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Radio World

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 See
 Buyers Guide, p. 70**

Vol 20, No 23

Radio's Best Read Newspaper

November 13, 1996

Tower Crash Kills Three

by Lee Harris

DALLAS The collapse of a 1,520 foot broadcasting tower in suburban Dallas on Oct. 12 left three tower workers dead, and three FM stations and a TV station scrambling to get back on the air.

Killed in the crash were Dana "Doc" Campbell, Joseph Kelly and John Stinson. The workers were at the 1,300-foot level when the accident occurred on one of eight towers atop 840-foot Cedar Hill, about 15 miles west of Dallas.

One worker who had not secured himself to the tower was thrown about 1,800 feet. The others plummeted down in a tangle of steel cables and beams. A fourth worker on the ground barely escaped death when the tower fell just a few feet from where he was standing.

Problems compounded

The tower came crashing down across an array of six high tension lines cutting power to the antenna farm and causing a transformer to explode and burst into flames. The wreckage landed on top of a building housing the transmitters for KXTX-TV, channel 39 plus Infinity owned FM stations KOAI, KRBY and KYNG. All were knocked off the air.

While police, firefighters and other

emergency response personnel were dealing with the disaster, engineers for the affected stations were faced with the



task of returning their operations to the air, a job complicated considerably by the absence of dedicated back-up sites.

The Dallas engineering community and broadcast supply vendors demonstrated extraordinary resourcefulness and cooperation in returning the three stations to the air.

Bob Henke, chief engineer for "Young Country" KYNG 105.3 MHz, was in New York when the tower came down Saturday morning. By the time he arrived back in Dallas, KYNG programming was being aired over KEWS at 94.9 MHz. This is the Infinity all-news station,

which is being sold to Salem Communications. Because the news format was doomed with the sale, this seemed like a logical move.

Next, KDMX 101.9 MHz came to the rescue offering the use of its back-up transmitter and site. The rig was re-tuned to 105.3 MHz and initially a tape loop was broadcast at 150 W, advising KYNG listeners to tune to 94.9 MHz. The signal was then stepped up to 3 kW and the actual country format was returned to the frequency (the KEWS simulcast is expected to continue until the sale to Salem is completed).

Luckily, Esco Communications, owner of the fallen tower had a new 1500-foot continued on page 10 ▶



WME: It's a Wrap

Radio World takes a last look at the final World Media Expo and the products and services that attendees found at the show.

Our new product coverage begins on page 14. We also feature a special *Haberspace* about new Internet tools shown at WME, on page 23.

Radio Networks Blanket Country for Elections

by James Careless

WASHINGTON Election night is one of frantic activity for radio networks, all of whom chase listeners who cannot tune

into TV for election results.

"The radio audience on the evening of election night is primarily an audience away from home," said Bernard Gershon, ABC vice-president of radio news. "So it's people who are in cars or in transit for some reason, or in offices late afternoon and early evening."

Planning at CBS was "tuned to people moving around," said Tony Brunton, CBS director of radio special events. "We were tuned to people in their cars, and people walking around with their portable radios between rooms. ... We're told there's quite a few of them out there."

What they did

How much coverage each network offered depended on its own particular style, reputation and target audience.

For instance, the CBS Radio Network offered two satellite channels of election coverage Nov. 5, all overseen by Executive Producer Charles Kaye.

Channel 39 offered updates that ran two-and-a-half minutes, including a 60-second network commercial. Anchored either by Bill Lynch or Ed Crane, these were to begin once at the hour at 4:31 p.m., EST, then go to five-times-an-hour beginning at 6:20 p.m.

In contrast, Channel 41 planned to offer wall-to-wall "All Election, All the Time" coverage anchored by Nick Young beginning at 7 p.m. Two-ways between CBS correspondents and local stations were also offered to affiliates.

continued on page 9 ▶

Society Tallies Up Votes

by Angela Novak

LOS ANGELES The Society of Broadcast Engineers installed new board members and officers at its annual membership meeting here.

SBE President Terrence Baun, CPBE, welcomed approximately 60 members representing 30 to 40 chapters to the meeting.


Members also heard comments from Executive Director John Poray and Treasurer Troy Pennington.

Baun, owner of Criterion Broadcast Services, a contract engineering firm in Milwaukee, was installed to a second term as SBE president.

Also elected for a second term, Edward J. Miller, CPBE, engineering manager, WEWS TV5 Scripps Howard in Cleveland, inducted as vice president:

continued on page 10 ▶


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World Radio History

NEWSWATCH

August Revenues Increase 5 Percent

DALLAS The Radio Advertising Bureau reported the 48th consecutive month of radio revenue growth in August. Combined local and national spot advertising increased 5 percent vs. August 1995.

Local revenue increased by 7 percent and national revenue decreased by 2 percent compared to the same month last year.

Year-to-date combined local and national revenue has increased by 6 percent compared to the same period last year, with national sales up by 4 percent

and local up by 6 percent.

The figures are based on the RAB radio revenue index of more than 100 markets.

Atlanta to Host Marketing Leadership Conference

ATLANTA "Change is in the air" describes the mood in radio now. The Radio Advertising Bureau will help answer the questions of how to deal with change, its ensuing opportunities and consequences at the RAB Marketing Leadership conference, scheduled for Feb. 6-9, 1997, in Atlanta.

Registration is open now and is \$395

(the price for registration will increase after Jan. 10, 1997). "Open a Window of Opportunity — Bottom Line: Management RAB '97" includes sessions and workshops dealing with topical issues, including: managing for change, new business development, managing your general manager, Internet, computers and software.

Call Dana Honor at the RAB for more information at (800) RAB-SELL.

Bellcore Offers Seminars On ISDN, ATM

PISCATAWAY, N.J. Bellecore will answer your questions at either of two,

two-day seminars. "ISDN Overview and Applications — How to Add Flexibility to Your Network" is a two-day comprehensive look at the capabilities, applications and deployment status of this important technology.

Choose between Nov. 18-19 in White Plains, N.Y., or Dec. 9-10 in Chicago.

For information on either seminar, contact Bellcore at (800) 521-2673 or (908) 699-5800.

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World Radio History

Joint Forces for Public Radio

by D.C. Culbertson

WASHINGTON When the Republicans took over Congress, one of the items on their "Contract With America" was to eliminate all funds for public broadcasting.

One person who decided to try to do something about this was Walter McRee. Although McRee has spent most of his career in commercial radio, he began his media career on a public radio station while still in college, and still feels a strong sense of loyalty to it.

"I love public radio so much," he said. "Without it, I think our society would be diminished. Something needed to be done to make this more viable."

As a result, McRee founded the Listener Alliance for Public Radio, which was initially unveiled at the Public Radio Conference in Washington in May.

The organization is built around the idea of "affinity marketing," that is, having listeners support stations by buying specific products and services from specific companies, with a percentage of the purchases going to a station of the listener's choice. (For more details about the alliance, see "Alliance Taps New Fund Source," *RW*, June 12.)

