

Industry Reacts to DAB Reversal

Eureka Still In the Game

WASHINGTON Although the NAB's endorsement of in-band digital audio broadcasting (DAB) seems to spell the end of its negotiations with Eureka, narrowband tests to be conducted in Germany this spring mean that the consortium still cannot be ruled out as a player in the race for DAB in the U.S.

In Germany, Egon Meier-Engelen, a section head with the German Aerospace Research Establishment and managing director of the Eureka consortium, confirmed that hardware tests for a narrowband DAB system will be take place this spring in Hanover.

The system works within a 270 kHz bandwidth, according to Meier-Engelen. It cannot be tested in the FM band, however, so tests will be conducted in the VHF spectrum of 223-230 MHz, he said.

Meier-Engelen stressed that the narrowband system was not developed as an in-band FM DAB solution, but

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Proponents Applaud Board Action

by Alex Zavistovich

WASHINGTON Not surprisingly, the NAB Joint Board's recent decision to pursue development of in-band digital audio broadcasting (DAB) has been greeted enthusiastically by industry insiders.

At its annual winter meeting in La Quinta, Calif., the NAB board adopted an in-band DAB strategy outlined by the DAB Task Force that would push for a national standard, accommodate current AM and FM broadcasters, prevent "economic dislocation" of those broadcasters and oppose satellite distribution of DAB.

The decision can be considered a victory for in-band advocates, who had criticized the NAB for attempting to negotiate a licensing agreement for Eureka technology. Industry insiders speculate that the board's recommendation might represent an end to the bargaining.

No need to pursue

DAB Task Force Chairman Alan Box conceded that he "can see no need to pursue any further agreements with Eureka." At press time, however, the NAB had not officially confirmed that talks with the Eureka consortium had been suspended.

According to Box, the NAB board's in-band support "in a de facto way" means an end to negotiations between the NAB and Eureka. "Any negotiations for an L-band spectrum DAB system with Eureka will stop," he said.

Box noted that the decision to encourage in-band development does not necessarily eliminate Eureka as a player in the U.S. "Eureka is beginning to show interest in in-band DAB," Box noted (see separate story, this issue). He cautioned, however, that that statement "should not be interpreted as a willingness (on NAB's part) to enter negotiations."

In general, reactions among industry insiders to the NAB board's decision were decidedly upbeat.

Ron Strother, who has come out in favor of LinCom's in-band DAB system, commented, "As a proponent who has railed against the NAB over its Eureka stance, I congratulate (the NAB) on (its) new positioning."

Strother said he has always viewed the association as needing to be "an independent broker for the industry it represents. The NAB has made a sincere attempt to move toward that end."

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Bits and Pieces:
Digital Workstations and
Automation Gear in Buyers Guide, p. 31

Freeze Move Gets Support

by Lucia Cobo

WASHINGTON The NAB will have the support of many in the radio industry when it begins to lobby the FCC to freeze new FM station assignments and to review the FM allocations and licensing policies. There will be some broadcasters out there, however, who feel the effort is too late to be of any real significance.

At the association's board meeting in La Quinta, Calif. earlier this year, the Board of Directors voted to endorse a statement asking the Commission to review those policies, as well as directing the NAB staff to lobby the FCC and other governmental offices.

The board decided on the directive "in light of the current state of the broadcast economy and the advertising market, the significant growth in the number of radio stations and both industry and government recognition that past allocation and licensing policies have oversaturated the radio station marketplace."

Facing the music

Apollo Radio President Bill Stakelin believes the Radio Board is facing reality. "A lot of people are being set up for failure," he said. "The market cannot support the number of stations out there—thereby threatening the economic health of the industry."

Although some may label the NAB move as "protectionism," or a move to ensure that "the rich get richer," Stakelin would respond: "Anyone who would use that argument did not live through the last couple of years as a radio operator, or they

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Satellite Digital Offered

HONOLULU COMSAT Corp. is awaiting approval from the FCC for its planned international satellite digital audio distribution service.

If approved, COMSAT will offer its service for one-, four-, five-, seven- and 10-year lease periods on preemptible and non-preemptible arrangements with bandwidths ranging from 100 kHz to 72 MHz. Six-month special promotional rates already are being offered through September.

COMSAT filed its proposal with the FCC Jan. 10, and if approved, it would officially be established Feb. 24.

Unlike satellite DAB proposals, which is likely to be S-band and broadcast to special receivers, COMSAT's systems would be transmitted to small C- or Ku-band antennas at radio stations or cable head-end for retransmission.

The COMSAT technology was first demonstrated at the Montreux Radio Symposium in June 1991.

New Records Access at FCC

WASHINGTON The FCC has implemented the Records Image Processing System (RIPS), which was designed to provide quick and timely access to documents associated with Commission docket and rulemaking proceedings.

The new system was activated Feb. 3, and enables the user to tap into FCC scanned documents proceedings via optical imaging technology. Previously, most Commission documents viewing required users to request the hard copies from FCC clerks.

The new system also utilizes "index terms" to facilitate retrieval of stored images in computer terminals located in the FCC's docket

reference room. Users who still want paper copies of FCC-related documents can still get them via the copy contractor.

For additional information, call 202-632-6410.

AM RF Study Available

WASHINGTON The FCC has released a study assessing human exposure to RF radiation from AM towers. (RW columnists have already discussed some of the implications of this study, most recently Cris Alexander in the Feb. 5 issue.)

The purpose of the study, conducted by Richard Tell & Associates, was to investigate RF field exposures of tower climbers who

perform maintenance such as light replacement or painting.

"Data on such exposure should help the FCC advise broadcasters of transmitting power levels that would allow maintenance tasks to be performed while still preventing exposure of tower climbers in excess of recommended RF protection guidelines," the FCC said.

Prior research has indicated that the body can absorb significant RF radiation—especially at AM frequencies. The FCC study measurements were made using calculation of induced currents from a 1 kW antenna.

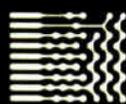
To get a copy of the study, contact the National Technical Information Service (NTIS) at 800-553-NTIS (order number: 92-125186), or the FCC's contractor at 202-452-1422 (order no. FCC/OET RTA 91-01).

DCC Introduction Delayed

VLAARDINGEN, Netherlands Philips has delayed its official public introduction of its new Digital Compact Cassette (DCC) decks from April to September.

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WCBS Escapes Fine for EBS Violation

by Frank Beacham

NEW YORK WCBS(AM), one of the nation's premiere network flagship radio stations, has escaped a fine for its failure to follow FCC-mandated emergency procedures during Hurricane Bob last August, but a small upstate New York AM station has been fined for the lesser violation of failing to keep proper logs of EBS tests.

The FCC's Field Operations Bureau (FOB) charged that WCBS did not follow proper EBS procedures during the hurricane. "It appears that WCBS personnel broadcast a taped version of the EBS two-tone attention signal instead of using the EBS encoder device for generation of the signals as required by the Commission Rule 73.940," Richard M. Smith, chief of FOB wrote WCBS on Jan. 13.

CBS officials admitted in October that the tape recording of the tone was off-speed when played back on an analog tape recorder and thus failed to trigger EBS receivers at Long Island stations that monitored WCBS, a CPCS-1 station, for emergency hurricane information.

A reprimand for CBS

"We are, by this letter, admonishing CBS for the failure of its personnel to abide by the requirements . . ." Smith told WCBS station management, warning that the FCC intends to levy fines to licensees who violate EBS rules in the future.

The future came quickly for WDOE(AM), Dunkirk, N.Y.

Chautauqua Broadcasting Corp. of Erie, Pa., the former licensee of WDOE (1 kW-D, 500 w-N) was fined \$1,250 for failing to record EBS tests on station logs between June 17, 1991 and Oct. 31, 1991.

WCBS was not the only CBS station that was involved in the Hurricane Bob incident. While the AM station forced N.Y.-area broadcasters to get hurricane information elsewhere because the recorded tones did not

trip EBS decoders, WCBS-FM chose not to participate at all with EBS. Like WCBS, WCBS-FM also is a designated CPCS-1 station and EBS monitors were tuned to its frequency during Hurricane Bob.

However, since EBS is voluntary, WCBS-FM's decision not to participate was not a violation of FCC rules, although EBS officials were critical of the station's performance.

Under a new system of penalties, the

"Their past history could be a mitigating circumstance. History is certainly a factor."

FCC can fine a station up to a maximum \$25,000 for playing pre-recorded EBS attention tones. However, no station has yet been fined for such a violation.

Asked why WCBS, which violated FCC rules in a real emergency situation, should be spared a fine while a small station is fined for less serious violations, Smith declined to answer. "I can't talk about specific cases until they are legally resolved," he said. "But in general there are a number of factors we are required to look at. It almost always boils down to some mitigating circumstance."

Past performance a factor

One possible mitigating circumstance in the WCBS case was past volunteer EBS work by network level executives at parent company CBS, who have committed air time, announcers, travel and personnel to voluntary national emergency tests.

Smith, in expressing confidence that WCBS has taken corrective steps against repeating EBS violations, said his trust "is based on our

past experience working with CBS personnel who have given many hours of volunteer work in developing the present EBS."

Asked if WCBS avoided a fine because of the good work of parent company employees, Smith said "their past history could be a mitigating circumstance. History is certainly a factor."

William Browning, chief of the FCC's EBS office, seemed frustrated in trying to reconcile the FOB actions regarding WDOE and WCBS. "You are trying to say that they are sticking it to the little guy and they are letting the big guy off scot-free. It looks like it in this case, but I don't think the whole thing is over yet. I don't know where it's headed, but you've picked up on an interesting story.

"This is hard for me at times," Browning continued. "Each case is different. There are so many different things that play into those decisions." When asked if politics is one of those things, Browning replied: "I'm sure it is, I'm sure it is."

While the FCC lavished praise for the network's prior EBS support, WCBS-AM and FM were seeking a way to decrease the amount of air time the two stations need to devote to EBS emergency announcements. The CBS stations requested and were granted the right to avoid a provision of New York's new EBS operational plan

which requires that emergency announcements be aired twice.

The "double tone-out" provision of the New York plan requires that stations repeat EBS messages to ensure that operating personnel monitoring down the line have time to properly record the emergency information. The CBS stations asked to use a single EBS attention signal tone followed by a one-time-only transmission of the emergency message.

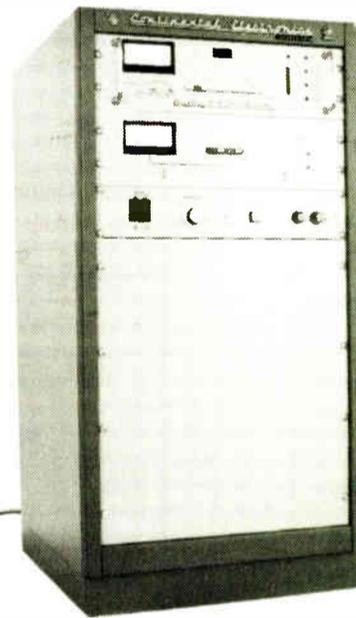
Although legal under FCC rules, such a procedure allows the station to use less than half the amount of air time than with the "double tone-out" method. This is less effective in conveying information in actual emergencies, EBS officials said.

New York EBS letters to WCBS stated that John F. Kelly, chairman of the N.Y. State Emergency Communications Committee, directed that the exemption be given to both the CBS stations. However, in an interview with *RW*, Kelly denied granting the exemption. He said it was approved by John W. Nelson, vice chairman of the committee.

Nelson disputed Kelly's claim that he made the decision. "Quite frankly I would not have allowed them to do it," he said. "If you have a plan everyone should stick with it."

CBS station managers requesting the changes in EBS procedures did not return calls regarding this article.

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You've Got to Read Between the Lines

by Alex Zavistovich

WASHINGTON Well, there certainly have been some interesting developments in the industry since we last met—developments that take some reading between the lines to appreciate fully.

Before we get into that, though, I've picked up some nuggets of news about people in the industry and what they're doing these days.

Pinnacle Broadcasting Co. has lost the services of Executive VP/Chief Operating Officer Scott Savage, who has resigned after less than a year. Savage was hired by Pinnacle in February 1990; he had been VP/GM of Texas State Networks in Dallas, Texas.

As a result of Savage's departure, Pinnacle has restructured its corporate operation. Edward Ferreri has been promoted to VP of operations and Chief Financial Officer. Scott Harris, of KLLL-AM-FM in Lubbock, Texas has accepted the position of VP of programming, while Roy Sova of WRNS-AM-FM has taken the role of VP of sales for the broadcasting company.

The board of directors of the Corporation for Public Broadcasting (CPB) recently re-elected five corporate officers. The board elects officers annually.

The re-elected members are Frederick DeMarco, senior VP for station relations and treasurer; Gene Katt, senior VP for programming; Paul Symczak, senior VP, general counsel and secretary; Gerald Hogan, VP of government relations; and Rozanned Weissman, VP of corporate communications. Meanwhile, CPB President Donald Ledwig continues to hold down the fort only until his successor has been appointed. No word yet on who that might be.

At National Public Radio (NPR), Michael Starling has been named director of technical operations for the organization's new Audio Engineering Division. Michael came to NPR as a senior engineer in 1989. He gained a Doctorate in Jurisprudence from the National University School of Law, and also has been an engineer at an FM station and the

general manager of an AM station.

Salt Lake City-based Bonneville International Corp. has named 16-year Bonneville veteran J. Talmage Ball as VP of engineering for the company. He replaces Bill Loveless, who recently passed away.

Group W Radio has named WNEW-FM VP and GM Ted Utz to the position of VP of programming and marketing for its three AOR stations: WMMR, Philadelphia; WLLZ, Detroit; and WNEW-FM, N.Y. In his new role, Ted will report to Group W Radio President Jim Thompson; he also will continue to serve as VP and GM at WNEW-FM until a successor is hired.



When Casey Kasem left American Top 40, he was replaced by Shadoe Stevens, as we all know. Now we've learned that another of the five finalists to replace Kasem, Arroe Collins, has touched down as mid-day personality at 95 Double Q/WAQQ, the Adams Radio modern CHR station in Charlotte, N.C. Arroe will produce "The Carolina Hit 30 Countdown" in addition to his other duties.

Finally, Donald L. Stoner, W6TNS, president of the National Amateur Radio Association (NARA), has written a book called "UPGRADE!" The book is designed for hams looking to upgrade from the "no-code" Technician Class to Tech-Plus and the General Class.

The book devotes one section to becoming Morse Code proficient; the remaining chapters discuss questions and answers in the pool of questions from which the General Class examination is drawn.

UPGRADE! can be ordered at all major amateur radio stores or directly from NARA. For more information, contact NARA at 206-869-8052, or fax them at 206-861-5780.

★★★

Remember the old saying about one hand not knowing what the other hand is doing? Well, events surrounding the NAB's recent board meeting in La Quinta, Calif., held true to that saying in two areas: in-band digital audio broadcasting (DAB) and the association's yearly budget.

Let's start with the board's decision to encourage in-band DAB development. A lot of people in the industry took that to mean an end to the NAB's licensing negotiations with Eureka.

I don't think it necessarily has to play out that way. DAB Task Force Chairman Alan Box has said only that negotiations for an L-band DAB system with Eureka have ended. Since the U.S. isn't getting L-band spectrum for DAB anyway, it's to be expected that those discussions would end.

But as far as the current status of the NAB's relationship with Eureka is concerned, no one at the NAB has officially said the two groups have stopped talking.

That's important to remember, especially when you add in what happened at the last Electronic Industries Association (EIA) DAB working group meeting about three weeks ago. From what I've been able to gather, the NAB pitched a proposal at that meeting that would require a single standard for both ter-

restrial and satellite DAB systems.

Only days earlier the board had recommended that, in addition to supporting in-band development, the NAB would strongly oppose satellite-delivered DAB. Now NAB staff is pushing the EIA to adopt a standard for the same technology its board voted to oppose.

What's going on?

Well, let's think about it. Which DAB proponent has hardware that can be used for a terrestrial as well as a satellite-delivered system? Eureka does. Maybe that's why no official word has come down about the NAB and Eureka parting ways. If a single standard were to be considered, Eureka would once again be a front runner in the race.

That's one possible reason why things with the German consortium still are up in the air. If Eureka is chosen as a standard, the NAB will not have closed the door on a licensing agreement. Meanwhile, if the waiting proves too much for the Eureka partners, they could pull out of the arrangement and the NAB will have saved face.

★★★

Besides the maneuvering going on in DAB, leaking of the NAB's 1992-'93 budget is another case where one of the association's hands was unaware of what the other was doing.

The NAB maintains that it does not release copies of its budget to the public or press, but some members of the media apparently were leaked the complete budget, judging by stories in two weekly publications that came out after the meeting.

According to NAB staff members, the budgets didn't come from them. Several staffers said they are instructed not to give out copies of the private association's annual budget. Apparently, individual radio and television board members leaked the reports.

"Frankly, it makes us angry," one staff member remarked. The staffer said that the numbers are nobody's business but the NAB's and pointed out that other communications association budgets are kept confidential. It seems that one or more of the joint board members don't feel the same way.

★★★

Before I sign off, one last item recently crossed my desk that was of considerable interest—it could be my ticket to radio stardom.

The NBC Radio Network has added a new daily feature to its programming called, "The Media Inside." Anchored by Ron Nessen, VP of news for Westwood One's Mutual Broadcasting and NBC Radio, the show will look at "members of the media who are making the news while covering the news." It sounds kind of like "Entertainment Tonight" for the "Nightline" set, or maybe "Lifestyles of the People Who Follow the Rich and Famous."

According to a statement from Nessen in a recent WWI press release, "Today, people in the news media are big-time stars, with big-time salaries. They are the subject of public interest and curiosity."

Hmm. Sounds good to me, Ron. Give me a call when it's my turn to be interviewed; I'll do my best to ease the curiosity of my many fans. Hey, it's the least we big-time media stars can do . . .

That's it for now. Tune in next time,

Alex

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A full plate of challenges

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I very much appreciate your tabloid and I use it a lot. I would like to see articles on the following subjects:

1. What range of services are offered by satellite for radio broadcasters? (Is it programming only or do any offer assistance with publishing tabloid matter pertaining to their announcers? What kind of sales/promotion assistance is given by each? What tends to be the difference between the satellite service's asking price and the price most stations really pay?)
2. Who are the satellite programming providers these days? (They sure don't seem to advertise much.)
3. What does the typical PD tend to do when the satellite supplier authorizes the same programming on two stations with overlapping coverage?
4. How well is the system for unattended-operation-with-a-motel-clerk-listening working for broadcasters? (I have been out of broadcasting for a few years and am concerned about how well this technology works and whether or not there are clashes with the FCC . . . and, how come I don't see such systems advertised in RW?)
5. What are the least expensive ways to have the studio phone number be on the local exchange of communities in your coverage area which are usually reached by long-distance? I have considered working directly with the telco but Telenexus links and others seem interesting.
6. With a few AMs going dark, how do the owners get the best deal on teardown of the towers? Can an ordinary salvage company be counted on to do the job safely? When a tower is torn down, which party would pay the other? How do you tell what all that iron is worth? What other salvageables would there be in an old AM station?
7. Hey, with all the satellite programming going on, and compressed signals, what does this mean to the possibility of small regional networks of radio stations sharing newscasts and sales abilities? I have not found anyone who knows anything about

8. How about a series of schematics for commonly used audio items (it would sure save me having to do a lot of math): Wein bridge 24 Hz oscillator using a 386 amp and having 1-volt out; 1-volt line amp; battery-operated mic preamp; t-notch filter; 24 Hz decoder; 24 Hz high-pass filter; a simple adjustable double-diode device (ghost powered) that limits the signal into a monitor amplifier to prevent DJs from turning the volume too high; lamp driver to make a VU meter for use on a billboard.
9. Please do a series on equipment for the handicapped in broadcasting. I know that people with special needs do not tend to like equipment made just for them. However, I find that special needs can force some very profitable innovation. (Any time the studio is an easier place to work, everyone reaps a benefit.) Start with a survey. Continue with a showing of the ideas.
10. What do you do when a switched power supply fails and there are no available parts? Will a couple of ordinary supplies do the job? How would you wire it up to get back on the air quickly?
11. Are there any new/good ideas for use of SCA signals on commercial FM? Has anyone fooled with the idea of dispatching concrete trucks and giving them printouts of the deliveries they must make?
12. What is the best kind of machine for winter mountaintop access? Is a two-tracked machine better than a snowmobile?
13. Has anyone tried anything really exotic to discourage mountaintop vandalism? Like loudhailer messages that explain the risk of getting too close to plexiglass bubbles on the sides of buildings that look like they cover cameras?
14. What really is the most popular modern microphone? What is the best microphone for doing production in the front seat of your sedan?
15. With the rules for program logs changed, how does a station prove what it did in categories like PSAs, newscasts, weather alerts, factory schedule changes for employees?
16. If a common owner is prohibited from owning both a radio station and a newspaper, then what businesses tend to work well together with a station? Is the definition of "newspaper" only dependent on a paper's second-class mailing privilege? If it is, then the station could be connected with a shop-
per or a "Coffee Partner News."

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Revive and survive

Dear RW,

One common denominator in letters written to RW seems to be dismay over the apparent decline of the radio broadcasting industry in our nation. Lamentably, it appears to be axiomatic that broadcasting is passing into a moribund stage, and we must ponder why this is so.

At the dawn of my career in 1970, radio

A Freeze Is Wrong

The NAB's recent move to freeze new FM licenses would be a relief to existing broadcasters suffering under decreased ad revenues this year. Unfortunately, a freeze based on a soft economic climate is inconsistent with this country's free enterprise system, and cannot be justified.

According to the NAB, the FM freeze was recommended "in light of the current state of the broadcast economy and the advertising market, the significant growth in the number of radio stations and both industry and government recognition that past allocation and licensing policies have oversaturated the radio station marketplace."

Many broadcasters, particularly those in major markets, have applauded the decision. They dismiss any notions of "protectionism" in the action. And yet, what else can it be called?

The FCC's FM Branch could not confirm whether all FM allocations in the table of allotments are filled. A report by the FCC, however, indicates that a certain number of these allotments are vacant, some with applications pending.

It cannot be said categorically, then, that the marketplace has been oversaturated. While many areas of the U.S. are undeniably "over-radioed," others remain underserved by terrestrial broadcasting. A freeze on FMs does these markets no good.

By precluding new FM licenses, the NAB has in effect said that diversity and the public interest can be served satisfactorily by existing stations. Yet every aspiring broadcaster turned away from the band is another voice that will never be heard.

It's a hard reality to face, but the possibility of failure is built into the concept of free enterprise. Stations that cannot compete effectively, for whatever reason, should be prepared for that eventuality.

Instead of a freeze, perhaps the FCC should offer tax incentives for marginally profitable FM stations to go off the air, as are to be offered to AM stations. In that way, stronger stations will remain, and fresh ideas can continue to be introduced. That is preferable to artificially altering competition by blocking the way for others.

The technical problems of markets in which the FM band is truly oversaturated should, of course, be addressed by the FCC. A freeze on new licenses, however, is not the answer. The only result that can be expected of such a freeze is a chilling effect on free enterprise.

—RW

was a fairly significant part of a person's life. There were actually radio personalities who, when making personal appearances, were fairly good "draws." The local radio stations all strived to provide full service and to become an integral part of the community. The "cookie cutter" formats were not yet in vogue as each station vied for a specific identity and uniqueness.

What I hear today, however, is a "homogenization" and universality of programming. You may travel from place to place, but you'll always be within range of a "Hot," a "Magic," a "Sunny," a "Rock," and of course, a "Morning Zoo."

Now lest I wax nostalgic, programming people—and to be sure some very educated and articulate ones—tell me that my opinions are based more on emotion rather than on intellect. People, I have been told, are "different" today. But are they?

If you truly believe this is so, allow me to suggest that you read Twain, Melville, Marcus Aurelius, Homer's "Iliad," or the Bible. See if, after scanning these literary works, you believe that the basic human wants, needs and motivations have changed at all in the 5,000 years of recorded human history.

People are the same, ladies and gentlemen. We all strive to attain that self-actualization goal on Maslow's hierarchy of human needs.

But several other factors have also, in my estimation, contributed to the present state of radio broadcasting. The abrogation of the anti-trafficking (or "three-year") rule for one, and the nefarious "Docket 80-90," provided an environment for the proliferation of speculative buyers of radio properties, who were little more than real-estate agents.

These people, in large part, cared little for our industry, but cared much for the hoped-for short-term gain. They would, as most of us are aware, operate a radio station "lean and mean" in order to improve bottom-line figures, often at an outrageous price not necessarily based on logic. Now, the company that made the purchase would then find itself in even more dire straits as it became

mired in high-dollar loan repayments, as well as the normal operating expenses.

This, as we all know, further exacerbated the problem as the station found it necessary to cut expenses even further, often through the elimination of positions and proper and customary maintenance expenditures. An employee would be called upon to perform "double duty" in order to pick up the slack.

Economically, this would seem to make sense. However, I might also suggest that a person's creativity diminishes when burdened with even more routine duties. This, through a ripple effect, in my opinion, has also been a contributing factor in our industry's decline.

What can we do to turn this trend around? Call upon the FCC to reenact the anti-trafficking rule, and force the applicant to provide a good faith showing of the desire to operate the station at some minimum standards (as it was once required).

I say to the businessmen of America: Stem the tide of short-term investment and return to the days when American companies were in it for the long run (it is evident that the Japanese and Germans are aware of the wisdom of this).

No, I am not advocating a return to the "good old days" of radio necessarily. I desire, and believe we need, all the programming creativity and American technology our nation can provide. We need an infusion of imaginative new blood in our business to draw people back to us.

What we need is active community involvement and not self-serving remote broadcasts from "La Cantina" in Caracas—who cares? I say, move your entire morning show to a popular restaurant somewhere in your city, and not in a sterile theme park location laden with out-of-town tourists.

Folks, I am very concerned about our business and my chosen walk of life. We have got to stop the lamentations and act. Our industry is circling the drain and only courageous action can plug it.

Dennis L. Sloatman
WPRD(AM)/WMGF(FM)
Orlando, Fla.

