the lowest unit rate provision and take the NAB up on its offer of several years ago to provide one minute of free time for every two minutes of paid political time."

Ornstein's co-chairman is Leslie Moonves, president of CBS Entertainment. Ornstein said that he expects Gore to appoint more broadcasters to the committee.

The committee must report to Gore by June 1, 1998.

Studio Sessions

Got \$5,000?
Here's
Your Mic
See Page 18



Radio World

Resource for Radio Production and Recording

August 20, 1997

Kyma: The Ultimate Processor

Dennis Miller

Get ready. You are about to meet the most advanced audio processing and sound design tool you have ever experienced: the Symbolic Sound Kyma Sound Design System.

Now available in software version 4.5, the Kyma System has significant new capabilities that will be of particular importance to anyone interested in unique audio processing and sound effects.

What is a Kyma?

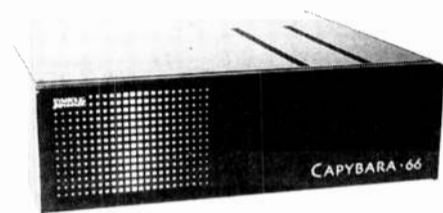
Kyma (pronounced "kee-ma") software runs on either a Mac or a PC and is used to control Symbolic's external "Capybara" DSP mainframe, a box of up to eight 66 MHz Motorola 56002 DSP chips that can be used for any type of sound generation or processing you can possibly imagine.

With its highly graphical and intuitive interface, Kyma makes short work of simple synthesis and sound processing techniques, while offering an enormous number of resources for more complex or unusual processes.

Kyma takes drag-and-drop to a new

level, because individual sound processing "modules" can be patched together. Simply grab icons, drag them to the screen and draw a line to connect them.

Though its \$5,000-plus price tag may be beyond the reach of many smaller studios, the system is multi-functional and could easily replace any number of traditional,



Capybara: Kyma's Brain-in-a-box

stand-alone effects or synthesis modules.

The Kyma main screen includes a "Prototype Strip" that runs along the top of the display, plus a work area on the bottom that can hold any number of open windows. The Prototype strip contains numerous icons that represent the various processes and sound generating methods the system provides.

Here, you will find common tools such as single oscillators, oscillator banks, delays, reverbs and filters. But you will also discover other functions for analyzing and altering a sound's spectrum and tracking the frequency or amplitude of live input to manipulate the speed of audio files as they play back from disk.

Kyma calls these modules "Sound objects," or just "Sounds." To edit the parameters they contain, simply open a sound editor window and drag the icon from the strip to the editor.

Once you are in the editor, you will discover quickly how easy it is to make both simple and dramatic changes to the "preset" version of a sound. All sounds include preset parameters that make them appropriate for previewing right out of the box.

Rather than massaging digital audio, your computer is working with only the instruction set for telling the Capybara how it should compute a sound. Storing

your designs requires little space on your hard drive, and you will soon build up a library of your own custom designs.

For example, Kyma offers at least a half-dozen different methods for altering the length of a sample while retaining its pitch. I have built templates that I use for each of the types of sounds I deal with, including one that works best for voice, another for pitched noises and a third for sound effects.

At last count, I had more than 100 different templates on my drive, in addition to the generous number of examples that come bundled with the system.

Constructing killer sounds

Simple sounds may have only one or two components, but when you want to get fancy, Kyma really shines. To build a complex design, drag as many icons onto the editor as you wish, then simply "hook" them together by connecting the output of one to the input of another.

A complex pitch shifter might include a source sample, a delay line with adjustable delay time, a panner and a touch of reverb.

See KYMA, page 21 ▶

SHORT TAKE

RPG ProFoam Is New Approach to Acoustics

A new approach to acoustical foam for studios and recording spaces is available from RPG Diffuser Systems.

ProFoam is a "nestable profile" foam product available in Melaflex- and Polyflex-fabricated panels. ProFoam uses variable-depth air cavity technology, trademarked as VDAC, where most of the foam surface is spaced away from the wall. The air gap between wall and foam surface aids in absorption.

The nestable profile allows future stacking of additional layers of ProFoam when the user wants more absorption. RPG calls this a VDAC Stack. According to company literature, the stacks can be as deep as 4 inches.

The Melaflex ProFoam panel is made from fire-resistant open-cell BASF melamine foam and is compliant with all codes for Class A interior use. The material is lightweight, at 0.6 pounds per cubic foot.

The Polyflex version is made from polyester urethane and is suited for Class B and C space uses. The design lends itself to use as an interior design element as well as acoustic correction.

Both versions are available in a range of colors and sized in panels of 4 square feet (2x2 feet) and 8 square feet (2x4 feet).

For information on ProFoam, contact


RPG Diffuser Systems in Maryland at (301) 249-0044 or circle Reader Service 199.

— Alan R. Peterson

D T V

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AD7014-003	Cue Decoder	on \$ 475.00
AD7350	7350 Chassis (230 volt power supply)	Analog \$ 845.00
AD7550	7550 Chassis (115 volt power supply)	Products \$ 695.00

(Various modules of Uplink and Studio Equipment also available)

Starguide Digital Networks previously acquired the Broadcast audio satellite distribution system products from Scientific-Atlanta, Inc. And has recently discontinued servicing the SCPC analog line of product. These components are in very limited supply and each order will be supplied subject to availability. Orders of five (5) or more items will be considered for additional discounts. All orders will be shipped C.O.D.

Circle (26) On Reader Service Card

Cart Label No. 2: What to Do?

Alan R. Peterson

What is the most annoying phone call you could get as production director?

"The client didn't like your spot" certainly rates as one of the baddies, as does, "This is Stu Tuffnails. Stop using my song in your commercial or I'll sue."

But one that always eats up your time is a listener calling to ask, "I didn't get the phone number on that car dealer spot that just played. What was it?"

This once meant having to figure out which dealer the caller was talking about, getting the cart from the studio, playing it back, writing down the num-

ber and making sure the caller got it right.

Clever, exasperated production folks eventually figured out that a *second label* on top of the cart could include this information, ready to be recited when the call came in. But then along came digital commercial playback with its virtual labeling methods and limited text fields. Suddenly there was no room for this ancillary information.

To complicate things, commercials began including Internet website addresses as well as phone numbers. More to keep track of.

The question becomes: How do you

stick a "second label" on a hard drive?

Some systems allow you to add that second label digitally when spots are produced or updated. If you are unsure if your digital storage and playback system has this feature, contact the manufacturer.

What to do?

The customer service division at Broadcast Electronics said the AudioVault includes a client/artist field where such data can be entered. Normally, this field is reserved for other types of data — i.e., "McDonalds \$2 Big Mac" — but with 64 characters of

text available, there is plenty of room for a phone and a URL.

Ron Burley of Broadcast Software International has included a Comment field in the BSI-licensed version of Cool

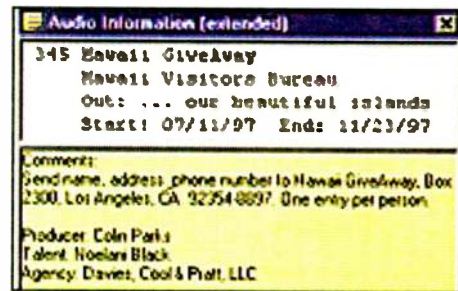


Figure 1: The BSI Extended Window

Edit. "It is not accessed in the current version of WaveStation or WaveCart," said Burley, but it will be available in the next generation of products.

Figure 1 is a screenshot of the coming BSI extended information window, which will be available in WaveStation and WaveCart. "The windows will be pop-ups that stay on-screen and users can define what information is displayed," said Burley.

Radio Computing Services (RCS) has both an aural and visual "second label" in its Master Control system. The Hook Marker — normally used to spot the "hook" in a song — can drop a flag right on the spoken telephone number or Web address in the spot. When "Hook Play" is engaged, the audio jumps right to the marked point with no waiting.

A Script Screen linked to an audio event can contain any text you wish to attach to it. Open it and you have access to anything written in the field.

CartWorks/dbm Systems includes two pop-up optional fields — Note 1 and Note 2 — in the CartWorks Plus.

Is it necessary?

Not all systems have a "second label" feature. In fact, some stations would not even consider this an important issue. But because a computer-based system is open-ended and can be modified and upgraded, this feature can be easily written and dropped in as a plug-in to be used only when and if necessary. After about 10 phone calls asking what so-and-so's web address is in their commercial, you will want it.

Again, contact the customer support division of the company that built your system and ask about the availability of such a feature.

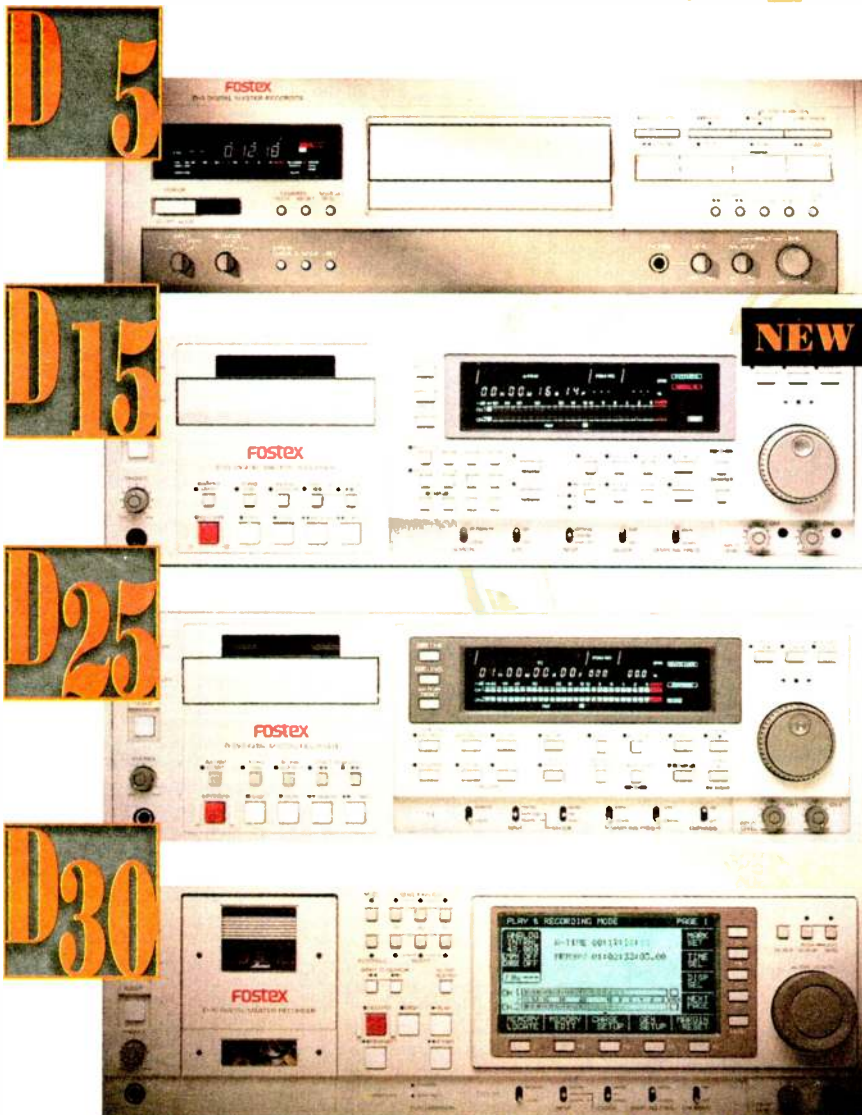
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World Radio History

Coming in
Studio Sessions

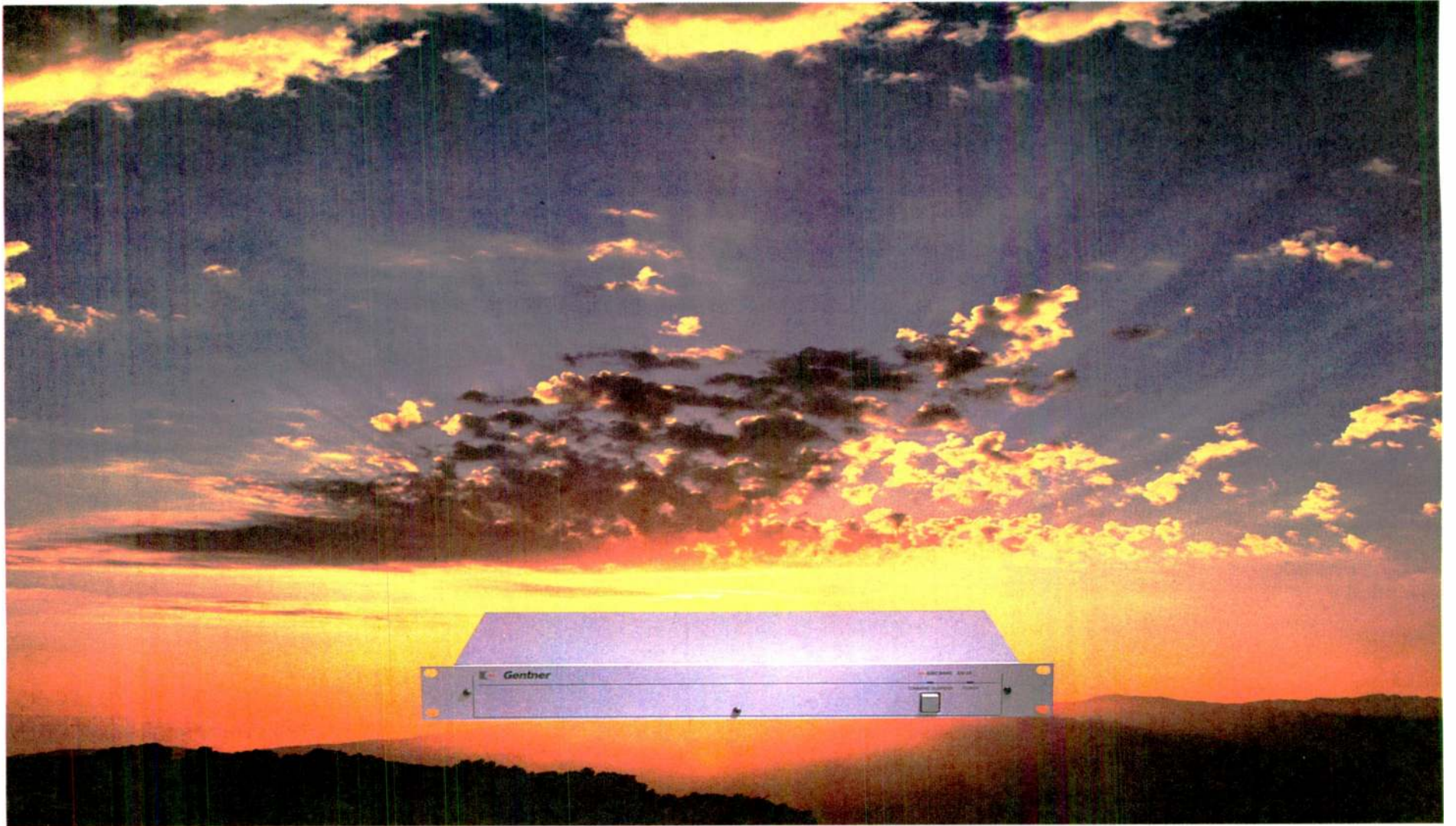
- Karen West on the evolution of a voice-over career
- Tom Vernon on the Behringer Eurorack Mixer
- Mel Lambert's "Digital Domain"

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Also, in emergencies, it will capture and log data. This will aid in the diagnosis and analysis of the event sequence that caused the emergency.

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Staying in control gets even easier when you accessorize.

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World Radio History

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World Radio History

Six Producers and One Big Shot

Ken R.

Every once in a while I take a break from creating ID jingles when someone requests my voice on a radio spot.

If you have ever spoken to me on the phone, you know I don't have a deep voice. In fact, if I could lower my voice about two octaves I would probably be considered only mid-range.

However, I do have a certain tone of believability and warmth. Or so my wife thinks.

The call came from another studio in town. "How would you like to read a spot with a celebrity?", the studio manager asked. As I had 35 minutes between jingle sessions in my own studio, I drove the four blocks to my alleged brush with greatness.

Apparently a "male college student" voice was needed for a large corporate client. Never mind the fact that I am 46 years old and possess a bald spot the size of Minnesota; my voice sounds like I am still 23. Lucky me.

Think 'women's clothing'

When I arrived, I introduced myself to the celebrity — a well-known television comedy star and Toledo native who made good. You would know him right away. He was as nice as could be: friendly, helpful and down-to-earth. No star trip here.

The producers and writers successfully pounded these spots into whimpering submission.

However, in the control booth were six folks representing the client. These included an executive producer, assistant producer, a junior executive in training, an aide to the producer, a hanger-on and a corporate trainee.

This did not look good. As they say on "Mystery Science Theater 3000," I've seen "good" before, and this wasn't it. Even though I arrived promptly for my scheduled session, I had to wait 30 minutes because they were still hashing over, rewriting and recording endless takes of a previous spot in the same series. Finally I was led into the dark, cave-like announce booth.

Setting up

A woman playing a female college student and I were each on our own mics. Meanwhile, the M.C. ("major celebrity") was in a separate booth, which afforded us all eye contact.

It was time to roll the ProTools and cut some tracks.

Read one: "Great! Timing was good. Now let's do another take."

Read two: "Great, perfect! Now, let's just change a few inflections."

Read three: "M.C., you were perfection. Let's do another one and see if we can get some more humor into it."

This went on for more than 25 minutes.

The celebrity was actually making helpful suggestions, bringing far more effort to the spot than it deserved. He was

unfailingly patient with the producers and strove to breathe life into a stillborn, somewhat humorless and confusing piece of copy. He also had great people skills and attempted to communicate warmly with the engineer, the producers and his fellow announcers.

What some of these six producers should have been doing was fixing the script; if not to add humor, at least to add clarity. None of the producers seemed to realize that the little changes in inflection they were making was like rearranging the deck chairs on the Titanic.

No one seemed to notice that the concept was weak and unfocused, but they all wanted to direct Mr. Major Celebrity. They

each needed to justify their own existence by making changes.

After about 14 takes, the "female college student" was asked to reread her lines again "wild" (not in context) so the engineers could edit and choose portions of her phrases. They planned to use ProTools to the utmost, I'm sure.

Off to the parking lot

How did these spots turn out? I'm sure they ended up a little better than the original scripts indicated, due largely to the major celebrity's efforts.

This corporate client at least picked a good spokesman, but the series of commercials seemed "committed" to death.

The producers and writers successfully pounded these spots into whimpering submission.

Many dollars were spent, much energy and time were expended, lots of people were involved and the results were unspectacular. Committees just can't create kick-butt advertising.

As I drove away, I was happy I had my real job to return to, producing jingles in my own environment. Jingles are produced in relative secrecy, the clients are hundreds of miles away ... and there is only *one* producer.

■ ■ ■

Ken R. produces classic PAMS jingles and contemporary radio imaging. He created the "Dork-a-Pellas" comedy collection last year with RW's Al Peterson. He can be reached at (800) 451-5367 or at kenr5367@aol.com

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World Radio History

PRODUCER'S FILE

Neumann M149 Is a (Five) Grand Microphone

Ty Ford

It felt weird plugging a \$4,750 microphone into a \$3,700 digital console. The mic was the Neumann M149, the console the Yamaha 03D. The job was to evaluate the new Neumann.

If the price of the M149 is not imposing, its size, large enough to make a U87 look like a U89 by comparison, surely is. And if those two attributes do not jerk your head around, consider that its transformerless solid-state output is 14 to 15 dB hotter than that of a U89. That means a peak voltage of 4,900 millivolts — almost 5 volts!

According to Neumann's Karl Winkler, the tube used is an Amperex 8254 triode that is hard-wired to a daughterboard that pops off the main circuit board. Need to run long mic lines? Neumann says the M149 can push 300 meters of cable.

What a mic

So what we have here is a large, loud tube mic with a capsule based on the M7 capsule design as used in the U47 and M49.

The dual-diaphragm capsule is a pressure gradient transducer capable of nine patterns between omni and figure-eight.

A seven-position rolloff filter goes from 20 to 160 Hz. There is no "off" for the filter, so if you are after anything below 20Hz, you may be disappointed.

I hope your console can take the almost 5V output, because the M149 has no pad. There also is a much more transparent head grille and attention to detail in building a curved slope beneath the capsule instead of a flat horizontal surface. The slope reduces the possibility of reflected sound within the grille from reaching the elastically mounted capsule.

A cloth dust cover is supplied and Neumann suggests you keep the mic covered when not in use to keep dust from

settling on the capsule.

Other, less-obvious engineering considerations include stabilization of both tube anode current and filament voltage by a control loop in the power supply.

The manual states, "Cable losses of up to 4VDC — which corresponds to a cable length of 100 meters between the



The pricey \$4,750 Neumann M149: You have arrived.

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microphone and the power supply unit — are detected and compensated for by a sensor line. A breakdown on this line due to a short circuit or an open circuit is not dangerous as the heater (filament) voltage would automatically be reduced and all other voltages switched off. The tube is very gently heated by current limiting with foldback characteristics."

The AF output of the external, wall-wart power supply has been designed to reject external phantom power because power for the mic is generated by its own power supply.

The power supply is connected to the mic by the KT 8 cable, a 10-meter, eight-conductor cable that carries -70V, +5V, +70V, the sensor line, ground, +32V, audio positive and audio negative.

Winkler said a new, more elegantly designed power supply should be available for the M149 by autumn at a price of about \$350. The M149 also comes with the EA170 elastic suspension mount.

Tube noise

The first consideration in checking out a tube mic is noise. To get a handle on noise I went to one of the quietest rooms in Baltimore: Flite 3.

Engineer Mark Patey and I compared the M149 with a U87 (not U87ai) connected to API mic preamps. With the preamps adjusted for equal mic loudness, the meters showed that the self-noise, plus room tone, of both mics was the same. However, the spectra of the noises were very different.

The U87 produced a high-pitched hiss, what most would call solid-state noise.

See NEUMANN, page 19 ►

► NEUMANN, continued from page 18
The M149 produced a lower-frequency, wider spectrum noise that sounded a lot like room tone. Bear in mind that to hear this noise, we had to crank up the monitors quite a bit.

Enabling a 50 Hz rolloff filter on the console dropped the M149 noise level another 6 to 8 dB, but did not do much for the level of the U87. The conclusion: the M149 is one of the quietest tube mics I have heard.

As for frequency response, the U87 has an output transformer that acts like a built-in, low-frequency filter. Because the M149 is transformerless, it passes frequencies no U87 or U89 can. Sounds below 70-80 Hz get rolled off a bit.

Transparency

I heard early appraisals of the M149 mention that it didn't sound much like a Neumann. After listening through several mic preamps, I think I know the basis for those comments.

The M149 head grille is less restrictive than those of the U47, U87, U89 and TLM170. It is so transparent, you can see the capsule rather easily through the grille, resulting in a noticeable lift in the 7 kHz-10 kHz range, and a bit beyond.

According to Winkler, "The old-style head grille has three layers that affected the sound more than we wanted. They provide a certain amount of acoustic compression and softened or widened the pattern a bit. In the M149 the patterns are textbook spot-on."

Without as much grille work, the M149 has a lift that is lower in frequency than the "air" of a 414, but higher than the mid-range plateau normally associated with the U87.

This lift gives the M149 a different voice than that of other Neumanns. It also demands that mic preamp choices be reexamined.

We found that, with a variety of male voices, an API mic preamp sounded either ultra-defined or slightly grainy. A popper stopper was almost enough to soften the grain. Raising a single sheet of facial tissue between the voice and the mic was slightly too much.

The experience left us wondering whether the extremely high output of the M149 was too much for the API input transformer.

Creative coffee filtering

Back at Technique, I placed a Braun "Swiss Gold" metal-mesh coffee filter basket over the head grille. It tempered the top end to a point between the tissue and the popper stopper and reduced the M149's sensitivity to popping.

Even without our makeshift filters, less-colorful mic preamps like the GML were not grainy. The preamp in a vintage six-channel Revox mixer gave the M149 a darker, more traditional sound. A Mackie 1604 made the M149 sound hard and bright with a slurred bottom.

There was also a discontinuity in the smoothness of the top-end response that sounded almost like a glitch. Even one trip through the UREI 1176 limiter at moderate settings ironed out the graininess we heard with the API and also destroyed most of the transients.

Regardless of which preamp was used, the hot spot of the M149 is relatively small, both vertically and horizontally. With a set of AKG240 headphones, I could hear the high end fade once I got off-axis by more than 20 degrees in any pattern, omni included.

The shift from the hot spot is subtle. In one experiment I could hear the rolloff in the AKG240s while recording a voice track to a Panasonic SV-3900 DAT, but I

The M149 is so sensitive that even close miking might not hide acoustic problems in your studio.

could not hear the rolloff upon playback. Without hard data to explain the phenomenon, I can only guess the 16-bit, 48

kHz recording compromised the top end enough to make the shift less apparent. I hate to say it, but maybe it is time to consider 24-bit, 96 kHz audio.

Proximity starts to take effect at a distance of about 3 inches. The exception, the figure-eight pattern, starts increased low-end response at about a foot. Perhaps due to its transparent grille, the M149 is more prone to popping than a U87.

It is also more susceptible to moisture-laden close exhales. I have exhaled directly into U87s and U89s without any effect. Doing so to the M149 caused it to rumble and pop a bit for about 10 seconds.

How does it sound?

The M149 is capable of capturing a high degree of detail. It doesn't have the "tube sound" that most older tube mics

have. The M149 is so sensitive that even close miking might not hide acoustic problems in your studio.

As to its persistence, I cut some fairly aggressive television voice-over tracks using 6-8 dB of full compression with a Compellor, and found that adding a narrow 2 dB at 60 Hz and 1 dB of 10 kHz shelving resulted in a smooth and open sound.

At Tony Eichler's studio near Baltimore, his wife Sandy played the flute in a bright, hard room while we compared the M149, U67 and U87 through GML mic preamps, a Mackie 24x8 board and Tannoy monitors.

The M149 sounded much more "naked" than the U67, the tube predecessor to the U87. The M149 was less thick than a U87. I cannot imagine a situation

See NEUMANN, page 22 ►

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

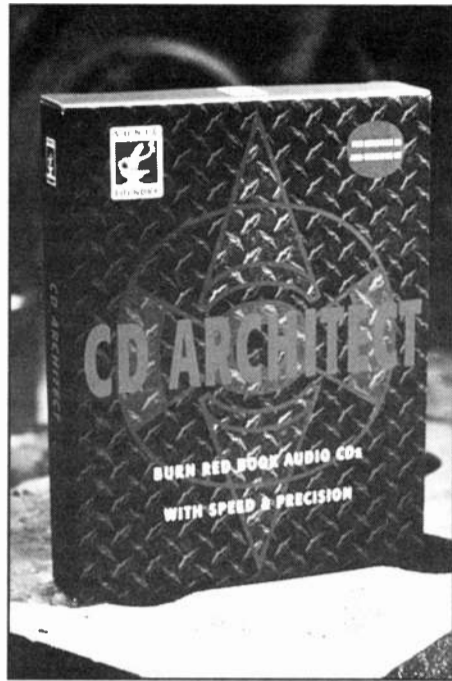
Sonic Foundry CD Architect

The new CD Architect from Sonic Foundry is now available worldwide. The product writes compact discs to Red Book specifications and supports a number of CD recording drives.

CD Architect can write CDs with up to 99 tracks, each with 99 sub-indices. Audio can be imported from other CDs, recorded from DAT or digitized through any Windows-compatible soundcard. The software can also optionally function as a Sound Forge 4.0 plug-in.

The program auto-detects many of the most popular CD drive products on the market, including units from Philips, Yamaha, Pinnacle, Ricoh, MediaFORM and Glyph. Suggested price for CD Architect is \$395.

For information, contact Sonic Foundry in Wisconsin at (608) 256-3133 or circle Reader Service 223.



PC laptop with the EMU8710 PCMCIA Card.

Designed for mobile high-quality audio and MIDI production, the EMU8710 works with Windows 95-compatible software that supports the playback and recording of digital audio and MIDI music files.

The card features 16-bit, 44.1 kHz stereo audio capabilities and a 2 MB General MIDI wavetable synthesizer. Reverb and chorusing effects are included, accessible through the built-in control panel software.

An optional media access breakout box includes audio I/O connectors, a S/PDIF digital output and MIDI In/Out lines.

For information, contact E-mu Systems in California at (408) 438-1921 or circle Reader Service 8.

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New TASCAM DA Recorder

TASCAM has expanded its DA line of modular digital multitrack (MDM) recorders with the DA-98 model.

Building on the success of the DA-88 and the more economical DA-38, the new DA-98 features confidence monitoring, switchable reference levels, input monitor select switches, an integrated digital patchbay and built-in synchronizer.

The confidence monitoring function alone makes the DA-98 notable. With it, you can verify the quality and integrity of the material going to tape without discovering mistakes after the fact.

The DA-98 is compatible with recordings made on DA-88 and -38 machines and all options, including remote controllers and meter bridges.

Suggested price of the DA-98 is \$5,999.



For information, contact TASCAM in California at (213) 726-0303 or circle Reader Service 32.

East•West Samples Online

East•West, distributor of sample CDs and CD-ROMs, has gone on-line with a 24-hour interactive website for auditioning and downloading soundfiles over ISDN or dialup links.

Visitors to the site can browse and audition sounds, then select them for purchase via a secure on-line ordering system. Files are sent in AIFF or WAV format with the Emagic ZAP Utility. One ZAP file costs \$9.95, with discounts of up to 70 percent for downloads of 10 or more files in a single session.

East•West also has new sample CDs for sound designers, including titles such as "Kritical Massive," "Kickin Lunatic Beats 2," "Alpha Dance 2" and "Ghost in the Machine." A free catalog is available.

For information, contact East•West in California at (310) 858-8797 or circle Reader Service 56.

Fostex Hard Drive Multitrack

Fostex Corp. of America has moved up to 16 tracks with the new D-160 removable hard disk recorder/editor.

The D-160 comes standard with a 2.55 GB removable drive for 30 minutes of 16-track audio and one hour of eight-track recording. A selectable stereo S/PDIF port and ADAT digital interface use two optical I/Os capable of accommodating 16 tracks of ADAT digital data.

Full random-access editing functions are included, including cut, copy, paste and move across all 16 tracks.

The D-160 comes in three models, with different functions for audio only, audio for film and video, and a combination of both.

Pricing on the D-160 begins at \$3,995.

For information, contact Fostex in California at (310) 921-1112 or circle Reader Service 80.

Benchmark A/D Converter

Benchmark Media Systems has the four-channel AD2004 20-bit analog-digital converter for critical audio applications.



The low-jitter converter is capable of quantizing very low-level signals; in fact, conversion can be made below the noise floor. An AES3 reference input allows the AD2004 to lock to a house sync signal, with the AES3 outputs block- and frame-aligned to the reference input.

For information, contact Benchmark Media Systems in New York at (315) 437-6300 or circle Reader Service 104.

Monster Cable for Speakers

From San Francisco comes the Z Series of high performance speakers cables from Monster Cables.

Included in the cable manufacture is a process called Time Correct winding, said to eliminate common "time smear" of conventional cables; a new dielectric compound known as PEX and a Magnetic Flux Tube to reduce interference from magnetic fields. The entire cable is jacketed in a Duraflex compound.

The Z Series is available in the Z1 model starting at \$74.95, the Z2 Reference and Z2 Biwire with prices beginning at \$149.95 and the top-of-the-line Z3 Reference, ranging from \$299.95 to \$399.95 per terminated pair according to desired length.

For information, contact Monster Cable in California at (415) 871-6000 or circle Reader Service 205.

AlterMedia Studio Suite

Studio Suite is a comprehensive software package from AlterMedia designed to manage the operations of a professional studio.

The software organizes and manages the complex environment of large multiroom facilities and includes a "click-and-book" calendar, tape library management, patchbay labeler, track sheets, bar code labeler, equipment inventory and more. Studio Suite is networkable across PC and Mac platforms and is Year 2000-ready.

Suggested price of Studio Suite is \$349.

For information, contact AlterMedia in Georgia at (800) 450-5740 or circle Reader Service 206.

Kyma Lets Imaginations Run Free

► KYMA, continued from page 13
The design for this sound, shown in Figure 1, was created *in just a few seconds* by connecting the icons on the screen.

When every element in the sound has its parameters set, Kyma will compile the sound and load it into the Copybara for playback. The sound then will begin to play automatically or wait for a trigger, if one was specified.

Of course it is just as likely that the sound or process you need will be included with the system; I have often found the perfect template among the included examples. For instance, I needed a good Doppler effect for a 3D animation on which I was working, and found just what I needed in the "Stereo Placement" examples folder.

I also needed a sound that went "whoosh" as it passed from the left channel to the right. Sure enough, opening the "Whooshes, Bys and Hits" example folder revealed several presets that worked perfectly.

The range of sound examples is enormous — Backgrounds and Textures is another particular favorite — and it is a trivial matter to tweak a parameter or alter a value to make the example perfect for your needs.

One of the most useful features of Kyma is its ability to trigger sounds in different ways. If you have a MIDI controller in the studio, you can assign "keydown" as a trigger, and the sound — whether a sample from disk or a synthetic tone — will trigger when the key is pressed.

You could also specify that a sound begin to play at a given SMPTE time; for that matter, you could build an entire SMPTE playlist containing any number of sounds. Sounds can also start up under the control of a "script," which could specify, for example, that the sound restart every 20 seconds over a total duration of 30 minutes. Try doing that with a MIDI keyboard.

The flexibility is impressive, and provides a near guarantee that you will find a comfortable method for working with the system.

Kyma is one of the most powerful systems with which I have worked, and

continues to amaze me as I discover new features and options. Also, the rate of upgrades and enhancements is impressive. The system now includes modules for nearly every major type of synthesis and processing available.

An excellent manual, complete with nearly two dozen tutorials, and context-sensitive, online help also raise the user's comfort level. Call it a synthesizer, a sampler, an effects processor, an analysis tool or what-have-you, the Kyma system can handle any sound synthesis or processing job you need.



For information and a cassette on the

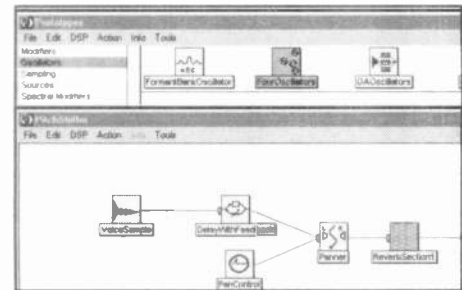


Figure 1: 'Connecting' Functions in Kyma

Kyma and Copybara systems, contact Symbolic Sound in Illinois at (217) 355-6273. Visit the company website at www.SymbolicSound.com

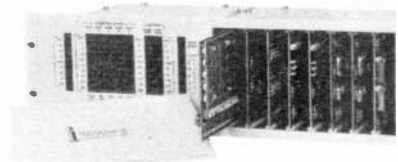
Dennis Miller is a composer living in the suburbs of Boston. Drop him a line at dhmiller@highway1.com

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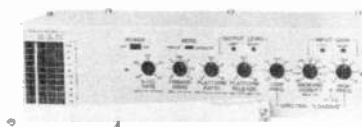


250 - Programmable 5-band Stereo Processor

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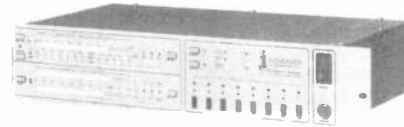


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A basic Stereo-Gen with impeccable specifications. Includes front-panel metering, internal subcarrier combining and a built-in Composite Processor.

