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KNX Web site sizzles. See page 49.

Radio World®

Vol 20, No 13 | Radio's Best Read Newspaper | June 26, 1996

It's Lights Out for Dark Stations

by Lucia Cobo

WASHINGTON Radio stations that have gone dark better power up or see their licenses terminated.

This is the new rule, enabled by the Telecommunications Act of 1996. At this point, 256 AM and FM stations nationwide are affected.

The move is not a new concept but rather a continuation of efforts by the Federal Communications Commission to clean up the AM band, according to National Association of Broadcasters Deputy Legal Counsel Barry Umansky.

"The logic is that if you are licensed, you ought to use that license to provide service," he said.

The new FCC rules stem from the congressional mandate spelled out in the Telecommunications Act, said Umansky. The mandate asserts in no uncertain terms that broadcasters should put their licenses to good use or lose them.

The new FCC rules specify that the license of any broadcast station that remains off the air for any consecutive 12-month period will expire as a matter of law, "notwithstanding any provision, term or condition of the license to the contrary."

As of April 23, 175 AM and 81 FM stations were listed as silent by the commission.

With a start date of Feb. 8 (when the Telecommunications Act became law), the first of these licenses will expire on Feb. 9, 1997.

That applies to any class of broadcast station: AM, FM, FM translator and booster stations, radio broadcast experimental stations, TV, TV booster, TV broadcast experimental stations, low power TV, TV translator and international broadcasting stations.

Stations that go dark subsequent to Feb. 8, will see their licenses expire 12 months from whatever date their "silent status" began.

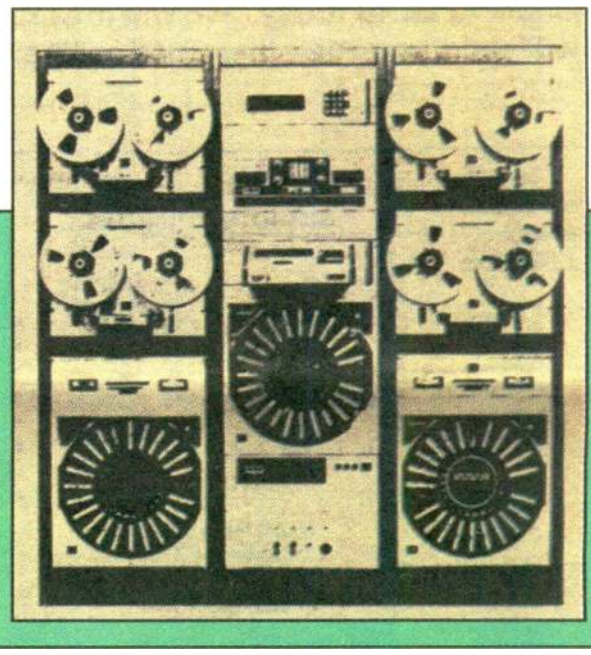
A station's authorizations and pending applications with the FCC do not in any way "toll or extend the 12-month period that triggers expiration."

On May 22, the commission did, however, announce expedited processing of applications filed by silent stations.

"It is an effort by the commission to try to give a break to those who are trying to get back on the air," Umansky said.

continued on page 3 ▶

Automation Systems: That was then . . . Check out now on page 54.



RW EXCLUSIVE

Daughter's Insights On The Father of Wireless

It was June, 1896 — one hundred years ago — when young Guglielmo Marconi took out patents in England for a new invention he called "wireless telegraphy." Soon after, the Marconi Wireless Telegraph Company was born, a business whose American operation would later become RCA, the Radio Corporation of America.

Marconi's great invention was the first transmission of coded messages through the air. It was other inventors and visionaries — such as Lee de Forest, Edwin Armstrong and Marconi's employee, David Sarnoff, who would create the medium of wireless audio that we know today as radio.

Gioia Marconi Braga

Ironically, however, Marconi's original vision — that of wireless personal communications — has come of age only in recent years in such devices such as cellular telephones, pagers and wireless data devices.

RW's Frank Beacham spoke recently with Marconi's daughter, Gioia Marconi Braga, founder of the Marconi International Fellowship, an organization that honors the work of scientists and engineers in the field of telecommunications. Mrs. Marconi Braga was 18 years old when her father died in 1937.

continued on page 10 ▶

Circle (187) On Reader Service Card

FCC Frowns On License Experiment

by Lynn Meadows

WASHINGTON Not all experiments go according to plan. Take Frankenstein, for instance. Or the real-world example of one experimental station licensee.

In September 1993, the Experimental Licensing Branch of the FCC granted Playfone an experimental license — KF2XFB — to "explore the technical and economic feasibility of providing live on-site radio broadcasts to attendees at sporting events."

Anywhere, anytime

The license authorized Playfone to broadcast 40 W on 530–1705 kHz; 30 W on 450–451 MHz and 455–456 MHz; and 10 W on 54–72 MHz, 76–88 MHz, 88.1–107.9 MHz and 174–216 MHz.

By early this year, using the same

continued on page 12 ▶

World Radio History

NEWSWATCH

Clear Channel Buys Heftel Shares

SAN ANTONIO Clear Channel Communications and Heftel Broadcasting Corp. announced that Clear Channel Radio Inc. will pay $23 each for all shares of Heftel Broadcasting that are not beneficially owned by Clear Channel.

Heftel management agreed to sell its shares which represent approximately 40 percent of the company's outstanding stock.

Clear Channel currently owns approximately 21 percent of Heftel Broadcasting.

Clear Channel, which has broadcasting operations in Australia and New Zealand, currently owns and/or operates 95 radio stations and 17 television stations in the United States.

Heftel Broadcasting is a Spanish language broadcasting company with radio stations in New York, Los Angeles, Chicago, Dallas, Miami and Las Vegas.

Radio Ad Revenues Increase

DALLAS Radio enjoyed its 44th consecutive month of radio revenue increases in April. The Radio Advertising Bureau reported that both local and national spot revenue posted six percent increases over April 1995.

National spot advertising dollars rose in every region except the Midwest. The six-percent local revenue gain was fueled by healthy increases in every region of the United States.

"These gains are particularly impressive when you consider that Radio revenues have increased over 30 percent in the last three years," said RAB President and CEO Gary Fries in a statement. "And we see no signs of a slowdown."

New FCC Toll-Free Service

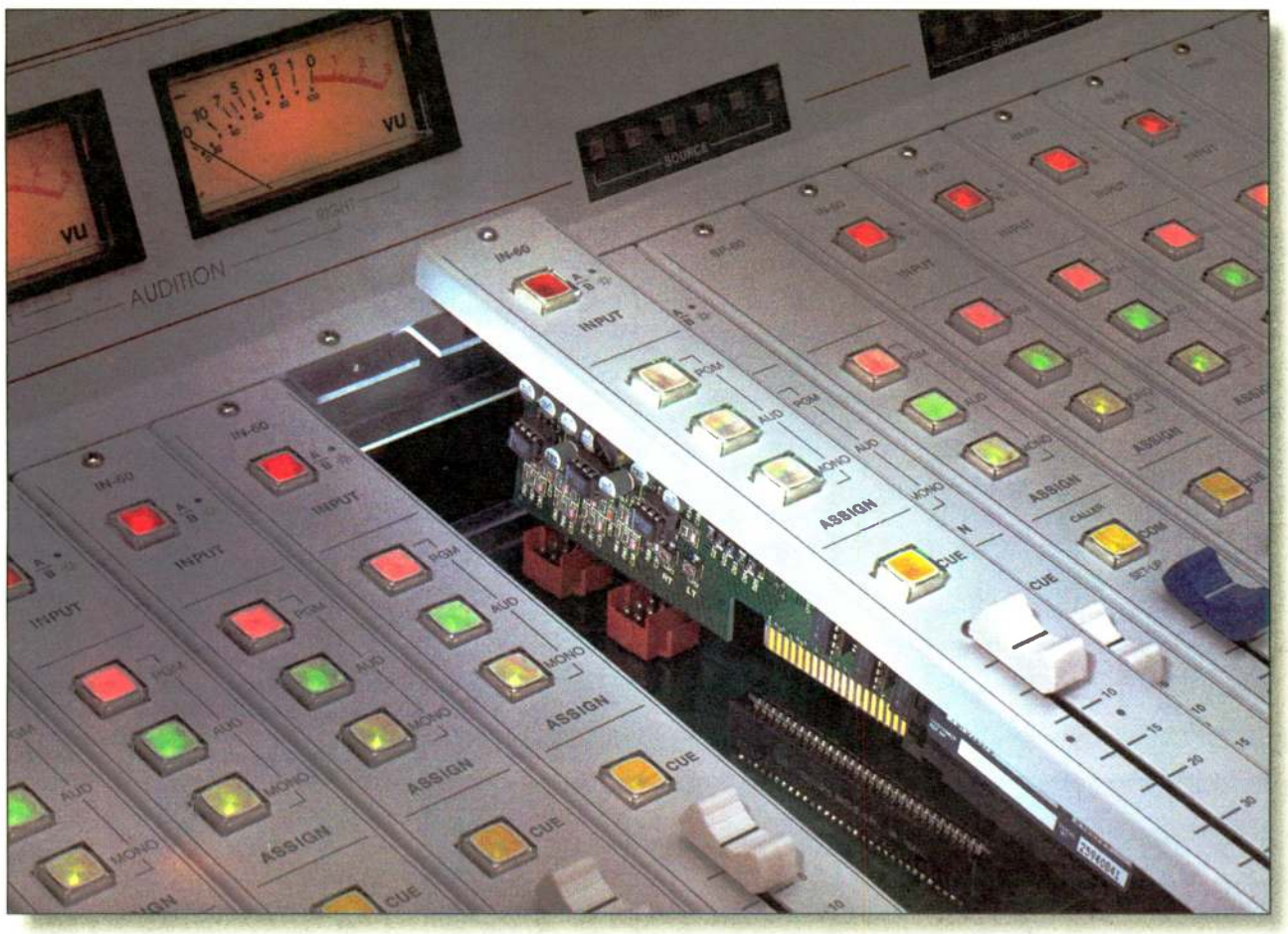
WASHINGTON The FCC inaugurated the first phase of its toll-free information line. Consumers can reach the FCC National Call Center in Gettysburg, Pa. by calling 1-888-322-8255.

The service will be staffed weekdays from 8 a.m.-4.p.m. and will also provide automated information 24-hours a day, seven days a week.

Staff at the Call Center will be able to provide information on obtaining a license or form, filing a complaint or expressing a concern about what a local radio or television broadcast station aired.

When FCC experts must be consulted, the call will be electronically transferred to FCC Washington Headquarters at no additional cost to the caller.

Take a LOOK at THIS:



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Mic & Line, +16dBu	.005%
IMD (SMPTE)	
Mic & Line, +4dBu	.004%
DIM	
Mic & Line, +16dBu	.005%
DYNAMIC RANGE	
Line	114dB
Mic	98dB
HEADROOM	
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World Radio History

Union Wants Volunteers Protected

by D.C. Culbertson

NEW YORK Ironically, the most liberal network in public radio is presently struggling with one of its member stations over a very conservative issue.

Unlike most public radio stations, three out of the five stations in the country operated by the California-based Pacifica Foundation are unionized. WBAI(FM) New York belongs to the United Electrical, Radio & Machine Operators of America.

Like the other four Pacifica stations, only about 22 of the WBAI employees are paid. Unpaid staff members — approximately 200 of them — do most of the on-air and production work.

Volunteer union

In 1987, when WBAI negotiated its initial contract with the union, unpaid employees were protected. And when a new contract was originally negotiated on March 26, there was no indication that this would change, according to Chief Steward R. Paul Martin, an unpaid staff member who hosts a late-night program, "Back of the Book."

In April, however, WBAI management unexpectedly presented the union with a 32-page proposal demanding that the station's unpaid staff be denied any union protection and be removed from the Collective Bargaining Unit.

In its proposal, management called for the union to institute a "no strike clause" in its union contract and tried to reduce vacation time, paid holidays, health care provisions and transportation reimbursements. It also called for increasing the probationary period for new employees from three months to 130 days.

At an April 30 meeting, Valerie Van Isler, who has been general manager at WBAI since 1990, admitted that these and other restrictive provisions had come directly from Pacifica. Martin said the original proposal was apparently drawn up by a consulting firm in Orange County hired by Pacifica.

Van Isler said she feels the union is being unreasonable by insisting its protection extend to volunteers.

Pacifica has made similar demands on its other unionized stations, KPFK(FM), Los Angeles and KPFA(FM), Berkeley in what Martin thinks is an attempt to bust up the unions there. The management demands are ironic considering that, in the past, such moves have been denounced on the WBAI airwaves and by Pacifica in general.

Business of a union

However, according to Van Isler, the unions at KPFK and KPFA do not have any provision to protect unpaid employees. Except for the one at WBAI, Van Isler said she has never heard of a union that includes such a provision in its contract.

Because the business of a union specifically concerns matters pertaining to paid employees like salary, benefits and work conditions, Van Isler said she feels the union is being unreasonable by insisting its protection extend to volunteers.

Pacifica Executive Director Pat Scott agreed. Scott was quoted in a recent article of the New York Magazine as saying, "We appreciate the volunteers. But they do not belong in the union."

Martin speculated that the real reason behind Pacifica's current union-busting attempts may be a hidden agenda to create a Pacifica Network, where all the member stations would be reduced to automated satellites carrying only programming that originated at network headquarters in Berkeley.

Martin pointed out that although all five Pacifica stations have satellite receivers, Berkeley has the only uplink. While automated satellites are not financially possible at present, Martin believes they will be by 1999.

Noting that this is just speculation, Martin said, "There's plenty of evidence to show we're not just paranoid."

The current climate in Washington may be another reason for the new Pacifica strictness according to Martin. Pacifica receives about $2 million a year from the government. There are fears of having that support cut off; Pacifica has a long-standing tradition of carrying programs most broadcasters would not touch because of their radical content.

WBAI poses a special threat in this regard. The station is unabashedly radical — Abbie Hoffman regularly called in updates during the Chicago Seven trial — and they frequently resist attempts by Pacifica to carry its national programs.

Still in progress

Negotiations are still in progress, but out of the station's hands. Van Isler said that although they offered to mediate, the union refused so a petition has been filed with the National Labor Relations Board.

The contract was extended to June 30 and over 11 meetings have taken place to date. Van Isler said she wants to do the best for the station's paid employees; consequently, WBAI management has backed down from some of its original demands, agreeing to keep the number of paid holidays intact, to reduce vacation times for new employees only and to compromise on the proposed watering-down of health and safety provisions. About 40 items in the contract are still open to negotiation.

Martin suggested that one way out of the existing situation is for WBAI to sever all ties with Pacifica and become totally self-supporting. He said he feels this is possible because its cash surplus last year reached six figures and the station regularly raises over $1 million during its fundraising marathons.

Van Isler admitted that the present situation is "difficult" and "unique," but did not speculate how matters will end.

Ending the Silence

▶ continued from page 1

Although the "responsibility for bringing a silent station back on the air is that of the licensee," the procedures recognize that in some cases, it is commission action that is required to get a station back on the air.

As of April 23, 175 AM and 81 FM stations were listed as silent by the commission.

The procedures provide specific instructions for filing such applications. Applicants must send the FCC a transmittal letter prominently labeled "Request to Expedite Application of Silent Station." The letter should include the station call sign, city of license and state, type of application, a brief explanation of why the application is necessary and the date the license will expire if the station remains off the air.

The Public Notice delineates a timeline of no less than 45 days from the date of filing for action on an "unopposed assignment and transfer" application and roughly four months for action on unopposed "minor modification" applications.

The commission, in its Public Notice, urged silent station applicants to submit their paperwork "as early as possible" and to "use extreme care in preparing those applications to ensure prompt action."

However, in a strictly worded paragraph, the commission stated, "The Telecommunications Act does not afford the commission discretion to extend license terms.

We therefore emphasize that, as a matter of law, the staff's inability to act on any application within a specific time cannot prevent license expiration nor give rise to any equitable claim that the license term should be extended."

FCC Spokeswoman Irene Bleiwess said the new rules apply specifically to licensed stations that have gone dark and not to CPs.

Any station that is currently on the air and for whatever reason goes dark, said Umansky, still has to abide by the Minimum Operating Schedule portion of the rules (§73.1740 — see "Silence Is Not Golden," page 6).

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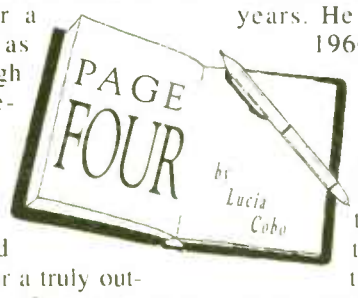
World Radio History

WFLS Shines; WHFS Forfeits

WASHINGTON The **RW** softball gang declared victory over the no-show WHFSers on June 3. Which means we are, as of this writing, undefeated in our inaugural season. Sure, they claimed they were too tired after the HFStival to play us in softball ... we think they just heard how hard and long we'd been practicing and got scared.

In any event, **RW** 1, WHFS 0, and we'll take calls for a reschedule as soon as they feel rested enough to pick up the telephone!!!



★ ★ ★

Every once in a while, I am privileged to visit what I consider a truly outstanding radio station. Yesterday, Lynn Meadows and I headed south on Interstate 95 and paid a visit to William Poole and the wonderful staff at WFLS-AM-FM in Fredericksburg, Va.

What a great place. Owned by the Free-Lance Star Publishing Co. (one of the best-run hometown newspapers in the country and still independently owned), WFLS-FM booms a 50 kW signal off a 492-foot tower and programs a Country music format.

But it also features one of the best news operations you can find. The commitment to news is obviously an intrinsic part of the parent company, but the newspaper and the radio stations do not share news operations. Sheila Quinn runs the news department for WFLS-AM-FM, and the walls of the radio stations are covered with the hundreds of awards she and her crack news team have earned in the last 10 years.

With a signal potent enough to blanket the metropolitan Washington area, WFLS-AM-FM instead chooses to superserve their city of license. When you listen to their newscasts, you don't just get a five-second audio byte from a network newsfeed, you get the whole sentence and more. They really dig into the local political scene and cover the gamut of community issues. I cannot describe how impressed both Lynn and I were with this operation.

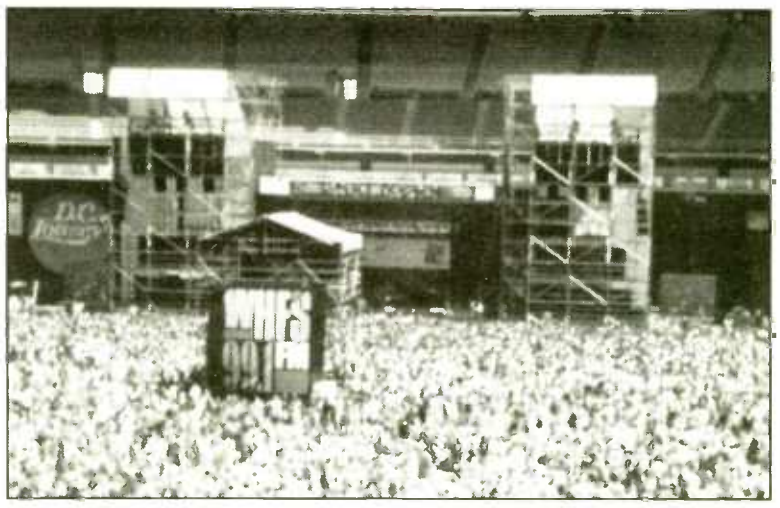
And unlike many cases in radio, the folks at WFLS-AM-FM all have lengthy track records with the stations. Starting at the top, Bill Poole has been there 36 years. He came on in 1960 to put the AM station on the air; the FM went on in 1962. Bill Poole tells us that the signal off the FM is so clean and powerful because it was designed that way from the get-go — by none other than Bob Silliman.

What impressed us the most, I think, is how completely WFLS just blew up our preconceived notions of small-town radio. This station easily ranks right up there with any major market operation.

From the Orban DSE-7000 in the production room to the Auditronics boards in the on-air studios, these stations reflect commitment to being the best radio station technology and talent can provide. Its commercial success, of course, springs from these roots.

★ ★ ★

Allen Weiner's is a name long familiar to U.S. broadcasters. He's in the headlines again with a new mission and a new boat. Lightwave Mission Broadcasting recently announced that it will be working in association with Becker Broadcast Systems to outfit a ship for International Shortwave and Mediumwave (AM) transmission.



The HFStival may be a major concert event, but I ask you: Does it justify forfeiting a major softball game with a certain unnamed major radio trade publication?

The new vessel is to be named the Electra in honor of radio great Guglielmo Marconi whose experimental radio-ship of the 1920s was also named Electra.

According to Lightwave Broadcasting, the purpose of this station is to provide a "free radio voice that can travel to those in need." Plans are for the offshore station to broadcast a variety of programs, many dealing with environmental issues facing the world oceans and peoples.

Lightwave Broadcasting announced that it will make broadcast time available for lease to interested parties.

"The beauty of this radio station is its ability to go where a radio presence is needed, anywhere on earth. The new radioship will be tough and dependable, able to broadcast anywhere," stated Allen Weiner.

Target readiness date for the Electra is summer's end.

Power 99 Benefits Big Brothers and Big Sisters

Philadelphia's Power 99 FM gave away a $50,000 customized Toyota Land Cruiser and a recording session with Boyz II Men to two of its listeners. The station co-sponsored the Philadelphia Youth Talent Show with Boys II Men, the Plymouth Meeting Mall and the Conicelli Autoplex. Grand prize winner of the talent contest was 13-year-old Sterling Simms of Mount Airy, who walked away with $1,000 and the promise of a three-hour professional recording session, compliments of Boyz II Men.

Emily Ward won the Power 99 FM spring contest which netted her a jet black, fully loaded customized Land Cruiser with each of the band member's names embroidered on the leather headrests.

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READERS FORUM

If you have comments for Radio World, call us at 800-336-3045 or send a letter to Readers Forum (Radio World, Box 1214, Falls Church, VA 22041 or e-mail 74103.2435@compuserve.com or MCI Mailbox #302-7776). All letters received become the property of Radio World, to be used at our discretion and as space permits.

History lesson

Dear **RW**,

In "Composite Processing Remains Hot," (**RW**, May 29) Eric Small wrote: "The reign of the Volumax ended when Orban and I developed the Optimod-FM integrated processor and generator." This statement cries out for amplification and a trip down memory lane into the mists of broadcast history, ca. 1974.

In 1972, I was helping out an old college friend at his Class-A FM in Los Altos, Calif. I built him a custom stereo limiter, which used clipping as the means of final peak control. A mystery arose when peaks that were clearly well-controlled at the studio produced egregious overmodulation on the air as read on the station's Belar FMM-1 modulation monitor.

A call to Arno Meyer at Belar revealed the reason: The 15 kHz low-pass filters in the Collins stereo generator were overshooting and ringing. I took a scope up to the transmitter and, sure enough, Arno was right — that was exactly what was happening.

Two years later I decided to design a broadcast compressor/limiter as Orban Associates' next product. I remembered the problems I had encountered with the stereo generator's low-pass filters.

It occurred to me that a good solution would be to design non-overshooting low-pass filters and to package the compressor, limiter, high-frequency limiter, filters and stereo generator together as a system. I proceeded to design and prototype a single channel of this processing and build it on a perf-board.

I had been working with Eric Small on the tests of the Nippon/Columbia quadraphonic broadcast system for FM, so it seemed logical that I take this prototype to him. We hooked it up to his Belar and he was very impressed. He had never seen the modulation meter swing so high with no peak flasher activity.

I told him that the way the system had to work was that two channels of this processing had to be packaged with a stereo generator so that any circuit elements that could cause overshoot would be contained within the system and would thus be controllable.

After thinking about it for a bit, he agreed, and said that he wanted to get involved with the marketing and development of the product that was to become Optimod-FM Model 8000A.

Eric's primary contributions to the development were three: He consulted on the user interface, he helped design the packaging so that the unit would be RFI-resistant and he interfaced with the FCC to ensure that the unit could legally be connected to transmitters (by making the unit's output look like the output of a composite STL, because these had already gotten the FCC's OK).

However, the circuit design, systems design and even the "Optimod" moniker were my creations, and I am the sole inventor named on the relevant patent (U.S. #4,103,243).

After my business partner John Delantoni and I completed design and packaging of the production 8000A in 1975, Eric Small and Associates was engaged to market and promote the unit for a period of two years.

Eric did a fine job in communicating the advantages of the systems approach to processing, and made sure that the unit got into the hands of the industry's movers and shakers early on. As part of the marketing effort, he made a number of measurements demonstrating quantitatively that the new system's approach achieved up to 3 dB higher on-air loudness than the old technology, while controlling peak modulation far more consistently. Optimod-FM was up and running and Orban started a period of rapid growth.

The 8000A was manufactured until 1980, when it was replaced by the 8100A, which ultimately became the best-selling FM processor in the history of the industry and is still being manufactured today.

After the expiration of Eric's two-year contract, Delantoni and I decided that Orban had grown large enough to move sales and marketing in-house where it could be more tightly coupled to our management structure. Eric moved on to other endeavors, eventually founding Modulation Sciences.

Robert Orban
Chief Engineer
San Leandro, CA

So-called pirates

Dear **RW**,

The April 17 edition of **RW** contained three articles on so-called pirate broadcasters. Several interesting points were made by the respective authors.

Mr. Juneau must be a former broadcaster or NAB lobbyist. These two groups are the only organized opposition to unlicensed or low-power broadcast operations. Most unlicensed stations are not, as Juneau alleges, frenzy stations. Many are offering community service, something their full-power brethren long ago abandoned.

The pejorative term "pirate" is another media/NAB concoction. Piracy is legally defined as theft and is classified as a felony. There are no (nor have there ever been any) felony criminal charges of piracy pending against any unlicensed broadcast operation.

Mr. Juneau would apparently have no problem in holding anyone related to or acquainted with unlicensed operators as accomplices. Fortunately for most of us (at least those living outside of the Juneau state of Louisiana), the justice system in this country does not function in that manner.

Hank Landsberg proposes guidelines for low-power FM that are, for the most part, very realistic. However, a cap of 10 W ERP is far more reasonable than his proposal of 50 W. Programming should comply with requirements for decency, or at least fall above the minimum Imus/Stern/Limbaugh standards.

However, there should be no stipulation for limited operating hours. Landsberg makes no justification for that requirement. Low-power FM assignments should be made on a first-come, first-served basis. Many additional channels could be made available if the FCC would reign in the growing epidemic of translator abuse by licensed operations.

Engineering should be kept sweet and simple. Type-approved equipment only, no cheap kits or home-built units. This station spent $2,000 for a type-approved unit; it is feasible and demonstrates commitment.

Finally, there is the story of A.L. Kobres' unlicensed operation. If the FCC has, as reported, seized Kobres' transmitter and studio equipment, the commission has apparently violated the law. 47 USCA Section 510 defines what equipment the FCC can seize ... assuming regulatory jurisdiction exists.

Kobres should pursue a complaint with the Justice Department for this apparent violation, which incidentally, is not the first by the FCC.

While he is at it, let's hope Kobres can also pursue a civil claim into court and get the FCC to cite the statutory for, as reported in RW, a local commercial station complaining of "losing listeners" to Kobres' community broadcast operation.

In closing, the subject of FCC jurisdiction over these low-power stations and the constitutionality of the commission's rules prohibiting low-power operation are the subject of current litigation in California.

While the outcome of that case will have limited and very localized impact, a favorable ruling for low-power operation will give judicial notice to the movement.

In view of the recent Telecommunications Act, which is the most heinous rape of the public trust in this century, the broadcast industry and its lobby, the NAB, can chew over the following.

Who really are the pirates and who indeed have stolen the public trust to mine obscene copious amounts of money while purveying "entertainment" targeted at the intelligence level of a low-grade moron?

Bill Dougan
KAFR
Phoenix, AZ

Some Good Regulation

It will be years before the long-term impact of the Telecommunications Act of 1996 will be fully understood and felt. Actions taken by the FCC to date have shown that much of the Act contains good regulation.

Some of the changes brought on were essentially fait accompli — such as the consolidation of ownership and the relaxation of duopoly restrictions.

Some of the changes will emerge slowly, as is the case with the Telecommunications Development Fund. Created as a helping hand to small businesses trying to enter and compete in the newly deregulated telecommunications industry, the concept is that the FCC will be collecting large amounts of money from spectrum auction deposits. While the money earned on spectrum auctions will be turned over to the Treasury, the interest accrued on those deposits will then be set aside to form the body of the TDF.

To satisfy the Congressional mandate, Chairman Hundt, within 30 days of the signing of the Telecommunications Act, appointed as TDF interim chairman Solomon Trujillo, president and CEO of U.S. West Communications Corp.

Notice, he is not a broadcaster. There will be a seven-seat board — hopefully one of those will be a broadcaster.

Another recently acted upon part of the Act enables the FCC to clean up our radio spectrum by terminating the licenses of stations that have gone dark and failed to return to air in 12 months.

As of April 23, 175 AM stations were listed as silent by the commission, as well as 81 FM stations.

The cleanup of our radio spectrum is an important tool toward the continued enhancement of the radio business. Station licensees should either get on the air and serve the public they were licensed to serve or lose their right to do so.

To date, changes brought on by the Telecommunications Act seem to have the right idea in the design. Broadcasters should toe the regulatory line.

—RW

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Next Issue of Radio World July 10, 1996

World Radio History

Inquiry Open on MPR Division

by Sharon Rae
Rover News Services

ST. PAUL, Minn. The Minnesota Attorney General's office is taking a hard look at the largest public radio system in the country.

According to a story in the St. Paul Pioneer Press last month, the office is looking into the relationship between the for-profit and nonprofit activities of Minnesota Public Radio — specifically if the for-profit ventures have been sufficiently isolated from the not-for-profit ventures.

While the office of Minnesota Attorney General Hubert H. Humphrey III would not confirm nor deny the existence of an investigation, an official at MPR acknowledged that an inquiry is taking place as did the state representative who initiated the probe.

MPR created a for-profit holding company called Greenspring Co. in the late 1980s when President Reagan suggested public radio find new streams of revenue beyond the conventional ones.

Greenspring serves as the parent company for three for-profits: Rivertown Trading, a direct mail catalog company, Minnesota Monthly, a Minnesota-based regional magazine, and The MNN Radio Networks.

The for-profits are entirely owned by the not-for-profit. Tom Kigin, vice president of MPR and executive vice president of Greenspring, said that the yearly reward back to MPR is based on the success of the profit-making subsidiaries. He stressed that any success that the for-profit has goes to benefit the not-for profit. And therein lies the reason for scrutiny.

Kigin admitted that the relationship between the not-for-profit MPR and its for-profit affiliate is somewhat unusual "in the extent to which the for-profit has been able to provide support to the not-for-profit.

He said, "Anytime you mix up size and not for profit and for profit and media ... invariably, people will have comments and concerns about that."

Representative Matt Entenza (D-St. Paul) chairs the Consumer Protection Committee in the Minnesota House of Representatives and is the former prosecutor in the Charities Division of the Minnesota Attorney General's Office specializing in nonprofit fraud cases.

Entenza said he was informed by workers at MPR in December 1995 that company president Bill Kling e-mailed employees asking them to go to the Greenspring offices to work at the Rivertown Warehouse.

"As a prosecutor, I knew that was illegal. It's illegal for people who are being paid out of charitable donations to be asked to work for a for-profit company ... (these workers) were on salary to MPR but working for the for-profit. That's the improper use of charitable donations."

Entenza contacted the attorney general's office and the U.S. Attorney regarding his concerns.

Tom Kigin said MPR simply encouraged its employees to work in the distribution center to help it through its difficulties.

Rivertown Trading Company, which accounts for about 97 percent of all for-profit revenues, suffered a painful year in 1995, unable to turn money back over to MPR. The subsidiary is not expected to do much better this year.

"What Rivertown did, as we didn't want to have to set up additional salary and compensation, was to make charitable contributions to the charity of the employee's choice to make things administratively simple," said Kigin. "And, it was only nine employees working a sum of about 35 hours. It was just peanuts."

"If it's only nine people, they still did something wrong," said Entenza.

"The facts weren't in dispute. Maybe the magnitude of the facts, but not the facts themselves. It's a fact that they asked MPR employees to work in the warehouse (of a for-profit subsidiary). And once you know that, then you know that there was a violation of the law — and the only question is how bad and how often and what should be done about it."

According to Kigin, much of the concern is misplaced and arises from a misunderstanding of the ownership structure.

"The ownership of the for-profit is entirely within the non-profit. So any success that the for-profit has goes to the benefit of the non-profit."

Aside from the attorney general's probe into the misuse of charitable contributions, there reportedly is also an investigation into whether the salaries of the for-profit subsidiaries have been legal.

Entenza said the same memo that announced the inquiry into the alleged improper use of charitable donations revealed that the attorney general was also doing a full investigation into the salaries of those involved with the for-profit subsidiary. These include Kling, president of both Greenspring and MPR, and Kigin who has a leading role in both corporations.

While Entenza did not prompt the secondary salary investigation, he did draft a bill last year requiring salary disclosure for nonprofits in an effort to close a legal loophole.

Entenza introduced the bill on the heels of the United Way of America scandal. In that scandal, William Aramony, now in jail, set up a for-profit subsidiary to the United Way.

"Under (my bill), if a charity has a for-profit subsidiary, they have to report the salaries from the for-profit subsidiary."

According to Entenza, except for MPR, most of the nonprofit sector supported his bill which passed this year. Under the new law, Bill Kling did, in fact, disclose his 1995 salary (between the for-profit and non-profit ventures) of about $350,000 a year. "Not an illegal salary, said Entenza.

"The attorney general, however, is going back to 1993 numbers for Mr. Kling and others who hold dual positions at MPR/Greenspring."

The concern is whether the salaries of MPRs top executives were too high. If dollars were going into excessive salaries, explained Entenza, it could be considered stealing from Public Radio since all profit is supposed to go to public radio.

While he remains a big supporter of public radio, Entenza said his bottom line is that non-profits play by the rules.

"Sometimes good people do bad things," said Entenza. "They made some bad decisions, including opposing my bill in the first place." He reiterated that his request for an inquiry was only to address the improper use of charitable contributions and that the attorney general decided to pursue the salary issue further.

Kigin said he believes Entenza's heart is in the right place.

"I think that he's genuinely concerned about the non-profit sector, and he should be, but I think that sometimes his judgment has been off. MPR values the trust that has been given to it by its contributing members and would never intentionally do anything that would put that trust or its non profit status in jeopardy."

Entenza said things should become clearer this fall when MPR discloses its salaries. Overall, MPR's profit making ventures can be seen as a success story. Greenspring is a $150 million a year corporation. Some say with success comes scrutiny. It appears the attorney general will have the last word.

Silence Is Not Golden

The following reprint of FCC Rule §73,1740 Minimum operating schedule (as amended June 6) is courtesy of Jeff Tobias at Pike & Fischer Inc.

(a) All commercial broadcast stations are required to operate not less than the following minimum hours:

(1) AM and FM stations. Two-thirds of the total hours they are authorized to operate between 6 a.m. and 6 p.m. local time and two-thirds of the total hours they are authorized to operate between 6 p.m. and midnight, local time, each day of the week except Sunday.

(i) Class D stations which have been authorized nighttime operations need comply only with the minimum requirements for operation between 6 a.m. and 6 p.m., local time.

(2) TV Stations

(i) During the first 36 months of operation, not less than 2 hours daily in any 5 broadcast days per calendar week and not less than a total of:

(A) 12 hours per week during the first 18 months.

(B) 16 hours per week during the 19th through 24 months.

(C) 20 hours per week during the 25th through 30th months.

(D) 24 hours per week during the 31st through 36th months.

(ii) After 36 months of operation, not less than 2 hours in each day of the week and not less than a total of 28 hours per calendar week.

(iii) Visual transmissions of test patterns, slides, or still pictures accompanied by unrelated aural transmissions may not be counted in computing program service (see §73,653).

(3) "Operation" includes the period during which the station is operated pursuant to temporary authorization or program tests, as well as during the license period.

(4) In the event that causes beyond the control of a licensee make it impossible to adhere to the operating schedule of this section or to continue operating, the station may limit or discontinue operation for a period of not more than 30 days without further authority from the FCC. Notification must be sent to the FCC in Washington, D.C., not later than the 10th day of limited or discontinued operation. During such a period, the licensee shall continue to adhere to the requirements in the station license pertaining to the lighting of antenna structures. In the event normal operation is restored prior to the expiration of the 30-day period, the licensee will so notify the FCC of this date. If the causes beyond control of the licensee make it impossible to comply within the allowed period, informal written request shall be made to the FCC no later than the 30th day for such additional time as may be deemed necessary.

(b) Noncommercial education AM and TV stations are not required to operate on a regular schedule and no minimum hours of operation are specified; but the hours of actual operation during a license period shall be taken into consideration in the renewal of noncommercial educational AM and TV broadcast licenses. Noncommercial eduction FM station are subject to the operating schedule requirements according to the provisions of §73,561.

(c) The license of any broadcasting station that fails to transmit broadcast signals for any consecutive 12-month period expires as a matter of law at the end of that period, notwithstanding any provision, term, or condition of the license to the contrary.

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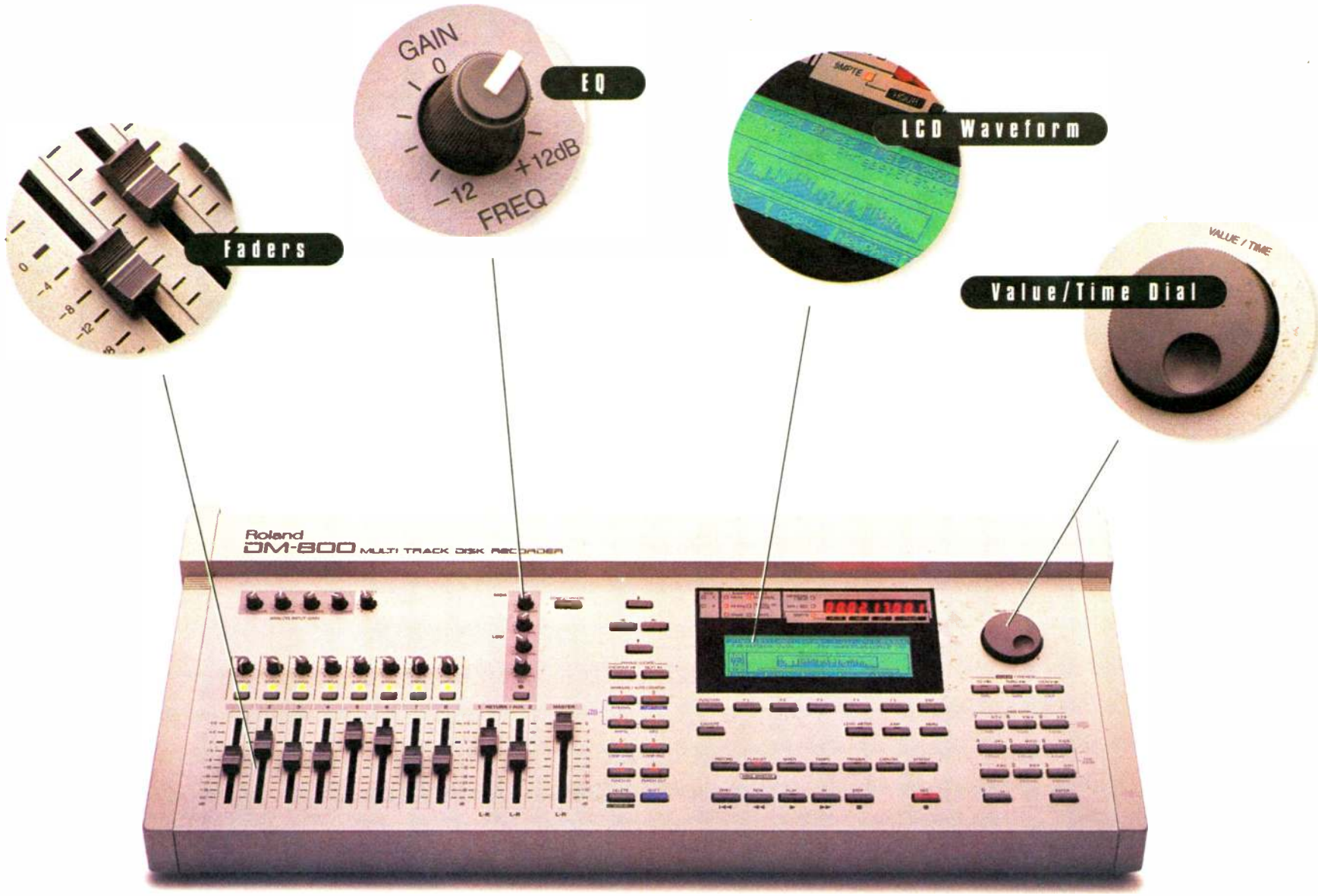

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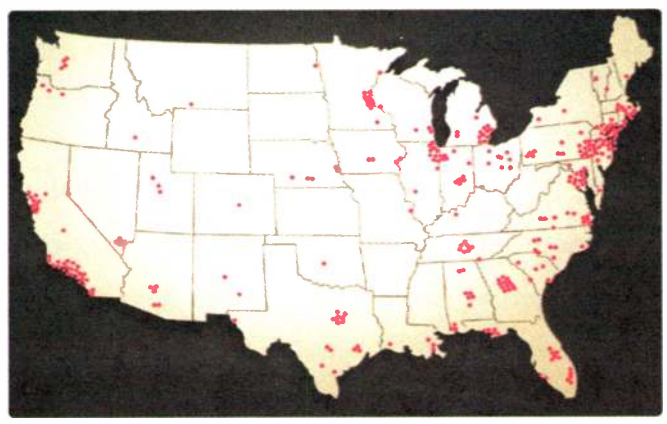

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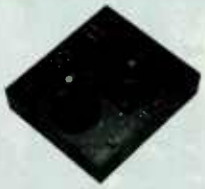

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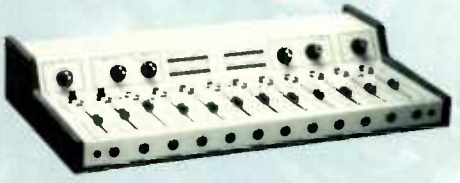

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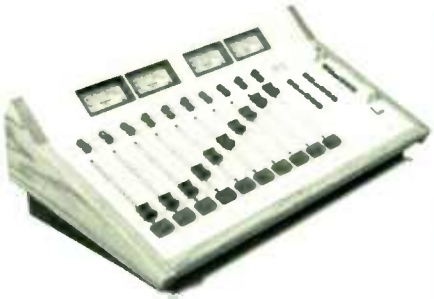

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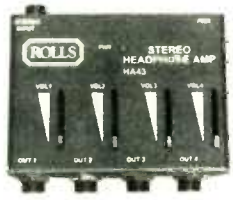

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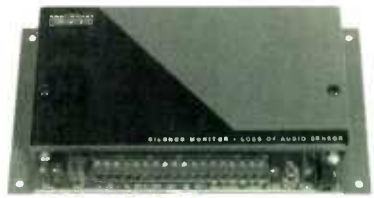
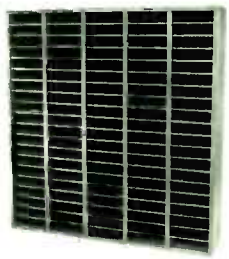


Silence Monitor –

Monitors stereo or mono sources for loss of audio. Provides relay closure after user programmed time delay.

SM **$189.00**



Cart Rack – The standard

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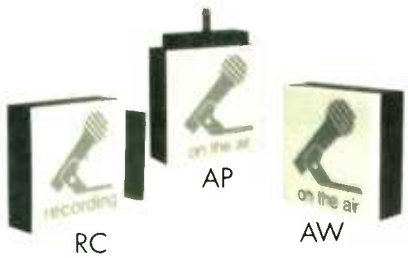

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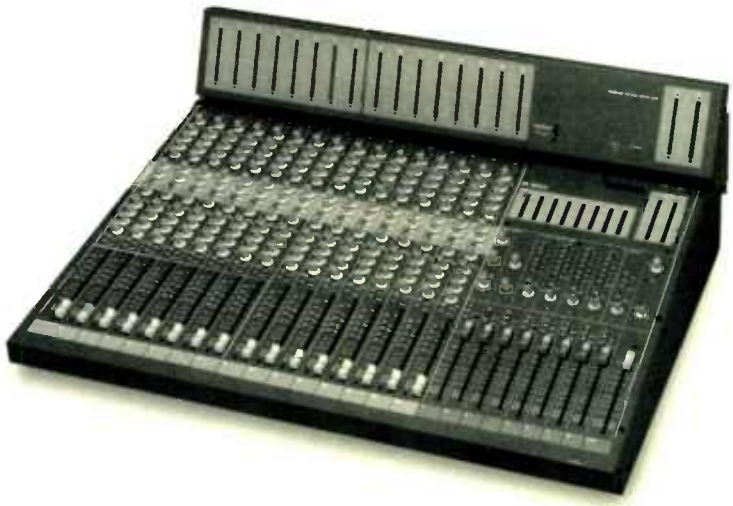

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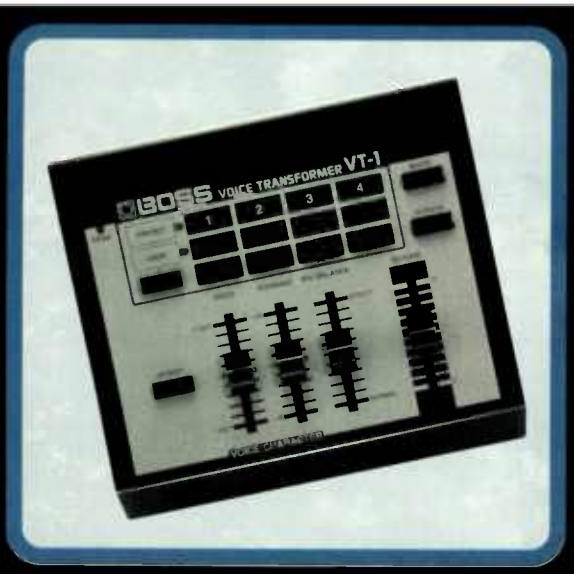

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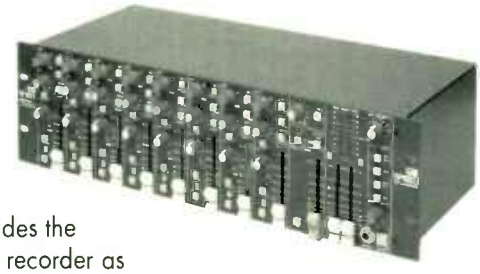

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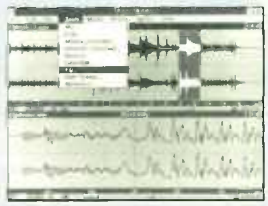

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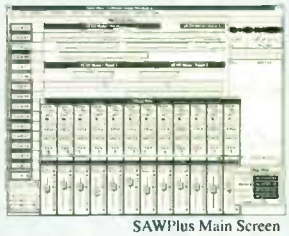

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IQS SAW & SAWPlus
Multitrack Production Software

SAW provides Windows-based multitrack recording, mixing and editing for your PC. 4 stereo pairs (8 tracks) can be played back in real time utilizing SAW's 4-channel, nondestructive, programmable mixing. Software features drag and drop editing, compression/expansion, custom crossfades and more. SAWPlus goes beyond SAW with 16 track mono or stereo playback with on-screen mixing, built-in EQ, gate/compression, echo effects, auto pan and the ability to simultaneously support mono and stereo sound files with different sample rates and resolutions. Both SAW and SAWPlus require a soundcard such as the CardDPlus.

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1	dbx	1024	buffer/interface amp	$ 239.95	$109.00
1	ART	DRX2100	digital dynamics/effects processor (NEW)	$639.00	$299.00
Analog Recorders/Players					
1	Tascam	102MKII	professional cass. deck	$369.00	$239.00
2	Teac	W416	dual cass. deck	$139.00	$69.00
1	Marantz	PMD201	portable cass. deck	$349.00	$199.00
1	Sony	ALIII	auto locator for multitrack (NEW)	$1,895.00	$399.00
3	Tascam	ATR602HS	1/2" 2 track reel-to-reel (NEW)	$4,500.00	$1,795.00
Digital Recorders/Players					
1	Tascam	DA30	pro DAT machine	$1,499.00	$899.00
1	Denon	DN980F	MD Player	$2,400.00	$1,688.00
1	Sony	MDSB2P	MD player	$2,200.00	$1,395.00
2	Sony	MDSB4P	MD player	$2,500.00	$1,495.00
1	Denon	DN970FA	production CD player	$2,800.00	$1,599.00
1	Pioneer	PDM403	six pack CD changer	$235.00	$149.00
1	Pioneer	PDM603	six pack CD changer	$270.00	$169.00
1	NSM	CD3101AC	100 CD changer	$3,800.00	$1,495.00
Digital Workstations					
1	Arrakis	DL2600	Digilink II Workstation	$7,995.00	$4,999.00
1	360 Syst.	DIGICARTII	DigicartII w/200MB HD	$4,995.00	$3995.00
1	Digidesign	Session•8	digital audio workstation for PC	$3,995.00	$1,995.00
2	Roland	DM80-8	8 trk hard disk recorder	$6,595.00	$4,995.00
2	Roland	DM80F	fader unit for DM80	$1,195.00	$799.00
1	Roland	DM80R	remote control for DM80	$1,895.00	$1,299.00
Telco/Remote Equipment					
1	Symetrix	111	digital telephone hybrid	$1,695.00	$399.00
2	Cylink	Airlink64D	wireless modem 64K	$2,895.00	$1,299.00
1	CCS	CDQ2001	digital audio codec - (NEW)	$7,400.00	$3,999.00
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1	Tannoy	PBM8	studio monitor speakers (pair)	$795.00	$299.00
1	R. Syst.	TM-3	studio timer	$195.00	$99.00
1	Ramsa	WSA70K	loudspeaker	$330.00	$99.00
Misc. RF/Transmission Equipment					
1	Moseley	DSP6E2	DSP6000 Digital STL encoder	$2,995.00	$2,495.00
1	Moseley	DSP6D2	DSP6000 Digital STL decoder	$2,995.00	$2,495.00
1	Catel	FMX2100	cable FM Modulator	$870.00	$399.00

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World Radio History

New Subcarrier Options Available

by Bob Rusk

SAN JOSE, Calif. The day may come when fee-based subcarrier services compete with advertising revenue as the primary source of income for radio stations.