Radio World

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**Next Issue of
Radio World
March 11, 1992**

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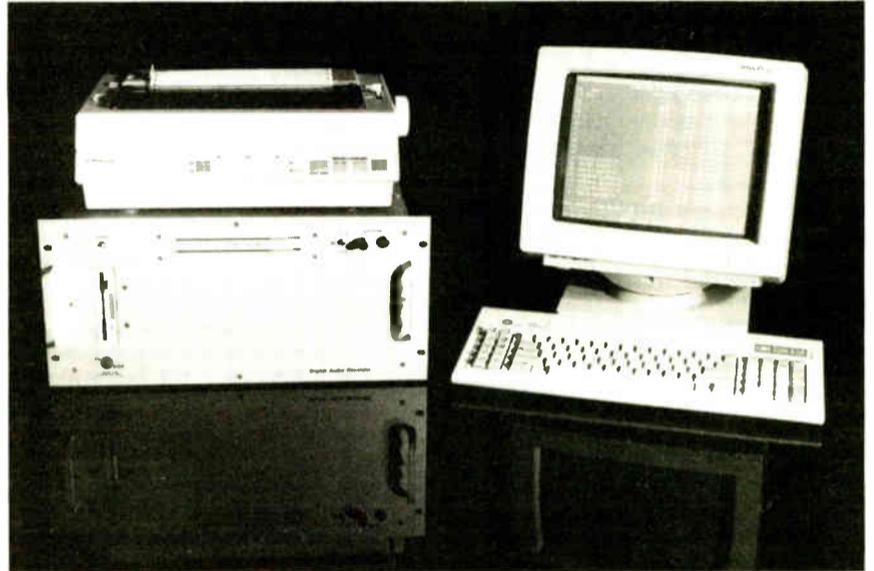
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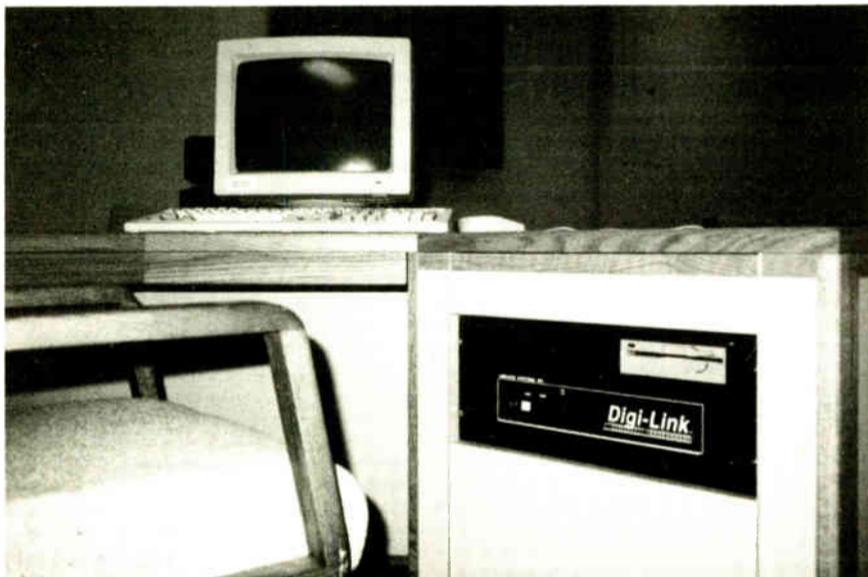
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Early Winter Ice Storm Brings Down Nebraska Station Tower

by John Gatski

WEST POINT, Neb. Having learned a valuable lesson from a freak ice storm last year that toppled its antenna mast and top tower section, KWPN-FM has decided to go with a "no stick" antenna on its new structure.

Station President Dave Kelly said the Nov. 29 tower collapse forced the station to invest about \$65,000 to rebuild the tower, strengthen it and secure the new Teflon-coated two-bay ERI FM antenna on a mast-less mount.

Prior to the mishap, the station was transmitting strong 3 kW FM and 5 kW AM signals from the tower and had been operating with no problems.

"It began to rain very early in the day," Kelly said. "The problem was that it was only 30 degrees."

As the day progressed, the weather wor-



An ice storm brought down KWPN's top tower section and antenna, but only slightly damaged the transmitter building.

Photo by West Point news

sened, with the wind picking up and ice accumulating on the 312-foot tower and the two antennas. Although Nebraska is an area that is prone to ice storms, severe ones are not that common, Kelly said.

AM troubles

Trouble signs began first from the AM side as the three-wire folded unipole's impedance fluctuated in the wind, causing the signal to become intermittent as the transmitter repeatedly shut off.

Finally, as the wind and the built-up ice (about four inches) took their toll, the 18-foot FM antenna mast's swaying overstressed the tower. The bolts holding the top 20-foot tower section broke and three guy wires anchoring the top of the tower also snapped, sending the mast/tower section tumbling to the ground. The falling metal and ice just barely missing the transmitter building.

"It could have killed both transmitters. We were lucky in that respect," Kelly said.

Without the guy wires, the rest of tower was leaning and unstable. Throughout the next week, workers from the tower installer, Utility Tower, and station engineers decided to bring the rest of the tower down in a "calculated fall" Kelly said.

Salvaging the tower

To get the station back on the air, the bottom 80 feet of the tower was salvaged and re-erected. Workers fed the transmission

line to a one-bay ERI backup antenna, which adequately covered about 75 percent of the listening area, Kelly noted.

The AM, however, was not in as good

The Nov. 29 tower collapse forced the station to invest about \$65,000 to rebuild the tower...

shape. KWPN was forced to string a long-wire "clothesline" set up that would not match with the solid state transmitter because of a reactance problem. Kelly said the engineers had to use the back-up tube transmitter and the coverage was drastically reduced.

The new tower now being constructed will be the same height, but will have no antenna mast. Instead, the new two-bay ERI will be faced mounted to the tower. The AM will be mounted at the same height as it was on the previous tower set up.

Kelly said he did not fault the tower company because the tower was installed according to station specifications, and it was built to take winds up to 90 mph.

But, he added, the station has learned its lesson: You have to plan for the "worst case" situations—even though they may never occur.

Ways Not to Be Nice to Ice

by John Gatski

WASHINGTON Almost any radio station in the country could potentially be at risk of tower icing, except stations in the tropical areas such as south Florida or Hawaii.

Over the years a variety of products and maintenance techniques have been developed to help stations avoid the costly damage that KWPN and other stations have sustained over the years. However, nothing will work 100 percent of the time if the weather is bad enough.

According to NAB Engineer Kelly Williams, a station's first priority is to have the tower and antenna inspected annually—especially in bad weather areas—to minimize chances of a structural failure during ice or wind storms.

Stainless Tower VP of Sales Owen Ulmer said minimizing ice damage potential needs to begin during the tower/antenna planning stages.

"Make sure the tower exceeds EIA standards in your design specifications," Ulmer said. "The EIA standard does not take ice into account."

Protection of the guy wire grip is considered vital and a variety of products are considered effective. Items such as the \$1.25 Crosby clip guy wire fastener may stop some of the ice from sliding off the wire and damaging the grip. The more-elaborate IceCracker cones were specifically designed for that purpose and work well, according to engineers who have used them.

Structurally, larger guy wires and welding on extra bracing to the tower legs can also add ice build-up stability to towers.

Paint-wise, some engineers said they painted their antennas black, which soaks up more heat from the sun, melting the ice quicker than other paints. There also is a special "hydrophobic" paint called Vellox, manufactured by M-Chem Corp. in Ayre, Mass. Vellox is said to repel water, which in turn means no ice accumulation.

Antennas have a few more options for deicing, most of which are made by the antenna manufacturers. The manufacturers make radome antenna covers, which are made of fiberglass, that keep ice from the antenna. Radomes, however, can increase wind loading, and tower size and strength may have to be increased.

Electrical deicers (heaters) that go inside the antenna elements are considered effective, but the tradeoffs are installation costs for running power to the antenna, higher power bills and more maintenance.

Teflon coating, "no stick" antennas are another solution. Just like the egg in a skillet, ice has a harder time sticking to teflon-coated elements, although the coating will eventually wear off and have to be reapplied. Many antenna companies, such as ERI and Jampro, will have their antennas teflon-baked if their customers desire the coating. Teflon coating can last as long as 10 years and works best in slight to moderate icing conditions.

Despite the many products on the market and a surplus of theories on how to beat ice build-up on towers, WHDH-TV Engineering VP Karl Renwanz said there is no magic cure.

Boston's Channel 7, which has a 1,000-foot tower, invested "tens of thousands of dollars" to beat the ice problems caused by the rough New England winters. The station has tried various paints, Vellox, screened mesh ice catchers, and even had MIT and Dartmouth scholars working on the project. The Dartmouth project suggested a vibrator might be the best approach, while the MIT researchers theorized a mechanical tower cleaner.

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In-Band DAB Proponents Applaud NAB

► continued from page 1

Still, Strother has some concerns about language in the DAB Task Force's strategy, particularly what is meant by "accommodating" AM broadcasters and what the NAB's plans are for "AM parity."

Protect the infrastructure

Ted Schober, founder of American Digital Radio, another in-band DAB system proponent, said he was "heartened that the NAB now sees that the way a system has to go is in-band. We have to protect the infrastructure of AM and FM radio."

Schober noted that "the spectrum of 88 to 108 MHz is the ideal broadcast band.

Any lower and you get ionospheric propagation effects; any higher and you notice shadowing effects and problems with obstructions of the signal."

Schober is concerned, however, that "someone will put up a DAB service on S-band satellites."

"A universal satellite service is not a good goal," said Schober. "You don't need it in the cities." A better application for satellite DAB would be to provide service to areas underserved by terrestrial broadcasting, he said.

Paul Donahue of Gannett Broadcasting, one of the proponents involved in USA Digital Radio's Project Acorn in-band DAB system, said the board's decision was posi-

tive. "The NAB has taken the right steps to endorse an in-band system; it could be the most beneficial system for existing broadcasters," Donahue said.

He noted, however, that the adjacent channel is not allocated to broadcasters. "It may be considered 'new' spectrum, unless you operate in the mask," Donahue said. "If so, it may be subject to some of the same problems as an out-of-band system." USA Digital Radio has been researching an in-band, on-channel system.

Appropriate for the industry

Randy Odeneal, a managing partner in Sconnix Broadcasting and a vocal in-band

advocate, said he was enthusiastic about the board's decision. "It's the appropriate direction for the industry to take," he said.

"An in-band DAB system would be the least disruptive to implement. If a system can be developed that works well, and is recognized as a noticeable improvement by the listener, broadcasters would benefit enormously," Odeneal said.

Odeneal remained confident that "L-band DAB won't work," and called the 1500 MHz region "inhospitable spectrum."

Still, he noted, "What's important is what is going to take place, not what has taken place. We have to look forward. Conceptually, in-band DAB is what's best for the industry."

For his part, Box still feels that one question remains unaddressed: "At what point do Eureka and American system proponents get together and talk?"

Box said such a meeting is logical. "At some point, they should put all their best patents on the table and see what happens."

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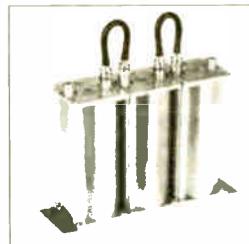
Tunable Notch Filter Type 6367

Standard Models 6367

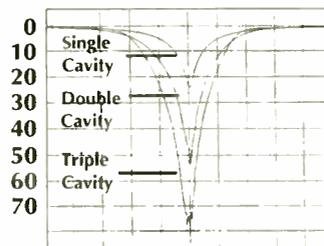


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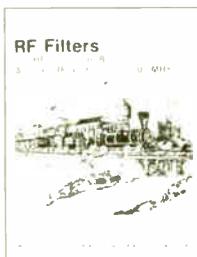
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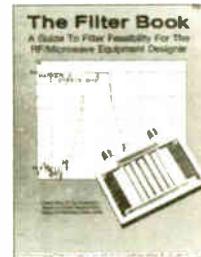
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NEWSWATCH

► continued from page 2

The official word from the Dutch electronics giant is that the music industry will not have enough pre-recorded software ready for the market by April.

The DCC technology allows users to record and playback digitally using the new medium and playback only of conventional analog cassettes. The technology is aimed at consumers and is considered an eventual replacement for the standard analog cassette.

The technology uses a compression scheme to conserve digital bits by using sound masking, a process said to be based on human hearing research that concludes that louder sounds mask softer sounds.

Patton Back in at Bonneville

NORTHBROOK, ILL. Bonneville International Corp. has announced the appointment of John Patton as president of Bonneville Broadcasting. Patton was president of Bonneville Broadcasting from 1981 to 1983.

Bonneville Broadcasting, a division of Bonneville International, develops and distributes music programming to radio stations throughout the U.S. and internationally.

From 1983 to 1992, Patton was president of Patton Broadcast Management and also spent some of his time managing KKHT in Houston and WKSG in Detroit.

HLTs To Be Phased Out

WASHINGTON The Federal Reserve Board joined the Office of the Comptroller of the Currency and the FDIC in approving the phase-out of the "Highly Leveraged Transaction" (HLT) definition and reporting requirement for banks.

The National Association of Broadcasters HLT Task Force, that spearheaded the lobbying effort, was led by Marlite Communications Chairman and CEO, Milton Maltz.

"We are extremely pleased with the steps it appears the administration and the banking agencies are taking to reopen the credit market for broadcasters," NAB President Eddie Fritts said in a press release. "The immediate recognition of cash flow criterion and the total elimination later this year of the HLT definition should go a long way to improve the broadcast lending climate."

TOP SECRET

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To: Ray Esparolini, Director of Sales
From: Gary Snow, President
RE: New Audio Console

Date: 11/20/91
To: Ray Esparolini, Director of Sales
From: Gary Snow, President
RE: New Audio Console

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Ray,

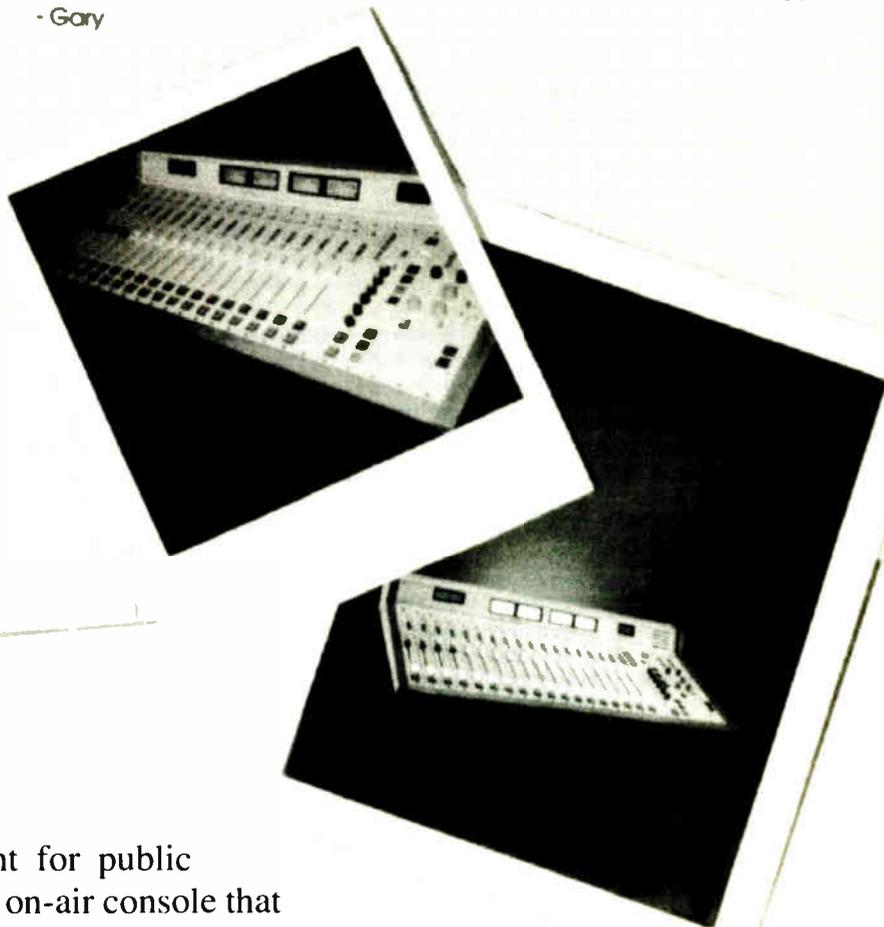
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Gary

- Gary

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World Radio History

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Engineers Skeptical of In-Band DAB

By Alan Carter

MUNICH, Germany Officials of the Eureka-147 digital audio broadcasting (DAB) project were not surprised that the NAB has backed away from supporting the European-developed transmission scheme in favor of an in-band solution.

But two leading engineers associated with Eureka-147 remained skeptical that U.S. developers can create a digital audio broadcasting (DAB) transmission system that will work in existing AM and FM frequencies.

The NAB Radio Board met in January

and adopted a position that in-band DAB development would be its main objective. The action comes one year after the board initiated negotiations for licensing rights to Eureka-147 in North America.

The NAB's support of Eureka's L-band created opposition from within the industry almost from the start. Some of the association's more powerful members, including Gannett and CBS, proposed their own in-band systems. More in-band schemes also surfaced during the year.

Speaking for himself and not Eureka, Dr. Georg Plenge, head of radio and TV sound engineering for the Institute für Rundfunktechnik (IRT) in Munich,

said he was not surprised at NAB's Radio Board decision.

The U.S. broadcast focus is different from Europe's, he said, because the U.S. considers DAB not as a replacement for AM and FM, but as a technology improvement.

Eureka, however, perceives DAB as an eventual replacement for AM and FM, and believes that using out-of-band technology, such as UHF spectrum, will work more effectively, according to Plenge.

Egon Meier-Engelen, a leading developer with the Eureka-147 team from the German Aerospace Establishment in Cologne, said project members were

aware this action could take place.

"This doesn't come as totally surprising," he said. "One year you are the favorite approach, and the next year others come up and throw you out of the race."

In defense of Eureka-147, Meier-Engelen said developers proved that the system works at L-band with tests in Canada, and reduced the bandwidth necessary for operation.

Meier-Engelen said he hoped the U.S. did not adopt "a marginal approach" to DAB because he does not believe an in-band system will be as robust or perform as well as Eureka-147.

He acknowledged Eureka-147 was initially developed based on the European broadcasting system but said engineers soon decided that there should be a worldwide DAB broadcasting scheme.

Eureka-147 is more flexible than originally designed, Meier-Engelen said, to accommodate concerns expressed by U.S. broadcasters, such as maintaining their tiered approach.

Whatever system the U.S. adopts, it will impact receiver development because the States are the largest consumer of radios in the world, Meier-Engelen said.

In hindsight, Meier-Engelen admitted that Eureka developers should have held more discussions with U.S. broadcasters, rather than with the NAB. He said NAB officials told them that if they moved quickly, the current situation with competing systems could be avoided.

Asked his opinion on the motivation of NAB to support Eureka-147 and to seek licensing rights, Meier-Engelen said, "We saw from the licensing terms that there was a definite idea (by NAB) to make some money. But of course we were happy to find a strong ally in the NAB."

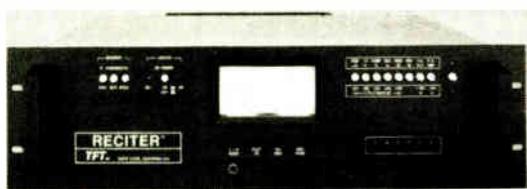
"It's disappointing they didn't have the stamina."

□□□

News Editor John Gatski contributed to this report.



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Sound Quality for 20 Years

Eureka Still in the Game

► continued from page 1

rather to compare the performance of wideband and narrowband systems. Eureka is proposing a wideband system for standardization, he said.

Although Meier-Engelen acknowledged that the technology "can be used in FM as an adjacent channel system," he pointed out problems in reducing the bandwidth requirements of the system to be compatible with U.S. allocations. Multipath-type problems begin to be experienced at narrower bandwidths, he said.

Other methods of reducing the bandwidth requirements suggest their own problems. Narrower bandwidth can be achieved, Meier-Engelen explained, by reducing the number of carriers, using lower bit rates for audio coding or adjusting error protection coding.

Asked whether Eureka's forthcoming narrowband tests will lay the foundation for an in-band, on channel (IBOC) system, Meier-Engelen said, "we don't have faith in such a system."

IBOC is too complicated to develop, Meier-Engelen said. It is too difficult to master problems of interference to the DAB signal in an IBOC system, he said—especially in a mobile environment in which reception is prone to frequency selective fading.

FM Freeze Gets Support

► continued from page 1

would realize how foolish the argument is." Rick Buckley, head of Buckley Broadcasting, believes the effort is futile. "The FM spectrum has already been damaged," Buckley said. "It is a noble position, but unfortunately it is not going to do anything for the industry."

Adding to the lateness of the effort, Buckley believes that the lobbying effort might not yield the expected results. "It is too late—the Washington establishment is not going to listen to the broadcasters anyway—they already think we are fat cats."

Any freeze to be considered, said Shamrock Broadcasting President Bill Clark, should be a temporary one. "I would generally favor this move at this time—in light of the current economic difficulties," he said. "But I'm hesitant to invite the government to exert authority to help alleviate economic conditions."

Clark hopes the industry leadership won't lose sight of the overall concerns of the medium. "Permanent structural changes are not something we should jump into without assessing our overall goals and direction."

Interference woes

The future viability of the industry is the main concern for engineers as well. Glynn Walden, director of engineering for Group W Radio, would like to see the FCC take care of the FM band. "If we continue to see packing of the dial, we will see erosion in coverage, and erosion in the quality of radio, and erosion of the listening public—in the long run," Walden said.

Interference problems exist in most markets in the country, he said. In Walden's estimation, the industry has already packed the FM dial. Broadcasters need to revisit the original interference guidelines, he said.

"The interference rules were written by geniuses. These are guys that knew what was

going on, and that you had to have 'X' amount of feet or miles between radio stations for them to work and not interfere with each other," Walden said. "So then we started shoehorning in more stations, and we say we are going to use directional antennas—but directional antennas don't work."

FM has become like AM, an interference-limited medium.

— Glynn Walden
Group W Director
of Engineering

The FM band is a "line of sight" medium, says Walden. "The only thing that protects one radio station from another is the curvature of the earth."

An example of the overpacked dial can be seen in the New York-Philadelphia-Jersey Shore triangle, says Walden. Jersey Shore travelers can now listen to some New York and some Philadelphia stations. "If they were to drop in more stations, the result will be something that refers back to the AM proceedings: 'islands of service in a sea of interference,'" said Walden.

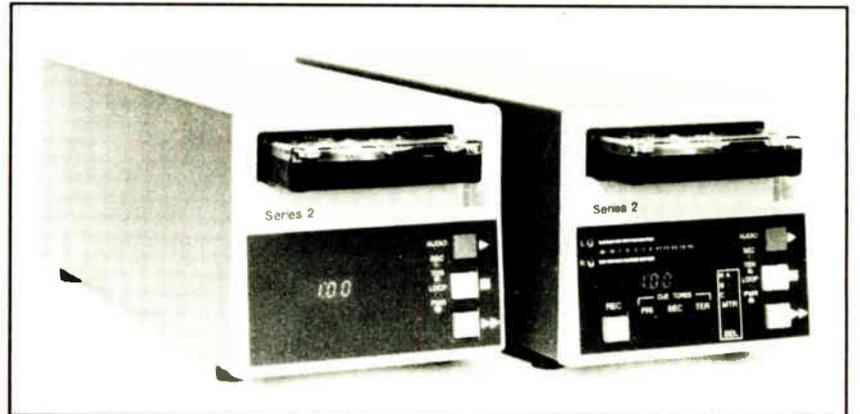
If the freeze is not put in place, what listenability there is to the FM band will be destroyed, according to Walden. "FM used to be a system that had clear reception within the coverage area. Now it has become like AM, an interference-limited medium," he said.

Don't forget DAB

Perhaps more importantly, future implementation of an in-band DAB system could be influenced by the state of the band. "All the DAB systems are going to be subject to the same interference requirements for clear reception that FM was," said Walden. "DAB coverage, particularly in the northeast, is directly related to the interference."

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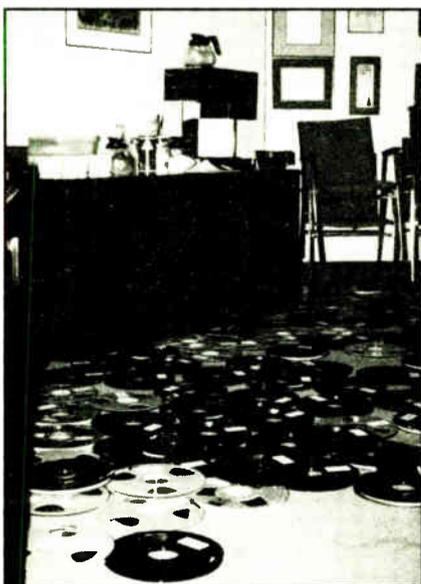


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Water Leak Soaks NPR Tapes

WASHINGTON The headquarters of National Public Radio (NPR) was busy drying out last month after a water main break flooded the basement and first floor of the downtown



Hundreds of NPR tapes had to be air-dried following a recent water main break.

office building.

The most serious damage was to NPR's tape archives, several hundred reels of which found themselves immersed in water during the flooding, which occurred Jan. 14. Water began flowing out of the main at about 5 a.m. and continued for most of the day.

A number of NPR's computers also were water damaged, as was some studio equipment. However, most of the network's transmission gear, including spare satellite equipment that was being stored on the third floor, was undamaged.

Despite the accident, NPR was able to broadcast its regular newscasts, as well as its daily newsmagazine, "Morning Edition," and daily classical music programming.

Other programs, such as the call-in show "Talk of the Nation" and "All Things Considered," were also fed on schedule.

As for the archive material, NPR officials were confident that there was little, if any, permanent loss. The network's meeting room was set up as an emergency drying area using portable heaters, fans and de-humidifiers.

PRODUCER'S FILE

Aphex Creates Compelling Audio

by Ty Ford

BALTIMORE As the pursuit of faster, louder and harder audio continues into the '90s, it's comforting to know that audio processing can actually keep getting better. There are, however, two sides to the progress.

On one side are the folks who use gain reduction to prevent transmitters from being over-modulated. They are being joined in increasing numbers by digital devotees who like to record as hot as possible to keep the bit rate maxxed

out for better definition.

On the other side are those who use compressors and limiters as effects boxes. For them, the fact that these boxes control dynamic range is secondary to the audible by-products they produce, namely pumping, thumping, breathing, hole-punching, clipping and thickening.

This affinity for processing by-products has even hooked the mainstream consumer. Years ago, when I was on the air at an AOR station, we used to get quite a few calls from listeners about our programming ploy of playing

a new album all the way through each weeknight at midnight.

Feeling a bit churlish one day, I asked a caller why he didn't go out and buy a copy of the album instead of ripping off the artist by taping it. To my surprise, the caller said he already had the album, but liked the way it sounded better when we played it on the air. Unknowingly, he was referring to "the secret sauce" I used in adjusting our station's audio processing.

It is just this kind of sauce that Don Werrbach and Marvin Cesar have been brewing at Aphex. In this month's edition of *Producer's File*, we'll take a look at the most recent version of the Compellor.

Three gain controls

The Compellor combines three different types of gain control in each channel: a high compression ratio, slow attack and release time leveler; a low

one-button toggling meter selector, front panel adjustment of leveling speed and new servo-balanced inputs and outputs with no output coupling capacitor.