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630 - FM "Relay" Receiver

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710 - RDS Encoder

A PROM-based "static" RDS/RBDS Encoder. Very easy to set-up and use *without the need for a host computer!* 15 separate memory "frames" may be programmed with station and program ID codes, service flags and radiotext messages. May also be used with a PC for song titles, promos, etc.



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Using Kyma In the Pro Studio

Kyma has found its way into a number of major Hollywood films in addition to national and international advertising campaigns.

If you saw the movie "Virtuosity," you have heard the Kyma system. It was used to create the voice of the film's cyber-villain. It also was featured prominently in "Star Trek: First Contact," creating the voice of the Borg, and in the trailer for the upcoming "Lost in Space."

Pete Johnston at London's Tape Gallery found Kyma to be the right tool for his unique radio ads for Smirnoff, ESSO, Walker's and Malibu, all of which are characterized by rapidly morphing voice-overs.

One spot used Kyma to morph between a British narrator and a character with a thick Bronx accent, while others include mind-boggling, gender-bending effects, musical transitions and cross-species morphing.

You can hear these and other examples of Kyma in action by visiting the Symbolic Sound website (see main story).

— Dennis Miller

Neumann M149 Mic 'Raises Bar'

► NEUMANN, continued from page 19 in which you will ever have to increase the top-end EQ on the M149 to get a natural sound.

The U67 gave us the sound we most expected the flute to make. The M149 offered much more detail.

In conclusion

I can almost hear the collective groan from studio owners whose top-shelf mic has been the U87. For them, and many others, the bar has been raised again.

The M149 is more than a significant microphone; it's a positioning statement. For an industry that feeds as heavily on image as this one does, hanging an M149 in the studio is a statement of accomplishment. It says you have "arrived," or at least have the money to buy your arrival.

This Neumann is a significant advance in microphony, but it may mean mortgaging the house. Whether your facility can justify the \$4,750 price tag is something you will have to decide.

For broadcast facilities, most of whom have a "thing" for physically imposing microphones, the M149 is impossible to ignore. As I said topside, the M149 is so big it makes a U87 look like a U89.

Realize the M149 is just a tool to be used, like any other piece of gear. In the hands of the wrong person, its heritage and potential will languish.

■ ■ ■

Ty Ford's schedule still has room for V/O work. Contact him at tford@jagunet.com

"Advanced Audio Production Techniques" is available from Focal Press, (800) 366-2665. Download his voice demo at FTP.Jagunet.com/pub/users/tyford

SHORT TAKE

Audio Components Get Smaller

Sometimes it is fun and interesting to see just how small you can crunch something down and still have it work.

Gadgeteers and hackers who enjoy working with very tiny audio circuitry will appreciate some new components from North American Capacitor Company (NACC) of Indianapolis and Intervox of Melville, N.Y. Both companies manufacture extremely small transducers with reasonably adequate audio specs.

NACC has a line of small, economical Mallory piezo and magnetic transducers (Figure 1), configured as surface-mount and miniature loudspeaker types. Available in 2- and 3-wire models, applications for these transducers include communications equipment, alarms, computers and talkback systems.

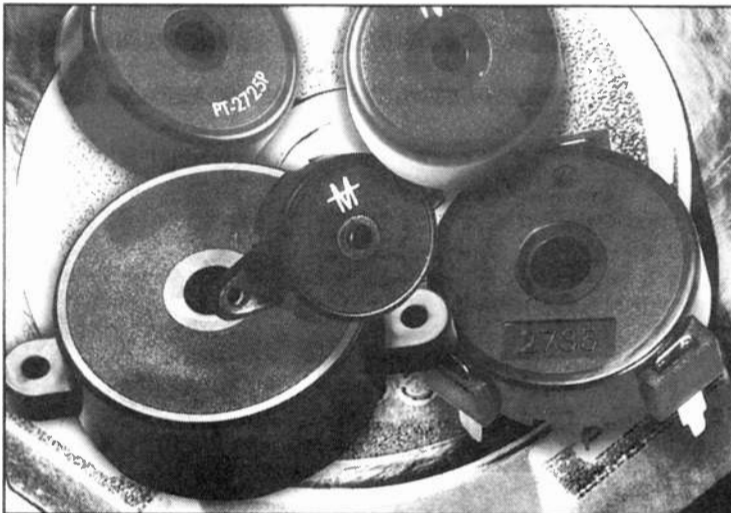


Figure 1: An Assortment of NACC Piezo and Magnetic Transducers

Sound output ranges from 75 to 105 dB and each transducer provides a "soft" output meant to be heard at close range.

From the Intervox Division of International Components Corporation comes a new series of electret microphone

configurations. Frequency response is up to 16 kHz on all units.

Prices in production quantities can

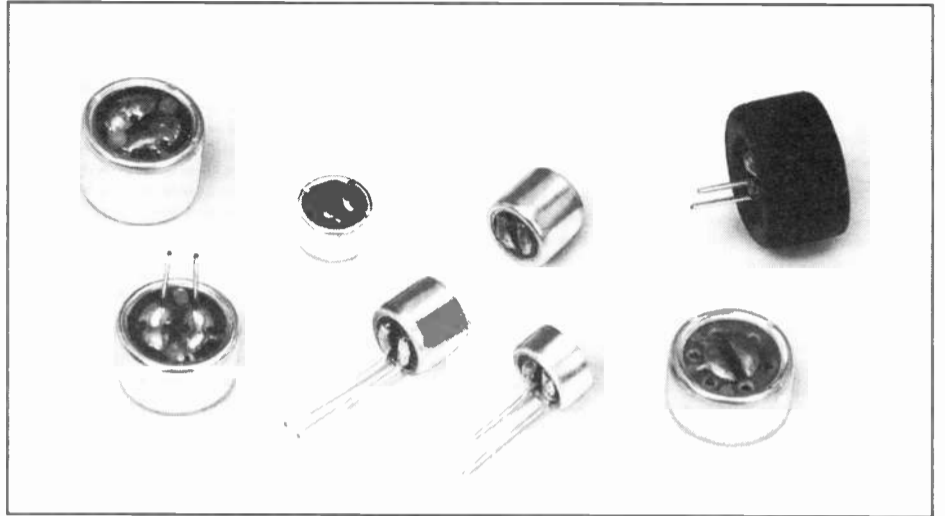


Figure 2: Intervox Mic Elements, Some Only 6mm Wide

elements shown in Figure 2, appropriate for multimedia and voice modems. Uses also include creating home-brew "invisible" mics for recording around shy children or apprehensive adults. More surreptitious uses can also be realized, such as "spy" mics in baseball caps or handbags, even pen barrels.

The new series includes omnidirectional, unidirectional and noise-canceling types, in pin or pad

be as low as \$.64 per element, with smaller batches being more expensive.

It is interesting to note that one of these mic elements can be coupled with a 56-cent, 5532 surface-mount opamp chip for about two bucks and the entire rig could slide down the barrel of a garden-variety felt-tip marker.

No one would ever know you are being miked.

For radio and audio tinkerers who always want to squeeze the most into the smallest spaces possible, these new products should prove stimulating.

NACC can be reached at (317) 273-0900. The Intervox number is (516) 293-1500.

Surfacemount components are available from Mouser Electronics at (800) 346-6873.

— Alan R. Peterson

Broadband RF/Microwave Meter

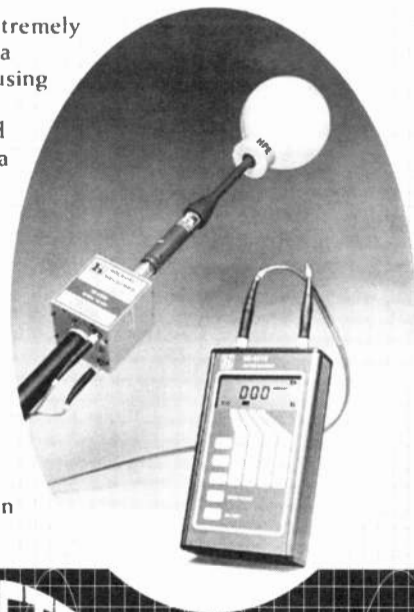
- ✓ LCD with bar graph
- ✓ Built-in datalogging and recorder output
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The flexible HI-4000 series allows an extremely wide measurement range by exchanging a variety of electric and magnetic probes using the same readout. The readout records highest field value and up to 150 logged readings, and the LCD display includes a bar graph. Options include a computer interface with software for complete field evaluation.

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LEVEL START



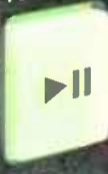
STOP



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PLAY PAUSE



REC



PROG. PLAY PROGRAM



PUSH ENTER



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World Radio History

SHORT TAKE

TuneFinder Fine-Tunes Tune Trek

Flip Michaels

My school colors were "clear." I used dull blades on an old two-track for editing and, oh yes, a wax pencil to mark the CD cuts I had just used. That is, until now.

TuneFinder 2.0 for Windows, from Airworks, is a comprehensive database, allowing production directors in the digital domain to stay exactly where they are.

TuneFinder is the younger cousin of the Airworks TuneBuilder, a 1996 RW "Cool Stuff" award winner. From detailed searches and usage history notes to auditioning prime cut choices

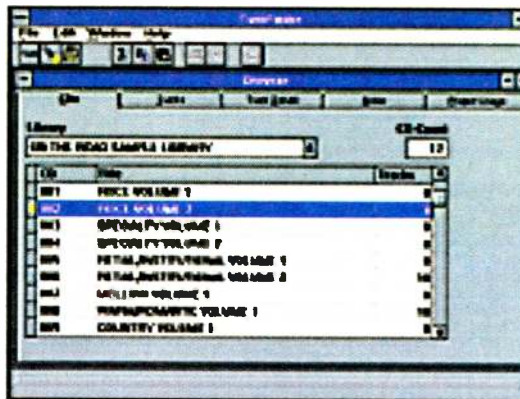
with a double-click of the mouse, TuneFinder 2.0 is an impressive complement to any well-organized studio.

Find me that song!

The idea behind the Airworks database program is to find the music you want to use, *now!*

With a complete computer catalog of your library's CDs, this little gem relies on three special engines — the Browser, Integrated Finder and Project Manager — making the TuneFinder built for speed.

Step one, use the Browser to select a



Airworks TuneFinder 2.0

CD — say, "Country Volume 1." Step two, locate music to match your project requirements, searching by any library, category, keyword, instrumentation, tempo and version in the Integrated Finder. Then audition short samples (or complete selections) until you find what you need. Step three, the Project Manager feature helps you keep track of your selected music. You can run more than one project at a time, adding facts like the client name, producer, air dates, really anything you would need later.

Available on CD-ROM, this cousin of Airworks TuneBuilder works with a handful of libraries like OGM/Capitol Records and Killer Tracks. Just about every production library can operate on TuneFinder 2.0 with some additional data-entry work on your part.

The idea behind the Airworks database program is to find the music you want to use, *now!*

Most supplemental program manuals seem to be written for the Egghead graduate instead of the above-average user. My install took only minutes, thanks to a good user manual.

Computer requirements include 4 MB RAM, Windows 3.1 or 95, a 4x CD-ROM drive and compatible sound card. Price depends on your library company and package.

Download the TuneFinder Demo at snazzy.com/airworks/Products/TFINDER.html

For information, call Airworks at (800) 525-5962, send e-mail to airworks@supernet.ab.ca or circle Reader Service 128.

Flip Michaels is production director of classical WGMS(FM) Washington. Reach him at fmichaels@wgms.com

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We are well known for offering the most innovative software. Last year was no exception. With the additions over the last four years, Audio Wizard for Windows is the most complete, full-featured system on the market.

OFFICE MANAGER - Fast and accurate business system
Colleen, our new Office Manager, will make sure your accounting and sales orders will be processed quickly.

DEVELOPED - An internal support/business database system
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JD (HARDWARE SUPPORT) IS STARING AT A SILENT PHONE BECAUSE:

- A) OUR SYSTEM IS JUST THAT GOOD
- B) HE REALLY WANTED TO BE A MAYTAG REPAIRMAN
- C) KEVIN TURNED HIS PHONE OFF AGAIN



GEORG* (L) AND SCOTT (R) ARE THE ONLY ONES WEARING TIES BECAUSE:

- A) THEY ARE VERY PROFESSIONAL PROGRAMMERS
- B) THEY WEAR A SUIT AT LEAST ONCE A YEAR TO SEE IF IT STILL FITS
- C) PROGRAMMERS WEARING TIES ARE COOL (PROGRAMMERS CREEDO # 3)



* YES, THAT IS HOW GEORG SPELLS HIS NAME.

JEFF (ENGINEERING SUPPORT) IS POINTING TO A MAP BECAUSE:

- A) HE IS POINTING TO OGALLALA, NEBRASKA THE HEADQUARTERS OF PROPHET SYSTEMS
- B) WE CAUGHT HIM PRETENDING TO BE A TV WEATHERMAN
- C) WHERE THE HECK IS SOLDOTNA, ALASKA ANYWAY?



TODD (SALES) IS GETTING READY TO LEAVE BECAUSE:

- A) HE IS LEAVING TO GIVE A DEMONSTRATION
- B) OUT OF SIGHT, OUT OF MIND (SALES RULE #1)
- C) IT IS 5 O'CLOCK—WATCH OUT!



COLLEEN IS A GREAT OFFICE MANAGER BECAUSE:

- A) SHE USES 20-YEARS EXPERIENCE TO KEEP PROPHET SYSTEMS ORGANIZED
- B) SHE STARTED WORK WHEN SHE WAS 3 (SEE ABOVE)
- C) 5 KIDS—'NUFF SAID!



EVEN IF YOU'VE CALLED BEFORE—CALL US IN '97

KEVIN'S OFFICE IS FULL OF WOLF PICTURES BECAUSE:
A) PROPHET SYSTEMS IS LIKE A WOLF—INNOVATIVE AND AGGRESSIVE
B) PLEASE— DON'T GET HIM STARTED ON WOLVES!
C) ALL OF US THINK HE WAS RAISED BY WOLVES



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Running Radio



Creative or Immoral?
Page 28

Radio World

Resource for Business, Programming & Sales

August 20, 1997

PROMO POWER

Is Your Fall Promo Calendar Set?

Mark Lapidus

Fall is an opportune time to incorporate that most important element of a radio station: promotion.

Why is it vital? Because music, personalities and production elements only put you at parity with your competition. Most radio stations today sound professional. Program directors know how to copy what works. Your music should be researched, even in small markets. Your talent should be the best you can afford. Your production elements should contain a great voice, sizzling sounders and, when applicable, decent jingles.

With those key elements in place, what separates you from the pack and creates a real feeling with listeners? Promotional activity!

September

As requested by many readers, here's an offering for fall. No matter how hard I preach about planning, I've learned that most station calendars are lacking, even a few months out. Use these suggestions or others; next year, use them again! Make them annual activities that your station can own.

Labor of Love: Award a nice prize package to the first couple who delivers a baby on Labor Day. This has tons of baby category sponsorship possibilities: a year's diaper service from Joe's Diapers; a crib from The Baby Store; six months' child care from The Day Care Center; a \$200 savings bond from National Trust Bank. You get the idea. If you get enough stuff (some of it unusual), you may even land a story in the newspaper or on television on a slow news weekend.

Face for Radio: Secure a slot for one of your good-looking DJs to appear on one of the many telethons running Labor Day weekend. I have no idea why listeners will be glued to their screens and hanging on every begging word and bad amateur performance. It costs you nothing to have one of your better-looking talents wear a shirt with your station logo and be a good guy or girl during the local breaks. Maybe your station can co-sponsor this great American media tradition.

Programming: There's a lot to pick from, but consider options carefully! Before you break format for either a syndicated or local special, think about your competitors. Find out what syndicators will offer in your format. There's always: 1) Top 500. 2) A to Z. 3) Double shots. 4) Artist features.

The Elvis Cadillac: On Sept. 1, 1956, Elvis bought his mom a pink Cadillac.

Doesn't the mother of one of your listeners deserve one, too? Start the contest in August, building up to press coverage when you deliver this to mom's house.



Registration prizes could be as inexpensive as Elvis memorial wrap-around sunglasses. Win a pair on-air and your mom (or better half) is eligible for the car. An alternative: Have listeners visit a dealership and try to guess the number of peanut butter and jelly sandwiches you've packed into the back seat of the car. Closest guess wins.

Run for Shelter: In most sections of the United States, fall is the best time for foot races. Help one of your local homeless shelters get ready for winter with a 10K race. All proceeds benefit the shelter. Sell the title sponsorship to a restaur-

ant that will provide pasta, juice and water for runners after the race. Entry brochures should be available only through this chain's stores or via mail. Runners and watchers should be encouraged to bring canned food to donate.

Monday Night Football: For stations with a male core, do this weekly. Encourage listeners to watch the game with your personality or one of your jocks. Do trivia questions and random drawings for prizes before the game

and during half-time. Sell the entire package to one sports bar or rotate among many. If you've got a female core, you can hold either a "ladies-only" party for women who like to watch the action, or have a "Ladies Night Out" while their guys are elsewhere being pigs.

Be sure to include a talent fee for the host!

October

Funniest Celebrity Contest: Every town has celebrities, even if they're just See PROMOS, page 35 ▶



Y' Not Send RW Your Bumper Sticker?
Y-107, KLYY(FM), in Arcadia, Calif., goes for a well-rounded look to promote its modern rock format. No corners or right angles in this station logo; just around the edges of the bumper sticker itself.

Does your station have an eye-catching bumper sticker? Send it to: RW Bumper Sticker, 5827 Columbia Pike, Third Floor, Falls Church, VA 22041.

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RULE BOOK

The Main Studio Rule, Revisited

Harold Hallikainen

Will the FCC change its main studio rule?

In May, the FCC adopted a Notice of Proposed Rule Making, or NPRM. This proposal deals with a rule that has existed in some form since 1939 and is based on Section 9 of the Radio Act of 1927, which provided for the "fair, efficient and equitable distribution of radio services."

Congress was concerned about the large number of stations in the immediate vicinity of big cities limiting the possibility of local radio service in smaller cities.

The proposal

Radio and television stations today are required to have a main studio located within the station's *principal community contour*, defined as the 5-mV/m contour for AM stations and the 70 dBu contour for FM stations. Further, stations are required to keep a Public Inspection File available *within* the city of license.

Various parties want to change the rule. Apex Associates and others filed a petition with the FCC seeking to modify the main studio rule to allow the main studio to be at any location which the licensee deems "reasonably accessible" to its community of license. Other petitioners want the FCC to allow the Public Inspection File to be located at the main studio, wherever that studio may be located. Another petition suggested modifying the rules requiring a station buyer to be responsible for documents in the Public Inspection File that were to be maintained by the seller.

The FCC stated in its notice that, since a 1987 revision of the main studio rule, Congress passed the Telecommunications Act of 1996. This major legislation substantially increased the number of stations one licensee may own in a "market."

For example, in a market with 45 or more commercial stations, a single

licensee may own up to eight commercial stations, not more than five of which may be in the same service, AM or FM. The FCC recognizes that a single licensee may own several stations in a single market, but there may be no area within the principal community contour of all the stations.

The petitioners say that this unnecessarily requires the licensee to have multiple studios within the market. They argue

The FCC also would 'encourage' stations to place their public inspection files on the World Wide Web.

that the substantial expense of maintaining these studios provides little, if any, public benefit. These expenses "deprive it (the licensee) of savings that could be put to more productive use for the benefit of the community served by the station."

It is interesting to note that almost any time a change is proposed that would save a licensee money, those savings would go to better serve the community. Is this indeed the case?

Contours

In its notice, the FCC also states that the main studio rule may place additional burden on smaller stations because the area in which they are allowed to place their main studio is smaller. High-power stations may have a principal community contour with 70 or 80 miles in diameter, while lower power stations may have a contour only 20 miles in diameter.

According to the FCC, a location out-

side the principal community contour may be easier for the public to access than some points within the principal community contour, because of the transportation infrastructure (commuting patterns, access to public transportation, major highways, public parking and maybe even bike lanes).

With this reasoning in mind, Apex wants to allow the studio to be located where reasonably accessible (as defined by the licensee), or "within 30 minutes normal driving time." The wording of the NPRM makes it clear that the FCC staff does not favor this approach because it is vague.

Another approach allows for the existing contour requirement, with the commission adopting a waiver policy that would take accessibility of a proposed studio location into consideration. Again, due to vagueness and the paperwork load on the FCC staff, this approach was not favored.

The FCC proposes a few definitive methods for determining an acceptable main studio location. The first approach would be to use the principal community contour of *any* station licensed to the community in question. This would eliminate the apparent disparity between large and small stations.

A second approach would allow the main studio anywhere within a certain radius of a common reference point within the community of license. These methods could be combined to allow, for example, a main studio location within the specified radius *or* within the principal community contour of any station licensed to the community, whichever provides greater flexibility.

But these approaches may place the main studio in an area where the station has few, if any, listeners. It may be substantially outside the principal community contour of the particular station.

I can imagine a Class A (or maybe even a Class D) station located far from the community of license but within the contour of a 50 kW directional AM station with substantial antenna gain and on a low frequency.

Public Inspection File

The FCC also wants the Public Inspection File to be accessible to the public, but has already established a different level of accessibility. Now, the file must be located within the community of license unless another location was authorized prior to July 16, 1987. The petitioners propose that the rules be modified to allow the public inspection file to be located at the main studio, wherever located.

One petitioner offered increased public access to files at main studios outside the community of license by providing free

See STUDIO, page 28 ▶

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Billboard Wakes Up Kalamazoo

Sharon Rae

A billboard for a radio morning team caused quite a stir in southwest Michigan. The billboard, advertising the morning show for WRKR(FM) Kalamazoo, perturbed many people in this conservative area. Others simply were amused. Various observers found it imaginative, innovative, indecent, insensitive or immoral.

"Wake Up Smiling!" proclaimed the advertisement, which featured the threesome in bed, together. The message was scattered across about three dozen billboards in

McKelly said he received calls on the air about the billboards. 'People think we're spreading AIDS!'

Kalamazoo and nearby Battle Creek. The station is owned by Crystal Radio Group.

"It was your basic four-week billboard run, but I think people got the impression that the signs were up and they were staying up until the devil took over," said WRKR morning man Mike McKelly.

"What they didn't realize was ... in radio, you do your billboard run during the ratings period and then you're done," McKelly said. "So on one hand it served the purpose, and on the other hand, it caused a little more disturbance than we had anticipated."

We are not amused

"We never thought people would be so prudish to come up with the reaction that they did," said WRKR General Manager Ed Sackley. "People typically wake up and hear the morning show on their clock radio while they are lying in bed. We simply thought,

'Geez, let's put the morning show in bed,' which is how the listeners usually are in the



Photo by Kris Warren

morning when they wake up."

Sackley said a "vocal minority" looked at the photo and came up with all kinds of seedy scenarios and maligned messages.

"We've got a humorous morning show," Sackley said of Mike McKelly, Scotty Bud Melvin and Diane Vunovich. "Every break you want to do something funny.

"But people took that one step further," he said. "'They're smiling because they've had good sex.' You can't stop a runaway train ... if people are reacting that way.

"People were actually calling me up, telling me we were promoting group sex and describing sex acts to me, and I would tell them, 'Ma'am, you have a very sick mind, and you should see somebody. Talk to your parish priest.'

"They would just go off and go wacky with hellfire-and-damnation calls: 'God will punish you.' 'I'm praying for you.'"

Sackley said several people asked advertisers to pull their business from the radio station, but no advertisers have dropped their spots.

McKelly said he received calls on the

air about the billboards. "People think we're spreading AIDS! We're causing

their kids to be promiscuous. And I tell them, 'If you raise your kids right,

they'll make the right decisions.'

"Don't look to me to be a role model; I'm a morning radio guy!"

City commissions in both Battle Creek and Kalamazoo heard from residents who said the billboards should be shelved. Some respondents to a sampling in the Battle Creek Enquirer described the ad as disrespectful, degrading, disgusting, dirty, disgraceful; others seemed to find it funny, using words like cute, creative, eye-catching, nice and humorous.

About those who found the promotion offensive, McKelly said, "One, we would have driven them away with something that happened on the air anyway; and two, hey, if they don't have a diary, screw 'em!"

Sackley is reflective in hindsight. "If I had to do it all over again, I'd have put them in pajamas."

■ ■ ■

Sharon Rae is news director at WXIK(FM) in Lansing, Mich., as well as a frequent contributor to RW.

FCC Takes a Look At Its Main Studio Rule

► STUDIO, continued from page 27

transportation to the main studio, delivery of the file to a location specified by the requesting party, or delivery of the specified documents by mail.

The commission seems to accept the idea that if the main studio is publicly accessible, then a public inspection file located at that studio also is publicly accessible.

In addition, the FCC realizes the rules regarding the contents of the Public Inspection File are out of date. It proposes removing the requirement that the file include the 1974 manual entitled "The Public and Broadcasting." The FCC also would update references to rules that have been deleted.

One petitioner stated that information about a former licensee, such as ownership, programming and EEO matters, has little relevance to a new licensee and should not be required in the file. The FCC tends to agree in its proposal, with the exception that information not specific to the owner, such as engineering information about a station's facilities, would continue to be relevant.

The FCC wishes to recognize e-mail as "written comment and suggestions," and stations would be required to maintain it in the Public Inspection File.

The commission also seeks comment on the retention period of various documents in the file. In general, it suggests documents should be available to the public for as long as they are useful to the public. For many documents, this now is defined as the term of the station license.

Various options are proposed, including the period of time applications are pending before the FCC or courts. If an action is no longer pending, must a licensee continue to make the documen-

tation available to the public?

Finally, the commission also may allow the Public Inspection File to be maintained in electronic form rather than paper. This is similar to the old program log rules, which allowed logs to be microfilmed as long as a microfilm reader was available.

On the Web

In this instance, should a station decide to put its documents in electronic form, a computer terminal for public use would be mandated. In addition, stations would have to print documents

Reply comments on the FCC's NPRM are due Sept. 8.

on paper in response to public requests. The FCC would "encourage" stations to place their public inspection files on the World Wide Web.

The FCC Notice of Proposed Rule Making is MM Docket No. 97-138. Comments on this NPRM were due Aug. 8. Reply comments are due Sept. 8. The NPRM and other documents cited in this article are available on the World Wide Web (www.broadcast.net/hallikainen/insite94.html) and via fax; call Hallikainen & Friends from your fax machine at (805) 541-0201.

Next time we'll take a detailed look at the history of the main studio rule. How did it get there? Is it still needed?

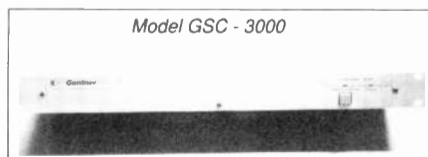
■ ■ ■

Harold Hallikainen is president of Hallikainen & Friends, a firm specializing in electronic design and technical writing.



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COLE'S LAW

The Telecom Act and Hot Dogs

Harry Cole

We all know about the miracle of democracy, and the superiority of the American legislative process. But at times, the notion of enlightened despotism starts to look pretty good (at least as long as the enlightened despot is you or one of your close personal friends).

What brings this to mind is a recent opportunity for the editorial staff of Cole's Law International to interact with the legislative process.

This rarely happens. The last time we had a chance to chat with the movers and shakers on Capitol Hill

good for everybody. The broadcasters acknowledged that this might be true in an industry with sufficient resources to accommodate anyone interested in participating. But, they pointed out, the broadcast industry is subject to the physical limitations of the radio spectrum. As a result, deregulation could lead to acquisition of most of the limited channels by a handful of entities, thus reducing competition.

On the whole, it was a discouraging set of meetings. The folks in Congress, it seemed, had not given much critical thought to this important question.

Congress, as we know, did proceed with the Telecom Bill. In February 1996, all national ownership caps on radio — and, in effect, most meaningful local caps — went away. Since then, we have witnessed a dramatic consolidation of ownership in the radio biz.

The member

Which brings us to our meeting with a respected member of Congress in June. As conversation turned to the price of radio stations, the member wondered aloud whether the upward trend in prices was attributable to the Telecom Act, or whether it was just a simple matter of economic pressure.

We tried to be polite.

Even if economic considerations did enter into the picture, we said, those considerations themselves were unleashed by the Telecom Act. After all, we observed, the economics of consolidation have always existed, but ownership caps prevented any significant consolidation. With those caps

gone, economics took over.

The good member considered this. He said was aware that the Telecom Act had deregulated ownership of television, but he didn't seem to recall that Congress had deregulated radio ownership.

The conversation veered off in other directions. But we were left with the clear sense that the member, by all accounts a diligent and respected individual, really didn't know, and may never have known, that he and his colleagues had thrown out radio ownership caps.

This is troubling. When the act was in its formative stages, one might expect some conceptual fuzziness, as Congress advanced, considered and debated various proposals.

But once the act had gone through the legislative process, and all senators and representatives had voted on it, you'd like to think they had a clue

about it. When a prominent congressman suggests that he didn't know about a pretty major aspect of a law on which he voted, you've got to wonder whether the legislative process could be improved.

Thorny issue

Reached the wrong result. Valid arguments exist for both sides of that question, and we are not taking sides just now. But in resolving that question by passage of the act, Congress may not even have recognized that the question was before it at all, much less that the question was a good deal thornier than the "leadership" may have let on.

Congress must deal with issues of enormous social, cultural and economic importance during any session. Obviously, no individual can be fully knowledgeable about everything passing through the legislative process.

Which brings us to hot dogs. Lots and lots of hot dogs get made. While the occasional minor piece of non-hot dog material may find its way into the occasional frank, we still expect the makers of hot dogs to know what's going into their product, and to avoid putting in large hunks of stuff they don't know about.

Can't we, and shouldn't we, expect the same of our lawmakers?

■ ■ ■

Harry Cole is a principal in the Washington-based law firm of Bechtel & Cole, Chartered. RW welcomes other points of view.



Photo by Laura McLane

He didn't seem to recall that Congress had deregulated radio ownership.

was two years ago, when the Telecommunications Act of 1996 was in draft form. Back then, we sat in on meetings with folks from the Hill and heard radio broadcasters tell them that wholesale deregulation of ownership limits might not be a good idea.

Deregulation mantra

But the responses were consistent. Just about everyone on the Hill hummed the same basic mantra: Deregulation invariably will lead to more competition, and competition is



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STATION SERVICES

Companies with announcements for Running Radio Station Services should send them to:
Radio World, c/o Managing Editor, P.O. Box 1214, Falls Church, VA 22041

International Music Benefits PRI

A CD compilation of world music will benefit programming on Public Radio International.

Proceeds generated through retail sales of "Travel the World With Putumayo" will go to support four PRI programs: "World Cafe," "Afropop," "The World" and "Sound and Spirit." The CD has a retail price of \$9.98.

Stations also can use the CD to promote their fund-raising drives. Affiliates carrying any of the four programs receive six free copies of the disc. Additional discs are \$5 each.

"Since our start in 1993, Putumayo

World Music has tried to support international music, artists and culture at a grass roots level," said Dan Storper, Putumayo World Music president. "The diverse, internationally syndicated programming of PRI ... offers us unique access to worlds beyond our own."

For information contact Janet de Acevedo at PRI in Minnesota, (612) 330-9230, or circle Reader Service 84.

'Fifty' Times Five

The good life can take on a different dimension after age 50, and that's where Talk America Radio Networks comes in.

"Life Begins at Fifty" airs on the net-

work five times a week, from 7 p.m. to 9 p.m. Monday through Friday. Host Tom R. Holter discusses such age-specific topics as retirement along with general subjects that can take on added importance as we grow older: health care, insurance, fitness and housing.

"I know the problems that people over 50 and approaching 50 have to face," Holter said. He described his show as "a general help program."

with Home Box Office. The radio network aims to bring to the listener the sound of every glancing blow, jab and any carnivorous activity in the ring.

The next scheduled bout was to be held Aug. 16, featuring Andrew "Low Blow" Golata taking on "Merciless" Ray Mercer.

For information contact Ted Kelly at Westwood One in New York, (212) 641-2052; or circle Reader Service 12.

For information contact Tom Star at Talk America Radio Networks in Massachusetts, (617) 828-4546, or circle Reader Service 60.

A Plethora of Production Music

Network Music Inc. wants to satisfy all your production needs — with a collection of 52 CDs.



The "Short Trax" collection brings together more than 40,000 tracks, including 59-second, 29-second and short tag edits. "Broadcast-length" versions of classical compositions in the collection total 400.

The company offers a range of leasing options for the "Short Trax" library.

For information contact Stacy Browning at Network Music in California, (800) 854-2075 (ext. 209), or circle Reader Service 36.

Network Trio From Westwood

This fall, the leaves on the trees won't be the only thing changing. Westwood One hopes to attract advertisers to three new networks.

The NEXTnetwork will include affiliates in the top 10 U.S. markets and reach more than 91 percent of the country. The Source Network, targeted to men aged 18 to 34, includes Washington powerhouse WPGC-FM and WKTU-FM in New York. Also launching is the NBC Radio Network, aimed at women aged 25 to 54, which will reach 99 percent of the country, according to Westwood One.

July marked the Westwood One debut of radio boxing coverage, in conjunction

Affiliates Line 'The Road'

Summer traffic on the radio dial has picked up.

"America on the Road," which claims to be heard on more commercial stations than any other automotive radio show in the United States, has lined up affiliates in

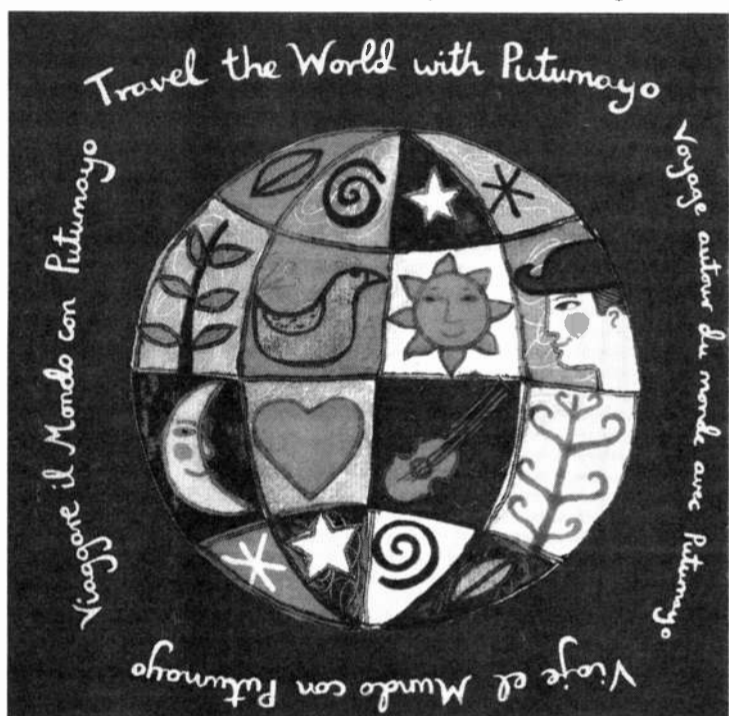


Affiliates line 'The Road.'