Stations are already earning thousands of dollars each month by leasing subcarrier space to companies that provide paging, differential global positioning system (DGPS) data and a variety of other offerings.

And work is underway by the NAB National Radio Systems Committee to build a high speed FM subcarrier standard. Digital DJ Inc., one of three proponents, is ready to roll with a system that could earn broadcasters millions of dollars annually. The system is a modified version of DARC (DAta Radio Channel) technology developed by the NHK Broadcast Technology Center in Tokyo.

The other two proponents — the Mitre FMC system and the Seiko High Speed Data System — are actively involved with separate Federal Highway Administration intelligent transportation system programs.

With the Digital DJ system, listeners will be able to receive information in text and graphic form while tuned to a station. The audience can then choose, on demand, from a menu of information such as the latest traffic reports by geographic region.

Local, regional, national and international news, business and financial reports, sports and weather are among the other choices that will be available with the DDJ High Speed Data receiver.

Digital DJ has been testing its system on a San Jose FM station since July 1994. Next, CBS-owned KPIX-FM, San Francisco is scheduled to introduce the DDJ subcarrier services to the Bay Area after installation, customizing and pre-commercial testing is completed. And WKLS(FM), Atlanta will test Digital DJ during the Summer Olympics.

"We see the Digital DJ System as an extension of the Internet," said Blaise Howard, vice president and general manager of KPIX-AM-FM. He likened it to a "wireless Internet service."

The station plans to provide listeners with information similar to that found on its Web site. But Howard is aware of what he called the "value-added services" that KPIX will be able to provide its advertisers.

"Just imagine the power of supporting an audio commercial with a display showing the address, phone number, and even directions to the location," he said. "There is also the possibility of creating new revenue streams including e-mail, real time sports scores, custom business news and stock portfolio management."

Unlike many other subcarrier companies, Digital DJ does not plan to lease subcarrier space. The company will gather information at its own facility and transmit a customized subset of data to participating radio stations. At each station, the DDJ Workbench will receive the information, automatically organize it and send it to receivers.

If 5,000 listeners subscribed to the fee-based service at $50 a month (a figure similar to what paging companies currently charge), the gross revenue for a radio station would be $250,000 each month or $3 million a year.

To generate interest, KPIX plans to give 100 receivers away to listeners during its test. Sanyo, Sharp and Goldstar are manufacturing the receivers. Both hand-held and car radio models will be available. They are expected to retail for about $150 and $500 respectively. In Japan, where over 30 stations use the NHK System to broadcast text and audio, more than 400,000 receivers are already in use.

One of the Receivers Available for Digital DJ System

The Smart Radio Store is unveiling another money-making subcarrier opportunity. The Seattle company that developed the MusicBoard billboard (which transmits data on the 57 kHz subcarrier) is now introducing the RadioACTIVE Display Network, an electronic sign that scrolls information.

"With MusicBoard software acting as an RDS file server, the radio station can instantly be in the silent radio business," said Allen Hartle, president of the Smart Radio Store.

"They can have a network of addressable LED signs which are fed messages that have nothing to do with the station's programming content."

Sports scores and news headlines, for instance, could be displayed in a local tavern or a retailer might buy the sign to advertise sales.

"It would work for any kind of business," said Hartle. "This is an instant profit center for the radio station. I can't tell you how many thousands of dollars this could generate. It's limited only by a station's coverage area."

Additional income realized from subcarrier uses could mean the difference between profit and loss for some broadcasters.

And as Rick Rhodes, a communications attorney with Irwin, Campbell & Tannenwald, pointed out, lease payments for subcarriers will likely increase.

"There's no place for the value to go but up," said Rhodes. "So many new things are being developed that can be done with the spectrum. Some (radio station owners) are going to be able to realize better revenues than ever."

INTERNATIONAL UPDATE

Will Data Services Hurt Eureka Audio?

MUNICH, Germany The very thing many broadcasters believe will make DAB a success may actually end up hurting audio quality: Data services, one of the most talked about aspects of DAB, needs bitstream space and that space will have to come from the audio portion of DAB.

Christer Grewin of Swedish public broadcaster Sveriges Radio (SR), which is a leading promoter of DAB, has looked into this topic and thinks broadcasters will have to be very careful in deciding how to divide the bit stream between data services and audio quality.

Expected success

"It is impossible to say which features or services will contribute most to the expected success," Grewin said. "Many broadcasters and other members of the Eureka-147 project regard data services or multimedia applications as the only, or at least the major, feature that can make DAB a success."

However, CD-quality audio was the original driving force behind DAB and that, in Grewin's estimation, cannot be sacrificed for data services.

The problem lies in the number of bits and the number of programs. Most broadcasters want to offer as many programs as possible. If they use 192 kb for each program, then they can have six programs. Most likely each of the programs will have associated data, lowering the number of bits available for audio even further.

Grewin points to the results of the 1994–1995 EIA tests to prove his point: The difference in the audio quality of ISO/MPEG Layer II at 224 kb and ISO/MPEG Layer II at 192 kb is significant. In critical listening material, such as water, which is difficult to duplicate correctly and is therefore often used to test audio systems, there is no noticeable difference at 224 kb between Layer II coded material and the original. However, the

continued on page 12 ▶

Legal Advice on Subcarrier Leasing

by Bob Rusk

WASHINGTON Gregg P. Skall, an attorney with the law firm of Pepper & Corazzini, is an authority on issues stations must address before entering into subcarrier leases. He presented the following tips at NAB '96:

• **TERM:** The lessee will want a term that provides an opportunity to achieve a return on investment, develop a business in the community and retain the right to use the subcarrier to maximize revenue.

The broadcaster will want a way to renegotiate or increase his or her return if the venture is successful as well as a way to change to a better utilization of the subcarrier in light of potential future developments.

• **RENT:** Some users prefer to pay broadcasters a flat rate for the subcarrier. As RBDS develops, broadcasters may prefer to joint venture with a service provider. Attention must be directed to methods for distributing profits, proper accounting procedures and maintaining books and records.

• **FCC REQUIREMENTS:** The broadcaster must obtain lease terms to assure he or she has control over the subcarriers and continues to fulfill license responsibilities. Joint venturers or lessees will be concerned that the standard of service and quality of delivery is maintained to provide for building of good will and a consistent national reputation for their business.

• **LIABILITY:** Both parties will want a liability provision to assure that they are not responsible for one another's negligence or wrongdoing.

• **INTELLECTUAL PROPERTY:** Each party should take appropriate measures to assure the integrity of its trade name, trademarks and service marks and to assure that they may be properly protected.

• **TERMINATION:** The method of termination, responsibility for equipment or its removal and rights to continue the business service must be dealt with in detail.

The subcarrier may or may not be replaceable with another in the same market. Broadcasters have a right to prevent the retransmission of their signals by others without licensee consent. All of these issues can create serious problems in a termination and must be dealt with in the initial agreement.

• **RELATIONSHIP:** The parties should specifically identify their relationship in the initial agreement and the method by which they are to deal with one another.

• **SERVICE:** The broadcaster has several subcarriers capable of carrying information to receivers. The rights of each subcarrier lessee or joint venturer should be specifically identified with respect to the subcarrier and the amount of time, bandwidth or data groups being provided.

With RBDS, the agreement should provide the data group that is available for use under the agreement and the amount of time in one-second cycles that it may be utilized for the purpose identified in the agreement.

World Radio History

Marconi: The Life of A Solitary Inventor

► continued from page 1

RW: *What kind of man was Guglielmo Marconi?*

Marconi Braga: He was really an introvert in the sense that he wasn't an outgoing person who would throw his arms around you. He was very absorbed in his work. But he loved us children and was very affectionate and followed our studies and kept in touch with us. Naturally life took him away from us quite a lot.

RW: *History says that Marconi's father showed little support for his son's work. But his mother ... your grandmother ... has been credited with helping him get that first critical recognition for his wireless telegraph invention when the Italian government showed no interest.*

Marconi Braga: His mother was Irish .. of Scottish origin, but Irish ... so when the Italian government turned him down she said "never mind, we'll go to England." And so together they went to London. He was only 22. She was introduced to Sir William Preece at the English Post Office. (Then, as now, the Post Office controlled telegraph and telephone communications in Britain.)

Luckily Sir William Preece was also a scientist in a way. He had also dabbled in electromagnetic theory. So he realized that what my father had was something very interesting, especially for the country's Navy.

His (Marconi's) father wasn't supportive at all. He was afraid his son was just wasting his time. He was very worried that he had not graduated from school. However, he changed his mind later after my father had success. Then he was very supportive of his son. But only after he had been recognized.

RW: *Did your father ever live in the United States?*

Marconi Braga: No. He just came and went. He did a lot of traveling between England and the United States. He started his company in London. He called it the Marconi Wireless Telegraph Company. There's a funny story there. At first he called it the Wireless Signal Telegraph Company and his father wired him and said you call it the Marconi company. He had suddenly realized it was important to have the (family) name on it.

RW: *How did your father relate with others in the community of inventors and scientists? Were they friends, adversaries or what?*

Marconi Braga: My father was really a loner. He did all of his work alone. In the beginning he wasn't even recognized by the scientists ... because he wasn't a real scientist, shall we say. He didn't have a degree. They thought sometimes he was an imposter. But, of course, he wasn't.

They said it was impossible to send a message from Europe to North Americ The reason was because they th these electromagnetic waves wou straight up and be dissipated. But he otherwise and, in fact, it was only af did it, that they discovered the io phere, which is what made it possibl the waves to rebound back and forth. father was an instinctive inventor knew a lot about his own field becau studied very much on his own.

RW: *What about his relationship David Sarnoff?*

Marconi Braga: My father empl Sarnoff when he was very young. In when I met Sarnoff years later he sai was so grateful to my father becaus had given him his first job. Sarnoff an enormous admiration for my fath He became famous because he capture the SOS from the Titanic. Sarnoff was great in that he realized how important the little box was for entertainment. My father never really thought of that. He thought of communications. His thing was to communicate around the world.

RW: *What about his later years? Did he work right up until his death?*

Marconi Braga: Yes, absolutely. And I remember the last thing he was doing because I was on his yacht when he was doing it. He was working with radar. But it wasn't called radar then. Only after he died did they recognize it as an invention of his. They thought it was an English invention. During the war the British Navy had radar and others didn't. It gave them an enormous advantage.

RW: *What might surprise your father today about what is happening in wireless communications?*

Marconi Braga: Well, it has changed so radically. It has become so enormous. However, I must say he always thought there was much more to it. My father was terribly interested in what was going to happen in the future. He was way ahead of his contemporaries in the sense that he always knew this was going to be a tremendous innovation. He always looked at it as communications that would open the door to the whole world.

In those days you could only do that with the telephone, that is if you had a line connecting one place with the other. Being able to do it through the air was extraordinary then and I think extraordinary now. Somebody once asked him: "Do you think these electromagnetic waves could reach the stars?" He said: "I don't see why not." As far as he was concerned, there were no limits.

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World Radio History

INTERNATIONAL UPDATE

Standardizing Eureka Receivers

by James Careless

OTTAWA When it comes to L-band digital radio receivers — the key component to making Eureka-147 digital radio a reality in Canada — all eyes are turning to Europe.

"We are relying on the European market," said François Conway, supervising engineer, broadcast spectrum, for CBC Engineering and the Digital Radio Research Inc. (DRRI) representative in EuroDAB Module 1.

DRRI is the private/public initiative that is promoting Eureka-147 Digital Audio Broadcasting in Canada. Module 1 is the EuroDAB working group charged with standardizing the features of DAB receivers.

"Canada is just like another European nation," said Conway when it comes to discussing specifications for DAB consumer receivers. "We have basically the same time frame, same standards and same frequency band, so we will use the same receivers."

There are about 15 receiver manufacturers presently involved in Module 1 including Philips, Grundig and Bosch-Blaupunkt, Sony, Kenwood, Pioneer, Alpine, Matsushita (Panasonic) and Delco (General Motors).

Delco is "in a very strange situation," said DRRI Executive Director David Garforth, "inasmuch as the Americans are not onboard with Eureka-147 yet. But Delco, being an international receiver manufacturer, is following the developments quite closely."

All of these companies are working toward the same deadline — the 1997 Internationale Funkausstellung (IFA) consumer audio show. Held in Berlin, this is where the industry's second-generation DAB receivers, consumer-grade receivers capable of receiving via both L-band and VHF transmissions, are due to be launched.

IFA is "the deadline for receiver manufacturers," said Conway, "because they want to have their consumer receivers available the fall of 1997, when the German DAB stations move beyond the pilot project stage."

"For the manufacturers who are involved right now, basically Germany is the key country for them," he said. "In terms of car receivers, Germany represents more than one-third of the market in Europe. Nobody would build receivers unless Germany was on board."

The impending deadline, less than 18 months away, only heightens the importance of what is being done in EuroDAB Module 1: development of a consensus by September on what features the minimum DAB receiver should include. A September decision would give manufacturers time to meet the IFA production deadline.

The group has to cover a lot of ground. EuroDAB Module 1 wants to set minimum standards for data-port rates (14.4 or 28.8 kbps), display size and the number of characters displayed, how the receivers will handle program associated data (PAD), how much memory they should have, and whether such a radio "would retune itself automatically once you select a service."

While all this talk is going on, companies like Philips are hard at work developing the kind of hardware being discussed by EuroDAB.

"At the moment our lab is specifying the next generation channel decoder chip set," said Henk Begas, project leader for DAB at Philips Advanced Systems and Applications Laboratory in Eindhoven, Netherlands. "That one is really intended for consumer receivers."

Once a chip is developed and standards for minimum features are established, the next question is what kind of receivers will manufacturers offer?

Grundig's first generation of DAB receivers includes the DCR 1000 DAB.

"At the beginning, the emphasis was on car receivers," said Conway, "but somebody has developed a DAB PC card. The card has the little antenna, and basically it converts a computer into a DAB receiver."

Such a card receiver would take a signal, decode it and then display PAD on the computer screen. If a multimedia PC with a soundcard and speakers is attached, it would use that as the sound system.

"I think we will see car receivers and PC cards, and perhaps they will do a little bit of hi-fi receivers and portable receivers," Conway said.

Conway said that prices are expected to run under $750 because the manufacturers "have agreed not to recoup their development investment at the beginning" of digital radio.

"With 15 manufacturers, there will be a competitive price," he said.

Fitting in with EuroDAB has been easy for Canada. Canada is unapologetic in its adoption of Eureka-147 despite the anti-Eureka sentiment of its southern neighbor. It has been testing the technology in the L-band for the past six years.

But Canada still does not have a "real" DAB station on air — unlike many European members of EuroDAB. Canada does have experimental stations on-air in Toronto, Ottawa and Montréal, however, with a fourth one due to sign on in Vancouver.

Getting digital radio on-air here is "a bit of a chicken-and-egg situation," said Garforth. With no stations, there is no reason to buy receivers. With no receivers available, why should broadcasters build stations?

"In order to launch DAB successfully in Canada, we must have the support of the manufacturers and the retailers," said Michel Tremblay, executive vice president of the Canadian Association of Broadcasters. "We are going to present a proposal to manufacturers and retailers in Canada to join in a common marketing strategy." "Obviously, this is going to be a quandary: Receiver manufacturers will only want to participate if we are rolling out DAB stations, and we will roll out stations if there are receivers on the shelf," said Tremblay. "What we are trying to do is ensure that there will be enough commitment from either side so that we can roll out together."

"Pioneer has a written operation agreement with DRRI," said Conway, "and one of the objectives in cooperating in the research and experimental phase was to potentially enable Pioneer to deliver some receivers for Canada."

"We are (also) having discussions with Ford Motors in the near future about the status of our own development plan and about roll out in Canada," Tremblay said.

When it comes to the tone of these discussions, Tremblay said, "I think there is a very, very clear focus. No ifs, ands or buts, there will be receivers."

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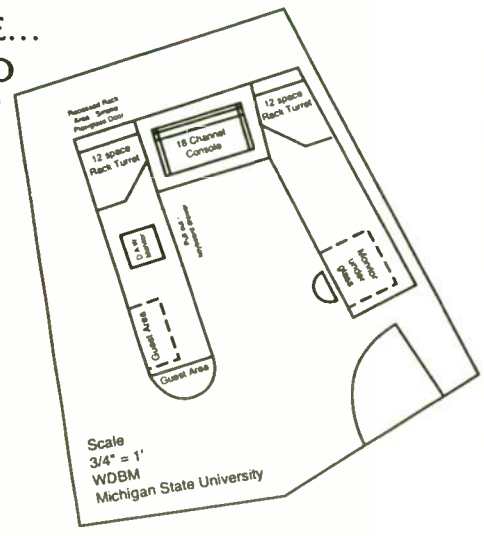

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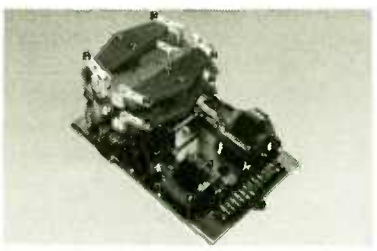

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Rent-a-Car Network

▶ continued from page 1

license, Playfone's sister company, Capital Broadcasting Systems, was planning to set up transmitters at 25 Avis rental car locations across the country to play travelers' information and promote its "'800' Avis Cares Concierge" service.

When the Avis operation was shut down by a curt FCC order in February, Capital was running five separate stations near the airports of major cities.

The FCC discovered the operation with the help of at least two sources.

First, a non-commercial station (89.1 MHz) at Emerson College in Massachusetts discovered a commercial station operating on 88.5 MHz around Logan Airport in Boston.

Initially, said Edward Perry, general manager and co-owner of WATD-FM, Marshfield, Mass., who is active in the Massachusetts Broadcasters Association (MBA), everyone thought the station was just a Part 15 station that only reached a couple hundred yards. Further investigation revealed a standard FM transmitting antenna.

Both the non-commercial station and WATD wrote to the FCC and the MBA set its attorneys on the case.

The second source was an article given to Bob Greenberg, senior supervisory engineer in Audio Services at the Mass Media Bureau. The article appeared in The Journal Record in Oklahoma City, Okla., on Oct. 13, 1995.

"From Avis and Capital Broadcasting Systems," it reads, "come two new free services that aim to take the stress out of business travel: FM radio programming that combines humor with travel tips and a 24-hour toll-free concierge service."

Local rent-a-car station

The article explained that the radio programming can be heard within a five-mile radius of car-rental locations and features "humorous anecdotes by George Plimpton as well as advice, updated monthly, on what's hot in the city a renter is visiting."

"Available now in Chicago, New York, Boston, Atlanta and Washington, by next month it will be introduced in another 20 cities."

Greenberg said he calculated that from the Avis location on M Street in Washington, a signal with a five-mile radius would just about cover the city.

Thus, a letter went out on Feb. 28, telling Capital Broadcasting Systems to stop the travelers' station operation immediately.

Hal McCombs Jr., a lawyer with Duncan, Weinberg, Miller & Pembroke, represents Capital Broadcasting Systems. The company does not feel it did anything wrong.

McCombs said while he certainly understands broadcasters' concerns about interference, his client worked very hard to avoid causing any. McCombs did not know what frequency the Avis station in Boston operated on, but added that if it was in the non-commercial part of the band, that is not really relevant.

"I don't think it matters because we were not operating a full service radio station," he said.

The FCC clearly felt The Avis Travelers Network exceeded the bounds of the original experimental license, however. Broadcasters will probably not encounter this problem again — at least with authorized experimental licenses.

John Morgan, chief of the Experimental Licensing Branch, said that now when his office receives requests for testing in the AM, FM or TV band, staff members tell the applicants to refile them under Part 74 to the Mass Media Bureau.

That "clarification of processing policy" took place in the past six months, said Morgan. His office will not renew the few experimental licenses that remain in those bands once they expire.

The Capital license is set to expire in July 1997. The company continues to do sports event broadcasting.

Escalating interest

According to Greenberg, the Mass Media Bureau gets almost one request each week for event broadcasting on the AM and FM bands for everything from Boy Scout jamborees to ski slope broadcasts.

Greenberg said that the bureaus have reached a point where, with interest in event broadcasting escalating, they need some rules.

In the Mass Media Bureau, the only two options for an event broadcasting license are an Special Temporary Authority, which is available only to licensees, and an FCC Form 309 technical experimental license application.

Experimental licenses are supposed to advance science, Greenberg said. That means event broadcasting, which does not advance science as a rule, is left in the cold.

The Mass Media Bureau has granted a few small-power (read 1 W) experimental licenses for special events like the Superbowl, but by and large, Greenberg said not too many have been issued since he started working for the FCC 18 years ago.

When Capital's attorney visited the FCC, Greenberg told him that there needs to be a filing to start either a Notice of Inquiry or Notice of Proposed Rulemaking on event broadcasting.

"We have considered it," said McCombs. He said he thinks the FCC has a genuine interest in event broadcasting, but added he believes the commission is worried that it could mean a proliferation of transmitters.

Greenberg said the event broadcasting applications all sound good on face value, but with the large volume of requests received, rules would help.

Plus, a NOI or NPRM would give broadcasters a chance to comment, seeing as some of these event broadcasters could interfere with full service broadcasters.

That is exactly what Boston broadcasters were looking out for and found. Perry said that broadcasters are going to have to be the first line of defense against this sort of thing in the future.

"With the FCC's diminishing resources, you can't expect the FCC to be everywhere," he said.

How to license and allow event broadcasting remains in question. The FCC now has its hands full handling the mandates in the Telecommunications Act. With the agency increasingly overworked and understaffed, it could be a long while before this issue is a priority.

Balancing Audio, Data

▶ continued from page 9

same recording played at 192 kb is found to be a little less than slightly annoying. The same is true for several other pieces of critical listening material.

Gerhard Stoll of the Institut für Rundfunktechnik (IRT), one of the main developers of Layer II, said that while there is a difference in audio quality between 224 kb and 192 kb, he feels it is not as significant as the EIA tests showed.

"There was a weakness in the joint stereo codec at 192 kb that was used for those tests," said Stoll. He maintains that Layer II is more robust at 192 kb than it appeared during the EIA tests.

However, Stoll agrees with Grewin that broadcasters must be very careful in not taking away too many bits from audio for use in the data services.

"For example, with 192 kb, you could get away with using 10 bits for data services. That would leave you with enough for good audio quality. However, that will limit the amount of data services, such as pictures you could transmit," said Stoll. "If you really wanted to go with a full multimedia presentation, it would take up to 30 kb for the data, and that would significantly affect the audio quality."

Stoll said that at 160 kb there would be significant degradation of audio quality. All of the listening tests performed to date have shown this as well.

But these tests are all performed using expert listeners. Why should the average listeners be concerned with what an expert listener hears? Because, said Grewin, "what an expert listener discovers during a listening test will be noticed at a later stage by an ordinary listener."

At 160 kb, "even inexperienced listeners will notice the artifacts and the reputation of the DAB is jeopardized," Grewin said.

Nonetheless, program-associated data (PAD) is definitely here to stay. In the past year, interest in data services for DAB has exploded. The German company Bosch is one of the first on the market with a DAB receiver, and the new receiver, available with a color or monochrome monitor, is geared toward data services.

"Some of the network operators and other parties with a commercial interest have proposed data services such as 'wireless printing' (a replacement for multiple faxes) or used car and real-estate information," Grewin said. In fact, everything from movie schedules and traffic information to road conditions and weather maps have been discussed for data services.

Grewin said broadcasters must ask themselves how much they are willing to compromise audio quality to accommodate data services. In the end, the most pertinent question is how different a medium is DAB than modern radio.

Grewin thinks that broadcasters must come up with a plan for DAB that balances audio quality and data services.

Several things are quite clear, said Grewin: During the initial years of DAB, audio quality and the ruggedness of the system will be the most important factors in encouraging people to buy DAB receivers; PAD services cannot be allowed to jeopardize audio quality; and, most of all, it must be remembered that many people are listening to DAB in their cars and, in a mobile medium, audio quality is the most important issue.

World Radio History

Studio Sessions

Equipment and Applications for Radio Production and Recording

Sing Along with Ken R. See page 20.

PRODUCT EVALUATION

New Forge Modules Restore Vinyl

by Read G. Burgan

LAKE LINDEN, Mich. The Sonic Foundry Sound Forge is revolutionizing digital audio production on the IBM-compatible PC. It provides intuitive, full-fledged audio tools to perform virtually any digital audio task imaginable.

Once again Sonic Foundry has added to its already useful Noise Reduction module for the Sound Forge software.

The original noise reduction module provided both impulse and continuous noise reduction capability. The click removal tool removed random impulsive noise like the clicks and pops associated with phonograph records.

You could make a noise print of continuous noise like record surface noise or an air conditioner, then create an envelope the software would use to recognize and remove the undesirable noise.

The latest version of the Noise Reduction module adds a Vinyl Restoration tool designed to reduce noise associated with phonograph records and broadcast transcriptions.

There are two essential components to the Vinyl Restoration tool: a Click Removal function and a Noise Reduction function.

My tests of Sound Forge's original click removal tool found it to be less effective than others on the market. The new click removal function is a substantial improvement.

The tool has only one slider, adjustable from 1 to 20. This determines the extent of click and pop removal. The higher the number selected, the more aggressive the software will be in removing pops and clicks.

At its lowest extreme, the program misses a lot. At its highest extreme, it may become too aggressive and begin to replace legitimate program material, thus creating undesirable artifacts or glitches.

The easiest way to set the tool is to copy a short portion of the affected sound file and then experiment on it. You will find a compromise that allows you to remove the maximum number of pops and clicks without affecting the program material.

My experience has been that, once I have arrived at a satisfactory setting, I can probably use it for most similar sound files.

So long, pop

Does the pop and click filter work? You bet. I compared it with Tracer Technologies Digital Audio Restoration Technology (DART) and found it every bit as good, and in some cases, better. I doubt if one can develop a software click removal filter that will do much more.

There is a finite limit to differentiating between noise and legitimate sound. The new Sound Forge Click Removal tool works very well. You may still find some pops and clicks remaining, but you can remove these manually through the Cut function in the Edit menu.

One technique that works well for me is to reverse the sound file before applying the click removal tool, especially if you are working with a sound file that features talking.

The human voice is especially impulsive on the leading edge of the sound wave. By reversing the sound file, the click removal software encounters the back side of the wave form. In the case of the human voice, this tends to be less impulsive.

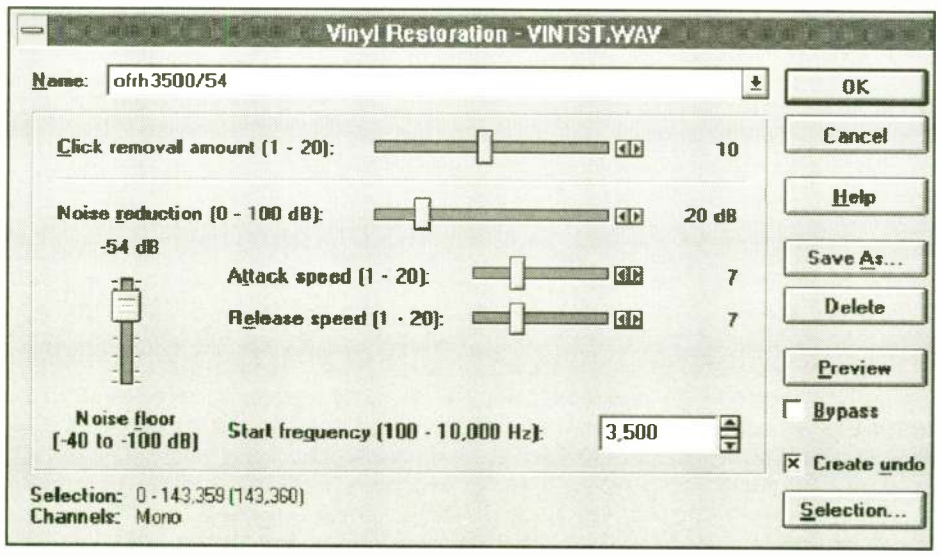
This allows you to set the click removal tool more aggressively than you could if you ran the wave form in the normal direction.

Most clicks and pops are impulsive on either side of their wave form so the tool is equally effective at locating them whether the file is run forward or reverse. Try it for yourself.

The other new feature in the Vinyl Restoration tool is its own noise reduction module. According to Sonic Foundry, this was designed to deal with noise specifically associated with vinyl recordings.

The noise reduction module allows you to control five parameters. Three of these are part of the basic Noise Gate and similar tools: Attack Speed, Release Speed and Noise Floor.

The Attack Speed determines how fast the associated algorithm responds to a noise-less signal. The Release Speed determines how fast it responds to noise. The Noise Floor sets a level above which the noise reduction algorithm will not affect the sound file.



A fourth slider determines the amount of noise reduction to be applied to the sound file. This can be set from 0 to 100 dB.

The final parameter is the Start Frequency, adjustable from 100 Hz to 10 kHz. Only those frequencies above the Start position are affected by the Noise Reduction function.

Does the Noise Reduction part of the Vinyl Restoration module work? And if so, what does it do?

After experimenting with it for several days, I reached the conclusion that the noise reduction module is actually an adjustable low-pass filter (LPF)... an erroneous conclusion, it turned out.

I tested it by listening to the pre- and post-noise reduction versions of sound files, then examined the effect of the noise reduction by the Sound Forge Spectrum Analysis tool.

What I found was the portion of noise on which the reduction tool was applied exhibited the same slope you would expect if you applied a high-cut shelving filter.

At whatever point the Start Frequency was set, the software applied a sloping frequency attenuation.

I did note an odd bit of behavior. With the amount of noise reduction set above 20 dB, the slope of attenuation applied to the noise did not noticeably increase on the spectrum analysis prints.

Did this mean that the attenuation control had no effect beyond the 20 dB point? And if so, why even bother to provide for further attenuation up to 100 dB?

Time to call

At this point I contacted Monty Schmidt at Sonic Foundry. I told him my conclusion that the Noise Reduction tool was

continued on page 19 ▶

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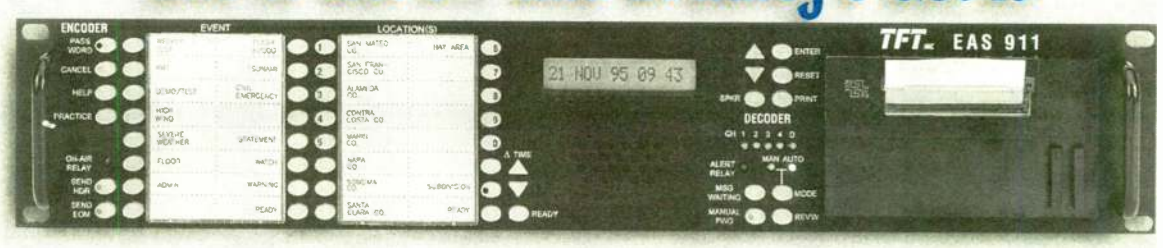

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World Radio History

PRODUCERS FILE

Big Adventures in Demo Land

Launch a Voiceover Career with the Right Tools and a Demo That Will Catch Everybody's Ears

by Ty Ford

BALTIMORE As a member of AFTRA (American Federation of Television And Radio Artists) and SAG (Screen Actors Guild), I spend a lot of time traveling from studio to studio to work on spots, narrations and character voices.

My home studio, while equipped with a killer workstation and CD production music library, is sometimes not the choice for some of the ad agencies and their clients. And that is OK, because it gives me the chance to see what other studios are using.

Regardless of where I record, my most important tool for getting my next voice job is my demo tape.

I'm asked a lot about what goes into a good demo tape and while the answer is usually "your best stuff," there are a few guidelines that can increase your odds of getting a freelance voice gig.

Pick a category

There are at least three separate markets for voice work: spots, narrations and character voices. Each requires its own approach.

In addition, I have another demo called "Ty Ford's New Read." This tape was produced in response to requests from producers for "real person" deliveries. It has more attitudinal deliveries.

I also have a guy/girl tape I did with local AFTRA/SAG member Liz Noone. It has seven or eight different kinds of guy/girl interaction, including various animal character voices. We produced it to demonstrate our rapport and what we sounded like together.

So really I have four tapes, and literally over one thousand copies out in the field. Some voice performers even have separate demos for political spots, because it is of such a specific market.

Good tape tips

Each tape should be no longer than three minutes. Start the demo cold or with a simple greeting like, "Hi, This is Ty Ford."

Obviously, insert your own name there.

For the commercial tape, edit short sections of your best stuff together. Let each section make its point, then cut to the next. Segments should not be more than 10 to 12 seconds, usually shorter.

Switching energy levels noticeably instead of gradually from segment to segment showcases your different styles more effectively than editing similar pieces together.

You can use commercials you have in the can, or make up some if you have really strong deliveries that you have not had a chance to use yet.

Note: Do not use the McDonald's donut to impress the folks at the ad agency. If they think you are trying to get something past them, their reception will cool very quickly.

Not fade away

Some people fade out between sections. I'm from the "cut it tight and move it along" school. I think the momentum of the presentation is almost as important as what is on the tape.

Remember, you are asking someone to give up three minutes of their life to listen to you. If they feel you've wasted their time, you will never be called.

Narration demos, while still under 3 minutes, should have longer segments; 20-30 seconds a piece.

If you believe the rationale, documentary and long-form producers have a longer attention span and want to be assured that the person on the tape will be able to sustain the mood over a longer period.

The character demo should only be used if you have some killer characters or if you are going after the video game or cartoon market.

You are asking someone to give up three minutes of their life to listen to you.

There is not that much character voice work in my particular local markets, but the last time I redid my demo, I edited in several very short foreign accent segments.

All demo material should be fully produced with music and effects. Producers like to hear you in context.

Keep in mind you will be competing with some highly produced demos (like mine). I've even re-recorded some scripts for my demo, adding different music and effects because I found the original final mix underwhelming.

Producers are used to seeing a cassette with a commercial demo on one side and a narration demo on the other. Make sure your label makes that clear, and make sure your name and phone number is printed on the cassette.

The J-card (the paper insert inside the cassette case) should contain some artwork along with your name in really large type on the spine. This way, the producer can find your tape when its stacked on a shelf with 50 million others.

The inside of your J-card should have a listing of the segments with a brief description of the read, like "Baltimore Ford Dealers — Hard Sell."

Making the dubs

Don't cheap out on tape stock. "Voice quality" tape is not good enough. And do not run to the local stereo outlet and buy 30 or 60 minute tapes because that is too expensive.

If you plan to run the dubs yourself, find a supplier of good-quality blank C-10 cassettes. I get mine from Polyline.

I buy the high-bias chrome tape (not metal type IV) and record on three-head decks with bias and EQ adjustments. Each machine can be tweaked for best results.

I also get the boxes, along with blank J-cards and cassette labels that will run through a laser printer.

At some point, you will get really tired of running your own cassette dubs. You will probably want to use a good cassette duplicator service. Just ready to pay for at least 100 pieces.

You will be surprised at how fast 100 cassettes can go out the door if you are doing your marketing the right way. The idea is, your time is better spent marketing yourself than running dubs.

There are three kinds of cassette duplication; high-speed in-shell, high-speed custom load, and realtime.

There is also a system that digitizes the audio master into RAM and spews it out to cassette, but usually only the big houses have this.

High-speed in-shell is the lowest quality. The master is a first-generation dub to cassette. It gets placed in the "master" bay and the blank cassettes get popped into the others. Hit the button and they all race at much faster than realtime.

It is definitely fast, but the tolerances of the roller guides inside the cassettes are not designed to spin at that speed. The excess movement of these parts can compromise the quality of the dub.

High-speed custom load systems make the dub from pancakes of cassette tape run on machines with tighter tolerances. The finished tape is then loaded into the cassette shells. If the system is in good shape, the product will be better.

Realtime duplication is a master machine — frequently a DAT — and a wall of distribution amplifiers and cassette machines. Provided the machines are all in good shape, this is a very good duplication method.

Scrupulous attention to maintenance, and lots of QC checking are the key with any of these.

These services also usually do on-shell printing and can provide boxes and art services for J-cards. They work with you to develop a J-card design.

Beyond that, you will need mailers and mailing labels. Whatever you do, don't cheap out here either. You only get one chance to make a good first impression.

Get used to it

That's the drill. Sure, it's a tough way to make a living. You are out of a job the minute you walk out the door from your last session. Your next job is finding your next job.

And, as you try to wrap your mind around the production of your new cassette demo, be advised that I and others like me are already on several voice talent compilation CDs and our clips are also downloadable from the Internet.

More things to think about when you are ready to launch that VO career.

□□□

Ty Ford's e-mail address is tford@jagunet.com

To download his voice demo from the jagunet.com FTP site, go through the "pub" and "users" directories to tford and click on TyFord.AIFF

"Advanced Audio Production Techniques" can be found at http://www.bh.com/bh/fp/24080082.htm

AUDIO IS NOT DATA!

Broadcasting is on the brink of a digital revolution. There is no doubt that we will become totally digitized sometime in the future. Digital processing is in it's infancy. Most DSP processors mimic the best analog processors and sometimes not too well. The truth is that there are some things that analog just does better. Stereo composite processing is one of these things.

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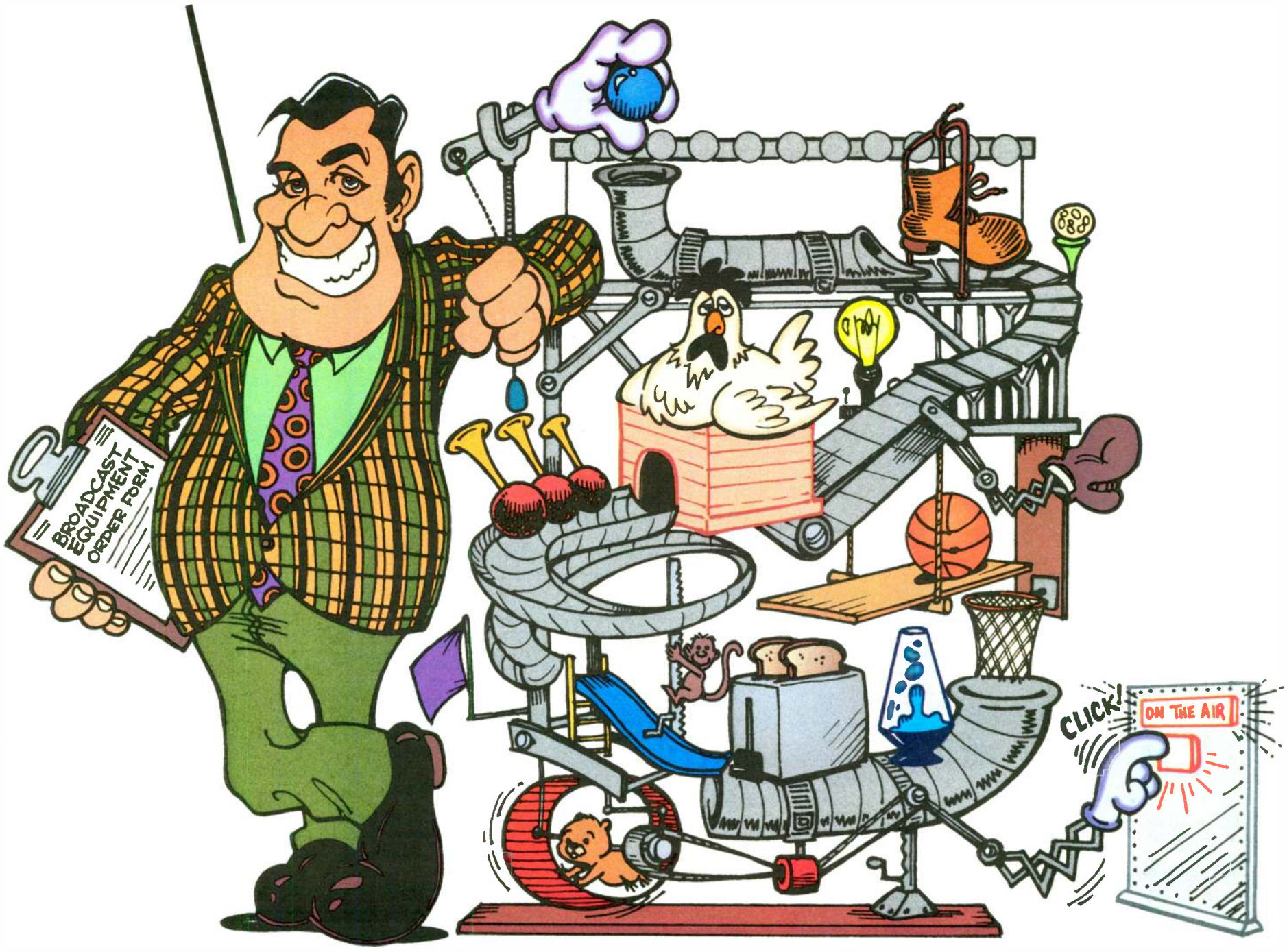

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World Radio History

PRODUCT EVALUATION

Ultra-wide Earthworks TC30K

by Tom Vernon

PHILADELPHIA Our latest guinea pig for testing in the World Cafe recording studios is a microphone which, in terms of performance and appearance, is a radical departure from conventional mics.

The Earthworks TC30K is a phantom-powered omnidirectional microphone with an ultra-flat frequency response. It was designed for the purpose of capturing live music, although vocal applications may benefit as well.

The TC30K does not look like any other microphone you have ever seen. The long, tapered stainless steel body seems more like something you would see in a physician's examination room than a recording studio.

The TC30K is similar to the original company effort, the OM1, except the earlier model was designed only for electronically-balanced inputs. This current model is compatible with transformer-coupled inputs.

Price is right

In the right applications, it is quite a powerful tool. Especially at around $500.

Because Earthworks is not a household name in the microphone world, an introduction is in order.

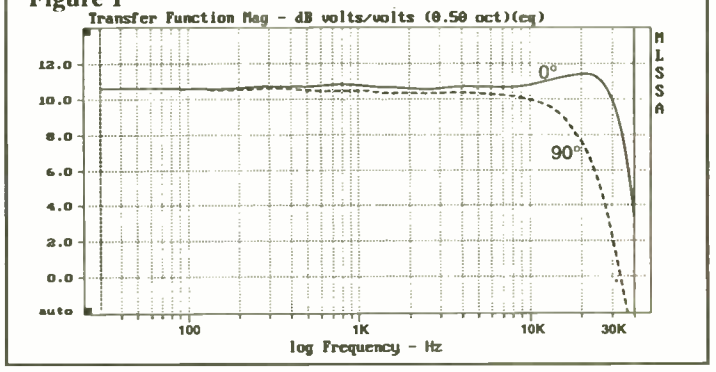
The company was set up by David Blackmer. He is perhaps better known for founding dbx and the innovative products he developed there.

In 1979, dbx was sold and Blackmer left in 1981, later to form his own company.

He bought an old mill in southern New Hampshire, restored its hydroelectric generator and Earthworks was born.

The company-stated purpose is to push the envelope back an order of magnitude and develop the next generation of products that upgrade the audio chain from mic to speaker.

Figure 1



Part of that philosophy is building equipment that has a frequency response far beyond the accepted 20 Hz to 20 kHz limits of human hearing.

Why? Because we can perceive — if not hear — sounds outside that range.

When a bass drum is struck, a wave of subsonic energy hits our body. While we cannot hear it, it is still part of our experience of "hearing" the drum. On the high end, there is growing evidence to support the idea that supersonic frequencies help us locate the source of a sound spatially.

The TC30K lives up to that philosophy with its time-coherent response from 9 Hz up to 30 kHz. Note the frequency response chart in Figure 1.

Careful use

The omnidirectional pattern places special stipulations on use of this microphone.

When recording live music, it must be placed closer to the source than is normally done; otherwise you will be unable to isolate the instrument being miked from others in the studio. Baffles and isolation booths are also a good idea.

There is no need to worry about bass proximity or overload when you move the TC30K in close, as its omnidirectional pattern and tolerance for high sound pressure level (SPL) make it immune to these problems.

With a 5 kohm load on the other side, maximum acoustic input to the TC30K is 151 dB.

The other point to remember when using the TC30K is its high level of self-noise; 27 dB SPL (A weighted) to be exact.

This is largely a function of its small diaphragm size — as size decreases, self-noise increases. Fortunately, so does accuracy.

This tradeoff was consciously made during the design and means there are some applications where the TC30K is a no-no,

continued on page 19 ▶

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CAN YOUR RADIO AUTOMATION PLAY 6 CUTS AT THE SAME TIME?

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Data Analysis:

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Record Channels: 12 stereo independent simultaneous (24 mono)
Powered by: D6 digital audio board - linear and compressed
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MD Cart Series Recorders/Players *The DN-995R, 990R recorders and DN-981F player offer all the advantages of MD without the conventional tape cart problems of wow and flutter or drop-outs and tape stretching. These full-function units provide audio and computer interface as well as a multitude of options, including synchronization. Optional "Hot Start" switchbox adds instant playback of any 10 tracks (DN-981F).*

The first name in digital, Denon has also become the premier manufacturer of MiniDisc products for broadcast and post production applications. Even the most demanding tasks of repetitive audio required by fixed installations are made easy and reliable with MiniDisc. Denon not only offers the most comprehensive line of MiniDisc products, they are totally committed to the further development of MD technology.

The MiniDisc format has proved to be the most convenient and reliable medium available. MD can literally be used millions of times without any signal degradation. The sonic quality is equal to Compact Disc and immensely superior to celluloid, while offering unsurpassed portability. More and more digital audio users are turning to MD for archival purposes.

From recording and replication to MD Carts and ENG MD recorders, Denon has a full family of products to integrate MD technology quickly and economically. Contact your favorite distributor and find out why Denon is the "first family in MiniDisc".

DN-1100R MD Recorder *The DN-1100R MD recorder offers 74 minutes of stereo recording time with a 44.1 kHz sampling rate, 16-bit linear (A/D converter) quantization and ATRAC compression. The unit also features 10 independent "Hot Start" buttons to which any 10 tracks from a total of 255 can be assigned. This feature is ideal for sound effects libraries, sound bytes and announcements.*

DN-80R Portable MD Recorder *The DN-80R is the most advanced ENG recorder on the market, allowing up to 148 minutes recording time in mono and 74 minutes in stereo, per disc. The portable unit provides news gathering personnel and reporters who are on-the-move with shock-proof recording and playback capabilities from a 40 second memory buffer. Further time-saving production features include field editing on a single disc. A standard 23dx video camera battery provides maximum power for a full 148 minutes.*

DN-045R MD Replicator *The DN-045R MD replicator performs exact digital-to-digital dubs, up to 3.5 times faster than realtime without the cascade of ATRAC compression. The included Windows™ software also allows fool-proof editing during replication.*

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World Radio History

Noise Removal Tools For Sound Forge

▶ continued from page 13

essentially an adjustable LPF with the added capability of limiting its action through the noise floor parameter.

Here is his response, quoting from the designer of the software:

"The vinyl restoration module contains two different algorithms. One algorithm is used for detecting glitches and smoothing them out. The other algorithm is the simplified noise reduction. It is not an adjustable low-pass filter with a threshold, although its results can sound like one."

It turns out the Noise Reduction tool is more like a series of bandpass filters. Starting at the cutoff frequency, they are turned on and off like a noise gate. The noise reduction amount determines the maximum reduction in dB for each filter.

With that information, I set out to re-test the software, this time relying more on my ears than on what the spectrum analyzer software told me.

The big guns

I have a 16-inch broadcast transcription circa 1935 that I use as my ultimate test of any noise reduction software.

This transcription has about every conceivable audio problem, including a noise floor about as high as the actual recorded sound. It also has multiple low- frequency noise at both 60 and 120 Hz and contains plenty of impulsive human voice sounds.

This is the acid test. To date, I have never been able to remove all of the noise on this transcription.

First I applied 18 dB of click removal — the maximum recommended degree — to the reversed sound file. Then I experimented with various settings of noise reduction.

In the end, I settled on a noise floor of -47 dB and 20 dB of noise reduction beginning at 1 kHz. The result was a great improvement, but there was still some noise.

Ah, but there was yet one more weapon in the noise reduction armory: the original Sound Forge Noise Reduction tool.

The very one mentioned at the top of the article that samples an area of noise and removes it wherever it may be. Using this tool, I reprocessed the sound file one more time. The outcome was as close to magic as I am ever likely to hear.

I was impressed with the Vinyl Restoration tool's ability to cover glitches.

The resulting sound file was very quiet. There was a slight loss of high-frequency content from the original material, but remember the original had a noise floor nearly as high as the sound itself.

Coverage

I was particularly impressed with the Vinyl Restoration tool's ability to cover large glitches.

I say cover because the software does not remove a click or a glitch, but replaces the offending item with material from the adjacent portions of the sound file.

That is why using the click removal tool at its highest setting may cause undesirable artifacts. If you replace too large an area with material from the surrounding sound file, you can sometimes get an echo-like result.

In the manual, Sonic Foundry recommends first running the click removal tool without using the Noise Reduction portion of the Vinyl restoration tool. It then suggests you go directly to the standalone Noise Reduction tool outside the Vinyl restoration function and see if that will remove the remaining noise.