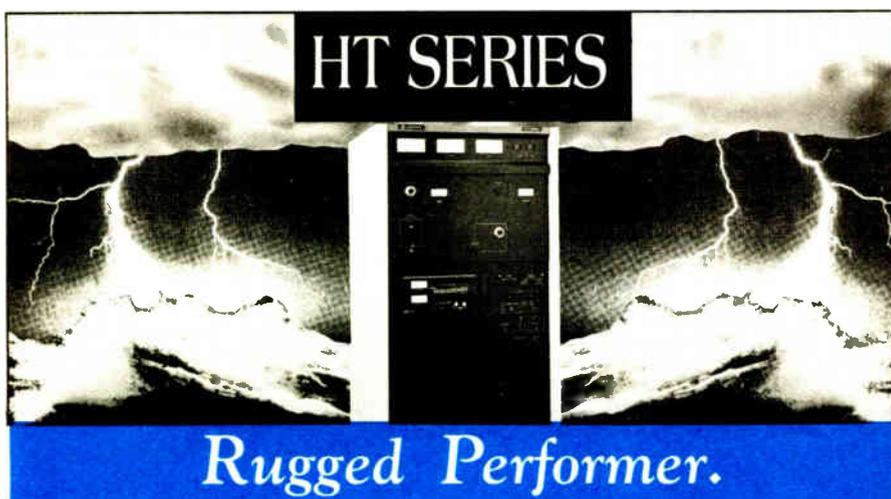
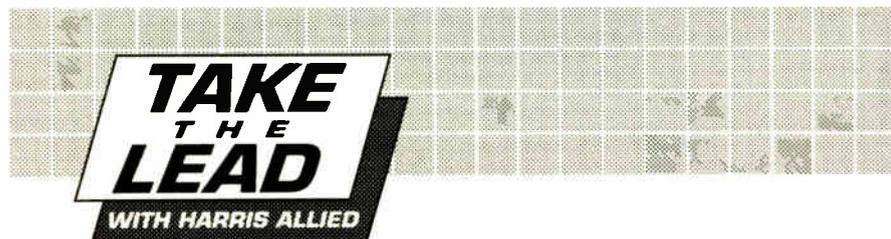
The new Compellor also allows leveling, coupling only or leveling and compressor coupling which come in handy for binaural and M-S recording. When in the "stereo enhance" mode, a little more gain reduction is applied to the stereo elements of the processed audio than to the mono elements, which tends to bring the stereo elements up in the mix.

Mechanical and structural improvements include a cooler running power supply with a new aluminum chassis, brighter LED displays and detented pots, which allow for a more exact repeated setting. The chassis doubles as a heatsink. All pots are now panel-mounted instead of mounted on the circuit boards.

Audible gain reduction

One of the major "complaints" from people who have tried the Compellor is that they can't hear it working. I could.

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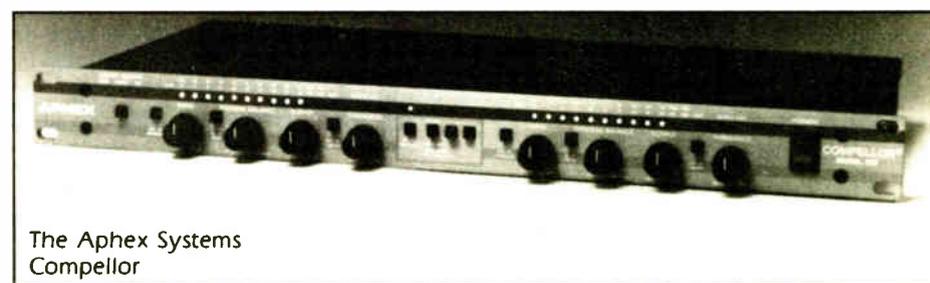


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Circle (119) On Reader Service Card



The Aphex Systems Compellor

compression ratio, faster attack and release time compressor; and a high compression ratio, fast attack and release time limiter.

The latest refinement of the Compellor has a number of improved features that increase its flexibility without changing the way it works. The two-channel chassis can be run either in stereo, dual channel mono, independent single-channel or in a back-to-back series configuration.

While modification of the earlier Compellor required access to the back panel and a bit of poking around inside, the new model has almost all adjustments on the front panel. The three-position operating level knobs and the new 600 Ohm output termination switches are the only adjustments that remain on the back panel.

If the Compellor loses power, the 600 Ohm termination is automatically lifted by the by-pass relay as it closes. Remote by-pass switching is possible via a rear-mounted RJ11 jack with tally light voltage.

Other modifications include a simpler,

quick "intelligent" circuitry, including the Dynamic Verification Gate, Dynamic Recovery Computer and Silence Gate, keep the by-products to a minimum—although I could definitely hear a decrease of dynamic range.

I began by processing a variety of audio (different types of music, voice only and DJ patter) through the Compellor and into my AKG DSE 7000 workstation. The peak metering of the DSE 7000 gave me an excellent visual reference for overall level and peak to RMS changes.

Visually it was very apparent that compression and limiting were occurring, but it took anywhere from 8 dB to 10 dB of gain reduction before I could really hear the "tightening" of the dynamic range. I tried this with classical and acoustic country production music CDs and "Hot Wire," my favorite KIX CD.

In all cases, the Compellor's capacity to bring up the lower level passages was dramatic. You might not notice this unless you know the dynamics of a particular

continued on page 26 ►

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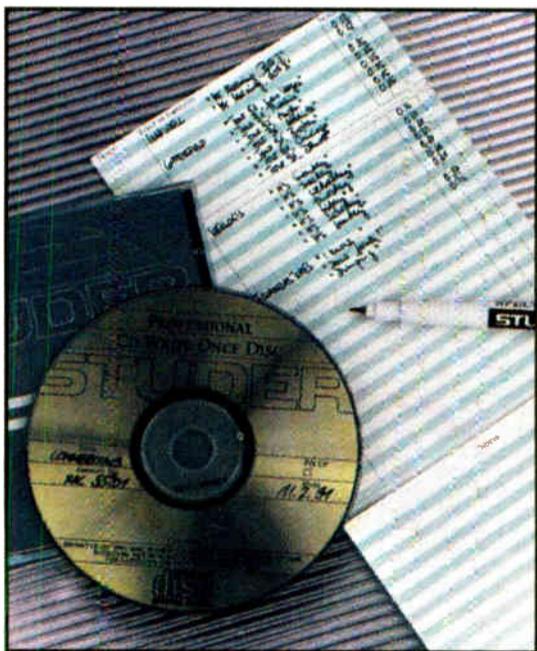
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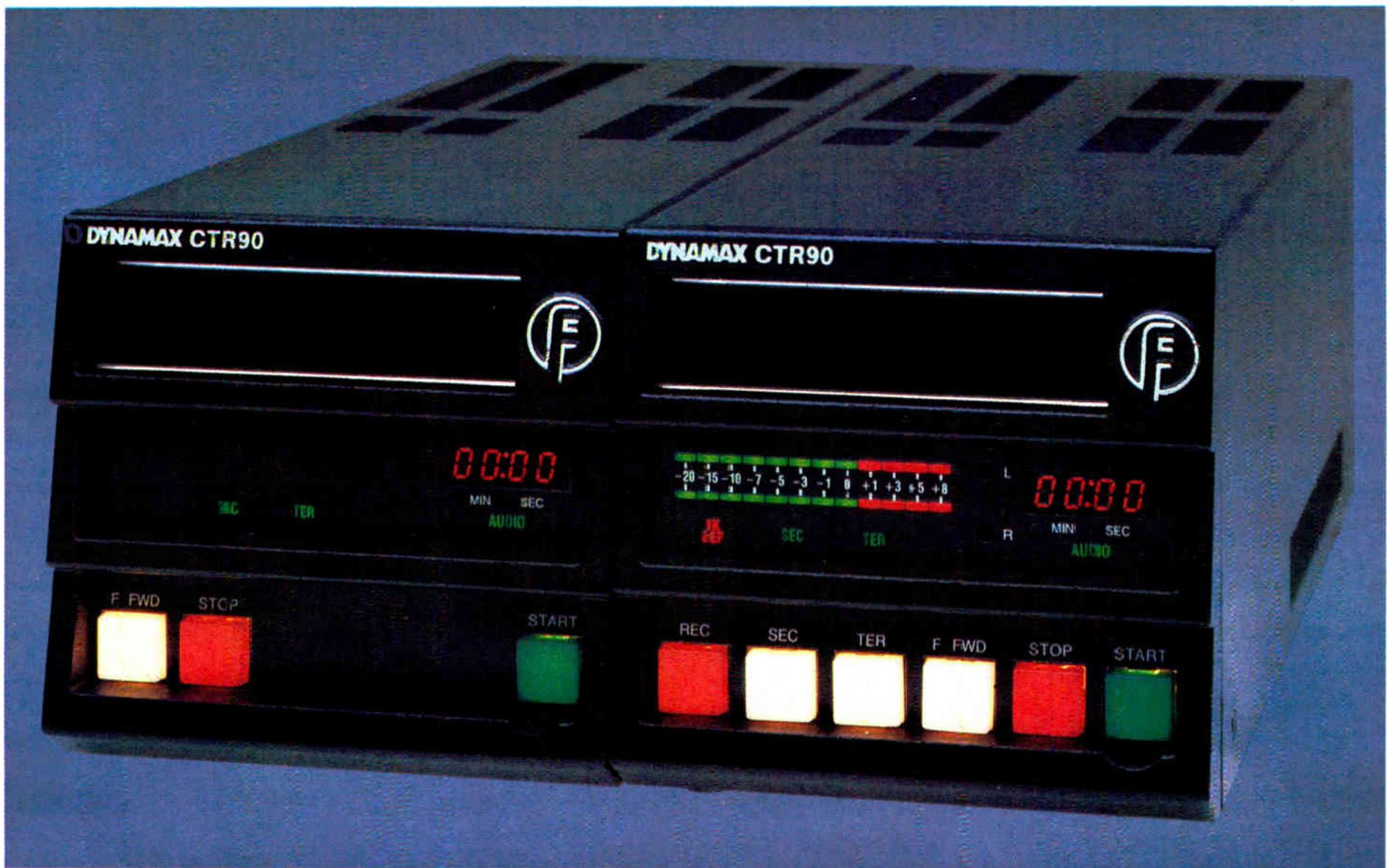
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There's More to Loudness Than What Meets the Ear

Dear Alex,

Leap month has brought me quite a busy time—among everything else, I was packaged and sold in a bachelor auction to benefit the Arts here in Danbury. Seeing myself in a tux is a pretty funny sight, and strolling the runway at the Holiday Inn ballroom with all the right Barbizon moves took everything I had to keep from cracking up out loud. All in all, just one of them “crazy deejay things” we all do.

Construction on our new studio is pretty much set, and if there's one crazy deejay thing I don't want to catch myself doing, it's running the headphone level up too high. There is a very fine pencil mark on the console now which shows the upper limits of my desired levels. I pass the mark and the phones come off for the rest of the shift, to be used as mini-monitors off to the side.

Documentation on the effects of loud sounds on hearing is nothing new, although with almost every pro sound trade magazine running a segment on it last year you'd think it was just discovered. What actually was recently discovered? Among others: the effects of the newest repro equipment; power amps with amazing transient response (every spike goes through); sealed headsets with improved drivers for icy, brittle highs, and bigger and better systems with MOSFETs so big they could reroute lightning bolts.

It's a subtle effect, but in time you notice it. There is the impression that the monitors at the studio seem to be “muddier” than they were only a week or a month ago. Extra highs are EQ'd into a spot or promo to overcome a lack of sparkle (sounds fine to me). Remember time was we'd have to replace monitor tweeters when a tape was rewound in cue, and cooked 'em? Now they stay intact but our heads are taking the abuse.

And beware of the jock who asks for the phone interface to be tweaked for more clarity. Chances are it's pretty good.

You know I'm not trying to be preachy, Alex. As I've said, more than enough has been written and blathered about on the subject. It's just that I've found out a little more about it—that may have escaped the other articles.

Interestingly enough, Mom Nature has built into our heads an efficient little spring device to hold things in check for us. It's called the *stipedial reflex*, and it works like this: Let's say a clap of thunder hits next to you and the sonic blast knocks you on your glutes.

You'll be shaken up and your tush may hurt, but inside your head a series of muscular contractions involuntarily took place to dampen the hit by absorbing some of the shock waves traveling down the middle ear.

Again, this all happened by itself. I used to think it happened the same way you “scrunched” your head up in anticipation of a loud sound—say, a fireworks display. Apparently not—nothing happens then, except by holding your breath you may be bracing the eardrum with a support column of air.

Unfortunately, while Mom Nature prepared us for thunderclaps, she didn't get our heads ready for 200 W Kraco car amplifiers with bass boost cabinetry. The *stipedial reflex* works great, but gives up after about ten seconds because of fatigue.

For comparison, pick up a safe in your arms, then invite Lou Ferrigno over to try and knock it out of your grasp. That's what is going on inside your middle ear. Once they give

up, anything and everything on it's way to your cochlea gets there and does its damage.

In November, I shuttled a friend to Norwalk Hospital for a tympanoplasty (an operation to close aberrations in the eardrum), and took a hearing test shortly after that. My highs are OK, but there's a very minor dip in and around 1 kHz. Too much “test tone in headphone” and it's right about where the middle overtones of my voice begin and end—too much EQ in the phones with too high a level.

It's actually pretty easy to get used to using no headphones in production. I find it en-

FROM THE TRENCHES

by Alan Peterson



hances my performance when I'm not concerned about how I sound to myself. When it's mixdown time, it's all done in the monitors. Airwork is much different, as the cans are a necessity. Again, when I see that dial creeping around to the pencil mark, off they come.

Look, just cuz I like doing those crazy deejay things, it doesn't mean I want to jeopard-

ize my livelihood. That's just crazy. Waiting for the sounds of Spring,

—Al

Al writes from WLAD-WDAQ Danbury, Conn., and recently lost a lot of sleep trying to envision the weird shape that must be built into headphones for DJs on the planet Vulcan.

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LOWPOWER LOWDOWN

Avoid Faulty Translator Applications

by Howard Enstrom

MOUNT DORA, Fla. The stature of the FM translator is being raised, and so is the cost for engineering and higher power equipment.

Most readers are generally familiar with the FCC's rule changes regarding translators. I think it's clear the Commission's intention was to make this secondary service co-exist with full services by strict limitation of different kinds of interference. Translators of 10 W power and higher were likened to Class A stations by invoking Part

73 rules, and Subpart L of Part 47 rules was revamped.

The FCC did some other things as well. It helped commercial stations with fill-in translator service, greatly expanded channel use, and zilched plans to proliferate translators for profit.

This month I will discuss the far-reaching applicable rules that can disqualify a translator application proposal. Because I'm assuming we're all familiar with the rules, I'll refrain from constant referral to and quotation of FCC rule sections and paragraphs.

Co-channel and adjacent channel interference are related to the translator's coverage—which is affected by the ERP, terrain characteristics, antenna height and

Figure 1.

Contour	100 dBu	80 dBu	60 dBu	40 dBu	20 dBu
F(50,50) Coverage	.9 km	3.3 km	10.4 km	32.0 km	74.1 km
F(50,10) Interfer	.9 km	3.3 km	10.4 km	35.2 km	107 km

shape factor of the radiated pattern. A coverage pattern can be a very severe distortion of the radiated pattern because

the effective height of an antenna above average terrain can vary from one radial azimuth to another.

Terrain data

For this reason, applications must include appropriate data about height above average terrain (HAAT) for 12 evenly spaced radials, from 3 to 16 kilometers out. In close-margined interference cal-

culations, additional radial information has to be furnished. The long and short of it all is that terrain elevation changes figure into all coverage and interference considerations.

Whatever the factors and parameters, the Commission controls interference by limiting the distance to a translator's 60 dBu (1 mV/m) predicted coverage contour to a nominal 7 or 13 kilometers, depending on the part of the country.

Contour distances are predicted from engineering curves, using an applied ERP and effective antenna HAAT to determine distance to a specific contour. Two such X-Y axis curve standards are used. The F(50,50) is to determine predicted coverage contour distance, and the F(50,10) for predicted interference contour distance.

Thanks to computers and brainy programmers using algorithms, curve information is handled as quickly and accurately processed data.

The two curves have interesting differences. To illustrate, consider a western state translator with an antenna height of 64 m HAAT and the ERP of 250 W. Contour distances, using the curves, would be as shown in Figure 1.

Figure 1 shows the curves running together for field voltage ratios of 100; 40 dB (100 dBu to 60 dBu). But they depart for the next ratio of 100; (60 dBu to 20 dBu). The 20 dBu interference contour distance is about 44 percent greater.

Depending on its class, a station may be entitled to more protection. A Class B station contour is guarded out to .5 mV/m (54 dBu), while a Class B1 station's contour is guarded out to .7 mV/m (57 dBu). All other classes of stations are 1 mV/m, or 60 dBu. When calculating a translator's protection, the proper 54, 40, 80 or 100 dBu interference contour must be used for co-channel, first-, second- and third-adjacencies, respectively.

Surprisingly, although translator calculations may show interference contour clearances, if the predicted 1 mV/m coverage contour overlaps a populated area already receiving a regularly used signal of a co-channel, first-, second- or third-adjacent channel station, including Class D non-commercial educational (NCE), the translator may be considered as interfering, according to the rules.

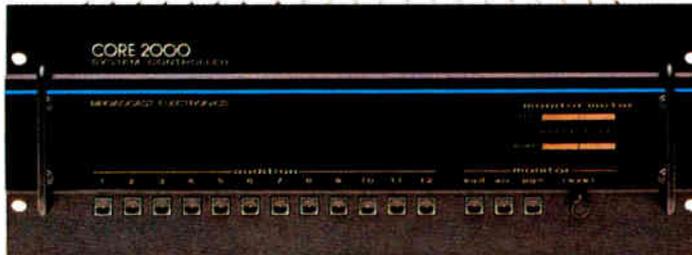
Again, without violating a protected contour, there can be a different kind of situation created by IF relationships. This is not IF image response involving a receiver's local oscillator, but when two FM signals happen to be spaced 10.6 to 10.8 MHz (53- and 54-channel spread in frequency), with equal level, they can produce a second IF signal from a receiver's mixer stage.

For such interference considerations, the FCC goes to Part 73 rules concerning continued on page 26 ▶

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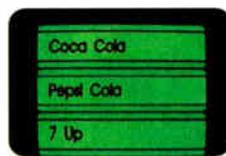


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WORKBENCH

Getting Organized with Film Canisters

by John Blisset

FALLS CHURCH, Va. Last issue, we offered an idea to get more from less by finding a use for those dummy slugs that come with wattmeter line sections. Well, that idea sure got your creative juices flowing.

Not with ways to use the dummy slugs, though—rather, in finding solutions for those plastic 35 mm film cans. Figure 1



A plastic film container slipped over a soldering iron helps secure its cable.

shows what I think is one of the best—a means of keeping the cord to your soldering iron tangle free.

Kevin Fox, the Technical Director at WUSQ-AM-FM in Winchester, Va. used a single-edge razor blade to slice the bottom off the film container. It then easily

slips over the AC cord, keeping it secure and from getting tangled in your tool caddy.

EBS rules required that the “enable” switch, which controlled the firing of the tones on your EBS encoder, be “guarded” in some manner. The thought here was for stations that ran their audio through the EBS encoder, the switch guard would prevent accidental triggering of the tones.

Enter the lowly 35 mm film case. By cutting the case in half and drilling a hole in the bottom, the case could be mounted on a panel over a switch. The plastic lip that thus surrounded the switch meant no one could accidentally bump the switch and fire the EBS tones by mistake. You had to reach your fingers *inside* the case to activate the tone switch.

Got another use for these little containers? Fax it to me at 703-998-2966.

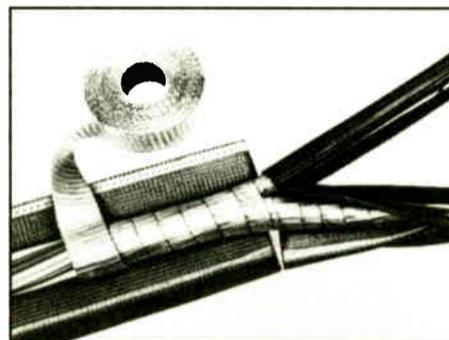
★★★

Larry Albert from Murray State University offered a couple of his own favorite alternative uses for everyday items—they involved cup hooks and plastic electrical boxes. Rather than spend the \$10 to \$20 for a metal chassis for projects, Larry suggests considering either the metal or plastic electrical boxes found at hardware stores.

The plastic is easy to drill, and as long as shielding is not a problem, makes for a cheap (under \$1) means of housing your circuit.

If your project is larger than a single box,

consider a duplex or triple box. Triple-size boxes offer nearly six inches of width inside. For those out-of-sight projects, you



Zippertubing's new ZIPMESH is a self-adhesive shielding tape that insures continuity of shielding.

can't beat the economy and availability. Cover the box with a blank cover plate, and you're in business.

Next time you plan to route wire under a console, remember this second idea from Larry. It involves screwing in the “miracle” wire retainer—a cup hook. Sold in hardware stores, these hooks come in several sizes and styles. Some have a security catch, which can be opened to add or remove a wire, yet prevent existing wires from falling out.

Wires can be organized in wiring ducts or by Ty-Wrapping the wires, but it's not

easy to update wiring later. The cup hook size is chosen based on the number of wires to be run. The marked size on the package is the depth the hook projects below the shelf, and not the diameter of the hook. (A one-inch size actually has an inside diameter of half an inch).

To prevent the wires from falling out (if security latch type screws are not used) the hook opening is alternated from front to back. So if a row runs the length of a shelf, the wire is zigzagged into position. As you plan your wire run, follow good engineering practice and anchor the cup screws to provide separate runs for low level, high

continued on page 27 ▶

ENGINEERING MANAGER

The World According to Harold Geneen

by John Cummuta

DOWNERS GROVE, Ill. The “G” in the headline stands for Geneen—Harold Geneen. He is considered by many to be the consummate manager, taking ITT from a mere \$765.6 million to \$16.7 billion in 18 years.

He built and managed a workforce of more than 375,000 people, of all races, color, creeds and nationalities. He wrote a book on how to be a manager, simply called *Managing*. That's just Geneen's style—never wasting an extra word or even an unnecessary syllable.

I met him once, and I felt like I was sitting at the feet of the master. When he rifled through his “Rules” of managing, I looked around for the stone tablets on which these commandments must have been written. With Harold Geneen there was no such thing as opinions, only facts. His facts.

Over the next few months we are going to examine management according to Geneen. I'm confident you'll find it succinct, efficient and, most importantly, “No-Bull.”

According to Geneen, there is no management theory that can answer all of management's problems in a given business situation. He has examined the various theories that have been promoted in this country, in Europe and in Japan, and essentially dismissed them as local phenomena that would not function well in our individualistic American society.

Rather, life according to Geneen is a learn-by-doing proposition. His favorite proverb for success is simply, “Decide what it is you

want to do, and then start doing it.”

I've seen more so-called *managers* who were immobilized by the paralysis of analysis, than I've seen managers who can just make a decision and start moving.

The analysts think that you can find a perfect solution to a problem if you consider it long enough—presumably you could then take error-free action.

The truth is that even NASA, with its sophisticated computers, must continually make mid-course corrections on its space vehicles, because there are simply too many variables that can affect the ship's track. It's the same in the business world. If you could make business decisions in a vacuum, you could study the situation and make the perfect choice.

However, since things that will affect your success are going to be constantly changing, the most effective strategy is usually just to start moving. Mid-course corrections can be made as needed.

Geneen does not believe you can systematize the development of people either. So throw away the personnel or human resource theories.

Brains and courage

Geneen cites a concept that asserts that people fall into one of four categories: brains and courage, brains and no courage, courage but no brains, and no brains and no courage. The theory then tells management to get rid of those with no brains and no courage, and put courage but no brains people in line jobs. Those with brains but

no courage end up in staff support positions, and only the brains and courage group should be developed into managers.

continued on page 28 ▶

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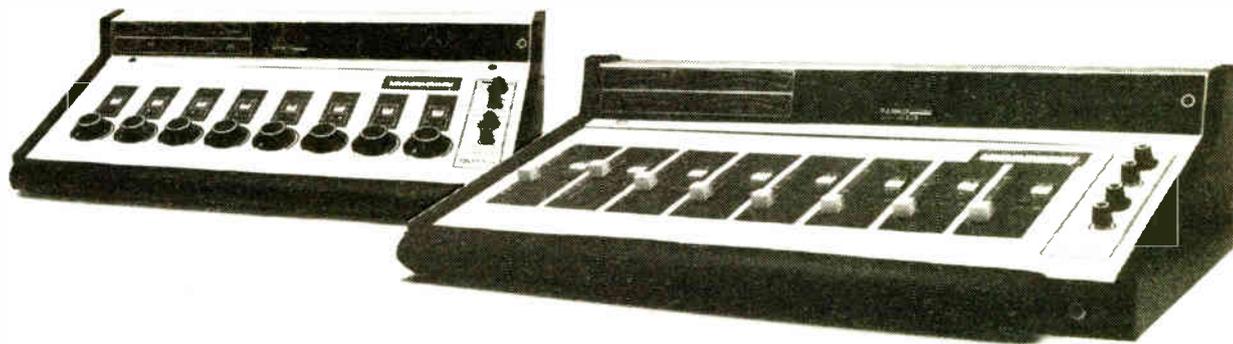
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World Radio History

Simple Steps to a High-Grossing Radio Station

by Sammy J. Parker

Part II of II

MURRAY, Ky. Can your small or medium market radio station actually gross a million dollars yearly, especially in troubled times?

Part one of this two-part article looked at five key pieces of the management puzzle that are consistently practiced at successful radio stations (see *RW*, Jan. 22, 1992). In part two I want to look at five more elements that are absolutely essential if you want to turn your radio station into a high gross/high profit operation.

There are many more success-producing concepts practiced in radio

management than the ten principles discussed in these two articles; however, these ten are critical foundation concepts. They are concepts that work, not academic theories to be tested. These principles are being used successfully by several high gross radio stations in small and medium markets.

Traceable advertising

The development of regional sales, through the use of traceable ads, is a key element of a successful operation.

Traceable or tangible ads are an essential ingredient of any sales effort. To sustain a long-term high gross, radio station retailers need to see the results of their radio advertising. When we say "traceable ads," we mean ads that allow the business to see the results of the radio campaign, regionally or otherwise.

Stations sell advertising on a regional basis not just because they want to or need to, but because they are actually serving an area larger than the city limits of their licensed community.

Programming and selling on a more regional basis does augment station revenues. Adding regional sales to the strategy, alongside other successful selling concepts, creates the foundation of a high gross station.

Such a station also tends to get a much larger share of national advertising than the typical broadcast outlet. With a carefully constructed plan, you can successfully solicit some national advertising that might not otherwise find its way into your market.

While there are no quick fixes for sales success, an organized plan can lead to gross revenues in excess of \$1 million or more in markets as small as 10,000 people. Traceable ads help.

Don't try generic

One way to achieve traceability is not to allow any generic ads to be broadcast. The generic ad is a favorite of many casual radio users. When you allow a generic ad to be broadcast, you leave your sales rep vulnerable to the sales objection that "radio doesn't work." A policy against the use of generic ads would help prevent the perception that using radio yields

poor results.

Advertising in the newspaper is usually very traceable (coupons, customer brings in the ad, etc.); hence, business owners use it over and over again as a basic advertising medium. Open your local newspaper and see how few generic ads there are. When retailers pay high dollar for ad space, they almost always run a price and item ad.

Now this may not seem like a big deal, but radio must do a better job of broadcasting traceable ads or risk the prospect that fewer and fewer ad dollars will be available in the future. "Seeing" results can mean the difference between a strong daily user of radio advertising or a buyer of mostly special sale ads.

The "kiss of death" for a radio station in any market is to foster the image that radio is a secondary advertising medium that can be purchased from time to time, as the budget allows. This is not the way successful radio stations sell advertising to local retailers.