Guam, Phoenix, Las Vegas, Mansfield, Ohio, Leesburg, Fla., and Carlisle, Pa.

Program and station details are available on the Internet at www.theautochannel.com

For information contact Al Herskovitz at America on the Road Inc., in Maine, (207) 781-5036, or circle Reader Service 176.



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Last Chance For NAB Early Birds

Early-bird registration for the National Association of Broadcasters Radio Show in New Orleans has been extended to Aug. 22. Fees for both members and non-members increase after that date.

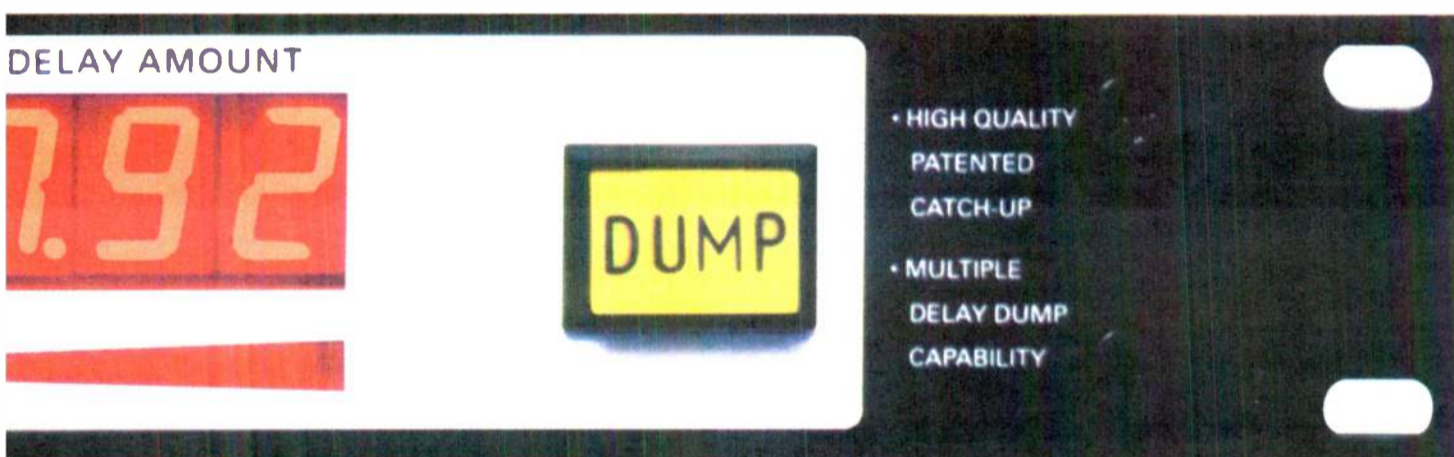
Full convention registration for members costs \$335, or \$435 after Aug. 22. The price includes all sessions, exhibits, exhibit hall lunch and one ticket to the Radio Luncheon. Spouse registration is an additional \$100. Non-members pay a higher rate.

For information call (800) 342-2460 or (202) 775-4970. To register on line, go to www.nab.org/conventions/

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Bad words, **#@\$^&*%!** like bad news, often come in threes. The new Eventide BD500 is the only obscenity delay in the world that can eliminate them. Now, when you hit the Dump button, you don't lose the whole delay and the obscenity **%#^!@*\$!** protection that goes with it. You can divide the total available delay time into not one, or even two, but several discrete segments. You still have protection even after dumping two consecutive **&*%#@#!** no-no's.

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And, because you may not be using that analog console forever, the BD500 is also the only broadcast delay that's digi-

tal-ready with optional AES/EBU digital audio inputs and outputs. It's stereo, of course. A convenient new "sneeze" button allows the talent to sneeze, cough, etc. without being heard on air, and without dead air. All front panel switches (except configure) and all status indicators can be remotod (both RS-232 and dry contacts are provided.) Plus, only the BD500 gives talent both a digital readout of delay time and a "quick read" LED bar graph that shows "you're safe" at a glance.

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Circle (76) On Reader Service Card

World Radio History

IBS Survives in Days of Change

Lisa Romanello

Fifty-seven years have passed since David Borst and George Abraham decided to create a helping hand for college broadcasters. The organization that grew out of their efforts is the Intercollegiate Broadcasting Society.

IBS remains a presence in the world of college radio, although its challenges are different. In recent years, the organization has survived changes in technology, competing associations, the World Trade Center bombing, and questions about its relevance.

President and Board Chairman Norman Prusslin leads the IBS in its

mission to speak to broadcast, regulatory and trade agencies, and to the broadcast journalism community, on behalf of college and student stations. It also helps members with the ups, downs and growing pains of station operation.

Borst remains an active volunteer board member. Abraham has since died.

IBS is all-volunteer. Prusslin, general manager and faculty advisor for WUSB(FM) at the State University of New York in Stony Brook, also teaches a broadcasting radio class in the Theatre Arts department there. His weapons in carrying out the IBS mis-

sion are forums, national and regional conventions, and one-day "facilitator sessions" at which volunteers help train station staff. IBS also performs telephone reference work and offers a

IBS Intercollegiate Broadcasting System

website (www.ibsradio.org).

Although IBS has sought to keep up with the times, Prusslin said it cannot offer paid staff time for services other

larger organizations might carry. So IBS is happy to share the field.

"Even 20 years ago, there were fewer active organizations that dealt with college stations and radio," he said. Since then, college radio has become more visible in the broadcasting industry, because many professionals had their first radio experience in college,

and in the music industry as well. "There are more people and entities in the field, so the reality is, each organization has to find

its niche and make its way through to best serve the membership that it has."

Fundamentals

Prusslin said IBS retains a focus on the basics: "How to staff a station, train employees, get news services, elect a board. That will always be necessary.

"Second to that will be our ability to ... speak for the college radio station universe, as appropriate."

The third part of the IBS mission is to keep up with technology. Prusslin remembers when CD players came on the scene, as noted during its conventions of 1980 to 1982.

"IBS was telling stations, 'You should know this new technology is coming. ... Vinyl records as we know them, who knows what will happen?'"

"In some areas of the country, the

Prusslin admitted IBS hasn't always made its presence felt effectively.

first stations to have compact discs were probably college radio stations."

Today, Prusslin said, the change is overwhelming. "The whole impact of the consolidation in the market of some of the commercial broadcasters ... what impact will that activity have on local non-commercial college stations?"

Prusslin said many stations also seek help in broadcasting on the Internet and converting to digital equipment.

Relying on volunteers isn't easy for any organization. Prusslin drew a parallel between IBS and its member stations. "Because the nature of the student population is always changing and so transient, we always find ourselves going back to square one. The station always needs training and retraining with new students."

Likewise, IBS volunteers come and go. The organization has a volunteer board of directors, with 10 to 12 members, and day-to-day work also is done by volunteers. Some come from the IBS board, others from industry or colleges. During the coming academic year, it can draw upon a pool of about two dozen volunteers to speak to stations, send information via e-mail to stations, or otherwise help out.

Prusslin said IBS has about 600 member stations, from a pool of about

See IBS, page 35 ►

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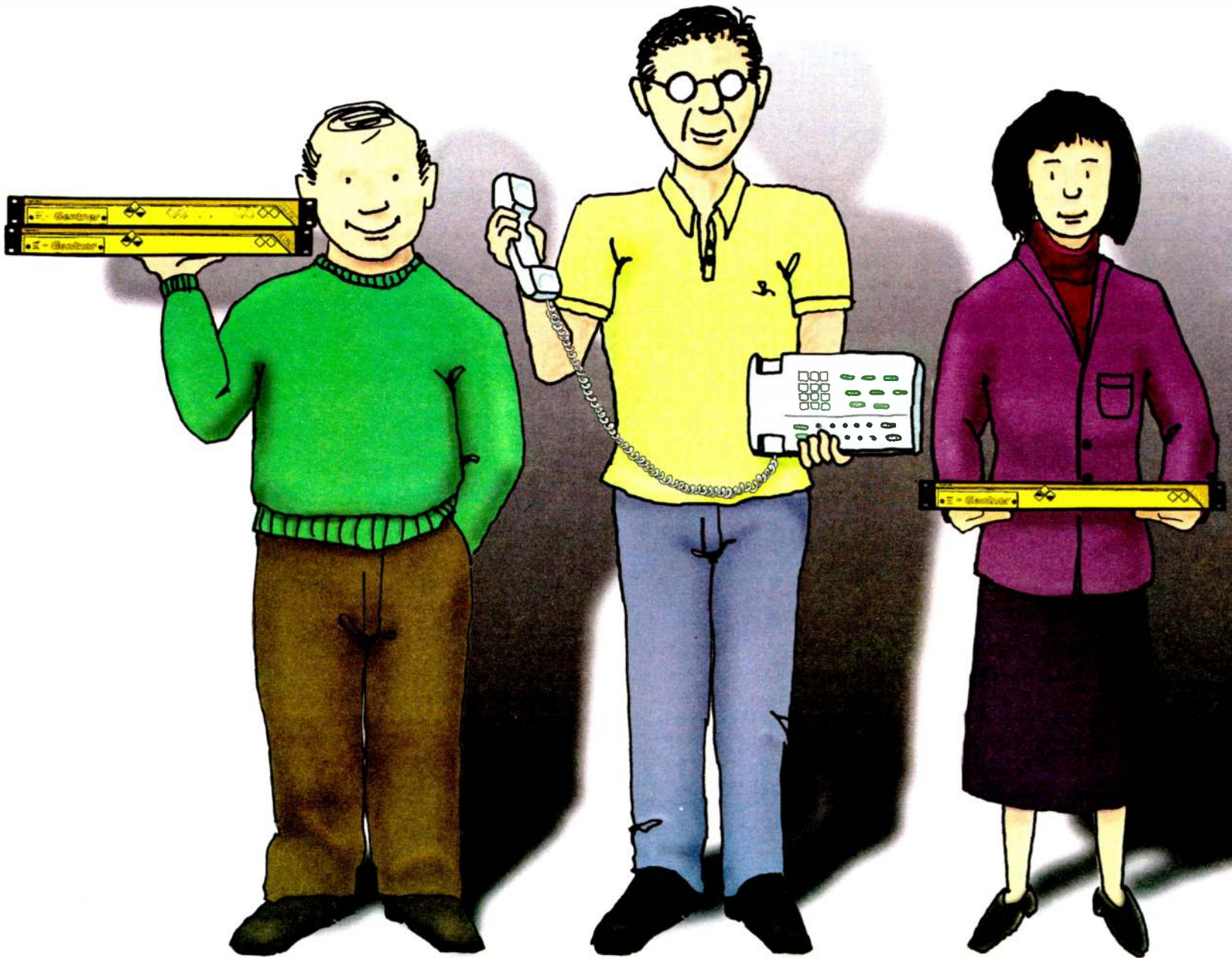
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World Radio History

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World Radio History

Jump-Start Your Fall Promotions

► **PROMOS**, continued from page 25 local teachers, politicians, retailers and journalists. Invite the best-known to participate in a fall joke-off. Each celebrity gets up to 5 minutes to try their hand at stand-up comedy. Invite a few people who are known to be generally serious. When stiff jokes, it can be hilarious!

Sell this to a bar or restaurant. Let them keep the cash bar. Carefully choose the charity that gets the door proceeds. That charity has to tug at the heartstrings of potential participants as well as those who have to pay to watch this. Be sure to invite TV stations to cover the event. Secure celebrities both on and off air.

Sex Sells: Madonna's book "Sex" was published on Oct. 21, 1992. Does your morning show have the decency not to make fun of the anniversary of this landmark publishing event? Could the DJs be arrested for comparing current photos against those from five years ago? Have a public "rate Madonna" contest.

Orson Lives!: If nobody else is airing "War of the Worlds," maybe you should! It was first broadcast on Oct. 30, 1938. The 60th anniversary is next year!

Halloween

Pumpkin Parties: The trick to gathering a lot of bar business is throwing several bar parties spread out across the city. Have different jocks host each party, or rent a party bus where the jocks hit each of the station parties. Costume contests are a must.

Haunted House: The Jaycees are the kings of this castle. If nobody's already tied in with them, get involved. This one always draws a crowd. See if your local independent television station would like to have one of your DJs host a scary movie from that location. Segments can be pre-produced and aired Halloween night.

Safe Halloween: Have a mall provide a safe haven for little kids who can get freebies at stores.

Pumpkin Drop: Rent a crane and have listeners bring their rotting pumpkins. Aim at targets in the center of the parking lot. The biggest splash wins.

My Dad always told me to end with a splash, so enjoy your planning and execution! (Pun intended.) If you've got unique promotions or promotion stories you'd like to share, please write or e-mail us.

■ ■ ■

Mark Lapidus is president of Lapidus Media. For marketing and programming consultation, call him at (703) 383-1805, or e-mail him at lapidus@erols.com

IBS Charts Course in New Era

► IBS, continued from page 32
1,300 qualified organizations.

Prusslin admitted IBS hasn't always made its presence felt effectively. He attributes a "loss of steam" in the early 1990s to two incidents.

One was the World Trade Center bombing, the week before IBS was scheduled to hold its convention there. The next year, a mid-March snowstorm struck during its convention. These bad breaks, Prusslin said, affected the momentum of IBS activities.

Strong Commitment

But Prusslin said IBS has not wavered in its commitment, and isn't about to wilt in the new millennium. "We have never gone anywhere. Our focus has been, and has not been any-

thing other than ... school, college and university radio stations," he said.

"The people volunteering as IBS board people have had the expertise in

We encourage a smart student to utilize all the resources that are available.

— Norman Prusslin

and the passion for student radio. We encourage a smart station or smart

student to utilize all the resources that are available — NAB and NACB — (to) touch base with as many as possible."

Prusslin said non-commercial FM broadcasting has become less of an option in many markets because of dwindling available frequencies. But with new technology, Prusslin said, "Maybe there's a place for a nationally delivered college radio service of some kind."

Stations interested in IBS can send e-mail to the organization at ibshq@aol.com or write to IBS, 367 Windsor Highway, New Windsor, NY 12553.

■ ■ ■

Lisa Romanello is news director for Berkshire Broadcasting in Danbury, Conn.

NACB Seeks to Develop Radio's Next Generation

If any organization can be considered a competitor to IBS, it is the National Association of College Broadcasters, which is gearing up for its 10th anniversary conference this November.

Prusslin said he doesn't consider NACB as competitors. His station, for example, is a member of both organizations.

The association was founded by Brown University students who were trying to start a TV station 10 years ago and realized there were limited resources for college stations.

"IBS was out there, but with more limited resources in the 1980s than in the '40s," said NACB Executive Director Kelly Cunningham. "They had scaled back some of their services. This new organization for radio, TV and to some extent film, wanted to be comprehensive, to help student stations in their management staff as well as faculty advisors."

NACB is a non-profit association, with four full-time paid staff members, in addition to a host of student interns. Cunningham said it is more national in scope than IBS.

Extensive offerings

NACB conducts an annual national conference and four rotating regional conferences. It publishes a quarterly magazine, a monthly member news fax and an annual station handbook for radio and TV, covering management, marketing, engineering and legal promotions. It offers U-Network, a student-produced satellite TV program network, and it runs an electronic bulletin board, so members can exchange information and questions.

Cunningham said NACB has almost 600 members, including college radio and TV stations, commercial and non-commercial, and some high school and middle school stations.

Asked about IBS, Cunningham said, "We've always enjoyed a relationship where we work together, since we're both serving part of the same population. If IBS were unable to provide service, a lot of our services would be

able to pick up the needs of the former IBS members."

Like IBS, NACB also focuses on the future. "We're looking forward to ... welcoming radio back into the golden age. A lot of the focus nowadays is on new media — the Internet and the Web — and one of the focuses of our

conference will be what radio's role is in that and what possibilities there are for those entering either the academic world or the professional world ... how they translate their skills into the new marketplace. We look forward to working with other organizations to do that, like IBS and NAB."

Cunningham said NACB likes to say it is the student version of the National Association of Broadcasters, grooming the next generation to become NAB members.

— Lisa Romanello

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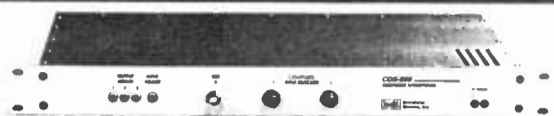
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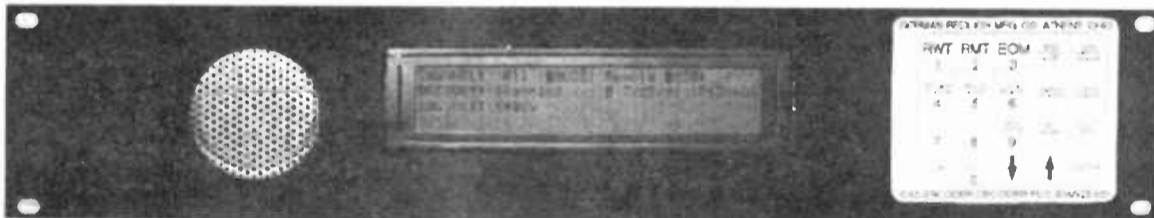
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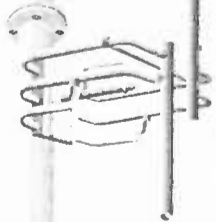
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The towers

Summer is an excellent time to have towers inspected. Employ a competent and bonded rigger to climb the tower(s). For AM towers, be sure to remove the excitation from the tower being inspected. On FM towers, you will have to reduce power and/or operate on the auxiliary antenna as climbers move around on the tower in the vicinity of active antennas. You should have a plan in place for this, and the rigger should be



aware of it so that you can coordinate your efforts to protect the crew from the hazards of RF radiation.

On the way up, have the rigger inspect the following items: paint, welds, hardware, guy wire attach points and preforms, guy insulators and fiberglass rods, conduit and junction boxes, antennas and transmission lines. Close attention should be given the welds across the flanges that join the tower sections together on AM towers. FM antenna bays, particularly the upper bays, should be inspected for pinholes from lightning strikes.

On the way down, the rigger should replace all bulbs and inspect the light fixtures, sockets and wiring, red lenses, and gaskets or O-rings. If there are any deficiencies, correct them right away. Little things tend to pile up or be forgotten.

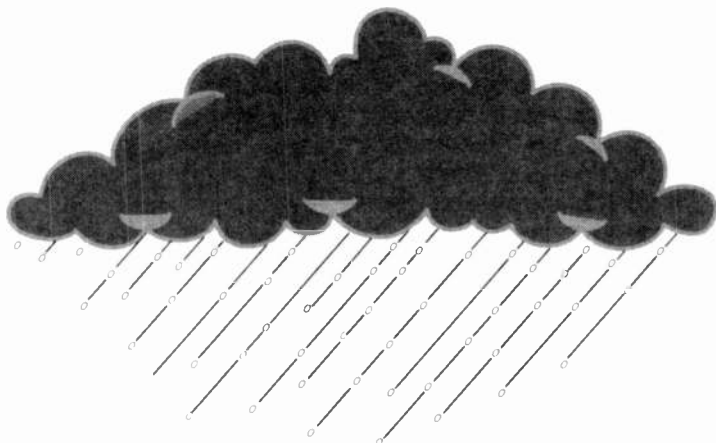
Log this as one of your required quarterly tower light inspections; use the inspection report or service invoice as part of the log documenting the inspection.

At the base

At AM tower bases, you should personally inspect the base insulator, feedpoint connection, lighting chokes/transformers, photocells, spark gaps and isocouplers. Be sure that RF excitation has been removed from the tower being inspected, and beware of RF energy induced by nearby radiators. If the tower is not at DC ground potential, watch out for static electricity.

Check the base insulator for cracks or chips. Many base insulators are hollow

and have drain holes inside. Be sure these are not clogged by pouring in a small quantity of water and watching for it to run out. If the drain holes are clogged, try using a shop-vac adapted to



a short length (3-4 feet) of half-inch garden hose. Insert the garden hose into the hole in the tower base plate and manipulate it around to clear the blockage. You may have to use a coat hanger or other instrument to loosen the debris. Having drain holes clear is very important. If the insulator fills with water, it will present a low-impedance parallel path to ground for the RF. If water gets in and freezes, it could break the insulator and drop the tower.

Visually inspect the feedpoint connection for mechanical and electrical integrity. If the tower is galvanized, the galvanization should have been filed away at the point where the connection was made. Check this area carefully for corrosion and treat with a cold-galvanizing compound if necessary.

For both AM and FM towers, check the condition and integrity of the tower ground. Lightning can vaporize an undersized ground conductor, leaving lightning energy no place to go except through your equipment! Another common occurrence is the inadvertent

cutting of the ground conductor during mowing around the tower base. Check for a good, tight ground connection, both at the tower base (or the grounded side of the spark gap) and at the ground rod. A cad-welded connection is best, but a sturdy clamp will suffice.

Check lighting

Look carefully at all lighting equipment at the tower base. Check for electrical connections, corrosion and foreign material (such as wasps nests). The bottom terminus of the lighting conduit will often have a screened vent facing downward. If this is

blocked, any water that gets into the conduit will remain there. Be sure this vent is clear.

Test the photocell and flasher, checking the beacon-on current with a clamp-on ammeter. Note the current on the inside of the flasher box for future reference. With this data, you can tell if all bulbs are working even if you cannot see the lights during the daytime.

AM Austin-ring transformers should be checked for security, spacing and corrosion. Feel the rings to check for excessive resistive losses. Sometimes lightning will blow a hole in the rings and cause a short in several turns. The rings will still work but the turns ratio will be incorrect. Bulb voltages may consequently be low or high, and the windings may run hot.

Look at spark gaps for spacing and good connections. A high resistance in a spark gap renders it virtually useless for conducting static energy to ground. If you opened up your gaps during the winter to prevent them from icing over,

See TRANSMISSION, page 38 ▶

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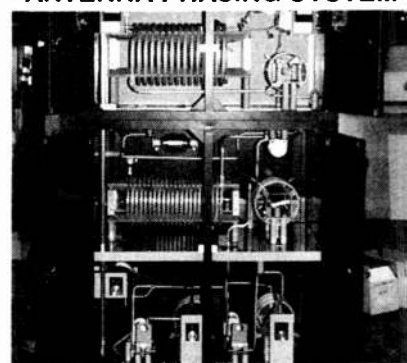


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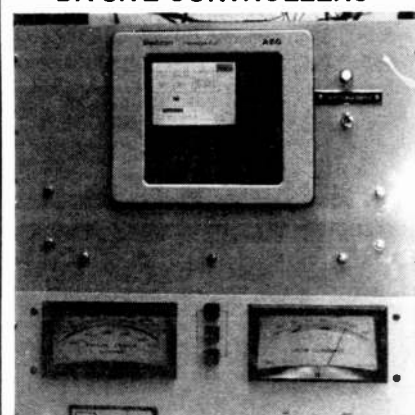
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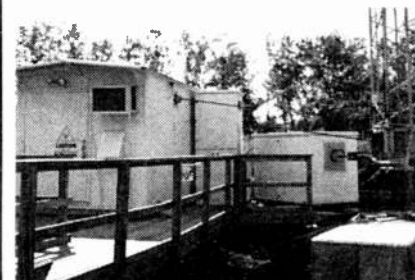
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Check the Chain for Problems Now

► TRANSMISSION, continued from page 37 close them back up to the proper spacing now. Remember that your spark gaps are your first (and best) line of defense against lightning. Proper spacing is about 0.02 inches per peak kV at sea level. The peak voltage can be determined by this formula: $V_{PEAK} = 3.18 \times Z_A \times I_A$, where Z_A is the antenna impedance (not the resistance!) in ohms, and I_A is the RMS antenna current in amperes. At higher altitudes, air ionizes at lower voltages, so the spacing must be increased. A good rule of thumb is to divide the spacing by 0.8 at 5,000 feet.

If you have isocouplers, they should be removed from the tower and checked. If you don't remove them from the tower, there may be holes in them on the back side, where they abut the tower leg (and are most likely to arc). There may also be water within that you can't detect without removing them. Shake each isocoupler; if it rattles, replace it. If it sounds like there is water inside, replace it.

Use your eyes

All guy anchors should be visually inspected for integrity and security. The rigger should perform this service as part of the inspection process. However, there is no substitute for seeing with your own eyes. Pay particular attention

to preforms, insulators, turnbuckles and safety wires.

Unless they are located in insulated, sealed buildings equipped with heat/air conditioning (not likely!), AM antenna tuning units (ATUs) are exposed to the elements all the time. Even in so-called "weatherproof" enclosures, the temperatures within will range from the lowest winter low to well above the highest summer high temperature.

Temperature changes will result in a good deal of expansion and contraction

The weather may be warm now, but the iceman cometh! The time to do outdoor maintenance is while you can.

in ATU components, cracking insulators and loosening hardware. Carefully inspect every ATU component, checking for secure mounting and tight connections. Any cracked or broken insulators should be replaced.

Look for and remove any foreign materials such as wasp nests and the

like. If the ATUs are housed in weather-proof enclosures, they probably have screened vents on the underside. Make sure these are clear and unobstructed with the screens in place. Check for security of the hardware mounting the entire ATU cabinet to its supports. If the ATUs are in doghouses, check for deterioration of the wood, paint and roof material, fixing any leaks you find.

Bowl insulators, either on tuning houses or weatherproof cabinets, should be secure and free of cracks and chip-

ping. Look for evidence of water seepage around bowl insulators. If necessary, replace gaskets and cork washers.

Look at all mica capacitors, checking for leaks, seepage and dissipation. It is best to do this immediately after shutting down the RF excitation. Physically touch each component, noting whether or not it is hot. Warm is okay; hot is not. If the component is hot near a connection but cool elsewhere, a poor connection may be indicated. Examine tubing for discoloration. When plated tubing gets hot, dark areas appear near the source of heat. Discoloration will usually point the way to a bad connection.

In many parts of the country (particularly the south), fire ants are a real problem. For some unknown reason, they seem to be attracted to 60 Hz AC. Watch for evidence of fire ants and other insects. Ants are a particular problem because they can get in anywhere and they secrete an acid that will damage components. Treat the ground around the tower base and ATU with a good repellent/insecticide. The best I have found for fire ants is Orthene. It smells really bad but it works great and for a long time.

Moth balls are a good insect repellent for tuning houses, ATU cabinets and other areas prone to infestation. Place a few mothballs in an open container (a soft drink can cut in half works great) and set them in the ATU or doghouse. Replace the mothballs periodically as they evaporate. Do not let the mothballs come into contact with tubing, copper strap or components as they tend to be corrosive. It is best to keep them in an open container. I keep a few mothballs inside phasor cabinets and transmitters, too, at sites that are prone to insect infestation.

Ground system

Out of sight, out of mind. That is the general rule when it comes to ground systems. Yet this hidden portion of the antenna system is absolutely critical to the efficient and proper operation of the station.

Generally speaking, a ground system will not "wear out" as such. Rather, something usually happens to damage or

destroy it. Thieves steal radials and strap for the copper, erosion causes radials to be unearthed, underground utility construction causes radials to be cut — I have even seen wildlife tear up a ground system. If a ground system is kept in the ground and the exposed portions are maintained, it will continue to function indefinitely.

The thing to do is look for problems such as these I have mentioned. Has rainwater runoff caused erosion that has left radials exposed? Is there evidence of vandalism or theft? Be on the lookout for these things.

If you see pronounced changes in the operation of your directional antenna (or in the base impedance of your non-directional antenna) when transitioning between wet and dry ground conditions, the trouble may be related to excessive close-in losses in the ground system. Look at the ground screen or interspersed radials at the tower base. Check to be sure the ATU is connected solidly to the ground system with a strap. Watch for broken or torn straps and make repairs as necessary.

Transmission lines

Unless you are using air-dielectric lines which must be kept pressurized, there is not much to check on the transmission and sample lines. Look at the security of the connections on both ends and watch for kinks or bends that may have occurred.

If a line does have a problem, the antenna system will usually show some symptoms. A wet line will typically have a mismatch at the place where the water is. In an AM system, this will cause a power loss in that leg and usually a phase shift as well, which will mess up the parameters of the whole array. It is not always readily apparent which line is at fault in a directional array with such a problem. In an FM system, a high VSWR will usually result.


Should a line problem be suspected, a bridge can be used to check the characteristic impedance and electrical length of the line. Problems, if they exist, will usually show up in such a test. The results of these measurements can be compared with the results obtained following the original installation to find out what changes have taken place. Once any uncovered problems have been repaired, run these measurements again and record the results for future reference. A time domain reflectometer (TDR) may be necessary to locate faults in a transmission line. If you rent one with a strip chart recorder, take advantage of the opportunity to pull a print on all your transmission and sample lines for future reference.

Transmitter building

Critters love warm transmitter buildings during cool weather. Varmints of all descriptions will utilize any opening, no matter how small, to gain entry. Once inside, they will find a warm, dry spot in which to hibernate, lay eggs or whatever critters do in the wintertime.

Cleaning of the transmitter site should include a professional extermination, whether or not an insect or rodent problem is evident. Because of the remote location of most transmitter sites, insects will abound and eventually cause problems. The best insurance is to exterminate aggressively. If you can stand the smell, use mothballs as

See TRANSMISSION, page 42 ►



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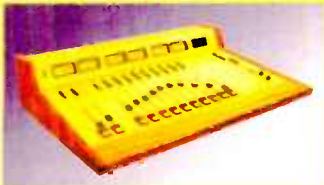
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Digilink & Trak*Star Workstations

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Available in two basic product families with literally thousands of variations, an Arrakis studio furniture package can easily be configured to meet your specific requirement, whether it is simply off the shelf or fully custom.

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With a choice of several console lines; digital workstations for live air, production, news, and automation; and two major studio furniture product lines, Arrakis can meet broadcasters needs from the compact news studio to the major market network origination center. Complete Arrakis equipped studios can be found around the world from Tokyo, to Moscow, to Japan, to Tahiti. Call Arrakis today for your equipment or studio needs,

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The new, Hinged Hanger from Andrew Corp. is designed for 6-1/8-inch and 3-1/8-inch rigid transmission line. It rotates to open,



saving installation labor.

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determined by the equipment mounted on the tower. Rigid line sections can then be hauled up, connected and the hanger jaws closed and bolted tight. Captivated hardware eliminates the safety hazard and wasted time caused when mounting hardware is dropped.

For information, contact the Andrew Customer Support Center at (800) 255-1479, ext. 253, bulletin No. 237371; or circle Reader Service 157.

Cellular/DAB Power Transistor From Ericsson

Whether cellular is your technology of choice or DAB, Ericsson can fit the bill with its new 125-watt, 1465-1513 MHz RF power transistor for use in both applications. The PTB20202 is available from stock from RF and microwave component distributor Richardson Electronics,

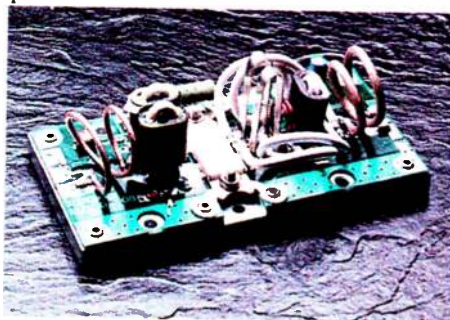
the exclusive worldwide distributor of Ericsson RF and microwave components.

The PTB20202 is a class AB, NPN, common emitter RF power transistor intended for 26 VDC operation across the 1.4 to 1.5 GHz frequency band. Ion implantation, nitride surface passivation and gold metallization are used to ensure excellent device reliability; 100 percent lot traceability is standard.

For information, contact Kevin Connor at Richardson Electronics at (630) 208-2200; e-mail kevinc@rell.com or circle Reader Service 109.

300 W FM Power Amplifier By Richardson

Drive your high-power tubes with the new 300-watt RF power amplifier. The FM300-108 can be used in FM broadcast transmission, for 87.5-108 MHz solid-state amplification or as a driver for high-power tubes.



The unit is a single stage pallet offering high power output (300 watts minimum) in a compact design. It can also easily be combined for higher multikilo-

watt transmission. Other features include a high 18 dB gain, low input VSWR, high output VSWR and a rugged design capable of withstanding occasional load mismatches.

The FM300-108 is available from stock from RF and microwave component distributor Richardson Electronics.

For information, contact Kevin Connor at Richardson Electronics at (630) 208-2200; e-mail kevinc@rell.com or circle Reader Service 133.

HP Enhances Analyzer

Three different types of analyses are possible with a new, enhanced box from Hewlett-Packard. The company updated its HP4396A analyzer to produce the HP 4396B, a 1.8 GHz combination analyzer

with network, spectrum and optional impedance measurement functions in one unit.



The enhanced analyzer simplifies RF testing in the lab, as well as in production settings. With this product introduction (the units are now shipping), the HP 4396A will no longer be available.

For information, contact Hewlett-Packard at (800) 452-4844, ext. 5401; or circle Reader Service 181.

A Transmission System Checklist for Autumn

► TRANSMISSION, continued from page 38

The elements are hard on antenna systems. Towers, foundations, antennas, transmission lines, antenna tuning units,

Riggers should inspect the following items:

- Paint
- Welds
- Hardware
- Guy wire attach points and preforms
- Guy insulators and fiberglass rods
- Conduit and junction boxes
- Antennas and transmission lines

sampling loops and just about every other piece of antenna hardware exposed to the weather will suffer some deterioration. Now that we have some good weather and the worst of the thunderstorm season is behind us, we should take a good look at these items and make repairs as needed.

The towers

Summer is an excellent time to have towers inspected. Employ a competent and bonded rigger to climb the tower(s). For AM towers, be sure to remove the excitation from the tower being inspected. On FM towers, you will have to reduce power and/or operate on the auxiliary antenna as climbers move around on the tower in the vicinity of active antennas. You should have a plan in place for this, and the rigger should be aware of it so that you can coordinate your efforts to protect the crew from the hazards of RF radiation.