It may seem contradictory that a company would design a new software tool and then suggest you use the old one instead, but there are several very good reasons.

The "new" Noise Reduction tool — and I wish they had chosen a different name — will almost certainly have some sonic effect on a sound file with a high noise level.

The original Noise Reduction tool targets only the noise you identify in the noise print. So if you can get by with using it, you will have little or no noticeable effect on the finished file aside from the removal of undesirable noise.

However, on a particularly noisy file — like my transcription — the original Noise Reduction tool cannot remove all of the offending noise without beginning to cut into the legitimate sound file.

This creates undesirable artifacts that draw attention to themselves. In some cases this can be worse than the original noise.

In a situation like this, the new Noise Reduction tool in the Vinyl Restoration function provides the necessary means to reduce the noise to the point where the original noise reduction module can remove the remaining noise.

High-frequency noise found on vinyl records and other analog sources is random in nature. The original noise reduction tool can eliminate constant noise, but the random nature of vinyl noise can slip outside the bounds of the noise print envelope.

The newer reduction tool applies equally to all noise at a given frequency and can reduce it to the point that the original reduction tool can eliminate the rest without creating artifacts.

The two Noise Reduction tools complement each other and make it possible to remove most noise affecting analog recordings.

Sonic Foundry has created an extremely effective means of reducing noise in vinyl recordings. The manual cautions you not to expect removing all noise from a really noisy recording. It suggests you are better off living with some noise rather than introduce artifacts, and it is probably right.

But my experience with the latest version of the Sound Forge Noise Reduction module is that you can expect to eradicate almost every vestige of noise in your analog recordings if you are willing to be persistent in applying the tools available.

Final analysis

In summary, the Sound Forge Vinyl Restoration tool is easy to use, very effective at removing noise like that found on vinyl records and — in conjunction with the other tools in its Noise Reduction module — capable of eliminating almost any analog noise you are likely to come up against.

The Noise Reduction Module requires Sound Forge version 3.0. It has a suggested retail price of $249 and comes with disks for both Windows and Win 95.

My only question for Sonic Foundry is, "What's next?" I do not believe for a moment that we have seen the last digital tool from their forge.

□□□

Sonic Foundry is at 100 South Baldwin, Suite 204, Madison, Wisconsin, 53703. Contact the company at (608) 256-3133 or visit http://www.sfoundry.com

Read Burgan is a freelance writer and a former public radio station manager. He can be reached at (906) 296-0652 or through e-mail at rgb@up.net

Unusual Microphone From Earthworks

▶ continued from page 16

such as live recording of very quiet or sparse sounds.

There is no doubt the TC30K is a highly transparent mic, but using it for vocal recordings showed that transparency is not always a desirable thing.

Vocal applications

Even deep male voices sounded thin when recorded with the mic's ultra-flat response and significant low-frequency EQ had to be added to get a reasonable sound.

Female voices revealed this even more. This is where we longed for the inherent bass boost of our directional mics.

The Earthworks TC30K is definitely a different kind of microphone. It takes some experimentation and a little getting used to.

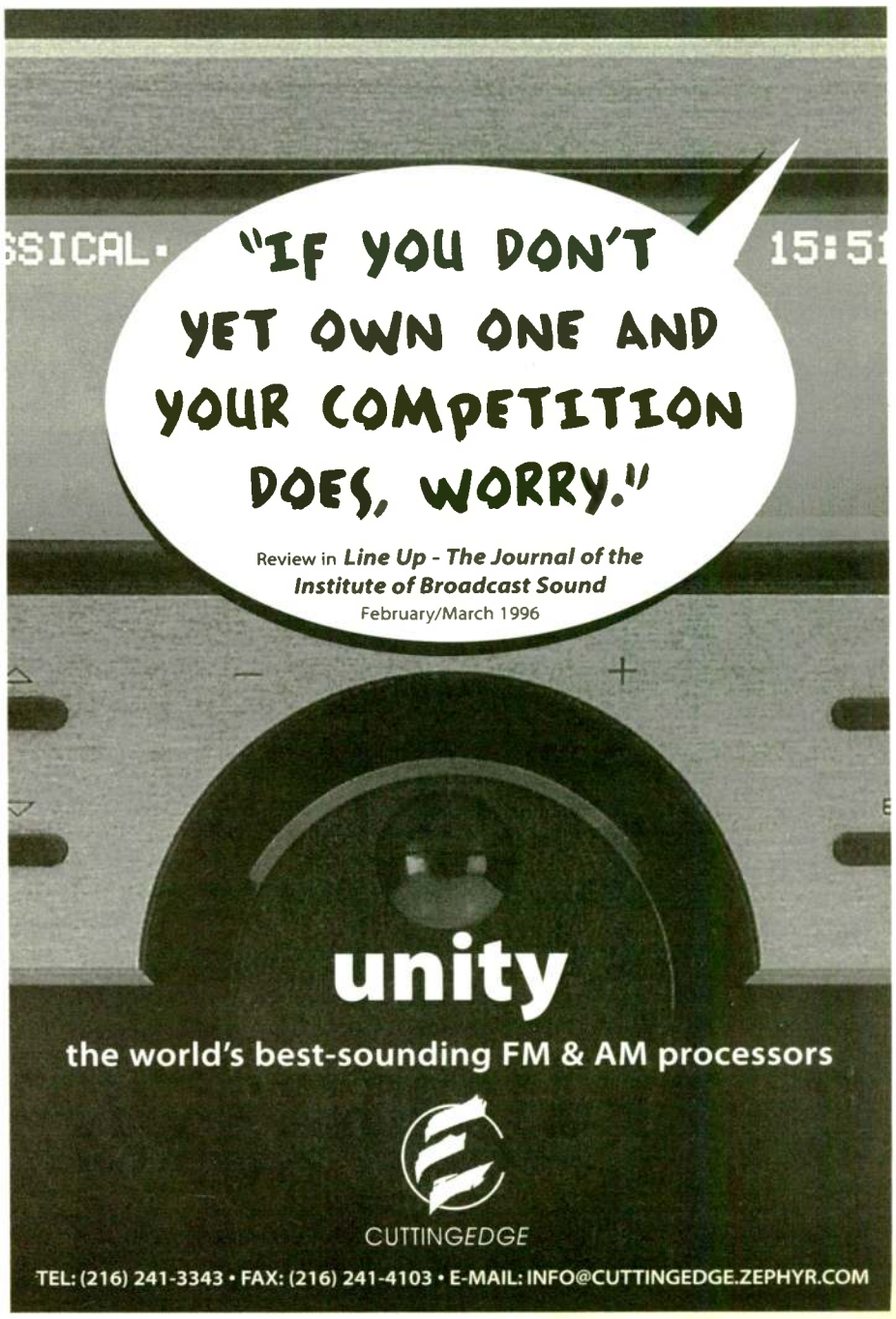
Valuable

But once you have found the right applications and placement, the TC30K is a valuable item to have in your microphone arsenal.

Special thanks to Joe Taylor and Chris Williams of the World Cafe, for putting the Earthworks TC30K microphone through its paces.

□□□

Tom Vernon divides his time between consulting and working on a Ph.D. His radio home is WXPN in Philadelphia. You can E-mail Tom at tlvernon@aol.com or phone (717) 367-5595.



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World Radio History

Ken R.: Old Jingles, New Twist

by Alan R. Peterson

WASHINGTON When that big reel arrived from Dallas, the jocks simply could not wait.

That magic tape would be threaded carefully on the old Ampex. The drums and horn section would cut through first, then those seven luxuriant voices would ooze the jock's names in fat, shiny harmony. This was the big time. This was real radio.

Station jingles. Nothing like them.

Lucky program directors and general managers sometimes get to sit in on recording sessions to assure the product is just what they are paying for. For the rest of us, we can only wait and wonder until the CD-R or DAT arrives.

Studio Sessions settles your curiosity and takes you behind the scenes to a very unusual recording date at Ken R. Inc.; a producer of high-quality commercials and jingles in the unlikely location of Toledo, Ohio.

From the top

The company boasts an extensive product line for many formats, but is well-known for licensing the legendary PAMS collections made famous years ago by giants such as WABC(AM) New York and KFWB(AM) Los Angeles.

The classic jingle has managed to dodge the "In Your Face Radio" bullet for years. While jocks, music and content have become more aggressive and belligerent in recent times, jingles have remained — for the most part — rather innocent.

All that changed when studio owner Ken R. Deutsch was approached by rock-formatted WEBN-FM, Cincinnati, for an April Fool's Day PAMS jingle package with one major difference: unusually rude lyrics.

The station has a long reputation of surprising listeners and making them wonder just what was up the other sleeve. The newly-named "Lunatic Fringe" jingle package — produced by Ken R. with lyrics written by WEBN's Jay Gilbert — only enhanced this legacy.

Listeners experienced a double whammy. They heard a classic jingle package that was miles out of step with the station format. And, where one would normally expect a singing version of "Good morning, it's a beautiful day," early risers were treated to "Sex and drugs and rock and roll... tasteless and offensive WEBN."

We have to sing what?

Other lyrics included "You suck, Jay Gilbert" and "We hope we die before we get old."

One jingle assured male listeners they would experience superhuman sexual potency just by tuning in. The WEBN package was so far out, it fit right in.

The jingles were to be used only for April Fool's Day, but positive listener response persuaded WEBN to continue their use.

Jingle production is frantic enough behind the scenes without being thrown for a loop by a set of questionable lyrics. But, troupers that Deutsch and company were, they cut the tracks with only a minimum of flinching.

Gilbert said, "Ken told me he wishes he had a camera the day the singers walked in and stepped up to the music stands." The ensemble had performed the music several hundred times before, but never to lyrics like these.

"One of the women singers said she doesn't think she had ever said the word 'erection,' much less sung it," Gilbert laughed.

Lyrics notwithstanding, here is how Deutsch and his performers made this atypical jingle session happen.

Performance

The singers come in every Monday and Wednesday to cut voice tracks. According to Deutsch, "They sight-read music like you and I read words. They'll sing for three and a half hours with a few five-minute breaks."

Behind the Scenes at Ken R.

Because the singers know the music well, all they need do is tack new lyrics onto the melody lines. A few passes to get warmed up, then it is time to roll tape. Yes, tape.

"The music comes off two tracks of a one-inch, 16-track analog recorder," said Deutsch, "then it goes to two-track."

Mixing and mastering is done on the SADiE system. ID codes are dropped in, then the tracks are burned onto a CD recorder directly off the SADiE for station use.

Typically, only five or seven singers are used for radio jingles, but the sound is usually much more lush and dense. How come? "We will normally sing the main five parts, then begin stacking the vocals," said Deutsch.

Stacking is essentially the same as overdubbing, except the aim is to make vocals sound thicker without taking on a choral quality. The recording sounds lush without emulating a church choir. "We will end up with 14, maybe 21 voices on a jingle," said Deutsch.

Microphone selection and placement are dictated by sound quality, but with a nod to tradition. Deutsch has used Neumann U87s for years. The mics are routed through Symetrix 528 processors and directed through a Tascam M3700 32-channel automated console.

To help lift the singers above the music tracks, the 528 processors are set to provide a little brightness in the 10-12 kHz range and remove some woofiness in the midrange.

Mixing it

The console automation is normally used when Deutsch produces commercial audio. Jingle mix decisions like music ducking are done directly on the SADiE.

Deutsch said, "Voices are miked as two girls, two guys and one mic on the bass singer. My lead singer, Lisa Young has been working with me for 16 years."

And then there is that bass singer. Jocks feel cheated when that tooth-rattling note is absent from a jingle or mixed too low. That deep, low bass tone is the cinderblock foundation the rest of the ensemble builds harmony onto.

Deutsch solves one of the great mysteries of the universe by finally identifying the voices that have shaken speaker cones for years.

"Our guy in Ohio is Ben Ayling," said Deutsch, adding, "The guy everyone knows from the old days is Jim Clancy down in Texas.

"He's a big, old, tall Texan who sings barbershop harmony and performs with an award-winning chorus there," said Deutsch. "If you stand next to him while he's talking, you don't hear him as much as you notice the rumble in your chest from his pitch."

Tricks of the trade

Special studio trickery is necessary to give music a "jingle" quality. First, lots of compression.

Deutsch uses a dbx 166 stereo compressor/limiter to give tracks some healthy overall squeeze. Subtle reverberation is provided by a Lexicon LXP1 and Alesis Quadraverb II.

Alesis? dbx? Tascam automation? A SADiE? One would think vintage jingles demand a Pultec EQ, a Fairchild limiter or at least something with a tube in it. Where is the EMT plate reverb? What is it with all this new technology?

"The advantage of vintage equipment is illusionary," claimed Deutsch. "I used to have an eight-foot EMT plate, but it took up one whole room by itself. I can adjust the new ones so much quicker."

Deutsch markets the larger collection as "PAMS for the 90s," so it is clear that even classic jingles require modern technology to continue sounding good. But much of the magic is also created by the vocal arrangements themselves.

There are reasons why some vocal music sounds "jazzy" instead of "churchy." First, the singers play to a microphone instead of a huge hall, placing the listener's ear right

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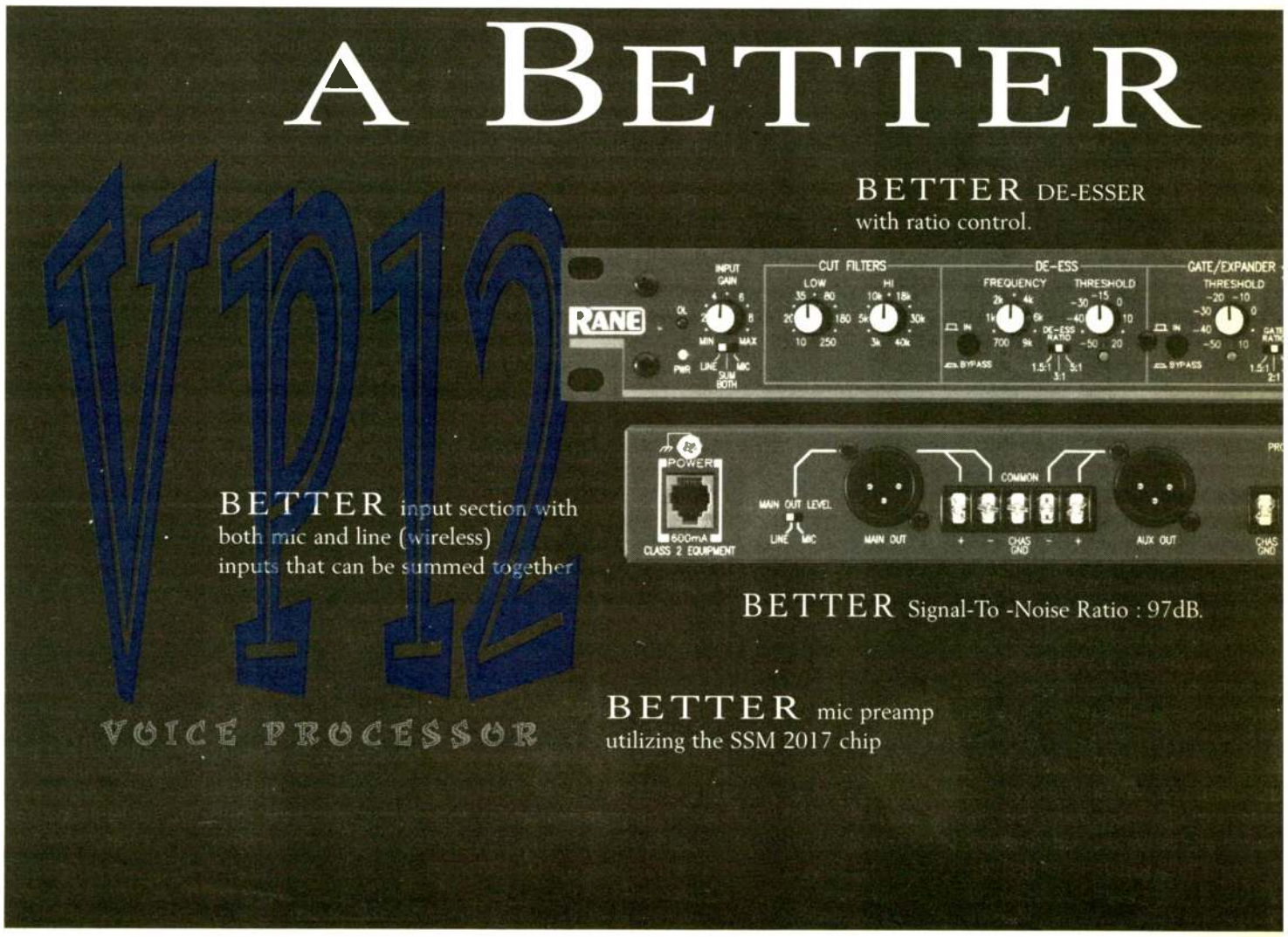


World Radio History

PRODUCT GUIDE

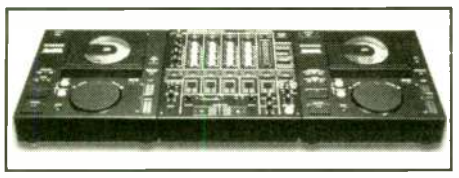
Companies with new product announcements for Studio Sessions Product Guide should send them to:
Radio World, c/o Studio Sessions Editor, 5827 Columbia Pike, 3rd floor, Falls Church, Va. 22041

Pioneer Pro DJ Line

Pioneer New Media Technologies (PNT) introduced two new products for the broadcast industry: the CDJ-500II CD player and DJM-500 mixing board.

The CDJ-500II player features a Master Tempo control which can vary the tempo of a song while keeping the pitch automatically locked in. Music can be sped up without a "chipmunk" side effect.

Other features include a seamless loop function that can lock and play back a sample from one frame to 10 minutes long. Start and end points can be captured in real time during performance.



The DJM-500 mixer features built-in delay, echo, reverb and flanger. It also boasts a beat-per-minute (BPM) counter that calculates the beat of virtually any type of music and displays it on a digital readout. Effects can be layered over the music and synchronized to the beat with a single control.

Each channel on the DJM-500 has three-band EQ and the effects are channel-assignable.

For more information, contact PNT at (310) 952-2111 or circle ***Reader Service 91.***

Tracer Noise Reduction

Tracer Technologies of York, Pa., is now shipping DART PRO noise reduction software for the PC platform.

Stations using CD-R will find this a useful software package for cleaning and conditioning existing recordings before the CD burn process.

The original DART software was designed to remove noise from any Windows WAV file. The new DART PRO adds hiss removal for cleaning up cassettes and poorly recorded analog audio sources.

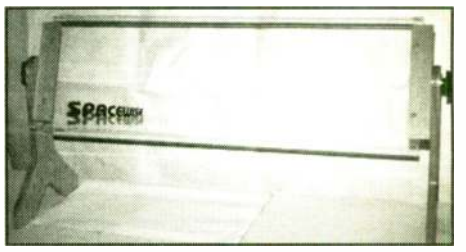
Other features include a spectrum analyzer and an updated Windows WAV manager. The manager allows compilation of renovated material into a playlist for in-order playback to DAT or cassette.

DART PRO is priced at $399. The original DART is still available as are upgrades to DART PRO and demonstration disks.

For more information, contact Jeff Kleindinst at Tracer Technologies at (717) 843-5833 or circle ***Reader Service 68.***

Spacewise Copy Stand

Spacewise Broadcast Furniture in Tucson, Ariz., introduces the Clear View copy stand.



The Clear View is made of oak and clear or tinted Plexiglas acrylic. Each stand is made to order to the exact size needed for a studio.

The incline of the stand is adjustable by two friction clamps on each side. Bothersome reflections from ceiling studio lights are eliminated and the angle can be adjusted to accommodate the preferences of each user.

For more information, contact Peter Palagonia at Spacewise at (800) 775-3660 or circle ***Reader Service 137.***

New Production Garden Music

The Production Garden Music Library announced new additions to its product line.

Spirit of the Olympics is a new compact disc with athletic themes. Real Rock features strong guitar/percussion tracks in 3:00, :60, :30 and :10 edits. Urban Rave and Worldbeat combines hip hop, house and rap styles with rave and worldbeat.

Production Garden also features Music Search locator software for Mac and PC.

For more information, contact Production Garden at (800) 247-5317 or circle ***Reader Service 114.***

Telebyte Surge Protection

Telebyte Technology announced availability of the Series 27A surge protectors for computer port connectors. These are useful for computers for audio playback and station automation control.

The 27A protectors contain 600 W semiconductor protection circuits for

each of the 24 lines, fed through the industry-standard DB-25 connector.

Each circuit dumps surges to Frame Ground, Pin 1 and the shell of the DB-25 connector. A central ground lug connects the surge protector to an earth ground.

The model 27A1 is used for EIA-530 connectors (that use RS-422 signals) and the 27A2 is used with RS-232 ports.

For more information, contact Telebyte Technology at (516) 423-3232 or circle ***Reader Service 45.***

On the Lunatic Fringe

▶ continued from page 20

in the middle of the performance. This requires pop singing techniques rather than operatic or choral stylizing.

Very clear diction is important, especially on station calls. You want to hear the proper way to pronounce a "W"? Listen to jingle singers.

Filling the cracks

Uncommon chord structures fill in the musical "cracks" and lend a richness to the sound. Dizzying intervals like augmented fifths, major sevenths, ninths and thirteenths jazz up a vocal arrangement.

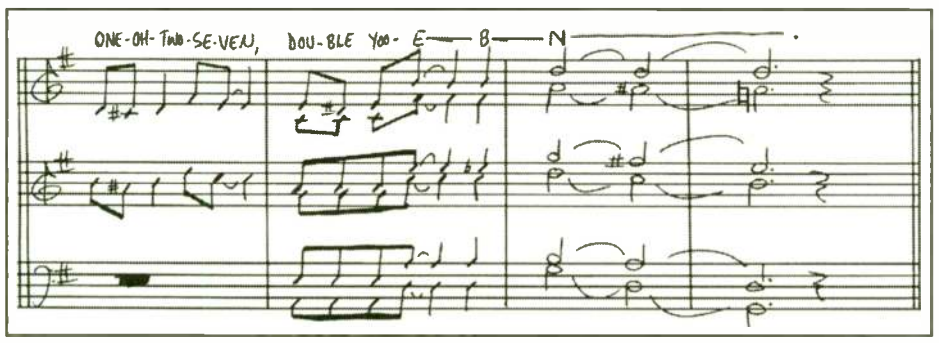
Did you ever wonder just what the group was singing? Check out the vocal chart shown to the right. Now you know.

Now that the WEBN session is over and the performers are done singing about unsafe sex and a guy named Weasel, is it back to business as usual?

Afraid not. The success of Lunatic Fringe convinced Deutsch to add it to the Ken R. product line and offer it on the company's next demo CD. In fact, WPLR-FM in New Haven, Connecticut, has already placed its own order.

The proposed WPLR news intro will sing the praise of "death, destruction and disease for you," while other jingles invite listeners to "fondle this classic cut" or "pig out, pork out and freak out."

Radio continues to grow and change to reflect the times and the tastes of listeners. But whether the topic is weekend weather or male virility, there will always be station image jingles, the companies that produce them and the people who love them.



A Typical Vocal Chart (used with permission, Ken R.).

□□□

Ken Deutsch was an on-air personality before founding Ken R., Inc. He can be reached at (419) 243-1000 or on the Internet at kenr5367@aol.com or 70661.2126@compuserve.com

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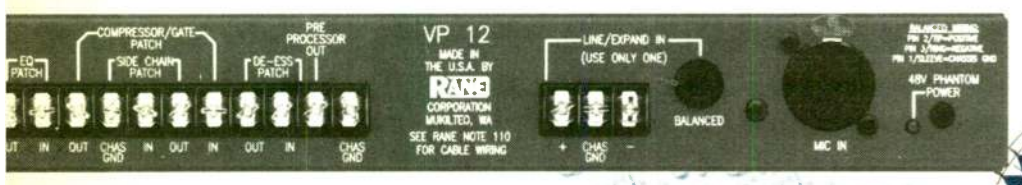

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World Radio History

PRODUCT EVALUATION

Producing Music with Korg i5M

by Alan R. Peterson

WASHINGTON While it is unusual to cover musical equipment in a radio publication, the Korg i5M Interactive Music Module is one device you should know about for your production studio.

This looseleaf-sized box is part MIDI synthesizer, part computer and sounds as if there are 50 little composers and arrangers inside it directing your own band.

The Korg i5M is packed with rich sounding orchestrations and slappy, punchy contemporary arrangements. And you get to pick what you want.

Uses

Production directors can use the i5M to create musical backing for special spots. Morning show teams can quickly create comedy songs and time-sensitive parody material.

On-air use is possible too. Creating quickie bumpers and appropriate music beds on the fly for cute show moments can be done on the i5M.

With a few button-strokes and some simple notes tapped out on a MIDI synthesizer or sampling keyboard, the i5M generates good-sounding musical arrangements in a number of styles.

In fact, a MIDI keyboard is not even necessary, as musical decisions can be input directly from the keys on the unit itself.

The first impression of the i5M is, it looks like one of those "chicky-boom" one-man-band machines from the late '70s. There are buttons marked Cha-Cha, Foxtrot and (eww) Polka1 and Polka2.

To Korg's credit, many contemporary styles are built into the i5M, so do not worry about getting stuck with only dippy-sounding waltzes.

The real magic is in the sound. Korg dropped a powerful library of sampled and synthesized sound into the i5M to sound big and meaty. Add in a bank of clever effects including nine reverbs, distortion, flanging and a couple of solidly stacked effects.

The i5M conforms to General MIDI (GM). An arrangement created on another machine with another sound module will still sound correct when played on the i5M. Drums stay drums and pianos do not turn into singing ducks.

There are also three preset banks of 64 custom sounds each in the i5M; sounds that are unique to the i5M can be substituted for the GM sounds.

Making it work

Take an arrangement like "Rock Ballad." Poke the big rubber buttons on the front panel, hold down a couple of notes on your MIDI keyboard and hit Start.

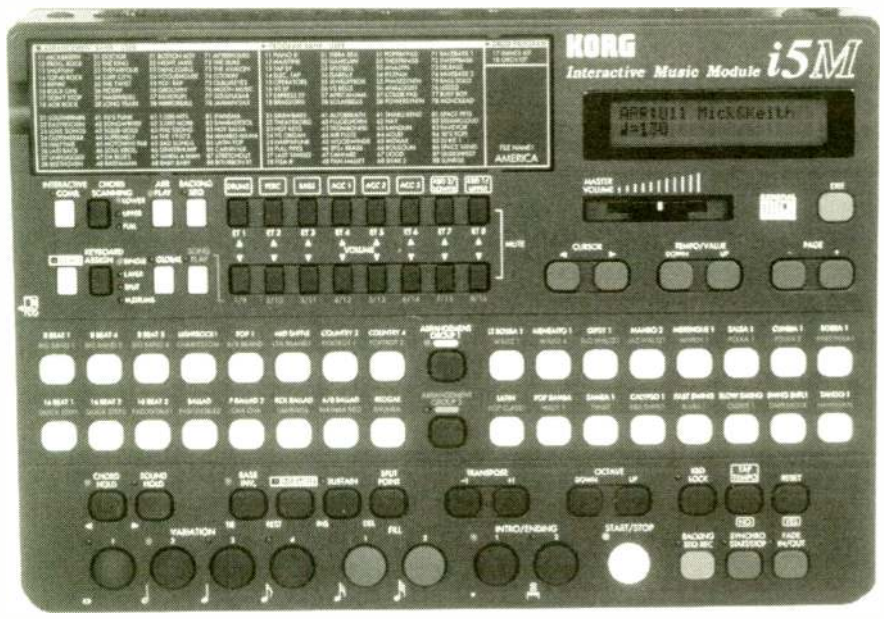
The i5M calculates the chord you are playing and fires up a tight six-piece ensemble. Depending on style selection, you could get bass, drums, extra percussion, piano, guitars, strings or whatever else the computer plugs in.

Don't like the arrangement? Would you rather "shoot the piano player" and replace it with a cathedral organ?

Do it. The i5M allows interaction and lets you decide the way you want your band to sound. Replace the jazzy drum set with a decidedly Madonna-ish electronic set or put a human choir where the horn section would go.

Four buttons on the bottom left choose variations within the arrangement. For example, the "Motown" program includes a very nice "Can't Help Myself (Sugar Pie Honey Bun)" string section. The Variation buttons let you decide how busy or quiet the strings will be.

Two Fill buttons let you put human-sounding breaks with drum fills into the music. Two more keys place intros and endings on a piece for a better musical feel.



Korg i5M Interactive Music Module

A Synchro-Start key assures the i5M will start only when the MIDI keyboard is touched. False or missed starts never happen. A Fade In/Out button makes an arrangement sound like a record that fades away with no resolution.

I got rhythm

It is hard to see in the photo, but there are 32 different Arrangement buttons on the i5M and a pair of keys that switch between two rhythm groups. This means access to 64 different styles.

You may think that is not a lot. But the i5M also has a 3.5-inch floppy drive slot to load new styles and arrangements from a diskette.

One such style diskette comes with the i5M and is packed with arrangement banks for the musical styles of Japan, America, U.K., Italy and Germany.

The emulations of European techno music and German oompah bands are especially wonderful and the Italian styles include a rapidly-trilled "Godfather" mandolin. I wish all synth modules had that sound.

An awkward feature is a stack of easily-lost plastic strips that fit on the i5M to describe each new style. When new styles are loaded, a strip has to be placed over the panel.

Loose strips won't sink ships, but they can slide behind a console and disappear. Korg can be conditionally forgiven for this, at least until the splendid smell of beachball plastic wears off the strips.

Some arrangements — by their very nature — suggest familiar songs. I found myself gravitating towards the Beatles' "Free As a Bird" and "Come Dancing" by the Kinks whenever a certain arrangement came up.

One Big Band program sounds like an old Bert Kaempfert arrangement. If you ever worked at a Music of Your Life station or remember "Swinging Safari" (the original "Match Game" TV theme from years ago), you know this sound.

The i5M includes a rudimentary, editable MIDI sequencer that can record and alter your performance from a keyboard.

Set the Backing Sequence button, hit Start and play your fingers off. An entire arrangement can be entered and saved in the i5M or offloaded via MIDI to a computer or other storage media.

You do not even need a MIDI keyboard. Many of the functions of entering your performance can be done from the front panel. For example, enter Global Mode and use the buttons directly on the front panel to select and name a chord.

This is time-consuming, but if you are an "ear player" and are better at figuring out music in your head than on a keyboard, this feature may be of great help.

Interactive Composition (IC) mode makes the i5M think for you. Play a tune into the unit and — based on rules of theory and harmony — it calculates the accompaniment without you having to wonder what to do.

Several levels of IC complexity add or suggest accompaniment of varying intricacy. Your choice.

Praises

The i5M is a clever, good-sounding device. Korg put some terrific sounds into this unit and had several bright minds burn some hot arrangements into EPROM.

I already mentioned how much I like the mandolin sound. I also enjoyed a circus drum roll hidden among the 17 drum sets. Fittingly, the key right next to it was the cymbal crash. Lovely touch.

Because the i5M is GM-compatible, a .MID file done at home on my non-Korg system will still sound correct on the Korg. I am never in for a foul surprise.

The disk drive means new arrangements should be coming from Korg and third-party software manufacturers. This box is by no means close-ended.

A semi-morph occurs when styles are changed on the fly. Sounds do not just drop through a virtual trapdoor and disappear, but slide effortlessly into the new style.

This can be heard when the Stop button is pressed and a new arrangement is chosen; a perceptible flanging effect occurs as the i5M pulls up the new style and resets.

I did encounter a few problems. First, be careful how you hold a chord on the MIDI keyboard. What makes musical sense to you will not to the i5M and you could get really ugly harmony.

This is especially true when using the IC feature. Think like a computer to get what you want out of this unit.

Problems

To my dismay, "Free As a Bird" was suggested by style entirely too many times. Several musical patterns, intros and endings are identical to each other, but with different instrumentation.

Much less-expensive standalone music software such as PG Music's "Band In A Box" or Soundtrek's "The Jammer" do not do this. There should be more variation in a device like this.

Korg manuals tend to be dry and clinical. The two books that come with the i5M manage to keep up the tradition.

Yeah, wall-wart power supply, too.

Finally, I realize this device will find a home with lounge players and musicians where such styles are fitting. But I cannot fathom anybody needing one Foxtrot, let alone two. If I could pry them out of EPROM with a screwdriver blade, I would be a happy man.

Big finish

For many years, I have encouraged radio production people to get into MIDI at any level. It is a powerful, creative audio tool, and — as the Korg i5M is proving — the instruments practically play themselves now.

The i5M is not an inexpensive device. But it combines a number of functions that would be a lot costlier as individual units: synthesizer, sequencer and auto-arranger.

Given its open-endedness and the potential for new styles being only a diskette away, it is a versatile unit that should be useful for some time.

As a standalone sound module, it is of very good quality. And of course, nothing is stopping really clever production people from creating their own arrangement diskettes on the i5M.

MIDI is not a high priority for radio production rooms right now; the conversion from analog to digital must still take precedence.

But if you give a look and a listen to the Korg i5M, maybe — just maybe — you will want something like it later when the studio refit is complete and your creative juices need new avenues to explore.

Product Capsule:
Korg i5M Interactive Music Module

Thumbs Up
- ✓ High quality sound
- ✓ Very good arrangements
- ✓ Open-ended design
- ✓ Thorough MIDI implementation

Thumbs Down
- ✓ Too many simillar arrangements
- ✓ Style strips are easily lost

For information, contact Korg at (516) 333-9100 or circle **Reader Service 69.**

World Radio History

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World Radio History

Un-Can-ny Effects? Good Knight!

by Alan R. Peterson

WASHINGTON When trying to create specific sounds and effects for a project, we sometimes let technology get in the way of the creative process.

It is tempting to simply switch on the effects box to modify a sound on a CD, hopefully to get close to the sound we need. Sometimes this works, but we are often forced to compromise.

If the sound is not part of the CD collection, the result is a shrug and "we can't do it" to the account executive.

Give yourself a moment to free up your mind. Stop digitizing the world for a few seconds. Look around the station and you will find all the sounds you need.

When this summer's crop of Renaissance Faire commercials begin coming in to the station, you will want to be ready with the sound of a knight in armor.

What does the knight sound like? Put a mic in a large coffee can.

What if a spot requires four effects — a knight walking, talking, riding a horse and flipping his visor — and none of these effects are on the CD collection? Analyze the walking sound and you will note it is simply a pattern of metallic squeaks and clattering. For the squeak, close-mic the lid hinge on the huge Dumpster behind the station and work the lid up and down a few times. Save the best squeaks on tape.

The best clatter sound is done by scraping some junked auto fenders together, but it is quite a stretch to expect spare fenders around the station.

Instead, try a cardboard box full of empty soda and coffee cans and a couple of metal wrenches borrowed from the shop. Tilt the box back and forth.

Take one can out, crush it halfway and flex the metal back and forth to get a crunching sound.

Assemble a walking montage out of these elements on the multitrack or on a sampler.

Tilt and shake the box faster for the horseback effect. Synchronize the tilts to a gallop from a CD. Presto, thine knight on yon horseback.

Open the helmet

The visor flip can be the recorded squeak of a toaster oven door, that cheap deskchair in the newsroom or even a rusty fireplace damper at home.

I remember seeing an actual fireplace in the production room at WHAI-AM-FM, Greenfield, Mass., 12 years ago. That would have come in handy.

Remember, unlike film, there is no visual cue that a visor is actually being opened. Have the knight say "Let me open this," and then add the squeak. The effect is complete.

What does the knight's voice sound like inside a closed helmet? Forget the reverb box and just put a mic inside a large empty coffee can.

Now, say the spot calls for the knight to dismount from his steed and fall down into a clattering heap of metal. Go back out to the Dumpster with your mic, lift the lid one foot and drop it. Mix the impact with the sound of the cans, wrenches et al being spilled onto the floor and a Hanna-Barbera "boing" for comic effect.

You might pick up a few freelance bucks offering your montage to the people producing the TV spot for the fair. If your DAW can sync to SMPTE timecode, you can lay the sounds right to video on one of their decks.

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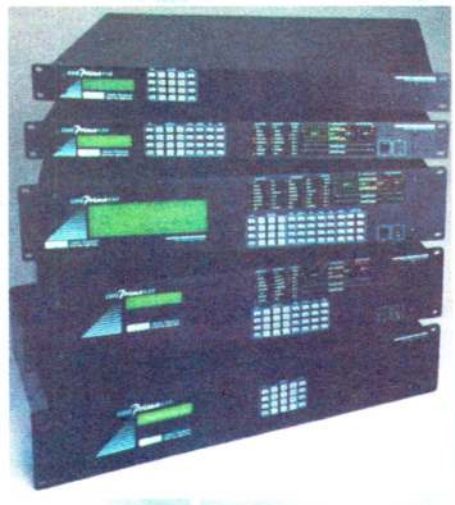

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World Radio History

FEEDLINE

Conquer Electrical Noise Problems

Part I of II

by W.C. Alexander

DALLAS Every year, I am asked to step in at one of our stations to try and resolve a noise problem. One of Murphy's laws states that the noisiest receiver location will be located at a valuable client's home or place of business.

Quite often, a high noise level (resulting in a poor signal-to-noise ratio) at a particular receiving location will be misinterpreted as weak signal. "I can't pick up the station here," or "Your station doesn't come in very well," is what we often hear from people in these locations. Many times, these locations are in areas where the signal strength from the station is quite high.

One of the advantages that FM has over AM is relative noise immunity. There is a twofold reason for this advantage: FM modulation systems tend to ignore amplitude variations; and most electrical noise tends to lurk at the low end of the radio spectrum — right in the medium wave (AM) band!

AM broadcasters and the amateur radio community have led a long and somewhat successful campaign for tight controls on devices that produce electrical noise (such as RF lighting devices and bug zappers). Still, there is a whole world of unregulated apparatus out there that produces hash, and many of these devices are connected to a great big transmission line — the commercial power grid — that conducts the garbage right into our homes and offices.

Utility companies and some others have a responsibility to eliminate such interference, but with the huge array of lines in even the smallest power grid, it is impossible for most utility companies to patrol their systems and fix all the problems as they occur. In many instances it is up to us, the users of the radio spectrum, to find these problems for the utility companies.

The first step in diagnosing an electrical noise problem in a fixed location is to listen to it.

On the other side of the coin are all the cars, plus the in-home and in-office devices that generate hash. The utility company's responsibility to deal with electrical noise problems ends at the customer's meter. Problems in a car are usually easy to address, while those in a home or office can be more difficult to find and fix, particularly if the people involved choose to be uncooperative. Still, there are ways to deal with such problems. Here are some things that have worked for me.

The most likely location for an electrical noise source is close by the receiver. If the receiver is located in an automobile, the ignition system is suspect. Ignition noise usually is manifested by a rapid popping sound that changes in frequency with engine RPM. If the individual pops are discernible, chances are only one of the spark plugs or wires are at fault; if they are too frequent to discern individual pops, more than one plug or wire is likely the cause.

One of the first and easiest things to do is to make sure that all the wires are seated properly, both on the distributor and the plugs. It is a good idea to pull each of the wires from the plug or distributor port to which it connects (one at a time!) and reseat it. This will ensure that the connection between wire and plug/distributor is good and no arcing is occurring. Be sure to include the coil wire in this procedure. If that doesn't fix the ignition noise problem, ask how old the plug wires are. If they are more than four years old, the insulation could be breaking down and arcs through the insulation could be occurring. Replacing the wires with a good set of resistor wires will more than likely cure the problem and improve engine performance as well.

Another possibility is the spark plugs. It is possible that there is a break inside one of the plugs that is causing an arc to occur outside the engine block. If this is the case, it is probably just one plug and not all of them.

Sometimes, carbon can build up between ports on the inside of the distributor cap, making an arc path between ports. Cleaning the inside of the cap (or replacing it altogether) will fix this and often dramatically improve engine performance, too.

One last thing to check is for grounding of the vehicle's hood. On many vehicles, a ground strap is installed between the hood and the vehicle body to ensure that the hood is well grounded. This ground will cause the hood to act as an electrostatic shield and will prevent unwanted ignition noise from radiating out of the engine compartment where it can be picked up by the radio antenna. Check the condition and connection of this strap. If it does not exist, it is easy to install one. Cut a 10–12-inch piece of RG-8 coaxial cable. Carefully strip away the outer jacket, then pull the copper ground braid off the center conductor. Use this to ground the hood to the vehicle body, using existing hardware to connect each end of the strap. Be sure to clean the paint off at the connection point at each end of the strap.

Alternator noise is another potential source of electrical noise in vehicles. It is

continued on page 52 ▶

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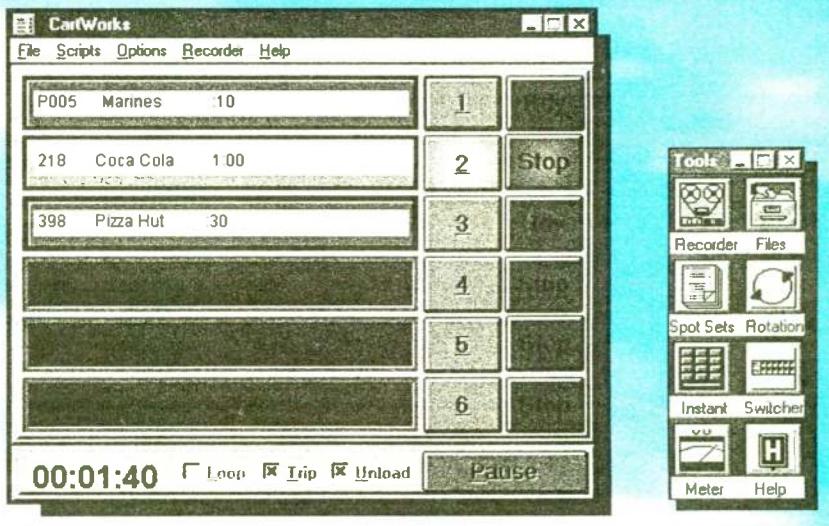

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World Radio History

Monitor in the Frequency Domain

Part II of II

by Jim Somich

BROADVIEW HEIGHTS, Ohio Last month we discussed spectrum analyzers in general. This month we will zero in on specifics.

There are some jobs that cannot be done without being able to accurately monitor in the frequency domain. A reasonable familiarity with spectrum analysis can be invaluable in these situations.

The frequency scale of the spectrum analyzer can be scanned in three different modes: full, per division, and zero scan.

The full scan mode is used to locate signals, because the widest frequency ranges are displayed in this mode. Not all spectrum analyzers offer this mode.

The per division mode is used to zoom-in on a particular signal. In per division, the center frequency of the display is set by the tuning control and the scale factors are set by the frequency span or scan width control.

In the zero scan mode, the analyzer acts as a fixed-tuned receiver with selectable bandwidths.

Absolute frequency measurements are usually made from the spectrum analyzer tuning dial. Relative frequency measurements require a linear frequency scan.

By measuring the relative separation of two signals on the display, the frequency difference can be determined.

Resolution

Before the frequency of a signal can be measured on a spectrum analyzer, it must first be resolved.

Resolving a signal means distinguishing it from its nearest neighbors. The resolution of a spectrum analyzer is determined by its IF bandwidth. The IF bandwidth is usually the 3 dB bandwidth of the IF filter.

The ratio of the 60 dB bandwidth (in Hz) is known as the shape factor of the filter. The smaller the shape factor, the greater the analyzer's capability to resolve closely spaced signals of unequal amplitude.

If the shape factor of a filter is 15:1, the two signals whose amplitudes differ by 60 dB must differ in frequency by

> **Familiarity with spectrum analysis can be invaluable.**

7.5 times the IF bandwidth before they can be distinguished separately. Otherwise, they will appear as one signal on the spectrum analyzer display.

The ability of a spectrum analyzer to resolve closely spaced signals of unequal amplitude is not only a function of the IF filter shape. Noise sidebands can also reduce the resolution. They appear above the skirt of the IF filter and reduce the offband rejection of the filter. This limits the resolution when measuring signals of unequal amplitude.

The resolution of the spectrum analyzer is limited by its narrowest IF bandwidth. For example, if the narrowest bandwidth is 10 kHz then the nearest any two signals can be and still be resolved is 10 kHz.

Traces its shape

This is because the analyzer traces out its own IF bandpass shape as it sweeps through a CW (continuous wave) signal. Because the resolution of the analyzer is limited by bandwidth, it seems that by reducing the IF bandwidth infinitely, infinite resolution will be achieved.

The fallacy here is that the usable IF bandwidth is limited by the stability (residual) FM of the analyzer.

If the internal frequency deviation of the analyzer is 10 kHz, then the narrowest bandwidth that can be used to distinguish a single input signal is 10 kHz.

Any narrower an IF filter will result in more than one response or an intermittent response for a single input frequency.

A practical limitation exists on the IF bandwidth as well, because narrow filters have long time constants and would require excessive scan time.

Sensitivity is a measure of the analyzer's ability to detect small signals.

The maximum sensitivity of an analyzer is limited by its internally generated noise. There are basically two

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Circle (44) On Reader Service Card

World Radio History

Bolton Thrills Hams on AM Band

by Al Parker

HICKSVILLE, N.Y. Sometimes the technology and gear are so compelling that we forget radio's real purpose is to be a conduit. All sorts of information sparkles across the heavens, carried by chariots of RF. From simple navigation beacons to complex symphonies, the clouds are alive with the sound of radio.

Ed Bolton, WA3PUN

Fidelity and subtlety

Amateur radio is composed largely of scratchy voices engaged in everything from emergency communications to plain old chit-chat. The AM mode is unique in that it has an abundance of fidelity and subtlety, so much so that the true character of a personality is revealed. Some say its the camera, but I contend that it's the microphone that doesn't lie. Without any visual clues, audio nuances become very important to the process of strangers becoming radio friends. I guess that's why the most interesting and gregarious folks in amateur radio are drawn to the AM mode.

When your baseline personality quotient is at such a high level, it is difficult to stand out. One individual who has managed to make a very distinctive mark in the world of AM is WA3PUN. Ed Bolton, or Uncle Ed as he's known to hams all over the country, is one of those guys who grab your attention within seconds.

The experience of spinning the dial late at night and being riveted by a personality is reminiscent of the good old days of talk radio. I'd thought those days were past until night a few years ago when I spun the dial on a battle weary National NC-109 and heard the music again. The powerful signal was flawless and the voice had the deep resonance of a professional announcer. I had to look at the band-switch again to make sure that I wasn't accidentally tuned into a broadcast station.

Before I had the opportunity to read the dials, the voice laughed, "This is WA3PUN. People understand nothing, your Uncle Ed in Harrisburg." His companion's response was confirmation that I was in fact listening to amateur radio. I lost track of time as the jovial roundtable group carried on under the gentle guidance of the master of ceremonies, Ed. Most of the airtime was devoted to his jokes, wry observations and stories.

That night I made the decision to make the transition from long-time shortwave listener to full-fledged ham.

During the period of study for the various license tests, I listened to the ham bands almost nightly. The late show in the east coast AM window (3.880–3.885 MHz) was the highlight. Uncle Ed seemed to be a limitless source of radio fun and information. He was obviously a talented singer, performing tantalizing tiny samples of popular and classical selections, a capella, with perfect pitch. It didn't surprise me to hear that he had been the lead vocalist with the world famous Wayne King Orchestra.

He was also an accomplished impressionist, doing a very convincing John Wayne, Jimmy Carter and William F. Buckley. One night several years back, his Henry Kissinger fooled so many people that it caused a sensation as nationwide Associated Press stories first trumpeted the remarkable ham-band appearance and foreign policy pronouncements of the great man, followed by the revelation that it was all an Uncle Ed gag.

New adventures

Tuning in was always a new adventure. One night he'd be reprising old-time radio shows, acting out all the parts from memory; the next night he'd be carrying on a QSO with a Canadian station in fluent French.

Little by little, I learned that the secrets of Ed's radio appeal were in his diverse life experiences and a generosity of spirit. Here was an individual who had actually shaken the hand of Albert Einstein; performed in every imaginable venue form, from opera to the U.S. Air Force Band; and rubbed elbows with the greats of show business. Ed was also unique in that he held nothing back.

As I tuned in to Ed and the other incredible personalities of 75-meter AM, it became more and more apparent that I would devote most of my energy toward becoming a part of the group. The first step was to trek out to my first hamfest to find an affordable rig with AM capability. This turned out to be an old Hallicrafters HT-37.

At that point in my radio education I didn't realize that the rig was primarily an SSB transmitter. The low-level (20 W) AM mode was usable but not as desirable as the plate-modulation I'd been hearing about on the air.

To make a long story short, the very night I passed my Advanced License test, I fired up the HT-37 and waited for an opportunity to break into Uncle Ed's roundtable. I must admit that I was nervous — funny, considering that I'd done a fair amount of public speaking in corporate life. After several attempts to break in, Ed finally responded.

He was having a hard time understanding my apparently distorted signal, but got enough to realize my situation. He advised me to switch to SSB. I did so with a certain amount of embarrassment and disappointment. Fortunately, my lower sideband was working enough for us to communicate. Ed had used the same model rig in the past and detected immediately that there was a problem in the balanced modulator. He even took an educated guess as to the specific troublesome tube. The accuracy of his diagnosis was confirmed by my return the following night on AM.

Tuning in was always a new adventure.

Encouragement

It was at that point that Ed started gently encouraging me to improve my signal. I did what I could in terms of working toward Ed's ideal antenna height (60 feet for 75 meters), but had no luck in finding a plate-modulated rig in the 100 W category. This was considered the minimum power level for comfortable "prime-time" communication on that crowded band.