Involve CPB

However, McRee still felt it was important to involve the Corporation for Public Broadcasting in the alliance, and as a result, applied to the CPB for the alliance to be included in recently established CPB Radio Futures Fund. Recently, the alliance was dealt a setback when, for the second time, its application was turned down. McRee is not sure why the organization didn't meet the necessary criteria.

"It was our feeling right from the start that the CPB would have some interest in what we were doing," he said, but admits the CPB is "a fairly complicated organization" and there were doubtless

many factors that had to be taken into consideration.

"Needless to say, it's been a disappointment," he said, adding that the CPB action "validates our need to move on." He said the CPB decision has actually reinvigorated the alliance board, and strengthened its commitment to the organization mission.

The Listener Alliance for Public Radio

On Oct. 16, the alliance board, largely made up of public radio veterans such as the original editor for "All Things Considered" and "Monitor Radio" Director David Creagh, met to discuss problems with the present structure and

McRee thinks many listeners tune out fund drives because they get tired of program interruptions.

how they could be rectified. The board decided to revise and expand the present program in a number of ways.

Of chicken and egg

One problem with the current structure, McRee said, is the "chicken and egg" solution that resulted between stations and corporations. Stations would often be reluctant to join the alliance because they wanted to know how many and what kind of corporations were interested in participating, and corporations in turn were often reluctant because they wanted to know the same about participating stations.

As a result, although 11 stations initially signed up, few others have joined since. Ultimately, however, McRee believes

corporations will support the idea of the alliance because public radio "has acquired one of the most desirable markets in the economy," due to the fact that many public radio listeners are "well-educated and computer-savvy." In turn, it will be good for their image, as the public will likely perceive them as heroes.

Another result of this is the elimination of membership fees. When the alliance was

formed, stations that wished to join had to pay an annual membership fee based on listenership that ranged from \$250 to \$3,000. McRee said the stations which initially joined, which he refers to as "courageous pioneers," will have their

fees returned, adding that the subsequent loss of funds, "only a couple thousand dollars," will not hurt the organization.

Initially, the alliance supplied promotional spots to member stations, two of which were specifically supposed to run after the Sept. 1 kickoff date. McRee

says these spots "didn't sit well with all stations," and attributes this to the fact that every station tends to be very different from every other one, and every station wants promos done in a different way as well (some want theirs voiced while others want carted ones, some want them 30 seconds long, others 20, and so forth). Because he believes stations should always be the "ultimate determinants" of what is said on their airways, this aspect will be revised also.

Good reasons

He believes listeners in turn will support the idea of the alliance because it's a relatively painless way to support public radio.

At present, only about 10 percent of station listeners give money during fund drives, and McRee thinks one reason for this is that many listeners avoid listening to stations during drives simply because they get tired of having programming interrupted with long appeals for donations.

When asked if a possible Democratic takeover of Congress in this year's elections will make a difference in government funding for public broadcasting, McRee admits that while it might, he doubts that government funding for public radio will increase significantly in the near future. Instead of depending on the government, he feels supporters of public radio should take matters more into their own hands.

"We have been supplicants ... and yet, we have a wonderful resource that has a marketable value."

FCC Privatization Plan Saves Time and Hassles

by Paul J. McLane

LOS ANGELES An FCC program is helping reinvent one part of government, even as it encourages the broadcast industry to regulate itself.

James Zoulek, district director of the FCC field office in Los Angeles, told an SBE session at World Media Expo that eight states are now participating in the Alternative Broadcast Inspection Program, and broadcast organizations in 39 others have expressed interest.

"From all reports to me, the program is working quite well," Zoulek said.

Other states with programs are Alabama, Arkansas, Louisiana, Florida, Georgia, Mississippi and Wisconsin.

The program allows an FCC district director or resident agent to enter into an agreement with a local entity that will conduct its own station inspections and submit certificates of compliance.

The program eases some of the workload on the FCC and helps stations avoid routine inspections for two to three years. If a complaint is received or if a survey is required, the station would still

be subject to FCC inspection.

The local entity might be a broadcast association, SBE group or other party. Zoulek said the actual inspector typically is an ex-FCC employee or retired broadcast engineer, chosen by the entity and approved by the FCC office involved.

He said the program, also sometimes called "mock inspection," allows station executives to help themselves and the FCC at the same time.

He said the Los Angeles field office alone has shrunk from 28 employees to nine in the past 15 years, at a time when the commission has more devices to track.

The inspectors will rely heavily on the FCC Self-Inspection Checklists for TV, AM and FM, published in 1995, Zoulek said. Stations can obtain copies to help them prepare, by calling (800) 418-FORM.

Zoulek also reminded the audience that the FCC has a new call center to take public calls about problems including telephone interference, television interference and long-distance billing. The number is (888)-CALLFCC.

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Less Owners Earn More Money

WASHINGTON It had to happen. The number crunchers had to confirm what, at first blush, sounds like my worst fears. The nice folks over at BIA sent over some figures about the "Incredible Shrinking Radio Ownership Structure."

We are closing in on a year since the enactment of the Telecommunications Act of 1996. Since that time, BIA has tracked 1,836 radio station transactions equalling \$13.1

Ownership Control in Top 50 Markets Year End 1995 vs Year-to-date 1996

Market groups		# Owners	# Stations	Avg # Stns Per Owner	Avg 1995 LCS	Avg 1995 Est. Rev. Share
Top 10 Markets						
	Dec 1995	86	220	2.5	78.8%	86.5%
	Oct 1996	33	245	7.4	86.9%	93.6%
Change in Ownership		(53)	25	4.9	8.1%	7.1%
Markets 11-20						
	Dec 1995	76	177	2.3	83.8%	88.2%
	Oct 1996	45	200	4.4	90.0%	94.4%
Change in Ownership		(31)	23	2.1	6.2%	6.2%
Markets 21-30						
	Dec 1995	68	153	2.3	84.0%	90.7%
	Oct 1996	40	169	4.2	89.6%	94.6%
Change in Ownership		(28)	16	1.9	5.6%	3.9%
Markets 31-40						
	Dec 1995	58	156	2.7	85.6%	90.9%
	Oct 1996	48	174	3.6	92.0%	95.6%
Change in Ownership		(10)	18	0.3	6.4%	4.7%
Markets 41-50						
	Dec 1995	45	117	2.6	78.7%	88.3%
	Oct 1996	40	141	3.5	86.9%	93.6%
Change in Ownership		(5)	24	0.3	8.2%	5.3%
Avg per market	Dec 1995	7	16	2.3	82.2%	88.9%
Avg per Market	Oct 1996	4	19	5.0	89.1%	94.4%
Avg Change in Ownership /Market		(3)	3	2.7	3.1%	3.0%

Source: BIA

billion worth of deals. Of the 5,222 entities owning the 10,367 stations in the United States in 1995, only 4,964 owners remain (as of Oct. 25). That is a 5 percent decrease in the number of radio station licensees in less than 12 months. In other words, 258 less owners competing for the \$10.5 billion ad revenue pie.