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- Secure mounting and tight connections
- Foreign materials such as wasp nests
- Screened vents on the underside to ensure these are clear and unobstructed
- Security of the hardware mounting the entire ATU cabinet to its supports
- Deterioration of the wood, paint and roof material
- Bowl insulators
- Mica capacitors
- Fire ants

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Workbench

Radio World, August 20, 1997

Good Hunting in These Parts

John Bisset

Our *Workbench* Business Contact file continues to grow. Russell Humphrey of Country Music Radio WCMR(FM) in Bruce, Miss., faxed us a list of a couple of his favorite parts companies, to which I've added. We'll label this card "Parts, Electronic."

Russell depends on toll-free order numbers and next-day delivery of parts because he maintains a rural facility. Each company had a list of print catalogs, which are free for the asking. Newark maintains local branch offices. Call the administrative number for the branch closest to you.

Odds are that you know of other companies. Fax the info to us at (703) 764-0751 for a future *Workbench* column. Meanwhile, give these folks a call next time you need something you can't find at the local Radio Shack!

★ ★ ★

I know it's a little early to think of snow and ice, but now is a good time to plan for slushy days ahead, and consider how they will affect your satellite downlinks. If you are a contract engineer, issue a memorandum to your station's operations manager, tasking him with sweeping out the dishes when it snows. After all, he's at the station every day, you're not. Send a copy to the general manager. Remind him or her that forgetting to sweep out the dishes may result in an emergency visit (and corresponding bill).

Take an afternoon to weatherproof connectors now.

As for the dishes themselves, coat the solid ones with a good paste wax that you apply and "buff" with a mop. This will help cause ice and snow to slide out of the dish.

Al Kazlauckas, a contract engineer for WZAK(FM) Cleveland and WJMO(AM)-WZJM(FM) in Cleveland Heights, proffered electric heat tape, but wondered about the best way to affix the tape to the dish. His suggestion: good old duct tape. Anyone got a brighter idea?

We've used heat tape with pretty good success, and also used the duct tape. It works better when it's applied at this time of year. When the temperature is 20 degrees, the duct tape edges curl,

and this problem is exacerbated when you try to sweep snow or ice out of the dish. Pretty soon you're sweeping the heat tape out, too!

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Be sure you apply the tape on the reflective or "top" part of the dish. I found that one station applied the tape to the *back* of a fiberglass dish, and then wondered why it didn't work!

If you're out at the dish, now is a good time to give the feed horn a spritz of Wasp Killer again. (Long-time readers of this column appreciate that I hate bees!)

★ ★ ★

Dave Jackson, a chief and contract engineer in Santa Cruz, Calif., faxed a note about chasing RPU receiver problems due to rain. Dave once had a setup that included 5/8-wave vertical radiators with four quarter-wave ground plane radials. Originally, the array was tuned for 27 MHz, but Dave and his crew re-cut the antenna for 30-32 MHz private use.

The antenna had a "ring"-style resonating feed element, where the center conductor of the quarter wave line was coupled via a locking clamp. VSWR was great (less than 1.2:1) until it rained. The VSWR shot up to 3:1! The received signal strength would drop by 4 dB, and the noise would increase by at least that much. Dave went through much of the same procedure to troubleshoot as we've described, all to no avail. The answer? Coax sealant putty to cover the clamp, Super 33 tape, and more coax putty.

The putty is more expensive than electrical tape, but, as you tell your boss when he brags that he can get an engineer to replace you for \$20K a year, you get what you pay for! Check the putty on your dish LNB, and any other outside coax connections. Take an afternoon to weatherproof connectors now, when the weather is nice. The work will pay off when it's windy and cold. I have

yet to find gloves that allow enough dexterity to pull off old electrical tape or waterproofing compound, which means you use bare hands. Do it once, and you'll never postpone this kind of maintenance again.

★ ★ ★

Joe Stack at ABC in New York is looking for an LM-1800 (National Semiconductor) PLL FM Stereo Demodulator chip. He's not sure if these chips still are manufactured. Any ideas can be sent to our on-line address wrwbench@aol.com

★ ★ ★

Speaking of parts, Steve Tuzeneu, the chief of WCUW(FM), a small non-commercial FM station in Massachusetts, has an old ADM console. Fortunately, parts still are available, but when Steve went to replace a fader, the cost was more than \$100 for one pot (and these aren't P&G faders, either). Anyway, Steve is looking for carbon composition pots, 5 kohm, stereo, audio taper type. Steve found a discontinued product, Allen Bradley's MOD POTS (Remember them?), and thinks Bourne's may have a compatible replacement. But the distributing sources he contacted want a minimum order of 100 pieces. Steve doesn't want to get into the console spare pot business, so if a reader has another idea, let us know.

■ ■ ■

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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When we can't find the right tools for the job, we build them. Here are two of our newest. The MD-1 combines a high-quality mic preamp with a clean headphone amp, and adds a line input and mix control. It's ideal for parabolic and news mics.



The MD-1 provides a transformer isolated line-level feed for long cable runs.

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BOTTOM-LINE BROADCASTER

Design a Silent Sense Alarm

Jim Murphy

Due to de-regulation that now permits LMAs, JSAs and multiple station operations, the hallways of a modern broadcast facility often resemble a carnival or a game arcade. Not that the music is the same, but it is quite common to hear rock, country, oldies and a ball game all at the same time. During the late hours, it's hard to keep an ear on all the programming, and the staff might not notice that the station is off the air or audio has been lost.

A cheap solution to this problem is the silent sense alarm circuit shown here. It consists of only a few parts from the junk box. And with a few suggestions in design tactics, you can use a variety of parts, and modify the circuit to suit almost any situation.

Starting the design

Getting your design off the ground is not that difficult if you follow a few rules and procedures. The first rule: work from the general to the specific.

Just as you would not grab a hammer as a first step in designing your house, neither should you grab a handful of components and a breadboard to start your electronic design. Follow the rules of the software programmer and work from the largest concept to the smallest.

Here are the five steps we will follow in designing our circuit:

Step 1: Develop the idea in block fashion, determine all requirements.

Step 2: Break down into smaller modules, adding more details. Try to imagine the circuit operation.

Step 3: Draw circuit details, calculate values.

Step 4: Construct the circuit.

Step 5: Debug, modify modules, test.

Follow these steps before you grab the soldering iron. They might help avoid frustration and eventual abandonment of the project.

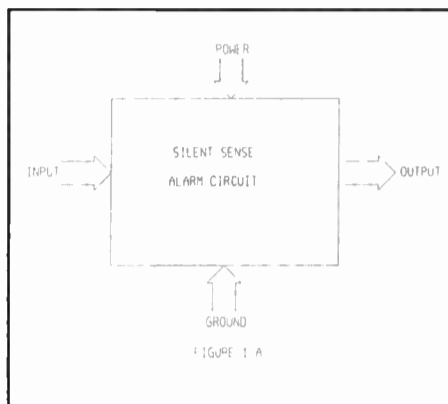
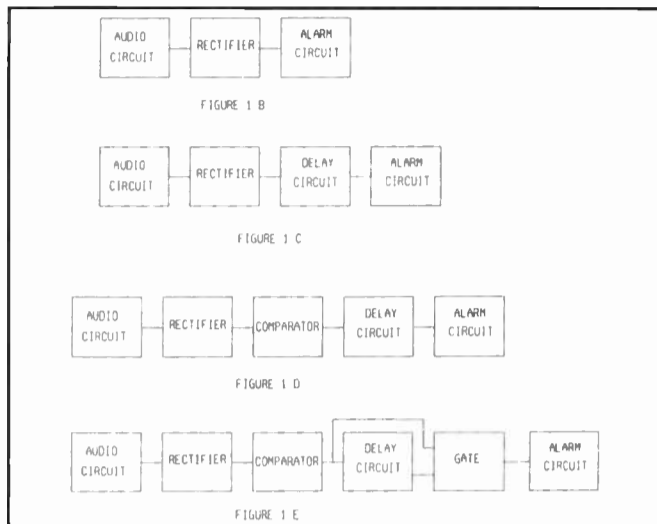


Figure 1A

input will be audio. It should be able to handle levels ranging from -30 to +10 dB, with an input impedance of at least 10 kilohms, and it should be balanced. Your



Figures 1B - 1E

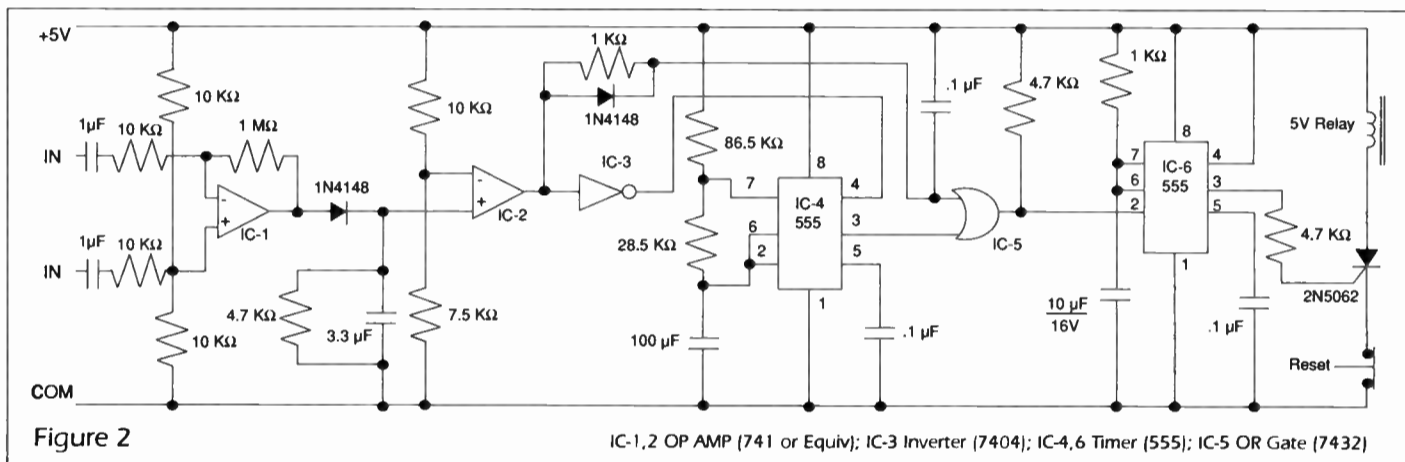


Figure 2

IC-1,2 OP AMP (741 or Equiv); IC-3 Inverter (7404); IC-4,6 Timer (555); IC-5 OR Gate (7432)

Figure 1A shows a black box, which is the usual starting point. We will have an input, an output related to the input, and power connections. Let's examine them more closely.

Input and output considerations: Our

requirements may be different, perhaps a higher input impedance, or you might want to accommodate an RF signal. Those factors should be noted at this time.

For our circuit, we want the output to provide us with an alarm if our input

Now we can move into Step 2 and get a bit more detailed with our design, and break our black box down into modules as in figures 1B, 1C, 1D and 1E.

From the input side, we need an audio

See SILENT, page 45 ▶

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.....

► SILENT, continued from page 44
section followed by a rectifier, then an alarm circuit, shown in 1B. If we try to imagine an audio loss, we immediately see a problem: every audio pause will activate the alarm. So we add a delay circuit. This is shown in 1C.

Figure 1D came later, after I began drawing the circuits. I found that I needed to establish a threshold to determine valid audio. This can be done numerous ways, but I chose a comparator. You could easily use an adjustment on the audio stage or the rectified voltage.

Drawing the circuit

It's time to drive a nail, i.e. draw some circuitry as we begin Step 3. At the input we need an audio amplifier that will accommodate the range of signals we specified. One way would be to build a variable-gain amp. But because

this audio was only going to develop a DC voltage, we use a single-stage op amp with a lot of gain so it would square off the audio. Any op amp would do here, except a JFET input type. A high level application might destroy it.

IC-3, the comparator, does a couple of things: It restores our voltage levels and gives us good transition from logic low to logic high, and by adjusting the comparator's reference input, we can develop a threshold.

The 555 family makes building a delay circuit a snap. Ours is configured as an astable multivibrator, which is held off until we lose audio. The length of the pulse is adjustable to 10 seconds with a 100 K pot, and if audio returns within that time, the unit is reset and stopped, averting a false alarm.

I returned to my block diagrams at this point, because I needed extra considerations on how to do this. Figure 1E shows that the comparator feeds a gate until audio is lost, then the delay feeds it. If audio returns before the delay runs out, the gate is again satisfied by the signal from the comparator. The alarm will be triggered only if there is no audio from the comparator, and the delay pulse falls low.

The circuit from here out can be most anything you want. I used the falling edge of the gate to trigger a second 555, which then pulses an SCR-relay circuit. Note the required reset switch.

So far we have completed three of the five stages. It's time to gather parts and breadboard our project, so on to Step 4. This is the fun part, so grab your components and a breadboard, and go to it!

When I got to Step 5, I found a bug in the system: false triggering of the final 555 stage. I traced it to a timing problem. When a loss of audio occurred, the gate would lose both inputs for an instant, and this triggered IC-6. To solve this, I added a capacitor to freeze this input for an instant. I also added a diode and resistor to give IC-2 a fast turn-on, slow turn-off.

Following a system and proceeding through stages will keep you from "hitting the wall," becoming bogged down in circuitry, feedback loops, timing problems ... in other words, debugging while trying to design and create.

So, scoot up to the desk, sharpen your pencil and give it a try.

■ ■ ■

Jim Murphy is an independent broadcast engineer. Reach him through RW.

War-Time Care of YOUR RADIO

War-Time Care of YOUR RADIO

—pertinent suggestions to lengthen the life of your radio equipment

By D. A. HILL

RW writer Sharon Rae found this little pamphlet at a garage sale this summer. "War-Time Care of YOUR RADIO" by D.A. Hill is a peek into another era, when a manufacturer could advise the buyer not to overuse the radio because radio tubes were busy "fighting at the front."

The pamphlet was copyrighted in 1944 by Northwest Radio Laboratory in Philadelphia. It contains "pertinent suggestions to lengthen the life of your radio equipment," including the following:

"Consider your radio as a fine instrument — an instrument that reproduces sound transmitted from the four corners of the earth."

"Don't operate your radio unnecessarily. Use it only for your favorite programs. Most radio tubes today are fighting at the front — few are left for civilian use."

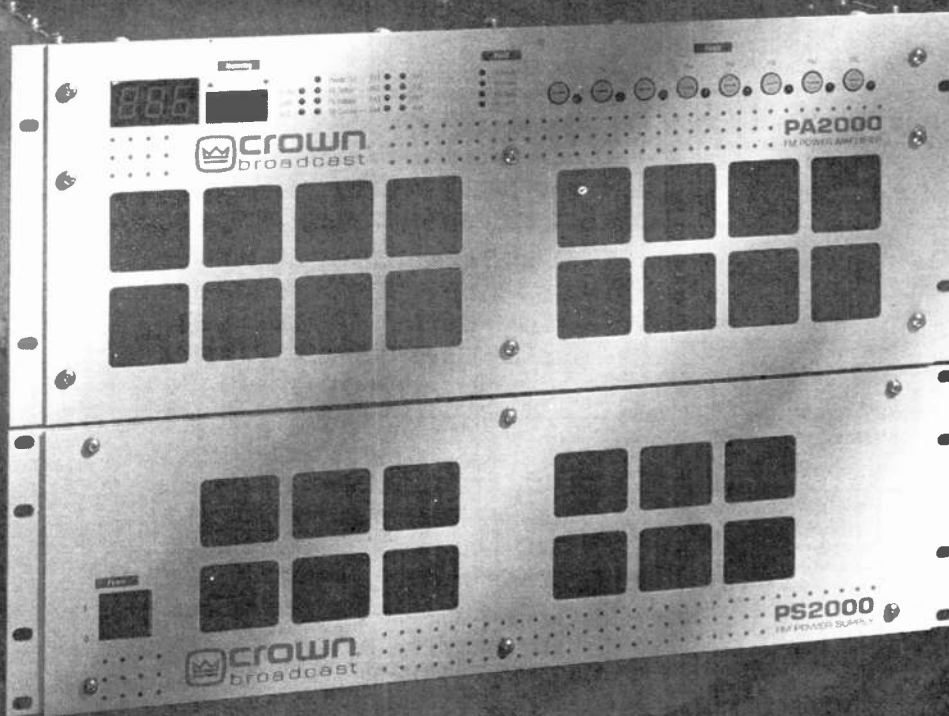
For AC-DC receivers: "If the set has a flexible antenna wire, do not connect it to a water pipe or radiator — these sets require no ground connection."

For car radios, "Start the car — then turn on your radio — this procedure will prevent a possible voltage surge from damaging the vibrator unit."

And under the "Your Radio Man" section: "Your serviceman is doing his best to take care of YOUR RADIO — please be patient if he keeps the set a few days longer than usual."

— Paul J. McLane

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Children's Hospital of Pittsburgh sells a Lucite paperweight that contains a slice of the AM radio tower that served historic station KDKA for 58 years.

The 718-foot carbon steel tower was made by the American Bridge Co. It was erected in Saxonburg in 1936, then moved in 1939 to Allison Park, Pa. When

Shelly Tolo of the hospital said the proceeds go toward its "Free Care Fund," which benefits children in the greater Pittsburgh area who need care and can't afford it. Sales have produced about \$46,000.

To order, send \$23 to Children's Hospital of Pittsburgh, Development Dept., 3705 Fifth Ave., Pittsburgh, PA 15213-2583, or call (412) 692-5317.

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Dwight Weller of SBE Chapter 46 in Baltimore brought the paperweight to our attention.

KDKA, part of the CBS Radio Division, was the world's first commercial radio station, born Nov. 2, 1920. The 50 kW station is heard at 1020 kHz in 38 states and half of Canada.

— Paul J. McLane



The old tower was replaced in 1994.



Photo by Alan R. Peterson

it was replaced in 1994, slices were made into 4,000 paperweights. About 1,000 remain for sale.

"At first we thought of it as a memento for special clients and employees," said Greg Jena, director of marketing and promotions for KDKA. Then the staff began to use them as premiums at remote broadcasts. Eventually someone hit on the idea of offering them as a fund raiser for the hospital, which the station has supported for five decades.

GUEST COMMENTARY

Engineers Should Lead, Not Follow

Don Dobbs

With all the recent publicity on the digital technology in broadcasting, I have noticed that people's views toward new technology are landing on two sides of the fence. As usual, some are sitting on the fence waiting to hop down to join the winning side.

These views toward new technology can be divided into at least two groups. The first group of people share the excitement and adventure of new technology. They feel comfortable implementing leading-edge technology, and are willing to cope with the problems inherited with being on the "bleeding edge." They are always pushing their limits and asking for more, demanding more and looking forward to change.

The second group is the opposite. They see the implementation of new ideas as an inconvenience. They feel more comfortable doing things as they have always been done. If the technology was good enough then, it should be good enough now. After all, if it ain't broke, don't fix it. They are satisfied with the status quo.

Neither viewpoint is right or wrong. Ultimately, the decision rests with the unpredictable group of managers known as "the consumers." This group of policy makers historically has neglected quality and left us with some pretty inferior products.

Broadcasters should be flexible and willing to take a chance on change and new ideas. In today's competitive environment, if we don't do it now, someone else will.

As engineers, we need to be leaders in the implementation of new technology. If the engineering team doesn't push these new frontiers and strive for the best, why should the production, news, sales or even accounting departments be any different?

The challenges of tomorrow's technology such as digital radio, direct satellite transmission and HDTV, will be made possible by advances in engineering. We will continue to play an important role in the implementation of this new technology in our stations.



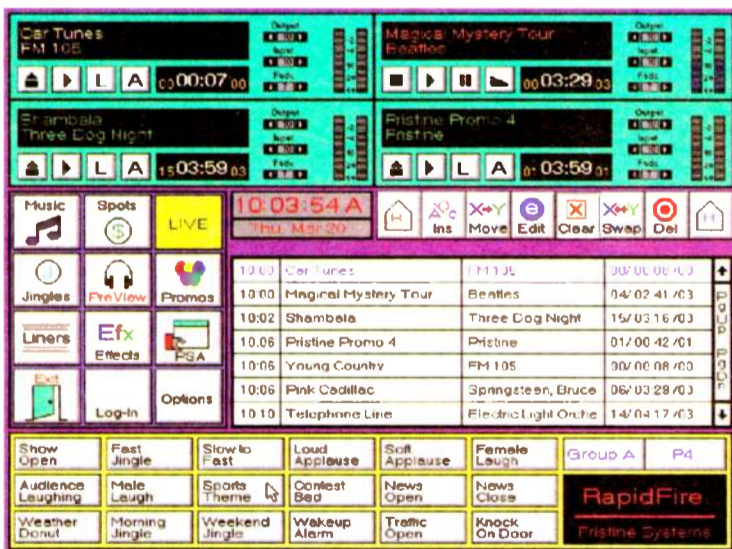
Don Dobbs is chairman of SBE Chapter 56, the Society of Broadcast Engineers of Northeastern Oklahoma, and director of engineering for television station KOTV in Tulsa.

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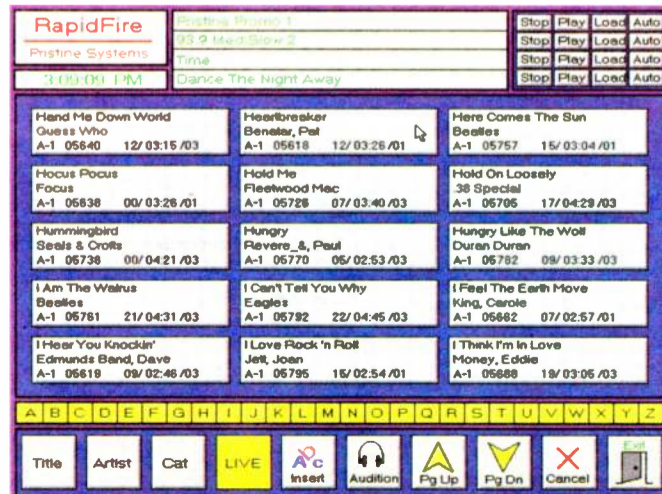
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Telco, Talk, Remote, Field Audio

August 20, 1997

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See
Pages
52-72



Photo courtesy of Bell Laboratories

Do It Yourself With a PCXpocket

Rich Rarey

Riddle: What professional digital audio card is the size of a credit card, and makes more sound than 16 plain-vanilla sound cards?

Answer: The PCXpocket from Digigram Inc., aptly named because you just slip the tiny card into your laptop's PCMCIA slot, install the software drivers, and go.

The PCXpocket debuted as the first card for the laptop using professional audio from Digigram. It is packed with plenty of smarts and enough features to turn a laptop into a



high-quality multitrack for work in the field.

Neil Glassman, vice president for Digigram North America, said the PCXpocket is also the first of the company's "do-it-yourself" products.

Real-time mixing

Based on the 66 MHz Motorola 56002 DSP, the PCXpocket does some serious 16-bit audio number crunching using MPEG Layer I or II compression. This allows simultaneous encoding/decoding of MPEG audio during recording, a helpful feature during multitrack recording and playback.

This card can mix — in real time — up to 16 MPEG (mono 128 Kbps) files or a maximum of six linear (PCM) audio files.

The PCXpocket requires software drivers, which we installed in two laptops, one running Windows 3.11, and a fast 133 MHz Pentium running Windows95.

The PCXpocket is the first Digigram 'do-it-yourself' product.

Even with the relatively slow operating system and processor, we had no trouble using the basic Play and PlayRec applications. Although we installed the PCX driver software on the faster laptop, we set up the WAV drivers on both, a requirement if you want to use the clunky WAV players bundled with Windows95 or other sophisticated WAV editors such as Cool Edit, Samplitude or Sound Forge.

Installation also required opening the Control Panel and activating the Digigram WAV NP driver from the Multimedia folder.

No phantom power

The I/O is accessed by plugging an umbilical into the edge of the card. A mini DB-15 splits into two female XLRs for two-channel balanced ana-

log inputs and a stereo mini for two-channel unbalanced line/headphone output.

The inputs — software selectable between mic and line level with no phantom — have a programmable gain range of -50 to +12dB and can accept up to +4dBu. Driving a POTS phone line from the analog outputs requires an additional buffer amp or isolating transformer. Note by using MPEG technology, one could simply FTP the audio file.

Digigram calculates that disk storage for 48 kHz MPEG Layer II audio at 128kbps would be about 960,000 bytes (960 kB) per minute of recorded



time, approximately six times smaller than a linear PCM file.

Of course, the PCXpocket easily handles linear PCM (WAV) files, but depending on the laptop performance, can play back only six PCM files simultaneously.

Comparing Apples to PCs ...

Much conversation has ensued in the professional audio community regarding audio file format. When there were just Apple Macintoshes and slow 386 PCs, files were AIFF and WAV. Interestingly, both formats held identical audio data, with the bytes reversed for the convenience of the platform's native processor.

In their quarterly technical newsletter "GO DIGIGRAM," Digigram describes the emergence of the Broadcast WAVE Format. Files in this format are an extended WAVE file, a type of Resource Interchange File Format.

A file in this format is essentially a collection of well-defined chunks containing audio data and descriptors listing the amount and type of audio data, as well as origin time.

By recognizing this format, Digigram states that "easier file transfer between PC-based workstations of different manufacturers lies in defining a minimum standard necessary for the file exchange, while allowing individual applications to create and use information that belongs only to it."

The European Broadcast Union has released its Technical Document 3285 that fully defines the Broadcast WAVE Format and offers some new possibilities for those who want to send and receive MPEG-encoded audio in a recognized format.

Almost concurrent with the releasing of the "do-it-yourself" PCXpocket is the publishing of the Application Programming Interface (API) which exploits the PCX series audio cards. API describes, in programming terms, the high-level functions that perform useful work.

More than 50 API functions can be called by programs written in Visual Basic and C. More exciting is the prospect of controlling high-level functions of the audio card using one's own programming to facilitate automation, live assist or any other task where commercial software is too expensive or doesn't meet one's needs.

Digigram provides these "PCXTools" free of charge on their website at www.digigram.com and, for a fee, offers additional comprehensive software development support.

More neat stuff

In our evaluation package was Digigram's Xtrack multitrack editing software. Combined with the PCXpocket, the elements of a laptop multitrack workstation were realized.

Originally developed for other Digigram audio cards, Xtrack lets the laptop user record audio while listening to multi-channel playback ("amuse your friends with your 16-part harmonies") and offers easy control and management over the PCXpocket card.

The multitrack session is managed by one 'title' file and composed of separate audio files — you can record them one-by-one or lay them in at will. In our brief perusal of Xtrack, we found it not very intuitive, but with some no-deadline practice, quite serviceable for creating multitrack productions just about anywhere.

Hint: Editing on trains and subways is difficult. Travel vibrations make it hard to click and drag markers and press virtual controls accurately. But then, how many people could say they're actually "working on a mix" while commuting?

The Xtrack offers waveform editing, multiple Undo, special effects of stretching, automated level changes, Noise Reduction, solo, mute, pitch shifting, playback forwards/backwards, three-band EQ on each track and external applications to assist in maintaining sound libraries.

Xtrack requires a licensed "dongle" plugged into the printer port, making

See PCX POCKET, page 69 ▶

Coming To You Live, By Remote

This month in Buyer's Guide, we visit a broad category: Telco, Talk, Remote and Field Audio.

The PCXpocket from Digigram is a new PCM soundcard for laptop computer recording. Rich Rarey puts this winner of our NAB '97 Cool Stuff Award to the test.

RW technical editor Alan R. Peterson retires the phrase "The Smart from Marti has not begun shipping." He reports on an Independence Day remote broadcast using a Smart codec. Peterson also compares two portable mixers for remote telephone broadcasts, from JK Audio: the RemoteMix C+ and RemoteMix 3.

"Just what is ISDN and how do I get on the bandwagon, anyway?" Think you know the answers? Bell Atlantic representative and lecturer Pat Innencenzo speaks frequently to radio people about ISDN. He answers broadcasters' most frequently asked questions in this issue.

Wondering what might be in store for telco and remote gear? Janet Evans and Don Elliot spoke with manufacturers and distributors who have surprising insight. Also, look for technology updates on individual products. Alice Hornbaker looks at the bags and boxes used for transporting remote and field audio gear.

Got a suggestion for Buyer's Guide? We'd like to hear it. Send an e-mail to sgary@imaspub.com, or write us at RW.

USER REPORT

Now Shipping: The Marti Smarti

Alan R. Peterson

I had been anxious to give the Marti Electronics Smarti a workout.

Every RW piece on POTS codecs included the statement, "Marti is not shipping yet." As a broadcaster who happily used Marti RPUs at remotes, football games and special events, I was itching to get my hands on the 1996 "Cool Stuff"-winning Smarti.

My opportunity came when cable radio station WEBR-FM (Fairfax County, Va.) booked an all-day remote on July 4, complete with four live bands. The audio would air over the

Media General Cable Television system in this suburban Washington, D.C., county and over the Internet at axsamer.com

WEBR is a community-access cable radio station that shares accommodations with a cable access television facility. A diversity of talk and music programming, all volunteer-run, makes the station unique. Programming airs over the Media General Cable Television system in this suburban Washington, D.C., county and over the Internet at axsamer.com

Two units hot off the Marti assembly

line became available just in time, and were delivered to my office by no less than Jim Godfrey, president of Marti. How can you not feel confident when the big guy himself, drops off the goods?

Preliminary look

From left to right, the Smarti front panel consists of a four-channel mic/line mixer with balanced XLR ins, a monitor position for two headphones (with variable Program/Return balance controls) and the telephone keypad with display.

telco line simulator. Trouble: A loud stream of digital noise and distortion poured out of my headphones, but no audio.

Before calling down to Texas for a replacement, we decided to pop the top of the offending unit and found that a ribbon connector had worked loose. It must have had a bumpy ride here.

Extremely bumpy, in fact. When we pressed the connector back in place, it grabbed and held very tightly. Marti uses extremely snug connectors to couple the boards together and to see one come loose was a surprise to both Godfrey and myself.

With the connector back in place, Godfrey "dialed" my Smarti unit across the room. It worked fine. Off to the remote.

The logistics of the Independence

So, What's Behind This P.O.T.S. Codec



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The Smarti at Work

Rubber feet and a riser-leg support the unit on a table and a second set of feet allow the Smarti to tip sideways 90 degrees and stand vertically.

The dialer pad includes Menu and Select membrane keys and a 10-number memory. Two dry-closure Relay buttons control studio functions from the remote site. A full duplex serial data port on the Smarti allows two-way message sending. The LCD display reports all pertinent information including line conditions and audio level.

Bandwidths up to 7.5 kHz are achieved with an internal U.S. Robotics modem and MPEG Layer II compres-

Day remote were interesting, to say the least. Our phone line was dangling out the window of a local library; feedback and groundloops between the event PA and the Smarti mixer made things difficult. AC power was tapped from the PA guy (future Smartis will include an optional 12 VDC battery connection) and a loose connection to the Audio I/O strip on the back of the studio unit kept us from starting on time.

A nine-hour day

Once we were ready to begin, the remote crew dialed the studio from the library phone while I board-op'd back at WEBR. Both Smartis grabbed a 28.8 connection and held it for the next nine hours.

For the remote, we selected "MPEG Medium Quality" from the menu. This gave us a 7 kHz signal and a reasonable compromise between bandwidth and overall quality. A 7 kHz signal is about one octave less than FM, but once the signal was processed through

WEBR's Optimod, it sounded as good as anything coming out of a TV speaker.

On larger speakers, you could hear the difference. High end was smeared and some harmonic birdies could be heard on complex signals during groups performances. But the bottom end was audible, speech was clear and *we were getting 7 kHz response from a crummy telephone line!*

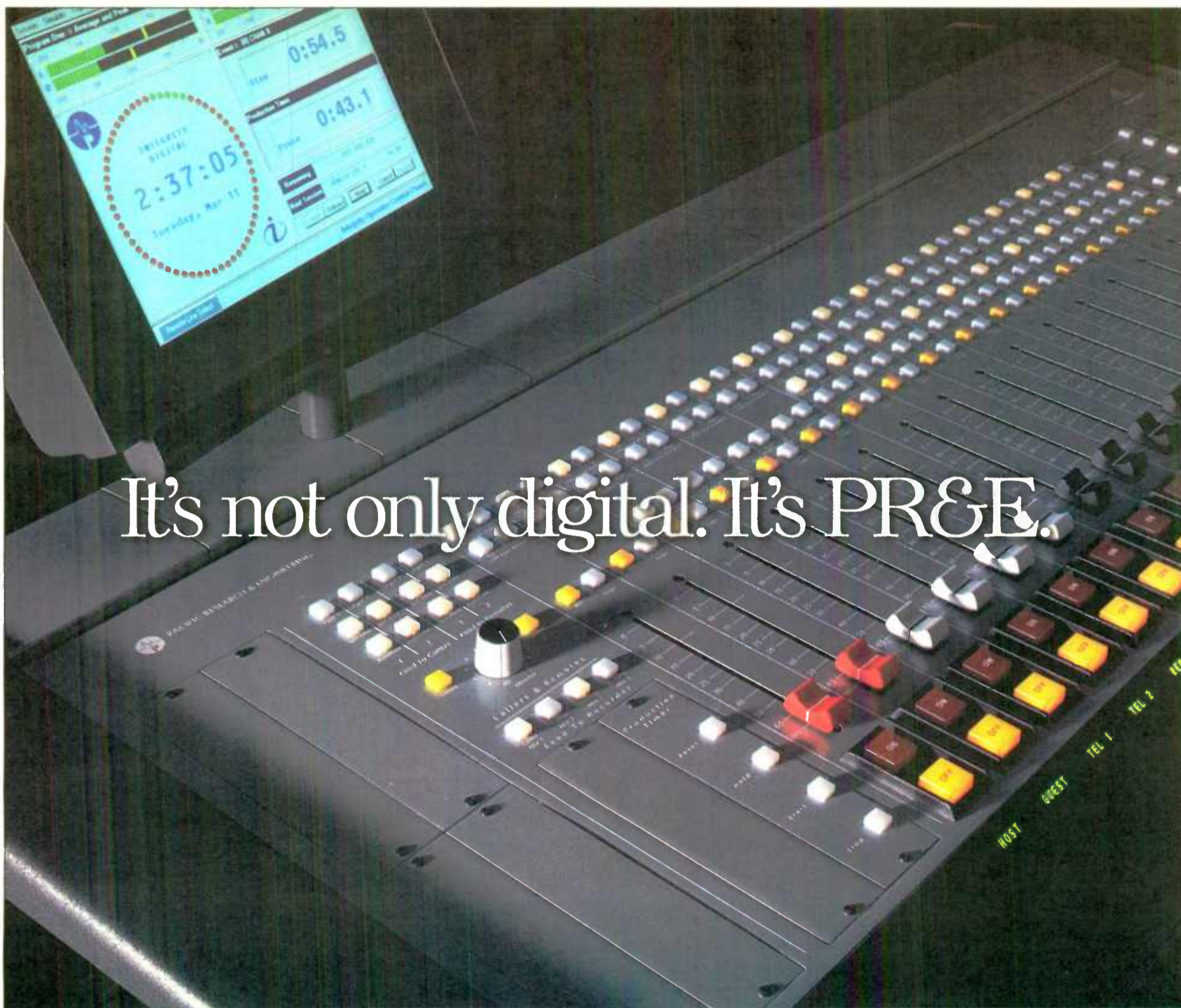
See SMARTI, page 55 ►



sion. Phone company line quality is the limiting factor in a POTS codec. Baud rates between 16800 and 33600 are acceptable — the higher the better.