Again, Ed came to the rescue. Late one night, an old friend of his announced that he was getting rid of an old boat-anchor Johnson Viking II. "Santa Ed" grabbed it for me and had it shipped my way within a few days of Christmas. As I tore into the package, I was about as excited as a school kid.

This act of kindness typifies the best spirit of amateur radio and is an example of the reason hundreds of hams credit Uncle Ed with inspiring them to join the amateur ranks.

Ed has often observed that, "The countless shortwave listeners using simple radios who were drawn into the hobby by our group would probably not have been able to listen if we'd been transmitting in the SSB mode. This is another very compelling agreement for the preservation and promotion of AM."

Uncle Ed Bolton, WA3PUN of Harrisburg, Penn., can be heard most days around 3 p.m. on or about 3.825 MHz. His busy teaching and performing schedules have forced him to curtail his late-night radio show during the week. However, don't be surprised if, in the wee hours of some weekend, you hear "Duke Wayne" signing off with, "I've ridden off into so many sunsets that my horse's rear-end is blistered!"

□□□

Al Parker writes about amateur radio and photography. He can be reached at (516) 681-6733.

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World Radio History

SIGNAL TO NOISE

Radio-on-demand on Internet

by Frank Beacham

NEW YORK First there was Internet radio. Now there is personalized, custom-designed Internet radio-on-demand.

Timecast, a new free Internet service (http://www.timecast.com) from Progressive Networks of Seattle, goes the next step in personalized Internet radio by enabling users to customize their own daily news broadcast with time-sensitive audio content and have it easily delivered back to them on the World Wide Web.

Timecast, now in operation and free of charge, is the first end-user controlled central audio web site to actually deliver customized multimedia news and information from a wide range of audio broadcasters on the Internet.

"Timecast is a breakthrough in the delivery of multimedia information," said Rob Glaser, chairman and CEO of Progressive Networks. "Timecast makes it easy for Net users to find, select and immediately listen to the multimedia news, information and content that's available today at hundreds of Web sites."

The new service is based on Progressive Networks' RealAudio client-server software system, which enables Internet and on-line users equipped with conventional multimedia personal computers and voice-grade telephone lines to browse, select and play back audio or audio-based multimedia content on demand, in real time.

The cornerstone of Timecast is the daily briefing feature that allows users to build a custom newscast with stories from a dozen well-known news and entertainment organizations such as ABC, clnet, Entertainment Tonight, CBC, Fortune, Web Review, ComputerWorld, Industry.Net and TST-Taylor Subscription Talk.

Individual user selections and preferences can be saved for repeat visits, so return users are never more than one click away from the daily audio news they want.

"Timecast tackles two compelling issues. Not only does it make time on the World Wide Web efficient by aggregating those (sites) that produce audio content, but it levels the playing field so that small entrepreneurs with innovative ideas can be listed alongside major media developers," said Allen Weiner, director and principal analyst, on-line strategies, Dataquest.

Timecast ties RealAudio content to a single Internet site, indexing a huge collection of audio content with an array of other "one click away" features. For example, a "Live Now" feature, which is updated every 10 minutes, takes users immediately to live events such as rock concerts, professional sports games, political speeches and talk-radio programs.

The "Live Radio Stations" feature connects users to one of over 50 radio stations throughout the world that are currently broadcasting their radio programs using RealAudio technology. In addition to numerous U.S. stations, radio stations from Canada, Italy, France, Australia, Malaysia and Hong Kong are broadcasting their programs via the Internet using RealAudio.

Every week, Timecast's "New Sites" feature will highlight the newest additions to the 600+ list of places to hear RealAudio, while the "New Sounds" feature will point to the latest audio on established sites. Timecast will also publish a weekly feature story citing how the Internet and RealAudio amplify and embellish topical human interest issues.

Timecast will also include a fully categorized search facility where users can find programming by keyword, title or capsule description on a comprehensive database of third-party sites that offer programming with RealAudio technology.

"As more and more audio becomes available on the Internet, the need for an on-line guide becomes essential," said Eric Canale, director of on-line programming at Entertainment Tonight & Premiere Radio. "Timecast is that guide and the daily briefing is key."

Since its introduction in April 1995, over 4 million RealAudio Players have been distributed throughout the world with over 25,000 currently being downloaded daily from the RealAudio Web site (http://www.realaudio.com). Thousands of RealAudio Servers, said Progressive networks, are currently delivering audio and streaming multimedia content on the Web on a worldwide basis.

One of those is @Computerworld, a publisher who uses spoken word broadcasting to reach an audience.

"Audio technology on the Web allows us to speak — literally — to our readers," said Editor in Chief Bill Brandel. "The daily briefing (feature of Timecast) will get more listeners tuned into the @Computerworld news on a daily basis."

□□□

Frank Beacham is a New York-based writer and producer. Visit his World Wide Web site at http://www.beacham.com. Mail: 163 Amsterdam Ave. #361, New York, NY 10023. E-mail: beacham@radiomail.net

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Above: Producer Edit panel; below: Mixer panel

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*via linked CPUs

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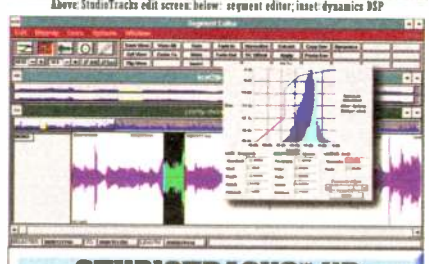
‡The software program Formerly Known As Prisma Music. Our *previous* Marketing Department did it.

Above: StudioTracks edit screen; below: segment editor; inset: dynamics DSP



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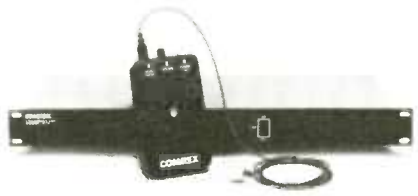

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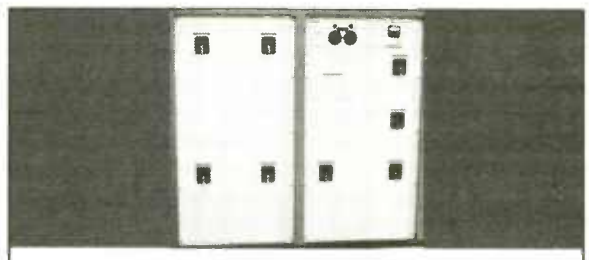

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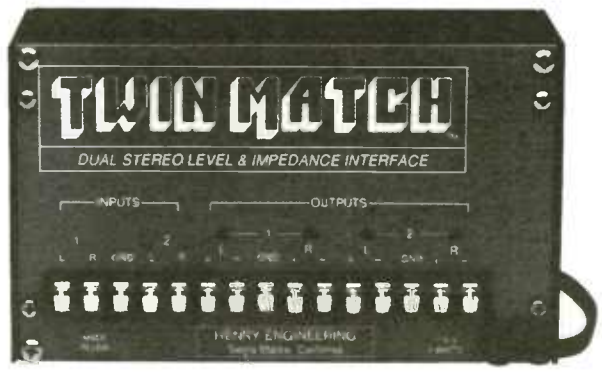

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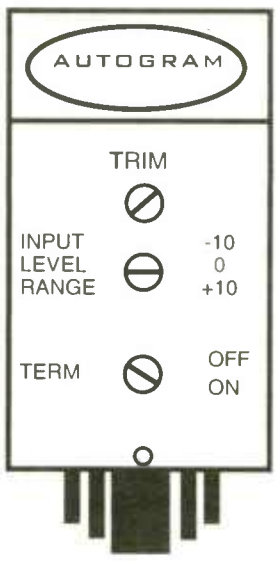

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See page 36.

INTERNATIONAL UPDATE

Talk Radio Heating up in Mexico

Opposition-party Proposals, Government Economic Policies and Personal Issues on the Air in Mexico

by Sam Quiñones

MEXICO CITY Federico Vale flips a switch in his teal-green studio, leans into the microphone and begins the second hour of his talk show on Ondas del Lago, 690 AM in Mexico City.

Vale's guest today is Dante DeCanini, a congressman from the state of Nuevo León and member of the Institutional Revolutionary Party (PRI), which has ruled Mexico for 67 years. And the topic is Sócrates Rizzo, the former governor of Nuevo León and a PRI loyalist, who recently resigned with more than a year left in his term.

The conversation touches on advances made by the opposition National Action Party (PAN) in recent years and the foibles of both Rizzo and the PRI. "We have made a lot of errors," DeCanini admitted.

To the ears of anyone used to the excesses of talk radio elsewhere in the world, all this sounds decidedly tame. But to Mexicans, the airwaves are burning up.

Coming on strong

Over the past two years, talk radio has come on strong here. Three stations converted to an all-talk format and several others have sizable chunks of programming devoted to it.

But it is not talk radio that is new here, rather, it is the type of talk being heard and where you can hear it.

Now, discussions on major commercial stations routinely center on opposition-party proposals, the latest blunders by a PRI politician like Rizzo or how the government is mismanaging the economic crisis.

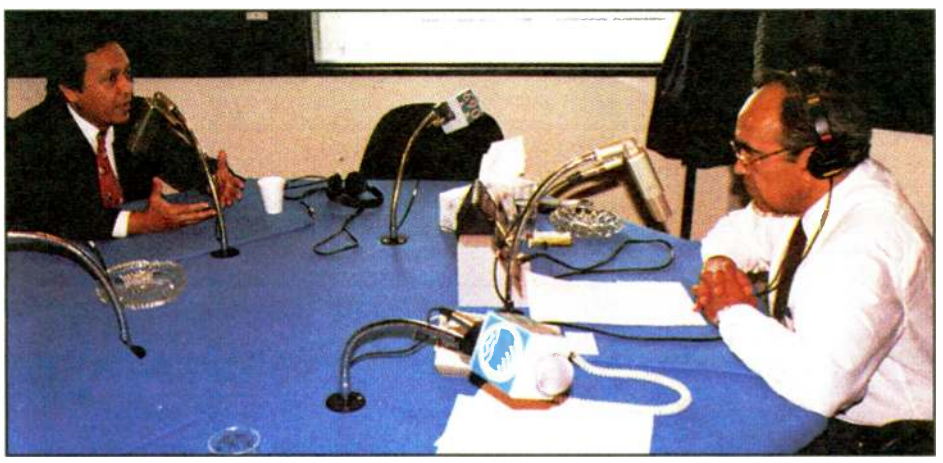
Not so long ago any opposition political party could expect its candidates, as well as its ideas, to be blocked entirely from the airwaves. As recently as November 1994, Miguel Ángel Granados Chapa was fired from his job as talk-show host on Radio Mil (1000 AM) for having Cuauhtemoc Cardenas, leader of the opposition Party of the Democratic Revolution (PRD), on his program.

Mexican radio was a sedative, consisting mostly of narrowly formatted music programs and discussions of soap operas.

"Maybe 15 years ago, people just wanted entertainment," said Luis Adame, director of Radio 13, 1290 AM, which switched to talk radio 18 months ago. "That is what radio was: entertainment and fun. Even the news programs were positive, not very critical."

But Mexicans are no longer willing to settle for a party line. They are more demanding both politically and as consumers. Mexico is more open and active politically, and talk radio reflects that.

"The last shove was the Zapatista uprising in Chiapas, the August 1994 presidential elections and then the departure of ex-president Carlos Salinas," said Susanna Albarrán, director of the Mexico City-based Center for the Promotion of Community Radio (CEPRAC). "People were just asking so many things and the media could not quiet them. This accelerated a real change in radio."



Federico Vale (right) questions Congressman Dante DeCanini on Ondas del Lago.

Part of this is due to radio's natural evolution: Music shows are gravitating to the better stereo capabilities of FM, leaving AM for news, talk and sports. This is accompanied in Mexico by a massive youth market that is increasingly looking for its music on FM.

AM stations, meanwhile, are finding that credibility, objectivity and reaching out to the public add up to good business.

Among the first

Radio 13 was among the first to figure that out. The station had an oldies format for many years until it was bought by Grupo Radio S.A. in December of 1994. It soon shifted to talk radio.

"We were not looking for only an opposition audience," Adame said. "We want to be a station with plural characteristics, but always with objectivity. We want to be a station that talks about proposals."

They hired Carlos Ramos, a 37-year-old radio and print journalist, as morning host, along with an entire news staff of people mostly under the age of 30.

On his "Al Momento" news and talk show from 6 -11 a.m., Ramos devotes an hour to an informal chat with politicians, economists and government officials who come in and discuss whatever is on their minds that day.

"It is for people who like hearing what they cannot hear at after-hours political cocktail parties because they are not invited," Ramos said.

The station has done well. Adame and Ramos believe Radio 13 is eighth overall among the 33 AM stations in Mexico City and the morning show is third in its time slot.

Advertisers also are responding to the change. In Mexico City, news/talk shows like Ramos and Vale's are filled with ads for banks, computers, cars and credit cards — all looking to reach the educated audience that the format attracts.

Advertisers responding

"The fees for ad buys on the news and talk programs are two, three, up to 10 times more than ad buys on music shows," said Carlos Garc'a, director of the Mexico City Association of Radio Broadcasters. "People want to be on these shows."

Meanwhile, this new-found freedom has spilled over into other types of talk radio.

Shows that discuss sexual and relationship problems are using a frankness unthinkable a few years ago. And already that market is segmenting. "Hora de los Adoloridos" is an hour-long show on a

continued on page 35 ▶

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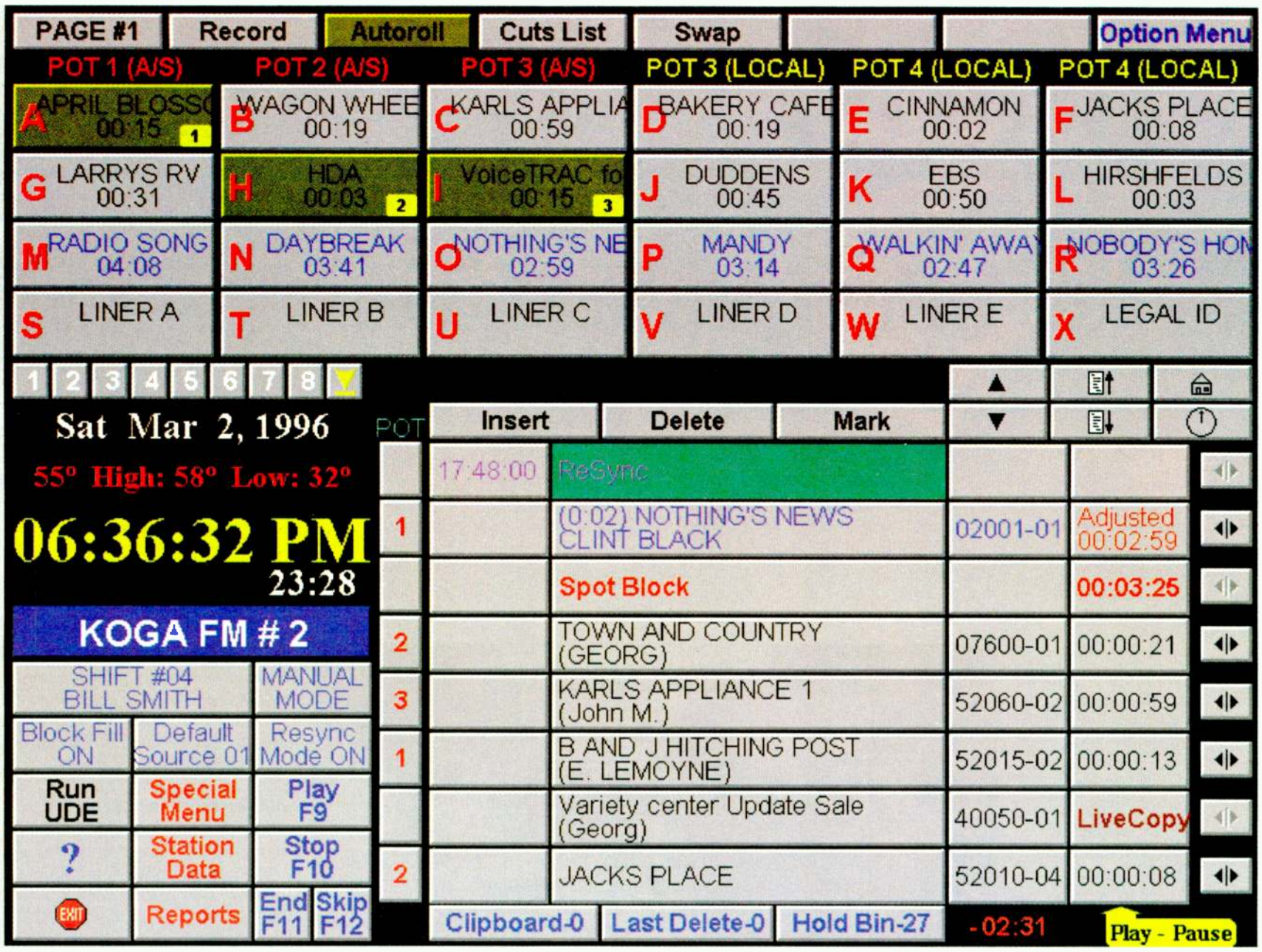

Version 5

Live Show Interface (LSI)

The centerpiece of Version 5 is the new Live Show Interface (LSI). This new interface allows the D-J to run even the most high energy shows smoothly. Fully utilizing the power of Windows, the Live Show Interface features:

- **Drag and Drop Commercials and Songs**
  Audio events can be easily moved around in the log using the mouse or touch screen. They can also be moved to the button bar and the holding bin.
- **Audio Source Management**
  Version 5 allows the D-J to specify which audio card a commercial or song will play out of ahead of time. It is easy to pre-position sliders and to crossfade items. Plus, Version 5 actually allows six stereo audio events to play simultaneously for each control room!
- **Fully Touch Screen Compatible**
  The Live Show Interface was designed from the ground up to be totally touch screen compatible.
- **Expanded Button Bar**
  Forty-two pages of buttons for immediate access to 1008 liner, jingles, laugh-tracks, etc.—PER SHIFT! And you can have up to 99 shifts!
- **Auto Roll of Buttons**
  Auto roll allows the D-J to mark buttons that will playback one after the other automatically. Mark up to 24 buttons which will all play back in order.
- **Quick Record**
  Take phone calls, edit them with our wave form editor, and place the event on log...all in just seconds.
- **Holding Bin**
  The holding bin is temporary storage for items that the D-J can't get to immediately. He can move them to the holding bin for easy retrieval later in the shift.
- **Macro Buttons**
  Accomplish complex tasks in one click of the mouse with macro buttons. Tasks such as changing from manual to satellite or auto control, changing the active station, turning on and off sources or relays, etc. become effortless with Version 5.
- **Pause/Reposition**
  Pause a spot or song, fast forward or rewind to a new point, begin play from a designated point using the pause/reposition button.

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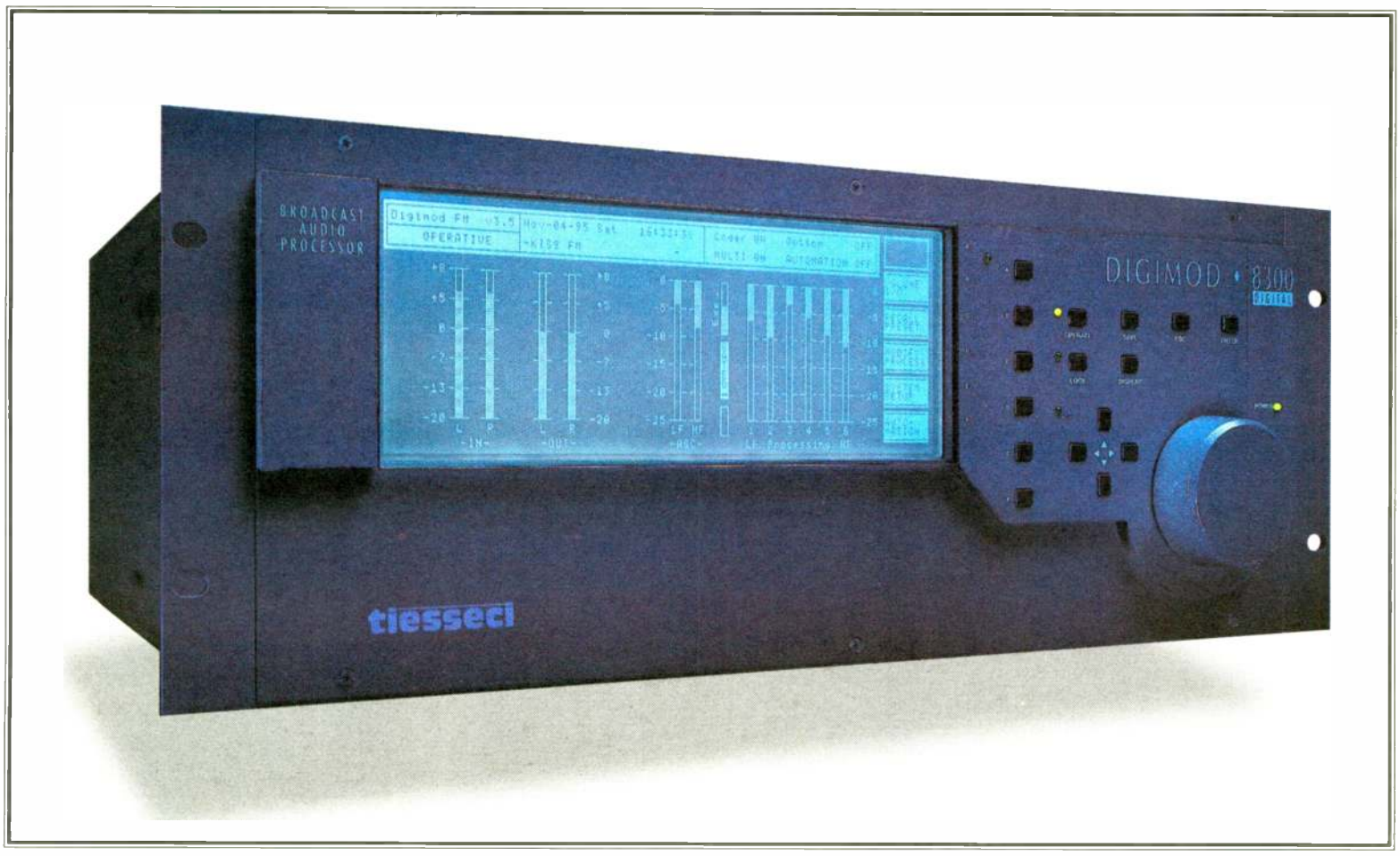

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INTERNATIONAL UPDATE

Berlin NewsTalk Seeks Stability

by Florian Grolman

BERLIN Hans hates car racing, and he is glad "every time a racer buys it in an accident."

Thorsten thinks racing is an attack on democracy.

Herr Seidel from the German Automobile Club, on the other hand, supports "free driving for a free nation."

Starting to work

Gradually, it is starting to work. More and more people from Berlin and the surrounding state of Brandenburg are learning what NewsTalk 93,6 is all about: opinions, opinions, opinions. And this garners applause from Bärbel in Hellersdorf, a typical new town in the former East Germany: "For 40 years, we could not say anything. That is over now with NewsTalk!"

Calls like that make NewsTalk Program Director Peter Laufer turn up the volume.

"We are exactly where we want to be," Laufer said with satisfaction, dashing from the room again to take care of "his" station.

Despite the praise, it is still clear that much that remains to be done. Sometimes the talk drags on through the afternoon like chewing gum. Too often, nobody calls.

"This medium will create stars overnight," Laufer said even before the broadcasts began. At the moment, however, it sometimes seems to be better at creating embarrassment.

Sven Blümel, the evening host, is talking for his life and, because he and his listeners have nothing to say, he is babbling on for the second evening in a row about the contents of his producer's sandwich.

Skeptics

How long can listeners endure such embarrassment before they tune out?

NewsTalk 93,6 is the first talk radio station in Germany, and one of the first in Europe. Many stations now have talk segments, but usually only for a few hours a week.

As the past few months have illustrated, talk masters do not just drop out of the sky. The big talk stars at the successful music stations are also keeping their distance for now. The industry is skeptical about whether NewsTalk can succeed.

Hit or flop? It is too early to tell. There are still no numbers to go on. For the time being, Laufer is relying on his gut and the monitor in his office that lets him track how many callers are holding to talk about what issues.

With some of the hosts, the number of callers tend to be pretty low. Just a few weeks after the station began broadcasting, the first "stars" disappeared from the scene. Take the unfortunate Anja Krystin, for example. The young Austrian woman's heavy accent apparently alienated many listeners. Some referred to her

continued on page 50 ▶

Talk Radio Heats Up In Mexico

▶ continued from page 31

pop music station aimed at the working class. "Friends Connection" is on an FM station and targets the hip children of the upper classes. Radio 13 has two such shows, both at night.

Patty Kelly, of Radio Red, 1110 AM, hosts two of the leaders in this genre. "Pareja Dispareja" is an afternoon show on the problems facing couples. "Íntimo" is a nighttime show on sexuality and sexual problems that focuses on a different age group each night.

Recently on Íntimo, Kelly led two psychologists and callers on a discussion that ranged from the advisability of sex during pregnancy to how to put on a condom.

"Our idea is to give people the information they need so they can decide," said Kelly. "No more paternalism."

Kelly admitted, however, that a sizable part of her audience tunes in for vicarious thrills, but she stressed that listeners no longer want to be talked down to. As in politics, so too in sexuality. People, she said, crave open discussions of abortion, divorce, orgasms, AIDS, spousal abuse and impotence.

Most people involved in talk radio, at least in Mexico City, see it growing even more popular, reflecting the nation's slow shift to a more plural society.

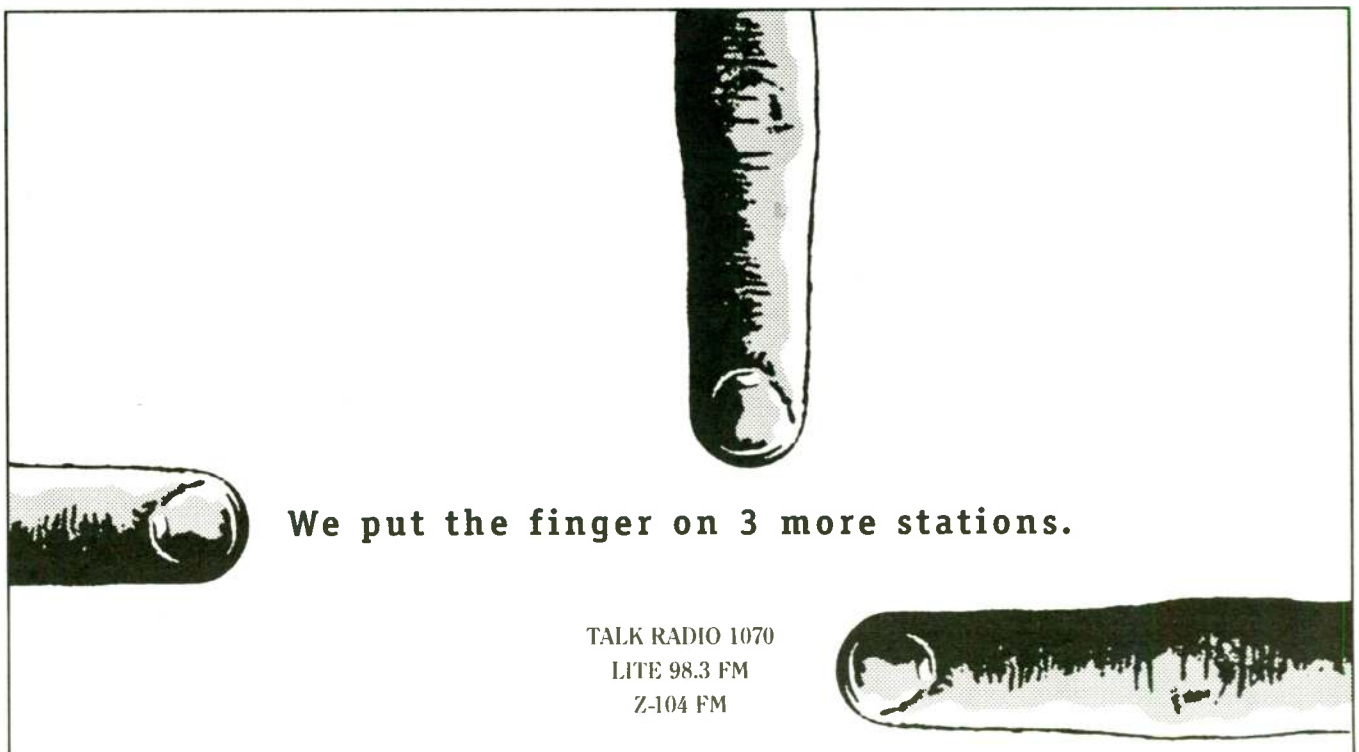
Federico Vale, of Ondas del Lago, is one of them.

"Before you could not hope to hear the leader of an opposition political party on the radio saying that the government had committed fraud or that the president is wrong," Vale said.

"I am 56. In all that time I have never heard on the radio a conversation like the one I had with Congressman DeCanini from Monterrey. This makes me think that the future of talk radio is promising."

□□□

Sam Quiñones is a free-lance writer based in Mexico City, Mexico. Contact him via e-mail at 74052.2607@compuserve.com



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OFFBEAT RADIO

Group Adds Stations, Automation

by Dee McVicker

PHOENIX There's a bridge over Interstate 65 in Mobile, Ala., that foretells a little about where the broadcast industry is headed in the aftermath of the recent Telecommunications Act.

Far reaching implications

It spans only about a mile and a half, but its implications are far more reaching for those broadcasters seeking new ways to cross over into megastation ownership.

No one can see it, of course, having been erected out of wireless technology with the only traffic in town being that of Capitol Broadcasting Company LLC computer network protocol to shuttle commercials, news and some music back and forth between two broadcast studio facilities.

The bridge is a wireless beam transmitting Ethernet packet data in the unlicensed 2.4 to 2.485 GHz frequency range, bringing together two hard-disk run studio facilities separated by a freeway.

For Capitol Broadcasting, the pathway opened up new avenues of efficiency, enabling it to double up from a three-station to a six-station operation of four FMs and two AMs — just two stations shy of the ownership limit in the Mobile market under the telecommunications bill passed earlier this year.

The pathway opened up new avenues of efficiency.

"We started a year ago getting prepared for the inevitability of the Telecommunications Act. We had purchased our then duopoly limit of two FMs and one AM, and we were involved with a couple of other stations. When the telecommunications bill went through, we went ahead and purchased those other stations with the vision that we were going to go totally digital," explained Capitol Broadcasting Chief Engineer Tim Camp.

The only problem in doing so was fitting all six stations into one broadcast facility; the group has plans to expand one of the facilities, but in the meantime, Camp has to make due with separate, ultimately digital facilities housing three stations each on either side of the road.

During an interim period, until Capitol Broadcasting completes the second floor of its original facility for all six stations, WMXC-FM (99.9), WDWG-FM (104.1) and WNTM(AM) (710) are on one side of the freeway on Broadcast Drive and the group's new tri-station purchase of WKSJ-FM (94.9), WRKH-FM (96.1) and WKSJ(AM) (1270) is on the other side of the freeway, on Western American Circle.

With only three production studios for all six stations, and the need to exchange some music library cuts, Camp set out to build an overpass that would hold up to the network traffic between the Broadcast Electronics AudioVAULT hard disk and digital studio systems residing on opposite sides of the freeway.

Ruling out ISDN because of its limited bandwidth, he checked into a T1 line. But this hope quickly fizzled out as he realized installation would run $4,000 and on-going circuit fees would cut into his budget at $800 a month.

Moving options

In search of an affordable, effective solution, Camp tapped into the Internet for information and began exploring an option used by companies for moving information between branches and main offices.

A wireless local and wide-area network modem link showed promise. For one, the price was right. The going rate for a wireless modem manufactured by Transformation Techniques Inc. (TTI), ultimately Capitol Broadcasting's product of choice, cost less than installing a T1. Plus, no frequency licensing was required.

Camp also liked the technology, which built upon the group's all-digital mandate. "We put all three initial stations on hard drive-music, commercials, everything. We have no cart machines whatsoever. In fact, the only tape machines in the building are some reel-to-reels in the production facility so we can take dubs from the outside," he said. The stations on Broadcast Drive have Moseley DSP 6000 digital STL systems that make the run up to their respective transmitter sites, and Harris DIGIT FM exciters with digital front ends. The Western American Circle stations — previously operated by Capitol Broadcasting under an LMA arrangement — soon will be outfitted with the same.

Dedicated music libraries of each station format — from country and A/C to talk/news and classic rock — reside on the seven file servers at Broadcast Drive and the three servers at Western American Circle. Occasionally, stations will cross-share library material.

Camp needed a digital trestle between the two facilities, and although the

continued on page 44 ▶

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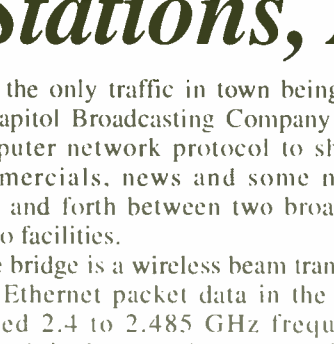

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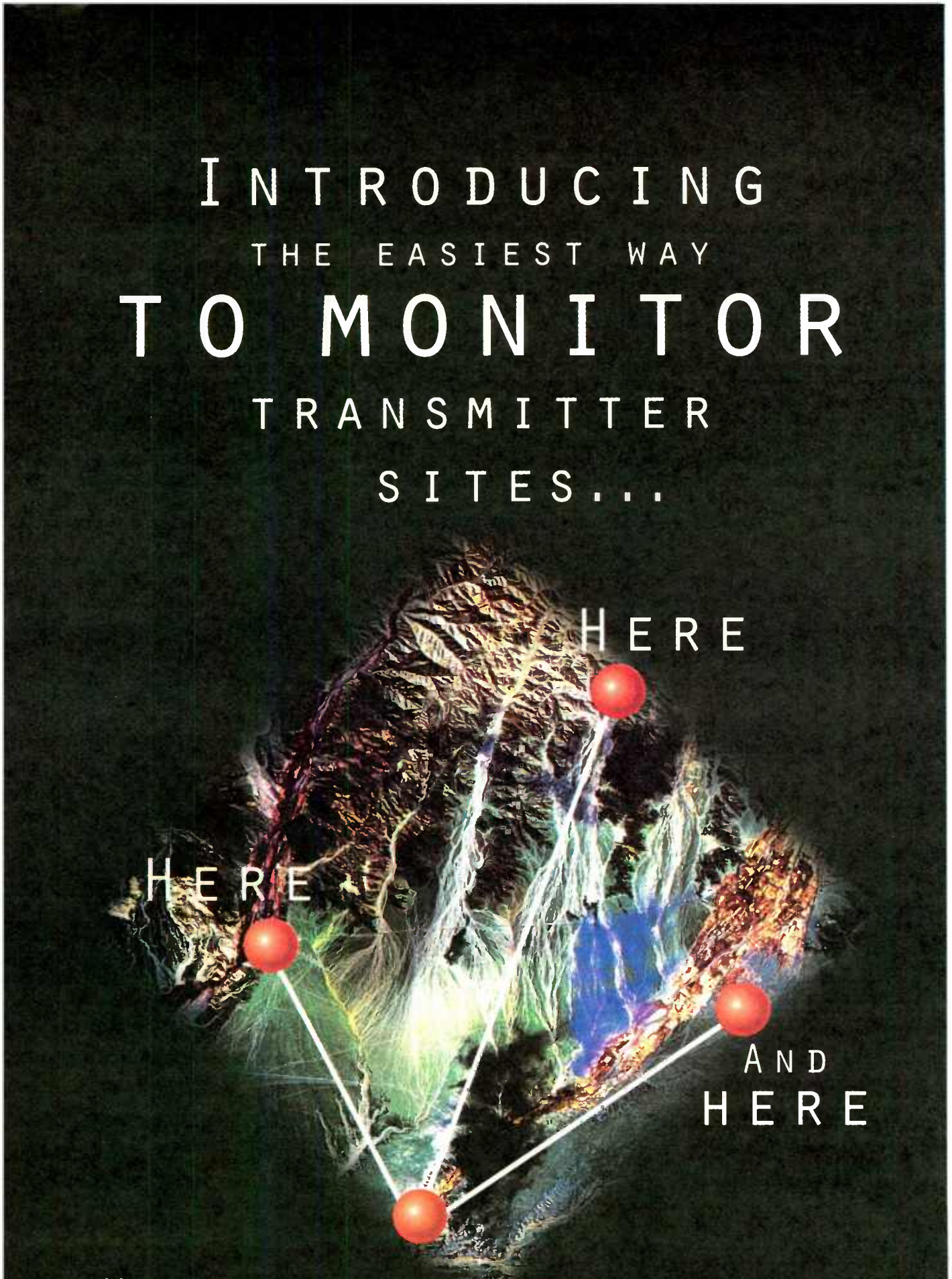

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ROOTS OF RADIO

Celebrating 'God Bless America'

by Richard W. O'Donnell

PORT RICHEY, Fla. Quick now! What was the most popular song ever introduced on radio? On American radio, that is.

Kate Smith introduced Berlin's 'God Bless America' on her radio show.

A clue: Irving Berlin wrote it.

If you said "White Christmas," you are wrong. That was first performed in the movie, "Holiday Inn."

Do you give up? It was "God Bless America." This is the remarkable history of that great song.

Big brass bands will play Berlin's patriotic tune this Fourth of July, while marching proudly along Main Street all across the nation. It will be featured at band concerts, on TV and , of course, on the radio.

Everybody knows the words, and many will sing "God Bless America" aloud this Independence Day. It is truly the theme song of the United States. In fact, there are those who believe it should be our national anthem.

Irving Berlin wasn't one of them. The songwriter, who died in 1989 at the age of 100 in his New York home, was convinced "The Star-Spangled Banner" was the perfect anthem for our country.

"We have a marvelous song as our national anthem," he once told an interviewer. "I am flattered there are those who feel my song deserves consideration for such a high honor. I wish such talk would stop. As far as I am concerned, 'The Star-Spangled Banner' is our national anthem. I hope it will always be our anthem."

Irving Berlin was born in Russia in 1888. Isadore Balin, as he was known back then, was brought to the United States when only an infant, and grew up in New York's lower East Side.

His formal education was limited, but he had a great love of music. One of his earliest jobs was as a singing waiter in a Chinese restaurant in New York's Chinatown.

In time, he turned to writing songs, and his fabulous career was launched. He was probably America's greatest songwriter. His hits include many tunes that are now an accepted part of our American way of life.

Bing Crosby's version of Berlin's "White Christmas" is the greatest selling record of all time. "Easter Parade" is another song America loves. "There's No Business Like Show Business" is the theme song of the entertainment world. He wrote "Blue Skies," "Alexander's Ragtime Band," "Always," "Remember" and "You Can't Get a Man with a Gun," to name a few of his classics.

Of all the songs Berlin wrote, "God Bless America" is the one Americans love best.

In August, 1918, Irving Berlin, who was in the Army during World War I, was given a special leave to produce a special soldier show called "Yip, Yip, Yaphank." The composer wrote all of the songs in the show, including the old favorite, "Oh How I Hate to Get up in the Morning." Twenty-four years later, during World War II, Berlin would produce a second soldier show, "This Is the Army." His two military shows were both tremendous hits.

"This Is the Army" had a fair share of sentimental and stirring patriotic songs. "Yip, Yip, Yaphank" was a different type of show. Berlin's songs were all snappy and in keeping with the musical mood of the nation at the time.

During rehearsal, he composed "God Bless America" for "Yip, Yip, Yaphank." It didn't blend in with the other songs featured in the show. There wasn't a spot in the fast-moving military review where it could be showcased.

In Berlin's home there was a trunk where he stored songs he felt were not quite right or that he could not market. He placed "God Bless America," which he liked, in that trunk. From time to time, he tried to find a spot for the tune, but things never worked out.

The song remained locked in the trunk, which was stored in the attic for 20 years.

In 1938, Kate Smith was America's queen of the airwaves. Her show, on CBS Radio on Fridays, attracted a tremendous audience and helped launch the radio career of "The Aldrich Family." Jackie Gleason first received national exposure on the "Kate Smith Show." So did the comedy team of Abbott and Costello.

Ted Collins, the producer of the radio show, received a call from Washington. At the time, the United States was at peace, but Hitler's Germany was rattling its weapons in Europe. Our leaders in Washington felt the nation would eventually become involved in a war and they wanted Kate Smith to introduce a new patriotic song that Americans would adopt as their own.

Producer Collins decided that Armistice Day — now known as Veterans Day — would be the ideal time to feature such a song. The problem was that he was without a song for Kate to sing.

He called Berlin and asked for his help. The composer had just returned from Europe, was weary from the trip and was not at the top of his form. He spent endless hours trying to come up with a suitable song, but without success. He wanted to produce a song worthy of his adopted land.

After several attempts ended up in the wastebasket, Berlin was about ready to toss in the towel. It was early November, and the radio show was less than a week away.

Meanwhile, Collins, who doubled as the announcer for the Smith show, had informed the nation that the next broadcast would feature "a brand new song by the great Irving Berlin."

Berlin had no choice. He had to keep going. He tried, but was unable to get what he wanted. When the words were right, the music wasn't; when the music was right, the words didn't blend.

It was then Berlin recalled the trunk in his attic. Was there something up there that might work? At that point, he recalled the stirring song he had written for "Yip, Yip Yaphank." He went upstairs and rescued "God Bless America" from the trunk.

Berlin had always liked the tune. He checked the words and music, and a messenger carried a copy of it over to CBS where the "Kate Smith Show" was already in rehearsal. The singer loved the "new song."

Kate Smith sang "God Bless America" for the first time on November 10, 1938, on the eve of Armistice Day.

The letters poured in. The song was a spectacular success. Kate sang the tune for 14 straight weeks. Berlin had given her exclusive radio performance rights, and she sang it for years on her show.

The record and sheet music sales were phenomenal. In 1940, Berlin established the God Bless America Fund, and gave all of his profits from the song to the Boy Scouts and Girl Scouts of America.

Kate Smith also donated all of the money she made from the song to worthy charities, including the fund Berlin had established.

In 1955, Irving Berlin was awarded a Medal of Honor by Congress. It was presented to him by President Dwight Eisenhower on February 18.

The inscription on the medal read: "Presented to Irving Berlin by President Eisenhower in national recognition and appreciation of services in composing many popular songs, including "God Bless America."

64 Years Ago

Reprinted from
Radio World June 18, 1932.
Editor's note: The **RW** of old, printed for a time in the 1920s and 1930s and today's RW are unrelated except in name.

HEARING HELD ON WJSV SALE

Washington

The reasons of the Columbia Broadcasting System for desiring to buy WJSV, Mount Vernon Hills, Va., situated near the estate of George Washington, were set forth before the Federal Radio Commission, which sat en bloc to hear the case.

The principal reason set forth was that the chain desires a Washington outlet that will not cause interference due to inability to mesh chain broadcasts. Mount Vernon Hills is just outside Alexandria, Va., which is across the Potomac from Washington, and CBS wants to feature more events of national importance emanating from the capital, tieing in the station with its own chain, and utilizing a remote control line about fifteen miles long, from Washington to the transmitter.

WJSV operates on 1460 kc and uses 10,000 watts power. At present CBS is using WMAL as its Washington outlet, but cites instances of interference.

Col. Charles I. Stengle, representing the board of directors of WJSV, said that if the proposed purchase is sanctioned Washington will receive better service and programs.

Speaking for CBS, Harry Butcher said that if the application is granted a new studio and transmitter will be erected.

The actual transfer of ownership would be to the Old Dominion Broadcasting Company, wholly-owned subsidiary of CBS. Sam Pickard, vice-president of CBS, said CBS will be financially liable and vouched for the financial integrity of the Old Dominion company.

Andrew Ring, engineer for the Commission, pointed out that CBS would control 7.4 of the quota units in the United States, counting ownership and leases.

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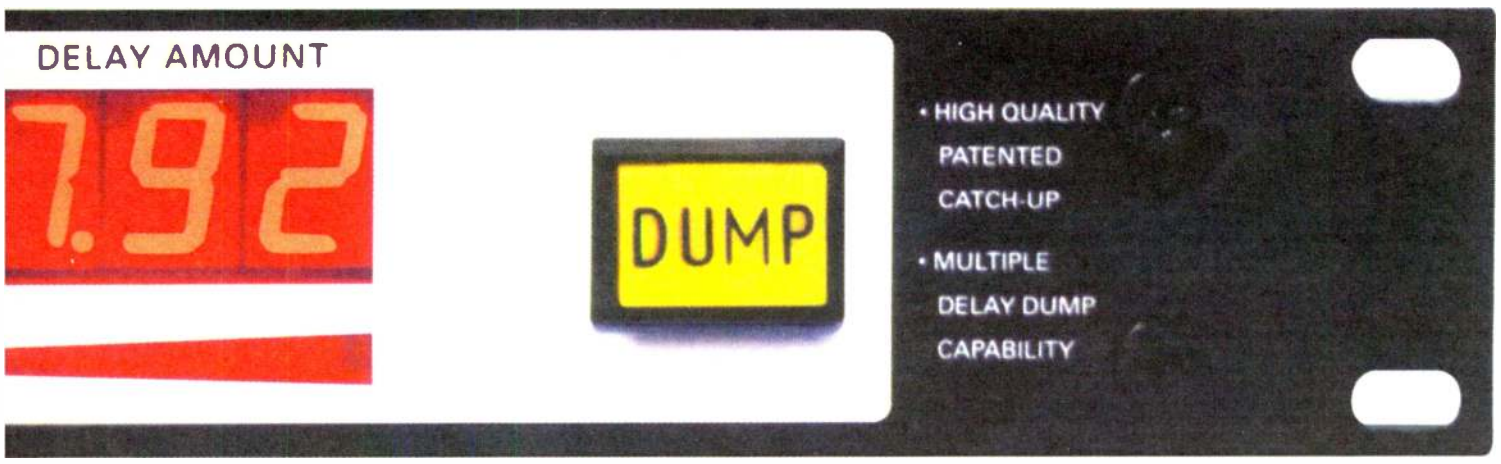

And, because you may not be using that analog console forever, the BD500 is also the only broadcast delay that's digital-ready with optional AES/EBU digital audio inputs and outputs. It's stereo, of course. A convenient new "sneeze" button allows the talent to sneeze, cough, etc. without being heard on air, and without dead air. All front panel switches (except configure) and all status indicators can be remoted (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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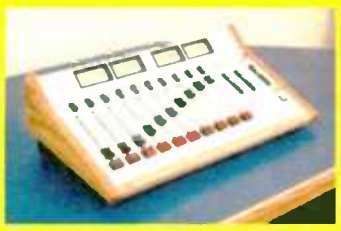

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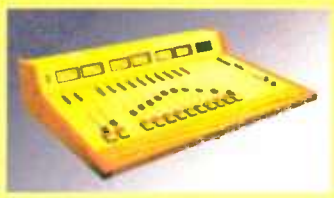

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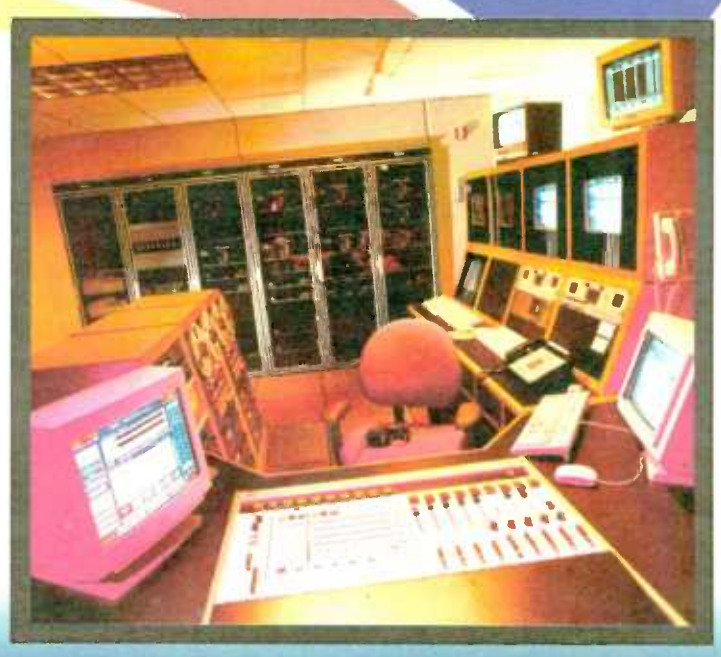

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World Radio History

This Local Daytimer Makes Money

by Ken Hawk

CLINTON TOWNSHIP, Mich. It's no secret that many hometown radio stations depend on programming from outside sources in their efforts to reduce overhead and keep up with a shrinking bottom line.

Hardest hit

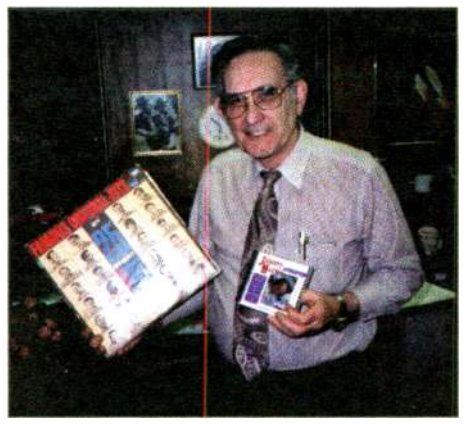
Daytimers are generally hardest hit, in part because of their limited operating time. In this case, one would expect to put a station on the bird and virtually eliminate programming costs, right? Well, according to Mike Panjuscek, co-owner and general manager of WKZV(AM), Washington, Penn. (about 30 miles southeast of Pittsburgh), the answer would be a resounding, "Wrong!"