The top 50 owners now operate 1,346 stations that garner an estimated wealth of more than \$5 billion. In 1995, the top 50 radio owners operated 876 stations that garnered an estimated wealth of just \$4.5 billion. One last item: Today, it requires just the top 24 owners operating 890 stations to amass the same \$4.5 billion.

More interesting and telling data can be gleaned from the chart above.

All this data explains at least in part why everyone was so intense at the NAB Radio Show in Los Angeles. Sure, one travels to conventions to work and learn and see the new toys there are to see. But this show, more than any other I can recall, seemed to be

about Business. Our Business. Transacting Business. What is ahead in the Business, and who's still in Business.

I first thought perhaps there weren't as many people in attendance (but attendance was 16,000-plus for World Media Expo). But then I realized that people were there — they were meeting privately, taking care of Business.

People came out of the woodwork, though, to listen in on what the radio group heads had to say. Almost everyone turned out for the "Group Heads: Meeting the Challenge of Change," session that featured the heads of ABC Radio, American Radio Systems, Evergreen Media, CBS Radio, Clear Channel Communications and Jacor Broadcasting.

The message was optimism and openness. Concerns included running 100-plus station groups, maintaining creative levels, attracting and keeping top talent.

The underlying current, however, was the question of "Will the new radio monoliths leave room in radio for the entrepreneur?"

Infinity President Mel Karmazin took some heat on that issue from a discouraged small-group broadcaster, but no real answer was forthcoming.

Time will tell whether radio can survive this most recent and dramatic change to the fabric of its structure. Until then, we can only continue to watch the business metamorphize and hope for the best.



★★★

One related note: If you are indeed struggling to deal with the new structure of radio and its mega-groups, set aside some time and money in next's year's budget for the RAB Marketing Leadership Conference (see the related Newswatch item, page 2).

When you register before Dec. 1, you will be automatically entered in a drawing to win a free limousine to use at RAB '97. A nice little touch for you and your staff to celebrate a good year!!

The Broadcast Education Association held its fall board of directors meeting Oct. 12 in Los Angeles. BEA President Norman Pattiz, founder and chairman, Westwood One, recently launched a fundraising campaign directed at broadcast and electronic media professionals. In addition to his outreach for monetary support, Pattiz hopes to educate media professionals on the resources and services of the organization.



Board members in attendance included (top row, l to r): Alison Alexander, University of Georgia; Lew Klein, NATPE Educational Foundation; Norman Feisethal, Temple University; Don Godfrey, Arizona State University; Jerry Zumwalt, Corsicana, Texas; Rebecca Lind, University of Illinois, Chicago; Fritz Leigh, Arizona State University; Jane Coleman, WITF Inc.; (bottom row, l to r): Joe Foote, Southern Illinois University, Carbondale, Ill.; Louisa Nielsen, BEA executive director, Norm Pattiz; Roger Hadley, Oklahoma Baptist University, and Norman Medoff, Northern Arizona University.



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Small caveat

Dear RW,

I just read Stephen Lampen's article about wiring for digital audio. I enjoyed the article very much, but wanted to point out an error. Lampen states that data rates are different for stereo and mono AES signals and this is not correct.

AES/EBU digital transmission uses FM channel coding to send two multiplexed channels of 32 bits for each audio sample period.

Each set of 32 bits is called a subframe.

The 32 bit subframe can be used for 16-, 20-, or 24-bit audio, the remaining bits being used for status, timing and ancillary uses.

The 32 bits comprising each subframe are always sent. Each set of two, 32-bit subframes, makes up a 64-bit frame. For a stereo signal, the first subframe, A, (first 32 bits) is the left channel and the second subframe, B, is the right channel. For a mono signal, (that is, a single channel of audio), the A subframe is defined

as the audio channel, but the B subframe is still sent.

A status byte is a set that tells the receiver that it is receiving a mono signal and the B subframe is ignored by the receiver. The data rate remains the same whether a stereo or mono signal is sent. At 48 KHz audio sampling, the AES data rate is 3.072 MHz, stereo or mono. With the FM channel coding used for AES, the lowest transmission rate occurs when the data being sent is a string of zeros and this equals half the bit rate. A string of ones in the data should result in a transmission rate equal to the bit rate, 3.072 MHz.

Ken Tankel

Manager, Engineering Support
pro-hel inc.
Malvern, PA

Duly noted

Dear RW,

Thanks for passing the letter on to me from Ken Tankel. A day does not go by that we do not learn something and this is our lesson for the day. Despite the fact that we have published for years that the single channel bandwidth is 3 MHz and the dual channel (or stereo) bandwidth is 6 MHz, we are indeed wrong.

I am amazed that no one has called us on this before!

We pulled the ANSI S4.40-1992 AES Recommended Practice for Digital Audio Engineering, and, sure enough, it says very clearly in Section 2.2.2 (Frame Format), "In monophonic mode, the transmitted bit rate remains at the normal two channel rate."

Perhaps part of the confusion comes from Section 6.2.1 (Output Impedance) which states, "The line driver shall have a balanced output with an internal impedance of $110\Omega \pm 20$ percent, at frequencies from 0.1 to 6.0 MHz, when measured at the output terminals."

It further states in 6.2.3 (Balance), "Any common-mode component at the output terminals shall be more than 30 dB below the signal at frequencies from DC to MHz."

Also in 6.3.1 (Terminating Impedance), "The receiver shall present an essentially resistive impedance of $110\Omega \pm 20$ percent to the interconnecting cable over a frequency band of 0.1 to 6 MHz when measured across the input terminals."

So, our cable better pass 6 MHz, but, as Birney Dayton of NVision filled me in even further, the actual signal is indeed a bi-phase digital code at 3.072 MHz. This gives a rate of 3.072 Mbps for "1's" and 1.536 Mbps for "0's" regardless of whether it is one or two channels.

Thanks to Ken for setting us straight!

Stephen H. Lampen
Technology Development Manager
Belden Wire & Cable
Richmond, IN

Honor the Recognition

The NAB Radio Show ended, as it has since 1989, with the black-tie Marconi Radio Awards dinner. Honoring radio's best, the celebration drew a packed house.

For an industry of 11,000-plus, we tend to under-honor our own. The NAB Crystal Awards, the NAB Radio Award for Lifetime achievement, the Emerson Radio Awards and the Marconi Radio Awards are pretty much it. Of these, the Marconi Radio Awards are, by far, the most glamorous and high-profile. To boot, the winners are nominated and selected by radio broadcasters. Recognition from your peers.

So it was with some dismay that we witnessed a lack of enthusiasm for the celebration among nominated stations. Not all the winners even sent a representative to the show. Most embarrassing, WFAN(AM) New York finally received the kudos it deserves for years of pioneering work in creating, launching and thriving with a new format on the AM band — it walked away with station of the year by format and major market station of the year — with nary a representative from the station to receive the beautiful award and thank the gathered broadcasters.

Leeza Gibbons, host of the event and appearing courtesy of Premiere Radio Networks, was doing double duty emceeding the event and editing out rather mean and off-color material from the remarks that had been prepared for her (we know because we were sitting close enough to the TelePrompTer to read what she was editing out).