Management must think and train the entire staff to pitch radio as a "basic advertising medium," using traceable advertising copy. The future of your station depends on how well this is handled.

One step further

In the same vein, stop all sales promotions and work instead on developing your radio station into a basic advertising medium. Sales promotions are quick fixes—or merely serve to bring immediate additional revenues at many radio stations.

The high gross radio station operator has learned that special 30-90 day sales promotions do not produce long-term daily advertising dollars. Small and medium market radio stations must develop significant numbers of long-term daily advertisers in order to increase gross revenues.

It is easier to sell an existing business some additional advertising than it is to sell a non-radio user even a small amount of ads. The reason is simple: One business believes that radio advertising works and the other doesn't. High gross stations have found that sales promotions produce additional immediate ad revenue at the expense

Essential Elements of Success

- Develop a strong regional sales base—a station serves an area larger than the city limits of its licensed community.
- Disallow the use of generic ads on the air. Foster the use of "traceable" ads.
- Stop all sales promotions and work instead on developing your radio station into a basic advertising medium. Sales promotions are quick fixes, or merely serve to bring immediate additional revenues at many radio stations.
- Management should develop and share a mission statement with all employees. High-gross radio stations have a "team" concept where the entire staff is working together toward the same objectives.
- Radio stations mustn't be afraid of asking higher rates. Never treat the medium as a second-class advertising vehicle.

of consistent long-term daily ad dollars.

Avoid sales promotions, not because they don't work, but because they send the wrong message. How many sales reps have heard the expression, "What a great promotion, see me again when you have another one?"

Although some managers will vehemently disagree with this principle, what we are suggesting simply is that radio be established as a basic advertising medium, rather than a special promotional vehicle. The former produces results every day, the latter is much more sporadic.

Teamwork and community

The staff's role in building a successful station also is a key element to success. It is imperative that management share its vision and mission with all of the employees, especially sales, programming and technical staff. High-gross radio stations have a "team" concept where the entire staff is working together toward the same objectives.

In some instances managers have discovered overt staff resistance to management goals and business objectives. It is important for managers to ensure that the station's vision, objectives, and mission are clearly understood by the staff.

To build a high gross radio station, management objectives must include special community events. Successful radio stations have found a tremendous market for special event sales from the local 4-H events, high school sports banquets, to special seasonal events.

These events are usually broadcast the next evening on a tape-delayed basis. The revenue stream here over 12 months can be substantial (ranging from \$10,000 to \$100,000). The profit/loss statement of most stations would look better with an additional \$10,000-\$50,000 yearly.

Most stations would turn up their noses at selling a 4-H banquet and rebroadcasting it by tape delay; however, radio stations can take advantage of both the increased revenue generated and better service to the local community agencies and organizations.

Make it dear

The final element may be the most difficult to implement. To develop gross revenues of \$1 million or more in your

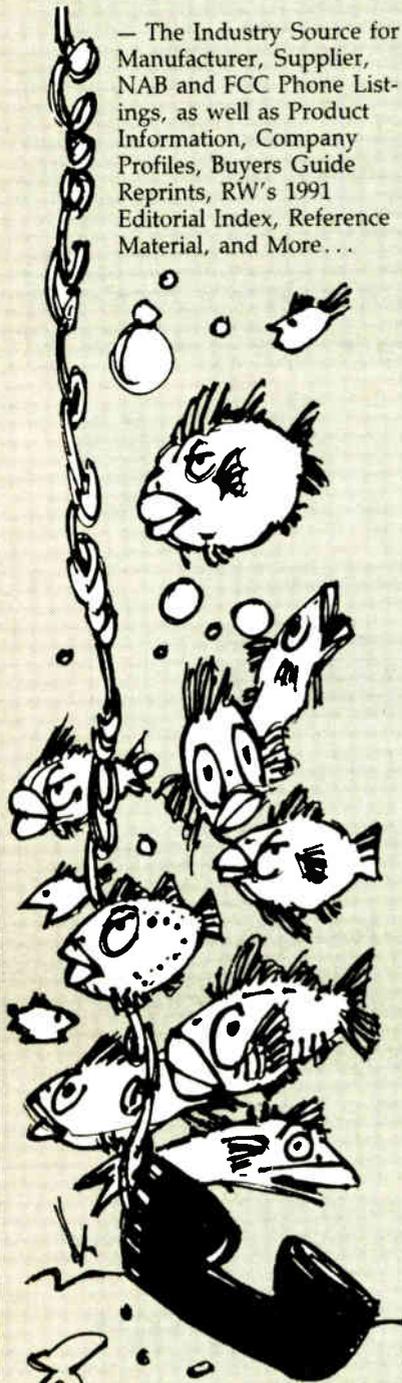
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|-----------------------|---------------------------|
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| 003 | 025 | 047 | 069 | 091 | 113 | 135 |
| 004 | 026 | 048 | 070 | 092 | 114 | 136 |
| 005 | 027 | 049 | 071 | 093 | 115 | 137 |
| 006 | 028 | 050 | 072 | 094 | 116 | 138 |
| 007 | 029 | 051 | 073 | 095 | 117 | 139 |
| 008 | 030 | 052 | 074 | 096 | 118 | 140 |
| 009 | 031 | 053 | 075 | 097 | 119 | 141 |
| 010 | 032 | 054 | 076 | 098 | 120 | 142 |
| 011 | 033 | 055 | 077 | 099 | 121 | 143 |
| 012 | 034 | 056 | 078 | 100 | 122 | 144 |
| 013 | 035 | 057 | 079 | 101 | 123 | 145 |
| 014 | 036 | 058 | 080 | 102 | 124 | 146 |
| 015 | 037 | 059 | 081 | 103 | 125 | 147 |
| 016 | 038 | 060 | 082 | 104 | 126 | 148 |
| 017 | 039 | 061 | 083 | 105 | 127 | 149 |
| 018 | 040 | 062 | 084 | 106 | 128 | 150 |
| 019 | 041 | 063 | 085 | 107 | 129 | 151 |
| 020 | 042 | 064 | 086 | 108 | 130 | 152 |
| 021 | 043 | 065 | 087 | 109 | 131 | 153 |
| 022 | 044 | 066 | 088 | 110 | 132 | 154 |

Chicago Gains First All-Sports Station

by Bruce Ingram

CHICAGO An idea that has long seemed a natural to broadcasters in this market came to fruition recently when Diamond Broadcasting went on the air with WSCR(AM)—Chicago's first all-sports station.

Harvey Wells, general manager of WSCR and co-owned progressive AOR outlet WXRT(FM), says Diamond decided all-sports was a sound choice because Chicago is a thoroughly sports-crazed town and listeners are already acclimated to AM.

In addition to Tribune Broadcasting's full-service WGN(AM), the city's long-time ratings champ, the AM band boasts two successful all-news stations—CBS's WBBM and Group W's WMAQ—and Evergreen Broadcasting's comedy/sports/talk station WLUP. Coaxing an audience away from FM is one battle that WSCR will not have to win.

A natural choice

Wells says Diamond considered a number of formats for its new AM outlet, which it intends to sell in combo with WXRT (FM). The company also owns a one-third interest in ethnic time-share station WSBS(AM). After mulling over everything from jazz to new country to business radio, they kept coming back to all-sports.

"We run an FM station based on passion for music," Wells explains, "And Chicago

The station has no intention of doing play-by-play broadcasting or of using network sports programs, so there is no need to be on the air at night.

Wells also expects that ratings and advertising for this type of programming will be most prevalent during the daytime. "Frankly, 12 hours of sports-talk a day is plenty for us," he laughs.

Beginning several months ago, Diamond management launched an aggressive campaign to lure a top-notch staff away from other sports-oriented stations in the market to do the talking for the station.

They were most determined in their efforts to secure the services of two of the

best-known sports names in the city, Bruce Wolf of Fox's WFLD-TV and Evergreen's WLUP, and Chet Coppock, also of WLUP. (Wolf is the voice of the short-form syndicated comedy feature "Chet Chitchat," which lampoons Coppock's excitable style.)

Diamond failed to entice Wolf and Coppock, but it did coax away WLUP executive producer Dan McNeil.

Playing hardball

"They immediately went after our entire staff," said WLUP-AM-FM vice president and general manager, Larry Wert. Wert acknowledged that his AM station is proba-

bly WSCR's most direct competition right now. Its sports programming emphasizes personality/talk—even though it does not turn to sports until after dark.

WLUP also does no sports play-by-play at the moment, though it did in the past before losing the Bulls to WMAQ. WLUP intends to get back in the sports play-by-play arena in the future if it succeeds in landing the Chicago Blackhawks.

Wert is less than sanguine about the viability of all-sports as a stand-alone format: "On its own, that station wouldn't have a chance of survival in this market." Wert went on to say the idea of selling it in combo with WXRT has merit.

Rick Starr, vice president and general manager WMAQ(AM), home of the Bulls and White Sox, says the station also was raided by Diamond. It convinced WMAQ

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fans are of course extremely passionate about sports. It felt like a good fit."

Diamond picked up WPNT(AM)—a 5 kW facility on 820 kHz—from Century Broadcasting for \$675,000. The station went dark in January 1991, when Century lost use of the land on which it had erected a four-tower array.

The four-antenna arrangement had been created to protect the nighttime signal of clear-channel WBAP(AM) Dallas, a Cap-Cities/ABC station. Diamond's intention to switch the 820 frequency to its single tower, which transmits WXRT, meant that the station would have to revert to being a daytimer—a plan that resulted in a long, protracted wrangle with the FCC.

To avoid interference with WBAP (broadcasting from Grapevine, Texas), WSCR is on the air from sunrise to sunset. That means the station's hours of operation are always shifting: its broadcast day ends around 6 p.m. in one season and around 8 p.m. in another.

Form and function

Is Diamond satisfied with this somewhat bizarre arrangement? "It was basically what we could get," says Wells, "There aren't that many AMs available here."

Wells believes the station's daytimer status will ultimately work to its advantage.

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World Radio History

Chicago's All-Sports Station

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sports anchor Ron Gleason to join the WSCR team by offering him the program director's slot.

To date, the WSCR line-up consists of Tom Shaer, weekend sports anchor on WMAQ-TV, as morning host, and Tom Webb as morning news anchor. Former Bears and CBS Sports commentator Dan Jiggetts follows, teamed with Mike North, owner of a Chicago hot dog stand famed as a sports hangout. Former WLUP man McNeil is next up, teamed with the "Chicago Sun-Times" sports writers Terry Boers and Brian Hanley.

Chicago-style AM

Regardless of the talent involved—with the exception of Don Imus on WFAN(AM) New

York, who already had a huge following before the station's shift to all-sports—Starr says he also sees some weaknesses in the all-sports format. He points out that except for WFAN, none of the 10 or so sports stations currently in operation are raking in big numbers.

Like Wert, however, he sees the wisdom of WXRT's decision. He points out that it will give them a clear advantage over other FM-only rock stations in town—such as heavy metal WWBZ(FM) and classic rock WCKG(FM).

"From a sales point of view, I think there is some natural money that will come their way—beer, men's clothing, automotive after-market," Starr says. "I don't think they're going to be the killer radio station of Chicago, but I think they'll have a nice little niche."

Wells says the advertiser response has already been encouraging, partly because many of the decision makers, the people spending ad dollars, reside in the demo they are targeting. The station is already receiving favorable commentary from that group.

Welcome aboard

Wert and Starr both emphasize that they welcome WSCR to the AM band. Even WGN vice president and general manager, Dan Fabian, who makes it a policy never to comment on other stations, says he is delighted that another attraction has joined the AM line-up in Chicago.



Morning personality Tom Shaer, behind the mic at Chicago's WSCR.

"The only thing that could really depress us would be if we ever became an island on the AM band," Fabian explains. "As long as there are four or five stations causing people to tune in, we'll get our share. So I very selfishly hope they do well."

WSCR's Wells says he can understand that many operators might consider all-sports too narrow a niche to gamble on in a stand-alone situation. But he still believes the format will continue to grow.

"It's going to keep happening," he says. "Any market that supports major sports teams is eventually going to have one of these stations."

"It doesn't take a genius to look at a market like Los Angeles and say, 'Geez, they've got two football teams, two basketball teams, one hockey team and a billion radio signals.' It's impossible for me to believe that before spring there won't be an all-sports station there."

Steps to Higher Station Grosses

► continued from page 20

market, you must have higher rates. This concept will be the most difficult for management to believe and to achieve because the historical trend in the industry has been to cut or lower rates to increase business.

I believe one question should put this principle into proper perspective: How much is your best local newscast worth per ad?

The value is determined, for the most part, by how much you charge for it. In effect, high gross radio stations have pushed their ad rates up because they view themselves as being more valuable today than last year.

Recently, an owner called me asking what he should do; his major radio competitor had dropped ad rates about 50 percent. If I were a local retailer I would have dropped all my advertising on the station that cut its rates—because it must not be worth very much. I think you get the point.

Managers must be strong enough to create the highest value possible for station air time if they want to create high gross radio stations. Good sales management will find ways around the price objection so frequently offered to radio sales reps. It's amazing how irrelevant ad prices become when good effective traceable ads are broadcast. Radio does get results, despite us.

□□□

Dr. Sammy J. Parker is director of basic courses at Murray State University in Murray, Ky. He is the author of a 55-minute audio cassette, "High Profits from Small Market Radio," available to any radio station requesting the tape. Parker also operated a stand-alone AM for more than 12 years and a Class C FM before both stations were sold in June of 1990. He can be reached at 502-762-4460.

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Station _____ Phone (____) _____
Address _____
City _____ State _____ Zip _____

Beware of LMA Pitfalls

► continued from page 19 rallying for FCC approval for LMAs.

Admittedly an LMA could provide a potential buyer with a no-risk, no-obligation test drive of a property with an option to buy, should the FCC reconsider its duopoly and multiple ownership rules. But why put people out of work and risk limiting the medium's growth potential?

The current climate calls for more people touting radio's benefits to the retail community—an effort that could result in a greater share, for radio, of the total advertising dollars still available.

Point of diminishing returns

Further, have none of the LMA supporters considered the potential diminution of the going-concern value of a radio station that al-

Most LMAs could legally be considered a technical violation of the covenants . . . of a borrower's original loan agreement.

lows a competitor to supply programming and advertising sales services as a means of reducing expenses? Senior lenders have.

The Rhode Island Hospital Trust objected in court to Jacor's LMA proposal involving Ream's bankrupt Cincinnati WZRZ(FM). The Judge shared the bank's discomfort over the Jacor proposal in light of expected further changes in FCC policy with regard to LMAs.

Any borrower contemplating either an LMA or bankruptcy as a means of easing financial pressure should study this case. Most LMAs could *legally be considered a technical violation of the covenants* included as part of the terms of a borrower's original loan agreement with his senior lender. Check with your banker before entering into an LMA. To do otherwise could be considered a display of bad faith.

The WZRZ(FM) LMA would have been the second flank of an attack that Jacor began mounting with its first Cincinnati LMA (another direct competitor, WAQZ(FM)). Modifying the formats of these two stations would have effectively eliminated additional competition for listeners and advertising dollars from the upper and lower end demographics of Jacor's flagship radio station, WEBN-FM. You cannot blame the company for trying. Jacor makes it plain that they play to win.

It is just this kind of anti-competitive behavior, however, that Representatives Dingell and Markey appear to have been concerned about when they made the decision to sponsor H.R. 3715, a bill which seeks to limit LMA eligibilities.

Political denouncement

The FCC is hardly in a political position to ignore these two very powerful voices from Capitol Hill. Enforcement Division Chief Chuck Kelly recently offered a preview of some of the measures that the Commission may take to avoid congressional interference on the LMA issue.

While most experts doubt that the FCC will adopt H.R. 3715's more draconian regulatory proposals, the implication is that any licensee that has entered or will enter into an LMA probably will forfeit the expectancy of license renewal. Where is a station's

"going-concern" value without its FCC license? What would the impact of such a loss of renewal expectancy be on the value of the assets held by a lender holding the senior note on a radio station?

Do we really want to give those institutions that once represented traditional sources of "cheap" financing for acquisitions another reason to forestall re-entry into the broadcast lending market? Ask the broker pitching that LMA.

Or, ask former Home Shopping Network honcho Bud Paxson about the can of worms that his LMA with Panmedia, the "interim" owners of WRXJ(AM) in Jacksonville represents right now. Paxson first purchased the station's former FM sister (WCRJ, now WROO) after its previous owner had already committed to selling the AM to Panmedia.

Paxson saw some benefit in re-uniting the two, so he entered into the LMA, supposedly while negotiating the purchase. Ironically enough, WROO is a direct competitor to the market's leading country station, WQIK-FM—which just happens to be owned by Jacor.

Jacor filed a petition with the FCC to deny transfer of control of WRXJ's license to Paxson, on the grounds that the LMA with Panmedia actually represented a "flagrant" premature transfer of control in violation of the Commission's Rules and Regulations. That's just one more creative way of keeping the competition at bay while pointing out the potential for abuses with the LMA.

It's a jungle

How many of your competitors are out there just waiting to find some new way to eliminate competition for the shrinking pool of advertising dollars in your market? And why not complain to the FCC about that LMA if it represents a way to scuttle your efforts at increasing market share at another station's expense?

Chuck Kelly has publicly acknowledged that as of December 1990, out of about a dozen pending complaints before his division, all but one were filed by competitors of LMA stations. Calling all communications

attorneys: How is *that* for a new source of business come license renewal time?

My point in advancing this argument is to draw attention to the fact that the entire controversy over LMAs is absolutely unnecessary. If consolidation is the goal, why not lobby the FCC simply to deal with the issue of increasing the multiple ownership limitations and eliminating the duopoly rules?

LMAs simply muddy the waters—making it virtually impossible to determine whether an acceptable number of "independent voices" already exists in a market to warrant the abolition of these antiquated policies. Radio would be better served by those who resist the "quick buck" potential LMAs represent to the precious few, and look toward

a longer term solution to this industry's present financial woes.

Only when we as potential operators begin to demonstrate more logical approaches to the economic challenges that face us all, will capital for investment and acquisition begin to flow back in our direction.

□□□

Paul Robinson is founder and president of Broadcast Trust Management Inc. (BTMI), which has represented senior lenders in the restructuring of debt involving broadcast assets with collateral values in excess of \$2 billion. Robinson has been involved in the acquisition, ownership, management, operation, and sale of broadcast properties for more than 25 years.

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WWI Offers "Entertainment Report"

Westwood One has named film critic and entertainment historian Chuck Rich, to host Mutual Broadcasting System's daily feature, "The Entertainment Report." In addition, Rich will provide movie reviews and entertainment news for Mutual's weekly program, "America This Week."

"The Entertainment Report" features reviews of films, videos, television series and specials, books and books on tape,

albums and CDs, as well as celebrity interviews and news from the world of entertainment.

For more information, contact Katie Garber at 310-840-4383, or circle **Reader Service 149**.

Satellite Comedy Net Available

New York-based CD Media introduced a new offering this month, "Satellite Comedy Network." The program will be offered via satellite (SatCom C-5), Mon-

day through Friday, at 5 a.m. in each of the four time zones. "Satellite Comedy Network" will consist of a 15-minute feed that will include four or five comedy bits. It will be available on a barter basis.

CD Media has hired Keith MacGregor, formerly of RCA Records, as the manager of affiliate relations. MacGregor will oversee the distribution of the comedy offering, as well as the company's other product, "Rick Dees' Weekly Top 40."

WPLJ(FM) New York's Todd Pettengill is the executive producer of "Satel-

lite Comedy Network."

For more information, call Keith MacGregor at 212-836-4425, or circle **Reader Service 104**.

BRN Launches American Forum

Business Radio Network has launched a new product, a 24-hour service called "The American Forum." The line-up features interactive talk programming, including Star Communication's "Sports Final" and "Sports Extra."

"The American Forum" will be headed by Don Emanuel, formerly of American Radio Network. Business Radio Network and "The American Forum" will have a combined affiliate base of roughly 200 stations.

For more information contact Jeff Behan at 800-321-2349, or circle **Reader Service 68**.

Arbitron Extends Support Hours

The Arbitron Ratings Co. has extended the hours of operation of its Radio Micro Services Customer Service Team. The team, based in Laurel, Md., provides support services for customers with Radio Micro and on-line computer applications: Arbitrends, PC AID and On-Line AID, FasTraQ and CrossTraQ, Fingerprint on diskette and DiaryVue.

The company said the extended hours were added in an effort to better serve Central, Mountain and Pacific time subscribers.

For more information, contact Thom Mocarisky at 212-887-1314, or circle **Reader Service 34**.

SMN Strengthens StarStation

Satellite Music Network has hired Ron Parker as program director for the company's StarStation, adult contemporary format. Dave Allison, currently operations manager for SMN's Stardust nostalgia format, adds duties as the operations manager for StarStation. StarStation has 180 affiliates.

In a release, Robert Hall, SMN vice president of programming, said the restructuring was done in an effort to give the format "greater programming strength and more manpower to devote to the increasing StarStation affiliate network."

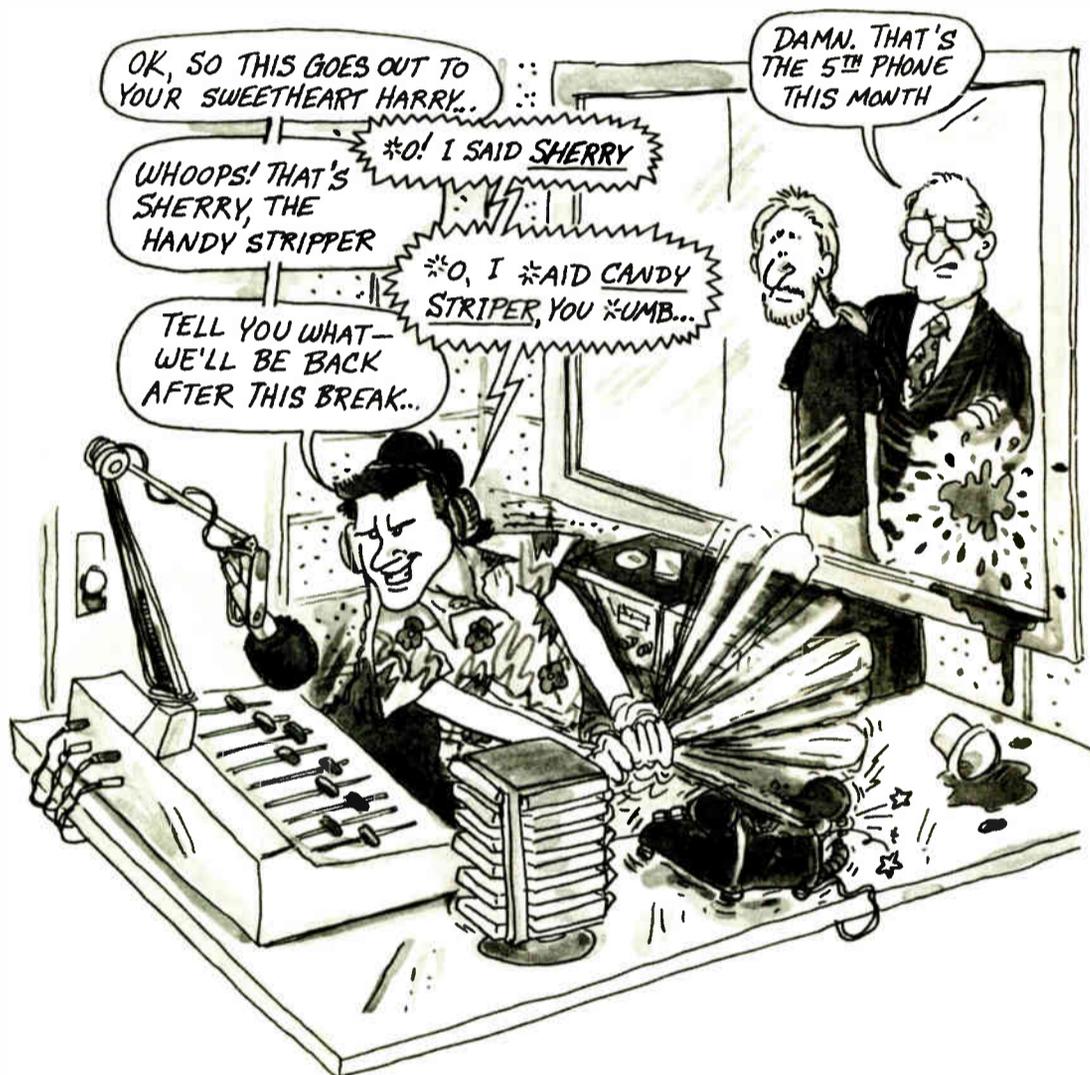
For more information, call Marianne Bellinger at SMN at 214-991-9200, or circle **Reader Service 115**.

M&N Offers Events Catalog

M&N International, a supplier of decorating and promotional supplies, is making available its "Spring & Summer 1992 Party & Promotion 'Bright Idea' Book."

The book provides ideas for low-cost business events, along with the supplies necessary to organize them, from custom-imprinted T-shirts to company buttons. The catalog also highlights a Special Events Planner that lists over 100 occasions during the next six months that can be used as a cornerstone for a radio station promotion.

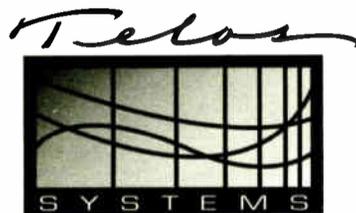
For more information, contact M&N International at 708-680-4700, or circle **Reader Service 38**.



Non-duplex telephone interfaces can turn off both your staff and listeners. Why make them suffer? For only \$985, you can enjoy natural, two-way conversation with the Telos ONE.

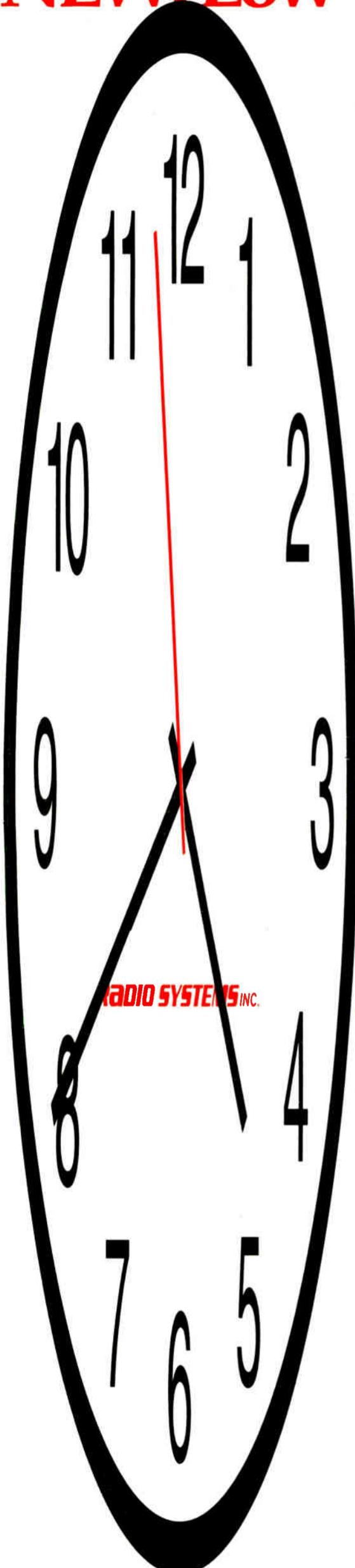
Advanced digital hybrid processing eliminates up-cutting and announcer voice distortion. And callers can be monitored through open speakers without feedback.