Panjuscek, who also owns a local diner, runs WKZV with co-owner Helen Supinski, who also functions as the station's bookkeeper and business manager. At time of purchase, KZ Country was airing a satellite-fed Country format, and according to Panjuscek, heading down the same path that took it to darkness twice under its original call letters, WKEG. His first order of business was to replace the satellite programming with two local DJs — each working half the broadcast day.

"It was a mess," said Panjuscek, referring to the operation he inherited. "We knew we couldn't win without being local." He added that once potential advertisers discovered the station was automated, it lost its salability. Compromising the situation further was ineffective management and poor salesmanship.

"I'd walk into businesses trying to make a sales call," said Panjuscek, "and when they heard (what station) I was from, they didn't want to talk to me. I had to stop and tell them, 'Hey, we're the good guys.' Then I'd get them to tell me what problems they had with the other people."

Though WKZV is far from rich, it's also far from poor. The station functions with a staff of six, keeping overhead low with a healthy bottom line, which took about 18 months to achieve.



WKZV General Manager Mike Panjuscek

Format

Though Panjuscek said contemporary country came close to killing WKZV for the third time, he still recognized the appeal from artists like Alan Jackson, Shania Twain and Garth Brooks, and thus made a place for them in his new format. He also recognized that local and independent artists like Joe Smith, Tracy Ramsey and Howard Vokes were going to give him the niche he needed to make it in the Pittsburgh market.

Panjuscek also programs the music heard on WKZV. The station has all the full-service features that every small-town station has, like local news with world and national news from Standard News at the top of each hour. As for the music, the on-air staff follows a clock designed by Panjuscek, which divides the music in five different categories: contemporary, bluegrass, gospel, independent/local artist and '40s to '70s gold.

Naturally, competition can be dirty.

Artists from independent labels or the local area are the highlight of KZ Country's programming. "I have 98 packages here of music that I haven't even had a chance to listen to yet," said Panjuscek, referring to a cluttered area behind his desk. "How people find out about us, I don't know. I can't see why some of the bigger stations don't give them any airplay. A lot of these people can really get big if they're given a chance."

Sales and promotion

In addition to Panjuscek, there are two other full-time sales people. Though the station survives on virtually 100-percent local business, agency buyers are beginning to take notice. "They know we're here," said Panjuscek. "Now they're starting to realize that we're not going to go away."

Panjuscek also has bumper stickers, shirts and flyers all proudly bearing the KZ Country name and logo. They've done a lot of remotes, station tours for local area schools and PSAs with heavy community orientation. His own 33-year history in the tri-state area as "Polka Mike" brings even more listeners to WKZV. Despite his daily administrative

continued on page 44 ▶

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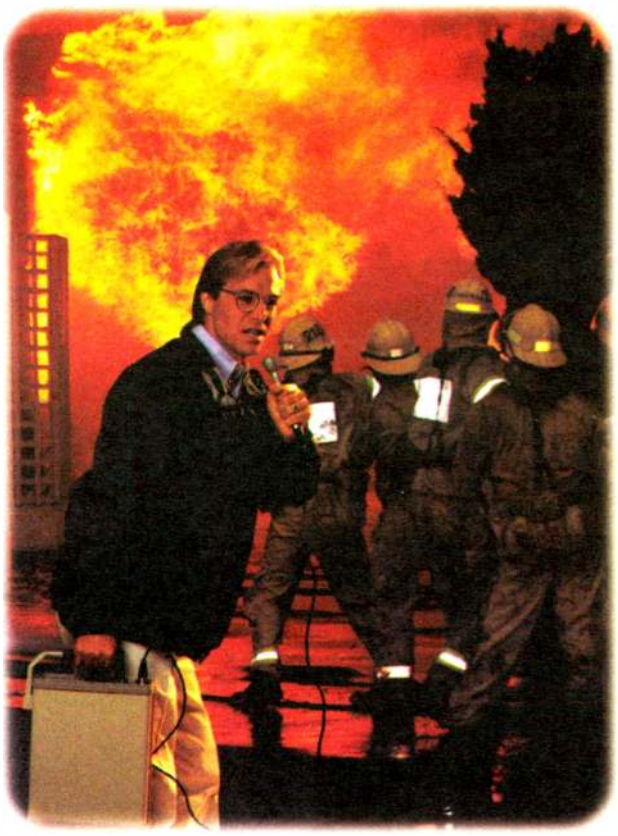

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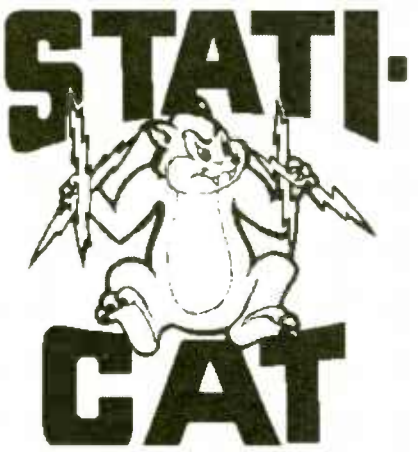

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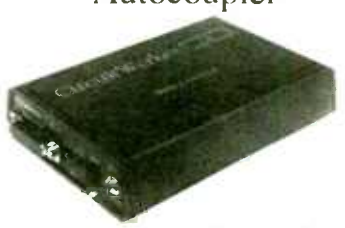

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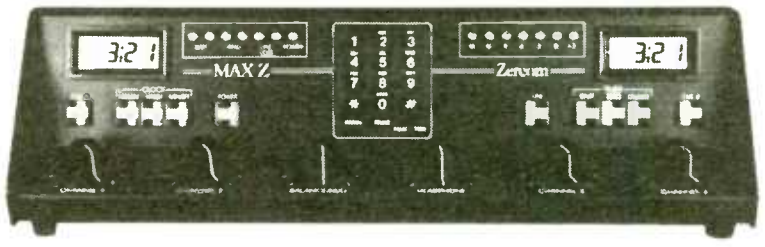

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World Radio History

Station Goes Local

▶ continued from page 42

duties, he still finds time to devote two hours to polka fans on Saturday, and five hours on Sunday. Both shows are sold out.

Naturally, competition can be dirty. WKZV co-exists in a market boasting two other AM/FM combos, and an AM standalone. "I tell my people, whatever (the competition is) saying about us negatively, we're not to do the same. That's sometimes hard for them to understand, but we're not going to play that game," said Panjuscek.

After touring the facility and receiving a hearty handshake from Panjuscek, it dawned on me that a lot of these small stations have so much pride and class. The Panjuscek operation is just one example of how even the most hard-to-sell radio stations can really shine if special attention is given to every detail, including profit potential — regardless of its size. WKZV is one of the few daytimers in this country that is truly doing well because of that philosophy.

If you have a success story of your own that you'd like to share, call or write me in care of RW.

□□□

Ken Hawk is an independent programming and economic consultant to the broadcasting industry, and is currently operations manager of WIFN(AM), Marine City, Mich. He may be reached at (810) 791-3757.

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Group Adds Stations

▶ continued from page 36

spread spectrum technology was not exactly broadcast equipment fare, he decided to go with it. "I happened to talk to a network system operator for one of the local banks here, and he said 'We have one of those,'" said Camp. It indicated to him just how far broadcast engineers have gone in respect to computerization.

He hired a local computer consulting firm to install the TTI InterBuilding Link, which beams the signal to the receiving site from a small Yagi antenna. The AudioVAULTs on either side continually sweep their respective hard disks for files to be transferred.

"AudioVAULT has software that basically scans the drives throughout our plants and decides which cuts go where, and if they're destined to go across the street, then it sends them over there.

And if they have something over there destined for here, then it is transmitted the same way," said Camp. The only problem: Because the InterBuilding Link operates at a 2 Mbps file transfer rate, files can line up quickly in the queue, like bumper-to-bumper traffic during rush hour.

The group's Novell LAN, by comparison, moves data at 10 Mbps, an optional file transfer speed available on the link for more money. "Certain times of the day, with as many radio stations as we have on the LAN, it can get pretty busy. But because we're basically using it (the bridge) to transfer commercials in other than real-time, 2 Mbps is fast enough," said Camp.

Nonetheless, when making cuts destined to go over the wireless bridge, production personnel have learned to allow at least 15 minutes lead time.

In the next few months, after the second floor of the Broadcast Drive facility is completed and, according to Camp, "we have 10 broadcast studios on one floor encircling a master control arena," the InterBuilding Link will have served its usefulness as a bridge and will be called on to serve a different function, that of repeater system.

The group will use the unit to control the AudioVAULT systems during remotes.

Capitol Broadcasting plans to continue making inroads into new digital and computer technology this coming year, with datacasting and RealAudio just a few of the projects planned.

□□□

Dee McVicker is a free-lance writer for the computer and broadcast industries. She can be reached at (602) 545-7363; or via e-mail at roots@primenet.com

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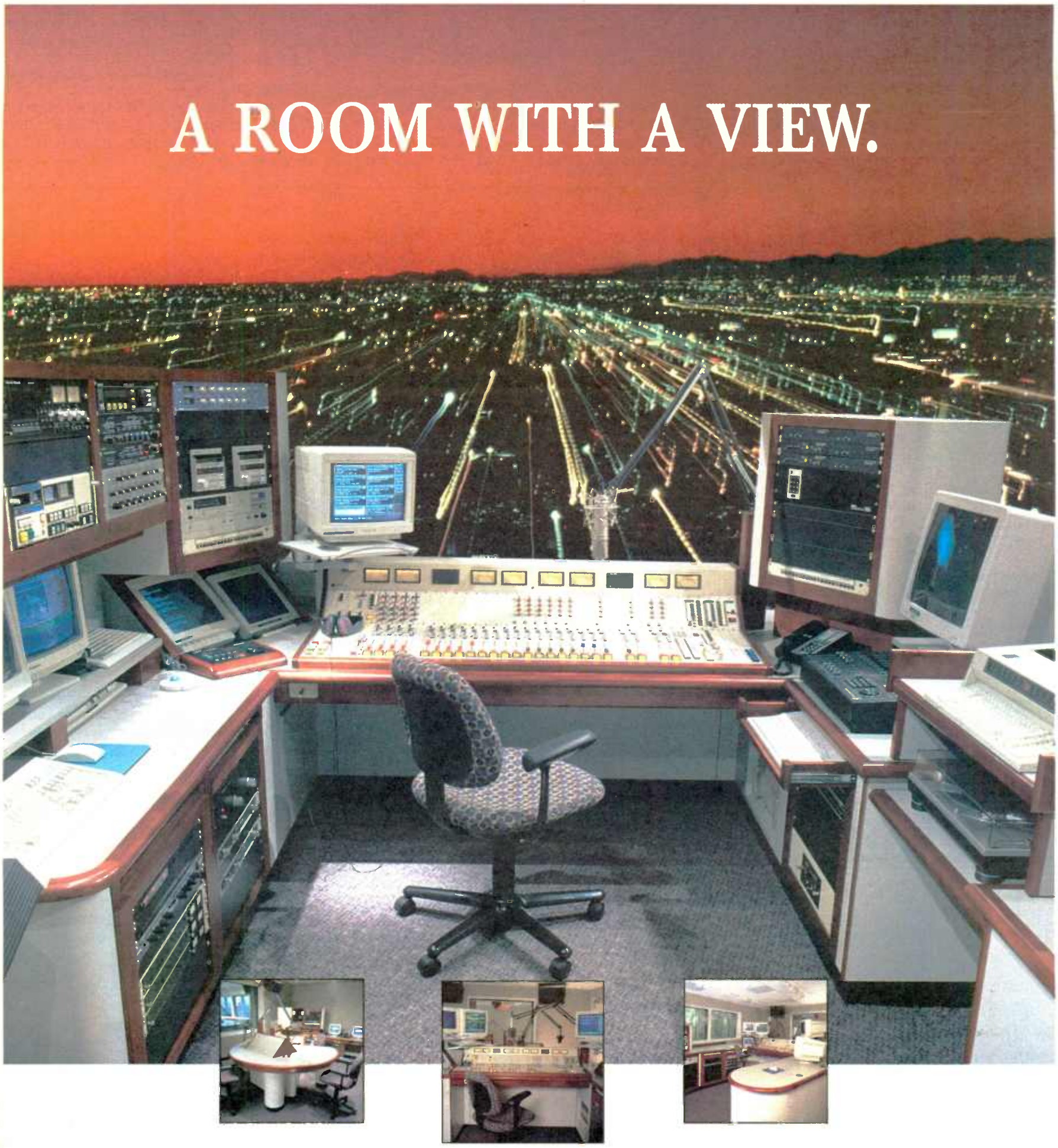

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World Radio History

Diplexing onto the Expanded Band

by Thomas R. McGinley

WASHINGTON WJDM, Elizabeth, N.J, America's first AM expanded band station, has been operating for almost seven months. The story of how this pioneering operation evolved has been well covered in the trade press, especially the allure of being heard by DX listeners around the globe in the absence of interference.

The station's original owner, John Quinn, has since sold the 10 kW 1660 kHz station to a children's programming group and is now enjoying the fruits of the sale while he continues to operate the original 1 kW daytimer at 1530 kHz.

The details of how this station was put on the air have not received much exposure however, except for the presentation offered by Charles Hecht, the station's consulting engineer at an NAB '96 engineering session.

Eighty-six other stations have been awarded expanded band channels in the FCC revised allotment plan released two months ago. Most of these stations are expected to implement the expanded band channel and will likely need to diplex on their existing tower.

Good science

Successful diplexing is of course based on good science, but some practical real-world compromises almost always have to be made to achieve good results without spending too much time and money.

Hecht shared with me many of the technical insights gained during the WJDM diplexing effort, which will in turn hopefully benefit other engineers assigned with the task of diplexing their stations as the expanded band begins to roll out.

The large majority of the candidate stations are in small to medium markets with limited financial resources to add expanded band operations. Costs must be carefully controlled and important compromises made. WJDM was no exception.

Hecht teamed up with Kurt Gorman of Phasetek in Quakertown, Pa., to devise a simple but effective diplexer and matching design for the 105-foot self-supporting tower.

Such a short tower (only 62.6 degrees at 1660 kHz) and only 130 kHz of spacing with the parent 1530 kHz channel, plus the requirement that both stations operate in stereo, presented an extra challenge to assuring decent bandwidth and efficiency, especially with both using new solid-state transmitters. Solid-state outputs have always been much more load-sensitive than the older tube-type transmitters.

Hecht first decided to replace an old, small-gauge, wire-folded unipole with a more mechanically stable installation using larger-gauge stranded aluminum wire. While using six drop wires was preferred, NEC modeling indicated only a 6 percent difference in efficiency when compared with the three-wire design, which was chosen at a significant cost savings.

Incidentally, unipoles using steel wire should be avoided due to the very measurable loss in efficiency.

The new skirt wires were positioned closer to the tower legs (22 versus 30 inches) to obtain lower driving point impedances and flatter reactance slopes for both channels.

Phasetek modeled the bandwidth performance and efficiency of various lengths of unipoles and different tap positions on the tower, finding that a full-length unipole connected only at the top provided the best compromise for both channels on this electrically short tower. The resulting base impedances were 32.5 + j255 at 1530 kHz and 155 + j402 at 1660 kHz.

Compromises had to be made with every facet of the design and the adjustment so that both channels would yield decent performance.

The diplexer/matching unit can be broken into three sections as shown in Figure 1. Moving backwards from the unipole common feedpoint, the first section is the variable series capacitor set of C6 and C7. This was adjusted to provide the flattest reactance slopes for both channels across each ± 10 kHz bandpass. Again a compromise had to be set, as improving the high channel would generally degrade the low channel. The middle sections of L4/C2, L5/C3 and L9/C5 plus L10 comprise the main bandpass/band-reject filters for each channel.

Each series/parallel section is designed and adjusted to obtain near-zero impedance for the pass channel (series resonance) and very high impedance for the reject channel (parallel resonance). The Q values are high, but not too high to penalize bandwidth of the pass channel. Similarly, they are not too low so as to penalize the required isolation of about 40 dB between the two channels at this point.

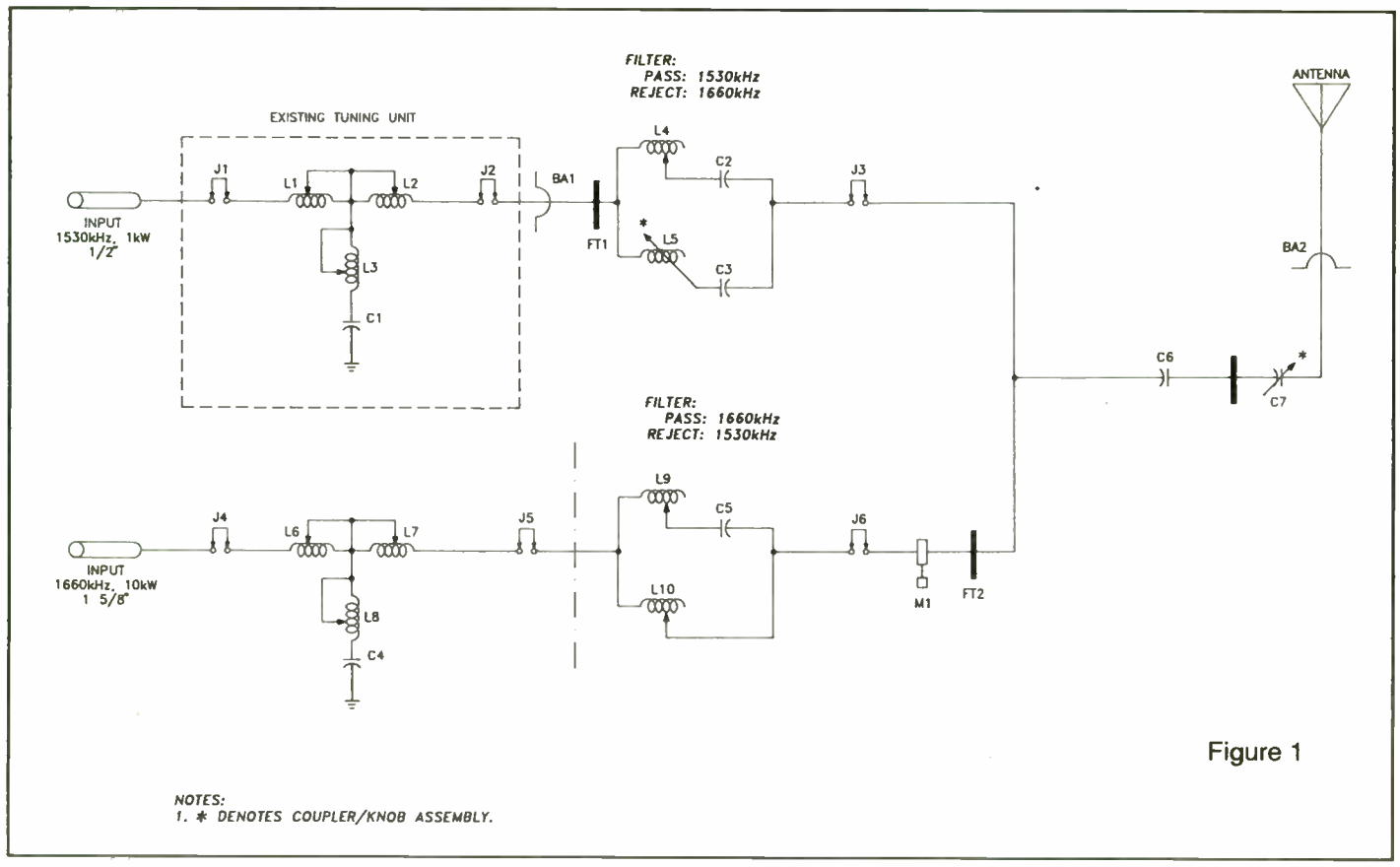

Figure 1

Adding phase shift

The front-end T-network of each side of the diplexer (L1, L2, L3, +C1 and L6, L7, L8, +C4) was designed to provide a match from the 50 + j0 transmission line to the input impedance of each pass/reject filter, and also to add a desired amount of phase shift to better position the impedance slopes for bandwidth symmetry across each channel's bandpass.

A third aspect of each T-net design included choosing a total reactance combination for the shunt leg that not only yielded the correct value for pass channel matching, but also a zero impedance value at the reject channel (series trap circuit) to increase the channel-to-channel isolation another 20 dB or so.

Phasetek computer modeling provided the target values for all reactance arm settings, but field trimming was necessary to fine-tune for optimum results. The 1530 kHz 1 kW BE transmitter was particularly fussy about reverse power and would shut down with VSWR trips with only a sniff of power from the 1660 kHz DX-10.

Hecht's preferred method for resonance and network adjustment employed the Delta OIB-3 impedance bridge, setting each reactance arm to its target design value and then fine-tuning the T-networks for minimum reflected power at each transmitter output.

One of the real-world constraints Hecht had to deal with was the very limited amount of space available in which to

continued on page 48 ▶

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World Radio History

Expanded Band Diplexing

▶ continued from page 46

had to deal with was the very limited amount of space available in which to construct the diplexer.

Practicality

This necessitated using the minimum number of components in the design while still achieving the desired performance goals of reasonably good bandwidth, stability and efficiency.

A better design was certainly possible, but not practical or easily realized without significantly higher costs.

Because of these space limitations, the system exhibited some arcing due to the high reactive voltages producing corona flares on the 10 kW filter components. The flash-over areas were located by observing the networks under full power and modulation with the lights turned off.

Vacuum capacitor C5 had to be replaced with a higher voltage rating and mounted on longer standoff insulators, plus the flat tapping strap of L9 had to be replaced by a tubing strap to inhibit the corona. This area of the diplexer also had to be vented to control heat buildup.

The due diligence of Hecht's design and performance included "stress testing" the system with the Harris DX-10 transmitter operating at 13.5 kW under full modulation during the experimental period. Everything tolerated the abuse just fine.

Diplexer input isolation from port to port measured better than 65 dB. The final bandwidth performance measurements produced the following data:

Frequency	Impedance	VSWR
1520	34 -j2	1.47:1
1530	50 -j3	1.06:1
1540	54 +j16	1.37:1
1650	53 -j9	1.20:1
1660	50 -j2	1.04:1
1670	44+j7	1:22:1

The final audio Proof of Performance measurements, sampled from the DX-10's modulation monitor tap, yielded very acceptable results. Frequency response was within 1 dB up to 12.5 kHz and THD of 0.54 percent to 1.1 percent between 50 Hz and 5 kHz in mono and 1.5 percent to 2.1 percent between 50 Hz and 5 kHz in stereo.

Separation exceeded 30 dB across the same response window. Admittedly, distortion started falling apart at 10 kHz and higher because of the filtering requirements of the diplexer.

Since the system's installation, everything has operated smoothly with no glitches or off-air outages, according to Hecht.

Hecht has also been an advisor to the installation and tune-up of KXBT, Vallejo, Calif.; the expanded band's second station at 1650 kHz with an 1190 kHz parent operation.

□□□

Tom McGinley is director of engineering at Washington-based WPGC-AM-FM and technical advisor to RW.

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Touch either of the two buttons at the top right of the main screen to see our "Wall of Carts" with all your audio ***on-line!*** Touch the sound, spot, jingle, promo, PSA or comedy you want and it plays ***instantly***. Or, you can put it anywhere you want in the day's schedule. Audio is displayed any five ways you like.

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When spots, promos, PSAs, or any other digital audio events are recorded, they're immediately playable in ***all*** your Scott System air studios. Nobody wastes time carrying carts down the hall or redubbing spots for additional stations.

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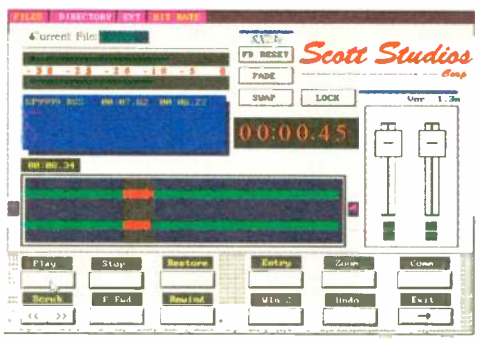

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World Radio History

HABERSPACE

Copter Live on Web

by Alan Haber

ALEXANDRIA, Va. Like a bolt of lightning from out of the cyber-blue, it's the trusty titans of the World Wide Web.

And now for something completely different: an example of how to effectively use a radio station Web site to promote a particular strength or achievement of the station.

In this case, the strength/achievement was pulse-pounding, on-the-spot reporting, and the station was KNX(AM) 1070 Newsradio in Los Angeles.

Imagine yourself up above, looking down on the action taking place below ...

It's March 25th. KNX's news anchor is serving up the latest temperature check, and segueing into something rather unnerving: "63 degrees in Hollywood," he says. "There's a freeway pursuit underway. Let's go live now to KNX chopper pilot Bob Tur in Chopper 1070. Bob?"

Tur picks up the action as it's speeding along. "Right now, it's in Beverly Hills," he begins, relating the as-they're-happening details: A stolen car is zipping along at speeds up to around 60 miles an hour, narrowly missing cars and pedestrians. The police are on his tail.

The object of the chase crosses the double-yellow line and is traveling on the other side of the road. People are trying to get out of the car's way. Quick-paced from the beginning of his on-the-scene report, Tur continues: "The suspect is pretty much just out of control at this point," he notes.

The speeding car turns right onto Santa Monica Boulevard. Los Angeles Police Department ground units are still on the car's tail. "He's being boxed in because of traffic," Tur tells his audience, his delivery charged. "Nowhere to go. But he's still moving; as traffic moves forward, the suspect moves as well."

LAPD vehicles come up alongside the car. The police get out of their cars and draw their guns. The police are trying to kick open the car's window. They pull the suspect out of the car through the window. They get him on the ground, and snap the handcuffs shut.

"The suspect is in custody right in front of the LAPD sheriff's station, or, excuse me, the L.A. county sheriff's station, here in West Hollywood," says Tur, his voice still racing. Tur is no stranger to chases, having covered O.J. Simpson's dash through the freeways of L.A.

Tur signs off. "Reporting live from Chopper 1070, Bob Tur," he says, his voice still energized. The anchor comes back, not missing a beat: "Breaking news, live here on KNX 1070 Newsradio."

That was the three-minute scene that transpired, broadcast live in living, breathtaking color. Twenty-seven-year-old Tur's report is featured in RealAudio format on KNX's terrific Web site http://www.gointeract.com/knx for all the world to hear. (You can jump directly to the report, Tur's bio and a photo of the Aerospatiale 350b jet helicopter he flies, by URLing over to http://www.gointeract.com/knx/tour/chopper.html)

I've talked before in this column about promoting your station's strengths and achievements within the pages of your Web site; never have I seen a more dramatic realization of this. Without a doubt, KNX's Web site — thanks to Tur's brave reporting — is July's Neat-O Site of the Month.

The fiercely dedicated Haberspace staff has found a whole lotta cool stuff this month — so much, in fact, that most of it's gonna have to wait until next time. (That's what the 'Spacers get for being busy, busy cyber-beavers!)

So ... here's some of the 'Spacers' current catch (I let my staff take the spotlight this month): They checked in at Los Angeles adult contemporary station K-BIG 104's home on the Web (http://www.kbig104.com — a nice, short, easy-to-remember and type address). A beauty of a home page, said our intern Fuzz (got him from the garment district, naturally). Spiffy graphics (that load quickly, by the way) set against the Haberspace staff's background of choice: white.

Here's what's on parade: Links to the station's Joke o'de Day contest, up-to-the-minute traffic reports, show biz news, contest info and pix and bios of the air staff (and rundowns on the station's special programs). What more could you want?

The 'Spacers also found themselves at "Paul's Place," run by Paul Bishop. One of the Place's pages collects links to 24 radio stations from coast to coast (in the form of colorful station logos) and three radio resources, all presented in the

continued on page 50 ▶

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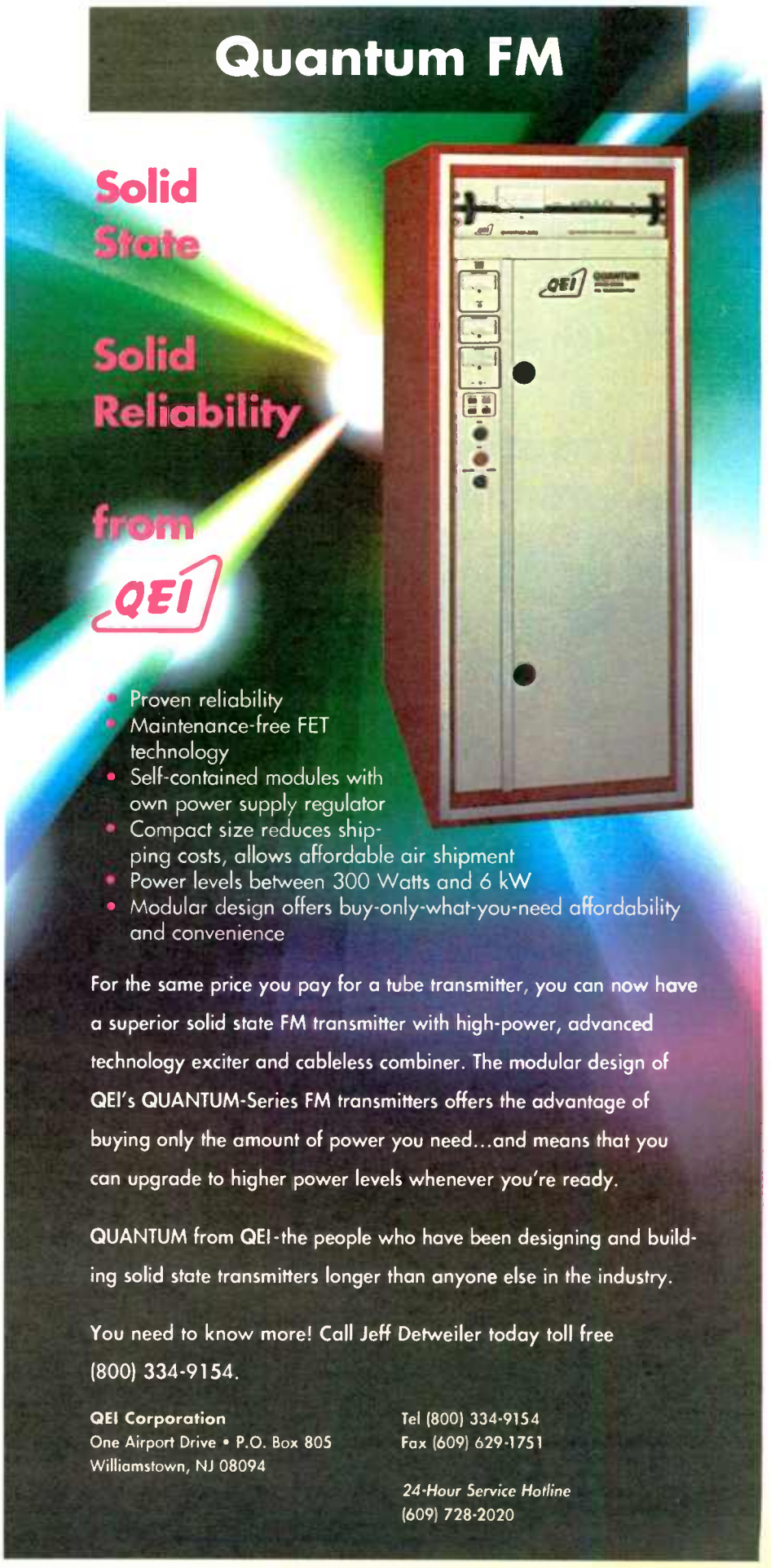

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World Radio History

Station Broadcasts Live News on the Web

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increasingly popular "tables" format.

Bishop does a nice job here at http://www.pacificrim.net/~pbishop/radio.html, says the only real surfer on the 'Spacer staff, Waxy Board. (We don't know his real name, and, by the looks of him, we probably don't want to.)

Our blues specialist, Annie O'Blue (so-called because she's always crying the blues on payday), dug the playlists (that go back to, like, January, man) on display at the site for Beef Stew's "The Blues Playground" show, heard Sunday nights on WCCC-FM in Hartford, Conn. (find the site at http://www.neca.com/~bfstew/program.htm).

The playlists include the songs played and the albums they come from, artist names and the labels that put the good stuff on the market! O' says this makes her wanna hear Beef's show. Beef (a.k.a. Stew Crossen), by the way, e-mailed us to say that he enjoys Haberspace. We can dig that, Beef baby!

Coming next time

Well, nice job, 'Spacers! Next month, however, I'll be in the driver's seat (after all, it is my seat)! I'll be bringing you the lowdown on sites operated by San Luis Obispo, Calif., contemporary Christian Music station KLFF(FM), and by KSLU(FM) in Hammond, La., which serves up "a gumbo of entertainment, mixed with news and spicy music." I can almost smell the crawfish cookin'! I'll also bring about the triumphant return of the Net-O Live Broadcaster Site of the Month!

'Til next time, keep those e-mails coming about your station's Web site and 'net activities — especially your plans to broadcast live on the Web! You can catch me at zoogang@earthlink.net.

And now, like a bolt of lightning ... see ya!

Berlin Tries Talk Radio

▶ continued from page 35

as the station's "Polish washerwoman" rather than the charming Viennese hostess with cosmopolitan flair NewsTalk promoted Krystin as.

"She brought us publicity we could do without," Laufer said.

The programming low point appears to be the weekend. The handyman talk show "Do It Yourself" was the repeated victim of radio satire by competing stations. "If you don't know how to pound a nail into the wall, call me at ... um ... what was that number again?" These and similar humiliations finally ended and host Claudio Bamberg had to go too.

The once-popular Berlin TV host Marianne Behland has been on "sick leave" since the station began broadcasting; perhaps she wanted to watch her new employer from a safe distance first. Her contract now has been terminated by mutual consent.

Media scene fears

Before it went on-air in February, there were fears in the Berlin media scene that NewsTalk 93,6 could turn into Germany's first hate radio. One of the founding partners, the Ufa group, which is owned by Bertelsmann, pulled out of the project before the station opened. The concern was, according to Ufa Managing Director Hans-Roland Fäßler, that the station would be an anti-immigrant or a "Germany, shut up" station.

Nothing of the sort is evident so far. In fact, NewsTalk 93,6 tends rather to fall into the opposite problem — banality.

"I cannot believe no one out there has an opinion on this," is one of the station's stock phrases. But if nobody is interested in expressing themselves on the latest riots by Kurds in Germany, they just talk about the weather, an issue that consumes up to 20 percent of some programs.

To entice listeners to the telephone, even the most trivial issues are turned into controversies. Even decisions like to smoke or not to smoke become sectarian. The result is a rather irrational excitement on the part of the host and yawning boredom on the part of the listeners. And all the while the telephone is silent.

Despite its name, "NewsTalk," the competence of the station in delivering news is rather mediocre.

World news, bought from a network news company in the same building, is broadcast on the hour. Regional news, produced in-house with modest resources, is broadcast once or twice an hour. Live events in the Berlin metropolitan area of 3.5 million people are reported by cellular phone at best. Usually, the editors settle for a dry reading of a wire service report. According to current plans, the station will not have an outside broadcasting van until later, once the money starts coming in.

Expansion course

Nevertheless, NewsTalk is on an expansion course.

Since mid-May, a night program was added "for all the lonely hearts of this city," said Laufer. Before that, the morning shows were rebroadcast after 23:00.

It is impossible to predict whether this and other moves will actually profit for the station. So far, there have been only qualitative surveys gauging the response of Berliners to the station. The first data on the actual number of listeners per hour will not be available for a few months.

It will probably be mid-1997, when Media Analyse, the bible of the German advertising industry, publishes new data on audience size, before the station begins to make some serious money. Until these data are available, NewsTalk will have a hard time attracting sufficient advertising. This has been the experience of other specialized programs in Berlin in the past.

To counter this argument, Managing Director Jörg Filla insists that NewsTalk 93,6 is particularly effective as an advertising medium because advertising spots are perceived as less disturbing in a news/talk format than on music stations.

Whether or not that is actually true remains to be proven by the German market.

□□□

Florian Grolman is a free-lance radio and print journalist in Berlin. Contact him via e-mail at anton@zedat.fu-berlin.de

NewsTalk 93,6 is accessible via the World Wide Web at http://www.newstalk.de/

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World Radio History

Tower Tips from the Experts

by Troy Conner

BRASSTOWN, N.C. "Why am I here?" I thought vaguely.

This was not some comfortable, philosophical "What is the meaning of life? Why am I here?" question, but a more realistic "What in hell am I doing here?"

"Here" was the side of a massive transmission tower some 1,300 feet above the Houston skyline, thoroughly slathered in grease, standing with another man on a three-foot square platform suspended by a finger-sized wire.

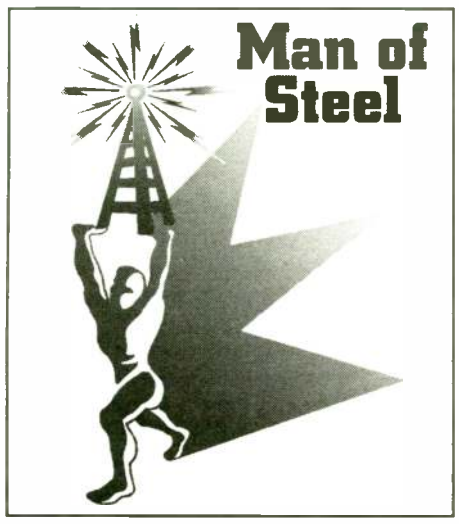
Daunting and disgusting

The block we hung from had been fitted onto one of the nearly two-inch diameter top guy cables. We boarded the platform at the guy anchor and, as always, it had been an exhilarating, high-speed magic carpet ride to the top of the tower.

On a rope around my neck I wore a two-way radio, which had been carefully taped up inside a plastic bag. With a yell into the radio, we began our slow, agonizing descent.

The task ahead of us was daunting — disgusting in fact. In order to slow corrosion of the guy cables, we had to ride each wire and manually apply a coat of NO-OX-ID, "A Special" grease to 45,060 feet (eight and a half miles) of cable.

By the time we finished, we had used more than 500 gallons of the stuff. The "A Special" grease is a wax-based



byproduct of paraffin production.

It has the vilest viscosity and a consistency like the stickiest axle grease. Scooping with bare hands into one of the five gallon buckets also occupying our platform, one man shoveled grease while the other smoothed it onto the wire.

Two hours later, we reached the guy anchor and our waiting ground man. By then, we were both so slick with grease that one slip left both of us hanging by our safety lanyards. All we could do was dangle there, laughing uncontrollably because neither of us could even stand and re-board the platform.

Caring for cable

Looking back, I have to wonder about the effectiveness of after-market guy cable treatments as corrosion inhibitors. There are basically two schools of thought with regard to galvanized steel guy cable care.

Some engineers feel that any type of treatment of aging guy wires is a prudent preventative measure given the replacement cost of a set of guy cables. Engineers on the other side of this issue feel that the chemically self-sacrificial nature of the zinc in the galvanizing makes cable treatments unnecessary.

The latter group also feels that any cable treatment could possibly trap moisture and thereby create a potential problem where none might otherwise exist.

Most manufacturers and engineers alike agree that spot treatment of rusted areas with cold-galvanizing is appropriate to restore the lost zinc.

The most critical factors involved in guy cable life are environmental. A tower subject to severe environmental conditions like those found in an industrial or coastal location or an area subject to acidic rain can reduce the effective life-span of a cable by half. Any drop in pH greatly accelerates the sacrifice of zinc in the galvanizing.

Bob McCrossen of Florida Wire Rope and Cable estimated the effective life span of a galvanized steel cable at between six and 15 years depending on its location.

Keep in mind that many of the transmission structures standing today are between 30 and 40 years old. This is particularly true with older AM stations. It is this group of tower owners who should rightly be concerned with the structural integrity of their guy cables.

Termination hardware

Actually, the termination hardware of guy cables is far more likely to fail than the cables themselves. By nature, almost all types of termination hardware reduce the effective breaking strength of the cable.

For example, wire rope clips will hold approximately 80 to 90 percent of the wire rope strength if properly applied.

On the other hand, improperly applied, they may only develop 40 percent of the cable strength. Swaged or socketed terminations are indeed stronger but are somewhat unusual in structures shorter than about 400-500 feet and they do not allow internal inspection of the cable.

Typically, small towers have more guy-related problems than larger structures. This can probably be attributed to several

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Spectrum Analysis

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types of internal noise: thermal (or Johnson) and nonthermal noise.

Thermal noise power can be expressed as: Pn = k x T x B
where:
Pn = noise power in watts
k = Boltzmann's Constant (1.38 x 10-23 Joule/K)
T = absolute temperature in Kelvin
B = bandwidth of system in Hertz

As seen from the equation, the noise level is directly proportional to bandwidth. Therefore, a decade decrease in bandwidth results in a 10 dB decrease in noise level and consequently 10 dB better sensitivity.

Nonthermal noise accounts for all noise produced within the analyzer that is not temperature-dependent. Spurious emissions due to nonlinearities of active elements, impedance mismatch, etc., are sources of nonthermal noise.

A figure of merit, or noise figure, is usually assigned to this nonthermal noise which, when added to the thermal noise, gives the total noise of the analyzer system.

This system noise that is measured on the CRT determines the maximum sensitivity of the spectrum analyzer. Because noise level changes with bandwidth, it is important to weigh sensitivity specifications for equal bandwidths when comparing two analyzers.

A spectrum analyzer sweeps over a wide frequency range, but is really a narrowband instrument. All of the signals that appear in the frequency range of the analyzer are converted to a single IF frequency that must pass through an IF filter; the detector sees only this noise at any time.

Therefore, the noise displayed on the analyzer is only that which is contained in the IF passband. When measuring discrete signals, maximum sensitivity is obtained by using the narrowest IF bandwidth.

Video filtering

Measuring small signals can be difficult when they are approximately the same amplitude as the average internal noise level of the analyzer. To facilitate the measurement, it is best to use video filtering.

A video filter is a post-detection low-pass filter (LPF) that averages the internal noise of the analyzer. When the noise is averaged, the input signal may be seen.

Due to its video bandwidth limiting property, the video filter should not be selected if the resolution bandwidth is very narrow for the span. Doing so would prevent the amplitude of the analyzed signal to reach full amplitude.

Analyzer sensitivity

Specifying sensitivity on a spectrum analyzer is somewhat arbitrary. One way of specifying sensitivity is to define it as the signal level when signal power equals average noise power.

The analyzer always measures signal plus noise. Therefore, when the input signal is equal to the internal noise level, the signal will appear 3 dB above the noise.

When the signal power is added to the average noise power, the power level on the CRT is doubled (increased by 3 dB) because the signal power equals average noise power.

The maximum input level to the spectrum analyzer is the damage level or burn-out level of the input circuit. Before reaching the damage level of the analyzer, the analyzer will begin to gain-compress the input signal.

This gain compression is not

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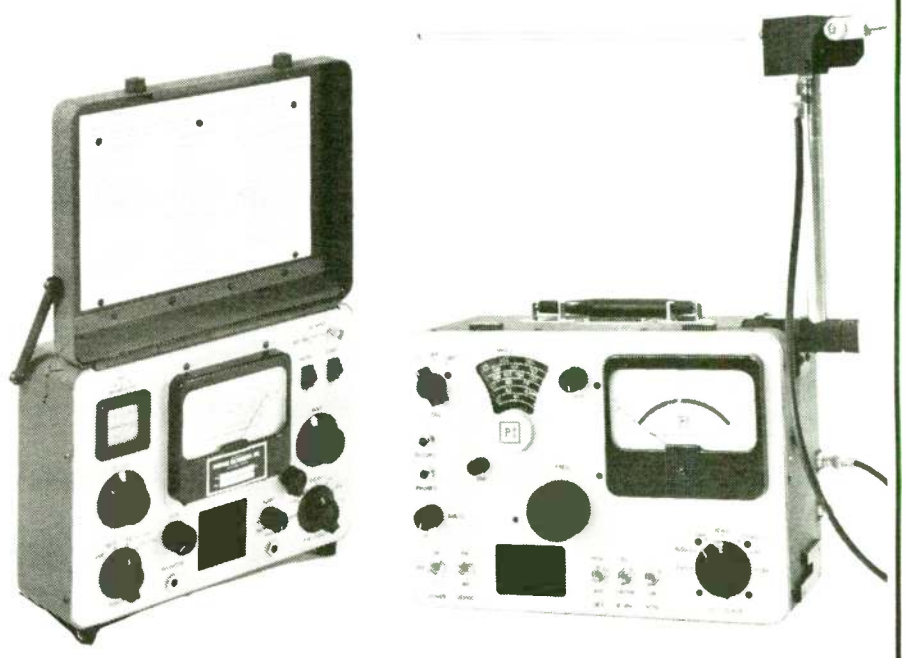

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World Radio History

Expert Tower Tips

▶ continued from page 51

by Troy Conner

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By the time we finished, we had used more than 500 gallons of the stuff. The "A Special" grease is a wax-based byproduct of paraffin production.

It has the vilest viscosity and a consistency like the stickiest axle grease. Scooping with bare hands into one of the five gallon buckets also occupying our platform, one man shoveled grease while the other smoothed it onto the wire.

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Caring for cable

Looking back, I have to wonder about the effectiveness of after-market guy cable treatments as corrosion inhibitors. There are basically two schools of thought with regard to galvanized steel guy cable care.

Some engineers feel that any type of

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Electrical Noise Problems

▶ continued from page 25

from every direction, you may have to resort to Plan B. This requires a VHF receiver, such as a portable scanner that works on aircraft frequencies (and thus has an AM detector) and a hand-held yagi antenna. I use a five-element hand-held yagi I made out of piano wire and a broom handle. Because the power contained in a broadband noise source decreases with frequency, by DFing the noise at a higher frequency (above 108 MHz), its source may be much easier to locate. Again, take two bearings, triangulate and repeat until you locate the source.

Should your search lead you to another house or building, you will have to (diplomatically) enlist the assistance of the owner or tenant in repeating the "circuit-breaker test" in that location.

It could be that the noise source has been tearing up the owner's TV or radio reception as well as that of the rest of the neighborhood and he or she would be willing to replace the device. On the other hand, if the owner is not having problems and doesn't feel very neighborly, you may have to resort to a commercial AC-line filter or replacing the device at the station's (or other listener's) expense.

Should you find that a power line is at fault, call the utility repair people responsible for that area. They will have on-staff people skilled at tracking and dealing with such problems. Usually, if you can isolate the problem to one or two city blocks, they can take it from there. A cracked or broken insulator, loose splice, faulty wire-tie or loose hardware can cause such problems.

Whatever the case, let the utility people handle the problem. If they are uncooperative, you should then (and only then) enlist the help of the nearest FCC field office. Chances are, they can get the utility company off the dime with a phone call.

Radio station general managers shouldn't expect their engineers to spend a lot of time running around town tracking down electrical noise problems. That simply is not our job. From time to time, however, it may pay big dividends to clear up a certain problem — especially the one in the general manager's neighborhood or the one around a big client's business. (After all, would you buy airtime on a station you couldn't hear clearly?)

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Cris Alexander is director of engineering for Crawford Broadcasting in Dallas. He can be reached at (214) 445-1713 or by e-mail at 76440@compuserve.com

World Radio History

Analyzer Performs Various Tasks

▶ continued from page 51

considered serious until it reaches 1 dB. The maximum input signal level, which will always result in less than 1 dB gain compression, is called the linear input level.

Frequency response

The frequency response of an analyzer is the amplitude linearity of the analyzer over its frequency range.

For a spectrum analyzer to display equal amplitudes for input signals of equal amplitude — independent of frequency — the conversion (power) loss of the input mixer must not depend on frequency.

If the voltage from the local oscillator is too large compared to the input signal voltage, the conversion loss of the input mixer is frequency-dependent, and the frequency response of the system is nonlinear.

For accurate amplitude measurements, a spectrum analyzer should be as flat as possible over its frequency range.

Flatness is usually the limiting factor in amplitude accuracy as it is extremely difficult to calibrate out.

And, because the primary function of the spectrum analyzer is to compare signal levels at different frequencies, a lack of flatness can seriously limit its usefulness.

The tracking generator is a special signal source whose RF output follows (or frequency-tracks) some other signal beyond the tracking generator itself.

In conjunction with the spectrum analyzer, the tracking generator produces a signal whose frequency precisely tracks the spectrum analyzer tuning.

The tracking generator frequency precisely tracks the spectrum analyzer tuning. This precision tracking exists in all analyzer scan modes.

The noise displayed on the analyzer is only that which is contained in the IF passband.

Thus, in full scan mode, the tracking generator output is a start-stop sweep. In zero scan mode, the output is simply a CW signal.

Two configurations

The spectrum analyzer/tracking generator system is used in two configurations: open-loop and closed-loop. In the open-loop configuration, unknown external signals are connected to the spectrum analyzer input and the tracking generator output is connected to a counter.

This configuration is used for making selective and sensitive precise measurement of frequency by tuning to the signal and switching to zero scan.

In the closed-loop configuration, the tracking generator signal is fed into the device under test and the output of the device under test is connected to the analyzer input.

This way, the spectrum analyzer/tracking generator becomes a self-contained, complete swept-frequency measurement system with source, detector and display.

Please refer to the figure in last month's column to see how the tracking generator interfaces with the spectrum analyzer.

Because of the precise nature of spectrum analysis, these devices are expensive, precision test instruments.

There are situations when no other piece of test equipment will show you what the spectrum analyzer can. Becoming familiar with spectrum analysis can be valuable preparation for the time when you must analyze signals in the frequency domain.