The Marconi Radio Awards are indeed a great honor. Stations nominated for and receiving this honor should make an effort to appreciate that recognition by at least showing up to the event. To date, the event has featured the likes of Harry Connick Jr., Lyle Lovett, Donna Summer, Dick Clark and Gary Owens. Top-level talent like Leeza Gibbons and country music singer Randy Travis (this year's entertainer) will be tougher to secure for these events if they are perceived to be less-than-prestigious.

Give the Marconi Radio Awards their due. They are important recognition of a job well done and a chance to present our best in the most entertaining and appropriate way possible — in an event that comes but once every 12 months.

And please, don't book those magicians for next year.

—RW

What's that, again?

Dear RW,

I would like to comment on the article titled, "Folded Unipoles vs. Series Fed" in the *Guest Commentary* of Sept. 18 by Dr. Jeremy K. Raines.

Dr. Raines has made a clear understanding of the folded unipole nearly impossible by his convoluted explanation of the physics involved.

I fail to understand what Dr. Raines means by "superior efficiency." He presented no *measured* field strength data. The NAB Engineering Conference presentation he refers to, presented a wealth of such data and I fully agree with the conclusions on page three, paragraph four, of the paper: "No major differences in field strength were found between the folded unipole and series fed cases found for any of the configurations tested."

My total concurrence with the conclusions in the NAB paper is based on very exhaustive field strength tests I made many years ago to demonstrate a one-on-one direct comparison of series feed to folded unipole feed.

The results of my tests are entirely consistent with those contained in the NAB paper. One of those tests used a nondirectional, daytime only, station that wanted to convert their old tower from series feed to folded unipole feed. We decided to compare both modes of operation with a set of "before-and-after" field strength measurements typical of directional partial proofs.

With four radials drawn out, 90 degrees apart, on a few topo maps, we made 10 *measurements* on each radial with one kilowatt delivered and measured into the feed point, series fed. Later that night, we made the conversion and tuning adjustment for folded unipole feed. Power was kept at the same one kilowatt level, of course.

The following day, we repeated those same 40 measurements and found 40 surprises! We literally found not a single hair of field strength difference between series feed and unipole feed at any of the 40 measuring locations (average ratio was 1:1 indeed). In this case, a "hair" is the width of the indicator needle on a Nems-Clarke Model 120 Field Intensity Meter.

The folded unipole antenna does have its merits. While superior efficiency is surely not one of them, the folded unipole does eliminate the need for lighting chokes, transformers and isocouplers as well as allowing us to create built-in impedance transformations in order to escape awkward and unmanageable impedances. It provides somewhat broader bandwidth which is most likely due to the "thickening" of the radiator by adding fold wires which increase the static capacitance of the antenna. However, this can just as well be done with similar wire cages where the wires are directly connected to the tower at the top and the bottom so that we may stick with series feed.

Dr. Raines has had 30 years during which he had plenty of opportunity, modeling facilities and equipment with which to gather as much field strength data as I and the authors of the NAB paper did. Yet, he presents not a millivolt of demonstration of any "superior efficiency" provided by the folded unipole antenna.

The lesson to be learned here comes from one of the most eminent fathers of electrical measurements, the British physicist, Lord Kelvin. His famous admonition, made almost a century ago, bears repeating here: "Until you can measure, you cannot know." In this case, we have measured and we do know.

Frank S. Colligan
Telecommunications Consultant
Bethesda, MD

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November 27, 1996

CouponRadio Presses Forward

by Bob Rusk

LOS ANGELES Advertisers who like to put coupons into the hands of consumers may eventually cancel their newspaper budgets and spend the money instead on radio.

CouponRadio, a patented technology, allows broadcasters to transmit data — including electronic coupons — via RDS. Listeners can save the information on a credit card-size "smart card," the same information that was previously available only on a printed coupon.

The "smart card" is inserted into a special receiver and the information is recorded on a computer chip. The card can then be taken to the retailer, where it is put into a reader, and the coupon is redeemed.

"What's nice is, nothing in radio changes," said David J. Alwadish, creator of CouponRadio. "This enhances the selling of spots to advertisers."

The station and advertisers would control what electronic information is sent. Under a typical scenario it could be data such as a phone number and address, which is difficult to remember from a traditional radio spot.

"The only problems advertisers have with radio are message retention and trackability," said Alwadish. "My coupons will have the date, time, and radio station call letters. Advertisers would be ecstatic to know that advertising on radio works."

Radio station support

Although CouponRadio is not yet up and running, Alwadish has pitched it to industry executives—many of whom have voiced strong support for the device.

"The radio industry should always look at new technology to increase our capability to work for advertisers and increase radio's share of advertising dollars," said John Fullam, general manager of WKTU(FM), the number one-rated station in the New York market.

"CouponRadio is potentially promising."

While Fullam said it is too early to tell if his station would commit to CouponRadio, he stresses that "it warrants a look."

Michael Oatman, CEO of Great Empire Broadcasting (with stations in Omaha, Neb.; Tulsa, Okla.; Wichita, Kan.; and Springfield, Mo.) is eager to see CouponRadio begin.

"We want to stay abreast of the efforts to get the radio into production and circulation," said Oatman. "We've offered air time and manpower in all of our markets so (Alwadish) can come in and try some things."

"This has a lot of possibilities in the area of electronic merchandising, especially with fast-food or impulse purchases."

Oatman envisions that stations could offer advertisers more service and, as a result, raise their rates with CouponRadio.

"The radio industry could benefit from an easier way for consumers to obtain coupons. That gives added value to a package of radio spots," he said. "If you package your couponing efforts with your spots, it might also be a lot more interesting to retailers such as grocers—rather than just going in and trying to sell air time."

The main drawback Oatman sees is possible confusion among consumers who don't understand the concept of electronic coupons.

"It clearly needs to be low-tech. If it's too complicated, you will have trouble getting people to change habits," he said. "But in today's world, with people adapting to the Internet and all kinds of personal communications systems, this may not be that big of a pump to get over."

Philips Electronics is conducting feasibility studies on the CouponRadio project. The company, however, has not committed to manufacturing specially equipped receivers, according to Philips marketing manager, David Canha.

Philips has made available a concept

receiver that is capable of CouponRadio functions, with internal software changes. Alwadish showed RW the concept receiver at the recent NAB show in Los Angeles.

He plans to conduct a market test for

CouponRadio next year in Miami, beginning with as many as eight stations. For CouponRadio to ultimately work, he must get receivers into cars — where the service would initially be available.

"My discussions with automobile manufacturers lead me to believe that something that gives consumers so much value is worth having," said Alwadish.

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Radio Listeners Hear From Capitalist Forbes

by Alan Haber

NEW YORK The position of radio commentator may well be a world away from that of presidential candidate, but Steve Forbes, ex-White House resident-hopeful and editor in chief of Forbes magazine, is giving it a go nonetheless.

Airing each weekday on about 350 CBS Radio Networks affiliates, "The Forbes Report" features Friday commentary by Forbes, based on his Forbes Magazine column "Fact and Comment." Announcer Jonathan Davis handles the duties Mondays through Thursdays.