The box is deceptively light (5.3 pounds). When I lifted one, I thought I received an empty case like those displayed at trade shows.

Educating me in the finer points of POTS codecry, Jim Godfrey wired up both Smarti units in my office through a



It's not only digital. It's PR&E.

Now you can get digital technology and PR&E reliability in the same console. Integrity.[™] It's the first digital on-air board that also speaks fluent analog. All 16 inputs can handle analog signals. Ten can also accept digital inputs at any sample rate. So you can deal with the hodge-podge of equipment in real-world studios. A unique architecture also guarantees a level of reliability other digital consoles can't match. So you can rest assured your signal will stay on the air.

What's more, you get on-board DSP voice processing, remote or local configuration controls, and channel-specific remote control connections. And you can set, save and recall each board configuration at the touch of a button for seamless transitions from show to show.

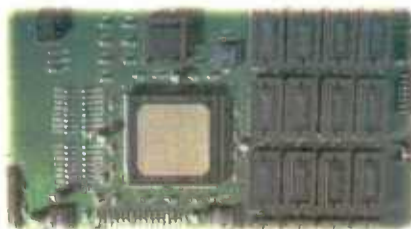
For a brochure, call us at 760-438-3911, visit www.pre.com or e-mail sales@pre.com



The LCD displays audio levels, time-of-day clocks, session status and event timers with a Windows[®] interface to powerful configuration management and session-based features.



Integrity's difference is more than just digital. It also offers four special-purpose buses to provide automated mix-minus for telephone and remote feeds, each with IFB.



Integrity uses an array of state-of-the-art floating-point digital signal processors to perform its mixing, routing and other functions.



Each fader has a 10-character alphanumeric display. The display changes when another audio source is assigned, which can happen either manually or at a preassigned time.



PACIFIC RESEARCH & ENGINEERING

SPECIAL REPORT

It's Time You Ran an ISDN Line

Patrick D'Innocenzo

Rolling throughout the Mid-Atlantic region and beyond, ISDN is an exciting telecommunications service. It is particularly suitable for broadcasters because it allows real-time, CD-quality, digital audio transmission over the telephone company's network, opening the door for superior remote voice-overs, remote broadcasts and virtual studios.

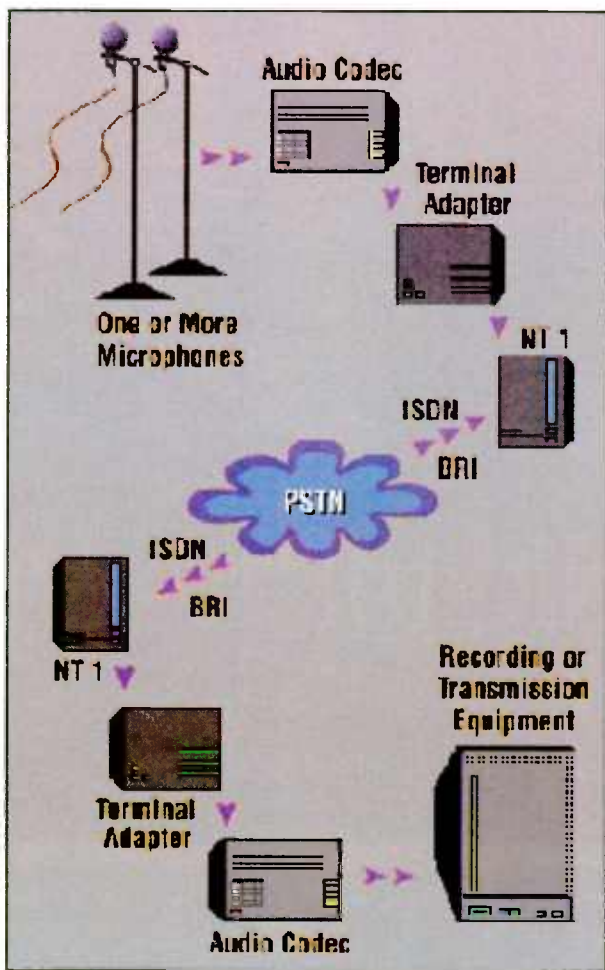
Many radio users have already put ISDN to work; others would like to do so. Because ISDN remains a relatively new technology, broadcasters still have many questions, not the least of which is, "What is it and how can I jump on the bandwagon?"

Patrick D'Innocenzo, director of Bell Atlantic Business ISDN services, often speaks to radio engineers and SBE chapters about the technology. He explains how it can be used in broadcasting, fields questions and takes suggestions.

Here, he draws from his experiences as a lecturer and ISDN expert and answers some frequently asked broadcast questions.

What exactly is ISDN?

ISDN is an acronym that stands for *Integrated Services Digital Network*. It is an international network architecture



Follow the ISDN path.

Key to Abbreviations

- NT: Network Termination
- BRI: Basic Rate Interface
- ISDN: Integrated Services Digital Network
- PSTN: Public Switched Telephone Network

Benefits:

- Remote broadcasts save time and money
- Tap a greater talent/programming pool
- Reliable, high-quality, affordable
- Cut production time
- Today, radio stations and recording studios throughout the United States use ISDN, as do TV stations and voiceover talent.

Source: MUSICAM USA

for a 100-percent digital voice, data and video communications network over standard interfaces. Standardization translates to compatibility, meaning that ISDN service (and related equipment) in Baltimore is compatible and can communicate with the ISDN service in San Francisco, New Orleans or Paris.

Local telephone companies offer ISDN, which runs over standard copper telephone wires or over high-capacity fiber optic lines. Hence, ISDN service is sometimes called an ISDN line.

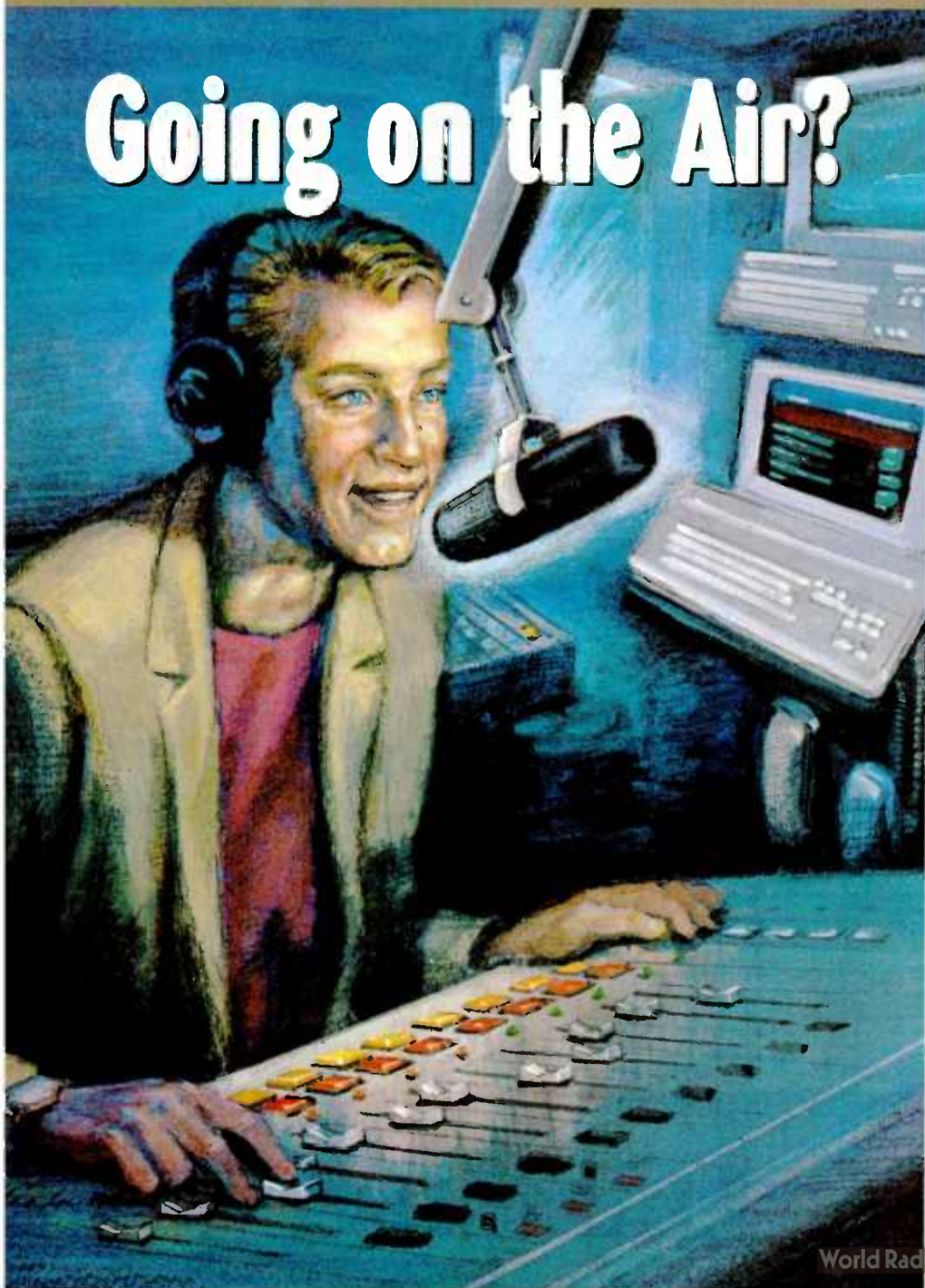
How many types of ISDN lines are there?

There are two major types of ISDN service: ISDN-BRI (Basic Rate Interface) and ISDN-PRI (Primary Rate Interface).

The more common of the two, ISDN-BRI, is sometimes referred to as 2B+D because the specification calls for two "B" channels and one "D" channel. Think of it as three virtual channels in one: the two "B," or *bearer* channels, transfer high-speed 64kbps data or video communications and voice communications; the "D," or *delta* channel, serves as the traffic cop to direct all three virtual channels and can also be used for packet data transmission.

Bell Atlantic offers both business and residential ISDN-BRI service, which differ in features, but fully interoperate.

See ISDN, page 61 ▶



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Circle (221) On Reader Service Card

SPECIAL REPORT

POTS Not Panned in the Studio

Don Elliot and
Ann Schwab

ISDN, for many broadcasters, is the best path to high-quality remotes. But while manufacturers continue to develop tools to take advantage of the power of ISDN, several companies have also developed solutions that let stations use POTS (plain old telephone service) and yet retain broadcast quality.

David Lin, director of sales and marketing at MUSICAM USA, said the trend toward digitization of radio accelerated as ISDN became more widely available. "ISDN is just the beginning of the revolution," he said. "Broadcasters will always want more bandwidth."

**All formats
need telephone
interaction. We live in
an interactive world.**

— Rich Finnlinson

Kris Bobo of Comrex said some manufacturers adapted algorithms designed for high-speed circuits such as ISDN to try to make them work on the lower-speed POTS. Comrex, meanwhile, developed an algorithm for the HotLine POTS codec specifically designed to work in the range of 12 kbps to 33.6 kbps, achieving up to 10 kHz response.

Michael Hagans and Kyle Magrill from CircuitWerkes said ISDN service remains extremely difficult or impossible to get in some areas. POTS codecs come to the rescue. Dial-up remote control systems, which also feature relay closures, are used often as backup transmitter remote controls or interfaces to automation.

Hank Landsberg, owner of Henry Engineering, sees people using higher-level data compression to get good fidelity from standard dial-up phone lines, as opposed to moving to ISDN.

Maximizing budgets

This ability to achieve high quality is perfect for today's radio users, especially group owners and LMA stations. As Rich Finnlinson of Innovative Devices Inc. (IDI) said, "Group ownership is extremely profit-driven, and formats are volatile depending on where the group ascertains the need or hole in the market ... to be competitive. These parameters are constantly shifting from ongoing changes and consolidations of facilities.

"What groups are asking for is assurance that hardware will work across multiple formats. Therefore, if and when the station is resold or formats shift, this flexibility is a bonus not only in adaptability, but also in economy."

Finnlinson remarked on the appeal of dubbing a spot to a central hard drive where multiple stations with joint or combo ad buys can access it. "This can also apply to a called-in traffic report or feature that needs airing on multiple

outlets," he said.

Gerardo Vargas of AEQ believes companies purchase equipment if, and only if, it is cost-effective to do so. "Implementation of new technologies must offer value-added to the customer," he said.

Vargas sees customers looking for an integration of telco and hard disk storage. With increasing dependency on technology, he said, the interconnectivity on telco with hard disk storage in the studio is a must.

Where is equipment going next and what are customers asking for?

Hagans sees more complex problems for tomorrow's customer, thanks to the move toward automated remote broadcast equipment. He noted recent trends including higher demand for an "in-studio" sound from remote locations. With more POTS one-man shows emanating from the field, with the host controlling the automation, the latest products are geared to unattended stations.

Bobo said the telecommuting talk show host has become a reality in many markets and no longer presents a quality problem. Stay-at-home talk-show hosts such as the Carey Brothers on KGO(AM) San Francisco now can easily screen calls using the same ISDN line at high quality. Syndicators and groups like Jacor and CBS have also adopted POTS codec units for this purpose.

Moseley, manufacturer of program conveyance devices, finds the greatest adaptations in STL, TSL and digital RPU. Dave Chancey said syndicators and organizations such as Metro Traffic have been successful in using Moseley units for its applications.

Focus on the customer

By remaining focused on customer needs, manufacturers are creating some exciting results.

Because access to ISDN lines may be limited, Vargas of AEQ said, "I foresee that the communication equipment must become an integral part of the digital computerized equipment in the studio."

He said his customers are looking for two main benefits from their in-studio telco equipment: communication and remote control capability.

Lin said MUSICAM USA customers are asking for compatibility and standardization. Because the company develops its own compression algorithms, it can design its units with multiple algorithms for flexibility.

Lin said products are backward-compatible and not everyone wants to (or can) jump on the latest, fastest product. He said every MUSICAM product must be designed to work with the oldest technology that Lin's customers are likely to possess.

Finnlinson said, "All formats need telephone interaction. We live in an interactive world and telephone interconnectivity with the listener is needed now more than ever before. People expect it. People want instant gratification."

One goal of IDI has been to simulate the in-studio feel and environment so that it is an easy leap for the talent to the remote world. The company strives to make the remote end respond with a

look and feel similar to the in-studio environment so the talent can focus on on-air efforts.

Note the interesting and timely parallel here: the business world in general expects laptops to emulate the entire office PC environment. It has become the way we live and a social adjustment is addressed with more interactive radio.

Chancey said consolidation, automation and LMAs have stimulated business. Many stations are simulcasting. To simplify operation, larger markets find great advantage in using the same equipment smaller stations use for automation as "jock-assist" machinery.

Two or more stations under the same roof may share talent, production libraries and some of the same music. Use of a central server as storage is not uncommon; engineers are working to expand use to simultaneous accessibility by several stations on-line.

Hagans and Magrill said the general manager-owner-operator-talent may also be the engineer, and may request quick-turnaround delivery. Often, he or she requires only a phone call to walk them through the hook-up.

Listener sophistication

Henry Engineering produces listener information phone systems that store and play digital audio on demand.

Customers ask for more flexibility, through telephone option menus and the ability to handle multiple incoming lines, so sister stations can share the equipment while each records its own greeting.

"We put in the ability to do multitasking within itself," Hank Landsberg said. Stations can decide which greetings, menus and audio segments will be devoted to each incoming listener line. He also said the system allows public relations firms and news organizations to distribute quality audio actualities for broadcast use.

Landsberg said station managers must remember the listener when designing remotes.

"When we hear less-than-station-quality audio, we're automatically cued in to the fact that it's a remote," he said. "If the sound quality's too perfect, the listener doesn't think the remote is real!"

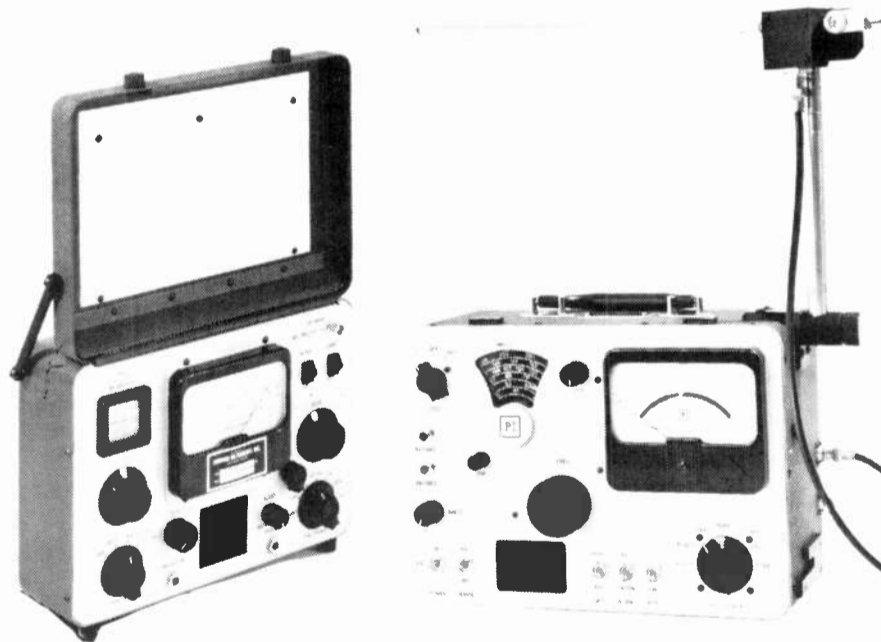
This ultimate compliment brings to mind the Goldilocks desire of "not too hot and not too cold." We too want it "just right" — an order that is getting easier to deliver with today's technology.

■ ■ ■

Ann Schnieders-Schwab is a freelance writer and broadcast consultant with Don Elliot Creative Services, LA. She also teaches business seminars for Dale Carnegie Systems.

Don Elliot is a voice actor in Los Angeles and operates Don Elliot Creative Services, specializing in commercial, jingle and promo production.

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TARGET: IN-STUDIO TELCO

Telco Gear for the Studio End

Broadcasting from a remote site requires a special combination of planning and technology. Checking and double-checking equipment, making sure phone lines are reliable, allowing for enough set-up time, anticipating potential problems with equipment and the site itself are just a few things to think about during the planning stages.

Meanwhile, back at the ranch, how does the in-studio engineer handle audio coming in from the site? There is a caller on Line 3 and he wants to speak with the reporter who is in the field. Can it be done? Noise and hum is interfering with the connection. What are we going to do about it?

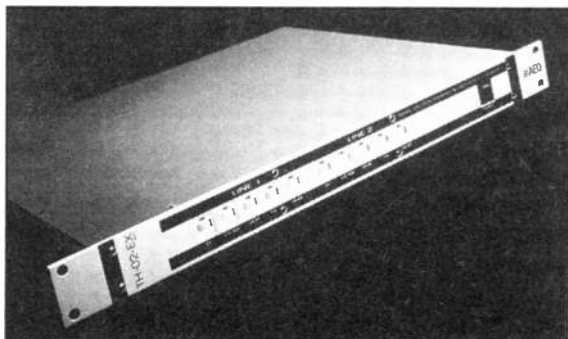
Companies have thought of all of these situations and have engineered solutions for those circumstances, plus others.

AEQ

Put two callers and the personality on the air at the same time with the

AEQ TH-02 EX digital telephone hybrid. Housed in a 19-inch rack-mount chassis, the unit provides standard built-in frequency extension, an RJ-11 connector for each phone line, XLR connectors for audio inputs and outputs and four controls for two lines on the front panel: Remote Control or Local Operation, Frequency Extension On/Off, Talk or Wait and On-Air On/Off. A second phone line is optional.

The rear of the unit features a multiplexing capability switch which allows the broadcaster to have multiple callers and the personality on the air simultaneously.



The unit requires no manual adjustment; all processing and adjustments

of the TH-02 EX function internally.

For more information, contact Gerardo Vargas in Florida at (954) 424-0203 or circle Reader Service 9.

AEV

The ITB 202, a 1 RU, dual telephone hybrid from AEV, can connect several units independently or in conference.

Equipped with a mix-minus system, the ITB 202 provides independent adjustment of Send and Receive levels and includes an Anti-Local Effect (A.L.E.) adjustment. The ITB-202 also features automatic replay and optional remote control.

With a capacity to connect to 2/4 wire or mobile telephone, the ITB-202 can be used for mobile studios. Powered by 110/220 VAC, the ITB-202 provides 600-ohm impedance, a Receive level of -16 to 0 dBm and a Transmit level of 0 dBm. All inputs are transformer-isolated.

For more information, contact AEV in Bologna, Italy at +35-51-950249; fax: +39-51-950201, via e-mail: aevsales@aev.dsnet.it visit the website: www.affari.com/aev or circle Reader Service 33.

CIRCUITWERKES

The CircuitWerkes DR-10 is targeted for unattended remote broadcasts or EAS control. The DR-10 has 10 relays; eight normally open, two DPDT. Connect the DR-10 relay outputs to an automation system and connect the telephone audio output to an unused station input.

When the DR-10 answers, enter a password, and the station can be con-



trolled via the buttons on any phone. An audio send port and built in hybrid also lets the user listen to the station from anywhere.

An optional sub-board, called the Silencer, completely removes DTMF tones from the DR-10 audio output, keeping them off air.

For more information, contact CircuitWerkes in Florida at (352) 335-6555, visit the website: www.circuitwerkes.com or circle Reader Service 81.

COMREX

With increasing numbers of remote and audio sources, the audio fed back after mixing can become difficult to manage. The Mix-Minus Bridge from Comrex allows the user to preset up to five separate feeds bypassing the console and saving operator setup.

Inputs are separately selectable and



the Mix-Minus Bridge offers individually controllable levels and sends a backfeed to all devices from the studio's audition bus. An interruptible foldback input (IFB) sends producer cues to the field through microphone or line adjustable input.

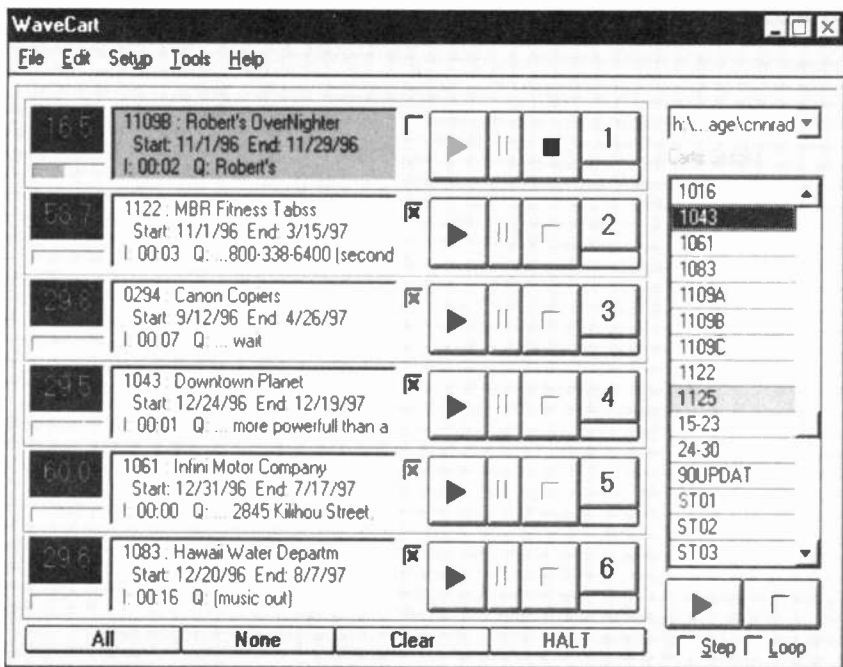
All controls are remoteable.

The Mix-Minus Bridge requires 120/240 VAC, both internally selectable. Rack-mountable, the Mix-Minus Bridge weighs in at 7.5 pounds.

For more information, contact Kris Bobo at Comrex in Massachusetts, (508) 263-1800, fax: (508) 635-0401, via e-mail: kris@comrex.com or circle Reader Service 105.

See IN STUDIO, page 53

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AUDIO TECHNOLOGIES INC.

Mix in stereo with the NanoAmp Series MX200 from ATI.

Stereo program outputs and headphones are driven by three panned mic/line inputs with independent gain and phantom power selection. The MX200 features balanced or unbalanced line level outputs that are selectable for +4 or -50 dBm. Output connectors are universal two-piece pluggable screw types.

Powered by 24 VDC, the mixer also has independent headphone monitoring and LED bargraph VU meters. In a rack or desk mount design, the MX200 can be connected to one or two input expanders to increase inputs.

For more information, contact ATI in Pennsylvania at (800) 959-0307; fax: (215) 443-0394, visit the website: www.atiguys.com or circle Reader Service 57.

Walkaway:

Turn off the lights; lock the doors; go home. A few short years ago this level of automation at radio stations was impossible. But thanks to rapid advances in technology it's now an everyday occurrence. Anyone can go home, but to go home legally it takes specialized equipment. If you're contemplating a walkaway, you need to call about our RFC-1 Dial-Up Remote Control and our DAI-1 Dial-Up Audio Interface. For instant information 24-hours-a-day call our "Fax-On-Demand" from your fax machine and request documents 101 and 110.

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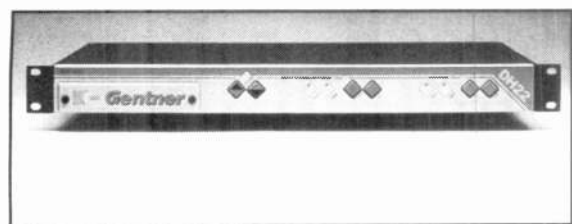
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Fax-On-Demand: (615) 227-2393

Circle (54) On Reader Service Card

► IN STUDIO, continued from page 52

GENTNER

Gentner offers both analog and digital telephone hybrids; the analog



Gentner's DH22

SPH10 and the digital DH20 and DH22 telephone hybrids interconnect between standard telephone lines and audio equipment.

The SPH10 features balanced inputs and outputs and audio filtering with EQ to eliminate noise and hum. Monitor incoming calls by using the hands-free feature. Balanced and unbalanced mix output enables the recording of both sides of the conversation.

Unveiled at the 1997 NAB Convention, the DH20 and DH22 digital telephone hybrids include such features as auto-answer, auto-disconnect, automatic mix-minus and call-progress detection.

The DH20 is a 16-bit DSP hybrid offering automatic gain control (AGC) and caller ducking. A speaker amplifier allows the user to monitor callers without headphones.

The DH22 dual digital hybrid features all benefits of the DH20 while providing two telephone interfaces that interconnect between two standard telephone lines and audio equipment.

For more information, contact Gary Crowder in Utah at (800) 945-7730; fax: (801) 977-0087, via e-mail: gcrowder@gentner.com visit the website: www.gentner.com or circle Reader Service 129.

HENRY ENGINEERING

Keep your listeners up-to-date with "listener information" lines. The Audio Online telephone information system from Henry Engineering is caller-interactive, fully automated and supports two to 16 phone lines answered simultaneously.

Consisting of a multi-line telephone modem board, Audio Online includes software that runs on a DOS-

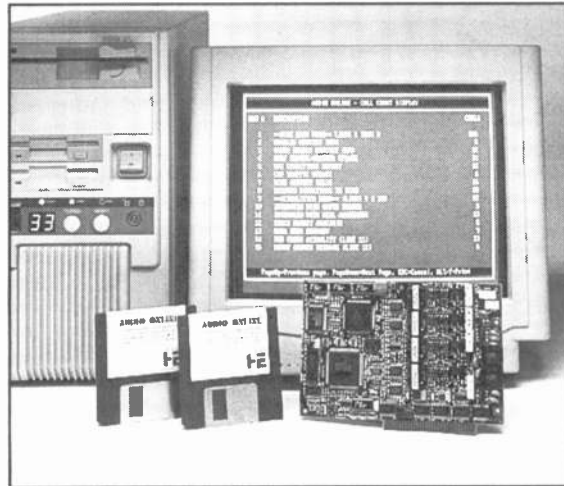
based PC. The computer's hard drive digitally records the messages; an 80 MB drive stores two hours of messages.

Lines can be programmed to answer with a single message or with a menu directing the caller to make selections. A line routing feature allows lines to operate independently or in groups.

Other features include an edit function, call counter, screen saver, record password, call count reset, reports, and direct record line inputs.

Computer requirements: a dedicated 386 or better, 40 MB hard drive, 1.44 MB floppy and DOS 5.0 or better.

For more information, contact Henry Engineering in California at



(626) 355-3656; fax (626) 355-0077 or circle Reader Service 153. Please note area code change from (818) to (626).

INNOVATIVE DEVICES INC.

The first production units for the MITS series from IDI began shipping recently. A multi-line telephone system targeted for talk shows and other on air applications, MITS can accommodate as many as 15 phone lines and as many as 30 systems can be networked.

By integrating call screening, network routing and call progress indication for PBX and Key Systems, MITS removes the need for additional network interfaces and routing devices.

Several versions of on-air control surfaces include options such as a built-in LCD for call screening; saving space and eliminating the need for a separate PC and monitor.

For more information, contact Rich Finlinson in Utah at (888) 890-7424 or circle Reader Service 177.

INTRAPLEX

A new arrival on the market, the IntraLink modular ISDN multiplexer from Intraplex allows radio engineers to utilize ISDN services for applications ranging from remote broadcast and contribution links to call screening, automation system control and LAN connection.

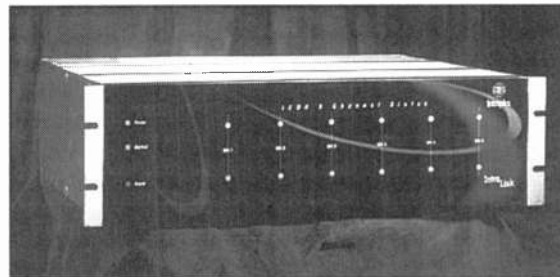
Broadcasters can customize and configure the IntraLink to

meet audio, voice and data communications requirements. As many as six Basic Rate Interfaces (BRIs) can be connected and managed from a single IntraLink 3-RU shelf.

With the IntraLink, broadcasters can transmit 15 kHz mono audio program feeds on a single ISDN B channel, while voice and high-speed data applications can be combined on the second B channel, all over a single ISDN circuit.

IntraLink supports transmission of MPEG and APT compressed audio, synchronous and asynchronous data and voice communications over ISDN.

For more information, contact Intraplex in Massachusetts at (508) 692-9000; fax: (508) 692-2200, via e-mail: sales@intraplex.com visit the



website: www.intraplex.com or circle Reader Service 201.

RADIO DESIGN LABS

A member of the Rack-Up Series from Radio Design Labs (RDL), the

RU-MX5 audio mic/line mixer can be mounted anywhere it is needed. The RU-MX5 allows a combination of mic and/or line level signals to be mixed.

Four inputs can accept mic or line level inputs; the fifth input is for line level sources. The RU-MX5 features a rear-panel jumper that can selectively connect an internally provided 24 VDC phantom voltage to any or all



mic inputs. Balanced or unbalanced, high- or low-impedance audio lines can be connected.

Two balanced/unbalanced outputs are provided: one at mic level and the other at line level.

Three LED indicators display output level metering.

Powered by single-ended and ground-referenced 24-36 VDC, the RU-MX5 provides headroom of >18 dB above +4 dBv output and THD of <0.030 percent.

For more information, contact RDL in California at (805) 684-5415; fax: (805) 684-9316 or circle Reader Service 10.

RADIO SYSTEMS, INC.

A true hybrid, the TI-101 from Radio Systems, Inc., has no objectionable gating; using the TI-101, the two-way conversation between host and caller is clear and natural.

Featuring caller EQ, a Send limiter, Receive compander, caller mute, bandpass filtering and LED clipping indicators, the TI-101 can be linked with another TI-101 for two incoming telephone lines and host.

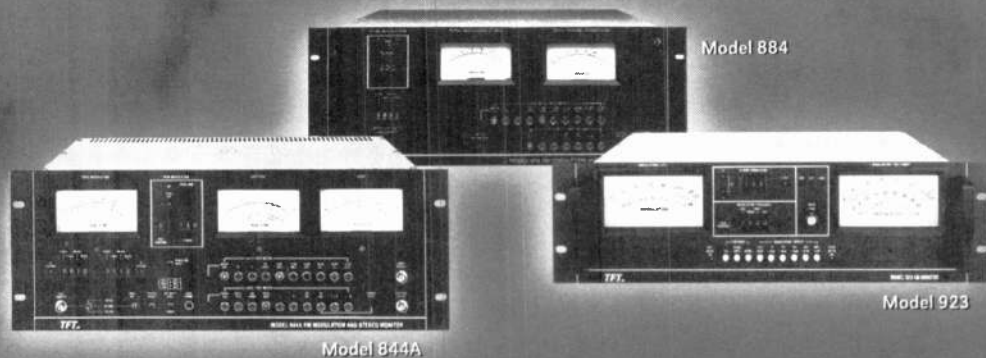
The TI-101 is compatible with virtually any professional mixer or console.

Powered by 120 or 220 VAC, the TI-101 has a response of 300 Hz - 3 kHz, ±3 dB and an electronically balanced input impedance of 16.7 Kohm with a telephone port impedance of >600 ohms.

See IN STUDIO, page 63 ►

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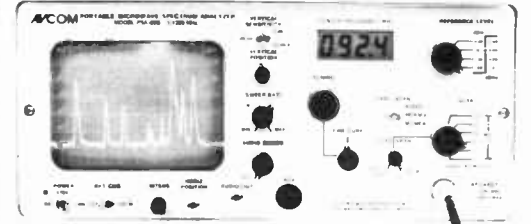
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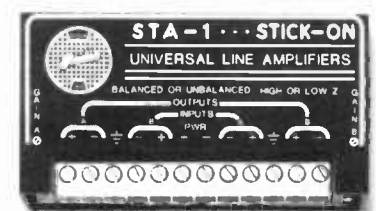
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July 4th Remote Featured Smarti

► SMARTI, continued from page 48

We knew CD quality would never come out of that phone line, but were extremely happy with what did. For an operation used to phone-ins and occasional live-taping at music events, WEBR members were overjoyed with the ability to do a real-time music broadcast with good-quality audio. It almost made us all forget we were working for free on the Fourth of July.

Our studio-to-site talkback was not working properly, and when we tried to use it, we got the same digital junk we experienced with the loose ribbon connector. I chalk this up to the rush to get units out to us in time for the event.

Because Smartis actually began to ship right around that time, we just might have received one of "those" units. It happens, and I spoke with the Marti tech staff about the difficulty.