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Jim Somich is a radio broadcast engineering consultant and president of MicroCon Systems Ltd., a manufacturer of broadcast equipment. He can be reached by e-mail at jimsomich@aol.com

62 Years Ago

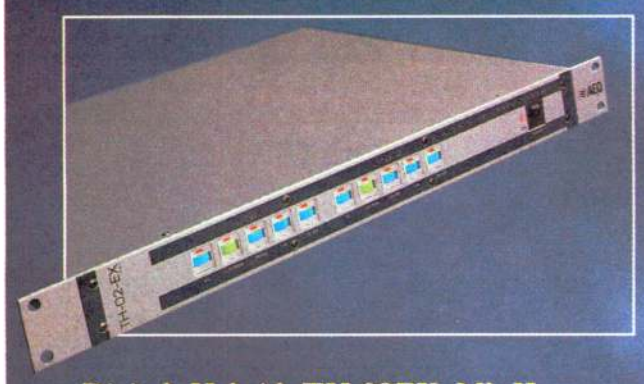
Reprinted from Radio World June 23, 1934.
Editor's note: The RW of old, printed for a time in the 1920s and 1930s, and today's RW are unrelated except in name.

A THOUGHT FOR THE WEEK

THE NEW NRA DEVELOPMENTS regarding price-fixing, etc., are interesting in themselves as well as in their probable effect on the various markets affected. But has it ever occurred to you that price-fixing, discounts, cost sheets and all the varied paraphernalia that go toward arriving at money conclusions do not have anything to do with the desire to listen in on programs? When all is said and done, all the technical, marketing and financial problems in radio are reduced to the question of whether folks still have ears that function, and intelligence that enables them to listen to symphonies or to jazz with discrimination and understanding. Remove the urge to listen to programs and whatever is left doesn't amount to a hill of beans so far as radio fans are concerned. That is to say, the essential of the whole problem of radio is whether our millions of listeners-in continue to want to turn the dials in preference to indulging in any other entertainment activities.

And all that's smack up to the interest and value of the programs presented.

AEQ Digital Hybrids show the way to lead



Digital Hybrid TH-02EX Mk-II

- Frequency Extensor included as standard.
- Works with one or two telephone lines.
- Second line provides true multiconference. Simultaneous speech between operator and two listeners.
- 60 dBs hybrid null.
- No previous re-alignment required.
- Ideal companion for remote connections with the Portable Mixer-Extender **TLE-02**.

Frequency Extender TLE-02

- On Air phone call with audio presence, depth and clarity of voice. No "telephone sound".
- Designed for non-technical users. Ideal for field reporters.
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- Independent level control of Mic/Line input, auxiliary input and headphones.

Portable Mixer PME-02

- Three independent Mic/Line switchable inputs (XLR connector) electronically balanced and one unbalanced input (mini-jack) for line level portable stereo tape recorder.
- Independent input level control.
- Electronically balanced output (XLR connector) and follow up output(mini-jack).
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Circle (167) On Reader Service Card

World Radio History

USER REPORT

KFAN-KEEY Digitizes With RCS

by Richard Gerlovich
Chief Engineer
KFAN(AM)-KEEY(FM)

KEEY Announcer Pete Stevens is on the air using the Radio Computing Services Digital Studio.

MINNEAPOLIS In November of 1994, the RCS Digital Studio became the heart of New Country KEEY(FM) and Sports Radio KFAN(AM). Linked with Selector, the RCS music scheduler software and the Columbine traffic system, the RCS Master Control provides a completely digital on-air music and commercial system for our stations.

Along with the above, we use the Cartwall Editor. This is a basic two-track editor that integrates with the above programs and produces a virtual cart on a virtual cart wall. It has some useful features like time compression to shorten commercials and additional features found on most digital editors.

Features and flexibility

For multitracking, we have the RCS Prosonix. We use the RCS Newslink software to gather and distribute news and sports information to the appropriate studios. The system has the most features and is the most flexible one I have found so far.

We have a seven-studio complex, each with a 486dx66 computer with 8MB of RAM and a small hard drive. These computers house the necessary programs and manipulate the audio. The MC program used in the KEEY studio requires a log editing computer and an audio computer. These programs are DOS-based and do not require a "hotrod" computer system to run.

The studios are hooked up with a Novell 3.12 network and the file server has an external 9GB mirrored hard drive system that stores the music and spots for both stations. Our computers are all located in a separate room and the peripherals (keyboard, mouse, monitor) are extended to each studio.

The RCS system can be accessed from any computer on our studio or office network with the correct password and path. I often load and upgrade software, perform maintenance and trouble shoot from my office, which is away from the hustle and bustle of high-energy studios associated with these formats.

The RCS system will integrate with most scheduling software — we use Selector. Columbine integrates fully with the system and both Selector and Columbine channel through another RCS program called Linker and then load into both on-air studios.

For KFAN, we use the text version of the MC — the simplest form of the software. We mostly play commercials, promos, sound bites and news recorded automatically in the background earlier and placed in a virtual cart. This version displays the log as it would look on paper, a jingle bank and three virtual carts that are loaded and cued automatically. All of this fits comfortably on a 14-inch monitor.

The system provides a log of commercials and the times they played as well as the ones that were missed. It also allows the producer to swap, replace, add and delete events at the discretion of the program director who, establishes the programming parameters to be applied to each of the dayparts. This feature provides flexibility for the producer while insuring consistency of the overall programming.

This system is not without its faults — it does have a tendency to lock, requiring a cold boot-up. The procedure takes about 60 seconds to get back to where it stopped. We have a 60-second "FANfare" analog promo cart to play if this happens. But in our usual sold-out situation, it can be hard to make good on that missed commercial.

In the KEEY studio, we use the full graphics version of MC. This system has a separate log-editing computer that displays the log and allows the board operator to manipulate the music and spots to fit their show again within the programming parameters established by the PD. The PD can lock out any event manipulation options for any particular time of the day. Also on the screen is a time bar that moves across the monitor and shows post time, then remain time and then turns red when it approaches the end of the event.

Rapid fire

The Log Editor then performs two tasks. First, it loads the audio computer's virtual carts with the next events and, second, displays text (i.e., PSAs, artist information, promotional liners) on a separate monitor. The audio computer cues up two events to play and displays the jingle bank. On both MC systems, an operator can use a rapid-fire keypad to start events and fire jingles.

This MC version has the same problem of occasionally locking up. Usually just the Log Editor locks, leaving the audio computer to play the two events still cued up. This gives the operator time to cold-boot the computer and get back on-line before any dead air. We usually have a couple of CDs cued up in case the audio computer locks.

The production studios use the Cartwall Editor, which has the usual features expected on a good two-track editor. The user can pull a cart off the cart wall, open it, add and edit the audio. When you are finished, you type a cart label as you would for an analog cart and place it in the Cartwall. This cart is immediately available in all rooms.

Newslink is also available in all the studios. It is housed on a separate computer in the on-air studios because the MC computers cannot be interrupted to look up news. Newslink is an efficient way to gather news in one location. The user can edit and print stories from any studio or workstation.

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WAOA Jumps to 20th Century

by Jon Roberts
Engineering Director
WAOA(FM)

MELBOURNE, Fla. When our 1970s' control room equipment finally died last year, we made the decision to bring all of our equipment into the 20th century.

Imagine the sound our 100 kW station could produce if we did not play music and commercials from carts. And imagine the time the jocks could actually devote to their on-air presentation if they did not have to worry about pulling music, commercials, jingles, etc. from hour to hour. The move to the paperless studio was started.

Final decision

There were certain features that we knew we wanted our new system to have. It had to be networkable, remotable, satellite capable, RDS ready and, most importantly, easy to operate. After evaluating many different systems, we finally decided on the Ultimate Digital Studio II from **T.M. Century**.

The UDS II could provide all of the features we demanded and more, especially in the "easy to operate" department. The learning curve for the jocks was pretty much as simple as finding the Advance To Next Event button — much easier than learning the operation of a new control board.

Although equipment configurations can vary from station to station, our installation included a standard 486 computer with modem, network interface, a T.M. Century-supplied RS 422 board and printer. Also part of the setup were a Sony CDK-3600 jukebox, a digital audio storage system and an audio switcher. I would recommend using a UPS of suitable rating to handle all of the elements of the system.

Installation was straightforward. There was even a pictorial diagram in the UDS II book that showed the exact placement of each interconnecting cable. The only problem I encountered during installation was the audio levels being very hot coming from the jukebox (+26 dB). I built an audio pad (-20 dB) to bring the audio levels within a controllable range.

There is an adjustment on the audio switcher input, but the range was not sufficient to compensate for the very hot levels from the jukebox. The audio pads were small enough to hide in the XLR connectors at the jukebox.

The unique function of the UDS II is its ability to combine your music scheduling and traffic software into one log that becomes your editable on-air log. UDS II

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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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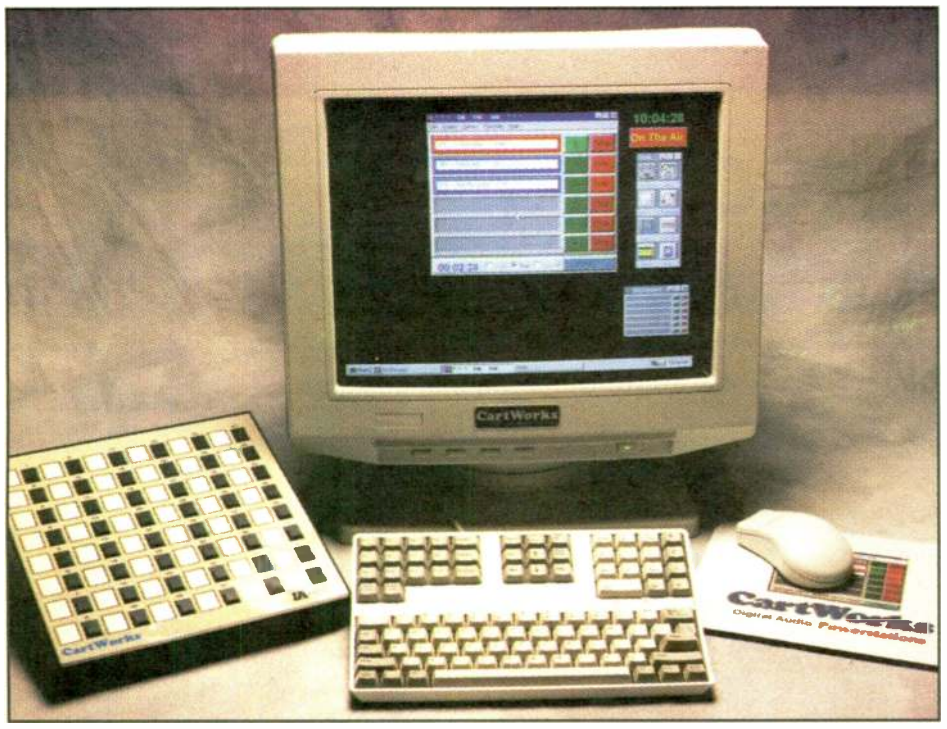
World Radio History

USER REPORT

CartWorks Eases Labor Pains

by Chris Bailey
Production Director
WJDX(FM)

JACKSON, Miss. I have been working in radio for 24 years, the last four having been with SFX Broadcasting in Jackson, Miss., at WJDX(FM). We were the "typical" AC station, playing our music from CDs and playing spots from cart tapes. Three years ago a great change took place. I was introduced to CartWorks from **dbm Systems**, and what a change it was.



CartWorks has simplified work at SFX's Jackson, Miss., operations.

CartWorks is the most unique digital audio system I have seen. It is easy to use, and I would have to say the Windows 95-based system looks and acts almost exactly like a six-deck cart machine with a lot of neat extras.

Perform necessary functions

SFX has five radio stations in Jackson. The first one to install CartWorks was our sports station, WJDS(AM). It is fully automated 24 hours a day, except for local and statewide live sports. CartWorks performs all the functions necessary to integrate Prime Sports radio Network with ABC News, ESPN Radio and the local state network (also using CartWorks at its uplink facilities).

For live sporting events where automation is not desired, CartWorks allows us to temporarily pause the regular programmed automation mode, enabling us to operate manually. When the event is complete, CartWorks automatically synchronizes itself at the click of a button so normal programming resumes at the correct position.

In addition to the normal spots, liners, promos and IDs, feature-length programs are also produced and played with the CartWorks system.

The other four stations are full-time live, with the exception of WKTF(FM), which carries "After Midnight" and various weekend satellite shows. The CartWorks unit in this control room automates these satellite feeds and operates in live-assist mode the rest of the time.

The WJDX CartWorks unit operates full-time live assist, as do the units at WSTZ(FM) and WMSI(FM). WMSI has an additional CartWorks unit that is used by the morning crew. Phone calls, comedy bits, sound effects, drops, etc. are played from this unit.

All the control room units take advantage of a feature that was originally intended for satellite automation: the On-Demand deck. This is a mini six-deck window that holds most of the jingles, liners, etc. The decks are programmed to change the carts (audio files) loaded in them at each shift change so each jock has the ones he needs available. We added six push-buttons to the audio console that will fire each of these individually. The On-Demand deck is just one of the nice standard features in CartWorks.

The standard Instant Access window takes it a step further. Forty-eight individual carts can be loaded into it and played directly. There is no limit to the number of groups that can be preprogrammed for Instant Access. WSTZ recently added the optional 48-button box for Instant Access so these carts can be played without even being visible on screen. This keeps screen clutter to a minimum and eliminates confusion. We will be adding this to the other control rooms shortly.

Optional network

Of course we have CartWorks units in each of our three production rooms. All spots are dubbed into these units and then a copy is transferred to the appropriate control room via the peer-to-peer Windows network that all our units are connected to via RG58 coax. That is all except WSTZ, which is located in another part of town. We use the optional dial-up networking to exchange spots with this station via normal phone lines.

A spot has to be dubbed only once. The network makes sending a copy to another station a breeze. The best thing is that we do not have to bother with carts anymore. CartWorks is an ideal replacement for carts and many reel-to-reel tape functions. Some of the features I like are spot rotation, displaying of live tags and end cues, CD quality audio and direct access to liners, IDs, bits and jingles.

If, for some unforeseen reason, the hard drive in one room crashes, we have a complete backup of all audio in the other rooms. Although we have never experienced a failure, if we did, we would simply place a production-room system in the control room and be back making money in a matter of minutes.

Instant adjustment

With five stations, you can imagine that we go through quite a few part-timers. How do they adjust to CartWorks? Instantly.

It only takes a few minutes to explain how to use the system because it is so much like what they are already familiar with ... carts.

There is so much more I could say about the CartWorks system, but there is not enough room for it all. I would like to mention Windows 95. There are lots of powerful features built in that help us out. We use the Pop-up Messaging often to share traffic and weather information between control rooms. One jock can type in the information and then send the message to all others.

To sum it up, CartWorks is easy to use and flexible enough to accommodate most any task you could put to it.

You will quickly learn how to operate it and will not need a computer scientist to do it. Once you have used CartWorks, you will never want to be without it.

For more information from dbm Systems, contact Bob Buie in Mississippi at (800) 795-7234; or circle ***Reader Service 11****.*

Circle (31) On Reader Service Card

World Radio History

USER REPORT

Columbine Avoids Traffic Jams

by David Stewart
Head Engineer
KBNA-AM-FM

EL PASO, Texas KBNA-AM-FM duopolized with the purchase of KAMA(AM) and wanted to improve efficiency with shared staff. After experimentation with format, the decision was made to automate some dayparts on KAMA. This meant replacing tape with digital storage.

After lots of study, talking to users, reading books, seeing shows and talking to sister stations with other automation systems, KBNA/KAMA bought AudioVault from Broadcast Electronics. We finalized the order after a bid process yielded a feature-for-feature comparison.

The reasoning

Among our reasons: BE had successfully re-invented itself for decades with products for the times. It had done NAB carts and machines, cart-based automation, audio consoles, transmitters and exciters. We thought BE would survive the industry shake-out to support our purchase. The company has a reputation for product support and customer assistance, and the delivered price was attractive.

AudioVault puts its smarts on the audio card with a SCSI controller. Windows for Workgroups provides the network and user interface. The PC serves a database function by keeping track of audio and a control function by doing the job of many different switches.

We equipped the KBNA and KAMA control rooms, two production rooms, and a dedicated server. BE calls this an On-line system. The server backs up the air and production computers files. This puts audio on three different hard drives in three different rooms. Production can take the place of the control room in a few minutes.

We have recorded all of the KAMA music and spots onto AV. We have used linear digital from CDs as well as MPEG compression at various ratios, and have noticed no tandem coding problems, even though some spots come in coded Musicam 6:1 and apt-X 4:1.

KBNA had **Columbine JDS** traffic and billing which was expanded to include KAMA and to add Automation Interface AI software.

The Columbine AI allows the translation of the traffic log into PC format through the use of IBM's PC Support function. The log can then be copied to a PC, floppy disk or network and from there fed to Master Control where it can be easily read by virtually all manufacturers' equipment. The AI eliminates manual keying of copy information and reduces wasted time and errors.

Running properly

We use Selector from RCS for music, and we needed a merged log for AudioVault to run properly. This can be done with the BE-provided filter program

Wasted time and errors are reduced.

or with software from a third party. Columbine referred us to Richard Rowland at PowerLink software who had interfaced many traffic to on-air systems. Rowland comes from a family of broadcasters and provides complete software installation and training.

PowerLink Editor had been used at our Houston stations between Columbine and a TM-Century UDS/DCS with good results. It was installed on our music PC and on a PC interfaced to Columbine.

PowerLink takes the commercial log, adds the music and then formats it for AudioVault. After airing, it strips out the music and feeds the list to traffic for reconciliation.

AudioVault can be controlled from each of the computers. Traffic can add special instruction fields, programming can add break notes in Selector and the PowerLink editor screens allow a few other helpful features such as substitute event commands and dynamic carts. We have been using sneakernet (transfer by disk) to move files around but expect to convert it to wired network shortly.

It took only a handful of pre-air calls to BE and PowerLink between unpacking the equipment and getting on-air. The equipment is well-documented — two rather large books answer most questions — but we were in a hurry. Factory help is available, but has not been used often.

Abbreviated curve

PowerLink has interfaced many systems, and has contacts in large and small stations with all kinds of equipment and traffic systems and all kinds of storage systems. This network of contacts got us on quicker, abbreviating the learning curve.

Everything the system can do is controllable from a PC keyboard, on screen mouse clicks or touch screens, as well as button boxes and other computers. The machines have been very dependable. We have been very pleased.

For more information from Columbine JDS, contact the company in Colorado at (303) 237-4000; or circle ***Reader Service 81.***

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Any digital audio system is expected to provide immediate operating efficiencies and improve the bottom line. But systems are often selected without giving proper credit to the role as a platform for future capabilities and expansion.

Can the system adapt when you decide to change formats or automate overnights via satellite... or accept and delay more external feeds? What if you do your own in-house automation? Can it handle an LMA or duopoly, integrate a new station, maybe even simulcast with the present one? How flexible will it be for the new PD, or that hot morning jock... both of whom will likely have strong opinions on how to best utilize the system? Most digital audio products just don't adapt very easily, and you will most certainly be faced with additional software and/or hardware expenses for any changes... not with DAD.

DAD486x is the ultimate Master Toolchest for broadcast professionals. Your staff may not use all of the tools at first, but as proficiency is achieved, they'll come to apply them in more and better ways to improve your entire product. DAD doesn't dictate an operational structure. For any given task there are multiple tools and solutions. It runs on standard, non-proprietary computer hardware, easily interfaces with other professional equipment and systems, and can implement various levels of redundancy and fault tolerance. Featuring a completely open architecture, it maximizes future adaptability, is easily maintained, and can readily be configured as anything from a stand-alone workstation to any number of networked workstations, each optimized for specific tasks.

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World Radio History

USER REPORT

WLTW Secure with AudioVault

by Bob Tarsio
Chief Engineer
WLTW(FM)

NEW YORK About two years ago we began to seek out a new system to replace our aging NAB cartridge system that we used for 99.44 percent of our on-air playback. While the cart system served us well, increased maintenance, higher cost of media and an uncertain future for our back-lubricated tape availability led us on a search for a digital storage system.

We finally selected the AudioVault system from **Broadcast Electronics**. Some of the key reasons for selecting AudioVault included central storage and routing of audio data within the server and not over the network, a straightforward user interface, system flexibility and the reputation of BE as a supplier. No one of the criteria being less important than any other, I worked closely with WLTW(FM) Program Director Kurt Johnson so that we were both satisfied that we had an easy system to use, install and maintain.

Redundant servers

From the outset we opted for a dual server-based system. We outfitted the station with redundant servers that would contain identical information on their respective drive arrays. Three BE AV100 boards were installed in each of the servers with daughter boards attached to each. Each AV100 board allows stereo record and playback capability with the daughterboards adding two additional stereo playback channels. This allows us to record/play audio in six different locations and allows for playback only in additional locations.

Each of our air studios — fed by different servers for redundancy — have record capability and six stereo playback slots all appearing on their own fader on our consoles. Control of playback can be accomplished with a mouse or directly from the console via a BE interface adapter board that plugs into the local PC and is interfaced directly to the console.

In every other location we have record/playback capability. These locations include our dubbing studio, production studio, newsroom and newsbooth. Audio recorded at any of these locations is instantly available at any other. Each location has a local PC that is connected to a 10BaseT network for communication with the respective servers.

AV100 boards can be placed in a PC for standalone operation when desired. This is a great way to have a backup system on a budget. A standalone computer with an AV100 board and a 9GB drive can store an entire commercial library and several hours of music (in case of a server failure) in a single server system.

The system can also be set up without a central server using PCs connected to share audio files. The system has quite a bit of flexibility based on your station's needs.

Instant access

We included a PC in our traffic office that is capable of playing back audio so our continuity/traffic department has instant access to any cut on the system. Traffic can also download to logs directly to the system via the BE Core Utility program. Core allows us to have something we never had before: a fully integrated music/commercial log on screen.

We still use an IBM system 36 for traffic and billing. This system is a boat anchor by today's standards. Despite that, BE was able to work with us to interface the old workhorse to the new system. If you are wondering about system compatibility, it is very high.

Many people ask me how easy the system is to use and how long it takes to get up to speed as an operator. The answer to these questions is "easy and fast." We use the BE AVAir screen in both of our control rooms and the production screen everywhere else. The software developers allow a lot of flexibility in how these screens are configured. They are easy to set up and learn and can easily be modified if desired.

As with most companies developing this type of software, BE chose to emulate cart type functions on screen. This works well because it quickly breeds familiarity with our announcers and production staff.

Installation of the equipment required only placement of PCs in each location and a run of 10BaseT cable to each system. Audio cabling was already in place and needed only to be connected to the servers located in our existing master control.

As with most things used by broadcasters, a computer-based audio system requires good manufacturer support when needed. My past experiences with BE, dealing mostly with transmitter support, have been good ones.

We were careful to select a company that understands that broadcasting is a 24-h[illegible]-a-day business.

Reputation for support

Many software providers do not offer the level of support that BE has built its reputation on. Yes, we have called at 2 a.m. on a Saturday and yes, the response was swift and effective. This level of service is very important to anyone contemplating installing such a system.

In one smooth operation, we have eliminated tape as a storage medium and have provided the station with greater flexibility in the way we manage audio and logging. The AudioVault from BE has provided us with a reliable, easy-to-use and expandable platform that will serve our needs for years to come.

For more information from Broadcast Electronics, contact Tracy Peterson in Indiana at (217) 224-9600; or circle ***Reader Service 15****.*

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Circle (53) On Reader Service Card

World Radio History

USER REPORT

WZRQ Radio Localizes with DCS

by David Arcara
Owner & GM
WZRQ(FM)

ALBANY, N.Y. When I first bought WZRQ(FM) in the Schenectady-Albany market, the station was playing commercials from enormous tape reels. Clearly, we needed a computerized automation system to reap the full benefits of our satellite format.

This is a very competitive radio market, with six rock stations (there used to be seven), and it is important that we have reliability and meet the needs of local advertisers.

We are a (Satellite Music Network) Z-Rock station playing the sharpest alternative rock music, so I knew our format could compete. When we added the **Computer Concepts** Digital Commercial System (DCS) hard disk automation three and a half years ago, it helped give us the kind of operation we needed to take full advantage of what today's satellite music has to offer.

Easy drop-ins

One of the benefits of DCS is being able to localize traffic reports, live remotes at our client locations and other types of events. DCS accomplishes this even without a jock in the studio. DCS acts as if it is handling a cart. Each of our live features gets a cart number for a specified length. The reporter doing the live event keeps the report to the correct length and DCS does the rest. We like how it blends smoothly into the satellite format.

Another benefit of using DCS is the automatic satellite fill feature. When a break comes up short, DCS automatically chooses prerecorded and predesignated carts of correct lengths to fill the extra time.

We have even recorded music onto DCS to use for longer length fillers. The music sounds great, it blends seamlessly into the Z-Rock format and times out perfectly.

Probably one of the greatest economic benefits of using DCS for satellite automation is the way we have been able to streamline our on-air and production operations. We have one full-time production person and one part-timer. These two plus DCS do it all. At night, we just turn the lights off and walk away. The full redundancy we use with DCS keeps me from worrying about reliability.

I know the station sounds good, but as a manager, I want it to work ... and DCS works.

Of course, when we first put DCS into the station, as with any new equipment, there was a learning curve and a break-in period. But we called Computer Concepts and got a quick response. They have always been very helpful. I guess you could call me a "happy customer."

Create excitement

This is a market that is brutally competitive, and one in which radio stations have to create their own excitement and advertiser demand.

Our revenues are good, our numbers are good and we come out in the top three or four stations among adults 18–34. I am pleased, because if a you can make it in the Albany market, you truly can make it anywhere.

For more information from Computer Concepts, contact the company in Kansas at (913) 541-0900; or circle ***Reader Service 99.***

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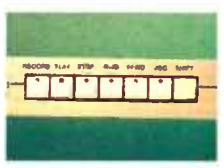

RMC 240 - using the embedded data facility on all APT codecs, the RMC 240 provides complete remote control over all DAT functions.

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Circle (83) On Reader Service Card

DATACOUNT

OPELIKA, Ala. Known for its DARTS Traffic & Billing software, Datacount Inc. has added complete and seamless interfacing to all known digital audio systems.

Regardless of the digital system used by your station, DARTS passes the commercial traffic log directly with no manual keying of what commercials air at what time. The commercial log can be easily passed via LAN or diskette.

The interface to digital systems has been available for over four years. It now brings the actual play (audio file) from the digital system back to DARTS for log verification. DARTS compares what the digital system played to the commercial log passed to it and notes any spots missed, out of time range or not on the original playlist. This makes log reconciliation faster and more accurate.

Automation Log Reconciliation is now available for all known digital suppliers. Whether your digital system is one of the big names or one of the international products recently introduced in the US, DARTS moves the commercial log information back and forth with ease. Some existing multistation DARTS users report savings of up to three hours per day with drastic improvements in billing accuracy.

For more information from Datacount, contact Debbie Hamby in Alabama at (334) 749-5641; fax: (334) 749-5666; or circle ***Reader Service 34.***

World Radio History

Products & Services Showcase

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

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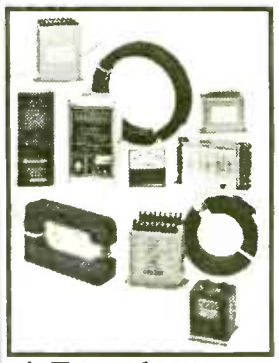

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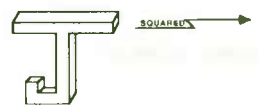

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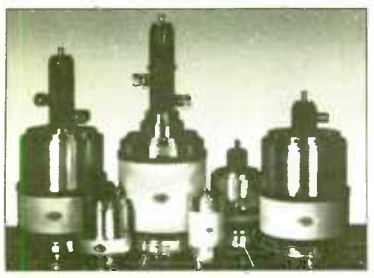

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The converter runs at a fixed sample rate of either 48 or 44.1 kHz. A dual sample rate option is available. The two 75 Ω BNC outputs conform to AES3-id.

Metering has both coarse and fine scales for monitoring near FSD. A selectable hold function can retain the highest peak until manually reset. FSD detection is exact.

The **AD2004R** has the same performance as the AD2004B but has an 110 Ω AES3 reference input, two 110 Ω AES3 outputs, and a word clock output.

With *absolutely* the highest performance, its per channel price is *only* 30% of some converters. At $1800 it's about to start a revolution! Call Rory Rall today!

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READER SERVICE NO 109

World Radio History

USER REPORT

Mitchell Centralizes with CBSI

by Mary Riemenschneider
Executive Vice President
Mitchell Broadcasting

OMAHA, Neb. The first step in building a successful centralized operation begins the moment owners and managers decide to look beyond the way they have done business in the past and can foresee how to do things differently in the future.

That is precisely what Vice President of Sales Dan Charleston and I had to do for our unique situation. We needed to streamline the operation of our eight radio stations throughout Nebraska: KOIL(AM)-KKAR(AM)-KQKQ-FM in Omaha, KGFW-AM-KQKY-FM in Kearney and KODY(AM)-KXNP-FM in North Platte.

Originally, each station had separate traffic departments in each market and each station used different traffic systems that produced different reports. We needed a system that had more sophisticated sales-reporting capabilities than we currently had.

How could we better manage these stations? For Mitchell Broadcasting, **CBSI/Custom Business Systems Inc.** was able to meet the demands of our unique situation. The solution was to use a combination of CBSI Classic and Elite traffic and billing systems, CBSI Analyzer and CustomRemote. By doing so, all time orders for our eight stations can be reviewed and approved at our main office in Omaha.

Streamlined operations

This centralization streamlined operations for AM/FM combos in Kearney and North Platte where both sales departments now fax their time orders directly to our centralized traffic department in Omaha. Orders are entered at Omaha and the logs are produced and sent via modem back to the Kearney and North Platte sites.

The CBSI Classic system can be accessed at any time from any location by using CBSI CustomRemote.

Although cost reduction was not a primary factor, we were extremely pleased when Nadine Bittel, vice president of finance, reported a $20,000 annual savings.

Easier management

By using the CBSI InterAcct accounting system and the CBSI payroll system, the general ledger, payables and payroll accounting were all centralized. Mitchell now has uniform reporting procedures, the ability to do consolidated reports and a greater capability to manage its stations.

We recently upgraded our system to the new CBSI DeltaFlex traffic engine. Not only was that conversion a smooth one, it has streamlined the workload for our two traffic operators. Before the upgrade, they entered and had to re-enter combo orders for each station. Now they save time by just copying those orders from station to station.

The traffic duties are evenly divided for all eight stations. One operator handles the Lincoln and Omaha stations while the other is responsible for the four Mitchell operations in Kearney and North Platte. This may seem like a daunting task to some operators — especially on a weekend — but it poses no special problems for the operations.

For many operations, centralization is simply a more efficient method of accomplishing the same task. The benefit of a more efficient operation is better management capability. For us, CBSI also provided substantial savings in annual operating costs and time — that was a bonus.

For more information from CBSI, contact Bob Lundstrom in Oregon at (541) 271-3681; (800) 547-3930; fax: (541) 271-5721; or circle ***Reader Service 10.***

Into the Next Century

► continued from page 54

supports just about all brands of music scheduling and traffic software.

Ready for operation

After installing the UDS II software, loading the music library and daily schedule, the system was ready for operation.

The on-screen display tells you at a glance the status of your system, including what event is on the air and how much time is left before the next event. The next event to air and the event to follow that are also displayed. All pertinent information about the three events is described, including intro and outro times, total time, song name, artist, etc.

The on-air log that is loaded into the system is fully editable up to and including the next event to air. A song or commercial can be added or dropped within a moment's notice and be cued for play almost immediately.

The UDS II comes out of the box ready for RDS, providing all real-time information about the current song, the next song and a programmable 64-character message that is sent as RDS radio text. The impressive fact of this feature is that the RDS text is updated in real time. That is, if you have a hot request song that just came in, the song information is updated as you make the change to your current music lineup.

The system does not rely on information from the music scheduling software that may have been put together yesterday. The UDS II gets its RDS information directly from the next events to air as you have programmed or changed them.

Attention-getter

The RDS feature has been a real attention-getter at a remote broadcast or station event. We have added an LED sign and RDS receiver to our remote gear. Most people get a real charge out of somehow knowing what song is coming up next.

With the addition of a network card to the basic computer setup, we now have the ability to load the next day's log from any other computer on the network. This also allows the traffic director, program director, music director and engineer to read the information they may need directly from the UDS II without shuffling disks back and forth from the control room.

Some of our overnight and weekend programming is syndicated from a satellite source. The UDS II handles satellite automation in the same effortless manner as the rest of the day's regular routine: flawlessly. All it takes is wiring up the contact closures to the UDS II from your satellite decoder, make a few additions to the program log, set up the source audio and watch it work for you.

As long as the satellite network operators are consistent in what they do, you will have no problem with the UDS II. I did run into a situation of the satellite network sending up to three second-long contact closures for liners and voice-overs. UDS II did not like the long contact closures.

Genuine interest

Tech support from T.M. Century has been good. The support people seem to take a genuine interest in any problem you may be having and are patient as you explain, in cryptic terms, your concerns. Generally speaking, problems are resolved quickly and you wind up asking yourself, "Why didn't I read the book for the answer?"

In summary, I can recommend the UDS II for any station that is interested in improving its sound and technical operation.

For more information from T.M. Century, contact John Schaab in Texas at (214) 406-6800; fax: (214) 406-6890; or circle ***Reader Service 16.***

RCS Digital Studio

► continued from page 54

We find the RCS paperless and tapeless studio to be less cumbersome than tapes and CDS. The problems we do encounter with the system are more easily remedied and RCS technical support is available 24 hours a day. RCS has been working on the lockup problems and continues to update the software accordingly.

The learning curve is very short. We train inexperienced interns and have them operating the equipment in minutes. I would like to see more user-friendly versions of the user

RCS provides flexibility.

manuals for the general staff. The manuals are technical and sometimes confusing.

The RCS system provides the flexibility our stations need as we strive to improve the quality of our product while improving the efficiency of our operations.

While I appreciate the features offered by the RCS system, there is room for improvement. RCS is working toward providing a higher quality product, making upgrades as needed to better serve the needs of radio stations.

For more information from RCS, contact the company in New York at (914) 723-8567; or circle ***Reader Service 38.***

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Circle (168) On Reader Service Card

World Radio History

USER REPORT

Station Automation Creation by Radiomation

by Val Davis
Broadcast Automation
Consultant

EMMETSBURG, Iowa While I was speaking with the rep for **Radiomation**, a man from South America came up to the display and attempted to request information. Unfortunately none of the Radiomation reps spoke Spanish. Undaunted, the South American gentleman sat down and began experimenting with the system.

The oohs and ahhs rolled as he marveled at the ease of use. Within minutes he was entering orders, scheduling spots and transferring the necessary information to the production node. Then he repeated his experience on the production unit, the control unit and the news unit. This system was designed for power and simplicity from the ground up. While other systems attempt to "add" features and capabilities to their code, no amount of upgrading makes up for a poorly-designed system.

Lower learning curve

Radiomation is Windows-based. By using Windows, Radiomation is capable of importing data from any other Windows-based database, text editor, etc. Its visually-based operation lessens the learning curve — everything is point and click, heightening the user's involvement with the system.

Radiomation consists of four workstations: Control, Traffic, Production and News. These four workstations allow for every aspect of station operation to occur simultaneously. All four stations are networked together and work as a unit to allow for flowing station operation. Its power and uniquely efficient operation comes from minimizing the amount of work required to get a spot to air.

This system was designed for power and simplicity from the ground up.

Order entry is simple. Features include automatic dayparting, packaging, code separation, log transfers to the on-air unit and manual override for nonstandard orders. Closed-loop feedback from the air log allows for rescheduling missed spots, which reduces the number of "make-goods."

This is the most complete and easy-to-use traffic system I have ever seen, and I have seen many. Verification logs, account rep reports, commission reports, co-op affidavits and a graphical representation (charts) of the station's air blocks are just a few features that set this traffic system apart from the pack.

Many of the live assist automation systems out there today have attempted to create digital .wav editors. Radiomation simply incorporated a piece of existing software into its production node. Cool Edit was written by Syntrillium and it is one powerful piece of software.

You can record a wave using any sound card and save your audio in any number of formats including ADPCM, voc., wav and even MPEG Layer II. After your spot has been recorded, you can cut, copy, paste and insert audio. You can also add reverb, compression, flange and a large number of effects to your recorded audio, all from within the software. In addition, Cool Edit features a CD player so you can start and stop background music and sound effects from within the program.

Optional configuration

Radiomation can either be configured as a music-on-hard drive (MOHD) system or as a jukebox system utilizing a CD changer. While Americans have been moving toward MOHD systems, Europeans believe in CDs. Radiomation can be configured as either. The control screen automatically brings up the next break while the jock can either choose from a list of songs or enter a song number to pull up a specific request. The interface looks like a CD player with start, stop and pause buttons. The system is totally keyboardless and uses only a mouse or trackball. One screen is used for the on-air studio.

As soon as a spot is aired, traffic is notified via the network to add another spot to the verification log. The system automatically receives audio from production and news nodes via the LAN. Multiple studios (AM & FM combos) can be linked together via the LAN.

The system can take satellite closures to automate on satellite systems or it can be set up to play from the log totally automated. Voice tracking is simple to do from the production node.

Radiomation is also capable of performing flawless unattended record and playback insertion which allows for delayed rebroadcasting of shows. The system performs beautiful crossfades between cuts. In Robojock (the fully automated mode), the music to be aired is scheduled with a music scheduler — either your own or the powerful music scheduler included with Radiomation. If I were to attempt to list all of the functions of the on-air system, this article would be a book.

Text and audio

The Radiomation news system integrates text and audio. It has the capacity to collect news actualities and text from agency sources over a cable or satellite or locally input items. It includes all of the utilities to enable the components to be worked into stories. The stories can be compiled into fully timed bulletins within seconds. The news system allows presentations of the resulting bulletin to air either autonomously or operator-assisted via the on-air computer in the control room.

Because of the high level of integration of the rest of the systems, it is possible for the accounting or traffic system to be fitted with an audio card at a very low cost, which would allow these computers to act as additional news stations to be used during elections or disasters for gathering information and recording actualities. During this time, the accounting or traffic computers are seen by the news team as additional resources. After the election or emergency has passed, the system shrinks to its original size without any interference having occurred.

Radiomation is currently in use on most of the stations in Ireland, while the BBC in the United Kingdom has more than 20 news/production nodes. These references only add to this systems appeal.

Though Radiomation is based in Ireland, it will soon have a U.S. representative who will provide stateside sales, support and installations.

You will not regret looking into Radiomation.

For more information from Radiomation, contact the company in Ireland at 011-353-903-26047; or circle ***Reader Service 75****.*

USER REPORT

RDS Phantom Powers WKXF

by Dave Marcum
Owner
WKXF(AM)

EMINENCE, Ky. It must be a special kind of hell for engineers when they hear a dumb disc jockey bought his own radio station, so it is with some trepidation that I tell you that on New Year's Day, 1996, I became the proud owner of WKXF(AM) Eminence, a 500 W AM station 35 miles east of Louisville, Ky. Thirty-five miles is far enough and Eminence is big enough to warrant a radio station of its own to serve community needs, but close enough to receive most Louisville stations.

It is my opinion that small markets in this situation can be economically viable in one of two ways — syndication or automation. I chose the latter. WKXF uses a niche format, bluegrass, to complement a heavy local news and information commitment. We chose The Phantom from **Register Data Systems** to handle virtually all of our programming needs.

Plenty of time

Because WKXF is mono and AM, The Phantom Dolby AC2 digital signal processors, set at 32 kHz sampling rate, enabled us to get 24 hours of recording time out of a 1GB hard drive. In bluegrass tunes, that translates to 400 titles in rotation with four hours left over for commercials, promos, jingles, two one-hour syndicated shows that air twice a week, five different news, sports and Ag. Feeds recorded on a timer for playback later and closed circuit commercial feeds.

We use Music 1 scheduling software for the music library and RDS traffic and billing software for spots. Both software packages import their schedules directly into The Phantom via floppy disk. The

RDS handles all of our programming needs.

Phantom's internal multicut cart capability ensures flawless rotation of commercials through six different clocks we use. KY News Network is our only satellite input and, frankly, we do not make nearly as much use as possible out of The Phantom input relay array.

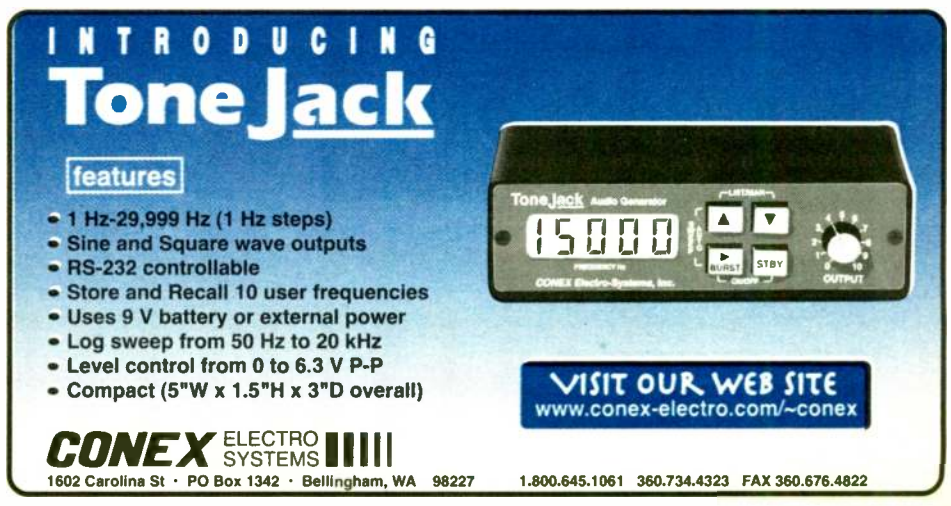
I do a live assist morning show from 6 - 9 a.m. and The Phantom does virtually everything else. The Phantom overlap feature that allows you to set an overlap point on each cut individually makes the on-air sound smooth and tight during our automated dayparts.

The RDS Phantom has made it possible for WKXF to operate efficiently with only two employees. My wife, Kay, and I program, promote, sell and super-serve Eminence and the six counties in our coverage area.

The initial setup of the system was very smooth as The Phantom was ready to go right out of the box. No software to install, no PC interrupts to set; just connect the audio lines and go. It took just a week or so to smooth out the rough edges on the format clocks I designed for The Phantom. Minor tweaks between our Music 1 scheduling software and The Phantom clock definitions made everything fall into place without the need for a lot of manual schedule editing after importing.

The only thing I'd like to add is kudos to RDS for a successful application of The Phantom and a huge vote of thanks for its tech support.

For more information from Register Data Systems, contact Russ Nelson in Georgia at (800) 521-5222; or circle ***Reader Service 2****.*



Circle (25) On Reader Service Card

World Radio History

USER REPORT

Riverside Running on DigiLinks

by Pat Hurley
Technical Director
Riverside Radio Group
of Louisiana, Inc.

MONROE, La. The Riverside Radio Group of Louisiana, Inc. is a group of four micromarket radio stations in the northeast and central portions of the state.

In the spring of 1994 our owner, Tom Gay, wanted to update KFNV-AM-FM, our Ferriday operation. He hired a manager with grandiose ideas of a format calling for the use of seven satellite networks. This was to be accomplished with a 20-year-old automation system, no budget and an owner who was horrified when you mention "computer." After two weeks, the rocket scientist manager came to the conclusion that he could not do the programming he wanted with the existing equipment.

No arguments

The new manager wanted to go with the DigiLink II by **Arrakis**. Knowing Mike Palmer and his gang at the company from its beginning, who was I to argue? My only concern was the compatibility of the DigiLink for use in our other operations.

A phone call to Bob Groom at Arrakis resolved any doubts that I had. I then began pulling my hair out over how we were going to switch five satellite networks from the same receiver and get the proper transponder and channel select. Bob suggested we use the machine control circuits that are available on each input source.

The machine control is wired to a binary diode array that selects the channel and transponder in the satellite receiver. The switch occurs using the computer clock at the appropriate time. Machine control start allows you to fire the EBS generator when its channel is called upon.

Three weeks later our first DigiLink arrived. The new manager informed me that we could sign KFNV off for one hour while I installed the new system. I uncrated our new toy and was impressed with what I saw. The computer proper was in a rack-mounted case and Arrakis sent all the connecting hardware including the crimping tool. Twenty-eight hours later we were on the air with the new system and format.

The owner viewed the DigiLink as a cart machine replacement. The manager saw it as a way of doing away with the part-time personnel. I looked at the DigiLink as a system — a master control of sorts. The DigiLink is switching the satellite receiver audio channel numbers, selecting the proper transponder, airing the Sunday morning church services, transmitting EBS tests when assigned and playing the commercials, liners, calls and IDs with virtually no one watching. The system worked out great; however, the manager did not fit.

Easy installation

During the summer of 1995, we acquired our second DigiLink for KCTO(AM) in Columbia. Still with no budget, the up side to this one was that I had a little time to put it together. KCTO could have been a nightmare in level matching all of the sources that were common to the console and the DigiLink,

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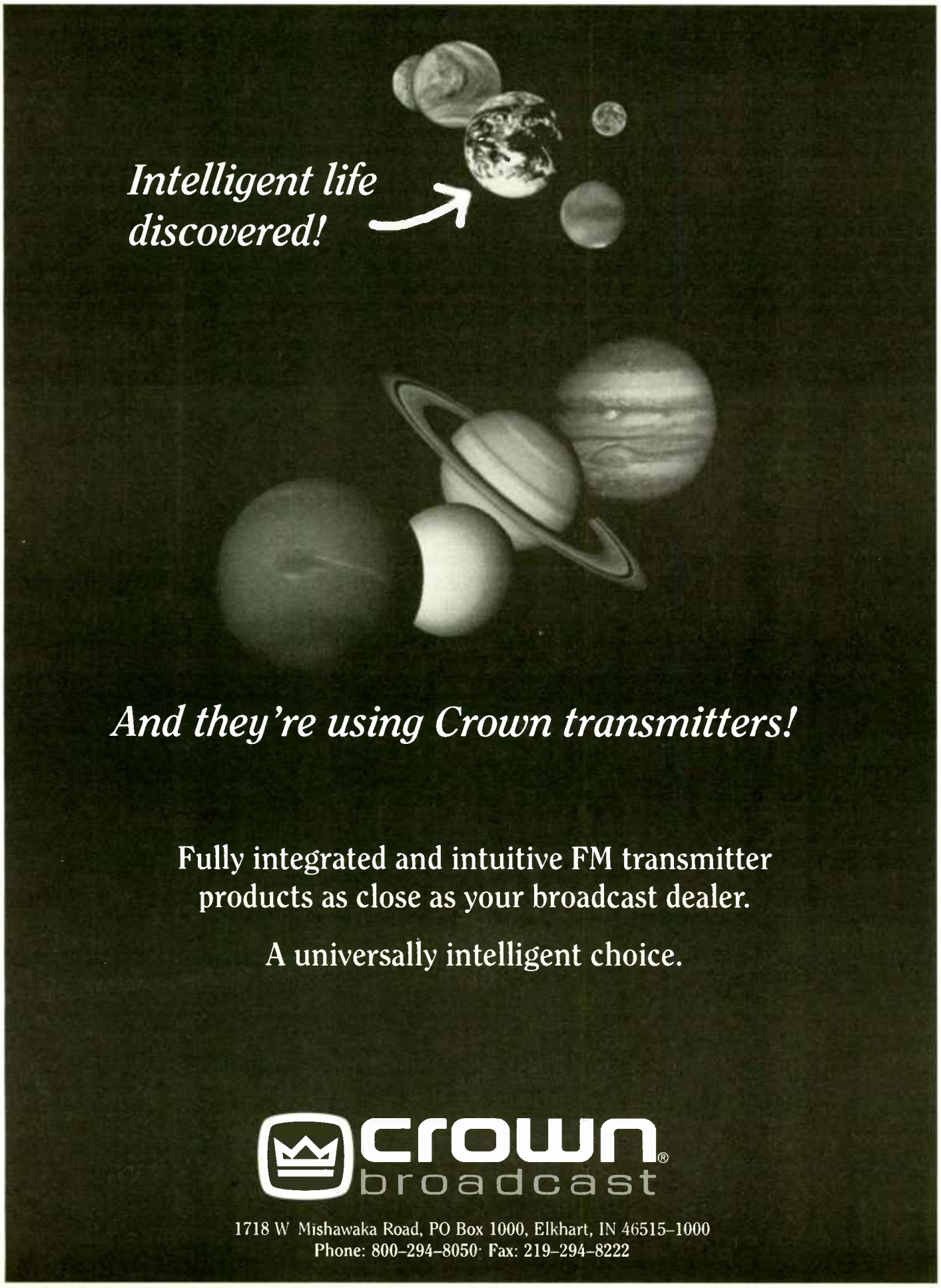

Circle (23) On Reader Service Card

Learfield Takes It to The Wire

by Charlie Peters
Chief Engineer
Learfield Communications Inc.

JEFFERSON CITY, Mo. Learfield Communications provides network audio news, agricultural and sports programming for more than 700 radio affiliates throughout the Midwest. In addition, Learfield offers a full-service wire service called Learfield Data. Learfield uplinks 13 channels of audio and text information services from Jefferson City and operates full-service news bureaus in Missouri, Iowa, and Wisconsin.

Learfield started with a basic WireReady electronic news system from **WireReady NSI** in our Jefferson City newsroom five years ago. Over the years, we have expanded the system so that now any operator can sit at any workstation and access wire services, type local news and, most importantly, record or playback digital audio cuts. All the audio and text data is stored on the Novell server so all of our information is available from any workstation at any time.

Add-on products

When searching for a digital audio system, we learned that WireReady NSI offers three add-on software products: CartReady, ReelReady and ControlReady. These products can be integrated with the WireReady and NewsReady electronic newsroom system.