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- Low-Cost Impulse Clocks • Digital Slaves available
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Radio Systems' low-cost impulse clock system offers features not found on units costing ten times as much. And it overcomes all of the shortcomings of other inexpensive systems.

Super-stable and reliable operation is achieved through the use of a digital divider and pulse synchronizer board installed on the rear of each slave clock. This board also allows each clock to be frozen, set individually, and then accurately sync-started from the master impulse driver.

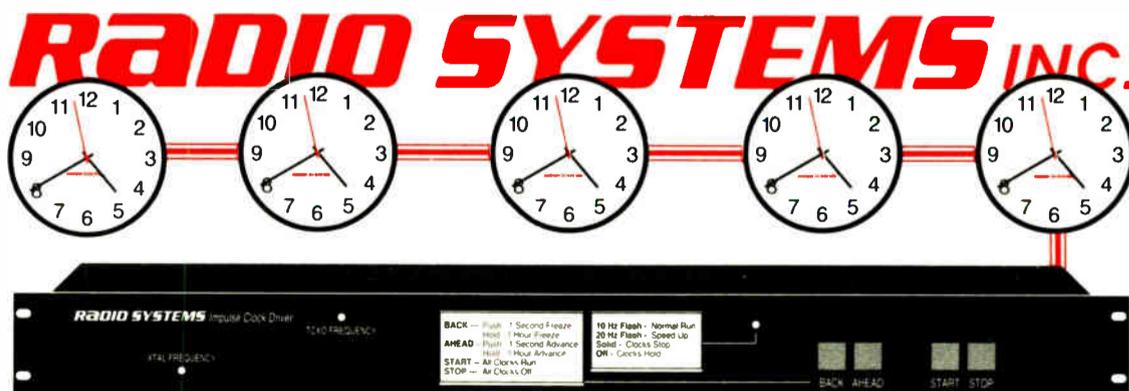
The single space rack-mount driver derives its time-base reference from either AC line or crystal references (user-selectable). The driver automatically switches to a battery-backup, internal crystal oscillator if line power is lost. Any 1 Hz or 10 Hz TTL, C-MOS or balanced external sync source can also be referenced. The sophisticated digital drive circuitry switches sync reference without missing a second.

Front panel switches greatly simplify the clock-set procedure by providing one second "advance" or "freeze" control. The driver also features buttons which automatically stalls all clocks or runs them at twice normal speed to gain or lose one hour for Daylight Savings or Standard Time changes.

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Circle (65) On Reader Service Card

Aphex Creates Compelling Audio

► continued from page 12

piece of music, and compare it with and without processing.

For on-air use the Compellor is not absolutely "jock proof." Sloppy levels, especially ones that are too low, are still too low. It also doesn't hide bad mix moves.

Open a window

What it does do is create a larger window of acceptability, as long as your level is high enough to make it to the window. The leveling and compression work well together, locking the different elements of a mix together in a subtle but coherent way.

While processing an on-air mix of voice

and music, the Compellor automatically reduced the volume of the music when I began to speak. The reduction in music level was greater when the Level Rate switch on the front panel was in the "slow" position than in the "fast" position, and the return of the music level when the announcer stopped talking was slower in the "slow" position. If you like that "jock-buried-in-the-mix" sound, you'll want to keep the Level Rate switch in the "fast" position.

As good as the Compellor is in maintaining a very constant audio level, don't expect it to perform miracles. The adjustable Silence Gate will "freeze" the release of the gain reduction circuitry to prevent noise swells, but it won't discriminate between low level audio and the noise in which it may be buried.

I was able to fool the Silence Gate into bringing up the noise floor when I used the Compellor as a voice-only processor. I made just enough noise after the gate closed to trigger the compression release.

Turning up the Silence Gate threshold control all the way helped, but extraneous noises, like dropping a cart on the counter, released the compressor and brought up the noise. This could be a problem if you've got a noisy operator who likes to leave the mic on.

I found that as a mic processor the Compellor did a great job of keeping constant voice levels. Even when I went

from a whisper to a scream and back to a whisper very quickly, the Compellor tracked along with me without losing the low parts or crashing the screams.

Up to eleven

If you've got the budget and a "turn-it-up-to-eleven" attitude, consider double processing your mic, using both channels in series in the unlinked mode.

The peak meters on the workstation showed that I reduced the peak to RMS ratio by at least one more decibel. Setting the first Silence Gate threshold at 10 o'clock and the second one full clockwise also made the gate harder to fool.

To check out claims that the Compellor is useful in producing a consistent

output from a wide range of inputs, I mixed a series of commercial CDs, highly compressed and limited spots and unprocessed music to duplicate the air and production studio environments.

The sources with less pre-processing were more affected by the Compellor. It reduced their peak to RMS ratio and made them louder. The material that was heavily processed changed very little, which is good. The Compellor is "smart" enough to differentiate audio that has been processed from that which hasn't.

The Compellor is available in three models: the single channel 301 (\$795); the single-channel with aural exciter 303 (\$949) and the dual channel 320 (\$1,350). Call Paul Freudenberg at Aphex, 818-767-2929, for more information.

□□□

Ty Ford may be reached at his beta test site studio at 410-889-6201, via MCI Mail 347-6635 or America Online (Tford).

Avoiding Faulty Applications

► continued from page 16

distance requirements for translators (as Class A) versus other stations, according to class. (Of course, if FM receivers had ideal single FM channel front-end selectivity, there wouldn't be such a problem. But ideals get lost in the world of mass-produced, competitively-priced consumer products.)

Channel 6 Interference

TV interference—channel 6 type. Incredible that such a 6 MHz wide video information and sound channel is allo-

cated right below the FM band. The TV interference caused by NCE translators operating closest to FM Channel 201 have been serious.

So much so, that the Commission adopted very tough rules for translators considering use of any of the first 20 NCE channels. Perhaps because many NCE translators simply would not be able to use these channels in a TV channel 6 area, the Commission opened up all 80 commercial channels for NCEs. Here's what the rules say:

For NCE translators proposing operation on Channels 201 through 220, a table shows cut-off distances. Within 148 to 131 km of a TV channel 6 station, a translator will not be authorized without certification that the applicant has coordinated its antenna with the TV station. This calls for locating the translator within .4 km, or less, from the TV station.

Another table shows which interference contour, for channels between 201 and 220, is used to determine the F(50,10) interference contour distance. That contour is not permitted to overlap the TV channel 6 station's Grade B (47 dBu) contour. This would be non-compliance:

A proposed Channel 209 non-directional translator has an antenna COR of 27 m HAAT and an ERP of 170 watts. Its site is 131 km from the TV station, whose Grade B contour is 129.05 km out. In other words, the translator is located 1.95 km outside the Grade B contour. According to the table, for FM Channel 209 we use the 73 dBu interference contour, which calculates at 3.0 km.

That is no good, because the TV station's Grade B contour is overlapped by 1.05 km. Of course, there are solutions to the problem such as directionalizing radiation, reducing ERP or moving the site.

Next month, I want to tell you about the ongoing work of the Rocky Mountain Corporation for Public Broadcasting in establishing alternate FM service. They are using 100 W FM translator/broadcast stations for which the Commission has issued special rule waivers.

□□□

Howard L. Enstrom is a broadcast consultant. He has owned and managed an AM station and is president of FM Technology Associates, Inc., specializing in engineering design and sale of FM translator equipment. He can be reached at 904-383-3682 or by fax: 904-383-4077.

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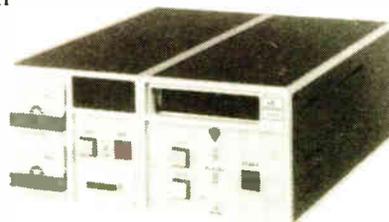
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Understanding Parallel Circuit Theory

This is the ninth in a 10-part series called DC Fundamentals. Northern Virginia Community College will offer 1.2 CEUs (Continuing Education Units) to registered students who successfully complete the course and an examination mailed at its conclusion.

To register, contact the Director of Continuing Education, Annandale Campus, 8333 Little River Turnpike, Annandale, Va. 22003, or call 703-323-3159. The fee for the course is \$30.

by Ed Montgomery

Part IX

ANNANDALE, Va. The parallel circuit is another way of arranging electronic components around a voltage source to achieve a different relationship of voltage, current and total resistance in a circuit. Figure 1 illustrates a parallel circuit.

Note that the same voltage source and resistor values are used in this example as were used in the series circuit example in Lesson Eight. Note how the resistors are connected in the parallel arrangement.

All components are connected directly across the positive and negative battery terminals. Points A, B, C, and D, and E, F, G, and H are electrically the same point.

Points A through D, and E through H, are often referred to as bus bars or busses. They are an extension of the battery terminals placing the same voltage on each component.

Home and office

In this example, each resistor has 150 volts applied to it. In a parallel circuit, the voltage across all components is the same. Most homes and businesses have electrical utilities

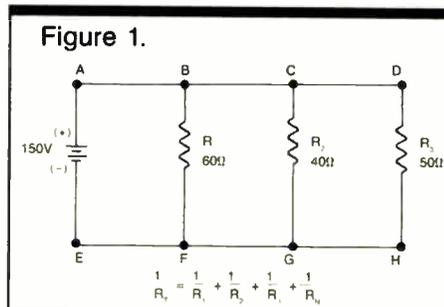
wired in a parallel fashion. All plug receptacles have the same voltage at their output.

There are a number of reasons for using this method of wiring. One is the uniform voltage this wiring produces. It standardizes the requirements for manufacturing electrical and electronic equipment.

An advantage to using parallel circuits is that you can disconnect an individual component from the bus without affecting the voltage and current in other components. If R2 were disconnected from the circuit in Figure 1, the voltage and current on R1 and R3 would not be affected.

Total current in a parallel circuit is dependent upon the total number of components

connected across the voltage source. It can be calculated using Ohm's Law. Each branch



current needs to be individually calculated: $I = (150 \text{ Volts}) / (60 \text{ Ohms}) = 2.5 \text{ Amperes}$

$$I_2 = (150 \text{ Volts}) / (40 \text{ Ohms}) = 3.75 \text{ Amperes}$$

$$I_3 = (150 \text{ Volts}) / (50 \text{ Ohms}) = 3 \text{ Amperes}$$

Total current is equal to the sum of the individual branch currents. In this example it is 9.25 Amperes. Referring back to Lesson Eight, you will note that the total current supplied by the battery in the parallel circuit is considerably higher than what was in the series circuit.

Resistance

The total resistance of a parallel circuit is a factor surrounding the total current and voltage. In Lesson Eight the total resistance could have been calculated using Ohm's Law by dividing the total voltage by the total current or $(150 \text{ Volts}) / (1 \text{ Ampere})$, resulting in 150 Ohms.

Ohm's Law can be used to calculate the total resistance of a parallel circuit as well—continued on page 28 ▶

SEE SPOTS RUN.

On-screen traffic log display

Gas Gauge: Indicates what percentage of the system is available for recording.

The Play Line: Shows what's currently playing on-the-air, with a count-down timer.

Record Line: Shows what DCS is currently recording.

Queue Window: Just click on a listing, to place recordings in the queue for playing.

Filler Window: This special pop-up window gives you quick access to PSAs, jingles, promos and other fillers.

WORKBENCH

▶ continued from page 17

level, and power cables. Isolating the runs will make tracing the wires easier later on.

For the low budget station that can't afford the higher priced cabling products, the cup hooks offer an inexpensive alternative. Larry Albert can be reached in Murray, Ky., at 502-762-4664.

★ ★ ★

We all have cases where we need to RF proof cables, and a new product on the market, manufactured by Zippertubing Company of Los Angeles solves the problem. Zippertubing is a protective plastic sheath or tube that splits apart to permit insertion of wires, and then is zipped back together, forming a protective covering. The company's offering that caught my eye was the Zipmesh™. Shown in Figure 2, this self-adhesive shielding tape is super flexible, and can be used with the snap-loc tubing to shield cable splices, or cable branch-outs.

If you're interested in Zippertubing's catalog, circle Reader Service Number 37. In addition to the company's catalog, you'll get a "Cable Caliper" free of charge. This flexible plastic tool is marked to help you gauge the diameter of your wire bundle in either inches or millimeters. The scale will also determine the correct diameter of Zippertubing to specify.

□ □ □

John Bisset is a principal with Multiphase Consulting, a contract engineering and projects company. He can be reached at 703-379-1665.

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Understand Circuit Theory

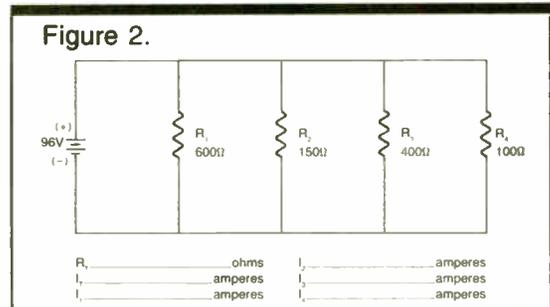
► continued from page 27

by dividing the total voltage by the total current. In this example it is:

$$(150 \text{ Volts}) / (9.25 \text{ Amperes}) = 16.216 \text{ Ohms.}$$

Note that using the same components results in a much lower total resistance when components are connected in parallel.

Total resistance in a parallel circuit is always less than the smallest resistance in the circuit. Adding more components across the battery in parallel will provide more avenues for current to flow. With voltage from the battery remaining the same, total resistance will decrease as a factor of Ohm's Law.



Total resistance of a parallel circuit also can be calculated using several parallel resistance formulas. A universal one that can be used in computers and calculators is illustrated in Figure 1. It is known as the inverse of the sum of the inverses.

If the total resistance is divided in the voltage source, the total current of the parallel circuit will be calculated. The sum of the individual

branch currents must equal the total current calculated using voltage and total resistance. This is known as Kirchoff's Current Law.

Power

Total power dissipated in the parallel circuit is calculated in the same manner as in a series circuit. Using Watt's Law, the power in each branch can be calculated. Power can also be calculated by multiplying the voltage by the total current:

$$(150 \text{ Volts})(9.25 \text{ Amperes}) = 1387.5 \text{ Watts.}$$

This is considerably higher than the total power calculated in Lesson Eight.

Figure 2 is an example to test your knowledge of a parallel circuit.

Here are the answers to lesson eight's series circuit problem:

Total Resistance: 100 Ohms
Total Current: .5 Ampere or 500 milliamps

- V₁ = 7.5 Volts
- P₁ = 3.75 Watts
- V₂ = 15 Volts
- P₂ = 7.5 Watts
- V₃ = 27.5 Volts
- P₃ = 13.75 Watts

□ □ □

Ed Montgomery is a communications teacher at Thomas Jefferson High School for Science and Technology. He has taught broadcast engineering at Northern Virginia Community College and worked as a broadcast engineer for several radio stations. He can be reached at 703-750-5090.

The World of H. Geneen

► continued from page 17

Geneen points out that people rarely fall neatly into psychological pigeonholes. Reverting to his "start doing something" attitude, he would hire a person, put him or her in a management position and watch him manage. Performance is the only criterion, according to Geneen.

And Captain Kirk of the original Starship Enterprise would agree.

In "Star Trek II, The Wrath of Kahn," Kirk tells a subordinate officer who just made a mistake, "We learn by doing." A nationally-recognized success trainer, Tony Robbins, says that the single most important key to achieving success in anything is "the ability to take action."

My own opinion is that anyone willing and gutsy enough to *act* will, by default, be immediately ahead of their competition—most people don't have the nerve to initiate anything. They theorize, plan, discuss, daydream and otherwise waste cranial capacity; but they rarely *do* anything.

The idea was, even if your course wasn't exactly right you could still make adjustments and start moving in the proper direction. The people who don't move at all cannot possibly reach a successful destination.

Where theories and operational business structures seek to provide a systematic way of dealing with all of a business' potential challenges, Geneen feels that approach puts the cart before the horse.

The "G" system dictates that the only theory or structure you want is one designed to gather operational facts about the business. From that point, you throw away the system and act on the facts—not on the system.

"Your decisions in business have to come from within you, as an amalgam of everything you have ever learned applied to the facts of the situation or problem at hand. In short, you cannot run a company, a division, or a department with a checklist of things to do or by slavish devotion to a theory devised by the most brilliant professor at a business college, because business, like all of life, is much too vital and fluid to be wholly contained by any checklist, formula, or theory." Thus sayeth Geneen.

We'll be serving up some more Geneen for you next month. See you then.

□ □ □

John Cummuta is an independent marketing and management consultant, and he can be reached at 708-960-5999.

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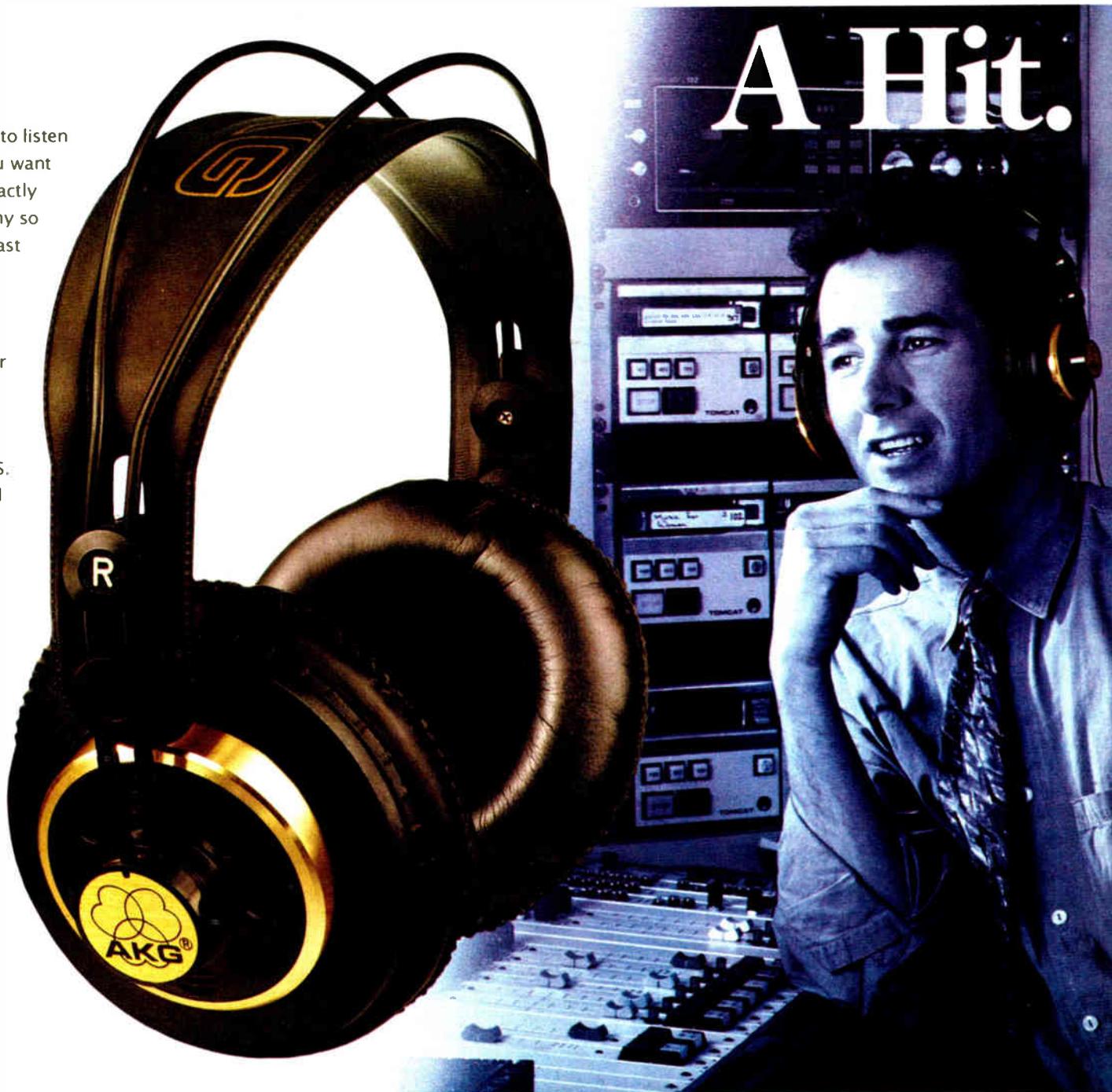
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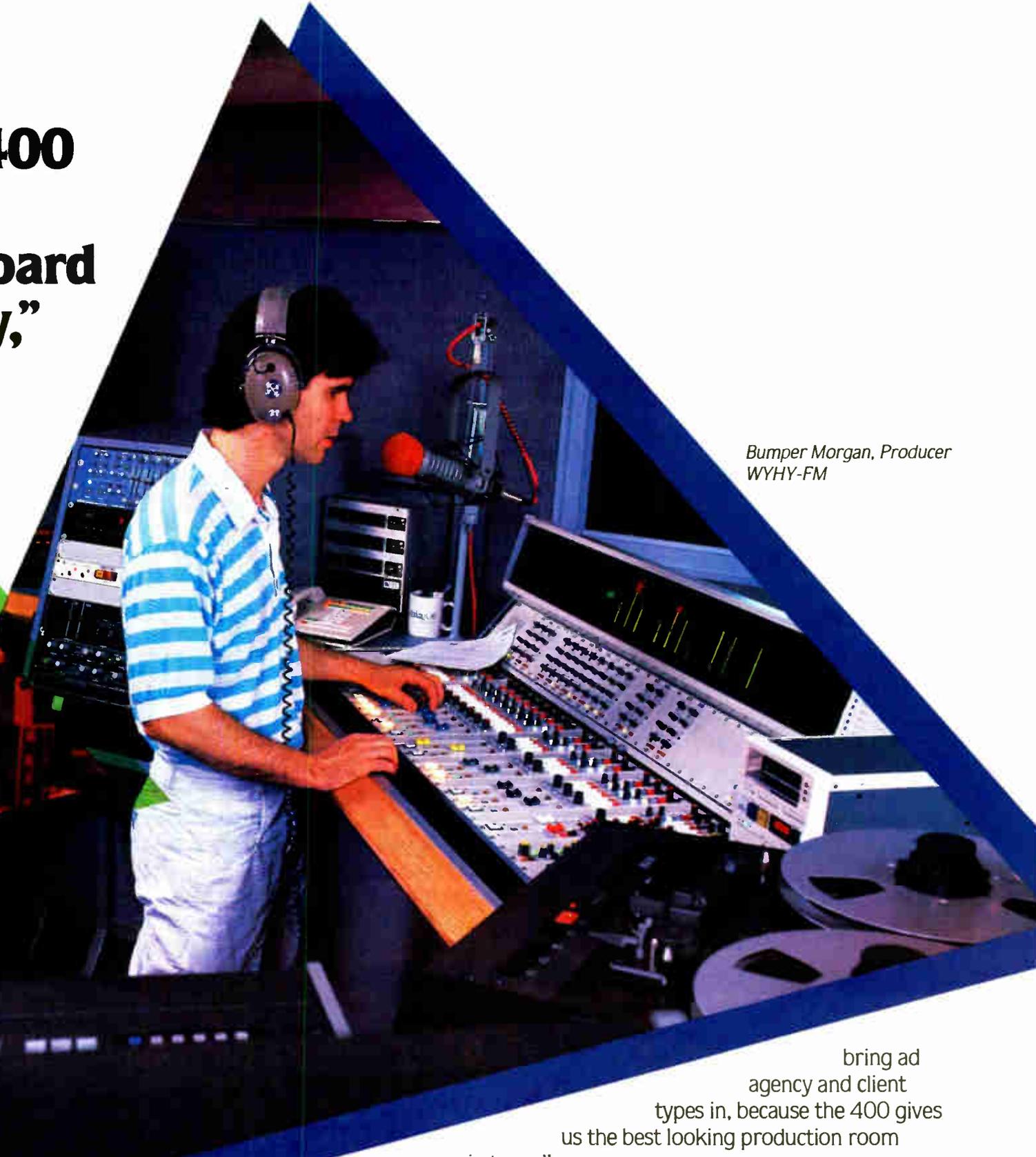
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"Auditronics' 400 is the best production board for the money,"



Cameron Adkins
Chief Engineer
WYHY-FM
A Jacor
Communications
station



Bumper Morgan, Producer
WYHY-FM

says Cameron Adkins, Chief Engineer of Nashville's outrageous Y107 FM. "In fact, Auditronics' sound has helped make us number one in our market for the last five books, and we expect to capture our sixth one as well."

"After looking at all the production consoles that were out there, we found the Auditronics 400 was the best buy for the money. It had more useful features than any other console in its class, and was less expensive overall. So we decided to buy it not only for WYHY here in Nashville, but for two of our other stations as well."

"We bought the light-bar metering version because the ballistics and characteristics are more meaningful for what the production engineer needs to know. Our producer, Bumper Morgan, likes the light bars better than conventional VU meters because he can see from across the room if he's got one channel a little hot without having to stare at the board all the time. The light bars also give the console a high-tech look that helps our sales people when they

bring ad agency and client types in, because the 400 gives us the best looking production room

in town."

Bumper Morgan, Producer at WYHY says, "Auditronics has really set a new standard in radio production consoles. Going from our old board to this 400 was like going from night to day. The light-bar display gave me instant gratification. I use the foldback modules a lot. I like the range of the eq and the very clean overall sound of the board. Besides our own work, I do a lot of promos, sweepers and liners for other broadcasters from Honolulu to New York, and I continually get compliments that the sound of our packages helps stations sound better than their competitors."

Adkins says, "The Auditronics 400 was easy to wire in. And nobody's board surpasses this 400 for reliability or stability. We're a heavily produced station with seldom a break that we don't air something that was produced here on this board. Even with this heavy workload, we've had zero failures. Literally nothing has gone wrong since day one," he says.

Call 1-800-638-0977 toll-free today for more information on the 400 production console Cameron Adkins buys.



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Each program element is validated for logging and to prevent airing out-of-date material. R-DAS reports the exact date and time each spot ran to the traffic system for verified logging. Instant on-screen editing is possible for any last minute changes to schedules.

Every break automatically filled by the traffic system is timed right to the second by R-DAS. Audio cuts may be timed to the second when recorded. R-DAS can automatically record a pre-timed source from any satellite or network, schedule it, and play it back at any desired time.

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TECHNOLOGY UPDATE

Wheatstone Makes On-Air Access Easy

by Kelly Major
Assistant Marketing Director
Wheatstone Corp.

SYRACUSE, N.Y. Wheatstone's Not So Hard Disk (NSHD) is logically divided into two parts: an air disk playback terminal and a production/edit room record terminal.

The disk playback terminal gives the audio console operator access to only the playback functions of the system. The



Wheatstone Corp.'s Not So Hard Disk system.

operator can play selections that have been assembled as a "playlist"; he can create and edit playlists as required, or he can assemble sequences that play a salvo of selections at one stroke of the Start button.

Two stereo playback channels are provided that allow segue, just like traditional NAB cart operations. The Not So

Hard Disk's start and stop functions can be tied to an audio console's On/Off buttons for convenient remote control.