Right time, right ears

Forbes, who is taking his first major stab at radio with "The Forbes Report" after doing some commentary work in the past, says he decided to tackle radio because it "reaches the kind of people you want to reach when they're traveling, when they're in a mood to listen. (Radio) reaches a very good audience at particular times of day. People are more in a mood to absorb what they are listening to than

Radio seems to be the right place for Forbes.

"I think people are, to be blunt about it, very much more alert usually when they're listening to radio — otherwise they're not going to stay on the road or be doing their work very well," he said. At night, he said, when "many people do watch TV, they are sort of in a passive mode of just wanting to be entertained. So, I think you can get subjects across on radio far more effectively if you are aiming (them) at the right time of the day."

Radio also seems to have been a good medium for Forbes during his presidential bid.

"I think television gets you a very widespread audience," he said. "Radio, particularly when you stay to the point or when you have talk radio and are able to have a dialogue, (is) a very effective instrument to reach people unfiltered."

In addition to being a prime venue for opinion, radio is most certainly a prime venue for advertising messages. How can radio increase its share of the advertising pie, which stood at 7 percent in 1995 according to advertising agency

continued on page 8 ►



Steve Forbes

(when) they are being couch potatoes watching television."

Experience as a presidential candidate may well have had an effect on how Forbes approaches doing his radio show.

"I continue to do what I've always tried to do," he said. "But obviously, having been through the process — what you might call the hazing process of the Fourth Estate — you try to be more succinct and get your message across quickly in ways that people can quickly grasp, because they don't always get it through the filter of the media," Forbes said.

Radio enjoyment

Forbes is enjoying his new radio gig and the accompanying less manic lifestyle. In fact, he says that after running for president, "You have a more sensible schedule each day. You have a better sense of what you're going to be able to do each day. I've enjoyed being back at the magazine."

The Big Radio Stories of 1996

The election, the World Series and the Macarena are fading into memory. But 1996 has witnessed more than politics, sports and annoying dance music. It was a year of massive change in the radio business.

In our Dec. 25 issue, as we have in past years, RW will feature our Top News Stories of the Year. These are the issues and news items that we feel have had the greatest impact on radio and on our readers.

We'd like to know what you think. Fax or e-mail us with your own list of the three top radio news stories of the year.

Dear RW: Here are my choices for the top stories about radio in 1996, and why:

- 1.)
- 2.)
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Circle (4) On Reader Service Card
World Radio History

Alwadish Lobbies On

► continued from page 6

"The consumer could actually pay for the radio in the first year. There might be a coupon offer for a free hamburger, free french fries, or \$2 off on a purchase."

"Several general managers have met with Alwadish to discuss the test. It sounds like a good idea," said Scott Schwartz, general manager of classical station WTMI-FM in Miami. "But the success of the test depends on how many cars there are in the market that are equipped with the CouponRadio."

Schwartz hopes to participate in the test, but is concerned that RDS still has not caught on, which he feels could stall CouponRadio progress.

"We were one of the first stations to have RDS capability," said Schwartz. "Unfortunately, there are not enough receivers to make it a major factor. The

Alwadish has invested 'into the six figures' in CouponRadio.

distribution just is not there yet.

"Out of 3 million people in the Miami-Ft. Lauderdale market, it is estimated that there are about 2,000 RDS receivers. Of the people who listen to our station,

maybe a couple hundred have the receiver. So it is just not cost-effective for us to be using RDS on a regular basis yet."

Alwadish acknowledges that this could be a problem, but is optimistic CouponRadio — which he has been developing over an eight-year period with "into the six figures" of his own money — would help sell RDS receivers.

Although he does not yet have an agreement with a manufacturer to produce receivers that can operate with the CouponRadio function, he is confident receivers will be available by the time his test begins.

"I'll make sure that enough radios are available," he said. "I have a clear vision about how this will happen and how it should be intro-



Philips made a concept receiver available

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"Stations won't have to worry about the number of receivers in the marketplace. It will take care of itself. It will grow like an emerging technology — just like radio grew throughout the 1930s and '40s. Once CouponRadio takes off, broadcasters will benefit from it."

Forbes On Air

► continued from page 6

McCann-Erickson?

"It is really a marketing job of convincing major advertisers that just because you have controversy or dialogue on the radio, (it) doesn't mean that people aren't listening," said Forbes. "I think some of the mass advertisers haven't quite grasped that yet."

Nevertheless, it looks like radio won't be counting out advertisers any time soon.

"I think that mass advertisers like TV because it reaches mass audiences," said Forbes.

'Radio ... (is) a very effective instrument to reach people unfiltered.'

"But, as marketers become more niche oriented and want to have some assurance that their message might get through with all the competing advertisers, I think you will continue to see growth in radio."

Forbes' commentaries delivered during "The Forbes Report" could propel the man who might have been president to radio stardom. But, for now, he's simply keeping the accent on timeliness.

"People hate stale information," he said. "Stale bread, whether it's (the) eating kind, the visual kind or the hearing kind."

Whatever happens with "The Forbes Report," at least radio man Forbes can be content in knowing that, all campaigning aside, he is president (and chief executive officer) of Forbes Inc. after all.

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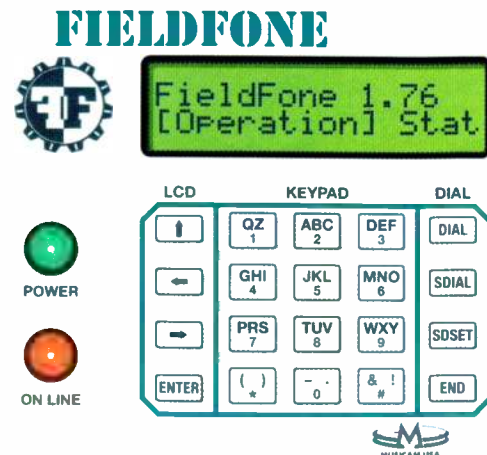
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Your **FieldFone** will never be obsolete. The latest software upgrades can be downloaded directly from the factory to your **FieldFone** – over a regular analog phone line.