We upgraded our existing WireReady/ NewsReady system to a software suite

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World Radio History

USER REPORT

Adventure Runs with Scott Studios

by W. Lee Simmons
Vice President, Director of Engineering
Adventure Communications, Inc.

HILTON HEAD, S.C. How would you operate five great-sounding, well-executed radio stations with only five on-staff announcers? That is not the question we asked ourselves four years ago when we started this adventure, but that is what we are doing now.

Our five stations do not all sound like robots just taking satellite network cues. WLOW(FM), WFXH-AM-FM, WOCW(FM) and WIJY(FM) each sound live, involved and local. Our local news and public affairs programming sets the pace for the South Carolina "Low Country" while dozens of remotes and local promotions keep our stations in the eyes and ears of the listeners and the business community.

Adventure automated with Scott Studios.

Efficiency and success

All of this is accomplished by a few talented people, a lot of "smart" work, and an integrated, reliable and flexible digital audio storage and delivery (automation) system. These three components make up our operational efficiency and our success.

The talented people consist of five full-time air personalities and one full-time production director. Each of the five announcers works one live air shift — usually morning drive. Each also "voice tracks" two other shifts on different radio stations.

The "smart" work involves changing our way of thinking about radio and what makes it work. We used to cover each air shift with a (more or less) full-time person. That person only put his or her talents to real use 20 to 30 percent of the time. The rest of the time was spent waiting for the song to end, waiting to push the next button, waiting for the news to finish, etc.

We used to dub a commercial two, three or four times to cart for our different stations. Now we dub commercials once and send them over our **Scott Studios** computer network to the control rooms for airplay. We are doing meaningful work more and more of the time. Our stations sound better for it and, for the first time, we have material control of our bottom line.

The hardware and software that allows us to work this efficiently is from Scott Studios Corp. We started with one of basic Scott systems about three years ago. Then we added workstations and on-air systems as we acquired more radio stations to the point where we now operate five stations with Scott Studios music and satellite systems. Some particular attributes of the Music on Hard Drive system have proven quite valuable in Adventure Radio's growing facility.

Optimized performance

The first attribute is the flexibility of the Scott Studios system. Our stations run the gamut from sports-talk to satellite-based music to live-operator with music-on-hard-drive. The same operating software runs each of these different setups. Simple changes in the software's configuration optimize its performance for each station. Moreover, many day-parted operating parameters can be changed through commands in the traffic or music schedule. This feature makes it easy to switch from live-assist to satellite, or from doing a remote broadcast back to automated music on hard drive.

The flexibility of Scott Studios is also evident in its hardware setup. Our systems use a mixture of IDE and SCSI hard drives with equally good results. And, because the software is not particularly dependent on specific hardware, we have been able to mix and match system components as our stations have grown.

Another attribute is the built-in networking. Scott Studios includes basic computer networking hardware and software to connect all the on-air and production computers. Network cards and software are also included to connect your traffic and music scheduling computers to the on-air system. This networking is terrific because it lets people do their jobs and be efficient in their own offices and workspaces.

The real advantage of the built-in networking is evident in our production department. The production director or any announcer can produce a spot in any of our production or control rooms. Just a few seconds later that spot is available in any or all of the other control rooms. Indeed, some of our announcers do their voice track recording for one station while in another station's control room. The voice-track files are then sent over the network to the appropriate control room for playback.

Traffic benefits

The traffic department also benefits from the Scott Studios computer network. Last-minute changes and updates to any of our stations' logs are easy to get on the air. Spots can be added, deleted or changed conveniently from our business office or from the programming office. Likewise, we can update live copy from virtually any computer on the network. We edit weather forecasts, promos, live PSAs and sponsor tags from several desktop locations.

The third important attribute is the convenient, intuitive and powerful software package.

This is what sets our Scott Studios system apart from the others we have owned. The on-air screen jumps out at you with simplicity. Everything a jock needs to know is right there in big letters.

In addition, the big touchscreen buttons are color-grouped for instant identification.

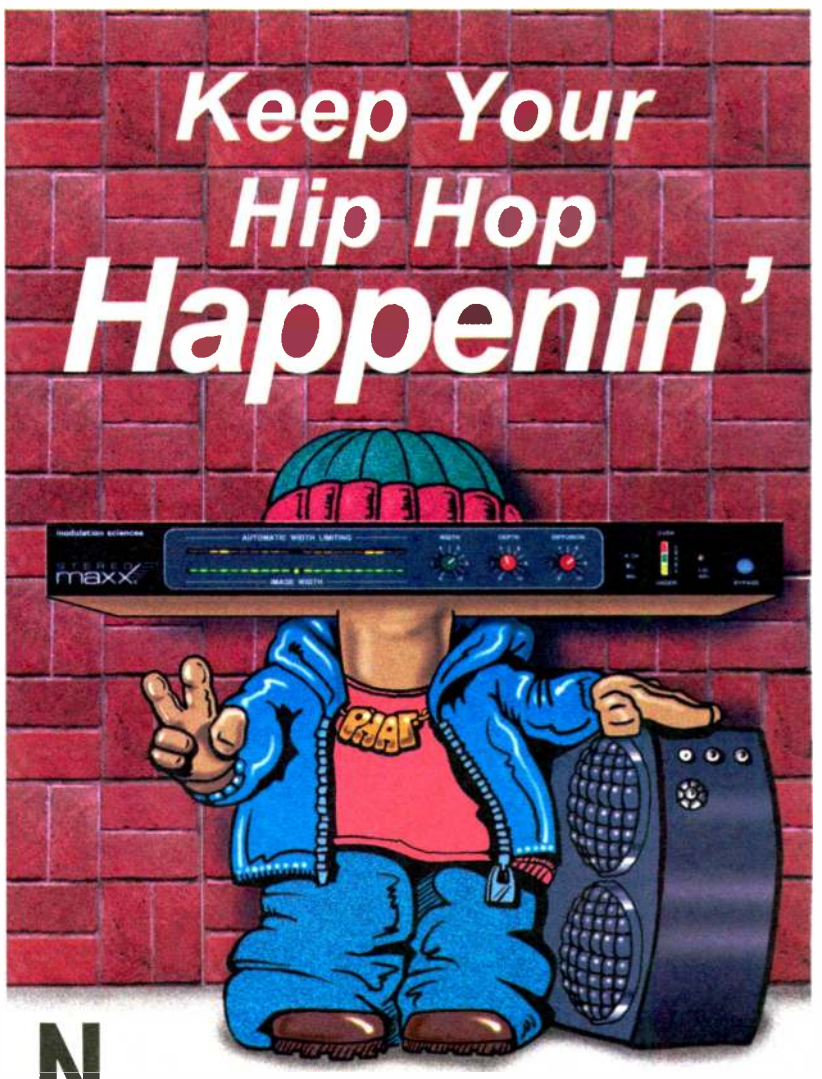
With cart machines and CD players, it is not too difficult to make a mistake and start the wrong deck, but when the buttons are labeled with what they are going to play, it is foolproof. There is just no chance for error.

Our announcers spend most of their time with phone-ins, news gathering and voice-tracking other shifts. The live-assist just about takes care of itself and helps the announcer sound slick and professional.

There have been only two or three technical glitches with our system as we have expanded it. Between our own knowledge of computer systems and the Scott Studios Tech Support people, those glitches were solved quickly.

The bottom line of our experience with our digital audio systems is our ability to truly control our stations' profitability. We can afford to pay for good on-air talent. Our five stations have true localism and terrific on-air execution. And we can all go home at night, lock the station doors, and listen to ourselves on the radio.

For more information from Scott Studios, contact Dave Scott in Texas at (800) 726-8877; or circle ***Reader Service 125.***



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Circle (189) On Reader Service Card

World Radio History

USER REPORT

KBPK Auto-Mates on a Budget

by Edward Ford
Owner
La Palma Broadcasting

ANAHEIM, Calif. Budget constraints are always a factor in equipment repairs or purchases unless you are lucky enough to work for a group with unlimited money. As a part-time instructor and facilities tech for the Fullerton College radio program, I am not so fortunate. Funds are always limited.

A cart machine in the on-air studio at KBPK(FM) left us with two choices. One was an expensive repair to a cart machine that was factory-serviced just a year ago for the same problem; the other was to try something new.

The division dean was not going for option number one and seldom does a shortage of funds allow you to step into digital audio. The Auto-Mate software from **Auto-Mate Systems** was the right price and was there to solve a problem at the right time.

The Auto-Mate software uses IBM-compatible computers and Soundblaster sound cards, allowing the end user to use a new or existing computer. The Auto-Mate will operate on 386DX or better PCs. The program is DOS-based, but you will have to have Windows 3.1 on your computer. This is a requirement for installing Soundblaster hardware/software onto your system.

Auto-Mate Systems was there to solve a problem at the right time.

Audio is recorded into three different soundfile areas with the Auto-Mate software: spots, music and liners. Each of these can be set up with different recording/playback attributes.

It allows recording in mono or stereo; sampling at 44.1, 22 or 11 kHz; and the use of compression if your sound card supports it.

Spots can be played back in On-Air Assist, a multistack cart machine mode. Spot numbers are entered for the stop set, then they are played back to back once Enter is pressed.

Pause and continue can be used for spots with tags while starting playback automatically at a designated time is also possible. There is a template playback mode and an automated mode. This is where the Auto-Mate can play back spots, IDs, liners and unattended music.

Popping plague

I first installed the software in a 486DX4-100 with an Intel CPU and a 540MB hard drive. A Soundblaster Vibra 16 card was used. This proved to be unsatisfactory. The recorded audio was plagued with popping as it played back.

A switch was made to another 486DX4-100 with a Soundblaster Multi-CD with ASP card and a 1.2 GB hard drive. The glitches in the audio were still there.

After assembling a 486DLC2-66 computer and buying another Soundblaster Multi-CD sound card, the popping audio was still apparent. This made the system unacceptable for on-air use.

I then used a standard ISA hard disk controller. The three previous systems were all using Vesa local bus controllers. This was the solution to the audio problem. After that, Auto-Mate was ready for its first on-air test.

I decided to test it out for one shift. The test was successful and the next day was spent recording all the current spot inventory on the Auto-Mate.

Tricky recording

Recording directly to the Auto-Mate was tricky at times. Just like a cart, the audio could be too loose or could be clipped if I started it late. Another problem arose occasionally that placed an audio pop at start or end of the spot. This required recording it again.

The Auto-Mate also lacked dynamic, on-screen VU meters. Some trial and error was required, though the default settings usually work okay.

There is always resistance to new, unfamiliar equipment. Using a keyboard to start spots is an annoyance to some on-air operators.

This problem was solved by the chairman of the electronics department at Fullerton College. He modified a keyboard and interfaced it to the console. This enabled the console start switch to function as Enter on the keyboard, which starts playback on the Auto-Mate. This improved on-air execution of spot clutters and eliminated excuses and objections.

Transferring soundfiles from one computer to the Auto-Mate computer can be accomplished by networking a simple printer/file sharing system.

Hard drive failures can still happen, but are much less likely with the new, more reliable drives. In addition, hard drive prices continue to drop and there are many backup options for PCs.

The Auto-Mate may not be the solution for every on-air situation where a digital system is needed. A weakness is the Soundblaster cards themselves. According to a technician at a firm that designs software for recording audio, they are not as clean as high-end sound cards. Soundblaster cards are inexpensive though, and are readily available.

The Auto-Mate presently does not have audio overlapping capabilities. This would make playing music with tight transitions challenging.

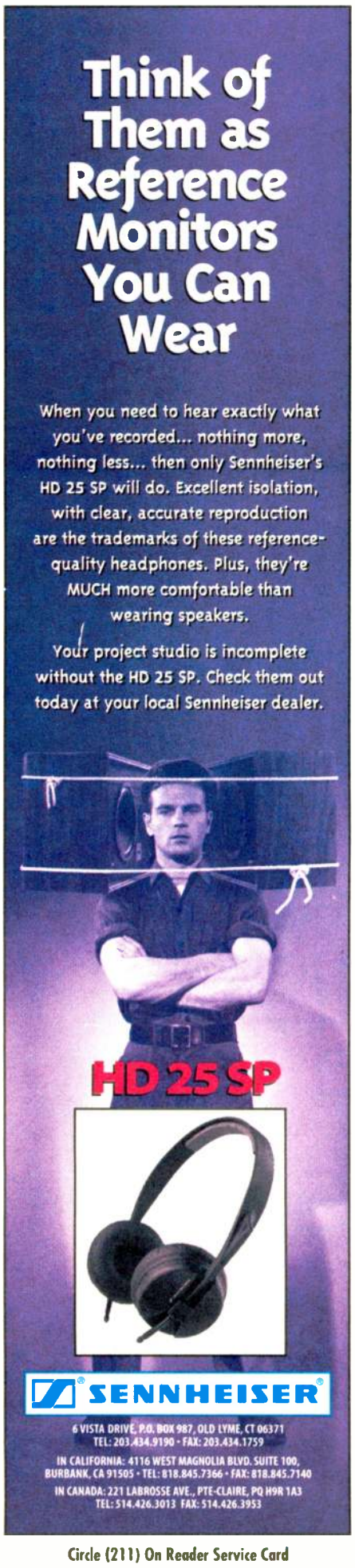
It does excel in commercial playback where your clients probably do not want another spot playing over part of the one they paid for. The Auto-Mate will play back the entire stop set of commercials flawlessly.

Other uses

The system could also be useful in the production studio to store sound effects. The Auto-Mate would be ideal in the news studio, giving the newsperson control of their sound bites, beds and commercials.

Before you spend money for a new cart machine and give those gray Fidelipac 300s some more spins, take a look at the Auto-Mate. Cart machine replacement may be as close and inexpensive as a PC.

For more information from Auto-Mate, contact the company in Oregon at (503) 769-AUTO (2886); or circle ***Reader Service 33.***



Circle (211) On Reader Service Card

DigiLinks at Riverside

► continued from page 62

but Arrakis supplied individual gain adjust. This was a rather easy installation and I did not lose too much air time.

KMAR-AM-FM in Winnsboro became our next project. This differed from the other two in that KMAR uses a country format and produces a live morning show during the week. This outlet has CD-produced shows that run on Saturday and Sunday.

The install was a piece of cake. How did we get the CD shows on the air without an operator there? We took a shot at using the 4 to 1 compression. You can detect the difference from the 2 to 1 compression we normally use, but it is airable.

Arrakis had just introduced software version 3. One of the many features of version 3 is that it allows the use of Hot Keys, assigning each jock 40 carts that are fired instantly from the function keys. Time announcements are also a new feature on version 3.

The next timesaver on the new version is Auto Trim. This feature backtracks from the assigned length of your recording and trims back to where it detects the threshold level set for the auto start of recording. Remember Tom Gay, the owner who did not like computers? Tom was so impressed he ordered software updates for the two older DigiLink.

Finally, we had one station left in the chain: KAPB-AM-FM in Marksville. KAPB is our Cajun connection. The staff understands crawfish and gumbo; they had no concept of a digital system.

Through some foul-up, we were sent a DigiLink III instead of the II. The gang at Arrakis outdid themselves on the design of this box. Multiple VU meters allow setting record levels prior to recording. A meter is supplied for each of the play cards in addition to an output meter that shows activity if anything is going through the system. The staff at KAPB was probably the quickest to pick it up because they had no preconceived notions as to how it worked and the DigiLink III screens are easier to interpret.

I would change the design of the input switcher by making them rack-mountable with the power supply in the case and the source termination on the rear panel. This would allow you to adjust levels from the front of the rack. The architecture should call for each source to be directed to either the on-air bus, record bus or both. When you add the extenders, it is confusing with the source numbers 1-4 on the main frame and 9-15 on the extender. I would write the software to have progressive source numbers.

The next major Radio Group update will be to try and marry the four markets together, thus enabling the use of all of the announcers on all four stations. This is good because I am running out of hair.

The Radio Group has acquired a class C FM in a bigger market and is already structuring its next Arrakis system.

For more information from Arrakis, contact the company in Colorado at (970) 224-2248; or circle ***Reader Service 97.***

World Radio History

WireReady Is Good News

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WireReady NSI offers called RadioReady. RadioReady includes all the software modules we needed with one bundled price. When ordered together, WireReady NSI combines all its separate software programs into a single executable file that is then loaded on our own PC-compatible computers and Novell server.

The system is a DOS-protected mode application that allows each workstation to take advantage of up to 16MB of RAM. In this fashion we did not have to switch back and forth between separate programs or worry about multitasking one or more programs in the background.

When looking for a digital audio system, Learfield needed a system that would be easy enough for news and air talents to use because their primary audio experience was limited to using carts and reels. We wanted fast and easy ways to record and playback audio with a few simple cut-and-trim edit capabilities for doing bit work.

With a single integrated program, the news operators can switch between several screens without having to navigate between different programs or menus. The system consists of browsers that let operators search and organize both wire and local copy as well as audio cuts. There are full and split word-processing screens that time out the newscasts as well as cart-style audio playback and record/edit screens.

Powerful feature

A powerful feature of the system is how it integrates text and audio. Audio cuts can be embedded in scripts by simply typing the audio cut name in brackets. These names can be typed by freehand or stamped by highlighting and selecting an audio cut from the library. Because the audio cut is referenced and not stored with the text file itself, the audio can be edited and redubbed on other workstations without having to re-edit the original text file.

When an operator needs to go on the air, they can either read off paper and use the cart playback screen or they can read the text file off the screen and go completely digital. Each time they hit the play key or push-button, the next cart embedded in the newscast plays and a countdown timer appears at the bottom of the screen.

As a DOS-protected mode application, the program does not have to run under Windows. The screens are organized into simple boxes that let the operators highlight and select choices and move around the screen without typing cryptic commands. Many choices appear as colored buttons on the screen that correspond to the F-keys on the keyboard. Operators can start a search for something and word process and manipulate audio files at the same time without the overhead of running Windows.

By staying out of Windows during these mission-critical operations, there is no chance that another program or something the operator did an hour ago can get in the way. However, operators can run Windows for other software we use in-house including SAW in our production facilities.

All audio stays uncompressed on the hard drive. Learfield did not want to be locked into a proprietary compression algorithm because we did not want to worry about conflicts with any future digital transmission system we might adopt. For this reason we chose to configure the software with the Card-D Plus audio card from Digital Audio Labs.

> **I would highly recommend anyone contemplating a digital recording system to look at WireReady.**

There are no black boxes in the system. Everything consists of standard off-the-shelf PCs, Card-D cards, the software provided from WireReady and our own Novell servers.

WireReady provides unlimited 24-hour technical support that we can call anytime we have a problem — even when it is not a software problem. For example, when we built our first Novell server through a local company, there were some initial difficulties getting the new server to run. WireReady technical support allowed us to quickly diagnose the problem as a bad hard drive, and acted as a coordinator between us and our local hardware vendor to solve the problem.

WireReady software is covered under an annual software maintenance program that includes free upgrades along with the 24-hour support. We have received several free upgrades over the years — some as a direct result of our own suggestions.

I would highly recommend anyone contemplating a digital recording system, whether in a large or small environment, to look closely at RadioReady.

For more information from WireReady, contact the company in Massachusetts at (800) 833-4459; or circle ***Reader Service 5.***

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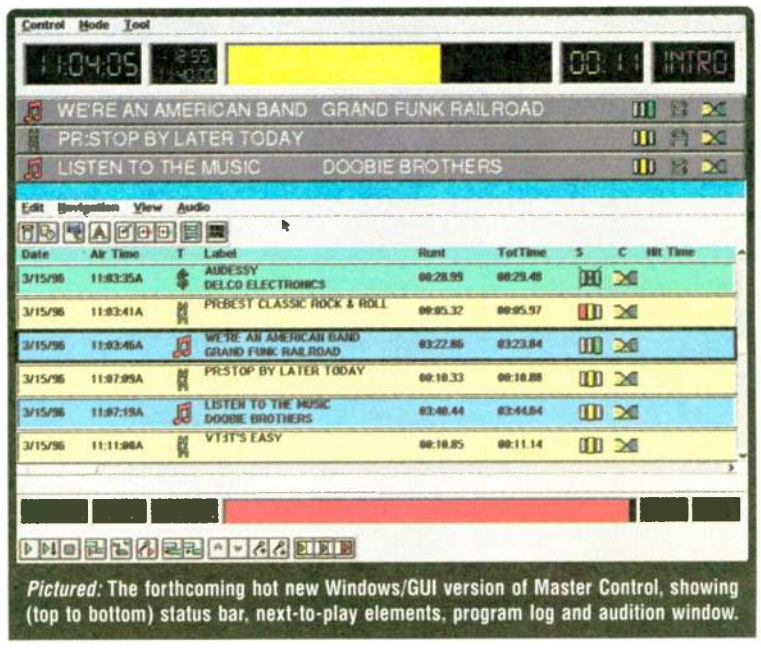

Pictured: The forthcoming hot new Windows/GUI version of Master Control, showing (top to bottom) status bar, next-to-play elements, program log and audition window.

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Circle (190) On Reader Service Card

World Radio History

USER REPORT

KJEE Gets New DAD from Enco

by Jim Evans
President & Owner
KJEE(FM)

SANTA BARBARA, Calif. In December of 1994, KJEE(FM) was experiencing its first holiday season and it seemed like every employee wanted to get away for at least a few days. While I could understand and sympathize with their wishes, I felt like the manager of a fast food restaurant, madly juggling workers' schedules to keep the business operating.

As the 1995 holiday season approached, I dreaded repeating the same scenario. My general manager and I had come to realize the limitations of our current CD player-based automation system, and I accepted the fact that it was time to bite the bullet and get a complete digital automation system that not only supported talent schedule changes, but could offer operating economies as well.

Dramatic price drop

My first call was to **Harris**, where I had purchased most of the other hardware for my station. I was already aware that the price of hard disk storage had dropped dramatically since I first contemplated such a system. And perhaps understanding computers somewhat better than the average station owner, I was looking for a system that would run on off-the-shelf hardware, permitting me to build much of it myself. Harris recommended the **Enco** DAD486x Digital Audio Delivery System and provided full information plus a list of users.

One of the users that I contacted for a reference was a non-commercial station in Los Angeles that I knew to have high standards. They were very satisfied with their DAD and it was evident that the system would do all the tasks that I required. I also discovered that DAD supported dBase schedule and billing transfers, which was a plus for me as it meant that I could utilize my existing systems in addition to adding another dimension of control that was previously unavailable.

I ordered DAD software and the audio boards for a single standalone workstation in early December. Following the computer hardware recommendations of Enco, I began assembling the system. The staff immediately became interested in what I was doing and several hinted concern about how it would affect their jobs. The project was dubbed "The Hal 2000 Computer."

As I did not start until December, it was not practical to have the system operational by the holidays, but by early in the new year we had transferred our music to hard drive and were ready to go.

A few initial glitches were experienced as we learned the system and the first on-air trials were automated overnights.

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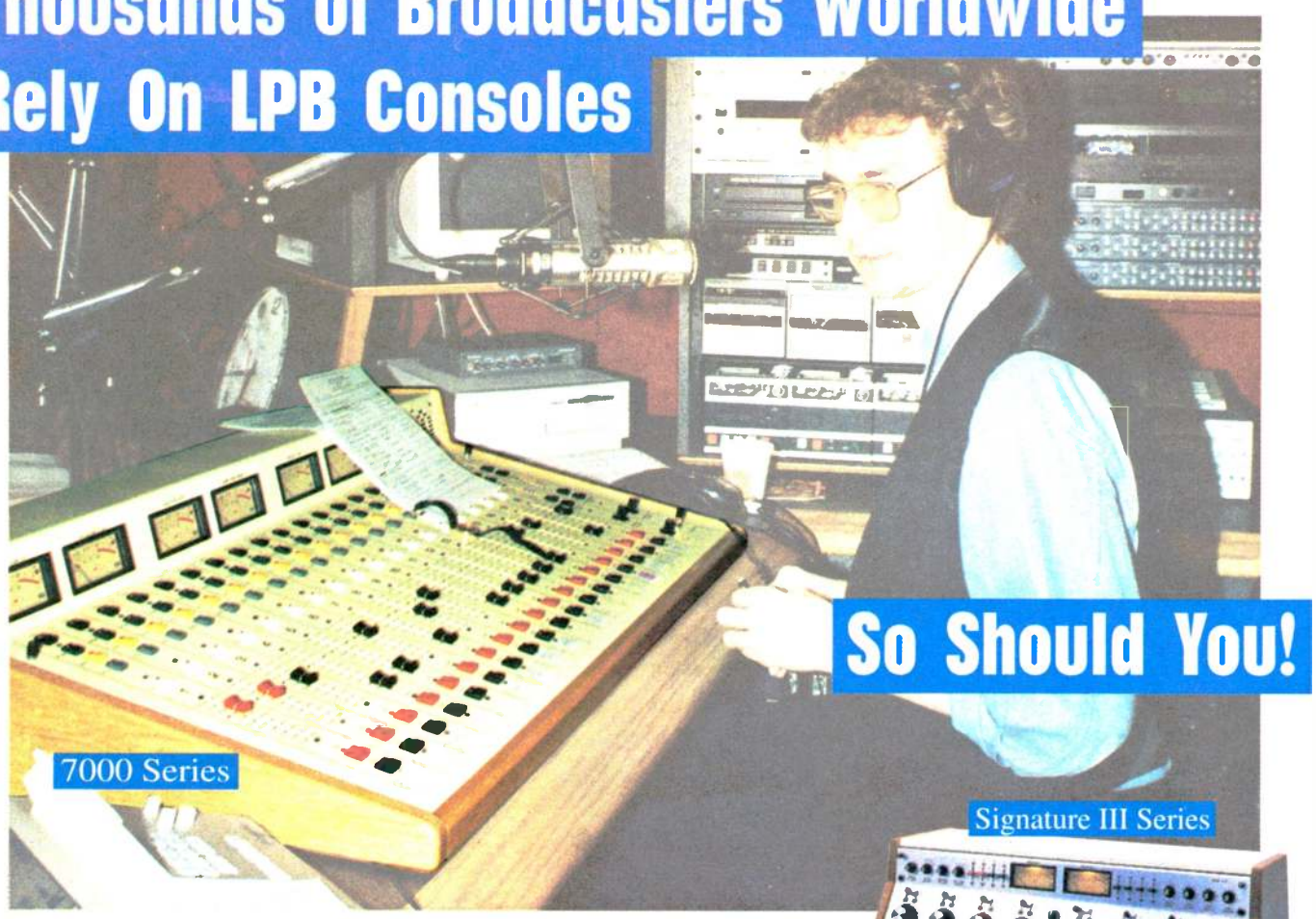

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*The 18 Channel 7000 Series Console pictured above was used for live US/Hong Kong broadcast from BSW's booth at the 1995 NAB Convention.

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Circle (212) On Reader Service Card

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MILWAUKEE The Nexus Automation Server from **A-Ware Software** continuously monitors the outputs of your traffic and music scheduling software.When a change is made in the traffic or music system, the other system along with your automation system are immediately notified and updated. Likewise, when a change is made in the studio, the Nexus Server sends those changes back to your music or traffic system immediately.

The Nexus Server requires MusicMaster music scheduling software. A-Ware Software routinely converts data from other music scheduling software, usually without any additional charge.

Most traffic systems designed many years ago do not have the ability to respond to real-time instructions from the Nexus Server. In order to provide a complete solution, A-Ware Software also offers TrafficMaster. This new traffic and billing system will work with any combination of radio and television stations, even if each of them is using different automation hardware.

TrafficMaster features real-time interaction with the Nexus Server on a continuous basis. The system includes sales contract management, program scheduling, rate card management, yield management and integrated work queues for copy writing and production assignments.

Using the combination of TrafficMaster, MusicMaster, the Nexus Automation Server and a compatible automation system, it is possible to schedule a commercial into an upcoming break or make music changes in today's log and see those changes appear instantly in the studio.

For more information from A-Ware Software, contact the company in Wisconsin at (414) 521-2890; fax: (414) 521-2892; or circle ***Reader Service 111.***

Information about A-Ware Software is also available via the World Wide Web at http://www.a-ware.com

World Radio History

USER REPORT

Bick Broadcasting Picks Pristine Systems

by Bud Janes
President
Bick Broadcasting

HANNIBAL, Mo. Bick Broadcasting, operates a group of six radio stations in Missouri, with five — four FM stations and one AM news talk — of them already using the **Pristine Systems** Music Management and Commercial Control System (MMCS).

The sixth station is still using an older hard drive system with satellite, but it will convert to Pristine early in 1997.

My first contact with Pristine Systems came through advertisements in different trade publications, and I also had discussed Pristine with a couple of other broadcasters who were looking for a system.

Previous experience

I had previous experience with older automation equipment that controlled reel-to-reel machines and cart carousels. The carousels were a great tool in their day but had a lot of moving parts, to say nothing of the carts themselves.

We also had been using an early hard disk system that was designed basically to take relays from some outside source like a satellite. It worked fine, but the audio did not sound as good as we needed and it did not offer any CD control.

The first thing that attracted me to Pristine was the flexibility of the system. We could start with CD control and music scheduling and then add other features later. This allowed us to schedule our own music and determine how the music would blend together with breaks through our own database control.

I like the fact that Pristine offers a system with CD control and its own integrated music scheduler. I am not forced to buy other scheduling software and make it work with Pristine.

The Pristine Music Plus scheduler is quite powerful and has more features than we are able to use. It has a built-in traffic interface feature that uploads our DARTS traffic log easily. Music Plus is a nice piece of software.

We use Pristine for both live-assist and walk-away air shifts. For some of our stations, we may do up to 24 hours walk-away.

One impressive thing is that our country station, which is live assist for morning and evening drive, runs CD automation for much of the day, and then we switch to an overnight program off satellite — all automatically. The system controls all three very well, including playing random liners from the satellite program.

Our announcers like the time the system buys them during live times to work the phones during songs. They do not to have to worry about cuing up the next song or getting a big stack of carts ready for the next commercial set. Things have really changed from the not-so-long-ago days of turntables.

Recording is a snap

Voice tracking is currently being done on two of our FM stations and is the most-used of all the software. Pristine Voicetraxx makes recording an air shift a snap and allows us to announce, front and back, most songs that we want. Best of all, it is easy to use and is one of my favorite parts of the system.

Pristine offers many production programs and utilities, including SAW. We have just started using the SAW digital editing/mixing software package and we are really getting into it. Pristine is able to "auto convert" the SAW audio to whatever audio format we like — in our case, 48 kHz Dolby AC-2.

I believe that with the Dolby AC-2 format, the audio quality is just as good as CD. Because we record directly to the hard drive, the audio quality has dramatically improved in our commercials.

A major way computer control of your music helps the overall sound of your station is the consistent way that the music is played. It keeps the jocks honest to the list of music chosen by the music director.

We now have better-sounding announcers in the evenings and on weekends because we can use more of our jocks by eliminating "marathon" air shifts. Remember, a better sounding station does turn into more profit.

What is my advice? Although each station has different goals, if the station controls its own music, my suggestion is to start to plan on being 100-percent hard drive for spots and music from the beginning. It will simplify the operation.

Would I buy Pristine again? Yes; I have and will again.

For more information from Pristine Systems, contact the company in California at (310) 670-7500; or circle ***Reader Service 32****.*

People, Promotions and Appointments

Brian T. Brown has joined the **Harris Corp. Broadcast Division** as vice president of worldwide sales and marketing after having served as assistant vice president for local exchange carrier customers for **Alcatel Network Systems Inc.** Brown has 19 years of experience in the telecommunications industry.

Radio Design Labs announced the appointment of **Allen McAlister** to the position of domestic sales manager. McAlister was formerly regional manager for both **TOA Electronics** and **Altec Lansing Corp.** and will now be responsible for the continued coordination of existing RDL sales programs, trade show activities and product advancement.

Philip J. Cajka has been promoted to the position of president and CEO of **Audio-Technica US Inc. Kenneth R. Reichel** has been named executive vice president and chief operating officer of the company. Previously, Cajka was chief financial officer and Reichel was chief sales officer of the company.

Company News

The **Harman Pro Group** is realigning its North American distribution business to reflect the different needs of the European manufacturers within the group. The company is shortly moving to new premises in Nashville, Tenn., and will be distributing four major brands — Soundcraft, AKG, BSS and Studer.

Enco Has DAD for KJEE

► continued from page 66

However, we were soon successful in achieving the format that we wanted and it was obvious to everyone concerned that, even with the data compression used, the sound quality was far superior to our previous system, as were the operational capabilities and reliability.

System expansion

I was so pleased that I immediately started thinking about expanding the system. This time I decided to use Enco-supplied hardware and calls to both Harris and Enco resulted in expedited delivery of another workstation and file server.

This installation was essentially turnkey. Everything was ready to work right out of the box. The manual and other documentation were excellent and factory support, when needed, was prompt. I installed a network adapter in my existing workstation and, even though the intricacies of Novell NetWare were new to me, using simple commands I was able to easily transfer the entire music library over to the file server.

Now with both on-air and production workstations and shared access to the file server, the DJs could prepare their shows with segues and voice-overs without the worry of disturbing on-air programming. Everyone's job became less mechanical, which of course promoted creativity, and the end result was a better on-air product.

I was both startled and amused one day when I was in the lobby listening to the station and the on-air DJ walked in the front door. You cannot tell whether our station is live or automated, and sometimes you tend to forget.

When we began directly importing our music log, saving even more time and effort, a requirement was created for a third workstation to better accommodate everyone's needs. We added it and our operation has been streamlined. DAD automatically keeps a record of what aired, making reconciliation easier.

The tape backup feature is great. I can put my entire station library on five DAT tapes and hold them in the palm of my hand. The peace of mind this affords is considerable. I plan always to have a set in a fireproof lockup. If catastrophe occurs, I can quickly be back in business.

Better control

I now have much better control of my station. I can load a playlist and easily check what ran or is scheduled to run. I can hear what my station sounds like in advance of actual occurrence and quickly add songs, promos, liners, sweepers, etc., that I may not recognize by title.

Future plans include adding another workstation so I do not need to interrupt anyone else. I have already purchased a modem and software to permit access and control of the DAD from home and intend soon to add more hard disk storage to accommodate a larger and more diverse music library.

My selection of the DAD486x Digital Audio Delivery System has made a big difference at KJEE. The staff is happy and so am I.

For more information from Enco, contact Larry Lamoray in Michigan at (800) 362-6797; fax: (810) 476-5712; or circle ***Reader Service 67****.*

World Radio History

Products & Services Showcase

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

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READER SERVICE NO. 18

B-1000
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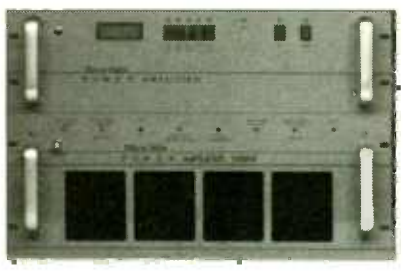

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READER SERVICE NO 87

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READER SERVICE NO. 41

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World Radio History

USER REPORT

WVST Automates Operations with Gefen

by Phil McIntyre
Engineer
WVST(FM)

PETERSBURG, Va. WVST(FM) needed to improve the quality of its broadcast signal and reduce operating cost, product theft and training time for new announcers.

After months of review, the **Gefen Systems** computer controller system, CDJ Pro, was selected and our staff loves it. The Macintosh PowerPC-based system lives up to the claims of affordability, ease of use and customer support.

WVST is a college-based, non-commercial station located at Virginia State University and currently operates at 100 W — not much in either power or money. Top priorities for the station were to find an affordable digital broadcast solution and to automate the control room.

Critical requirement

Because of plans to automate the production studio as well, Gefen Systems was able to meet a critical requirement to support the use of Macintosh equipment.

CDJ Pro provided many features that improved the operation of the station, including a computerized music manager that lets you program hours of hands-free music with unlimited track selection and playing options. The manager also allows you to edit any data field at any time, customize playlists as needed and create random playlists to include tracks from any selected disc. It even includes a convenient DJ mode for on-the-fly music selection.

The Gefen Systems automation package delivered what we hoped and paid for.

CDJ Pro also offers a logging function that records all program activities along with error messages.

From an administrative standpoint, reducing operating costs and improving the level of proficiency for each on-air announcer were high priorities. Improving the bottom line of WVST required improving direct play of Cds and reducing dependency on records, reel-to-reel, turntable and cassette operation. The commitment to a fully digital operation immediately demonstrated tangible reductions in costs.

Our system is programmed for one full week of music play, 19 hours a day, seven days a week. The CDJ Pro allows control of two Pioneer CAC-V3200 autochanger units and one Denon MiniDisk player. The MD offers insertion of station IDs, drops and promos and provides either manual or fully automated operation for the station. A second MD player provides broadcast backup for the main Pioneer CD units.

At WVST all music, the main computer, autochangers and the "system MiniDisk" are locked in an environmentally controlled storage room. The computer monitor, keyboard and mouse are located on the console with the audio control board. The on-air announcers are delighted with the redesigned configuration.

The CDJ Pro screen offers an intuitive interface with standard control features (play, stop, next, auto-off, auto-on) and automated icons demonstrating active play of the autochanger. The screen also provides helpful information detailing player head, slot, track and countdown of current CD time. The screen allows announcers to see current play, next play and the entire inventory of the present playlist with individual title details and more.

Neat package

This is basically a neat package with a lot of extras; it is well thought out and presented for both the beginning and more advanced on-air talent. The Gefen system has reduced the average training time for an announcer from roughly one-and-a-half weeks to less than 72 hours.

Because so much of what was needed was provided, drawbacks are hardly worth the time to describe. The CDJ Pro does not update and revise playlists automatically, adjust for tempo or program clock management or provide convenient error alarms on the desktop.

These days, when every station is struggling to meet the bottom line, any upgrade must bring real cost savings for every dime spent.

Going to digital broadcasting, automating the system operation, improving the performance of the broadcast management system and obtaining a reporting management system all in a convenient computer-based system that anyone is able to use is a stretch, but the Gefen Systems CDJ Pro automation software package delivered what we hoped and paid for.

For more information from Gefen Systems, contact the company in California at (818) 884-6294; or circle ***Reader Service 55.***

SMARTS

EMMETSBURG, Ia. SMARTS **Broadcast Systems** has added entirely new live functionality to its well-established automated digital audio product line. The new live screens are an integral part of the SMARTS software package, which allows an easy and seamless transition from full automation through live assist to totally live broadcast options.

The main feature is a user-friendly cut-and-paste operation that schedules music, spots, jingles and other items for broadcast in a manner similar to a computer word processor. Announcers can insert and delete material, cut material from one point in the log and insert it in another, backtime into network feeds, perform switching operations and even automate recording operations from the same unit at the same time.

Using the Post feature, a single keystroke causes the computer to display the actual start time of every broadcast item on the screen. The operator can scroll ahead, post a marker at a future point in the schedule and tell the computer what time that item should air; the computer will continuously calculate the fill time needed to hit that mark.

Another feature involves computer control. The computer-literate operator may use a conventional keyboard. Those operators that prefer not to use a keyboard can get most functions of the program through a series of pushbuttons that can be built into the control console.

The live functionality can be made part of the Generation 2000 networked system that allows multiple stations immediate access to recorded audio over a LAN, and can be integrated into special designs by the SMARTS Special Products Division.

For more information from SMARTS Broadcast Systems, contact the company in Iowa at (800) 747-6278; fax: (800) 398-8149; E-mail: smarts@ncn.net; or circle ***Reader Service 50.***

Information about SMARTS is also available via the World Wide Web at: http://www.ncn.net/smarts

LPB

FRAZER, Pa. The LPB SALSA line continues to meet user requests. The full production system offered includes four- or eight-track stereo editing and automated file transfer into the on-air system. Simply enter the data for that file, hit Transfer and walk away.

In addition to the integration of a full waveform digital audio production system, SALSA also has the ability to do remote text editing and transfer to the air system. AP News and other services may be brought into the unit, edited for the local market and transferred to a News Hotkey in the on-air studio.

Other hotkeys that can be accessed include Sports, Weather and Stocks. Hotkeys can also be user-titled. With a click of the mouse, a jock can make the text appear in the on-screen copy stand for live assist.

Even songs can have text data entry. Simply select a cut and get timely text information on the artist, song or events. The text incorporation system can even make your heavy metal-loving nighttime DJ gab like a country fan all night long.

For more information from LPB, contact John Devecka in Pennsylvania at (610) 644-1123; fax: (610) 644-8651; E-mail: LPBINC@aol.com; or circle ***Reader Service 27.***

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World Radio History

Olympic Effort for Broadcasters

by Bill Bennett

ATLANTA Seventeen days and 3,000 hours of live coverage, 271 Olympic events, 40 venues and fully equipped television mobile units, 535 video cameras, 278 videotape machines, 170 broadcast organizations, 10,000 accredited broadcasters, 1,471 commentator positions. Estimated cumulative worldwide television viewership: 35 billion people.

Those are just some of figures used to describe the Host Broadcaster for the 1996 Centennial Olympic Summer Games in Atlanta.

Atlanta Olympic Broadcasting (AOB) is the Host Broadcast group of the Atlanta Committee for the Olympic Games (ACOG). AOB's job is to provide an array of Games-related broadcast services to the world broadcast community. Some people refer to the scale of the Games as "40 concurrent Superbowls," while others just call it the "world's largest remote."

Whatever you call it, Atlanta's population will get a 2 million-person population boost during the Games, with two-thirds of the world seeing and/or hearing some broadcast coverage of the Games.

AOB is responsible for generating the multilateral Host Feed of all Olympic events. The Host Feed includes complete unbiased television coverage via traditional and specialty cameras (point-of-view, cranes and tracking cameras), slow-motion replays, extensive character generator pages, live up-to-the-minute Game statistics, ambient crowd noise and special effect audio.

This is the signal that more than 95 percent of the world's viewers will see emanating out of Atlanta. Most international Rights Holders use this multilateral Host Feed as the kernel of their coverage and add their own commentary, graphics and special segments.

A Rights Holder — sometimes called a unilateral — is a broadcast organization that has purchased the rights to broadcast the Games from the International Olympic Committee (IOC) and ACOG.

As Host Broadcaster, AOB coordinates World Broadcaster (Rights Holder) activities, acts as liaison between ACOG and the Rights Holders, and provides an array of production and technical facilities and services to the Rights Holders.

In addition to producing and archiving television coverage of every event, AOB also provides audio in the form of an International Television Signal and an International Radio Signal.

AOB also coordinates Rights Holder's needs for venue broadcast compound space, commentary positions, unilateral camera platforms and interview locations. AOB is building and operating the International Broadcast Center, a 500,000 square foot facility housing studios, control rooms, edit suites, transmission facilities and offices for both radio and television Rights Holders.

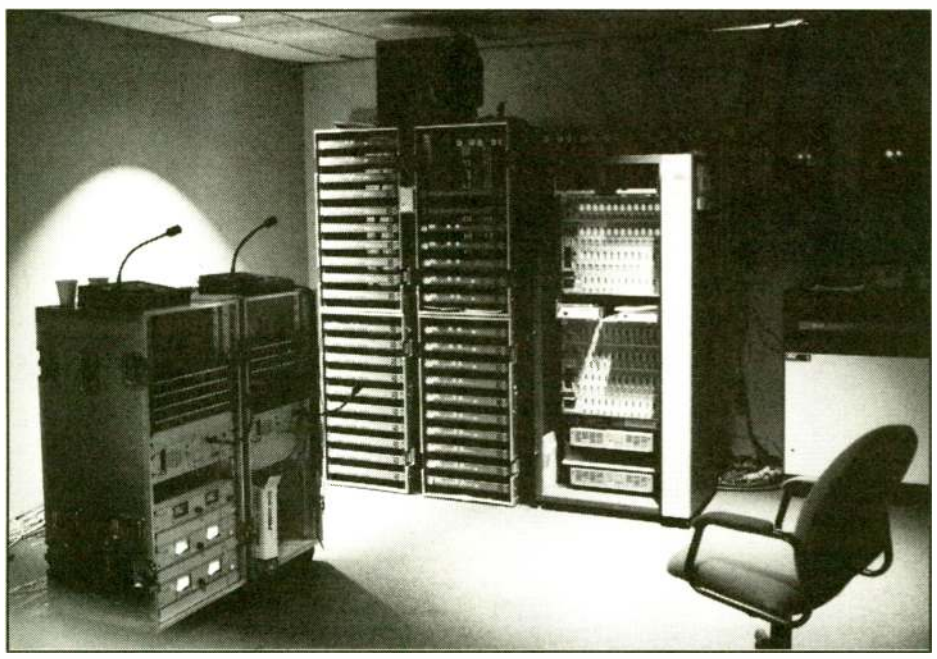
To connect it all, AOB is responsible for coordinating the installation and operation of thousands of audio and video circuits between the IBC and all venues — and other sites — as well as within the venues and IBC.

Rights Holders range from small independent broadcast organizations to large regional broadcasters, such as Television New Zealand (TVNZ), the Canadian Broadcasting Corporation (CBC), and the National Broadcasting Company (NBC).

Why a host broadcaster

For most radio stations, live sporting events involve a local sports team. Stations usually know the team Sports Information Director (SID), the home venue and probably the team's front office personnel.

Home games are easy to pull off, with many stations leaving their equipment in their own booth full-time. Away games can be more challenging, but usually involve contacting the away team's SID, securing a booth and calling the local phone company to arrange analog or ISDN lines.



Olympic Commentary Control Room

But imagine covering several sporting events in another country from as many as 30 or 40 different venues over a two-week period. The other country's electrical power standards may be different, their audio specifications may be different, and they may speak a different language. Commentators from the visiting station will also need to gather information on the teams, players and venues.

Enter the Host Broadcaster.

AOB provides all Rights Holders with the capability to reserve turn-key commentary positions at each venue and supplies advanced information on the power, audio and video formats being used during the Games.

AOB helps Rights Holders secure broadcast audio and video circuits, facilities, telephone and communication lines, and so forth. With ACOG's vast Olympic information resources, AOB also helps coordinate the dissemination of information pertaining to each team, player and venue.

AOB also takes virtually all of the timing and results information generated by Swiss Timing and IBM and transfers it to on-screen graphics while the respective event unfolds.

Some broadcasters may be unable to afford a position at every venue they want to cover. In such cases AOB can provide an off-tube commentary position in the comfort of the air-conditioned IBC. The listeners and viewers are not likely to notice the out-of-venue nature of their commentator, as he or she can still cover the game and synchronize to the video coverage by watching the monitors.

The commentator positions can be used to provide commentary for both radio and television broadcasters. Positions are usually clustered in areas offering optimum viewing of the field of play and consist of a 6 foot long table with three chairs.

A fully equipped commentary position can include a Commentary Unit (CU) with two Beyer DT-109 dual-muff mic/headsets, several channels of statistical data and one CATV monitor offering venue-specific video coverage and the AOB Host Feed signal leaving the venue.

For some statistically rich events, some venue positions will also have a touch-screen Commentary Information System (CIS) terminal provided by IBM.

Via the CU, the commentators can control their two headset mics and an interview mic, as well as monitor specific circuits such as the International Radio Signal, their program, return feed and intercom circuits (which we call GO, feedback and coordination, respectively).

They can also monitor the house PA system and the Host Feed director's cue. The director's cue is used by the Host television director to warn the commentators of upcoming replays so the commentator can talk up the replay beforehand.

While the International Radio Signal can be mixed with the radio commentator's program at the venue, most radio stations prefer to add the ambient signal from their IBC studio, where they can better process and control the mix.

All television broadcasters mix the International Television Signal from their studio.

All CUs are tied to corresponding Commentary Control Units (CCU) which are manned inside the Commentary Control Room (CCR) for each venue. CCU operators control the level of the International Radio Signal and can send tone, looped digital voice circuit ID, or program audio down the broadcaster's program circuit to the IBC.

The CCU operators can also communicate with both the commentators and their IBC studio personnel (when proper circuits are ordered) to assure efficient operations and troubleshooting.

Twenty-five-pair and 12-pair cable is used to connect between the CCR and CU, compound, pre/post and mixed zone areas. All commentary signals are run via line-level 4-wires. Four-wire means one balanced pair sends in one direction, while the other balanced pair sends in the opposite direction, thus assuring full-duplex operation. No signal ground is provided between equipment, which virtually eliminates ground loops.

Although 4-wires are rare in the United States, they are extremely common in Europe and much of the world.

From the CCR, the broadcaster circuits can be routed to the broadcaster's own optional mobile unit in the compound, other interview positions in the venue or to other commentators.

There are always interconnecting cables between the CCR and the compound's TOC (Technical Operations Center), which carry signals such as coordination, unilateral program/feedback, International Signal or other information. It is from the CCR that all commentary signals are transmitted to the IBC.

Other venue locations that commentators may utilize include a Pre/Post area and a Mixed Zone. Rights Holders who do not have a mobile unit at a venue may wish to book a Pre/Post area to perform a unilateral segment before or after the event. This segment would be broadcast from the venue on AOB's Host Feed, but, of course, only one Broadcaster would be able to broadcast it.

The Mixed Zone is usually located just off the field of play using it as a backdrop. Here interviews can be done with athletes as they walk off the field of play.

The network

Upon closer inspection of most CCRs, you will find that without the experienced help of the local regional Bell holding company, BellSouth, it would be far more difficult to get the all of the audio and video signals distributed between the venues and the IBC.

BellSouth is deploying 45 SONET (Synchronous Optical NETwork) rings within the state of Georgia, all running at OC-48 speeds (2.48832 Gbps).

These interweaved, bidirectional, self-healing fiber networks are key to transporting all of the audio, video and data needs of AOB, the Rights Holders and ACOG.

Inside most CCRs, BellSouth has installed AT&T/Lucent SLC-2000 subscriber premises equipment. These channel banks perform A-D and D-A conversion of program, feedback and coordination audio at either 3.4 kHz, 7.5 kHz or 15 kHz.