Line conditions dipped several times

Engineer, Smarti and Tornado

David C. Matyis, director of engineering for KVET-FM, Jarrell, Texas, recently gave the Marti Smarti a unique test up against Mother Nature's storm-of-all-storms, a tornado.

This past May, a twister touched down in Jarrell, generating winds of more than 70 mph in the nearby Austin area. KVET lost its studio microwave tower and, although the tower crew erected a temporary tower in less than 24 hours, they



could not reestablish the microwave link.

Already familiar with Smarti capabilities through their beta tests, the engineers at KVET-FM set a pair up to send audio to the transmitter site and began broadcasting — for nearly 44 hours straight.

"It never dropped off once and absolutely saved us in the wake of this disaster," stated Matyis. "In the face of this weather emergency, we were able to continue to broadcast and keep the public informed, while not sacrificing our advertising revenue."

Matyis was so thrilled with the performance of the Smarti that he plans to sing its praises to the Texas Association of Broadcasters.

In a salute to the ingenuity of KVET and Smarti engineers, Matyis stated, "Thanks again, for keeping us on the air ... even when the odds were against us!"

— Susan Gary

during the event. The Smarti error correction rebuilt the affected audio with little sign that anything was wrong. Although audio "machine-gunned" (a rapid digital stuttering) several times during dips, these episodes ended by late afternoon.

Successful remote

Recordings were made at both ends of the remote. There is no mistaking which tape was made where, but most everyone agreed the Smarti pulled off the job quite well. And at 7 kHz response, our broadcast audio was probably on-par with what the live audience was hearing; given the ten-

dency for many PA speakers to cut highs.

Should you use this for *entirely* remote broadcasts including music? Well, ISDN is much preferred for that application. Plus, the Smarti tends to delay audio longer than 0.4 seconds in MPEG mode, so interactive broadcasting would be a challenge.

But in the field with mics, an "Instant Replay" and perhaps a live musician, the Smarti is a contender. No worry about getting "the RPU shot" just right. If you are near a phone, you've got a clean hop back to the studio.

POTS codecs are not compatible with other manufacturers' units

(AETA, Comrex and MUSICAM USA included), nor will they work on a cellular connection; the data rate is inadequate.

Marti also has the CellCast, a combined mixer/cellular telephone with a frequency extender for extremely mobile broadcasting. It lacks the bandwidth of the Smarti but is a fine product itself.

I cannot guarantee Jim Godfrey will personally deliver your unit, but the Smarti is finally here and was worth the wait. I now retire the phrase, "Marti is not shipping yet."

■ ■ ■

For information on the Smarti, contact Marti Electronics in Texas at (817) 645-9163 or circle Reader Service 200.

Al Peterson is technical editor for RW and technical advisor to WEBR.

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Headphone Monitor Systems	1	2 independent
Relay Contact Closures	No	Yes, 4 send and receive
Line Output	Unbalanced	Balanced
Other Outputs	Tape output with Send/Return fader and level control	Unbalanced local mix and unbalanced return audio
Battery Operation	No	Yes, from 12-volt supply
Price, F.O.B. Factory	\$3350 for 2 units (2 required)	\$3350 for 1 unit (2 required)

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World Radio History

USER REPORT

Telephone Remotes the JK Way

Alan R. Peterson

The JK Audio way to do remote telephone broadcasts includes two portable mixers that work over POTS lines: the RemoteMix C+ and RemoteMix 3.

These are not high-tech rocket-boxes that digitize, quantize or ISDN-a-size. They are simple, straightforward, well-made interfaces/mixers that send tele-



phonic audio back to the studio from the ball park, county fair or scene of the fire.

Both are self-contained, two-channel mic mixers with built-in DTMF keypads, headphone amps and modular connectors that jack directly into typical RJ-11C phone sockets. All in heavy black steel cases less than 7 inches wide.

With fax/modem adapters (available at cellular phone dealers), the RemoteMixers will work with most cellular telephones. The RemoteMix 3 has a three-position slide switch to select analog, digital or multi-line phones to connect.

One more time

The original RemoteMix C+ was redesigned into the new RemoteMix 3, following customer feedback and a preliminary RW review early last year.

The engineers and designers put some good thought into both of these little mixers. They have RCA connectors to accommodate cassette decks; users can talk up a prerecorded interview, then play it right into the mixer. A balanced line-level XLR jack connects the RemoteMix to pro boards and high-quality recorders.

The steel chassis feels solid and does not flex under finger pressure when dialing a number on the built-in keypad. And where many remote mixers have feeble keypads, this one feels serious.

There is a battery test button on the front panel, and a wallwart supply is included with the mixer. A ringer can be switched on and off at will. A 10-turn pot adjusts hybrid null to balance send/receive levels. Mic inputs are for dynamic mics; there is no provision for phantom power.

Testing

Lacking high school sports during early summer, we tested both RemoteMix units under more controlled conditions. Another phone was called from the RemoteMix and both sides of the conversation were monitored and recorded.

DTMF tones were clean and stable, and at the proper level to be "heard" by

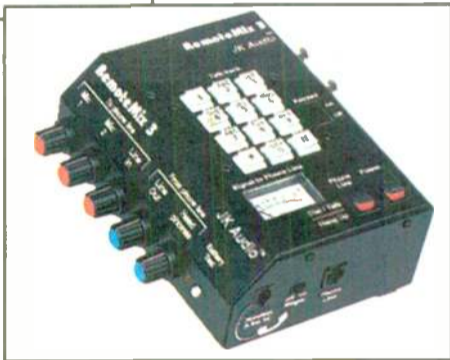
the phone company. A Dial/Hangup rocker switch on the top of the unit controlled the telephone part of the mixer.

A Sennheiser 421 mic was tested on both mic channels. Sound was clean on both inputs, but preamp noise was present on the original C+ unit. Mic signals tended to get clippy on loud passages, but this changed to nearly a mixer driven hard.

The null circuit, while not a true minimus, worked effectively. We did not need to readjust the balance, but if it had become necessary, the 12-page manual explained how.

There are two dials for Tape: Send and Receive. The user could easily grab the wrong one when mixing, so JK Audio gave the knobs different colors.

Two 9V batteries will power the RemoteMixer for 36 hours. They will quickly go soft if headsets are paralleled



or run at excessively high levels.

Also, the power switch is easy to forget when the broadcast is over. The batteries will continue to chug along and will not

be there the next time you need the mixer. Use battery power sparingly and run off the AC adapter when you can.

Ch-ch-changes

My impressions about the original RemoteMix C+ included an observation about construction. It was efficiently made while not being shabbily built. A smeared legend screening and a dimply basecoat on the earlier version caught my eye, but both have been resolved on the new units.

I noted noise in the original unit's mic preamp and headphone channel. This has

My favorite improvement was the bushing added to the screw on the battery compartment door to keep the screw from falling out.

been made better in the newer unit.

The earlier mixer had one headphone jack, and JK recommended a Radio Shack splitter for a second set of phones. Since then, a second jack has been added.

The C+ had no way to visually monitor signal level. I suggested a green/red clip LED because I thought there was no room for a meter. JK proved me wrong and found enough space to put in a VU meter.

In fact, JK found room for a lot of things. The top panel now includes a talkback button, a speaker and a switch to turn the keypad on and off. The panel is rather busy but easy to maneuver around.

My favorite improvement had to be the bushing added to the screw on the battery

compartment door to keep the screw from falling out. The earlier box lacked this feature, guaranteeing loss of this screw less than an hour after purchase.

Conclusions

Stations always need a portable, no-hassle telephone mixer at times. Both RemoteMix devices fit the bill nicely.

Both are small and durable, have the phone built right in and work well. With a tiny headset/mic combo, your field package might fit into a fanny pack.

Maybe you won't want a talkback button. Perhaps you wish to have the keypad

left on at all times to send DTMF tones back to the station to activate a recorder. Possibly a meter is not necessary for your needs. Having a choice of two boxes means you can get only the features you know you will need.

A suggestion: the RemoteMix comes in a cardboard shipping box. Keep it to transport the mixer when doing your roadshow or invest in a carrying case (see related article, p. 58). Besides keeping crud out of the circuitry, it minimizes the risk of your striking the device against a corner and shearing off the shaft of a pot. Location broadcasts are not known for gentle treatment of gear.

For more information or a catalog of other telephone products, contact JK Audio at (815) 786-2929 or circle Reader Service 152.

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Bag 'Em, Rack 'Em: Protect Your Gear

Alice Hornbaker

Sometimes, a demonstration can take an unwanted turn.

Freed International vice president of sales and marketing Cheryl Freed wanted to show a trade show audience just how tough an SKB case is.

"We asked the biggest guy in the audience to help us," said Freed. "We first gave him an ax and asked him to hit a wooden case. He shattered it. Next, he hit one of ours. Not a dent. But the ax head flew off the handle

and went right out into the audience."

Her point was well made. And so are the hard cases used to protect and transport gear to remote broadcasting sites.

Saddles, cases and the military

"Our cases are made to almost military standards, so they can withstand drops and hard conditions," said John Shaw said vice president of sales and marketing for G.H. Ellis Co. Inc. in Indianapolis. "We customize products ... or we can provide standard products."



GH Ellis bags can take the fall.

They make industrial cases for specific applications in the telecommunication industry and the military.

"We've been in business since 1902," Shaw said. "Back then, they made saddles and harnesses. Then, the telecommunication industry grew and new needs were identified to help them protect their high-tech equipment while on the road. G.H. Ellis Company grew, too."

Most of the radio equipment cases designed by G.H. Ellis are well-padded and made from tough, hard plastic. Recently, they have made cases from aluminum, which today are

Cases and racks are offered in a startling array of wood, plastic and other materials. Ask your dealer for suggestions.

used extensively in the Far East and throughout Europe. "They are really tough," Shaw said.

Casing made from harder materials is the trend for broadcast equipment. Because the gear is getting costlier, the company must make products that promote customer confidence.

"We offer a lifetime warranty on material defects and workmanship. While no single case is impervious to everything out there, our products are up to doing the job," Shaw said.

Tough enough

"Our mission is to build the highest-quality custom case in the world, in the fastest time and with on-time delivery," said Vin Calzone, vice president of Calzone Case Co.

By constructing the cases from plywood and covering them with an outer plastic laminate and all-steel hardware, Calzone hopes to make them "just about impervious to any exterior challenge."

Last year's merger with Anvil Cases of California reportedly made Calzone the largest manufacturer in the industry. The company's best-known product is the ATA 300, custom-designed to carry whatever equipment the

See CASES, page 71 ►

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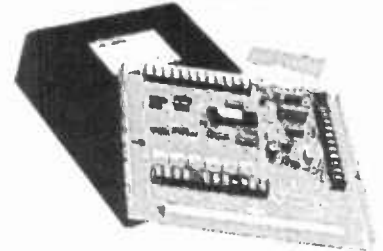
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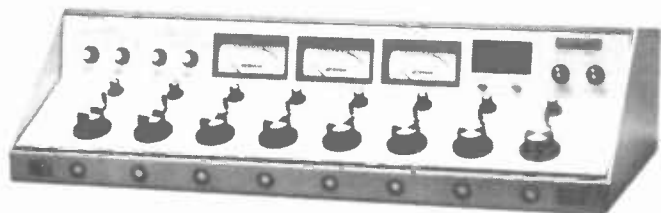
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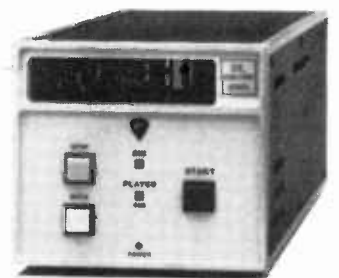
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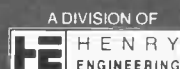


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Your ISDN Questions Answered

► ISDN, continued from page 50

ISDN-PRI service is much like ISDN-BRI, except that it offers 23 B channels and one D channel, and is, therefore, sometimes referred to as 23B+D. Offered to business customers only, ISDN-PRI is used primarily for video conferencing, Internet access and other high traffic applications.

Is ISDN deployed and really available?

ISDN service is widely available throughout the United States and Europe; of all the major metropolitan areas, ISDN is accessible to more than 90 percent of the potential subscribers.

Some ISDN service providers — Bell Atlantic, Pacific Bell, Ameritech and NYNEX — are offering "ISDN Anywhere" programs, making ISDN obtainable virtually anywhere in their service area.

Generally, service providers aim to make ISDN as attainable as POTS (Plain Old Telephone Service) and some have already accomplished it.

Are people and businesses actually using ISDN today?

According to company record, as of May 1997, Bell Atlantic has sold and installed approximately 235,000 ISDN lines within the Mid-Atlantic region, a 45 percent increase over 1996 figures.

In fact, Bell Atlantic statistics show that, so far in 1997, more than 6,000

ISDN lines per month have been sold and installed. The majority — more than 95 percent — have been for businesses, but residential ISDN use is beginning to come on strong.

If you are located in a region serviced by other than Bell Atlantic, you will need to call other numbers to order ISDN.

- Ameritech**
(800) 832-6328
- Bell South**
(800) 428-4736
- Cincinnati Bell**
(513) 566-3282
- NYNEX**
(800) 438-4736
- Pacific Bell**
(800) 472-4736
- SNET**
(800) 430-4736
- SBC Communications**
(800) 792-4736

How is ISDN used by radio broadcasters?

ISDN lines are put in at the studio and at a remote broadcasting site — a restaurant, for example. Once the broadcast begins, the audio is fed into an audio codec, which digitizes the audio, sending it to the studio over the ISDN Network as 100-percent digital data.

The ISDN line at the station receives the digital audio feed for broadcast.

Broadcasters benefit from ISDN in several ways. Remote digital broadcast audio is virtually error-free and much more reliable than analog. The 128kbps capacity of ISDN allows

CD-quality audio transmission. ISDN service is attractively priced, widely available and can be installed with minimal lead time.

What is the cost of an ISDN line?

Bell Atlantic offers Business ISDN-BRI throughout its service area with a monthly cost of about \$38 and an installation fee of about \$150.

With an installation fee of \$125, residential ISDN-BRI service costs between \$23 and \$31 per month with additional charges between one cent and two cents per minute for local data calls made.

How does one communicate using an ISDN line?

In order to communicate, the service requires ISDN customer premises equipment (CPE). Many vendors offer ISDN CPE suitable for a host of uses.

The ISDN CPE can take the form of an ISDN Modem, or terminal adapter; an ISDN Video Conferencing System; an ISDN NT-1; an ISDN router for Internet access; or an ISDN audio codec, like the type companies advertise in **Radio World**.

After equipment configuration and connection to the ISDN line, putting ISDN into service is easy. Dial the seven- or 10-digit telephone number of the destination.

How do I find out more about ISDN?

Business and residential customers in the Bell Atlantic service area can contact two specialized centers for information about ISDN.

For prices, availability, orders, post-sale support or general ISDN questions, businesses should contact the Bell Atlantic ISDN Sales and

Technology Center at (800) 570-ISDN and residential ISDN customers should call (800) 204-7332.

The Bell Atlantic ISDN website contains pricing, applications, technical and other information along with useful services. Order ISDN lines electronically through the site and correspond with the Bell Atlantic ISDN Sales and Technology Center via e-mail. The website address is: www.bell-atl.com/isdn/sbs

Patrick D'Innocenzo directs Bell Atlantic's Business ISDN services and speaks to local SBE chapters about ISDN technology. Contact him through RW at (703) 998-7600 or e-mail at 74103.2435@compuserve.com

Write to us about your experiences with ISDN service.



Problem:

I need a new FM transmitter but prices are so high I may have to settle for a used one.

Solution:

The ECO Series!

Rugged, Feature Packed & Reliable the **ECO** series was built with you in mind.

We've kept the cost low - so low in fact the **ECO** series competes favorably with the total cost of a used transmitter.

ECO quality - unsurpassed!

Plus you will experience the benefit of lower operating cost with extra long tube life and lower power consumption.

The most **ECONOMICAL** new transmitter on the market is available in powers from 2KW to 50KW.

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Great Solutions!**

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Valatie, NY 12184
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Fax 518-758-1476
energy-onix.com

Circle (198) On Reader Service Card

The North American ISDN Users' Forum (NIUF) is a good source for technical information about ISDN. The group holds symposiums throughout the year to present and discuss new uses, standards and technologies as applied to ISDN.

The NIUF has produced several papers and books on specific ISDN topics, including documentation on:

- ISDN Wiring and Powering Guidelines (Residence and Small Business)
- Wiring ISDN Service to a Single Target Room
- Wiring ISDN Service to Multiple Target Rooms
- Implementation Agreement for ISDN Terminal Adapters Providing an Extended Analog Voice R-Interface
- ISDN Basic Rate Interface Wiring and Powering Guidelines for Commercial and Multi-Tenant Residential Buildings, Version 1 (Single and Multi-Tenant High Rise Buildings)

For more information about ISDN or NIUF, write to NIUF Secretariat, c/o NIST, Bldg. 820, Room 445, Gaithersburg, MD, 20899; call (301) 975-2937; or visit the website at www.niuf.nist.gov/misc/niuf.html

How Many Ways Can We Use ISDN?

Increasingly, both businesses and individuals subscribers to ISDN service are learning to maximize its versatility. While some of its uses are directly related to radio (such as remote broadcasting), the most prevalent and fastest growing uses of ISDN include other ways of communicating between businesses and/or individuals.

Here are a few creative ways to apply ISDN in your company or station.

Digital Audio: The ISDN network is used to transmit CD-quality digitized audio for remote broadcasts, voiceovers and audio collaboration.

Internet Access: ISDN offers clean, all-digital, high-speed 128kbps access to the Internet.

LAN Interconnect: ISDN allows small offices and small local area networks (LANs) to communicate with each other electronically, making electronic commerce, e-mail and other wide-area networking applications for businesses faster and easier.

Telecommuting: ISDN offers

high-speed, digital access to computer networks and the Internet while offering the ability to have analog telephone or fax service on the same line.

File Transfer: ISDN offers a way for small companies to send graphics files, financial files and e-mail quickly and efficiently between companies and locations.

Voice Communications: An ISDN voice telephone system offers a multitude of sophisticated features, including Caller ID, one-button hold, drop, conference and transfer, the ability to track and log incoming calls, and enhanced call waiting/multiple call appearances.

The system is housed, provisioned and maintained in the telephone company's office rather than at the customer's location.

Video Conferencing: ISDN allows users to conduct real-time video, audio and data conferences over the ISDN network, across town, or across the continent using standard personal computers.

— Patrick D'Innocenzo

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.

POWERFUL DIAL-UP CONTROLLER



The CircuitWerkes DR-10 Dial-up controller is perfect for studio & automation control.

- ▶ 10 dry relay contacts out (2 are DPDT for switching bal. audio, etc.).
- ▶ Auto-answers on settable ring # and auto-disconnects with telco CPC.
- ▶ Each relay can be assigned to any tone & can be set to function as momentary, latching closure with distinct on/off codes, or interlocked latching with other relays. Any relay can be assigned to any tone(s).
- ▶ Up to 8 digit user set password prevents pirating.
- ▶ Each relay is programmable to close at beginning or end of tone and can beep when activated. End of tone closures are after the beep!
- ▶ Two-tone & detection delay modes eliminate faling for remotes, etc.
- ▶ 4 Status inputs beep when queried, dial 4 numbers & control relays.
- ▶ A simple, built-in audio hybrid, with active, balanced input & outputs, lets you control your equipment while monitoring local audio sources.
- ▶ All audio & control connections via easy to use screw terminals.
- ▶ Retains its settings & prior state after a power failure.
- ▶ Silencer option removes DTMF tones from output.
- ▶ List price only \$449.00. Compare our features & price to anyone else!

The DR-10 can do a lot more than space allows us to print. For complete info & downloadable manuals, check out our web site - <http://www.circuitwerkes.com/>
*end of tone closures function in momentary mode only.

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READER SERVICE NO. 20

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Our **Wired STL** lets you locate your audio processor and stereo generator in the studio. It transmits composite audio baseband through 2500 feet of inexpensive twinax line, so you can reach your STL on the roof or your transmitter down the hall.

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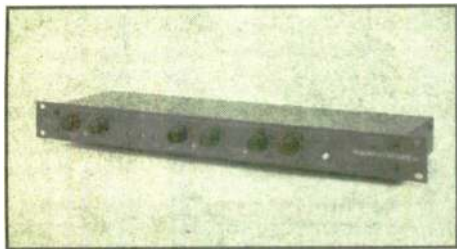
Phone:
415-824-3499

FAX:
415-824-4738

In-Studio Gear Helps Remotes

► IN STUDIO, continued from page 53

For more information, contact Radio Systems in New Jersey at (609) 467-8000; fax: (609) 467-3044 or circle Reader Service 34.



467-8000; fax: (609) 467-3044 or circle Reader Service 34.

RE AMERICA

Available in two versions — one for analog and digital audio formats and one for analog only — the RE 660/661 from RE America can encode and decode a stereo, mono or two-channel MPEG Layer II program, or one or two independent G. 722 mono signals.



The transmission bit rate can be selected between 56 and 384 kbps, and the sample frequency can be set from 16 to 48 kHz.

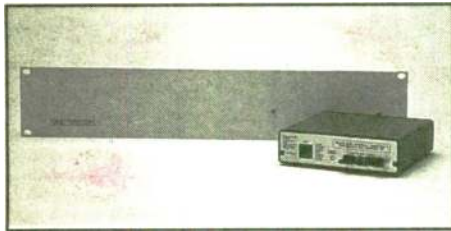
The encoder's configuration is set either via the instrument's front-panel keyboard or remotely through using relays or TTL signals. The decoder is self-configuring.

Two network connectors allow the encoder to feed two network paths in parallel (redundant mode) or split the bit rate (split mode).

For more information, contact RE America in Ohio at (216) 871-7617; fax: (216) 871-4303 or circle Reader Service 58.

SINE SYSTEMS

The DAI-1 Dial-Up Audio Interface from Sine Systems combines an auto-coupler, a dial-out alarm, two AGCs, a DTMF operated equipment controller and an audio switcher into one device.



Commonly used for emergency broadcasts and EAS alert notification, the DAI-1 can also allow "dial-up" remote broadcasts when the studios are unmanned.

An optional DAI-RP provides a space to rack-mount the DAI-1, a power supply, a screw-terminal interface module and five general-purpose relays for equipment control and audio switching.

Other optional accessories include the DB-1, a 50-millisecond delay board, and the CI-1 Composite Insertion Module.

For more information, contact Sine Systems in Tennessee at (615) 228-3500; fax (615) 227-2367 or circle Reader Service 82.

ZERCOM

Providing full duplex audio, the Zercom Telephone Hybrid (ZH-2) connects a telephone line to a studio console with two-to-four wire conversion. The interface features a nulling circuit to compensate for the inherent 15 dB send-to-receive level difference. The circuit reduces the local send audio as heard back in its receive output.

The Zercom Telephone Hybrid offers adjustable input and output gain controls which are active balanced. DC flowthrough is prevented by a user-selectable direct line hold configuration or an isolated capacitor.



Trans-hybrid leakage is reduced by an audio processor to the point where it is not normally audible to listeners.

The Zercom Telephone Hybrid is a complement to the Max-Z and Max-Z

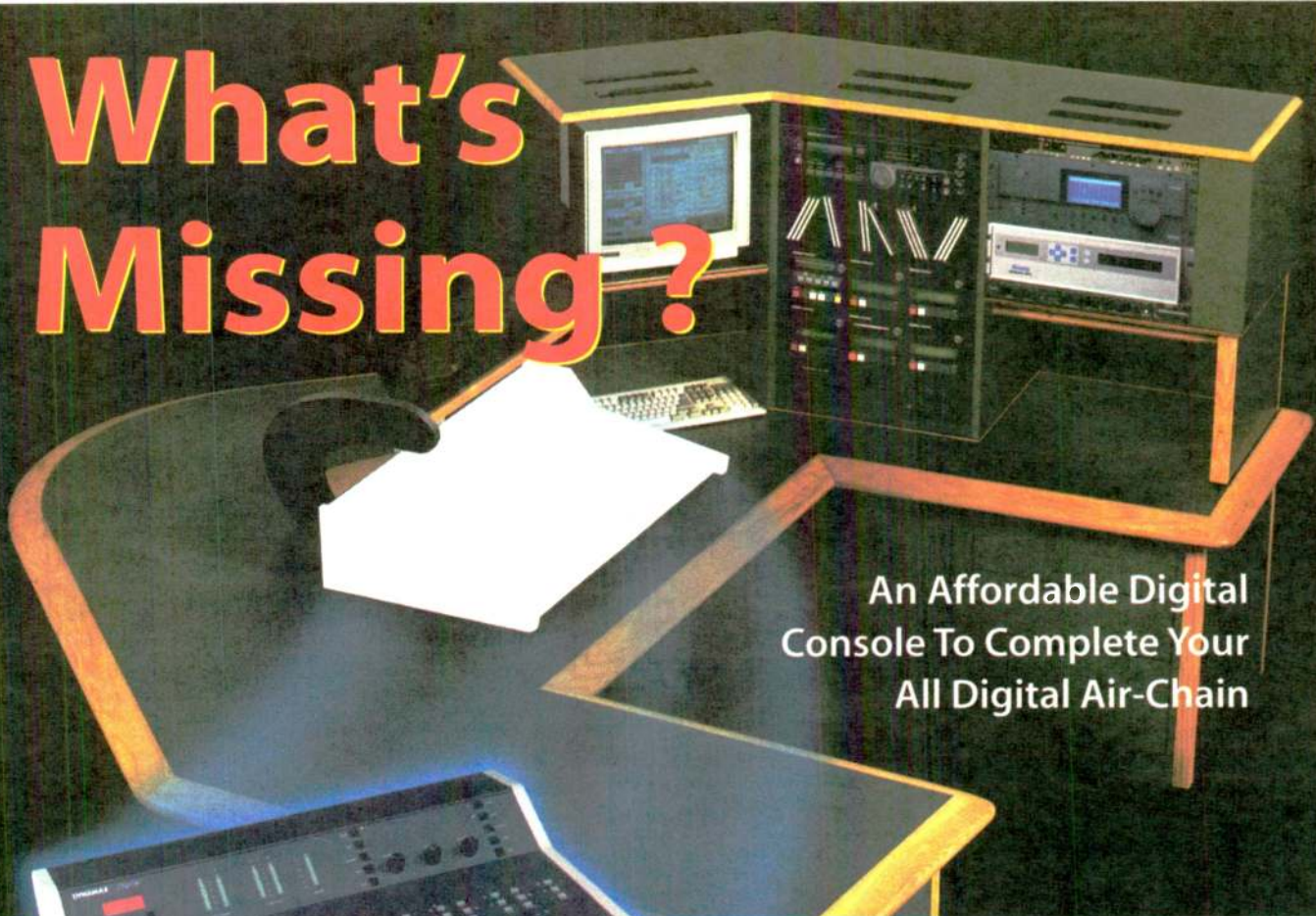
II remote telephone systems/consoles. For more information, contact Zercom in Minnesota at (800) 950-4260 or circle Reader Service 106.

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Our preview of the
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What's Missing?



An Affordable Digital Console To Complete Your All Digital Air-Chain

DYNAMAX MX/D Digital Audio Console

So your old on-air console needs to be replaced. Most of your air chain is digital and you know digital broadcasting is just around the corner. What do you do? The Dynamax MX/D Digital Console makes perfect sense. It offers pristine 24 bit internal processing to handle both digital and analog inputs and outputs with the familiarity and straight forward operation of analog consoles. A perfect blend of digital sonic quality, performance features and legendary Dynamax reliability, the MX/D is the right console to meet your current needs and take you well into the 21st Century!

**Complete
Digital On-Air Console
Under \$10,000**

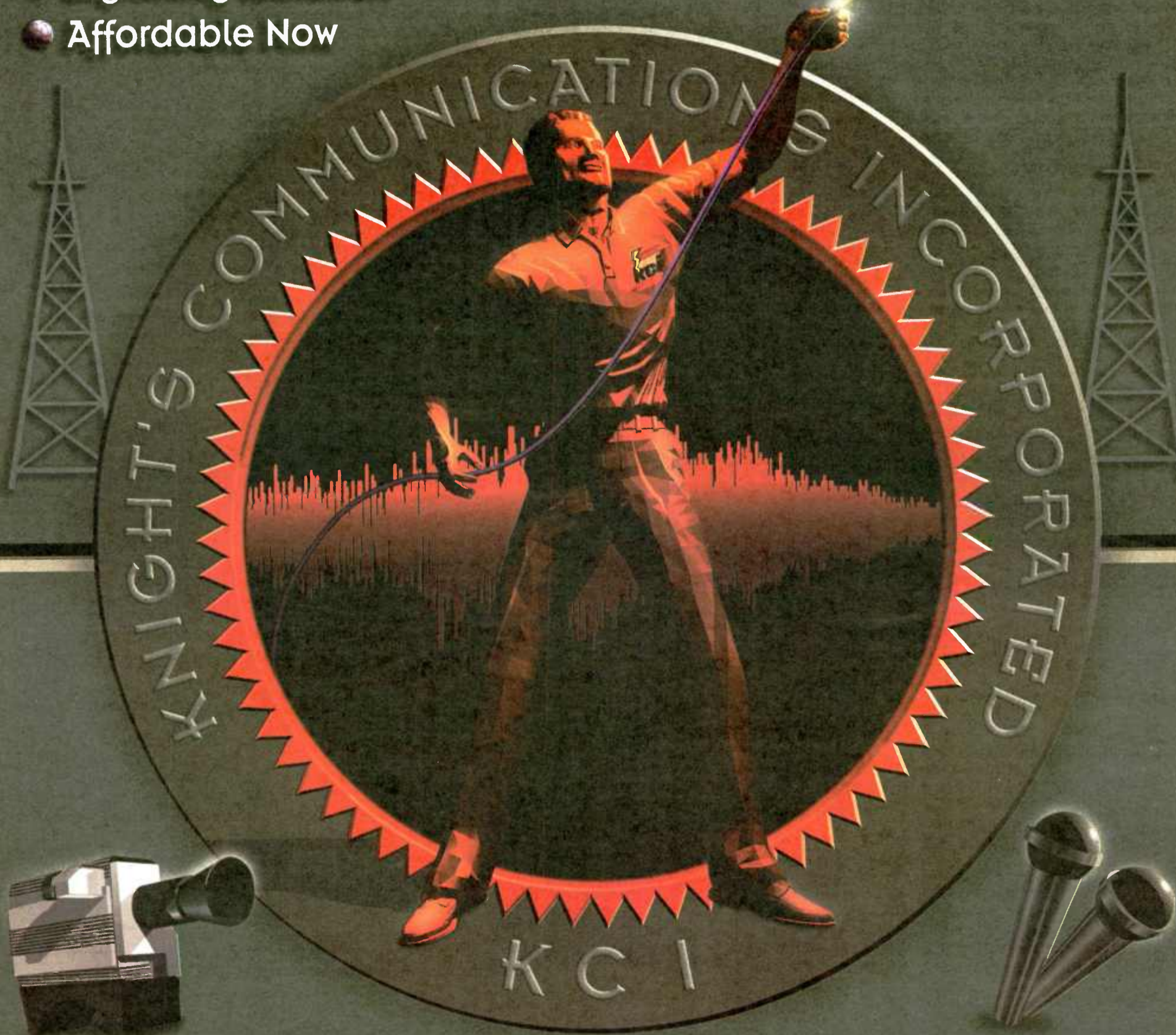
- 8 faders controlling 16 total inputs
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- AES/EBU and S/PDIF digital inputs with sample rate conversion
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TARGET: TELCO FIELD GEAR

Ideal Products for Field Work

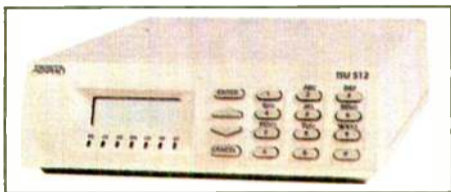
When your general manager says, "We've got a remote scheduled for next Saturday," does your heart start racing? Do you work overtime just for the "remote chance" (pardon the pun) that things will go right?

The folks at these companies solved some remote broadcasting problems and came up with some good ideas.

ADTRAN

The ISU 512, a basic rate inverse multiplexer from Adtran, connects data terminal equipment to the ISDN network.

The ISU 512 provides high speed data transmission for a single application at rates up to 512 kbps. Data terminal equipment is connected directly to the ISDN network with the ISU 512 and as many as four BRI lines, where two 64 kbps B channels are associated with each line.



At rates more than 64 kbps, the Bonding Mode I inverse multiplexing protocol synchronizes data using from one to eight 64 kbps B channels.

The ISU 512 also supports dedicated 2B1Q services for a dedicated point-to-point service where no dialing is necessary.

For more information, contact Adtran in Alabama at (800) 9 ADTRAN; fax: (205) 963-8699 or circle Reader Service 130.

AEQ

Designed as the field unit companion for the AEQ TH-02 EZ, the AEQ TLE-02 is a three-in-one product: digital hybrid, portable mixer and line extender.



Featuring a dial pad, pulse/tone selector, extended/normal mode, headphone jack and mic/line input, the TLE-02 includes a 12 DC transformer and the ability to run on eight AA batteries that provide a cycle close to four hours of autonomy. An RJ11 phone line connector in the rear of the TLE-02 enables the unit to link to a cellular phone through an interface.

Used as a frequency extender, the TLE-02 acts as an encoder/decoder and improves the sound quality of the limited phone line bandwidth.

Weighing 3 pounds, the TLE-02 comes complete with a carrying case.

For more information, contact Gerardo Vargas in Florida at (954) 424-0203 or circle Reader Service 154.

AUDIO TECHNOLOGIES INC.

A new addition to the NanoAmp Series from ATI, the MXS100 is a stereo output mixer for ENG and field production. The MXS100 features a test tone oscillator,



built-in slate microphone and three panned Mic/Line inputs with switched low-cut filters.

Powered by 24 VDC and providing mic phantom power, the MXS100 has independent gain and pre-fade cue selection, an independent headphone amplifier switchable to stereo program or L+R and external cue.

Outputs are selectable for +4 or -50 dBm into balanced or unbalanced loads.

For more information, contact ATI in Pennsylvania at (800) 959-0307; fax: (215) 443-0394, or circle Reader Service 178.

BE/MARTI

A whole studio in one is contained in the RBS-400 from Marti. The new remote broadcasting system eliminates line-of-sight requirements, phone line access and

antenna problems because the RBS-400 can operate using cellular technology.

A choice of three power options — AC power, internal battery or 12 VDC (cigarette lighter) adapter — is available. The



RBS-400 features a 2-line, 16-segment, backlit LCD display and a 3-watt cellular transceiver.

The RBS-400 offers a 4-channel mixer, program or cue, mic or line selectable.

For improved audio frequency response, Marti included a software-selectable single line encoder that is compatible with any major line decoder.

Several accessories are available, the AC power adapter, a 12 V cigarette adapter, an AC-to-DC power cable and an optional C80-RBS antenna.