The CRT displays a blue cursor line on the air disk playback terminal to indicate the currently playing channel (or channels) and shows remaining track time in the upper left- and right-hand corners of the screen. The red cursor indicates the next event that will be played when the Start button is pressed.

Press the button

When the button is pressed, the appropriate selection is played, the line turns blue and the red cursor automatically indexes down to the next track on the screen. An asterisk also appears in the display's left-hand column to show that a selection is in playback mode or already has been used. This helps eliminate skipped or duplicated events.

The production/edit room record terminal comprises a standard computer CRT and keyboard, the hard disk computer hardware and the hard disk drive enclosures. There are two primary functions provided at this terminal: recording and administration. When recording, you can type in your titles, track ID, play time and other reference information. You also can specify EOM (end of message or selection) trigger points.

You can modify title, reference information and, of course, delete tracks. Since it is an ROM-based system, operation is fast, smooth and easy to learn. In administrative mode, you can define various levels of password security, monitor system activity, set system operational

parameters and perform maintenance and diagnostic routines.

Interface

Additional features of the Not So Hard Disk include interface to an on-line printer to produce a log printout of what has been played. There is a provision for program-

Other options include AES/EBU digital inputs and outputs and multiple simultaneous playback and record capability (up to four simultaneous stereo audio channels). The system's networking capability to other Not So Hard Disks allows almost unlimited storage capacity.

The Not So Hard Disk from Wheatstone is not a general purpose PC or personal computer, it is a dedicated hardware package. It does not require floppy drive boot-up; the operating system is on a pre-burned-in ROM for superior reliability. The system delivers digital quality audio. Electronics are accessible from the front panel for easy service.

The hard drives are set in self-powered enclosures that also allow front-panel access. The Not So Hard Disk can support one production/edit room record terminal and two air disk playback terminals.

□ □ □

For information on Wheatstone's Not So Hard Disk, contact Ray Esparolini at 315-455-7740; fax: 315-454-8104; or circle Reader Service 14.

The Not So Hard Disk from Wheatstone is a dedicated hardware package.

mable EOM signals to trigger warning lights, timers and other external devices. Other features include track trimming, multiple record triggering capabilities (audio program detect, timed countdown start) and external logic control, allowing the system to receive trigger commands from a routing switcher.

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TECHNOLOGY UPDATE

BE CORE 2000 Works with the Operator

by David Evers, Manager
Digital Product Management
Broadcast Electronics

QUINCY, Ill. One of the Broadcast Electronics' goals in developing the CORE 2000 was to create an automation system that worked at the level of the operator using it.

Previous generations required the operator to think of his end product in terms of numerical events rather than songs and commercials. Numbers were used because they made it easy for the designers of the automation system, not because they made life simpler for the people who

used it day after day.

The intent of the CORE 2000 is to turn this situation around by providing a layered system from the operator at one end to the system hardware at the other.

Consider an example that requires the playing of two songs followed by a commercial. At the operator's level, the only things needed are the names of the songs and the spot. He communicates these instructions to the CORE 2000 by means of the User Interface (his doorway into the system).

The User Interface software turns the operator's wishes—in the form of keystrokes—into a meaningful digital

representation of them inside the CORE 2000.

The User Interface, in turn, invokes other layers in the CORE 2000 software. Most notably, the Database System is used to translate the names of songs and commercials into their locations within the various sources in the system. Although this is most likely a numerical representation, as in prior automation systems, the operator did not have to look up the numbers; the CORE 2000 did.

The next layer encountered is the Execution Engine. This part of the system software is responsible for taking the instructions handed down from the upper layers and actually performing them as ordered. This usually involves performing actions based on real time, monitoring the ready status of upcoming sources and responding to the End of Message (EOM) signals from on-air sources.

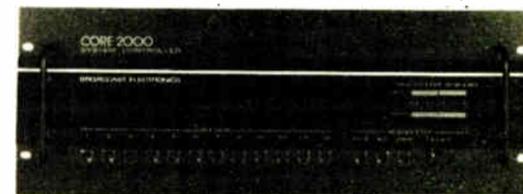
This is the main function on any automation system; the CORE 2000's Execution Engine is based on the sum total of years of broadcast automation knowledge and experience, gathered over the product lives of previous BE equipment and competitive systems.

The Execution Engine is designed not only to follow instructions that come down from above, but also to do the right thing when confronted with situations such as power failures and unready sources.

The Execution Engine, however, is not the last level of responsibility in the CORE

2000. In our example, we have instructed the system to play two songs and a commercial. Assume, that the first song is to be played from CD on a Sony CDK-006 CD Jukebox, while the second song comes from a Panasonic SV-3900 DAT machine, and the commercial comes from a 24-shelf Go-Cart or Carousel.

Obviously, the interface requirements and protocols of each of these source machines vary widely, yet the intent of the system is to insulate the operator from this level of complexity. The CORE 200 accomplishes this with intelligent Source Interfaces, which are the pieces of hardware responsible for communications between the system and the source machines.



Broadcast Electronics CORE 2000 Program Control System.

Source Interfaces for all but historically standard automation equipment (such as cart machines, reel-to-reels and studio/network sources) are fitted with dedicated microprocessors. These microprocessors allow the interfaces to be programmed with specific instructions and protocols for the machines they control.

The CORE 2000 is a platform equally suited for the past, present and future; our utilization of this technology has only started.

□□□

For information on BE's CORE 2000, contact David Evers at 217-224-9600; fax: 217-224-9607; or circle Reader Service 99.



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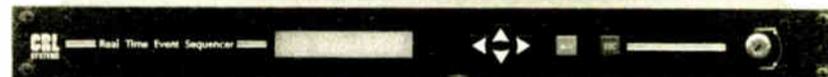
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USER REPORT

WKJR Field Tests ITC's DigiCenter

by Jay Martin
GM, WKJR-FM

SULLIVAN, III. For much of 1991, WKJR was a field test and evaluation site for ITC's prototype DigiCenter.

WKJR is a small market FM in East Central Illinois, licensed in Sullivan, and also serving the larger cities of Mattoon and Charleston. At the time ITC approached me, I was looking at various other systems to both enhance our production and on-air operations, and reduce overhead.

I eagerly accepted the company's offer, not only because DigiCenter was "digital," but because of ITC's unique approach to integrated features and expansion capabilities.

Enhance service

Our country format is originated live 6 a.m. to 10 a.m. Monday through Friday. The balance of our 24-hour broadcast day, as well as weekends, is covered by the Unistar Satellite country format.

DigiCenter has permitted WKJR to effectively utilize and even enhance this service.

It sounds incredibly local with super-smooth joins, while the large storage capacity for spots, liners and community announcements frees us from constantly double-checking our library.

There is no need to erase or "prep" carts and 20 weather cuts can be entered into the system in less than 10 minutes. If you make a mistake, simply touch a button on the touchscreen and rerecord it. You don't even have to select Start or Stop; the system will auto start/stop with the presence of audio and give you just the part you want.

You also can edit, again via the touchscreen, without rewinding or cutting tape.

Actualities can be automatically recorded and time shifted, with no action required on our part other than entering the original parameters.



VariTime, one of DigiCenter's unique and exclusive features, permits us to easily and automatically compress or expand the length of a liner or commercial cut, or even an actuality, with no pitch change.

Since the installation of DigiCenter, WKJR has run a 24-hour-a-day quality-sounding operation with only four employees. As for maintenance, DigiCenter pretty much takes care of itself. The few problems we had were fixed by ITC remotely through a modem and phone line from the company's headquarters in Bloomington. No

continued on page 34 ▶

TECHNOLOGY UPDATE

A New Era with DAWN-9000

by Russ Gentner
CEO
Gentner Broadcast Systems

SALT LAKE CITY In its simplest form, the Gentner DAWN-9000 is a replacement for tape cartridges and cart machines in a radio station. Spots are edited and recorded into DAWN at the production workstation and played on-air

workstation maintains a duplicated copy of the audio files on the file server. This provides for redundancy in case of a hardware failure.

The log for each day is either manually entered by the traffic department or automatically downloaded from the traffic system directly to the master workstation. DAWN plays commercials according to the log and then records the exact time the spots were played.

With the addition of one or two CD jukeboxes, the DAWN-9000 system can randomly find and play any song. Music also can be programmed in advance using DAWN's music scheduling system. Both the commercial log and music schedule are integrated into a single log.

Instead of using a keyboard or a mouse for commands, DAWN uses a special "keypad" with familiar, easy-to-use command buttons. To start the next stopset, for example, the talent simply presses the Start button on the keypad. The commercials are automatically played and logged.

DAWN comes in three standard systems, offering as standard features: total redundancy; six hours of stereo storage (20 hours mono); production/master workstations; Novell network-based, industrial-grade hardware, and multiple formats, including live assist, satellite and automation.

□ □ □

For information on Gentner's DAWN-2000, contact Elaine Jones at 801-975-7200; fax: 801-977-0087; or circle Reader Service 73.



Gentner's DAWN-9000 automation system

at the master control workstation.

DAWN uses a Novell local area network to link the master and production. Audio files (commercials) are stored at the file server and are available at any time to both master and production. Additionally, the master

RADIO SATELLITE MADE EASY
by HARRIS ALLIED

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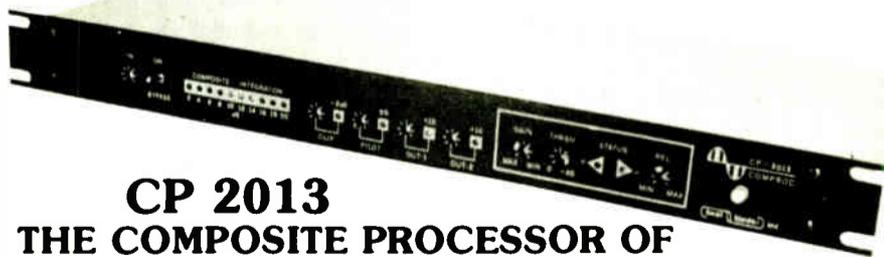
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TECHNOLOGY UPDATE

PostPro Integrates Digital Functions

by **Darren Abrams**
Marketing Communications
Coordinator
New England Digital

LABANON, N.H. With up to 16 tracks of hard disk recording, high speed random access editing, comprehensive timecode synchronization and on-board DSP, the New England Digital PostPro has become



New England Digital PostPro workstation (r), alongside NED's Direct-to-Disk workstation

combines all the features of hard disk recording and RAM-based sound design into one integrated product. To fully access the power of these products in a fast and intuitive manner, the PostPro workstations are driven by New England Digital's Macintosh-based MultiArc Audio Editing Software.

The MultiArc software provides a full-color graphic display for all editing functions. The modules consist of EditView, a tape-style editing interface; TransferMation, a librarian that catalogs both on-and off-line sounds; and the Transport window, which provides familiar transport controls for recording and playback and displays information about the sequence, such as timecode locations and available record times.

The heart of the MultiArc package is EditView, where audio cues, either stored on hard disk or in RAM, are displayed as blocks that scroll across the screen from right to left in the manner of a multitrack tape machine.

Cues can be arranged across any of the sequencer's 200 tracks and can easily be slipped, cut, copied or pasted using familiar Macintosh commands. To trim the start or end times or to place a crossfade on a cue, the user simply clicks on the cor-

ner of the block and drags it to the desired locations.

The TransferMation librarian catalogs sound files stored on either hard disk, optical disk, magneto-optical disk or in RAM, and can search for keywords or categories of sounds stored on both on- and off-line volumes. In a matter of seconds, the librarian can search through hundreds of thousands of sounds to find all that fit a particular category.

The Transport Window allows audio to be recorded directly into EditView at any speci-

fied location on any track. Available record times are displayed for any selected track, and punch-in and out times can be entered for frame accurate inserts. The panel is designed to be intuitive and familiar to anyone who has operated a traditional tape machine, and minimizes commands for all functions.

All of the MultiArc modules are displayed simultaneously on a 19-inch color monitor, which not only allows the operator to view the display, but allows producers to easily view the project and get directly involved in the editing process.

□□□

For information on New England Digital's PostPro, contact Darren Abrams at 603-448-5870; fax: 603-296-2075; or circle Reader Service 44.

TECHNOLOGY UPDATE

Software Upgrade for DSE 7000

by **David Angress**
VP Sales and Marketing
AKG Acoustics Inc.

SAN LEANDRO, Calif. The AKG DSE 7000 was conceived with the radio production person in mind. It is accessed via a console designed for intuitive speed and simplicity using dedicated buttons for track selection, tape motion control and track editing.

The system's color monitor displays helpful information in two windows: one for the status of all eight tracks and the other indicating signal level and a fast menu of options.

AKG has advanced this already powerful tool with a technology update in the DSE 7000 version 2.0 software. Many of the changes are hidden in the inner workings of the system and provide internal diagnostics to protect the integrity of the production. The changes are visible in that loading existing productions from the hard disk and shadowing new work is much faster, with productions loading in a quarter of their audio time.

Scrubbing and winding now sound even more like tape, even over complex edits. The user now has almost unlimited edit capacity with a new per-production capacity of 15,000 cuts—the equivalent of six rolls of splicing tape! Further, screen displays are faster and

more accurate.

If a station already has personnel familiar with the DSE, there is nothing new to learn, because most keystrokes and procedures have not changed, only the functions are more powerful.

There are a vast number of specific im-



Don McKinzie, American Media's head of production, is among many sold on AKG's DSE-7000 digital production system.

provements in the new version 2.0 software that have to be seen to be believed. It is important to know that upgrading is automatic and takes only ten minutes. No existing productions or elements are destroyed and you can use version 2.0 with production saved by earlier versions, since the first time you open a production its files are converted to the 2.0 format.

□□□

For information, contact David Angress at AKG Acoustics, at 415-351-3500; fax: 415-351-0500; or circle Reader Service 154.

WKJR Field Tests DigiCenter

► continued from page 33
muss, no fuss, no work for us.

DigiCenter has been easy for everyone to adapt to, with a monitor display that looks like a bank of cart machines and their familiar controls, although most on-air operation actually works from the console pots and switches. Playlist assembly is a snap and the editing screen is simple, even for the computer novice. In fact, we've almost forgotten that DigiCenter is a computer.

The heart

The heart of DigiCenter, the computer itself, is contained in a specially designed rack-mount cabinet hidden out of sight. ITC has designed the cabinet for heavy duty use in even the largest broadcast applications, with lots of expansion and redundancy capability.

ITC has developed its own DSP board (the part that digitizes and manipulates the audio in systems of this type), effectively quadrupling capabilities. Use of this pro-

prietary DSP permits DigiCenter to handle up to six stereo audio inputs and/or outputs simultaneously, with no degradation. This allows us to implement overlaps and cross fades, and emulate a "live" sound.

Our system has two workstations—one in production and one on-air, served from the same central unit. I am told that DigiCenter soon will include options for program automation and a traffic/accounting/billing interface that will be compatible with most scheduling software packages in common use. In the future, networking of multiple workstations will be offered.

DigiCenter is a phenomenal product and ITC's longstanding reputation for quality, reliability and product support is the icing on the cake. I intend to purchase the system at my station as soon as ITC will let me.

□□□

For information on the DigiCenter, contact ITC's Bruce Helling at 309-828-1381; fax: 309-828-1386; or circle Reader Service 25.

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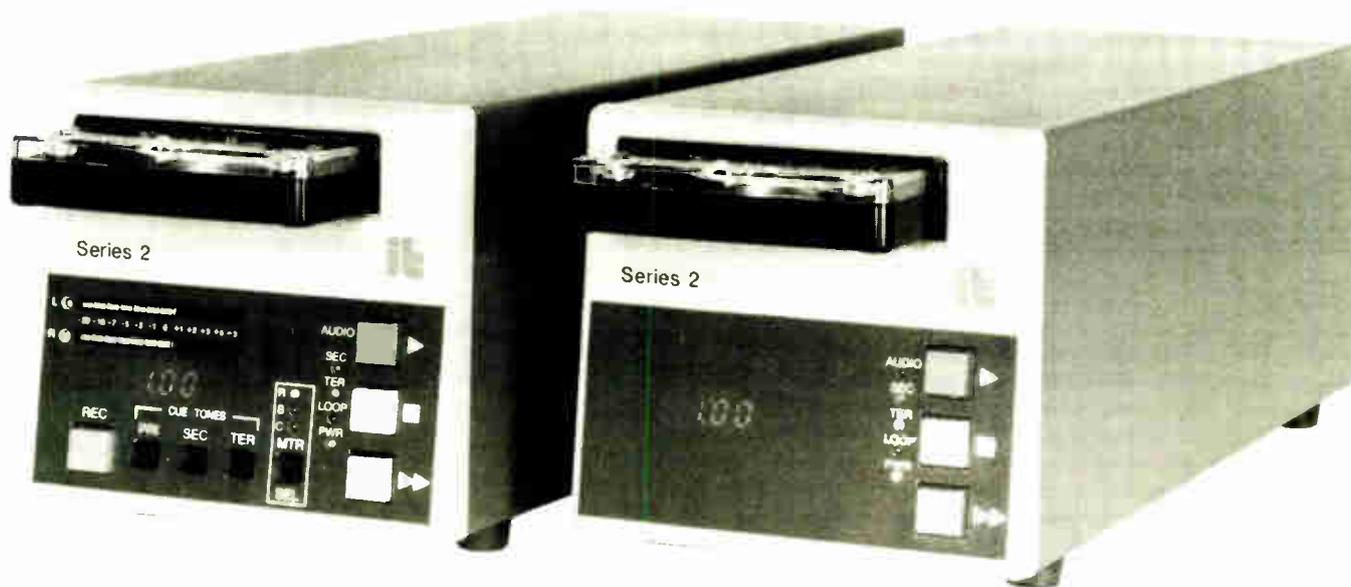
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USER REPORT

WGHQ Delivers via Computer Concepts

by Walter Maxwell
GM/PD, WGHQ(AM)

KINGSTON, N.Y. WGHQ went with Computer Concepts Corporation's PC-based Digital Commercial System (DCS), which records all programming material onto hard disk and plays it on-air in any manner wished. It also has the capability of switching up to eight different stereo audio sources at will.

Our stations have been utilizing Computer Concepts' traffic system for the past six years, so we knew who we were dealing with. A Novell network with six resident terminals already was in place. The DCS would require the addition of two PCs that could

directly interface with the traffic system via our existing file server.

With the DCS, the traffic system drives the automation directly via the file server. The control room log is updated automatically once every minute.

Installation was a snap. The production room PC was installed and hooked up just like a cart machine, with two audio pairs (left and right) for input and output, respectfully, to the console. An RG-61 coax to the file server and the production room was ready for service.

The control room was much the same, except there was an eight-channel stereo audio switcher that took up to 3.5 inches of rack space. All audio sources were connected to

the back of the switcher using Phoenix connectors (no soldering). A 36-conductor ribbon between the audio switcher and the PC was utilized. The control room was ready in less than a day.

This also included some wiring for cart start cues from SMN, switching for automation and live assist modes at the console that were required. DCS controls the audio switcher selecting any one of eight sources for airplay: 1-DCS, 2-NBC news, 3-SMN, 4-AM console, 5-weather cart, 6-news cart, 7-FM console and 8-NBC's First Light.

WGHQ has been operating with DCS for 18 months with little or no difficulty. The walk-away time, except for weather and news, can be days at a time.

DCS has met all expectations and exceeded many. One of the new features we plan on using in 1992 is DCS's ability to rec-



Computer Concepts' Digital Commercial System (DCS)

ord NBC's features during our live morning drive show. DCS has the ability to record off the network simultaneously as it plays a commercial over the air. Service has been excellent and the cost is well below expectations.

□□□

For information on Computer Concepts, contact Della Northcutt at 800-255-6350; fax: 913-541-0169; or circle Reader Service 19.



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USER REPORT

Pristine Automates KJLA

by Spike Santee
VP/GM, KJLA(AM)

KANSAS CITY, Kansas KJLA takes maximum advantage of the interfacing capabilities of the Music Management Control System from Pristine Systems.

The heart of the automation system is a CompuDyne 386-16 computer, configured with a hard drive and, among other components, a custom Pristine Interface for control of DAT tape players and Pioneer CD players. The system had interface connections for up to 32 playback devices.

Through a MetraByte ERB-24 interface and 24-channel relay output board, KJLA controls the interface of satellite-delivered Associated Press Radio News and automated weather forecasting services.

The MetraByte interface controls a Conex Electro-systems' ASI01 audio switcher. This switches various audio sources on-line for playback on the air. Through precise timing controls in the Pristine Applications Software, KJLA is able to control the Conex switcher for precise interface of live news broadcasts from AP Radio.

The weather forecast is phoned in from a weather service through a Gentner TC 100 telephone system to an ITC record/playback cart machine. Through the Gentner TC 100,

the weather service is able to control the erase, splice, find, record and playback functions of the ITC cartridge machine. Through the use of the MetraByte ERB-24, the Pristine system can call for the weather forecast at the pre-programmed time.

Each production room has a 386 computer with an Antex SX-8 Audio Processor Board, which is wired to the traditional production room equipment through the audio console. Operators can make commercials using the conventional broadcast equipment, such as the reel-to-reels and cart machines, or they can record directly to the computer hard disk, using software.

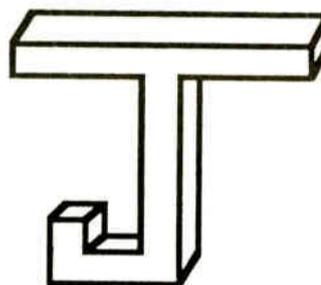
Finished production is then transferred via the network interface to a standby computer and the actual playback computer.

The daily music playlist is produced using the Selector Music Scheduling System from RCS, then is downloaded to the Pristine system for scheduling with the commercial load.

This configuration has proven to be a cost-effective and reliable method of automating a radio station by including a wide range of audio inputs to provide a variety of programming for our listeners.

□□□

For information, contact Boyce Williams at Pristine Systems at 213-852-0737; fax: 213-655-6207; or Reader Service 59.



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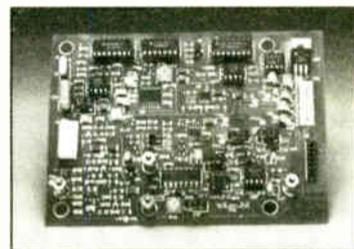
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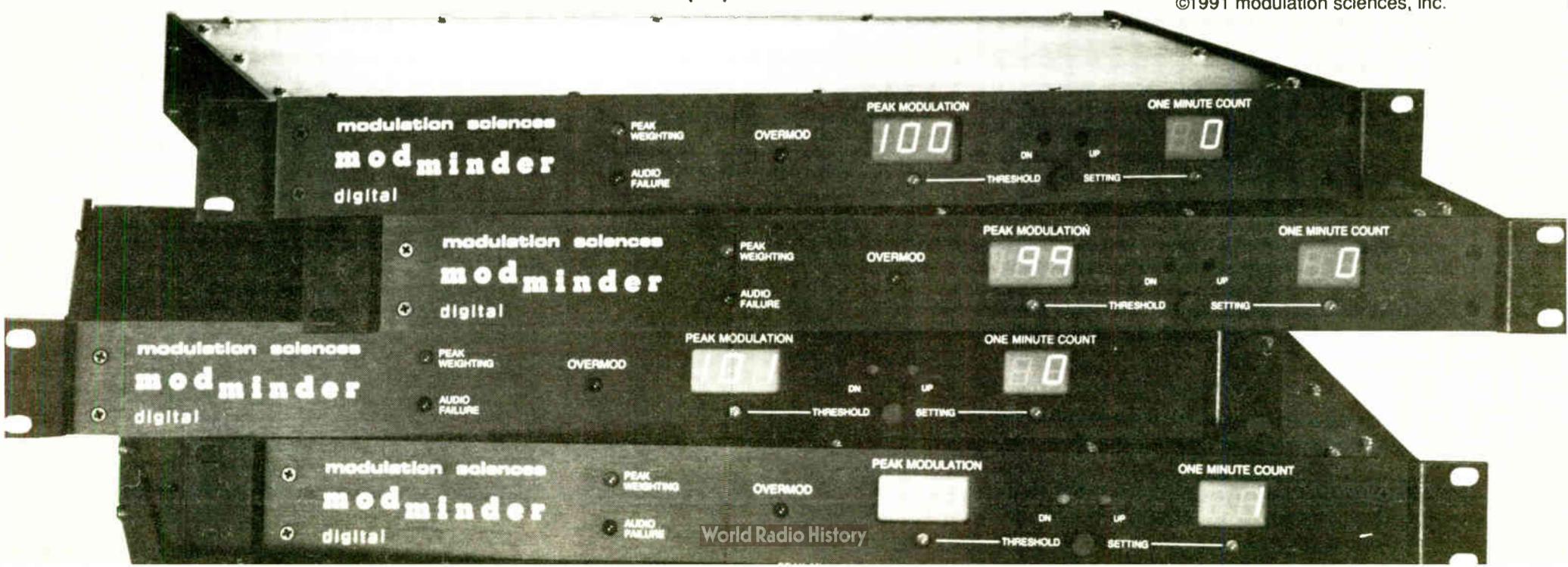
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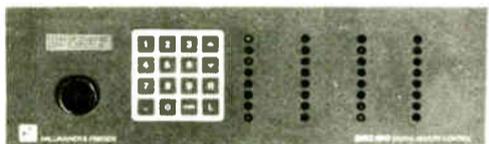
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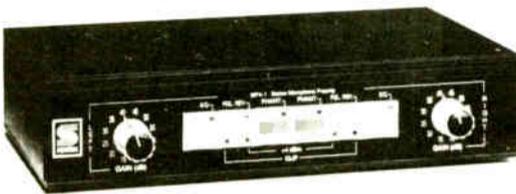
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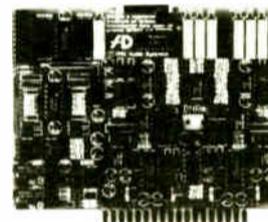


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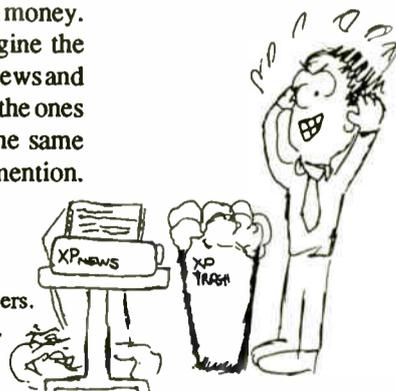
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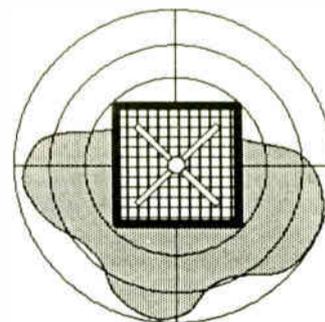
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READER SERVICE NO. 114

TECHNOLOGY UPDATE

Register Offers R-DAS Automation

by **Lowell Register**
President
Register Data Systems

PERRY, Ga. Register Data Systems' R-DAS (Register Digital Automation System) is an innovative way to operate a radio station in a digital environment.

R-DAS complements the RDS Traffic and Billing System, provided to more than 600 stations since 1979, and the RDS Digi-Corder, first introduced in 1991.