The sampled signals are then transferred onto the nearest OC-48 ring via an OC-3 (155.52 Mbps). There is identical equipment located at the IBC, which performs the other half of the A-D or D-A process. No audio compression is used in either the analog or digital domain.

For video, each VandA requires its own OC-3 circuit and utilizes an Alcatel Network Systems 1718 digital video codec at each end of the VandA. This codec provides the Rights Holders with one video and four audio channels, thus providing for compression-free composite NTSC transmission.

International broadcast center

On March 1, 1996, at 12:01 a.m., 17 tractor trailers initiated the construction of the IBC in the Georgia World Congress Center. Immediately, HVAC units were erected, walls were taped out and overhead cable routing schemes were implemented. Numerically, at the IBC

continued on page 72 ▶

World Radio History

GENTNER

TS612 System

It looks like a regular multi-line business phone but it actually provides capabilities that meet the unique requirements of broadcasting, distance-learning, business TV, video and audio-conferencing. Although, this system is highly sophisticated, it is still easy to learn and use.

Microtel

Microtel is a small, battery operated "mini mixer" that connects to the handset jack of your telephone for easy connection to the phone line. It is not a telephone coupler-Microtel does much more than standard couplers. With Microtel you can easily accomplish news reports, business, weather, ski reports, remote broadcasts, and as a tool for your salespeople.

TeleHybrid

The TeleHybrid is the only digital hybrid that can interface with the handset of your analog or digital phone. With the TeleHybrid, there's no need to install a new telephone line in order to connect your phone to your professional audio equipment. Price recently reduced, call for details.

The Source for Talk Radio

G2500 Superhybrid

Originally developed for the demanding feedback control requirements of corporate boardrooms, the G2500 adds Gentner's superior telephone audio quality for the stringent requirements of broadcasters. Housed in a sturdy rack mount chassis, the G2500 provides an advanced digital telephone hybrid with auto-answer/disconnect, auto-null and auto re-null on new line selection, receive mute, and remote control. The G2500 provides automatic mix minus!

G3200 Superhybrid

The G3200 is designed for telephone calls with a live audience or in-studio guests. The G3200 provides both advanced telephone nulling and acoustic echo cancellation. When used in live studio environments, the G3200 prevents transmission of the caller's audio back to the caller.

GSC3000 Remote Control System

The GSC3000 Site Control System takes the concepts introduced by the VRC2000 Remote Control Unit to the next level by providing a system that can cover a single site with minimum needs or multiple stations with extensive requirements. It offers single or multiple PC monitoring sites and friendly Windows® based operation.

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World Radio History

Broadcasters Ready for Olympics

▶ continued from page 70

there are 3 MW of power being consumed, 12 100-ton AC units installed, 400 illuminated exit signs, 1,000 doors, 3,000 telephone lines, 45,000 linear feet of drywall and 1.5 million feet of cable (fiber, coax and audio).

Interestingly, because the space is concrete convention floor space, absolutely no holes or nails can be driven into the floor: Industrial-strength double-stick tape is used to fasten the walls to the floor.

At the IBC, a visitor may well believe that they are in the world's largest temporary broadcast facility. And they would be right. AOB coordinates the installation of circuits for multilateral and unilateral video and audio signals between the venues and IBC, including almost 3,000 commentary circuits alone.

The AOB Distribution Center takes the approximately 40-venue video Host Feeds and distributes each of them to the Rights Holder's studios via discreet coax cables. Hundreds of Leitch video DAs and Panasonic monitors are used in this process.

The IBC has its own ZIP code.

The AOB Commentator Switching Center takes most of the commentary circuits and routes them from the SLC-2000s to tip-ring-sleeve (TRS) jackfields via T-66 punch blocks.

Each commentary circuit is normalized through the jackfield and sent on its way to the Rights Holder owning that circuit. Jackfields are grouped via venue, to make identification easier, and patching is only done for troubleshooting or special circuit configurations.

AEQ test units are used to both monitor circuit quality and for tone generation. Each jackfield is equipped with a third jack for noninvasive monitoring of the audio signal, even if both the "in" and "out" jacks are in use.

Once the audio and video signals are delivered to the Rights Holder's studio in the IBC, it is theirs to modify. Most studios have the ability to go live with talent and athlete interviews from their own studio or utilize another video or audio source outside of the IBC.

They can apply their own voice-overs, music, graphics and editing resources to the final air product. The Broadcaster's program signal will utilize an AOB-provided unilateral circuit back to AOB Transmission. From there, it is handed off to any of a variety of common carrier points-of-presence (POPs) such as Vyvx, AT&T or MCI, or satellite uplink facilities located in the AOB satellite uplink farm.

The IBC space will be occupied by the World Broadcasters 24 hours a day, with food served around the clock. Other IBC amenities include banks and ATMs, newsstands, cellular and pager rentals, US Postal services, security provisions, medical facilities and regional and local information.

The IBC is indeed its own world. It even has its own US postal ZIP code!

While it will take about four months for AOB and all of the Rights Holders to fully equip the IBC, all of it must come down in only 10 days, due to convention bookings in the same space.

Though the analog NTSC composite nature of AOB's video now reflects an international common denominator, in the future we will see a completely digital end-to-end solution for the Games.

I suspect commentary will move to all-digital before video, because mobile units will remain analog at some level for many years to come.

Once you digitize the commentary audio, technologies such as ATM can make for seamless insertion into and off of most emerging network topologies. One option is to loop broadband streams of voice-carrying data along all Commentator Units at the venues, and sending that Broadband signal straight to the IBC for distribution to the Rights Holders.

At the IBC, a similar technique could employ arrays of routers which could automatically gather all venue commentary signals for a specific broadcaster and deliver them to the Rights Holder's studio on one piece of fiber or coax. The same could be done for video. In both cases, data packets could be reserved for camera control, text messaging between venue CP and IBC studio, intercom signaling data, and other purposes.

We'll also see greater emphasis on ISDN, as well as emerging technologies such as Asynchronous Digital Subscriber Loop (ADSL). Both offer means of point-to-point data lines that can convey audio, video and data at speeds ranging from 64 kbps to 6 Mbps.

AOB will leave a legacy of 3,000 hours of videotape and memories which almost 200 broadcast Rights Holders will convey to two-thirds of the world's population. It is these things that make the Modern Olympic Movement a timeless and essential part of the indomitable spirit of mankind.

□ □ □

A Commentary Systems Manager for AOB 1996, Mr. Bennett plans to spend more time coupling broadcast with the Internet. He can be reached at 70742.365@compuserve.com

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Scott 299 tube amp, mint, $150; Soundcraftsmen MOSFET 45 w/chan, 1000 bridged, XLR inputs, excel cond, $375. R Cobb, Solid State Recdg Srv, 1044 Lightfoot Rd, Wimauma FL 33598. 813-634-1940.

Want To Buy

McIntosh Mc60's, 1 or 2 & one McIntosh Mc40 amplifiers. R Cobb, Solid State Recdg Srv, 1044 Lightfoot Rd, Wimauma FL 33598. 813-634-1940.

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Rohn 65 G tower, 180', gd cond, on ground, some cables, $5000. R Carlson, 801-268-8181.

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Collins 26W limiter, $200; Audiomax III ALC, $100; Volumax APC, $100; UREI 527-A EQ, $250; Micro-Trak PM5-MX mixer, $250; LPB S-2 compressor/limiter, $100; EV 605 Hi Z mic, $100, u-ship. H Mills, W3HM, Rt 3 Box 712, Harpers Ferry WV 25425. 304-876-6483 aft 6pm EDST.

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Telefunken V72A tube mic preamp, $575; (3) RCA BA2A tube mic preamps w/pwr supply, $700; (2) RCA SH1A tube mic preamps w/pwr supply, $500; Gates Level Devil tube comp ressor/expander, $500; Gates SA39B tube compressor, $600; Ampex MX10 6 chnl/stereo out tube mixer, $750; MXR blueface 113 digital delay, $300; MXR pitch shift/doubler, $300; Gates tube mono mixer, needs work, $300. 617-293-5671.

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Distribution amp cards w/from 5-8 inputs, individual controls to 600 ohm bal out mono, uses hi gain opamps, $25/pr +UPS. E Davison, 217-793-0400.

Pultec EQH-2, blue face, tube EQ (2), $2100 ea; Pultec Mavec tube EQ, $1100; Langevin EQ-252-A graphic EQ, BO; AKG R20E echo chamber, excel, BO. H/E Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450.

ADC patch bays, 1/4" 52 points, $169; ADC TT bays, $129 up; Furman 1/4" to 1/4", $95 ea; Rane ME15 graphic EQ, $150; Digitec 3.6 sec delay, $150. W Gunn, 619-320-0728.

EVENTIDE H3500-DFXE with infinity mod for Don Imus Show. New 6/95, $3400. Michael J. Tracy, KMOR, Scottsbluff, NE. 308-632-5667.

Want To Buy

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Telos Zephyr or other ISDN codec. 213-466-3595. oncue@earthlink.net.

AUTOMATION EQUIPMENT

Want To Sell

Cetec 7000 liquidation of all or parts, Level 2 automation, source cards, racks, spares, call for list. E Moody, KJEM, 216 N Main, Bentonville AR 72712. 501-273-9039.

IGM EC System, (3) 48-tray stereo Insta-Carts, 24 stereo Go-Cart & computer, $3000 for complete system, might consider selling individually. C Mandel, KAMP, 626 Main St, El Centro CA 92243. 619-352-2277.

Schafer 903E (3) w/Audiofile 1; ITC r-r, $1000. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

Sentry FS12B System, (2) 48-tray stereo Insta-Carts, (2) 24 stereo Go-Carts, (4) 42 Go-Cart machines & computer, $3750 for complete system, might consider selling individually. C Mandel, KAMP, 626 Main St, El Centro CA 92243. 619-352-2277.

SMC Instacart interface, $50; ESPI SMC pwr supplies (2), $50 ea; Audi-Cord cart recorder, $200; racks, $100 ea; Gates 55A3 silence sense, $50. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

SMC ESP-2 1988, gd cond w/(4) 450 Carousels, (4) ITC, R-R mod 755, (2) ITC 770 R-R, (3) racks, $2495/BO. J Helmkamp, Monett Comm, 1569 N Central, Monett MO 65708. 417-235-6041.

SMC 350 Carousels (2), $50 ea; SMC 450 Carousel, $400; (2) monochrome monitors, $50 ea; (4) SMC TS25 tone sensor (dual), $50 ea. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

SMC DP2 control head, $50; SMC DP2 spare parts kit, $50; SMC 350 Carousel spare parts, $50; SMC DS20A switcher, $50; Gates motor fader, $50. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

Systemation Satfire II system w/CPU, color VGA monitor, Epson printer, software, tape backup & wiring harness, set up for Jones GTO format, $2000/BO +shpg. B Toole, 19 Makowski Ln, Whitehall MT 59759. 406-287-5286.

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IGM EC w/4 Carousels & 3 random access interfaces, $1500/BO + shpg; Cetec 7000 (2), complete or parts, $200/BO ea + shpg; Schafer 903 memory board only, $25 + shpg. B Glenn, KGDN, POB 3258, Tri Cities WA 99302. 509-783-8600.

SMC 450 Carousel (2), $700 ea/$1300 both; Otari ARS-1000 R-R PB (3), $500 ea/$1400 all, all equip in gd working order w/manuals. H Espravnik, Magnum Comm, 915 Hwy 109 North, Gallatin TN 37066. 615-452-3983.

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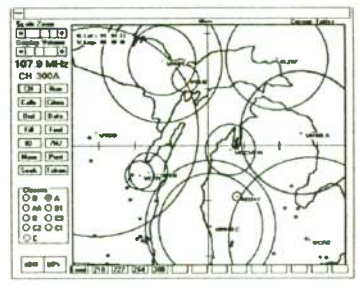

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Want To Sell

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ITC PDII & Gates 350 single play cart machine, $200 ea. 504-751-9800.

Tapecaster 700, mono, (3) players, $100 ea, recorder, $150 + shpg. B Glenn, KGDN, POB 3258, Tri Cities WA 99302. 509-783-8600.

ITC 3D. Gwen, 915-550-0558.

ITC record amps, 3 tone, stereo, $250 or mono $150. W Gunn, 619-320-0728.

ITC Delta - new pinch rollers: Mono playback (2), record/play (2), stereo record/play (1). MOTIVATED! Spotmaster series 2000 record (1). Wes, 818-798-9128.

Want To Buy

ITC Omega mono play. J Steele, WKBX, POB 2525, Kingsland GA 31548. 912-729-6000.

ITC, BE, Fidelipac cart machines: single, triple, mono, stereo, play & record/play. Call M O'Drobinak @ 619-758-0888.

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CONSOLES

Want To Sell

LPB 513C 8 chnl stereo, $1200; Harris Stereo 80, $1000. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

Soundcraft Spirit live mixing console w/2 additional stereo inputs & 5 aux buses, custom modifications, excel cond, $1650, roadcase extra; Mackie 1202 mixer, 4 mic/line inputs + 4 stereo line inputs, 2 aux & stereo outputs, modified w/tape return to monitor, like new, $250. R Streicher, Pacific A/V Enter, 545 Cloverleaf Way, Monrovia CA 91016. 818-359-8012.

Soundcraft 400B 24x4x2 in flight case, excel cond, $2900/BO +shpg. P Thompson, Moonlight Snd, 4763 WCR 32, Longmont CO 80504. 970-535-4748.

Studiomixer II 16 chnl 8 submix audio console, $750. R Blair, Columbia School of Bdctg, 5808 Columbia Pk, Bailey's Crossroads VA 22041. 703-820-2020.

Collins IC-6A stereo (2), $1000 ea. 504-751-9800.

McMartin MX-5 5 input mixer, similar to Shure M-67, excel cond, $125/BO. D Meyer, 805-962-8273.

Mackie 1604, $725; Tascam 512, $950; Tascam 520, $1750; Allen & Heath SYNCON 28x24, $8000; Ramsa 820, $2200. W Gunn, 619-320-0728.

Want To Buy

Stereo radio console, 7-10 channels, 15-20 inputs. Lino, 415-755-8370.

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Moseley TFL **280**, $50; Moseley TGR 340, $50; Volumax 4000, $50; FM Volumax 4000, $50. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

Orban 424A, mint cond w/(2) CBS Audimax 444 AGC, recapped, spare Nuvistors, $500/all. P Russell, Bowdoin College, Sills Hall, Brunswick ME 04011. 207-725-3066.

Texar Audio Prism (2) black case model, $1000 ea. J Vega, Urban Community Radio, 2434 Southport Way Ste A, San Diego CA 91950. 619-336-4900.

Inovonics 215 (2), $75 ea +shpg. B Glenn, KGDN, POB 3258, Tri Cities WA 99302. 509-783-8600.

Orban AM Optimod. K Carreker, WACL, POB 858, Waycross GA 31502. 912-283-1380. (6PM-8:30PM EDT).

Want To Buy

CRL DX-2 NR, stereo, will trade for other bdct equip, feedline, etc. N Gabeaux, 317-852-9119.

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Gates Sta-Level or SA39, SA39B, any cond. B Hatcher, 1591 Eldonlas Ct, Stone Mtn GA 30087. 770-498-7600, e-mail: Billhatcher@AOL.com.

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, 214-271-7625.

MICROPHONES

Want To Sell

EV RE/38 ND mic, like new w/case, $300/BO. Ron, GMI Media Group, 206-839-9414.

Bruel & Kjaer condensor mic, pwr supplies only, as is, $200; Altec condensor mic, pwr supplies only, as is, $200. V Vogt, Archaic Audio, 330 SW 43rd St, #247, Renton WA 98055. 206-382-5571.

Countryman TVH Tie-Clip mic, miniature hypercardioid condenser, requires phantom power, $165; AKG D-140 dynamic cardioid mic (3), $115 ea; Schoeps Colette KC5L cable, w/Lemo connector & adaptor, like new cond, $335. R Streicher, Pacific A/V Enter, 545 Cloverleaf Way, Monrovia CA 91016. 818-359-8012.

Neumann U87 mics & various other models, shock mounts & accessories, $2000. T Lawlor, Tom Lawlor Prod, 6 Newbern St, Jamaica Plain MA 02130. 617-524-0844.

Neumann CMV563 tube condenser mic w/M7 capsule & new regulated pwr supply, $2500. P Santo, Bugtussle Recdg, Box 634, Bryantville MA 02327. 617-293-5671.

AKG C-33E (2) tube stereo mics, BO; (2) Altec M54 condenser mics w/43-A capsules, n.o.s., $125 ea; AKG 330DB mic, mint w/case, $150. R Cobb, Solid State Recdg Srv, 1044 Lightfoot Rd, Wimauma FL 33598. 813-634-1940.

EV RE 20 in good condition. Lino Bugatty, Dance Mix USA Prod, POB 1802, Pacifica CA 94044. 415-755-8370.

RCA 44BX, $900; RCA 77DX, $1000; RCA ribbon, $250; Altec/WE ribbon (2), $200 ea; Cetec Vega Pro Plus R42 mic, systems w/Anvil cases (2), $1000 ea. Send request and or BO w/phone # to: F Spinetta, 521 Laurel Ave, Menlo Park CA 94025.

Sampson SH-2 wireless mic EV cap, $200. D Kocher, Digital Sound Makers, 1919 Hanover Ave, Allentown PA 18103. 610-776-1455.

Shure 55 S Elvis mics, 40 yrs old in mint cond w/original Shure tech sheet, $450/pr. Eric Toline, 525 W Stratford Pl, Chicago IL 60657. 312-975-6598.

Starbird wheeled mic booms (2), 8-10' reach, excel, $490 ea +shpg. H/E Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450.

Telefunken ELA M251, pair, excel, $16,500, single, $8600; (2) WE birdcages 639A, nice, $1120, single, $595; (5) Sennheiser goldplate/black ES-15, BO. H/E Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450.

WE 633A saltshakers, nice pair, BO; AKG D-12, pair vgc, $560, single, $310; others avail. H/E Studios, 1400 E Carson St, Pittsburgh PA 15203. 412-481-4450.

Want To Buy

RCA BK5 series, working or not, fair price. B Hatcher, 1591 Eldonlas Ct, Stone Mtn GA 30087. 770-498-7600, e-mail: Billhatcher@AOL.com.

DYNAMIC CARDIOID MICS NEEDED: Shure SM48, Sm57, SM58; Electro-Voice RE-10, RE-11, RE-15, RE-16 or other equivalent makes & models. Steve Kirsch, 516-763-1776 (voice), 516-763-1750 (fax).

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RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 214-271-7625.

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Conex Electro Systems AS101 audio selector switch, 10 in 1 out, $400; Lighting Control LC-700A beacon light controller/flasher, $400; Westinghouse ATSBM40100XXR auxiliary pwr transfer switch w/100 amp contacts, $2200. J Vega, Urban Community Radio, 2434 Southport Way Ste A, San Diego CA 91950. 619-336-4900.

CSI CS-100 DTMF controller, $200; Gentner EFT 900 phone coupler, $100; Russco DA 241B dist amp, $50; Nikke tuner AM/FM, $50; portable disco mixer, 2 CDs, 2 cassette, speakers, $1000. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.

Recordex 330WP & 330-II both master, 3 position slave cassette duplicator, new heads, recently refurbished music quality, $850 each/BO. C Roberts, Edgewater Co, 232 C St, S San Francisco CA 94080. 415-589-3313.

Tangent 1202A mixing console, 12 chnl in, stereo-mono out, EQ on ea input chnl, echo send/return, all inputs mic/line level, solo & foldback outs, $600. S Lawson, KAK Prod, 928 Hyland Dr, Santa Rosa CA 95404. 707-528-4055.

UPS Excide Electr Powerware 6 kva w/battery side car, deluxe front panel, comm package, still under warranty, many extras. P Appleson Studios, 954-587-7900.

300 best country songs 1975-76 on reel, $150; servo motor for Ampex AG440-C, has little click in motor but works, $250. H Sewell, Oakridge Music Recdg Srvs, 2001 Elton Rd, Haltom City TX 76117. 817-838-8001.

dbx 166A comp & limiters, $400; M85 MK 2 cassette deck for parts, $100; mic 64225 hand held needs rcvr, $100; Telex WT200 (3) no mics, $35 ea; KC 100 voice control key change, $150; dbx 1BX 111 range expander, $50; Rec-O-Kut record lathe, $350; tubes of all kinds; UREI 1176 LN limiters (2), $1500 ea; Sony CD player, nearly new, no rack mount, $250. H Sewell, Oakridge Music Recdg Srvs, 2001 Elton Rd, Haltom City TX 76117. 817-838-8001.

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AKAI vintage r-r, portable, stereo, tube-type, gd cond, BO. Al 712-362-7939.

MCI JH-116 2" 16 trk w/8 trk 1" stack, $2000; (8) dual chnl dbx-150 units, $500. R Blair, Columbia School of Bdctg, 5808 Columbia Pk, Bailey's Crossroads VA 22041. 703-820-2020.

Otari MK III-2 & BQII 1/4" machines, both in gd cond, on wheels, 4 trk has very low hrs, $400 & $550. Greg, Mars Audio, Astoria NY. 718-274-0771.

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Revox PR-99 2 trk in mint cond, $900, W Whitney, Whitney Creative, 2232 Wengler, Overland MO 63114. 314-428-8430.

Scully 280 4 trk 1/2" w/1/4" head stack in rollaround walnut console; Inovonics 375 R/P amp, VU meter is funky, the rest is up to specs, $100. L Beigel, Oncue Recdg, POB 85042, Hollywood CA 90072. 213-466-3595. oncue@earthlink.net.

Tascam DA-88 digital recdr w/remote excel cond, less than 600 hrs, recently serviced, $3400. J Range, Sing Studio, 8241 N Mariposa St, Fresno CA 93720. 209-436-4749.

360 Systems Digicart II digital recorder (2), Series 2500 w/1 gig hard disc, excel cond, $2995 ea. D Brown, KALS, POB 9710, Kalispell MT 59904. 406-752-5257.

Ampex 350 mono FT (2), tube electr, $150 ea/$250 pr + shpg; ITC 850 stereo 7.5/15, $250 +shpg. B Glenn, KGDN, POB 3258, Tri Cities WA 99302. 509-783-8600.

Magnecord PT-6M 10.5 reel extention; PT6-8A 7" deck w/2 trk staggered heads; PT6-8N R/P electr for 8A; PT6-8 7" deck w/FT heads; PT6-R R/P electr for 6-R. All in 6' rack w/wheels, needs a lot of work. Eric Toline, 525 W Stratford Pl, Chicago IL 60657. 312-975-6598.

Otari MK3-2, nearly new in vgc, overhead meter style. C Springer, KLMR, POB 890, Lamar CO 81052. 719-336-2206.

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Ampex AG602, unmounted, $250; rackmount for 600 series, $30; (2) Samsonite cases, 600 series, mono, brown, gr cond, $50 ea; Samsonite case for 600 series, stereo, grey, gr cond, $50; 601 tube type in case, $200; (7) Ampex 7.5 ips alignment tapes, unused, $20 ea. BO; various used Ampex capstan & reel motors, working, as is, $50 ea; Microtran table top degausser, like new, $150; AL 500-2 recorder, as is, $100; (2) AG440A mono FT, as is, $150 ea; AG440 mono FT, play only, $100; Scully 282-4, 4 trk 1/2" tape, $800. Mel Crosby, 408-363-1646.

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Want To Buy

25 Hz tone board for ITC 850 r-r, must be in working cond. B Knight, WAQQ, POB 344, Chillicothe OH 45601. 614-775-2600.

Ampex 350 & 351 R/P electr, any cond, 2 trk heads for 350, 351, 440; Magnecord R/P electr PT6 & PT7, any cond. B Hatcher, 1591 Eldonlas Ct, Stone Mtn GA 30087. 770-498-7600, e-mail: Billhatcher@AOL.com.

MCI JH-110A 2-trk cabinet wanted. J Borden, 414-482-8954.

Ampex ATR100 taperecorders for parts. Circuit cards, heads, motors, machine parts, or electronic parts. Call 818-907-5161.

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5 kW	FM	1969	RCA BTF 5D	5 kW	AM	1977	RCA BTA 5L
10 kW	FM	1968	RCA BTF 10D	10 kW	AM	1974	CSI T-10-A
10 kW	FM	1971	Collins 830F-1B	25 kW	AM	1982	CSI T-25-A
10 kW	FM	1976	RCA BTF 10E	50 kW	AM	1978	Harris MW50C3
20 kW	FM	1974	Collins 831G2/Cont 816R2				(1100 KHZ)
20 kW	FM	1968	RCA BTF 20E				

1077 Rydal Road #101, Rydal PA 19046
800-441-8454 • 215-884-0888 • FAX No. 215-884-0738
IF YOU WISH TO CONTACT OUR HOME PAGE,
WE ARE AT WWW VOICENET.COM/~TRANSCOM
IF YOU WISH TO E-MAIL US, WE ARE AT TRANSCOM@VOICENET.COM

Circle (131) On Reader Service Card

MARATHON PRODUCTS COMPANY

Audio Cartridge Rebuilding Division

Rebuilding/reloading, like new, all brands, any length up to & including 3.5 minutes, $2.05 for Standard Tape, $2.25 ea. for HOLN Tape. FOB out plant, 48 hrs delivery. (New rate effective 3/1/96)

New NAB Marathon cartridges prices on request.

35 Years professional experience!
Lifetime member AES R.D. MYERS Sr.
Manufacturers of Audio Devices, Continuous Tape Mag.
69 Sandersdale Rd. Charlton, MA 01507
1-508-248-3157 or 1-508-853-0988

Circle (130) On Reader Service Card

WHEN YOU'VE GOT SOMTHING THIS GOOD, YOU CAN'T HELP BUT BLOW YOUR OWN HORN!

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.

- Soild 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
752 Warren Street, Hudson NY 12534
518-828-1690
FAX: 518-828-8476

Circle (22) On Reader Service Card

World Radio History

TUBES

Want To Sell

Econco 5CS1500B newly rebuilt & never used. C Springer, KLMR, POB 890, Lamar CO 81052. 719-336-2206.

Svetlana
ELECTRON DEVICES

Quality* Power Tubes

3CX2500A3	4CX15,000A
3CX2500F3	4CX15,000J
3CX2500H3	4X150A
3CX3000A7	5CX1500A
3CX3000F7	5CX1500B
3CX10,000A3	572B
3CX10,000A7	5U4G
3CX10,000H3	6550B
3CX15,000A3	6550C
3CX15,000A7	6AS7G
3CX15,000H3	6BM8
4CX250B	811A
4CX250BC	833A
4CX250BM	833C
4CX250R	EL34
4CX350A	SV811-3
4CX350AC	SV811-10
4CX400A	TH5-4
4CX800A	TH5-6
4CPX800A	TH6-3
4CX1500A	TH6-3A
4CX1600B	YC130/9019
4CX1600U	8560AS
4CX3500A	SK300A
4CX5000A	SK1300
4CX10,000D	SK1320

- Watch this list grow.
- Shipment from USA stock.
- Manufactured in Russia's largest power tube factory.
- Generous* warranty based on high quality.
- Honest prices based on quality at low cost.

Broadcasters
Phone: 800-239-6900
205-882-1344
FAX: 205-880-8077

OEMs, Distributors
Phone US: 800-578-3852
Int'l & US: 415-233-0429
FAX: 415-233-0439

Circle (76) On Reader Service Card

EIMAC, AMPEREX, RCA 4CX250B, 4-400, 4-1000, 4CX300, 4CX350A, 807, 833, 3CX400A7. Westgate 800-213-4563.

FOR THE BEST PRICE
& 24 Hr service on transmitting tubes call Goodrich Ent Inc at **402-493-1886** day or night, FAX **402-493-6821**.

Premier Eimac® Remanufacturing

Have Your Power Tubes

Remanufactured by the Original Manufacturer

- Factory Processing
- Factory Testing
- Original Specifications
- New-Tube Warranty

Worldwide Availability Through Richardson Electronics, Ltd. (708) 208-2200

Call 800-414-8823
Int'l. (415) 592-1221
or Fax 415-592-9988

CPI
Communications & Power Industries
Eimac division

Circle (108) On Reader Service Card

D and C Electronics Co.

Lowest Price on Tubes including:
4-1000A/3-1000Z/
8877/4CX250B/833A
4-500/5-500/4-400/
4CX 3500/5CX1500
and much more!
Factory Warranty!

1-800-881-2374
(352) 688-2374

Se habla Español
FAX: (352) 683-9595

REBUILT ELECTRON TUBES

Partial List: 6623, 23791, TH150, 6425F, 6427, 8550, 6804, 6696, 6697, 5681, 5682, 5671, 7804, 3CX10,000H3, 3CX20,000H3, 4CX5000A, 4CX35,000C

Worn out power tubes purchased

Vacuum Tube Industries, Inc.
1-800-528-5014
508-584-4500 X75

ECONCO
Quality Rebuilt Tubes
Approximately ½ the Cost of New
Call for Our Price List
800-532-6626
916-662-7553
FAX 916-666-7760

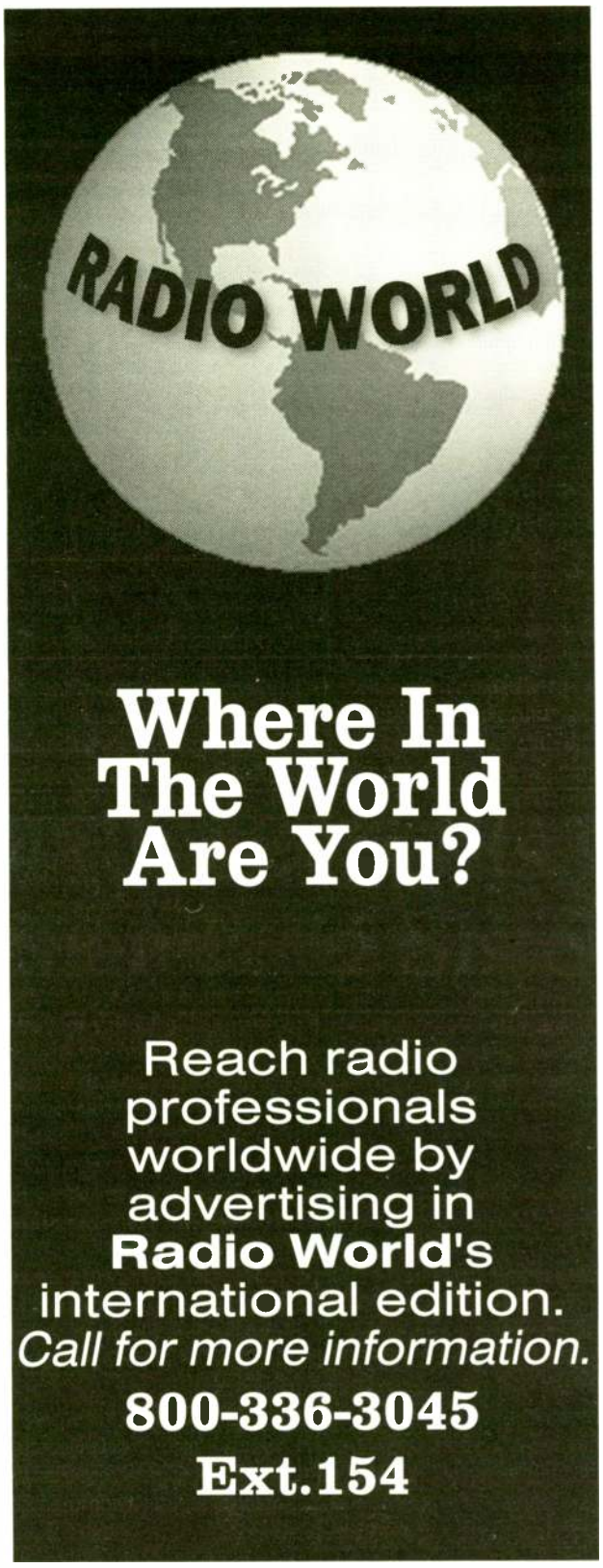
Circle (134) On Reader Service Card

TURNTABLES

Want To Sell

Kenwood KD2055 belt drive, vgc, $25. P Beckman, WTVK, 3451 Bonita Bay Blvd #101, Bonita Springs FL 33923. 941-498-4600.

Microtrak 740 (2), $50 ea. D Rose, KDUC, POB 250, Barstow CA 92312. 619-256-2068.



EMPLOYMENT

To place ads in this section, use the ActionGram form. To respond to box numbers write Radio World, PO Box 1214,

HELP WANTED

RF/AF Systems Engineer

Applicant should have a minimum of 5 years major market radio experience.Technical skills should include a strong background in high power directional AM and FM RF systems with the ability to troubleshoot to the component level. Applicant should hold an ASEE degree or equivalent. SBE certification a plus. No phone calls please. Send resume and salary requirements to: Tom Cox, Chief Engineer, KFMB AM/FM, 7677 Engineer Road, San Diego, CA 92111. EOE

Regional Engineers

James Ingstad Broadcasting, a top small & medium market radio company, is currently seeking regional chief engineers to handle groups located around the upper midwest. Applicants should have an in depth background in high power RF, studio equipment, facility design, installation, computers, and digital audio. You need to be self motivated with good communication and organization skills. This is an excellent opportunity for you to get involved with a fast growing broadcast company! Salary and benefits open. Send resume & references to: Engineering, 1807 Lee Blvd., N Mankato, MN 56003 or call (507)388-2900 for more details. EOE

POSITIONS WANTED

25 year pro seeking operations mgr or general mgr position, goal is to own my own station, looking for opening in Southeast. Ed 515-432-9466.

Afternoon air talent for #1 radio station in Gallup NM avail immediately. K Garrett, 505-722-4442.

Multi-year radio veteran seeks position, preferably in the Southeast, positions held include everything from announcer to GM. Jim, 919-523-0592.

15 yr pro Keven Hilley avail now to jumpstart your morning show, fun, great phones & team player, willing to relocate. T&R, 717-944-7673.

Afternoon air talent for #1 radio station in Gallup, NM, avail immediately. K Garrett, KXTC, 2495 E Aztec, Gallup NM 87301.

Creative personality & outgoing broadcaster ready to start ASAP, looking to get into sports, on-air, etc. Jay, 405-787-5736.

Grant writer & consultant to producers & stations. Develop, enhance & fund training, news/arts/public affairs, programs, equipment, special events. Betsy Lenke. 212-929-1231.

Studio/xmtr plant construction, directional antennas repairs, construction & proofs. 412-942-4054.

Young, enthusiastic graduate ready to use skills & training to bring you a different angle & personality. Greg. 405-964-5169.

For details on space availability contact Simone at 1-703-998-7600 Ext.154

Radio World®

Call Simone Mullins, Classified Ad Manager, to reserve space in the next issue. Use your credit card to pay, we now accept VISA and MASTERCARD.

5827 Columbia Pike, 3rd Floor Falls Church, VA 22041 • PHONE: 703-998-7600 Ext.154• FAX: 703-998-2966

Select from these categories for best ad positioning:

- Acoustics
- Amplifiers
- Antennas & Towers & Cables
- Audio Production (Other)
- Brokers
- Business Opportunities
- Cart Machines
- CD Players
- Computers
- Consoles
- Disco-Pro Sound Equip.
- Financial Services
- Leasing
- Limiters
- Microphones
- Miscellaneous
- Monitors
- Receivers & Transceivers
- Recorders
- Remote & Microwave Equip.
- Repair Services
- Satellite Equipment
- Software
- Stations
- Stereo Generators
- Tapes, Carts & Reels
- Tax Deductable Equipment
- Test Equipment
- Transmitter/Exciters
- Training Services
- Tubes
- Turntables
- Positions Wanted
- Help Wanted

Classified Advertising Rates Effective January 1, 1996

	1x	3x	6x	12x
1-9 col inch (per inch)	$65	62	58	52
10-19 col inch (per inch)	59	56	52	47
Distributor Directory	100	95	90	85
Professional Card	70	64	59	53
Classified Line Ad		$1.95 per word		
Blind Box Ad		$15 additional		

To compute ad costs: Multiply the number of ad inches (columns x inches) by the desired rate schedule for your per unit cost. Example: a 3" ad at the 1x rate is $195, at the 3x rate $186, at the 6x rate $174, at the 12x rate $156, etc.

World Radio History

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

ACTION-GRAM

EQUIPMENT LISTINGS

Radio World's Broadcast Equipment Exchange provides a FREE listing service for radio stations and recording studios only. All other end users will be charged. Simply send your listings to us, following the example below. Please indicate in which category you would like your listing to appear. Mail your listings to the address below. Thank you.

Please print and include all information:

Contact Name _____
Title _____
Company/Station _____
Address _____
City/State _____
Zip Code _____—_____
Telephone _____

Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Broadcast Equipment Exchange on a **paid** basis. Line ad listings & display advertising are available on a per word or per inch basis.

I would like to receive or continue receiving **Radio World** FREE each month. ❑ Yes ❑ No

Signature _____ Date _____

Please check only one entry for each category:

I. Type of Firm

☐ D. Combination AM/FM station ☐ F. Recording Studio
☐ A. Commercial AM station ☐ K. Radio Station Services
☐ B. Commercial FM station ☐ G. TV station/teleprod facility
☐ C. Educational FM station ☐ H. Consultant/ind engineer
☐ E. Network/group owner ☐ I.Mfg, distributor or dealer
☐ J.Other _____

II. Job Function

☐ A. Ownership ☐ G. Sales
☐ B. General management ☐ E. News operations
☐ C. Engineering ☐ F. Other (specify)
☐ D. Programming/production _____

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
_____
_____
_____
Price: _____

*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

Broadcast Equipment Exchange
PO BOX 1214, Falls Church, VA 22041 • Tel: 800-336-3045 • Fax: 703-998-2966

SUBSCRIPTION/READER SERVICE FORM

Radio World

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

☐ D. Combination AM/FM station ☐ F. Recording Studio
☐ A. Commercial AM station ☐ K. Radio Station Services
☐ B. Commercial FM station ☐ G. TV station/teleprod facility
☐ C. Educational FM station ☐ H. Consultant/ind engineer
☐ E. Network/group owner ☐ I. Mfg, distributor or dealer
☐ J. Other _____

II. Job Function

☐ A. Ownership ☐ G. Sales
☐ B. General management ☐ E. News operations
☐ C. Engineering ☐ F. Other (specify)
☐ D. Programming/production _____

Reader Service

June 26, 1995 Use until September 26, 1996

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

001	023	045	067	089	111	133	155	177	199
002	024	046	068	090	112	134	156	178	200
003	025	047	069	091	113	135	157	179	201
004	026	048	070	092	114	136	158	180	202
005	027	049	071	093	115	137	159	181	203
006	028	050	072	094	116	138	160	182	204
007	029	051	073	095	117	139	161	183	205
008	030	052	074	096	118	140	162	184	206
009	031	053	075	097	119	141	163	185	207
010	032	054	076	098	120	142	164	186	208
011	033	055	077	099	121	143	165	187	209
012	034	056	078	100	122	144	166	188	210
013	035	057	079	101	123	145	167	189	211
014	036	058	080	102	124	146	168	190	212
015	037	059	081	103	125	147	169	191	213
016	038	060	082	104	126	148	170	192	214
017	039	061	083	105	127	149	171	193	215
018	040	062	084	106	128	150	172	194	216
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021	043	065	087	109	131	153	175	197	219
022	044	066	088	110	132	154	176	198	220

Copy & Mail to: Radio World, PO Box 1214, Falls Church, VA 22041, or FAX to: 703-998-2966

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This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

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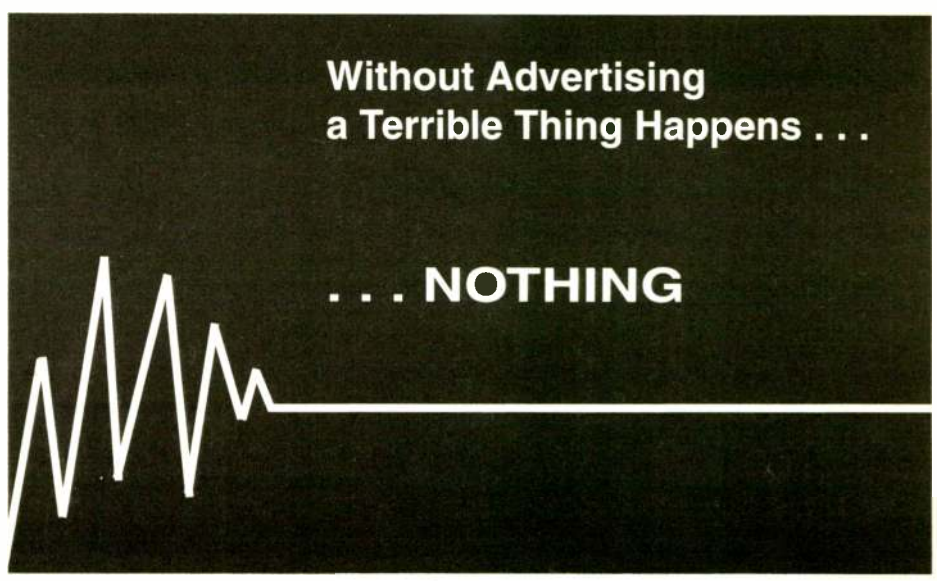
Publisher ..... Stevan B. Dana
Associate Publisher ..... Carmel King
Production Director ..... Lisa Stafford
Publication Manager ..... Heather k. Heebner
Classified/Showcase Production Coordinator ..... Vicky Baron
Ad Traffic Coordinator ..... Kathy Jackson
Production Assistant ..... Trina Masters
Production Assistant ..... James Cornett
Ad Coordination Manager ..... Simone Mullins
Circulation Director ..... Eleya Finch
Circulation Manager ..... Steven Bowman
Accounts Receivable ..... Steve Berto

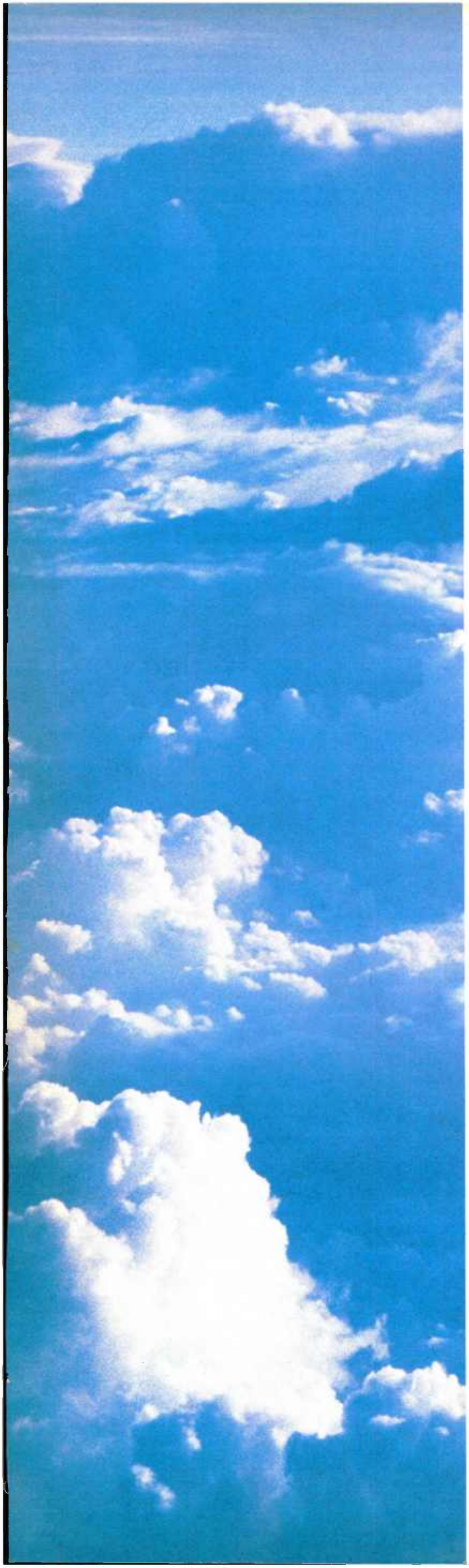
Advertising Sales Representatives

U.S.East: Skip Tash ..... 703-998-7600 Fax: 703-998-2966
U.S. West: Dale Tucker ..... 916-721-3410 Fax: 916-729-0810
U.S. Midwest: Sandra Harvey-Coleman ..... 317-966-0669 Fax: 317-966-3289
International: Stevan B. Dana ..... +1-703-998-7600 Fax: +1-703-998-2966
Europe: Dario Calabrese ..... +39-2-7030-0310 Fax: +39-2-7030-0211
Japan: Eiji Yoshikawa ..... +81-3-3327-2688 Fax: +81-3-3327-3010

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.



World Radio History



The Auditronics 801 Clean Air Policy.

What we surround ourselves with says a lot. The Auditronics 801 series says you won't settle for anything less than pure, seamless audio. More standard features than the others. Tomorrow's technology with the freedom to add options. The 801 says you know that when you own the best, the sky's the limit. Write or call for a free brochure.

The Sound Of Perfection

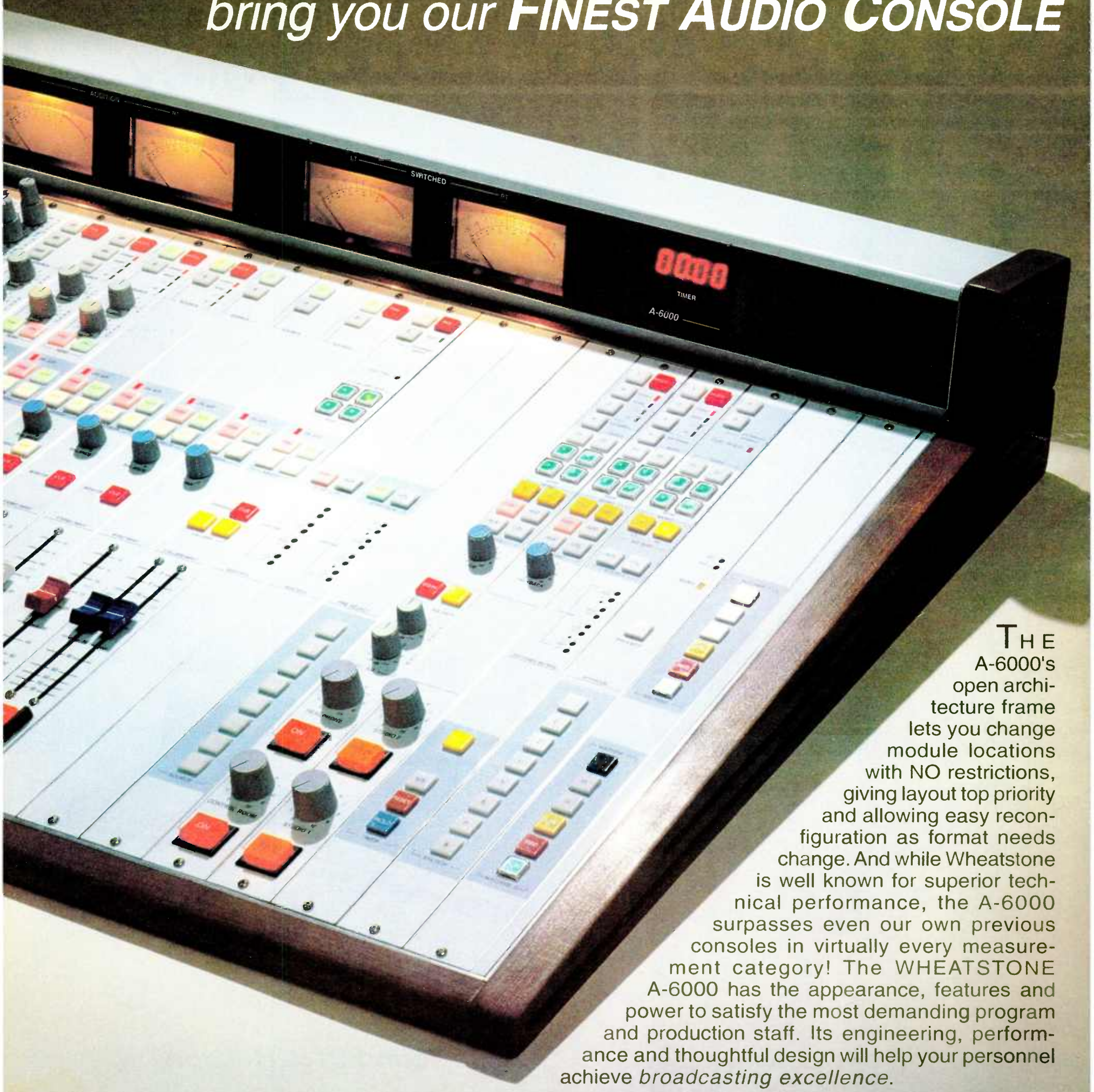
AUDITRONICS®

3750 Old Getwell Road, Memphis, TN 38118
901-362-1350, FAX: 901-365-8629

Circle (36) On Reader Service Card

World Radio History

*We've taken **all** we know, **all** you've asked for, and the very **best** of today's technology to bring you our* **FINEST AUDIO CONSOLE**



THE A-6000's open architecture frame lets you change module locations with NO restrictions, giving layout top priority and allowing easy reconfiguration as format needs change. And while Wheatstone is well known for superior technical performance, the A-6000 surpasses even our own previous consoles in virtually every measurement category! The WHEATSTONE A-6000 has the appearance, features and power to satisfy the most demanding program and production staff. Its engineering, performance and thoughtful design will help your personnel achieve *broadcasting excellence.*

A-6000 BROADCAST CONSOLE

7305 Performance Drive, Syracuse, NY. 13212
(tel 315-452-5000 / fax 315-452-0160)

Wheatstone Corporation

Circle (14) On Reader Service Card

World Radio History