For more information, contact Marti in Texas at (817) 645-9163; fax (817) 641-3869, via e-mail: marti@flash.net or circle Reader Service 202.

CIRCUITWERKES

The CircuitWerkes RP-1 is a battery operated combined portable mic and headphone amp, designed to be carried into



remote locations for broadcasting on any 4-wire circuit.

Powered by two 9V batteries, the RP-1 features XLR mic and program output connectors and 1/4-inch stereo headphone/cue jack and 3/5 mm auxiliary input jack.

The RP-1 includes a tone oscillator, calibrated LED meter, and auxiliary audio input for cassettes or other external sources and a cough switch. The RP-1 can be used as a line tester.

For more information, contact

CONEX

The newest addition to the Conex line of telephone interface products, the CellJack II is designed to interface to Motorola bag-type cell phones.

Incorporating a 3-input mixer with a front panel LED level indicator, two of the inputs of the CellJack II are either mic or line level and the auxiliary line level input. The two mic inputs and two headphone jacks eliminate the need for an external mixer for most applications.

The CellJack II features a tuner input for off-air monitoring, Send and Receive level controls and comes with an interconnect cable.

For more information, contact Conex in Washington at (360) 734-4323; fax: (360) 676-4822, or circle Reader Service 35.

COMREX

For 10 kHz full-duplex audio on standard POTS telephone lines, the HotLine from Comrex combines a high speed V.34 modem and a digital codec.



The digital codec uses a proprietary algorithm written specifically for the connection speeds obtainable on analog telephone lines, which is based on perceptual coding.

The HotLine also contains automatic modem negotiation, quick-dial memory storage and last-number redial.

The HotLine can be used for news, sports, weather and traffic feeds to drop-in remote broadcasts anywhere in the world.

For more information, contact Kris Bobo in Massachusetts at (508) 263-1800; fax: (508) 635-0401 via e-mail: kris@comrex.com or circle Reader Service 59.

EXCALIBUR

For both in- and out-of-studio use, the HC-1 Handi-Coupler connects in series

See REMOTE, page 67

Audio Solutions

Audio testing requires specialized solutions. Audio Precision offers three lines of audio analyzers for engineering and production testing.

ATS-1

- * Analog audio test system - 2 channel with advanced front panel operation & GPIB interface
- * High performance: System THD+N ≤ 0.0025%+3μV
- * Cost effective

System Two

- * A new standard for today's digital and analog audio systems
- * PC Multimedia & Digital interface testing
- * Reduced bit-rate codec testing for audio & telecom
- * Analog residual THD+N ≤ 0.0004% (-108dB)
- * Digital analyzer residual ≤ -140dBFS, wideband



System One

- * The Recognized Standard for analog & digital audio testing
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SPECIAL REPORT

Out of the Box and In the Field

Janet Evans

"Even if you're on the right track — you'll get run over if you sit still."

Will Rogers couldn't have imagined how true those words would sound today. Remotes, in his radio days, were more than a field trip — they were a downright adventure.

More than 60 years after his death, the radio industry continues an endless quest for new technology that will produce faster and better-sounding audio from the field. Rogers would be pleased to know that radio is not just sitting on the tracks, it is moving

— at breakneck speed — toward the audio solutions of tomorrow.

Manufacturers say new radio technology results from attention to customer requests.

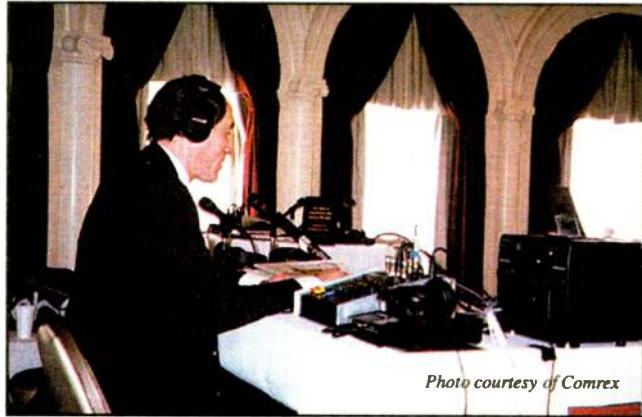


Photo courtesy of Comrex

'On the road again ...' Don't you wish your remote was always like this?

The search for answers to their questions leads to products with more bells and whistles.

Digital is everywhere

For instance, digital audio is at the forefront. No longer the new kid on the block, it is in a constant state of evolution in the development labs of broadcast equipment companies.

Ed Mullin, vice president of Audio Technologies Inc. (ATI), said, "The radio industry is running after new toys. Digital is great for getting rid of analog cart machines and razor blade editing."

Analog isn't dead yet but clearly stands in the shadow of digital. ATI, like many others, still sells to customers who have not made the high-tech leap. Some customers like the *reliability* of the equipment that worked before the advent of digital.

Broadcast manufacturers see a continued blending of technology, and must respond. Steve Cohen of Intelix said, "The way the industry is evolving, we're not just radio

the effects of radio's consolidation on manufacturers.

"Who are we selling to?" he asked. "Will there be more of an effort to buy

direct or buy group packages?" Godfrey said companies must find new marketing niches and be ready to grab them. Because buyers are demanding more tools and new ways to do remote broadcasts, new product technology must be pushed into the marketplace sooner.

'Damn close to ISDN'

Products that stretch bandwidth and create better telephone audio will continue to find a market among broadcasters who

seek new ways to put their reporters, talk show hosts and personalities on the road.

Kris Bobo of Comrex said the technology behind the company's HotLine POTS

Are we really improving things or just falling for buzzwords?

— Bill Ashley

codec processor is giving birth to instant remotes with audio "damn close to ISDN quality. Broadcasters can run audio anywhere they can get a phone line."

Line quality is a sticking point. The United States is still a mixed bag of copper lines and fiber optics, a volatile combination creating reliability problems for telco remotes.

The demand for bandwidth is unlikely to diminish. Adtran Vice President Tom Stanton said increasing bandwidth on copper lines builds the telco capacity to handle the increased load of data and audio from broadcast and other users. Adtran executives expect more demand, not less.

Certainly, this research into more effective phone lines and equipment has led to better gear in smaller boxes. Yesterday's big, black field box filled with audio consoles, mixers and microphones, which took two people to haul, has evolved into a device slightly larger than your hand.

Now, non-technical people can set up remotes because of the manageability of the new equipment they are using. The Telos ZephyrExpress, a condensed version of the Zephyr codec, is half the size of its predecessor, making it "bulletproof for the road," according to John Casey of Telos.

Casey said, "Audio mixing is coming off better for air talent in the field."

Can't resist better quality

The new high-tech field toys are not cheap, but manufacturers say most radio buyers will not pass up the promise of ever-better sound from a remote broadcast site. The lure of higher quality audio is too enticing, and that temptation will intensify as we approach the 21st century. Like the movie

said, "If you build it, they will come."

Broadcasters spend money to find the perfect field audio mix, but radio is not the only beneficiary of high-tech. The Internet is a new launch pad, another form of remote broadcasting that offers radio some distinct advantages.

Casey thinks webcasting will be successful through the ideas of creative radio programmers who already understand how to put content on the air. For the makers of equipment, this means opportunity, as they figure out how to serve these new webcasters. Look for more tools and toys aimed at them.

Many radio station managers and group owners want to buy products that fit the environment of duopolies, LMAs and consolidation. As big mergers mushroom, industry experts wonder if a new equipment buying model will emerge. Some groups already make big buys for several stations, and link operations and remote broadcast opportunities.

Gary Crowder, sales manager for telephone interface and site control at Gentner, said he sees a growing focus on walkaway operations and the remote control of transmitters. "Gentner is using technology that allows us to take advantage of what is happening in the marketplace," he said.

The changing face of radio ownership forces new ideas, including the trend of putting more remotes in non-traditional places, like private studios and the homes of talk show hosts. Crowder said, "A good 20 percent of telephone interfaces are sold for people doing remote broadcasts using a telephone line."

Don't forget why you do it

Is there a downside to radio's high-tech field hunt? Most manufacturers do not think so, but some, like Bill Ashley of Excalibur, think radio people are forgetting what got them into the business to begin with — a love of radio. He advocates stepping back and taking a hard look at the industry.

"Are we really improving things," he asked, "or just falling for buzzwords?" He predicted a leveling-off of digital develop-



The ATI NanoAmp Series simplifies your remote set-up.

ment in favor of enhancing the products that do work.

Harris Broadcast Digital Products Manager Jim Hauptstueck said, "Time is everything. Sometimes it's still the low-tech solution (for a customer) who doesn't have time or money to drop an ISDN line."

Quiz the manufacturers on what the high-tech radio field products of the future will look like, and the discussion usually leads to "the sky's the limit." In the end, cost and demand remain the most important factors, as manufacturers try to figure out how to create radio's next high-tech field toys.

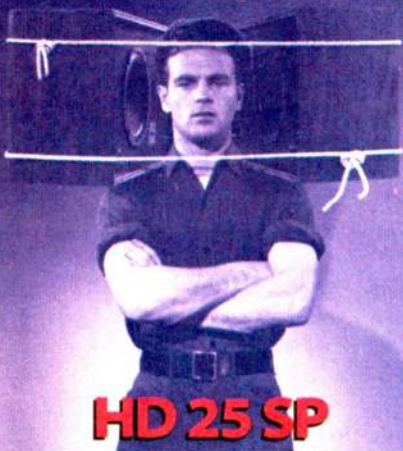
■ ■ ■

Janet Evans is a freelancer with a background in radio. She is the former news director of a Texas radio station.

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Circle (31) On Reader Service Card



The Comrex Buddy and HotLine snuggle before a remote like two peas in a pod.

people or television people. Manufacturers must make things that cross barriers into the new media world." He views automation as a driving force in the development of new products.

These trends are visible in the field as well as the studio.

Marti Electronics President Jim Godfrey believes the introduction of new products, including the Marti Smarti, is being driven by changes and demands on the industry. Like many of his peers, he wonders about

Gearing for Remotes

► REMOTE, continued from page 65
with the handset of a telephone using modular connectors to couple audio with a telephone.

The HC-1 can be used with almost any telephone because connection to the telephone line is not required.

External audio is connected via separate in and out TRS jacks on the rear of the HC-1.

Applications for the HC-1 include the on-air studio, production studio, newsroom, sales office and sports remotes.

For more information, contact Bill Ashley in Maryland at (301) 231-7800 or circle Reader Service 83.

HARRIS

For 7 kHz audio over a single plain analog switched telephone line, grab a Scoop Reporter from Harris. With a voice compression ratio of 10:1, the portable codec offers low delay and is designed for news reports, sportscasts and on site promotional broadcasts.

The codec connects to any RJ11



telephone wall socket and features full duplex operation. A built-in microphone amplifier and input for Mic 1, Mic 2 and line; a built-in modem, keypad and LCD display round out the list of standard features.

Speed-dial memory locks in three numbers and also features regular field telephone mode. The Scoop Reporter uses DSP technology and an enhanced CELP (Code Extracted Linear Prediction) algorithm.

For more information, contact Harris in Indiana at (800) 622-0022; fax (317) 966-0623, or circle Reader Service 107.

INTELIX

The Mix-Bag from Intelix is a package that contains an Intelix 8002MCB, a wood-and-cloth rack bag and on-board professional NiCad batteries.



The 8002MCB contains eight channels in one RU, XLR balanced inputs and outputs, master level controls for main and auxiliary outputs, LED bar graph output meter and front panel headphone output jack.

Mix minus and cueing are possible through front panel bus switches. The

mixer possesses an extra "ninth" line level input for easy linking.

The compressor/limiter can be set for a threshold of -40 dB to +20 dB, with an adjustable compression ratio from 0 to 100 percent.

The mixer can be purchased as part of the Mix-Bag or separately.

For more information, contact Intelix in Wisconsin at (608) 831-0880; fax: (608) 831-1833, via e-mail: intelix@intelix.com or circle Reader Service 131.

JK AUDIO

Recently, JK Audio began shipping THAT-2 Telephone Handset Audio Tap, an improved version of THAT-1.



For access to audio in and out of the telephone, THAT-2 connects between the user to play and record audio from analog, PBX, digital and ISDN telephones.

Featuring a three position switch which will accommodate electret, dynamic and carbon telephone handset microphone types, THAT-2 will emulate the type of microphone that is in the handset and allow the user to send audio.

THAT-2 allows the user to speak into

the handset and have access to a mix of both sides of the conversation. Then, by pressing a button, the user can play audio into the telephone.

Constructed of diecast aluminum, THAT-2 is portable and requires no batteries or AC supply.

For more information, contact JK Audio in Illinois at (800) 552-8346 or circle Reader Service 155.

LIGHTWAVE SYSTEMS

The Fibox from Lightwave Systems provides 20-bit, full-bandwidth digital fiber optic transmission for virtually any professional audio or broadcast application.

It features high common mode rejection, 20-bit A/D and D/A conversion and 108 dB dynamic range.

The Fibox has a 48 kHz sampling rate and can transmit through an optical fiber up to 2.5 miles. Its modular design allows expansion from two to 12 channels on one fiber and produces analog or AES/EBU digital output.

The Fibox is available in master and slave models.

For more information, contact Lightwave Systems in Texas at (800) 525-3443; fax: (214) 741-5145 or circle Reader Service 179.

MUSICAM USA

Up to 20 percent faster than its predecessor, the FieldFone II from MUSICAM

See REMOTE, page 70 ►



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KXGL



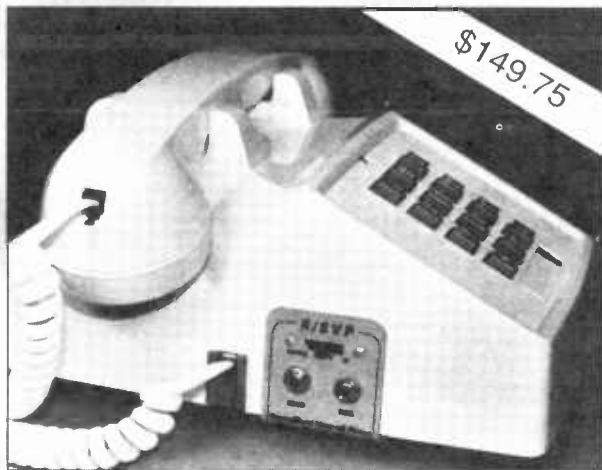
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XFMR INPUT (600 ohm: @+4dbm
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XFMR OUTPUT: -55db 600 ohm

Mention this ad and receive a 15% discount when ordering direct through 9-30-96.

800-688-8208

SOUND AMERICA CORPORATION

READER SERVICE NO. 91

Excalibur Electronics CDA-1 Composite Distribution Amplifier



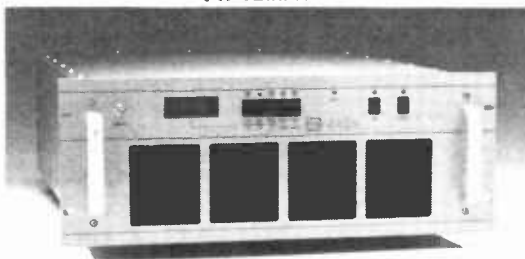
This 1 in, 3 out distribution amplifier allows you to distribute stereo composite and/or subcarrier signals as easily as audio.

- ◆ DC-100 kHz frequency response
- ◆ 90 dB signal/noise ratio
- ◆ +6 dB to -20 dB gain range
- ◆ Individual 20-turn output trimmers
- ◆ 1 3/4" rack mount enclosure

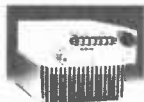
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READER SERVICE NO. 43

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READER SERVICE NO. 19

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CORPORATION

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- The Junior Audio Director™ - Stereo Mode Controller
- The Junior Audio Director™ Plus - 8 Channel Mode Controller

The Audio World Interface™ is a two-way recorder interface that is switchable to a line amp or a mono mix amp. The balanced inputs and electronic transformer outputs both have front panel recessed gain controls. The rack mountable chassis includes LEDs to indicate signal overload, switch position, and power presence.

Use it to mate R-DAT and analog recorders, to generate Mono from Stereo, or as a balanced line amplifier to compensate for level mismatches. Superlative performance, versatile operation, and an incredibly low price, make choosing the Audio World Interface™ a no-brainer!

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PCX Pocket: Big Audio From a Little Card

► PCX POCKET, continued from page 47
careful storage of the dongle absolutely essential.

Fire it up

In actual use, we recorded voice with an EV RE-18 mic, fed line-level audio and monitored on Sony V-6 headphones known for high-end punch. We found the mic preamps a bit hissy.

Because our objective was to evaluate the PCXpocket at its best, we used 48 kHz PCM linear format. Using 48 kHz and linear PCM coding yields the best sound, but consumed vast amounts of space.

When we connected a quality KMR-81 microphone and Sonosax SX-M2 mic preamp, we were pleased with the resulting sound quality.

Big plans

MPEG Layer II at 64kbps yields an appropriately grainy sound, but is miserly on disk space. Xtrack allows you to be the judge of quality/file size for your projects.

Our evaluation computer had a touch pad, the wear of which made our finger feel like we had been rocking analog reels all day.

With all these features packed into the PCXpocket, and the power contained in the Xtrack editor, Digigram is planning "The PCXpocket AD" said vice president Neil Glassman.

"(It) adds a S/PDIF input for direct dubbing from DAT or MD. Also, it will have a time code input — useful when the audio is destined for video

post. And the A/D and D/A converters will be upgraded for greater immunity from its environment," said Glassman.

Big plans for such a small card as the PCXpocket.

■ ■ ■

Rich Rarey is technical director of NPR's "Talk of the Nation" and pens the "Public Domain" column in RW.

PCXpocket Not-So-Bare Essentials

Although the published audio specifications of other Digigram desktop PC sound cards are superior, the PCXpocket specs are nonetheless respectable:

Frequency Response (48 kHz):
20 Hz-20 kHz, ± 0.35dB
Signal/Noise ratio: 79dB
Distortion + noise:
-74dB at 1 kHz
Crosstalk: -72dB at 15 kHz

Fun Fact: Mix 'n' match, literally, MPEG and WAV file formats and play them back simultaneously.

— Rich Rarey

Your Input, Please!



In our continuing effort to serve you, we'd like to know your thoughts concerning the improved Buyer's Guide.

In the July 23 and Aug. 20 issues of the newspaper, we want changes to this important section of the newspaper. We want to make sure those changes are helpful and informative. Our industry wrap-up articles are meant to peek into the future through the eyes of manufacturers and allow them to speak to you, the equipment user. Our technology updates are intended to help you compare products and bring you up-to-date about new or upgraded equipment in the category being covered.

Please let us know what you think. Or, if you have found an ingenious way to use a piece of equipment, tell us.

Feedback, opinion and suggestions are welcome. Send e-mail to sgary@imaspub.com or drop a line to RW Buyer's Guide, P.O. Box 1214, Falls Church, VA 22041.

— Susan Gary

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All Are Field-Ready

► REMOTE, continued from page 67

USA can operate at up to 10.2 kHz at 33.6 kbps.

The FieldFone II produces broadcast-



quality audio over POTS line. The FieldFone II retains the algorithm of the original FieldFone (noted for good signal-to-noise ratio), plus the Sound Shapers that fine-tune the encoding algorithm on the fly.

The FieldFone II offers improved control, two headphone jacks, balanced line output, and a switch that allows users to plug in their own mixer.

For more information, contact Doreen Arleth in New Jersey at (908) 739-5600; fax: (908) 739-1818, via e-mail: darleth@musicamusa.com or circle Reader Service 203.

O'GARA SATELLITE NETWORKS

Now available for civilian use, the Compact-M Personal Satellite Telephone from O'Gara Satellite Networks provides



communications capability, including voice, fax, data and secure (STU-III) voice/data via satellite.

It can be carried in its own padded

nylon case or in an attaché case. Operable through most 12 VDC power sources, including an optional rechargeable battery pack, a vehicle cigarette lighter or an AC/DC converter. The Compact-M comes pre-commissioned and pre-configured to operate in all four satellite regions.

The Compact-M employs SmartCard technology and can be connected to an optional remote antenna without disassembling the terminal.

For more information, contact O'Gara Satellite Networks in New York at (516) 586-5100; fax: (516) 586-5531 or circle Reader Service 108.

SHURE

Designed for electronic news gathering (ENG) and electronic field production (EFP), the FP33 portable stereo mixer from



Shure is compatible with virtually any type of dynamic or condenser microphone.

The FP33 can provide 12 or 48V phantom, and is operable for at least eight hours with a pair of 9V alkaline batteries. An external 12- to 30-VDC power source may be used.

Featuring transformer-balanced inputs and outputs, a range of input gain controls, and a link-switch to gang two and three inputs together, the FP33 has a frequency response of 20 Hz to 20 kHz and dynamic range greater than 100 dB.

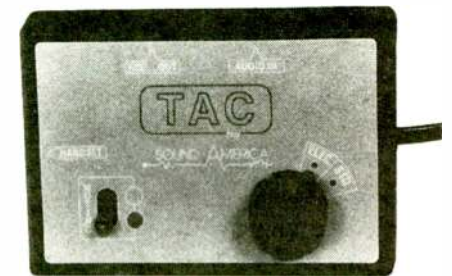
The FP33 includes a carrying case, shoulder strap and bus cable.

For more information, contact Shure in Illinois at (800) 25-SHURE or circle Reader Service 132.

SOUND AMERICA

The TAC and TAC+ from Sound America are telephone audio couplers that are compatible with virtually all phones.

Both units allow the user to mix voice with external source or mute, monitor continuously, and feed direct from a remote mixer. They feature a cough button and



transformer output for recording interviews. The units contain 1/8-inch mini jacks and modular plugs that connect between the handset and the base of the phone.

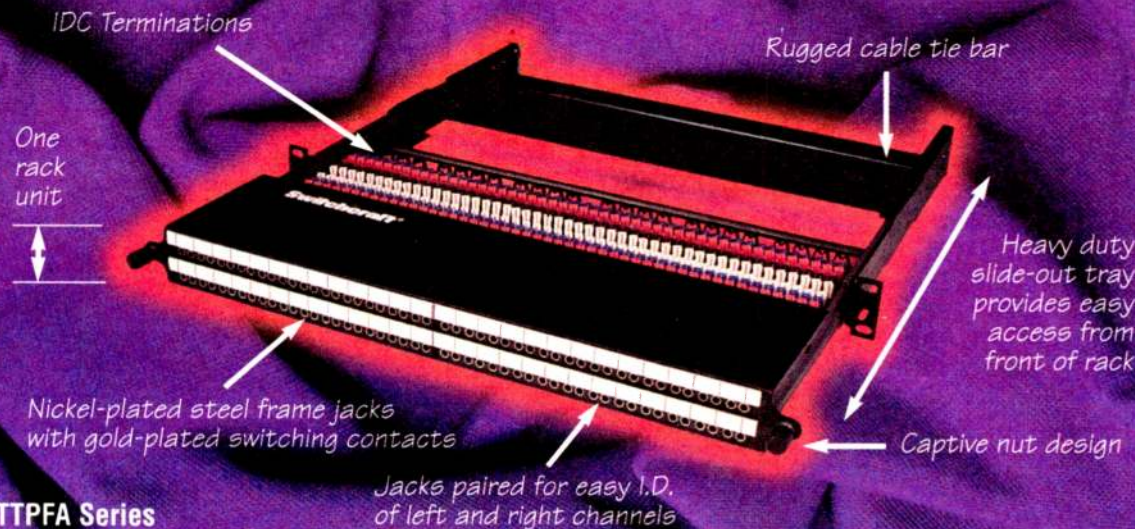
The TAC+ allows the user to select 8-32 or 600 ohm transformer input, while the TAC contains only 8-32 ohm input. The TAC+ six-step attenuator ranges from -10 to -60 db with level reduction, and cassette dubbing.

Carrying cases for TACs are available.

For more information, contact Sales in Georgia at (800) 688-8208 or Information and Tech Support at (912) 238-1771 or circle Reader Service 156.

See REMOTE, page 72 ►

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Introducing the Front Access Patchbay Series... an exciting new reason to make Switchcraft your source for audio panels.

Our innovative front access patchbay gives you space where you've never had it before and convenience you've never dreamed of, in a quality package you've come to expect from Switchcraft. Our heavy duty slide-out tray gives you access to the 96 nickel-plated steel frame jacks **from the front** of the unit.

But that's only the beginning! See the photo above for all of the features and benefits, which make this panel

ideal for use in studios, tape editing rooms, mobile facilities and anywhere space is limited.

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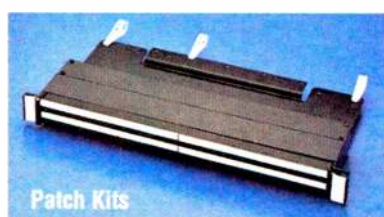
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- Rugged cable tie bar
- 3 1/2" or 1 3/4" panel height



- TT Nickel-plated steel frame jacks
- Rugged cable tie bar
- Extra wide labeling strips
- 1 3/4" panel height



- Extra wide labeling strips
- Fully-wired with EDAC connectors



- Choose from a variety of normalizing configurations
- 3 1/2" or 1 3/4" panel height (1/4" or TT)

Raytheon Electronics

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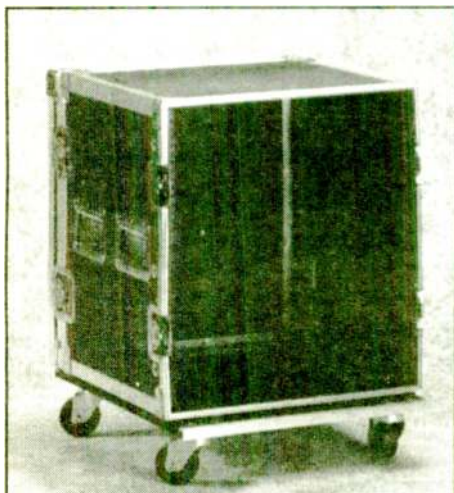
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Tough Cases Protect Remote Gear

► CASES, continued from page 58 station wants to transport.

"We sell cases to stations that are



Calzone Rack Mount Cases feature options like casters.

made just as tough as those we sell for military transport. Customers around



Don't try to split these cases, even with an axe.

the world come to us," said Calzone.

Competitor K&H Products, which offers items under the name PortaBrace, makes "heated cases that must go to the North Pole," said Ken Barry, corporate sales spokesman.

"We began designing products for the old reel-to-reel radio equipment," he said. "We wanted it to be protective



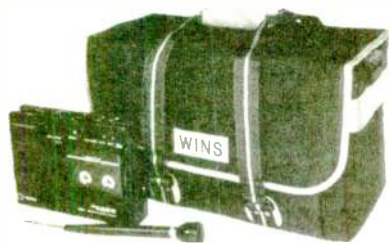
Anvil builds cases to customers' requirements for a snug fit.

and still make it easy to transport equipment into the field. We design with the customer's needs in mind, whether the engineers will carry equipment on their body, in a vest or on their backs."

K&H, like many suppliers, can also

custom-design cases for any particular model or type of equipment. Most of the approximately 300 items offered are made from a rugged nylon that looks like canvas but is more durable and rugged.

Sound America also has cases made from nylon. The cases have adjustable partitions and are shock-padded for



Sound America offers call letter plates for their soft cases.

extra protection. Sound America offers engraved call letter plates for quick identification of your equipment.

K&H Products supports its products with a warranty and rewards customer loyalty. "If a customer sticks with us, we will fix, repair or replace anything," said Barry.

Barry is able to maintain customer satisfaction through trade shows and telephone conversations with customers.

Hard plastic

And there are trade shows, such as the National Association of Music Merchants convention, for these products — the big one, held in California during winter, attracts nearly 40,000 people,

while the summer show, held in Tennessee, draws approximately 20,000 buyers.

Trade shows have proven to be effective tools used to increase business, expand client lists, improve design and construction and further develop product lines.

It was at one of these trade shows that Cheryl Freed's SKB case shook off that ax blow.

"We started out 23 years ago making guitar cases," said Freed. "Now our catalog offers everything from racks to casings. Our signature product is our shock rack mounts.

They are really special and have won awards as the product of the year."


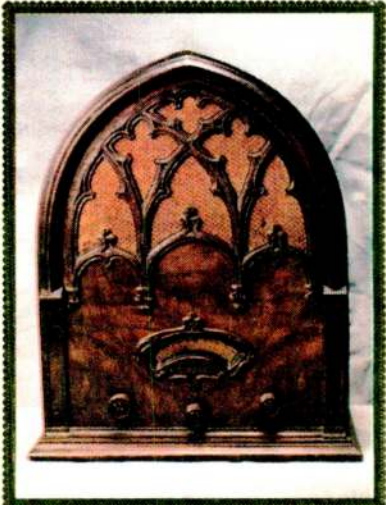
Freed said the only soft casing they produce today are those that go around the hard cases. "There are different ways to make hard plastic cases; we feel we've figured out the best."

Think about your next remote broadcast and how you plan to get your expensive, fragile gear from the studio to the remote site. Would you trust your valuable equipment to anything less than proven case products?



Alice Hornbaker is a freelance writer, veteran journalist, broadcaster and book author. She writes the column "Life After 50" for the Cincinnati Post.

You Must Remember This

The classic "cathedral" style of radio receiver design recalls a bygone era. Yet these radios, many of which were made in the period 1929-1937, were so attractive that they remain a popular staple for collectors and are the basis of many plastic modern imitations.

This six-tube Echophone Model 80 is a fine example. Made of walnut with a pressed wood grille, it was made in 1931 by the Echophone Radio Manufacturing Co. The firm merged four years later into Hallicrafters, with the latter as the dominant partner.

This is the first in a new series of photographs in RW featuring classic and less well-known radios. The pictures and descriptions are by collector Bill Overbeck, president of the Delaware Valley Historic Radio Club, who has made every effort to ensure accuracy. He became interested in old radios early, and began repairing them in his teens. Contact him via e-mail at billoradio@aol.com or through RW.

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NEUTRIK CORTEX INSTRUMENTS

AUDIO ANALYZERS+PSYCHOACOUSTICS

Circle (151) On Reader Service Card

Outstanding in Field

► REMOTE, continued from page 70

TELFAX

Telfax makes use of a small space with the GX-440 Phone Remote Mixer. The GX-440 contains six DIP switches hidden behind the removable Telfax nameplate.

For quick readings, the VU/Peak indicator is a 10-element, multicolor LED bargraph and the control knobs are color coded with numeric scale markings.

Four mic channels and two auxiliary inputs are provided, and a radio monitor input jack and switch allow the user to monitor the station through headphones.

The auxiliary output jack can be switched to mic or line level and can be



configured for a "send only" signal. The built-in peak limiter prevents over-driving

the phone line, while the squelch function drowns crowd noise pickups.

The GX-440 features tone/pulse dialing and external power transformer with cable for AC operation and battery charging.

The GX-440 also comes with a carrying case.

For more information, contact Telfax in Iowa at (515) 296-9911; fax: (515) 233-9601 or circle *Reader Service 180*.

TELOS

By integrating a full-featured codec, an ISDN terminal adapter and an audio mixing/monitoring system all in one, Telos created the ZephyrExpress.

The ZephyrExpress allows MPEG Audio Layers 3 and 2 as well as G.722.

An ISDN terminal adapter, a keypad,

an LCD display and an Edit control knob complete ISDN operation.

The three-input mixer has two monaural microphone-level inputs and a two-channel line-level input. Two independent headphone outputs have selectable source controls for monitoring local and/or return audio.

Bidirectional RS-232 serial data at 9600 bps for communications and control are transmitted simultaneously with the audio.

Windows-based software is included at no additional costs.

For more information, contact Telos in Ohio at (216) 241-7225; fax: (216) 241-4103, or circle *Reader Service 204*.

WHIRLWIND

In one battery powered box — the Whirlwind Qbox — there is a microphone, a speaker, a test tone generator, outputs for standard headphones, a quarter-inch jack and voltage presence LEDs for confirming phantom or intercom power.

Powered by a single, standard 9 V alkaline battery, the Qbox can be spoken into, watched, clipped to a belt or equipment rack.

The source section of the Qbox enables the user to send a 440 Hz tone or the signal from the built-in condenser mic back to the main console at +4, -20 or -50 dB levels.

The Qbox also contains a speaker volume control.

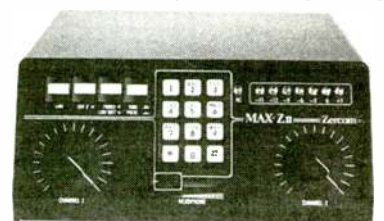
For more information, contact Whirlwind in New York at (800) 733-9473; fax: (716) 865-8930 or circle *Reader Service 13*.

ZERCOM

Combine a console with remote telephone system and you get the Zercom Max-Z. Condense it and the result is the Zercom Max-Z II.

Featuring four main channel inputs with one XLR3 connector, the audio inputs of the Max-Z cover a wide range. The Max-Z comes with a carrying case, built-in rechargeable batteries (20-hour continuous operation) with charger, clock, stopwatch, VU meter, cue channel, phone line alarms and memory dialing.

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24-hour continuous operation. Weighing half of the Max-Z, at 8 pounds, the Max-Z II features many of the same features of the Max-Z.

Zercom guarantees both products with a two-year limited warranty and offers replacement carrying cases and product manuals.

A package is available when purchasing the Max-Z or Max-Z II that includes a portable broadcast stand with wheels.

For more information, contact Zercom in Minnesota at (800) 950-4260 or circle *Reader Service 37*.

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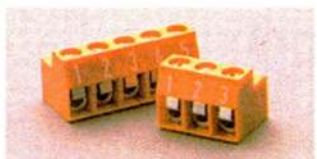
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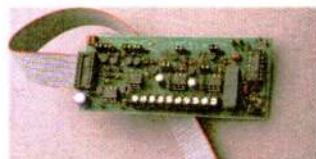
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World Radio History

Radio World Broadcast Equipment Exchange

"Broadcast Equipment Exchange" accepts no responsibility for the condition of the equipment listed or for the specifics of transactions made between buyers and sellers.

ACOUSTICS

Want to Sell

ERI 1100, 12-bay, high pwr, 99.5 MHz, in warehouse, \$5500; Windcharger, 300', tri-

7/97, \$2800. G Gilbert, CSRG, Box 492, Sulphur Springs TX 75483. 903-885-6122.

Mark Products P6120 GRN parabolic antenna, open grid type, 10' diameter, new; Taco C-1445 parabolic antenna, expanded mesh type, 12' diameter, used. R Meyers, Sound Masters, 4700 SW 75 Ave, Miami FL 33155. 305-264-5963 FAX 305-264-2357 eve/wknds, days mon-fri 305-995-2115.

Shively 6810 10 bay antenna tuned to 92.5, w/heaters, recently rebuilt, excel cond, reasonable BO. J Mosher, KPQX, POB 7000, Havre MT 59501. 406-265-7841.