StudioFone™

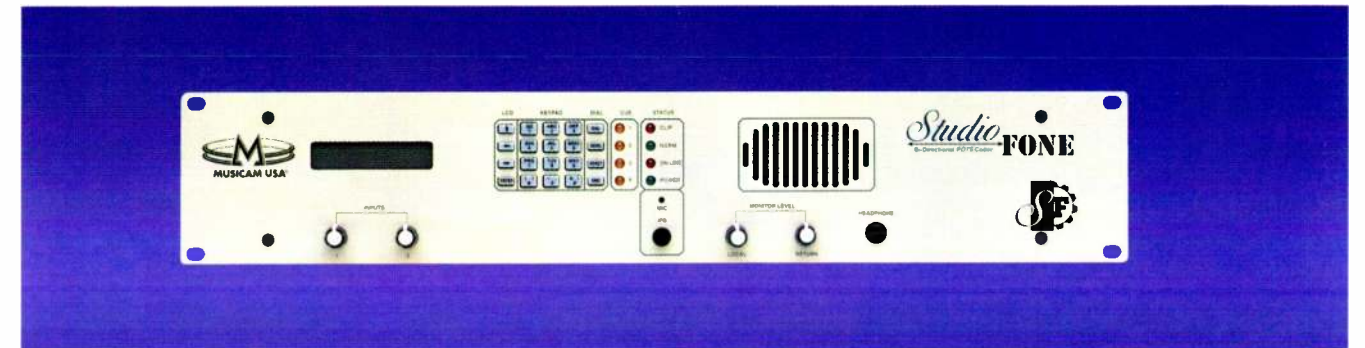
Broadcast Quality Over One Analog Line – Rack-Mountable

All the best FieldFone features – optimized for the studio

Fully bi-directional digital audio over one analog phone line, separate send and return level controls, new easy-to-use menu plus solid 7.2 kHz frequency response, low noise and distortion, efficient dialing and robust modem connection. A Layer III-based algorithm with our advanced error correction guarantees broadcast quality over a single analog line. And, like **FieldFone**, **StudioFone** accepts software upgrades over an analog phone line.

Built-in IFB

When studio-to-remote site communication is a must, **StudioFone** provides a built-in talkback feature. A front panel mic becomes active when the front-panel IFB button is pressed, and return audio to the remote site can be interrupted. Both the mic and the IFB function can be remotely located and controlled. Cueing is easier than ever with **StudioFone**.



Rack mountable – at the studio or in the field

StudioFone needs only 2U of standard rack-mount space and can be easily set-up even in portable racks for on-location remotes. Two mixing inputs switchable for mic and line, plus front-panel monitor speaker and headphone jack let you monitor both send and return audio, fed through two separate level controls.

Control other equipment from StudioFone

Remote relay contact closures on **StudioFone** can be activated from any **FieldFone** to control studio equipment remotely. Start recorders or cut over from automation from the field. And, if you connect **StudioFone-to-StudioFone**, the relay closures are fully bi-directional.

Total connectivity

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The First System For Broadcast Quality Audio Over A Single Analog Phone Line!



FieldFone rear panel



StudioFone rear panel



FieldFone and StudioFone Preliminary Specifications

Parameter	FieldFone™	StudioFone™
Frequency Response		20 Hz to 7.2 kHz, +0, -3 dB
Signal-to-Noise Ratio		70 dB (ref. +8 dBm)
Distortion		0.05% THD+N
Data Rates		28.8, 26.4, 24.0, 21.6, 19.2, 16.8 & 14.4 kb/s
Line Inputs		+21 dBu maximum, 600™ or >20kΩ, selectable, balanced
Mic Inputs		Gain 26 to 73 dB, balanced, 20 kΩ
Line Output Level	0 dBu nominal, unbalanced	0 dBu nominal, balanced, XLR
Headphone Output		+15 dBu, 30Ω, separate level controls for Send and Receive audio, mono feed to stereo connector
Front Panel Speaker	N/A	Monitors Send and Receive audio; mutes with insertion of headphones
Relay Contacts & Signaling	Individual control of four (4) relays at far end StudioFone unit	Four (4) opto-isolated inputs and four (4) dry, floating relay or TTL outputs for control of external equipment
IFB	N/A	Push-to-talk button lifts audio from Input 2 and substitutes audio from front panel microphone. Switch and mic inputs are remoteable.
Normal Coding Delay		320 milliseconds
Compression		12:1
AC Mains Power	110 VAC/60 Hz or 220 VAC/50 Hz (specify)	90 to 250 VAC, 47 to 65 Hz
Auxiliary DC Power	N/A	12 VDC, 3.5 A
Dimensions:	4.5" H x 11" W x 13" D (11.4 x 27.9 x 33 cm)	3.5" H x 19" W x 11" D (8.9 x 48.3 x 27.9 cm), 2U Rack Mount
Net Weight:	9.4 pounds (4.3 kg)	12 pounds (5.4 kg)
Shipping Weight:	12 pounds (5.4 kg)	20 pounds (9.1 kg)

Specifications are subject to change without notice.



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- **FieldFone™** sends contact closures to **StudioFone™** to actuate far-end equipment
- Field-tested to guarantee performance
- Down-loadable software upgrades direct from the factory

Election Coverage

► continued from page 1

National Public Radio also offered wall-to-wall coverage, simply by extending the run of its flagship "All Things Considered" program.

Meanwhile, ABC News offered its 20 affiliates a wide choice of programming via satellite.

These included regular "Election News Reports" and "Information Network Election Status Reports" ranging from one-to-two minutes in length, "General Network Election Updates," "Affiliate Two Ways" between local stations and ABC News correspondents, including Antonio Moro and Sheliah.

Unanchored victory and concession speeches, and "Live Anchored Coverage" by Bettina Gregory and Steve Roberts for four five-minute cut-ins per hour throughout the evening.

Starting at 7 p.m., EST, on Nov. 5, UPI had wall-to-wall coverage on UPI-2.

Howard Dieus and Pye Amberlayne. This coverage was formatted to provide distinct four-minute cut-ins every quarter hour, which could be aired on UPI affiliates not wanting to go to full program programming around the clock.

Complete coverage

In other news: for the first time, AP News Radio planned to devote each of its 24-minute news blocks, plus the six minutes normally devoted to features in program clock, to election coverage.

Wally Heides, AP assistant manager of programming.

The program change made sense, he said. After all, "any all-news station knows its salt realizes that a presidential election ... is the story of the campaign season."

The AP Network also scheduled election coverage in its hourlies, and added 12-minute live reports at 20 and 40 minutes past the hour.

Meanwhile, SRN/Standard News ended up its top-of-the-hour newscasts with headline inserts with solid election coverage.

Finally, the most-networks-to-coordinate award has to go to Bart Tessler, vice-President of News at Westwood One, whose company oversees the operation of Mutual Broadcasting, the NBC Radio Network, Westwood One news, and the distribution of CNN Radio.

Summarizing the NBC and Mutual operations, Tessler said the two networks needed "a number of different programs to affiliates, including long-form anchored continuous coverage, with a lot of cutaways for local stations."

CNN Radio also set wall-to-wall coverage from 7 p.m. to 1 a.m., EST, anchored by John Bisney and Dale Gribble, said Tessler, and Westwood One which he described as a "generic news operation which is primarily targeted towards FM stations which don't have as significant a news commitment as some of the news/talk or AM news stations" —

planned one- and two minute special reports scattered throughout the hour. Although the business of providing election coverage hasn't changed much in years, one aspect of technology has: namely, ISDN.

The availability of high-quality ISDN digital phone circuits, which eliminate the "trapped in a phone box" sound that often distinguishes live radio news from

TV, have produced a marked improvement in remote audio feeds.

A case in point: this year Westwood One made sure that, for the first time, it had "ISDN from every facility and every location," said Bart Tessler.

In addition, the use of ISDN in the field has become "more and more routine," Tessler added. "We actually are at the point where we have our own correspondents carry the gear themselves, set it up themselves, and really have no problem doing it."