R-DAS provides everything needed to record, store and play back commercials, liners, jingles, IDs and other promotional material on the hard disk of a PC computer, all with CD-quality sound. It also interfaces with the Traffic and Billing System, providing all necessary information to operate Satellite Programming Systems automatically.

R-DAS provides a choice of mono or stereo with a frequency response to 20,000 Hz+. Every audio source is ready to play instantly.

All R-DAS products use high-speed processors and other high-efficiency components and advanced operating systems and software. All audio switching is computer-controlled in an easy-to-use menu-driven format using broadcast language.

R-DAS has the flexibility to operate with complete control of all satellite functions automatically. Software design allows for virtually unlimited control of multiple satellite or network inputs and unlimited voice inputs

for each source. Each liner, ID or voice audio source is validated with start date and time and end date and time to prevent airing outdated material. Voices also can be overlapped with satellite or network sources.

Logs scheduled by the RDS Traffic and Billing System are updated directly into R-DAS. Logs may be scheduled into R-DAS as far ahead as desired with no limit. Other traffic systems also may be interfaced into R-

DAS. The system verifies back to the traffic system the exact date and time of each spot for billing. On-screen editing is possible for any needed last-minute changes to schedules.

Every break automatically filled by the Traffic system is timed to the second by the R-DAS. Audio cuts may be timed to the second when recording, or played back, if desired, at their original recorded time.

Other features include automatic record-

ing of a pre-timed source from any satellite or network, and scheduling or playback at any desired time; and simultaneous automatic recording from any source while playing and maintaining a constant vigil on the satellite programming.

Storage time is limited only by the size of the hard disk—the smallest model holds 100 minutes in stereo at 15 kHz. Other models are designed to hold from six to 10 hours in stereo at similar audio response.

□□□

For information, contact **Lowell Register** at Register Data Systems at 800-5521-5222; fax: 912-987-7595; or circle Reader Service 111.

TECHNOLOGY UPDATE

ProDisk-464 Grows with You

by **Mark Calice**
Product Specialist
Otari Corporation

FOSTER, Calif. The ProDisk-464 is a true multitrack, high-speed, hard disk-based digital audio recording and editing system.

The ProDisk provides a solid, reliable and expandable platform that we think can dramatically reduce your production costs. System configuration may accommodate from four to 64 channels of simultaneous digital and analog inputs and outputs in any combination.

Field upgrades also are possible in blocks of four channels. The Macintosh visual interface provides the quickest learning curve available, and because all audio processing is handled elsewhere, the system always runs at top speed with no slowdowns.

Current DSP options include real-time internal mixing, panning and level control, while future upgrades will handle time compression/expansion, pitch shift and EQ.

ProDisk's obsolescence-proof Programmable Logic Array and TDM SCSI disk technologies assure compatibility with tomorrow's storage products and software enhancements. The ProDisk's hardware architecture provides plug-in compatibility with standard multitrack tape machines, while the ability to punch in and out on any or all tracks assures a consistent and familiar operational base.

Standard features include unlimited length fades and crossfades, 8 mm tape backup and restore at 3× speed, audible Fast Forward and Rewind, Multitrack and Cue List style user interface with interlinking sound libraries, full SMPTE time code support, sound

quality yielding 96 dB dynamic range, high quality scrubbing and a visual waveform edit display capable of edits down to the sample.

Otari also provides complete system solutions, bundling Macintosh computers with any ProDisk purchase.

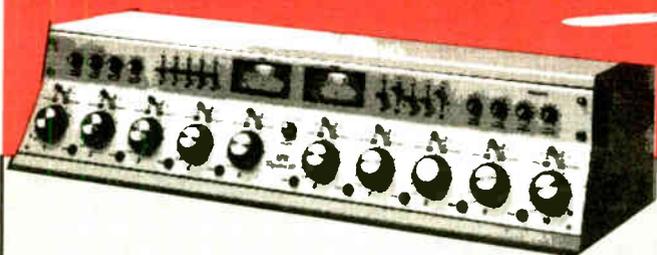
Optional features include multitrack digital I/O in AES, EBU, S/PDIF, SDIF-2 and PD formats and additional 8 mm tape drives to improve backup and restore times.

As the ProDisk-464 is a constantly evolving product, forthcoming enhancements will include a configurable hardware control surface with transport, jog/shuttle, soft-keys and dedicated editing keys, CMX auto-assemble/conform, a graphic style editing and list assembly interface (with an on-screen linear representation of tracks and sound elements), and central storage of sound effects libraries, accessible from any ProDisk terminal.

□□□

For information, contact **Mark Calice** at Otari: 415-341-5900; fax: 415-341-7200; or circle Reader Service 22.

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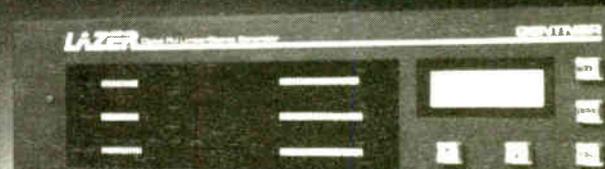
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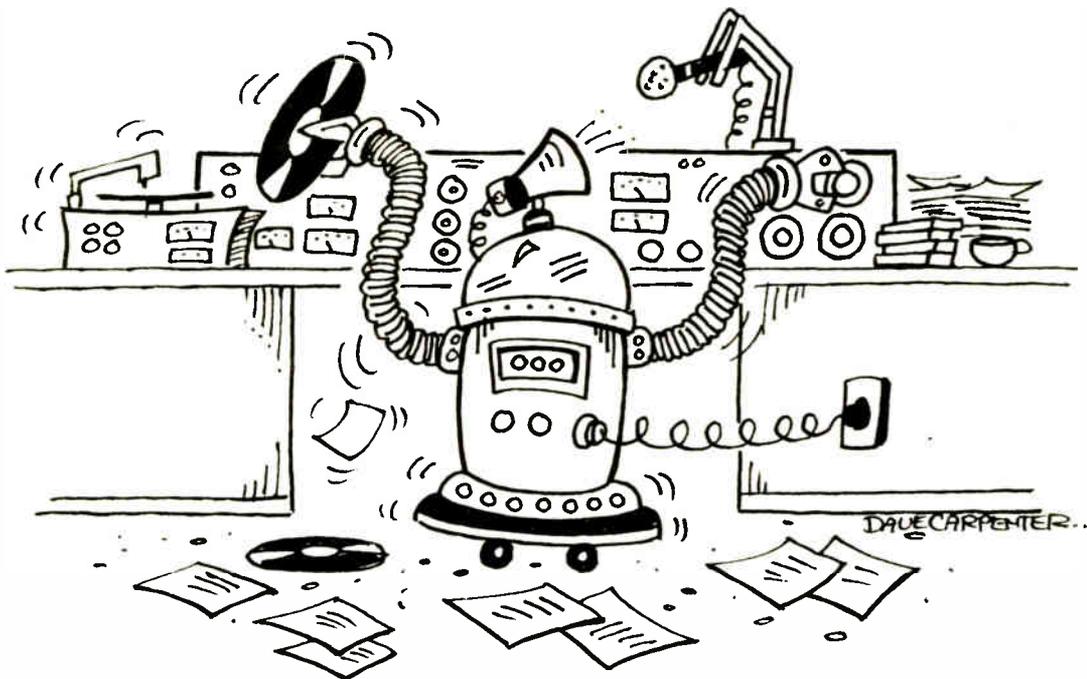
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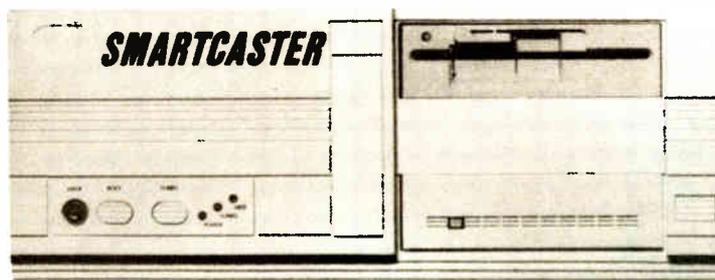
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SMARTCASTER

DIGITAL AUDIO



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TECHNOLOGY UPDATE

Understanding Hard Disk Jargon

by **Tim Valley**
President, MacroMedia

NORTHFIELD, Minn. So, you've heard about Audisk and those other new PC-

NAB show this year. This is true of every system, to the same degree that every word processor is just like a typewriter.

While it's nice to have software that will be familiar to someone who has used cart machines, if you buy a machine simply because it works exactly like a cart machine, you are missing out on the true potential of the technology.

A cart machine can't record a spot in one room and play it back in another at the same time. Audisk can, and any system you choose should.

"It works on a network" is another catch phrase. When you hear it, don't be afraid to ask questions. The truth is that it could mean many different things—not all of them good.

They might want you to buy a separate machine for every studio in which you want to use the system, and a "file server" to tie them all together. While this may sound like a great idea to them, a system that moves digital audio around on a PC network has some inherent problems, and not many real advantages.

One negative effect is that this type of network actually takes away some control and immediate access to the audio stored

on the system.

Audisk takes a different approach. Audisk records, stores and plays all the audio for a station on a single machine and gives you the ability to use that machine through terminals in other rooms if you want.

Also listen for the words "perfect CD quality." Just about all of the hard disk systems have better audio quality than carts and a few of the better systems can exceed the specifications of FM radio. (Audisk is in the latter

group.) The biggest problem with great digital audio quality is not making it happen, but making it happen without wasting huge amounts of expensive hard disk space for your spots.

Be sure the audio specifications of any system you're considering are quoted with digital data compression enabled (usually four to one), because that's how you'll need to use the system, unless 90 minutes or less storage is enough for your needs.

□□□

For information on the Audisk, contact MacroMedia's Tim Valley at 507-645-5970; fax: 507-645-6635; call Harris-Allied at 800-622-0022; or circle Reader Service 92.



Macromedia's Audisk

based "hard disk" or "digital audio" systems. They seem to have come out of the woodwork overnight.

We'd like to point out differences you may notice between Audisk and other systems on the market and help you sort through some of the buzzwords floating around about these systems.

"It's just like a cart machine" is probably one of the first sentences you will hear at the

USER REPORT

Digital DJ Makes It Fun Again

by **Jullan E. Jetzer**
President, GM, WXER-FM

PLYMOUTH, Wis. When I started in broadcasting back in 1958, every day was more enjoyable than the last. But as the years went by and I worked my way to station ownership, the fun slowly went away.

Recently, I was given the opportunity to build a new Class A FM from scratch, thanks to the FCC's 80-90 docket of several years ago. Suddenly, radio is fun again.

Transmitter, tower and antenna purchase decisions are easy enough. Just use good engineering advice and buy good used or new equipment, depending on your budget. For programming, we decided to use one of the excellent satellite services, since there were only a few in the market and

we had no music library.

Unistar's Special Blend was selected because it fit the market and is delivered digitally. Quality of the new radio station was highest on our list.

Like computers

With the format in place, we had to come up with a way to put it on the air and keep payroll in check. I liked the idea of using computers to do more than write letters, build logs and print payroll checks, so we decided to go with the Digital DJ from The Management.

I had been on The Management traffic system since 1981 and service, support and product advancement were always top notch. Its current software features and

continued on page 42 ▶

US

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Broadcasters all over the world ended their search for solid-state FM Transmitters with up to 8kW of power, after discovering that TTC has the only solid-state, broadband FM Transmitter with **field-proven**, superior performance.

Or did they choose TTC to get maximum efficiency, reliability, transparent audio specifications and

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For more reasons on why the world is buying from TTC and not the competition, call Russ Erickson at TTC at (303) 665-8000.

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"T

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Jeff Loughridge, Chief Engineer, WCDX, Richmond, VA
President, Audio Concepts and Engineering

Gentner

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USER REPORT

Sound Tools' Winning Automation Recipe

by **Darraine Maxwell**
Sr. Engineer, Monitor Radio
Christian Science Publishing
Society

BOSTON Monitor Radio produces three programs—"Early Edition," "Daily Edition" and "Weekend Edition"—that are distributed nationally to 190 stations by American Public Radio, and runs a 24-hour worldwide shortwave service.

We use three Sound Tools systems to edit, mix and air these programs. Sound Tools is Digidesign's two-channel hard disk recording and editing system, based on the Macintosh II PC.

One system is located in the main broadcast studio and the other two are used as remote editing stations. All three run on Macintosh IIci's and are connected with Ethernet, Tops and Timbuktu to transfer files and for remote operation from the broadcast center.

Typically, we bring in scheduled feeds from our Washington and New York bureaus every afternoon. They are recorded directly into Sound Tools, mixed and actually air from the workstation. As the story comes in, we enter markers while recording to the computer hard disk, flagging editing points.

Once the story is recorded, we call up these markers and quickly assemble our edits into a playlist. After some final tweaking in

the playlist window, the story is ready to air. The playlist gives us an exact time for the piece, which tells the producer exactly how much time needs to be cut, if any, before it goes on the air.

We also use Live List, a Digidesign utility program. Live List lets us cue up stories on the Mac and trigger them from the Mac keyboard.

Pieces don't have to be in order, which lets us work more flexibly with what actually is happening on a given show.

For complex pieces that require more than two tracks, we use Sound Tools like an additional reel-to-reel recorder. We mix the acts and tracks on the system, then we record that to analog tape while adding sound effects and backgrounds at the same time, creating a complete piece.

Sound Tools has really helped us deal with pieces that are filed just before we air a show. In one case, we had two stories filed and recorded, but not yet edited and assembled—at 3:55.

They were to air on the 4 p.m. live show as the second and third stories, which meant that they had to be on-air by 4:09, leaving less than 15 minutes for editing and mixing. We got to work and discovered that the second piece was long.

The producer instructed the engineer on the cuts while the show was running. We patched the remote Mac, where the editing had been done, into the show and triggered both stories live from that computer. That was six minutes of audio that was mixed, assembled and made ready for air in less than 10 minutes—which would have been impossible if we'd done it on tape.

Some of the producers and even the newscasters are working with Sound Tools. They



Digidesign's Sound Tools hard disk recording and editing system

often edit their own interviews on the computer. In fact, we're thinking about adding another system on the third floor so that the producers can edit from their own offices. With Ethernet and Timbuktu, we'll be able to control that station from the broadcast studio as well.

□ □ □

For information on Digidesign's Sound Tools system, contact Suz Howells at 415-688-0600; fax: 415-327-0777; or circle Reader Service 136.

Digital DJ Makes Radio Fun

► continued from page 41

those announced for the future seemed to outdistance the competition for my station plans. And best of all, the price was right.

I have worked with computers since building my own in 1974, so it didn't take much to convince me that some sort of backup system was an absolute must. I ordered two complete stereo systems: one with an audio switcher, to be used on the air, and one without for spot production and that all-important backup. A complete digital radio station for

less than \$25,000.

Installation was easier than I thought. Two cables from the satellite receiver, left and right channels to the switcher. Two cables from the Digital Audio Card (DAC) in the computer to the switcher, and two cables to the studio console, again left and right, and a computer serial cable from computer to the switcher.

Our plans included making this new system as integrated as possible, so we also purchased The Management's Super Log traffic system and associated software to make it work with the Digital DJ. We also bought the Lantastic network system (LAN) suggested by The Management to get all these computers to talk to each other.

Building the new logs necessary to work with the Unistar format took a few days, but everything fit together well since most of the satellite formats use similar liner, ID and commercial call systems.

Flawless

The computer has run the station flawlessly since we went on the air a few months ago. Our morning programming is live from 6 a.m. to 9 a.m. and all spots are played with the Digital DJ system in the live assist mode.

The rest of the time it just runs with digital quality, 24 hours a day.

Modems were installed in the program computer and in our fifth computer, which integrates with the Burk 8 remote control. My computer at home can call either one and handle complete control of the program computer, move or play spots, change the log or anything I could do at the studio keyboard.

I also can call the remote control computer to check transmitter operation and make adjustments as required. My laptop can do the same from any phone anywhere.

□ □ □

For information on The Management, contact Pete Charlton at 817-625-9761; fax: 817-624-9741; or circle Reader Service 84.



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World Radio History



BUYERS BRIEFS

RALEIGH, N.C. Micro Technology Unlimited's MicroSound Digital Audio Workstation brings precision and affordability to the art of recording, re-arranging, editing and mixing.

The system, which features Micro-Editor software, uses the "point and click" Windows 3.0 environment to ease you in. Features include simultaneous record and play of different soundfiles for precise sync, using only one drive; 110 dB typical noise floor; sonic purity at all 15 sampling rates from 8 kHz to 48 kHz; and fully automated mixes up to five hours long, and containing more than 1,000 audio segments.

The MicroEditor also can position up to 38 segments on virtual tracks to overlap and mix. Mixes can draw segments from up to 20 sound files stored on multiple drives or over networks.

Other features of the system: record and play analog or optional digital audio from CD or DAT; hear edits played in real-time if not mixing, no matter how long the audio segment or the edit; and instantly position or reposition any audio event in a mix to sample precision using Snap-to-Grids.

For information, contact David Cox at 919-870-0344; fax: 919-870-7163; or circle **Reader Service 7**.



SEATTLE The Sentry Systems automation system operates as a live-assist, fully automated or satellite-based device, using almost any source in any combination. The system uses a 100 percent IBM-compatible computer of the user's choice (XT, 286 or 386) and offers simple integration with popular traffic and billing software.

It also interfaces past and present sources: reel-to-reels, Instacarts, hard disk audio storage, CD jukeboxes and six-pack CD players.

The switcher handles 12 input sources standard and is expandable. The system offers built-in monitoring through metering and a cue speaker; it also has unlimited walk-away time.

For information, contact Bob Arnold at Sentry Systems: 206-441-1971; fax: 206-441-6582; or circle **Reader Service 124**.



LOS ANGELES The DM-80 from Roland Pro Audio/Video Group is a self-contained direct-to-disk recorder and editor. It can be controlled by the DM-80R remote controller or any Macintosh from a Plus on up that runs Track Manager software. The DM-80 is configured with either four or eight tracks and can be expanded to a true 32-channel system.

There is an optional digital fader, the DM-80F, that allows you to control level, two bands of EQ and panning for manual or fully automated mixes. The remote cable allows the hard drives and the processor to be out of the control room for completely quiet operation.

The system has eight balanced professional inputs and outputs, as well as the mix outs, four channels of digital inputs and stereo digital out. The DM-80 records incoming audio to either its own internal hard drives or one of up to 14 optional Mac-compatible fixed or optical hard drives for a total possible recording time of 24 hours.

Once the information is inside the DM-80, it is never lost. It can be cut, copied, moved and edited without ever losing the original and without using any more disk space.

The DM-80 has full SMPTE capability both as master and slave and can output MIDI time code or song position pointer. It also will lock to house sync.

For information on the DM-80, contact Albert Dugas at Roland: 213-685-5141; fax: 213-726-8865; or circle **Reader Service 110**.

the Desk Jockey™

NAPERVILLE, III. The Desk Jockey from Rodman/Brown & Associates offers digital audio automation at an affordable price.

Features include simultaneous record/play, flexible scheduling and inventory management options, and a proprietary format fault-tolerance system that actually

anticipates network mistakes and deploys automatic countermeasures to assure clearance of local paid content.

Standard features include satellite interface, printer, color monitor, on-site installation and training and a one-year warranty with 24-hour nationwide parts replacement.

For information on the Desk Jockey, contact Ted Czarniecki at Rodman/Brown & Associates at 815-744-1094; fax: 708-983-0977; or circle **Reader Service 131**.

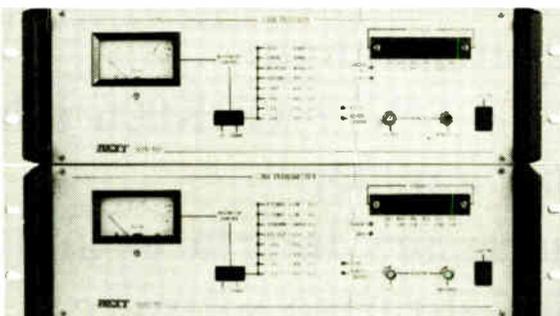
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USER REPORT

TM Century Automates WALX

by Scott Alexander
President
Alexander Broadcasting

SELMA, Ala. At Alexander Broadcasting's WALX-FM and WMRK, we use two TM Century Ultimate Digital Studios to give us complete program control.



TM Century's DigiCart

WALX-FM plays hit music live-assist weekdays 6 a.m. to 9 a.m. and 3 p.m. to 6 p.m., then runs unattended with recorded weather and voicers. Music is hot AC day-times, then CHR/urban nights, fine-tuned with TM's PowerPlay software.

Commercials are scheduled and billed using TM Century Traffic software. Music and commercial log diskettes are walked into our studios, then effortlessly loaded on the computer's drive in minutes.

TM Century's Digital Studio worked so well for our FM that we bought another for the AM. WMRK is full-service AM with local information, sports, (Larry King) talk and adult AC music.

When WALX-FM's vintage automation died, we interfaced TM Century's DigiCart hard disk digital audio players. DigiCarts give true CD-quality digital sound with seven hours storage for \$7,300 and a redundant production room DigiCart for \$3,995.

The DigiCart was on the air the hour it arrived. It worked flawlessly, running our heaviest pre-Christmas logs.

Our digital studios are extremely cost efficient. The equipment is amazingly affordable, using computers and CD decks that often can be traded out for advertising.

We now have programming flexibility, quality, security—and great digital sound. Stations are password-protected, so announcers don't play wrong songs or spots. All music is securely locked in our CD jukeboxes.

Nobody else brings it all together like TM Century.

□□□

For information on TM Century's Ultimate Digital Studio, call Brad Young at 800-375-1004; 214-448-0004; fax: 800-749-2121; or circle Reader Service 54.

BUYERS BRIEFS



EMMETSBURG, Iowa The Smartcaster is a complete automation system in a computer box, storing all spots, jingles, satellite liners and everything you would put on cart—all on the hard drive of a computer.

The result is unattended operation over an entire week, with logging, billing and traffic responsibilities handled automatically.

For information, contact John Schad at Smartcaster at 800-747-6278; fax: 712-852-4047; or circle Reader Service 20.

OGALLALA, Neb. The Audio Prophet from Prophet Systems is a digital broadcast system offering such features as a fast 486/33 processor, allowing room to grow; a fully redundant system for rapid switching from the control room to the production room to run your station; and satellite block following, which re-syncs a satellite feed every few minutes.

Audio Prophet also offers stereo 10-track digital mixing and editing such as cut and paste, digital splicing, digital mixing, dead rolling, dub-down and squeeze/stretch a track. The unit has CD audio quality with up to a 44 kHz sampling rate and 18-bit audio conversions; simultaneous play and record; automatic clock updates; and unlimited walk-away time.

For information, contact Kevin Lockhart at Prophet Systems: 800-658-4403; fax: 308-284-3517; or circle Reader Service 62.

TARZANA, Calif. At first glance, the DigiCart looks like a cart machine, but powerful digital editing features place the DigiCart squarely in workstation territory. Its DSP section does head trims, tail trims, fade-ins, fade-outs and level corrections at production speed. Optional hard disks provide up to 50 hours of storage, with random access to every cue. Advanced playlisting can sequence your cues for more complex production work.

The DigiCart is a two-channel, 16-bit linear recorder with technical specifications rivaling more costly digital recorders. Removable magnetic disks provide up to 45 track minutes of recording time, while an internal hard disk stores up to nine hours of audio. An unlimited number of cues may be placed on each disk.

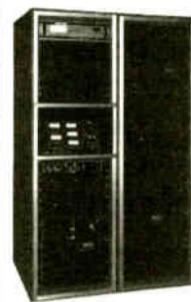
The DigiCart includes the new Dolby AC2 data encoding, which, when selected, provides a six-fold increase in storage time. Cue names, running times and other data are displayed on the front panel, while an optional remote control makes the DigiCart fit conveniently into any production setting.

For information, contact Robert Easton at 360 Systems at: 818-342-3127; fax: 818-342-4372; or circle Reader Service 33.



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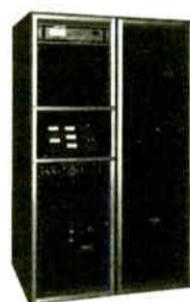


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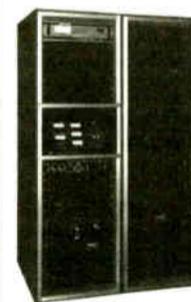
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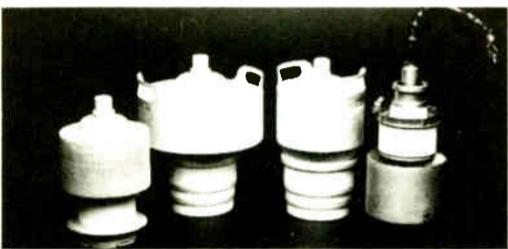
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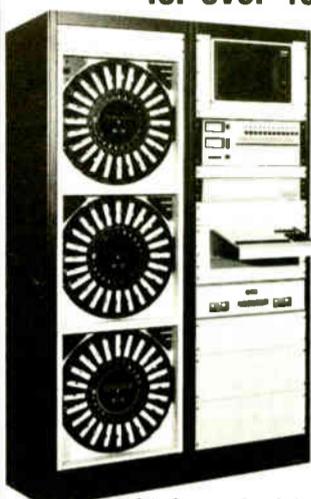
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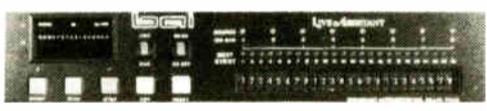
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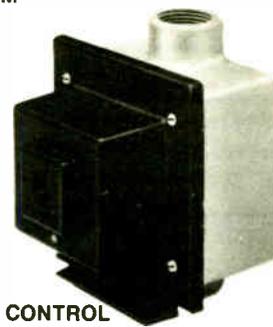


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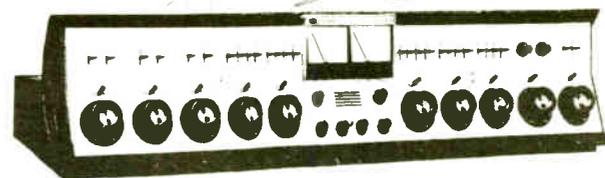
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RCA, Altec tube mic pre's & tube amps & mixers; Langevin AM-16's, sale or trade. Tracy Eaves, 615-821-6099 (evenings before 10PM EST).

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Harris 994-8524-001 30 A RF contactor, \$150. G Jablonski, WHMI, POB 935, Howell MI 48844. 517-546-0860.

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ERI 8 bay 37CP8 new O-rings & silver bullets, pressure tested, will negotiate freight and refurbish, or crate & ship, \$8000/BO. K Reising, WRZO. 812-378-1073.

ERI/Harris FML-3 Bay rototiller type, 1 5/8" end, FOB, \$3000 cash/trade. C Cooper, WQSM, 4720 Radio Rd, Ocean Springs MS 39564. 801-432-1032.

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EZ Way 350', 16" face up to 190'; 12" face 190'-350'; all lights, you disassemble & move/BO. C Jones, WQBZ, 2525 Pio Nono Ave, Macon GA 31206. 912-781-1063.

ERI 1100 series radomes, 2 bays, 2 yrs old, identical to Harris FMC series, \$650/BO. K Fitzgerald, WKGB, 495 Court St, Binghamton NY 13904. 607-723-2925.