Want to Buy

Helix 1-5/8" xmission line, 2 lengths w/end connectors needed, 180'+ & 70' or 250' total; xmission line fittings, 1-5/8" Helix to 1-5/8" & 3" EIA flanges; Bird Thru-line wattmeter grid line sections (2) 1-5/8" & 3" rigid EIA flange, single or dbl sockets; Bird 1-5/8" #4712A or 4715-200A or 3-1/8" #460A or 4610-200A, or equal. J Powley, Scholastic Informational Network, 9279 Dutch Hill Rd, W Valley NY 14171. 716-942-3000.

AUDIO PRODUCTION

Want to Sell

Art DR2A classic digital reverb, no wall wart, box, manual, mint cond w/upgrade, \$175. B Sheldon, Mediamaxx, 847 Kitsap Lake Rd NW, Bremerton WA 98312. 360-479-8491.

Fostex 3180 stereo reverb w/24 mS pre-delay, rack mountable vgc, will trade for UREI Cooper Time Cube. E O'Brien, Imperial Snd, 383 N Studio St, Terre Haute IN 47803. 812-877-2663.

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Ensoniq Mirage digital sampler, \$200. D Kocher, Digital Sound Makers, 1919 Hanover Ave, Allentown PA 18103. 610-776-1455.

Orban 622 parametric EQ, stereo, \$100. R Coleman, Coleman Bdcgt, 932 SE 2nd St, Box 222, Galva IL 61434. 309-932-2288.

Eventide H3000BLT harmonizer, new in box, \$2000. Marc, 914-471-1500 ext 132.

Tannoy 15" speaker pair, newly recond, \$1450; vintage recond tube mic pre's & mixers, \$300-\$700; new ADC patch bays _ 52 points, \$169; ADC TT bays, \$129 up; new ADC TT or _ TRS cords, \$9; Furman _ to _ patchbays, \$95 ea; like new tape, _x2500' 456, \$15 ea; 1" 456, 226, 250, \$25 ea; Digitec 3.6 sec delay, \$150; new pwr dist/filter rack mt, \$75. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Want to Buy

Texar Audio Prism, gd cond; Gentner audio prism, gd cond; Optomod 8100 card 5 for use w/Audio Prisms. T Keegan, 1421 S Water St, Starke FL 32091. 904-964-5001.

Compressors & EQs, tube and solid state. W Gunn, Box

2902, Palm Springs CA 92262. 619-320-0728.

POB 8260, Essex VT 05451. 802-878-8885.

AUTOMATION EQUIPMENT

Want to Sell

Arrakis Digilink CD controller w/(4) Pioneer 18 disc changers, vgc, \$1000/pkg; Format Sentry 12B controller, BO. J Antonuk, KCBF, 3528 Intl Way, Fairbanks AK 99701. 907-452-5121, johna@polar-net.com

Belar FMM-1 mod mon tuned to 92.7 & Belar FMS-1 stereo mon, \$1000/BO; Belar RFA-1 FM RF amp tuned to 92.7, cracked meter, otherwise OK, \$250/BO. L Fuss, WDTL, POB 1438, Cleveland MS 38732. 601-846-0929.

Schafer 903E parts; Audiofiles; Revox A77; ITC 750; SMC 450 Carousel, \$300; SMC pwr supplies, \$50. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

Smartcaster digital automation system, (2) 1.2 gb internal drives, monochrome monitor, used for SMN/Hot AC format, \$3500/BO. L Fuss, WDTL, POB 1438, Cleveland MS 38732. 601-846-0929.

Arrakis Digilink III w/updated software, used for sat bdcgt, w/monitor, keyboard & mouse, \$4500. R Coleman, Coleman Bdcgt, 932 SE 2nd St, Box 222, Galva IL 61434. 309-932-2288.

Coax, _, 75 ohm, 2000', never used, BO, will sell shorter pieces at \$3.50/ft. Megastar, 701 Desert Ln #4, Las Vegas NV 89106. 702-386-2844.

Kingdom Technologies automation control boxes (2) w/IBM interface card, \$500 ea/BO. A McEwing, WGLY,

Want to Buy

ACU for Desk Jockey automation system. E Stern, KVOU, POB 758, Uvalde TX 78802. 210-278-2555.

Howe console parts; Harris stereo 80; amps. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

SMC DP-2 System tech manuals & pwr supply. P Galasso, WOBN, 1015 Atlantic City Blvd, Bayville NJ 08721. 732-269-0927.

CART MACHINES

Want to Sell

Great Prices on original equipment tape heads for ITC, BF, Fidelipac, Otari, Tascam & others!
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ITC SP mono R/P 3 tone, mono PB (4), parts, gd cond, as set, \$375/BO. J Calabro, Hot Productions, 1748 70th St, Brooklyn NY 11204. 718-234-9374.

ITC SP, mono, play, vgc, \$295; Audicord 2 deck stereo, play, vgc, \$425. P Willey, WBTV, Historis Rte 7, Bennington VT 05421. 413-663-3419.

SMC 452 Carousel, \$300; BE cart recorder, \$300; ITC 3D 3 deck cart, \$300. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

Dynamax CTR10 players (2), vgc w/manuals, \$250 ea; Dynamax CTR10 rcd, vgc w/manual, \$900; ITC rcd, vgc w/manual, \$200 ea; Ampro triple player, gd cond, \$100; Tapecaster cart loader, gd cond, BO; assorted car-

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AMPLIFIERS

Want to Sell

Sony TA-AX500 integrated stereo amp, audio current transfer, \$75; Precision Electronics S-35 tube-type amp, \$125. H Goggan, KGNV, POB 87, Washington MO 63090. 314-239-0400.

B-300 amplifier, \$1500. L Walters, KTLF, 1802 Chapel Hills Dr #A, Colorado Springs CO 80920. 719-593-0600.

Bogen CTS-1100 100 W solid state amp, like new, 10 band EQ, low imp, very clean. E Davison, WNN5, 1129 Willowbrook Dr, Springfield IL 62707. 217-793-0400.

Want to Buy

Distribution amps. J Powley, Scholastic Informational Network, 9279 Dutch Hill Rd, W Valley NY 14171. 716-942-3000.

ANTENNAS/TOWERS/CABLES

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FAX: 773-539-3500

Andrew _ high-temp air dielectric Helix cable, brand new, original packaging, must buy all, \$2250/BO. A Jurison, WLTJ, 1064 James St, Syracuse NY 13203. 315-472-0200.

EF Johnson 145-102-13 AM antenna changeover switch, \$135. P Willey, WBTV, Historis Rte 7, Bennington VT 05421. 413-663-3419.

angular, 19" sides, 15 sections, lighting avail, \$4000; Cablewave coaxial cable, air-core, 7/8", painted, 200', \$300; Cablewave coaxial cable, foam, 1-5/8", new, 20', \$100. H Goggan, KGNV, POB 87, Washington MO 63090. 314-239-0400.

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Isocoupler 1-5/8" line, \$500; Andrew 3-1/8" 5' rigid, \$200; Delta torroid RF pickup w/meter 5 amp, \$400. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

Cablewave 7/8" transmission line, 300+ ft, on spool, 6 yrs old, u-pick up, \$1000; SWR 3-bay low pwr 3 kW antenna, 6 yrs old, stored since 1/97, \$1000. B Dixon, WAWC, 10129 N 800 E, Syracuse IN 46567.

ERI 1105-3A 3 bay on 104.3 w/heaters, \$2100/BO. A McEwing, WGLY, POB 8260, Essex VT 05451. 802-878-8885.

Harris FMS CP FM 12 bay antenna tuned to 98.1 MHz, pwr gain 6.8781, 40 kW input pwr rating, \$10,000/BO; Bogner LP 51 476-482, 15 chnl antenna, beam tilt 0 degrees, BO; Scala 26 antenna on 54-66 MHz, 50 ohms, BO; Andrew 7/8" foam filled Helix coax cable, 200', BO. D Blackwell, WQHL, 1305 Helvenston St, Live Oak FL 32060. 904-362-1250.

Jampro JMPC med pwr penetrator 4 bay in Radomes on 104.9, removed from tower

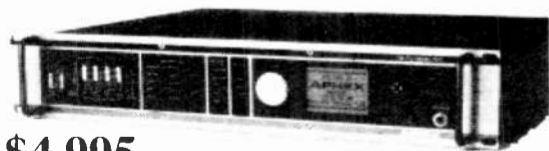
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CART MACHINES continued...

tridges & cart racks all in gd cond, new, BO. C Yengst, WAWZ, PO Box 9058, Zarephath NJ 08890. 732-469-0991.

ITC 3D triple deck, \$300. R Coleman, Coleman Bldg, 932 SE 2nd St, Box 222, Galva IL 61434. 309-932-2288.

ITC SP cart deck, dual unit, \$400; ITC SP cart decks (3), \$100 ea. L Walters, KTLF, 1802 Chapel Hills Dr #A, Colorado Springs CO 80920. 719-593-0600.

ITC upgrade PB to record, amps only-no deck, 3 tone, stereo, \$175. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

CONSOLES

Want to Sell

BE 5S250, \$500; 8S250, \$800, gd cond. J Antonuk, KCBF, 3528 Intl Way, Fairbanks AK 99701. 907-452-5121. Johna@polar.net.com

BE Mix Trak 100 (2), \$15,000/both. R Egan, Family Radio, 201 State, La Crosse WI 54601. 608-782-1230 or e-mail: regan@dickplaza.com

Getely 16x8 w/EQ on every chnl, 4 effects buss, quad monitoring, XLR connectors on the line, mic inputs & on the line outputs in custom

console, \$500. A Baker, Bdct Prod of America, 804 E 38th St, Indianapolis IN 46205. 317-925-7371.

RCA BC6 10 chnl mono, 2 power supply, tube workhorse w/complete manual, \$400 +shpg. L Watson, Scope & Focus Inc, 6035 Bridgewater, Ponta Verdra FL 32082. 904-273-1915.

Arrakis 500-SC 8 chnl, as is, \$1000. H Shumway, KSWG, 801 W Wickenburg, Wickenburg AZ 85390. 520-684-7804.

LPB 513C Signature 8 chnl stereo board, external rotary pots, expandable input, \$650. R Coleman, Coleman Bldg, 932 SE 2nd St, Box 222, Galva IL 61434. 309-932-2288.

Tascam 10 w/linear/rotary faders, for parts, no pwr supply, no meters, BO. P Helm, Sonlight Rcdrs, 2109 Glenwood Rd, Vestal NY 13850. 607-754-8507.

Wheatstone Audioarts 8X console pwr supply w/phantom, \$200. D Kocher, Digital Sound Makers, 1919 Hanover Ave, Allentown PA 18103. 610-776-1455.

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. 619-320-9728.

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Want to Sell

New lightweight portable DJ outfit, \$1000; Ross, Peavy bass reflex speakers, \$100 ea; Fostex EQ, \$100. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

JBL 4330 studio monitors 15" & horn, \$900/pr. D Kocher, Digital Sound Makers, 1919 Hanover Ave, Allentown PA 18103. 610-776-1455.

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LIMITERS

Want to Sell

Harris MSP 90 AM limiter, \$250; Moseley limiter, \$200. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

Orban 2200/AES-EBU digital Fm optimod w/AES-EBU option, as new, \$3200. P Christensen, Christensen Prod, 11142 Raley Creek S, Jacksonville FL 32225. 904-619-3899.

Orban Optimod 8100A (2), recently refurbished, excel cond, avail after 7/15/97. S Boucher, LM Comm, 1300 Greendale Rd, Lexington KY 40511. 606-233-1515.

Modulation Sciences CP-803 composite clipper, rack-mount, like new, \$450. D Kiker, WCOA, POB 12487, Pensacola FL 32573. 904-477-8500.

Orban 8000A Optimod, \$1000. L Walters, KTLF, 1802 Chapel Hills Dr #A, Colorado Springs CO 80920. 719-593-0600.

Want to Buy

Cash paid for tube compress, amps, on-air signs. 1-800-old-mics.

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

Neumann U87 (3), \$1695 ea. T Phillips, 419-782-8591.

RCA 77DX & 44BX mics completely refurbished. P Hayes, TCC Productions, 6327 Bahama Shrs Dr So, St Petersburg FL 33705. 813-867-8330.

Reslo RBM/T ribbon mic, c.1961 Beatles mic, new in sealed box, \$1500. P Carson, Carson Consultants, Rt 32, Box 73, W Friendship MD 21794. 202-215-3885.

Shure 548 dyn mikes (2), mint cond, \$150/pr, FOB dest; Shure 545 w/cable, sounds perfect, \$35 FOB dest. E Davison, WNNS, 1129 Willowbrook Dr, Springfield IL 62707. 217-793-0400.

Shure M67 4 ch mic mixer, vgc w/manual w/M675 4 ch add-on, \$50; Sony MX-20 8 ch mixer, fair cond, \$100; Crown PH-48 phantom pwr supply, vgc, supplies up to 4 mics, \$75. C Yengst, WAWZ, PO Box 9058, Zarephath NJ 08890. 732-469-0991.

Sony ECM 377 condenser, mint cond w/papers, \$450. D Kocher, Digital Sound Makers, 1919 Hanover Ave, Allentown PA 18103. 610-776-1455.

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. 619-320-0728.

Want to Buy

Cash paid for all/any old mics, 1-800-old-mics.

RCA 4-AA; WE 1-A or 47-A, working vintage mics from 20's & 30's. V Giordano, 1316 Elm Ave, Brooklyn NY 11230. 718-376-3489.

Broken E-V RE-20/PL-20 mics. 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. 619-320-0728.

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

450 point stainless dissipator, \$400; 1929-45 AM radio collection, \$800; Delta Labs DL4 effects delay, \$150; Sensaphone, \$100. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

RF Warning Signs

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10" x 19" \$19.95

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Harris 20FMT-101011, antenna tuning coil, 12"Dx13"Hx3/4", \$200. H Goggan, KGNV, POB 87, Washington MO 63090. 314-239-0400.

QRK TT's (2); (4) Scully 250 10" decks w/amps; (100's) 3 min carts; Gates RA-1 automation; (3) Carousel cart decks mic amps; old STL & 1000' cables & speaker cable; FM freq meter. BO. S Weber, KWVA, POB 453, Oakridge OR 97463. 541-782-2901.

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Tellabs 4008 equalizing program amps, 10 ea mounted in shelf w/pwr supply & fuse panel, \$1000/pkg. J Antonuk, KCBF, 3528 Intl Way, Fairbanks AK 99701. 907-452-5121. Johna@polar.net.com

Wood cart rack (2), holds 120 carts, \$25 ea. J Calabro, Hot Productions, 1748 70th St, Brooklyn NY 11204. 718-234-9374.

CRL SG-800A stereo gen, excel cond, \$750. D Kiker, WCOA, POB 12487, Pensacola FL 32573. 904-477-8500.

GE TM 18-410C, 208Y/120 VAC, 3 phase, 4 wire, 100 amp, 90 amp circuit breakers included, \$150. T Keegan, 1421 S Water St, Starke FL 32091. 904-964-5001.

RCA Bdct News magazines (105 issues), almost complete set, gd cond, BO/all or \$5 +shpg for single issues. J Powley, Scholastic Informational Network, 9279 Dutch Hill Rd, W Valley NY 14171. 716-942-3000.

Simpson 260 Series 5P, volt, ohm, milliammeter, excel cond w/carrying case, \$150; Philips RH-567 motion feedback, 3-way electr x-over monitor speakers, built in pwr amps, 22"x13"x11", black, matched pair, immac, \$450/pr. B Anderson, KIQX, POB X, Durango CO 81302. 970-259-4444.

Symetrix T1-101 telephone interface, vgc w/manual, \$150; Protech audio dist amp, fair cond, \$50; Pioneer SA-9500 hi-fi stereo amp, gd cond w/manual, \$50; Sansui TU919 stereo AM/FM tuner, gd cond, rack mounted, \$30; SAE 5000 impulse NR, vgc, rack mounted, \$50; (2) 6' steel equip racks, gd cond w/rear doors, \$150 ea; (4) space car-

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peted rack, vgc, no covers, \$20. C Yengst, WAWZ, PO Box 9058, Zarephath NJ 08890. 732-469-0991.

Telephone system, ideal for station still using this type of system, w/3 phones, call for more information. Marshall or Brian, WEKT, POB 577, Elkton KY 42220. 502-265-5636, between 9AM-5PM CT.

Vintage microphones, send #10 SASE for list or visit <http://k-bay106.com/sale.htm>. No calls.

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16" or transcriptions of Big Band & Sammy Kaye "Sunday Serenade", music only, Big Band type. R DeMars, Robert DeMars Prod, 222 Lakeview Ave. #160-256, W Palm Bch FL 561-832-0171.

16" radio transcriptions. J Salerno, 713-668-8650.

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, NNY 10003. 212-674-3060.

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Belar 67 kHz SCA monitor, new in box. R Edwards, WRBD, Pompano Beach FL 954-757-8668.

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Pioneer RT-701 2 speed, rack mountable r-r tape deck, mint cond, \$350 +shpg. E O'Brien, Imperial Snd, 383 N Studio St, Terre Haute IN 47803. 812-877-2663.

Tascam BR-20 2 trk r-r w/remote, rack ears, never used, mint cond, \$1950. B Sheldon, Mediamaxx, 847 Kitsap Lake Rd NW, Bremerton WA 98312. 360-479-8491.

Crown SX824, 4 trk, 3.75 & 7.5, gd cond, original carton & manual, \$500/BO. M Morris, NBC, 20 E 9th St #8-P, NY NY 10003.

Marantz PMD-220 prof portable 2-speed cassette system, mono, 3 heads, \$175. B Anderson, KIQQ, POB X, Durango CO 81302. 970-259-4444.

NAD 6240 cassette decks (4), gd cond, \$75 ea or \$300/all, incl shpg. P Paquin, Sound Dynamics, POB 608, Dennis MA 02638. 508-385-0805.

Nakamichi MR-1 cass decks (3), gd cond, \$300 ea; Tascam 122 cass decks (2), functional, need work, \$200 ea; Micro FX NR's (6), vgc w/rack adapters, \$65 ea; Otari MX5050 2 ch r-r, gd cond, rack mounted, 7.5 ips, gd heads w/manual, \$900; Ampex AG-440 2 ch r-r, fair cond, 7.5 ips, heads need relap, manual, roll-around cabinet, \$500; Crown mono r-r (6), cond unknown, very old, BO; Recordex Messenger mono cass duplicator, fair cond, \$20. C Yengst, WAWZ, PO Box 9058, Zarephath NJ 08890. 732-469-0991.

Otari 5050/B III 2 trk r-r, like new; Panasonic 3900 DAT rcd r w/remote controller. J James, Marin Voice Studio, POB 1641, Sausalito CA 94966.

Revox PR99 PB decks, (2) 3.75/7.5 ips, (1) 7.5/15 ips, FT stereo, \$350/BO. D Blackwell, WQHL, 1305 Helvenston St, Live Oak FL 32060. 904-362-1250.

Stellavox SM-5 portable w/sync 7.5 ips FT, mono, \$150. P Carson, Carson Consultants, Rt 32, Box 73, W Friendship MD 21794. 202-215-3885.

Tascam 22-2 "x7" reels, 7.5 & 15 ips, excel cond w/manual & new tape, \$450. M Schackow, Schackow Recording, 307 4th Ave E, Lemmon SD 57638. 605-374-3424.

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. 619-320-0728.

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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. 619-320-9728.

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Ampex ATR-700. D Bisbee, 685 S Roys Ave, Columbus OH 43204. 614-279-6163.

Recordex or like cassette rewriter. P Helm, Sonlight Rcds, 2109 Glenwood Rd, Vestal NY 13850. 607-754-8507.

Tascam 123 or equivalent, patch bay. J Freeman, Tech Systems, POB 1773, Pinehurst NC 28370-1773.

Ampex ATR100 taperecorders for parts. Circuit cards, heads, motors, machine parts, or electronic parts. Call 818-907-5161.

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Gentner 2000 remote control; Dolby digital STL. R Edwards, WRBD, Pompano Beach FL. 954-757-8668.

Marti RP T15 RPU w/receiver, \$500; Hallikainen DRC 190 analog remote controls, \$4000. L Walters, KTLF, 1802 Chapel Hills Dr #A, Colorado Springs CO 80920. 719-593-0600.

Marti STL 10 & R10 system on 948.850. Second set on 949.150, \$4800. F Martin, FM Productions, POB 146, Falls City OR 97344. 503-787-5707.

Symetrix 108, gd cond w/manuals, schematics & tech updates, \$500. L Penrose, KNWZ, 74923 Houley Ln East, Palm Desert CA 92260. 760-346-1270.

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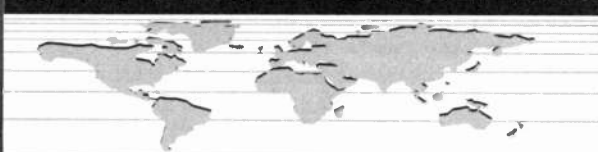
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audio tapes 1/2", 10" reels (13), \$15/all; carts in various lengths (25), \$20/all. L Walters, KTLF, 1802 Chapel Hills Dr #A, Colorado Springs CO 80920. 719-593-0600.

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222 Lakeview Ave, W Palm Bch FL 33401. 561-832-0171.

Conex Electro Systems 25 Hz sensor, \$300. L Walters, KTLF, 1802 Chapel Hills Dr #A, Colorado Springs CO 80920. 719-593-0600.

General Radio 1565A audio snd level meter, mint, w/books & case, \$150; Jackson 658-1 mutual conductance tube tester, mint w/books & chart, \$100. D Davison, WNNS, 1129 Willowbrook Dr, Springfield IL 62707. 217-793-0400.

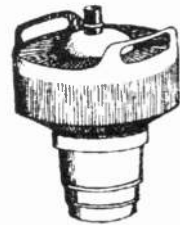
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Gates/Harris FM-10B 10 kW w/Harris TE-3 exciter w/Optimod input module; RCA BTA-50H 50kW. R Meyers, Sound Masters, 4700 SW 75 Ave, Miami FL 33155. 305-264-5963 FAX 305-264-2357 eve/wknds, days mon-fri 305-995-2115.

Gates 250GY AM 250-500 W w/spare tubes, pwr transformer & mod transformers extra, spares, \$2100/BO. J Cunningham, KEOR, Rt 2 Box 113B, Stonewall OK 74871. 405-265-4496.

Harris 2.5 kW w/MS-15 exciter, gd cond, on 104.3, \$9000/BO; Collins 830D 1 kW w/TE-3 exciter, gd cond, on 103.1, \$2500/BO. A McEwing, WGLY, POB 8260, Essex VT

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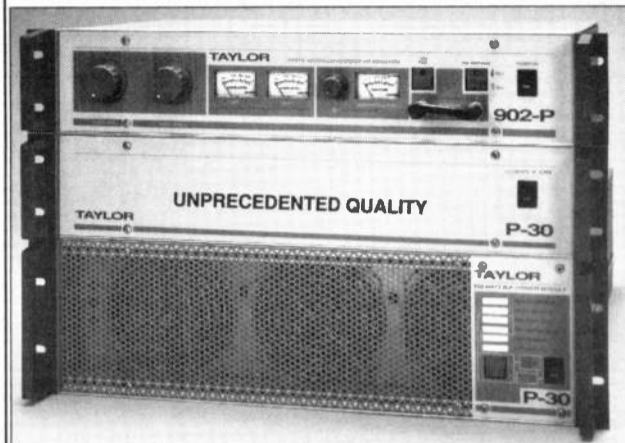
18901. 212-345-1570.
LPB AM-30 30 W AM TCU-30 coupling unit, used 2 hrs, w/manuals, on 650 kHz, can be re-tuned, \$650. M Lowery, KRMH, 121 Alsace Way, Colorado Springs CO 80906. 719-650-1445.

QEI 675 FM exciter, \$1000; CCA 20 FM exciter, \$1000. L Walters, KTLF, 1802 Chapel Hills Dr #A, Colorado Springs CO 80920. 719-593-0600.

QEI 675 FM EXCITERS, \$1550; **QEI 675T600 FM AMPLIFIERS**, \$3550, units are reconditioned and tuned on your frequency. Purchase includes manual and 6 month warranty. Contact Bob Brown at (609) 232-1625.

Harris Digit exciter w/digital input, used 50 hrs, \$7300; QEI 600 W FM exciter, \$4000, both work great. F Jankowicz, WATR, 79 Baldwin Ave, Waterbury CT 06706. 203-755-1121.

INCREDIBLE TRANSMITTERS



TV TRANSMITTERS		FM RADIO TRANSMITTERS Including Stereo Encoder	
1Watt	\$1,114	1Watt	\$1,138
2Watt	\$1,664	30Watt	\$1,499
4 Watt	\$2,138	300Watt	\$3,174
20 Watt	\$3,880	600Watt	\$5,960
40 Watt	\$5,046	1KWatt	\$8,716
100 Watt	\$6,206	2KWatt	\$11,905
200 Watt	\$9,874	4KWatt	\$20,741
400 Watt	\$13,171		
800 Watt	\$18,295		
1KWatt	\$22,900		
2KWatt	\$38,900		

TAYLOR
The Transmitter People

Taylor Bros. (Oldham) Limited, Lee St. Oldham England. Tel: 0161 652 3221, Fax: 0161 626 1736

Radio World

Broadcast Equipment Exchange

Is read by over 22,000 Broadcast Equipment Users Every Month! Sell Your Used Equipment Here. Call or FAX Simone Mullins for Information on Affordable Advertising Rates.

PHONE 703-998-7600 FAX 703-998-2966

Want to Buy

Used McMartin BF-5M 5 kW-FM, tuned and tested on your freq, completely refurbished; Also 3.5 kW & 25 kW. Goodrich Ent. Inc., 402-493-1886.

McMartin AM/FM xmtr, any model, exciter or stereo modules. Goodrich Ent., 11435 Manderson, Omaha NE 68164. 402-493-1886.

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- 10 KW FM 1986 ITA 10,000B
- 20 KW FM 1977 RCA BTF 20E1
- 20 KW FM 1973 Collins 831G
- 20 KW FM 1974 Harris FM20H/K
- 20 KW FM 1972 CCA FM20,000DS
- 20 KW FM 1982 Harris FM25K

- 1 KW AM 1975 Harris MW-1
- 5 KW AM 1979 Harris MW-5A
- 5 KW AM 1980 Harris MW-5A
- 5 KW AM 1980 Collins 828E-1
- 5 KW AM 1982 Continental 315F
- 5 KW AM 1982 Continental 315R-1
- 50 KW AM 1978 Continental 317C-1
- 50 KW AM 1981 Continental 317C-1
- 50 KW AM 1981 Harris MW-50B
- 50 KW AM 1982 Harris MW-50B

1077 Rydal Road #101, Rydal PA 19046

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There comes a time when a company knows it has a break through product. And for Energy-Onix, that time is now.

The **ECO 15-30**, Single tube, High Power Grounded Grid Transmitters up to 32 KW.

- ◆ Solid State driver up to 2 KW serves as emergency transmitter
- ◆ Straight Forward field proven control system
- ◆ VSWR Protection & More

◆ BEST OF ALL THEY ARE ECONOMICALLY PRICED!



"The Transmitter People"

Energy-Onix

1306 River St, Valatie NY 12184

518-758-1690

FAX: 518-758-1476

EMPLOYMENT

HELP WANTED

VP OF ENGINEERING - ABC RADIO DIVISION, NEW YORK, NY.

Must have good working knowledge of high-power AM and FM transmission systems, AM Directional Antennas, Satellite and Microwave Systems, and FCC Filing and Licensing procedures. Five years radio broadcasting chief engineer experience and excellent communications skills required.



Become a sales rep for established Nationally Syndicated Talk Show. Sell local avails in your market - Keep all the profits - No Gimmicks

JIN Radio Network PO Box 290685 Brooklyn NY 11229

WMTR/WDHA are looking for a creative Production Director. Excellent commercial broadcast production and copywriting skills are necessary. The ideal candidate must be proficient in digital production and automation systems, and must have a voice and delivery that is compatible with Album Rock and Adult Standards formats.

THE FAMILY LIFE NETWORK, a Christian, inspirational network of eight stations in upstate NY, has openings for announcing and creative production positions. Applicants must be positive, team-oriented, and have a strong desire for ministry.

ASSISTANT ENGINEER with 3 to 5 years radio experience with high power AM/FM transmitters, directional arrays and digital audio work stations,

etc. Contact Wayne Smith, Chief Engineer, Cox Radio, Inc., 7136 S. Yale, #500, Tulsa OK 74136. Fax: 918-493-2376. EOE.

POSITIONS WANTED

Award-winning prod director w/9 yrs exper seeks Chicago home. If you want fresh, new digital creative to drive your sales, call me for T & R. 815-337-2611.

Mgmt & drive-time position at contemporary Christian music station. Male w/20 yrs exper in radio, 6 in mgmt. E-mail: broadcastmanager@juno.com

Not a kid, not a dinosaur. Seek SE small mkt mgt opp. Tell an owner! Write POB 14706, Greenville SC 29610.

11 yr veteran seeks P/B/P sports position for a news/talk station, will travel. 804-292-7828.

CE/Computer tech w/20+ yrs hands on engineering exper, seeks CE position in a top 100 market, strong audio, computer networking & RF skills. 704-563-8676.

Daily weather for your area. Quick, reliable, digital audio quality, zipped & e-mailed. Guaranteed to be the best. B Brown, 217-466-8016. wxtrack@comwares.net.

Hard working, friendly, outgoing CE seeks employment, FT, PT, contract work, NE, TV/FM/AM/cable station, exper CET & FCC licensed, avail immed. M Rakoff, 81-12 Roosevelt Ave #413, Jackson Heights NY 11372. 718-969-5224.

Have an on-air opening?

This morning AT can fill it! 10+ yrs, PD/MD, all shifts considered. Kevin, 517-739-0328.

News anchor/producer, resonant pipes, creative for production, adult formats AT, avail now, VOA downsizing casualty. Alex, 513-777-8423.

Position for on-air announcer & prod and/or sales & promotions, lots of ideas & ready to use. Charles, 405-672-1539.

Semi-Fab radio A/T, tele-

phono's ballistico's, politicaly incorrect & vertically challenged. Mike, 517-362-7251.

Voiceover & image prod work needed, 10 yrs on-air & prod exper, currently employed on-air at large market FM. Call or fax Robert: 1-888-755-3472.

CE position, 10 yr job lost to sale, experienced w/computer, xmtrs, DCS, UDS, digital studios, great references. R King, 801-334-8315 (PM).

ADVERTISER INDEX

This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

Table with 4 columns: Page No., Advertiser, Reader Service No., Page No., Advertiser, Reader Service No. Lists various advertisers and their corresponding page numbers.

ABOUT OUR EMPLOYMENT SECTION

HELP WANTED

Any company or station can run "Help Wanted" ads for \$1.50/word or buy a display box for \$60/column inch. Payment must accompany insert, use your MasterCard or VISA; there will be no invoicing. Blind box numbers will be provided at an extra charge of \$10. Responses will be forwarded to listee, unopened, upon receipt. Call 800-336-3045 for details.

POSITIONS WANTED

Any individual can run a "Position Wanted" ad, FREE of charge (25 words max), and it will appear in the following 2 issues of Radio World. Contact information will be provided, but if a blind box number is required, there is a \$10 fee which must be paid with the listing (there will be no invoicing). Responses will be forwarded to the listee, unopened.

Mail to: BROADCAST EQUIPMENT EXCHANGE, PO Box 1214, Falls Church, VA 22041 Attn: Simone Mullins

SUBSCRIPTION/READER SERVICE FORM



FREE Subscription/Renewal Card

I would like to receive or continue receiving Radio World FREE each month. Yes No

Signature Date

Please print and include all information:

Name Title

Company/Station

Address

City State ZIP

Business Telephone ()

Please check only one entry for each category:

I. Type of Firm (check one)

- D. Combination AM/FM station
A. Commercial AM station
B. Commercial FM station
C. Educational FM station
E. Network/group owner
F. Recording Studio
K. Radio Station Services
G. TV station/teleprod facility
H. Consultant/ind engineer
I. Mfg, distributor or dealer
J. Other

II. Job Function (check one)

- A. Owner/President
B. General management
C. Engineering
D. Programming/production
G. Sales
H. Programming/news
J. Promotion
F. Other

Reader Service P81

AUG 20, 1997 issue Use until NOV 20, 1997

Please first fill out contact information at left. Then check each advertisement for corresponding number and circle below.

Purchasing Authority

- 1. Recommend 2. Specify 3. Approve

Table with 3 columns: 1. Recommend, 2. Specify, 3. Approve. Lists advertiser numbers for selection.

Table with 2 columns: Job Title, Name. Lists staff roles and names.

Advertising Sales Representatives

Table with 2 columns: Region, Name. Lists advertising sales representatives by region.

Free Subscriptions are available upon request to professional broadcasting and audiovisual equipment users. For address changes, send current and new address to RW a month in advance at P.O. Box 1214, Falls Church, VA 22041. Unsolicited manuscripts are welcomed for review: send to the attention of the appropriate editor.

Copy & Mail to: Radio World, PO Box 1214, Falls Church, VA 22041, or FAX to: 703-820-3310



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**TAKE A GOOD LOOK AT THE 2500 SERIES,
FASTEST SELLING SMALL CONSOLE AROUND**

Broadcasters with Major Rebuilds or minor restorations are motivated to find FEATURES, QUALITY, and VALUE. LOOK no further than the 2500 from AUDITRONICS with recent innovations and additional options which further define this Product Class.

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- ◆ **DC CONTROL** of all level functions
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- ◆ **20dB HEADROOM** maintained throughout
- ◆ Linear **CONDUCTIVE PLASTIC** 100mm faders (P & G Standard)
- ◆ External line selector with **CUE AND HEADPHONE ASSIGNMENT**
- ◆ Comprehensive **A/B EXTERNAL LOGIC** control

With nearly 30 years of supplying the Broadcast Industry with the best Audio Equipment, You will be getting the best Customer Commitment and Service available. Call today and find out just how affordable the 2500 Series from Auditronics really is.

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(901) 362-1350 FAX (901) 365-8629
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Some Countries Have It ALL!




WSIX - Nashville, Tennessee "Country Music Station of the Year"

A-500 Studio Furniture delivered March 1993
A-500 Console S/N 20789 delivered April 1993
A-500 Console S/N 20792 delivered April 1993
A-6000 Studio Furniture delivered March 1995
A-6000 Console S/N 22536 delivered March 1995
R-16 Console S/N 22557 delivered March 1995
SP-5 Console S/N 22593 delivered April 1995

1995 Academy of Country Music Award
1995 Marconi Country Music Award
1995 Billboard Country Music Award
1995 Country Music Association Award
1995 Country Music Association SRO Award
1995 Gavin Country Music Award
1996 Gavin Country Music Award
1996 Academy of Country Music Award

Wheatstone Model A-6000 Audio Console shown

 **Wheatstone Corporation**
tel 315-452-5000 / Syracuse, NY.

Circle (110) On Reader Service Card

World Radio History