Westwood One wasn't alone in using ISDN: virtually every network mentioned it as part of their coverage strategies.

With a story as big as a U.S. presiden-

tial election comes big challenges.

As ABC's Bernard Gershon said, "the biggest logistical problem Election Night is just getting everything on the air."

"It really is like a three-ring circus," he said. "For example, at the top of every hour on election night we (planned) four simultaneous newscasts."

Another is wading through the flood of returns that swamp the broadcasts during election night.

In the midst of this, "the biggest challenge is to look at the big picture," said Pam Fessler, NPR elections editor. "You know, what's really happening here, and to step back and say 'OK, what is this election really showing us?'"

"I remember 1994," Fessler said. "It was well into the evening before one of our analysts looked around and said, 'Hey, not one single Republican incumbent anywhere in

the country has lost a race.' And I think that was the first time that it became clear that this was an incredible Republican sweep in 1994, and it was before it was even clear that the Republicans were going to take control of the House."

However, one challenge that did not worry these radio people was taking on TV.

"I believe that it is a different market," said Diana Lucas, SRN/Standard Washington Bureau Chief, when asked why she wasn't concerned about competing against television. "Radio and TV are separate and they attract different people for what they are."

"We're not going to obviously try to compete with TV; we can't," added Tom Gauger, UPI Radio assistant general manager. "We're just looking for the audience that either can't get to a television or doesn't want to be bothered with it." ☺

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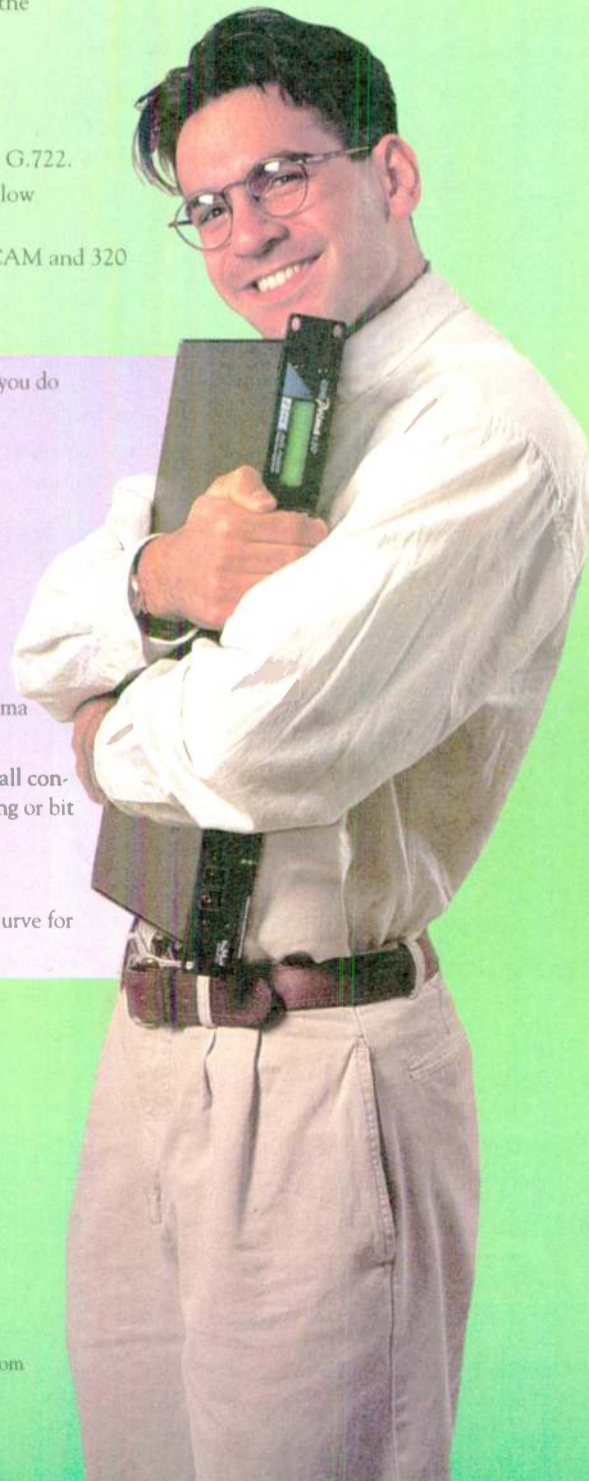
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Circle (89) On Reader Service Card

Stations Scramble After Collapse

► continued from page 1

tower under construction on Cedar Hill. This tower was already at the 900-foot level, but there were no buildings or power at the site.

A 400 kW generator was brought in and

Continental Electronics helped with that operation, and Continental's Brett Brewer said this permitted the jazz-New Age station to return to the air



When the TV pole hit the ground, the bolts sheared and the TV antenna shot hundreds of feet away.

Left: part of the top of the tower.

Upper right: The remains of a pickup truck.

Lower right: The transmitter building was also damaged.

Morgan Utility Construction of Dallas quickly put up three wooden utility buildings to house transmitters and associated equipment for KYNG, plus the two other stations knocked off by the tower disaster.

A six-bay SWR antenna was installed at 750 feet and Dallas-based Continental Electronics delivered a 27.5 kW transmitter that was not needed just yet in Edmond, Okla. Less than a week after the disaster, KYNG had a workable transmitting site for the immediate future.

KOAI (The Oasis) responded to the emergency by arranging for the re-tuning of the KKDA-FM back-up transmitter from 104.5 MHz to 107.5 MHz.

Monday afternoon, just two days after the disaster, with 20 kW at 1,000 feet.

Urban-formatted KRBV 100.3 MHz bought a used 20 kW Harris transmitter from Besco in Dallas and got on the air late Tuesday afternoon, using the KPLX-FM back-up antenna. Because KPLX-FM operates at 99.5 MHz, the mismatch was not too bad.

Bob Henke said that KYNG will probably transmit from its current facilities until this new tower is completed sometime next year.

At that point, KYNG hopes to return to its full 100 kW power as part of a 10-station combined antenna system atop the

new tower.

KRBV 100.3 MHz and KOAI 107.5 MHz will also move to the uncompleted tower, with plans to get on the combined antenna upon its completion.

Henke estimates that the stations will maintain about 70 percent of their coverage areas, pending completion of the project.

Henke has been in the business 35 years, and he said he has never seen anything like the Cedar Hill disaster.

"I don't want to ever see anything like it again. Having to remove equipment from a very ominous building surrounded by mass-

es of twisted metal was very frightening."

After more than a week with just four or five hours of sleep per day, Henke reported that the situation was relatively under control and he finally has had a little time to reflect on what he called the amazing way everyone pulled together for the emergency.

"The community of engineers opened up their doors. The competition was considered and calls to my pager never stopped. Everybody at every station wanted to come and help."

Among those who came to the rescue was KDMX chief engineer Chris Hudgins.

In addition to re-tuning his station auxiliary site for KYNG, he also helped KRBV move its temporary transmitter into the main site it shares with KPLX FM.