Shively 6813 w/radomes, new, on air 3 wks, tuned to 96.1, \$6500. D Magnum, WBOG, 1021 N Superior Ave Ste 5, Tomah WI 54660. 608-372-9600.

Cablewave 1-5/8", 60', \$100. H Beam, WAHY, POB 5588, Princeton WV 24740. 304-425-2151.

ERI 3-bay FM tuned to 92.1, 1 5/8" end input, you ship, \$3500/BO. E Coffman, KEZU, 7007 Riviera Dr, Ft Smith AR 72903. 501-782-0361.

Cetec FM 2 bay, true polarization w/pwr gain of 0.955, tuned to 95.9 w/radomes, \$1000. H Beam, WAHY, POB 5588, Princeton WV 24740. 304-425-2151.

RCA BFC 12-bay (12) de-icers, only used by KOSU, BO. D Lacy, Mountain States, 1885 Ponder Heights Dr, CO Springs, CO 80906. 719-636-2470.

RCA BFC-6 Circ polarized 106.7 MHz, 6 bays only w/radomes, BO. M Everhart, 9500 SW Barbour Blvd, Portland OR 97219. 503-245-1433.

Cablewave 510' of 4" Helix w/3 1/8" flanges, BO; ERI 6-bay circ polarized FM tuned to 102.1 MHz, BO. J Church, WLUW, 2500 N Mayfair, Milwaukee WI 53226. 414-771-1021.

DB OCX 7/8 CP, like MCI, 7/8 fittings, broad band, 2.5 kW per bay, made of AISI 316 stainless steel. A Branch, KYAY, 2402 Woodridge Dr, Decatur GA 30033. 404-325-7847.

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Single bay FM tuned to 104.9/close. E Coffman, KEZU, 7007 Riviera Dr, Ft Smith AR 72903. 501-782-0361.

Shively 6812 radomes, K Fitzgerald, WKGB, 495 Court St, Binghamton NY 13904. 607-723-2925.

AUDIO PRODUCTION

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Valley People audio pkg, 6 Kepex II, 2 Gain Brain II & tray, \$415; UREI LA4 compressor, \$165; ISI audio DA's & frame, \$145; Ramko MLATIE mic to line amp, \$115. FOB Allanta GA, D Nobles, 4330 Royal Mustang Way, Lithonia GA 30058. 404-978-1299.

ATI Emphasizer, \$500; (2) S/A 75 kHz demod cards, \$400 ea; (1) Moseley SCD-8 subcarrier demod, \$250. D Seavy, KROC, 122 SW 4th St, Rochester MN 55902. 507-286-1010.

IGM Go-Carts (2) 24-tray; (1) 42-tray in rack, w/Harris interface cards, gd cond, \$1700. G Fallus, WZMX, 10 Executive Dr, Farmington CT 06032. 203-677-6700.

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Systemation cassette, parts, boards, BO. L Dupree, CENLA Bdcg, 1115 Texas Ave, Alexandria LA 71301. 318-487-0347.

IGM 400 series w/(2) Revox PR99, 48-tray instacart, 24-cart Carousel & Conex 25 Hz tone gen, works perfectly, must sell. D Schroeder, WSWL, 904-433-1141.

IGM GoCart 24 (2), \$1500 ea; (4) Otari ARS-1000 reproducers, \$750 ea; (1) Format Sentry w/Commodore 64, \$2000; (1) Audicord S-series stereo PB cart, \$300. B Toole, KGVO, POB 5023, Missoula MT 59806. 406-721-1290.

IGM 60 78 tray, working w/o manuals, BO. D Vauhn, KSKI, POB 1610, Vail CO 81658. 303-949-7070.

Harris SC-90 complete system, less hardware, will sell indiv pieces, \$995. P Willey, WMMB, 466 Curran Hwy, N Adams MA 01247.

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IGM-EC w/Alpha 250 UPS, (4) stereo Go-Cart 24's, (2) racks w/ a/c, Panduit & (2) side panels, PC422 I/O card, interconnect cabling & spare parts kit, \$9500/BO. L Martino, 714-274-4959.

IGM Instacart, 48-tray, mono, \$3500; Revox A-77 tape deck, stereo, \$500; Revox PR-99 stereo player, \$850; ITC 750 stereo player, \$500; IGM rack mount 25 Hz sensor, \$50; ITC SP mono cart player, \$450; Otari ARS-1000 stereo player, \$600, all clean & functional. M Grieger, PTR Studios, POB 3588, S Pasadena CA 91031. 818-799-6244.

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ITC SP stereo (3) single play, gd cond, \$500 ea; RP-stereo PB/R, gd cond, \$750. R Walsh, WHCN, 1039 Asylum Ave, Hartford CT 06105. 203-247-1060.

Ampro (3) mono: (1) rec, \$500, (2) play, \$350 ea/BO. W Earle, WELD, Rt 1 Kessel Rd, Fisher WV 26818. 304-538-6062.

Pacific Recorders Micromax (2) stereo (NAB) w/all options, w/rack mount kit, \$1900; ITC RP cart recorder, stereo w/3 tones, new hds, perf cond w/rack mount, \$1100. H Landsberg, Henry Engineering, 503 Key Vista Dr, Sierra Madre CA 91024. 818-355-3656.

IGM Instacart, 48-tray stereo mdl, s+h extra, \$1495. B Boogalu, KNKK, 385 24th St #800, Odgen UT 84401. 801-621-3131.

ITC 3D0003, mono, \$1000; WP mono R/P RP0003, \$650, both wall cue tones, new heads/bearings/pinch rollers/IB, quiet, clean. Pegi, Global American, 1768 Coral Way N, Vero Bch FL 32963. 407-231-4800.

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Studer B-67, excel mech & electrical cond, gd appearance, port case w/manual, \$2000; A-67, gd cond, port case, \$1300. W McElroy, Bias, 5400 Carolina Pl, Springfield VA 22151. 703-941-3333.

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Akai 4000 4-trk w/remote control, NAB hubs, 10" metal reels, gd cond, \$325. Curt, WAWZ, Weston Canal Rd, Zarephath NJ 08890. 908-469-0991.

Revox B77 mkII logger slow spd, 2 trk, very gd cond, 10" reels, \$600. R Walsh, WHCN, 1039 Asylum Ave, Hartford CT 06105. 203-247-1060.

Stereo recorders Otari MTR10-2c, \$3995; TE-AC X10R dual capstan drive bidirectional, \$395. J Price, Price's Recording Studio, 2651 Globe Ave, Dallas TX 75228. 214-321-6576.

Scully 280 2-trks in console takes 14" reels, \$1195; 280B mono in console, \$895, motors, parts, 8 & 16 trk heads. J Price, Price's Recording Studio, 2651 Globe Ave, Dallas TX 75228. 214-321-6576.

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Revox B77 MKII, FOB Atlanta GA, \$370. D Nobles, 4330 Royal Mustang Way, Lithonia GA 30058. 404-978-1299.

AmpeX AG-350 mono w/solid state electronics rack mount, \$500. Art/Bill Baker, Bcd Prods of America, 804 E 38th St, Indianapolis IN 46205. 317-925-7371.

AmpeX MM1200, 8-trk remote AL control box, \$4500; 354 stereo in metal cabinet, \$495; PR10-2 stereo w/354 elec, \$295; 440 transports reconditioned bearings, brakes, \$935; motors parts 8 & 16-trk heads. J Price, Price's Recording Studio, 2651 Globe Ave, Dallas TX 75228. 214-321-6576.

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TEAC A1200, AKAI 280D, Pioneer RT-102OL, BO/all, D Morris, WKUN, 204 W Spring St, Monroe GA 30655. 404-267-6558/2035.

MCI Sony JH110C stereo big reels console, \$2500; JH110A stereo in console, \$1250; JH110 stereo play only, \$995. J Price, Price's Recording Studio, 2651 Globe Ave, Dallas TX 75228. 214-321-6576.

Otari ARS 1000 DC R-R's (4), 2 chnl reproducer, 1/4" 1/2 trk w/25Hz tone sensor & cuetone relays w/adjustable delay, excel cond, \$1100 each. R Chambers, 916-257-2121.

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CONSOLES

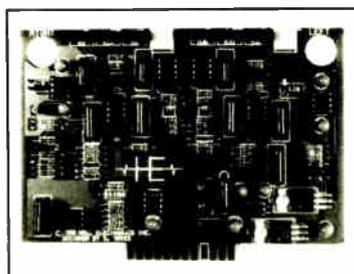
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BE 4 chnl mono board, works fine, gd for newsroom/remote operation w/wooden side panels, \$350. G Gabriele, WFOG, 215 Brooks Ave, Norfolk VA 23510. 804-622-6771.

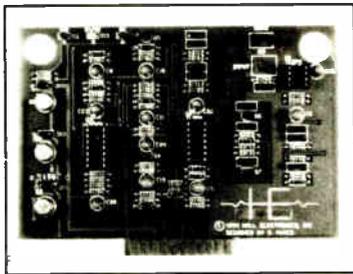
JBL 7510A (2) 24-chnl auto mic mixer w/manuals, \$495. J Hall, 804-974-6466.

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McCurdy SS 8500 custom 10 mixer dual stereo, excel cond, \$4250. D Vernier, KUNI, Univ of N Iowa, Cedar Falls IA 50614. 319-273-6400.

Gates President, \$300; Ramko DC-8M Touch Control, \$450, both recently removed from svc in gd cond w/books. M Vanhooser, KSKY, 4144 N Central Expy #266, Dallas TX 75204. 214-827-5759.

Ramko SC-5M 4-chnl mono board, excel cond, \$300. R Chambers, KSUE, 3015 Johnsonville Rd, Susanville CA 96130. 916-257-2121.

Trident 65 32x16 w/stand & wiring harness, \$10000. J Diamond, Blue Diamond, Box 102C, Chubbic Rd RD1, Canonsburg PA 15317. 412-746-3455.

Ramko DC 38-10M 10 pot mono, very gd cond; BE 4M50, 4 pot mono, BO/both. J Stanford, RT 3 Box 170, Lorena TX 76655. 817-857-4296.

Samick SM-1600 great production, 16x21x1, full EQ & panning, excel cond, 16-chnl w/overload, indicators & meters, \$750. Ron, Super-Sonics, 1401 NE 159th St, N Miami FL 33162. 305-949-2040.

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RCA 8 pot, older vintage, works, \$350+sh. E Stanley, 701-228-2483.

McMartin B-502 5-chnl stereo board, fair cond, \$495. B Boogalu, KNKK, 385 24th St #800, Ogden UT 84401. 601-621-3131.

Gemini MX8200 6-chnl stereo mixer w/reverb cue & many features, \$150. J Deering, Deering Imagineering, 329 Raindrop Lane, Hendersonville TN 37075. 615-264-2886.

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Sparta Cetec 3410 10-chnl stereo, \$1250; Ramko DA-6BR/E, mono 1 in/6 out, audio dist amp, \$75. M Persons, KKIN, Box 930, Aitkin MN 56431. 218-829-1326.

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AKG BX5 stereo spring reverb, \$150. P Cibley, Cibley Music, 138 E 38th St, New York NY 10016. 212-986-2219.

AKG BX-20 reverb w/remote & manual, BO; Altec 604-8G speaker systems (1) pair in Altec oak veneer cabinets w/Altec crossovers, drivers, excel cond, \$1000. W McElroy, Bias, 5400 Carolina Pl, Springfield VA 22151. 703-941-3333.

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dbx 155 (2) 4-chnl type 1 noise reduction unit, \$200 ea/\$350 both. P Cibley, Cibley Music, 138 E 38th St, New York NY 10016. 212-986-2219.

dbx 208 noise reduction system, \$850 & 216/224 systems. J Price, Price's Recording Studio, 2651 Globe Ave, Dallas TX 75228. 214-321-6576.

LIMITERS

Want to Sell

CRL IPP-100 mic processor, \$1250; SEP 400A compressor, \$900; SEC 400A compressor, \$1200; PMC 300A w/SPF 300 NRSC, \$1000; Studio Technologies AN-1 stereo synthesizer, \$250. M Persons, KKIN, Box 930, Aitkin MN 56431. 218-829-1326.

CBS Volumax 4000, \$500. D Seavy, KROC, 122 SW 4th St, Rochester MN 55902. 507-286-1010.

Dorrough DAP-310 for limiter cards, will trade 1 for 1 AM type-1 cards. F Vobbe, Great Northern Bdct Co, Box 5031, Lima OH 45802. 419-228-4199.

Fairchild 670 stereo or similar tube proc equip to be used w/disk recording, 45/78 records. K Gutzk, Custom Recording, 7134 15th Ave S, Minneapolis MN 55423. 612-866-6183.

Optimod FM 8100/8000 gd cond, NE preferred. P Galasso, WJLK, 605 Mattison Ave, Asbury Park NJ 07712. 908-774-7700.

Valley People 440 compressor & Aphex aural exciter types I/III/C. K Fitzgerald, WKGB, 495 Court St, Binghamton NY 13904. 607-723-2925.

Optimod 8000A
\$1495 & UP
414-482-2638

MICROPHONES

Want to Sell

EV-666 mint cond, \$200/BO. J Diamond, Blue Diamond, Box 102C, Chubbic Rd RD1, Canonsburg PA 15317. 412-746-3455.

Peerless MBC-520 (2) condenser w/pwr sply similar to AKG 451, made in Germany, \$400/BO. J Diamond, Blue Diamond, Box 102C, Chubbic Rd RD1, Canonsburg PA 15317. 412-746-3455.

Beyer M-500 cardioid ribbon, \$250. P Cibley, Cibley Music, 138 E 38th St, New York NY 10016. 212-986-2219.

SONY UHF WIRELESS MIC SALE

Ten frequency compatible WRT-27A true diversity systems available. Each system includes a body pack transmitter with a Sony ECM-77b lavalier. Four of the systems come with WRT-57 and/or WRT-67 hand mics. Ideally looking to sell as a whole package. The package includes high-gain yagi antennas, boosters, and base units to provide distribution for ten systems. We could break this up into **system pairs**. Units operate in the 900 Mhz. band. The receivers are configured into racks. Can be viewed at our facility in NYC.

Call Jeff at 718-706-3519. Best Offer.

AKG 451 EB (2) capsules, \$350 ea/BO; CK22 omni capsule, \$125/BO; (2) H-17A shock mount/windscreen for 414EB, \$150 ea/BO, all new. J Diamond, Blue Diamond, Box 102C, Chubbic Rd RD1, Canonsburg PA 15317. 412-746-3455.

Mics; desk mics (hi2), EV-Shure mic stands, also baby booms (3); tubes, new (32) RCA, GE, Sylvania; Sams tube sub books #8 & #6; RCA tube manual; Sony head demagnetizer (new); jack female connectors; EV 502 transformer prin/sec. Mr. Oliver, 212-874-7660.

Sony ECM-21 (6), \$100 ea; ECM-65F, \$225/BO; ECM-548 (2), \$175 ea/BO; ECM-56F (3), \$275; ECM-377, \$300; ECM-22 (9) \$150 ea/BO; C-22 (4), \$150 ea/BO; ECM-33P (8), \$200 ea/BO, all mint cond. J Diamond, Blue Diamond, Box 102C, Chubbic Rd RD1, Canonsburg PA 15317. 412-746-3455.

Telefunken U-47, Neumann U-87, KM-54 mint; RCA ribbon mics (2) KU3A's 10,0001,(3) 77-DX, (1) 44-BX, (2) BK-5; Altec tube mics M-11, M-20, M-30; 639 film version mic ect. Trade or sale. Tracy Eaves, 615-821-6099 (evenings before 10PM EST).

Postex M55RP new, \$300/BO. J Diamond, Blue Diamond, Box 102C, Chubbic Rd RD1, Canonsburg PA 15317. 412-746-3455.

Want to Buy
EV REJ20. K Fitzgerald, WKGB, 495 Court St, Binghamton NY 13904. 607-723-2925.

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Audio Technica AT-812 (2) mint cond, \$50 ea. J Diamond, Blue Diamond, Box 102C, Chubbic Rd RD1, Canonsburg PA 15317. 412-746-3455.

Electro-Voice RE-20 w/EFB boom, like new, \$400. D Morris, WKUN, 204 W Spring St, Monroe GA 30655. 404-267-6558/2035.

Sennheiser MD211 \$195; Teladi condenser Elektro Akustische Gerate Dusseldorf Germany w/pwr supply, BO; HME-WM 252 wireless w/SM58, \$295; Telex-WHM 500 wireless, \$250. J Price, Price's Recording Studio, 2651 Globe Ave, Dallas TX 75228. 214-321-6576.

Neumann SM 69 fet w/pwr control unit; SM 69 vacuum tube w/ wlo pwr supply, willing to trade pr of U-89 w/shock mounts for either; NS 69 control unit/pwr supply for SM 69 fet, willing to trade CU48; Z240 matrix xformers must have paired serial numbers. E Kelly, Mobile Master, POB 61, Glenele MD 21737. 410-381-0263.

MISCELLANEOUS

Want to Sell

ADC jack panel pre-wired, new, 1 1/4" double row of 24 jacks, 1/4" TRS w/6" tail to rack mount, Ultra patch panel, normals brought out, \$360. R Walsh, WHCN, 1039 Asylum Ave, Hartford CT 06105. 203-247-1060.

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(516) 623-6114

Valley LZ precision mic preamp IC, \$15; Lambda 24 V lamp pwr supply, \$15; Cinch 32 pin male & female blue ribbon connectors, \$3.50, Microswitch momentary illuminated switch w/lens, \$2, all new. J Hall, 804-974-6466.

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Radio World's Broadcast Equipment Exchange provides a FREE listing service for all broadcast and pro-sound end users. 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:

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II. Job Function

- | | |
|-----------------------|---------------------------|
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Make: _____ Model #: _____

Brief Description: _____

Price: _____

WTS: WTB: Category: _____

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Brief Description: _____

Price: _____

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Brief Description: _____

Price: _____

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*Closing for listings is the first and third Fridays for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

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MISCELLANEOUS . . .

Want to Buy

Manuals: Precision 98 VTVM; Presto 41 limiter; HP335B FM mon; GE BA-5; GR meter for same; replacement glass for FP 63300 tower light controllers. S Todd, 3399 Kent St #307, Shoreview MN 55126. 612-483-9163.

Wiring diagram for Micro-Trak console, model 6'50. D Parsons, 314-686-1663.

WP Software for TRS80 model 1, and Apple IIE. E Stanley, 701-228-2483.

Jazz record collections, 10" LP/12" LP bebop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, NNYNY 10003. 212-674-3060.

MONITORS

Want to Buy

Any older McMartin mod monitors. C Goodrich, 11435 Manderson, Omaha NE 68164. 402-493-1886.

RECEIVERS & TRANSCEIVERS

Want to Sell

Spilsbury IMTS telephone mobile, like new wantenna, \$1500. V Fisher, RR2, Brighton IA 52540. 319-694-2574.

Motorola M100 mobile radio, 45W VHF, synthesized tuning w/mic & antenna adapter, 2 chnls xmit & receive, \$475. J Andrist, KOMW, Box 151, Omak WA 98841.

SCA decoder, high quality micro-miniature 6792 kHz, prewired & ready to install, \$15. D Jackway, Backgrnd Music Eng, 5742 Fairoak, Springfield MO 65810. 417-881-1846.

AM STEREO RECEIVERS
Portable, Home/Studio, Auto
RRADCO GROUP
708-513-1386

Sony SRF A-100 AM/FM stereo, portable radios, quantities, \$120. C Fox, WOLF, 4853 Manor Hill Dr, Syracuse NY 13215. 315-468-0908.

DEALER PRICES

on Antenna Specialists two-way antennas & filters. Reduced E.F. Johnson prices. Transceivers—VHF: \$349; UHF: \$379.

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800-676-5439

Want to Buy

Any EBS encoder/decoder, any cond, under \$250. K Fitzgerald, WKGB, 495 Court St, Binghamton NY 13904. 607-723-2925.

REMOTE & MICROWAVE EQUIP

Want to Sell

TFT models 7610, 7630, 7640, 7832, 78410, 7841, ADS-01, FSU-01, PLC. G Jablonski, WHMI, POB 935, Howell MI 48844. 517-546-0880.

Marti RPT-40 xmr & rcvr w/antennas, VHF, gd cond, \$1350. P Wolf, WSUV, 1400 Colonial, Ft Myers FL 33907. 813-574-5548.

Andrew 23 GHz dishes 2-4' w/everything except wave guide & electronics, new, \$5000+ delivery. S Hooge/M Murray, K20AG, 9401 E Northern Lights Blvd, Anchorage AK 99504. 907-337-2020.

Burk ARC-16/SA demo unit in 'as new' cond w/2 Burk IP-8 interface panels, \$2995. J Hall, 804-974-6466.

Comrex PLX-II EXT single-line freq, port encoder and RLX rack mount decoder, excel cond, \$1000. R Walsh, WHCN, 1039 Asylum Ave, Hartford CT 06105. 203-247-1060.

Moseley Isocoupler ICU-1A 940-960 MHz, (2) Extel printers, Marti RMC-20 (partially works). J Heck, KGAK, 401 E Coal, Gallup NM 87301. 505-863-4444.

CAP RC-10A uses 1 pr, 1 xmr unit, 2 studio units, excel cond, \$300. A Daigle, WSJR, 6 10th Ave, Madawaska ME 04756. 207-729-4000.

Micro Controls 9-chnl remote control in gd cond, \$1000. R Swan, WROY/WROL, 101 W Church, Carmi IL 62221. 618-382-4161.

Gentner TC 100 telephone interface, 6 mos old, 2 mos use, IB, \$300. Pegi, Global American, 1768 Coral Way N, Vero Bch FL 32963. 407-231-4800.

Moseley ARC 1600 remote control, \$1800; QE1 7775 FM ATS system, \$500; Marti RPT-1 xmr 455.087+455.187 MHz, \$350. M Parsons, KKIN, Box 930, Aitkin MN 56431. 218-829-1326.

Want to Buy

Old non-type approved STL TXs/RXs, cheap/donated for conversion to ham use, tube units, range extender unit for Vitro Elec (Nems-Clarke) SDM 520 spectrum analyzer to cover 260-900 MHz, will take defunct mainframe if cheap, will pay s/h. S Todd, 3399 Kent St #307, Shoreview MN 55126. 612-483-9163.

SATELLITE EQUIPMENT

Want to Sell

Wegener (2) rcvrs for Unistar format 41 & country w/CNN card, BO. P Vessey, WDLB, Box 58, Walltor NY 13856. 607-865-4321.

Wegener SMN country newer version rcvr, \$1000/BO. P Wolf, WSUV, 1400 Colonial, Ft Myers FL 33907. 813-574-5548.

Wegener W/1601 w/pwr supply, 1606-01 rcvr, 1645 & 1646 tone cards, excel cond, \$600. A Daigle, WSJR, 6 10th Ave, Madawaska ME 04756. 207-728-4000.

Zephyrus 300 series 304 mainframe, 321C-T3-6.3 Mhz CNN, 381 tone decoder, 391 rcvr, 6 mos old, IB, \$750. Pegi, Global American, 1768 Coral Way N, Vero Bch FL 32963. 407-231-4800.

Want to Buy

Microdyne 1100 rcvr/demod, gd cond, \$1500. P Wolf, KSUV, 1400 Colonial, Ft Myers FL 33907. 813-574-5548.

Any 7.5 kHz DAT card. K Paul, JWC Bdctg, 259 S Willow Ave, Cookeville TN 38501. 615-528-6064.

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Want to Sell

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Class C FM/10 kW AM KMCM/KMTA, Miles City MT, top audience, regional signals, mint equip, steady economy, sales growth, \$595,000. P Bailon, KMCM/KMTA, 1218 Pioneer Bldg, St Paul MN 55101. 612-222-5555.

Want to Buy

AM/FM in SE that are in trouble or gone off air, send info, complete description & price. K Thompson, WWIC, 815 W Willow St, Scottsboro AL 35768.

Want to buy your station at your price. Call 914-986-5092.

STEREO GENERATORS

Want to Sell

Moseley SCG-9, \$300. D Seavy, KRCC, 122 SW 4th St, Rochester MN 55902. 507-286-1010.

EMPLOYMENT

To place ads in this section, use the ActionGram form. To respond to box numbers, write Radio World, PO Box 1214, Falls Church, VA 22041, Attn:

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Looking for new challenge 10 yr exper in programming, on-air & prod. D Moore, 713-448-9218.

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Volunteer avail for Rockland/Westchester area, a few days a week, to learn all phases of bdcg, prod, on air engrg. Mark, 914-425-2225.

Looking for super tech engr/announcer weirdo who solves problems and is fun, friendly, normal? Seeking PTF/anywhere. R Vogel, Silverton OR 97381. 503-873-6743.

Announcer w/6 yrs exper seeks FT pos, small/med market in MO/IA, any format, prom & prod exper. L Yates, 314-374-0617.

CHR PD for med market wants to help your station win, excel leadership skills, prod abilities, references. Jeff, 512-618-2824.

Mgmt consultant avail for workouts, reorganizations, Chapter 11's & all troubled situations, well known, excel credentials, reasonable. D Israel, 5812 Alton Rd, Miami Beach FL 33140. 305-861-3814.

Take no prisoners morning team! Let Jeff & Dan boost your cumes, AOR/CR/CHR, serious inquiries only. Jeff, 813-624-2922.

R&B jock w/5 yrs exper seeks FT pos in FL, TN, GA, AL, exper in commercial & news prod. F Smith, 615-624-7126.

FL coastal area exper all around broadcaster of 28 yrs interested in most any opportunity, 813-849-7005.

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Fax: 312-440-9377

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Chief Engineer for six station group in SE Alaska. Salary DOE. Resume to KJNO, 1361 Channel Drive, Juneau, Alaska 99801. c/o Steve Thyner, GM, 907-586-3630.

ENGINEER for Virgin Islands, worked w/Harris 10K transmitters; combiners; satellite; RF. Send resume, salary needs. Chairman, POB 333, Miami FL 33280.

PRODUCT MANAGER - Orban products. Minimum 5 years broadcast market experience, including both sales and station engineering. Conduct market research, create sales materials, respond to customers' applications needs. Send resume to: R.W. Smith, AKG Acoustics, Inc., 645 Bryant St., San Francisco CA 94107. EOE.

EMPLOYMENT SECTION

HELP WANTED: Any company or station can run "Help Wanted" ads for \$1.50/word or buy a display box for \$55/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 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.

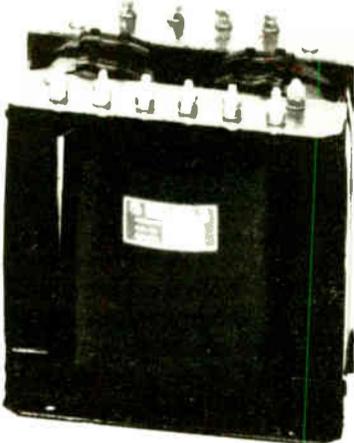
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And, of course, there's the componentry: all gold contact switches for the ultimate in reliability, gold bus connectors, gold I/O connectors, solid state on/off lamps, and triple burned-in ICs. Naturally, each console is also triple-tested.

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SP-44/4-Track