"We provided power out of our suite, put their exciter and STL receiver in our suite, and put the transmitter out in the hall. In Dallas, everybody pitches in."

Dallas radio listeners are joining the broadcasting community to help the families of the men killed in the tower collapse.

KYNG is undertaking fund-raising efforts on behalf of the employees who worked for Doty-Moore Tower Service. The cause of the disaster remains under investigation.

SBE Votes In Members

► continued from page 1

Troy Pennington, CSRE, chief engineer at WZZK-AM FM, WODL-FM, Birmingham, Ala., installed as treasurer; and Martin "Sand Sandberg, CPBE of Dallas, installed as SBE secretary.

The newly elected board members installed at the meeting were: Ra Benedict, CPBE, director of spectrum management, CBS Inc., Washington; Robert Hess, CPE, director of broadcast operations in engineering, WBZ-TV and Radio Westinghouse-CBS, Boston; Chris Hudgins, CSRE, chief engineer, KDMX(FM), Dallas; and Jerry Nichols, CBTE, chief engineer at KMTR-TV Eugene, Ore. Current board members, Leonard Charles, CSTE, engineer, WISC-TV, Madison, Wis.; and Tom Weber, CSTE, maintenance engineer, WISH-TV Indianapolis, were elected to serve a second term.

The newly elected board members join the current board members who are in the middle of their two-year terms.

These members are James Bernier, CSTE, Syracuse, N.Y.; Marvin Born, CPBE, Columbus, Ohio; James "Andy" Butler, CPBE, Alexandria, Va.; Richard Edwards, CPBE, Ft. Lauderdale, Fla.; Robert Reymont, CPBE, Mesa, Ariz.; and Larry Wilkins, CPBE, Montgomery, Ala. Also sitting on the board is the immediate past president, Charles Kelly, Jr., CBT, Quincy, Ill.

Europe's Secret is Out. The Philips All-in-One Sound Enhancer!

"The Sound Enhancer is an incredible box... It is a key part of our station operation and is the one tool that is indispensable for our music archiving." Paul Stenstrom, KGVL-AM, Greenville, Texas, in *RadioWorld*, May 1996

"Philips has packed a lot of useful tools into this one rack-space unit."

Don Jennings, Media Technologies, in *RadioWorld*, January 1996

"The decision to buy a Philips Sound Enhancer is a no-brainer. Just do it!"

Roger Nichols, *EQ Magazine*, January 1996

"Although its functions are complex, the enhancer is very easy to use. We use it every chance we can."

Frank Campbell, Bismarck Recording, in *Pro Sound News*, November 1995

Across Europe, and now in U.S., radio stations and recording studios, the Philips Sound Enhancer is becoming incredibly popular... for a very small investment. In one unit, working in the digital domain, you get the unique combination of a 24-bit digital sound processor, a sample rate converter, and 20-bit A/D and D/A converters. What's the secret? Scratch suppression (de-clicking), noise

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Canada Tests Distributed Emission

by James Careless

OTTAWA Can Eureka-147 digital radio be broadcast on the L band with just but a series of low-powered transmitters?

That intriguing question is what the Joint Technical Committee on Advanced Broadcasting (JTCAB), a Canadian industry/government research group, intends to find out in Ottawa.

No high-power source

Over a two-year test period, the JTCAB will use a series of five low-power transmitters throughout the Canadian capital region to see if the coverage and signal quality required for DAB reception can be generated without a primary high-power source.

The reason this "distributed emission" approach can even be considered is thanks to the nature of Eureka-147 DAB. Unlike analog AM or FM transmissions, Eureka can cope with multiple transmitters broadcasting on the same frequency. This is due to inclusion of a so-called "guard interval" in the receiver design, which lets the sets deal with signals that are out of phase by up to 62 microseconds. In other words, the signals can be sorted by the receiver and integrated into a coherent data stream.

"The guard interval allows us to constructively use echoes," said René Voyer, project coordinator for the Ottawa DAB transmission sites. Because of this, "we can have all kinds of transmitters working on the same frequency and they all look like echoes to the receiver."

The question now being asked is whether this capability — which was originally intended to allow the use of "gap-filler" transmitters in areas not reached by single all-market DAB transmitters — is robust enough to allow entire markets to be served by overlapping low-powered transmitters alone. If so, the potential benefits are numerous.

First and foremost, there is the issue of cost. For instance, serving Ottawa with a single DAB transmitter "would require about 500 W for more-or-less full coverage of the market with a single station," said Voyer.

"In contrast, computer models show that 250 W distributed over four to five low-power transmitters would be sufficient to cover the market with five stations," he said.

In addition, covering a city with a handful of low-powered transmitters would radically reduce equipment costs.

"You can buy smaller equipment that costs less," said Voyer. "You can also install this equipment in many transmission sites that currently exist, like cellular telephone installations."

Not much space

"It is easy to find such places," he said, "and most of the time you already have a very well equipped transmitter room on-site with some people already assigned to monitor it."

Helping the situation is the fact that DAB transmitter antennas do not require much space. For instance, the DAB site located at the Place du Portage office complex in Hull, Québec, directly across the river from Ottawa, uses only a two-inch thick, 12-foot omnidirectional whip antenna.

"More typically, we can get away with using a 3-meter or even just a 1.8-meter whip," said Voyer. "We can also use directional panels for focusing a beam in a particular direction."

Second, using multiple transmitters helps compensate for the tendency of L-band signals not to cover buildings completely through a single line-of-sight transmitter. With a number of sources, there are sufficient signals being reflected into buildings to ensure a reasonable degree of indoor reception.

Third, using a series of low-power transmitters — each on the same frequency — makes it possible for DAB engineers to custom shape the coverage

of various stations much more easily than they can now with AM and FM signal patterns.

In addition, the flexibility inherent in the multitransmitter approach means that radio stations can begin with an economical central-coverage approach, adding transmitters (or renting space on existing ones) as the need arises.

"If this concept works, you can expand your coverage as required," said Voyer, "as opposed to having to put an expensive transmitter in on day one, and having to live with it for the next 30 years."

Finally, the use of low-power transmitters only improves frequency reuse. With better-defined coverage contours, new services on

the same frequencies can be located closer to each other, with less chance of interference than between two high-power transmitters.

Obviously, the potential of distributed emission is exciting. The big question, however, is whether or not it is feasible.

At the heart of the debate is the issue of feedback.

For instance, JTCAB is going to be using the Place du Portage transmitter to feed an omnidirectional retransmit antenna located at Carleton University in Ottawa.

Endless loop

The concern is that the retransmitted signals from the Carleton antenna could be reflected back into that system's receiver, which is searching for the Place du Portage signal. The resulting feedback would generate an endless loop that

continued on page 12 ▶

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USADR Proceeds With DAB Plans

PITTSBURGH After USA Digital Radio pulled its in-band, on-channel systems from the digital audio broadcasting (DAB) field tests in May, many wondered if the company had found the problems encountered in the lab to be insurmountable.

Certainly, the two FM IBOC systems and one AM IBOC system from USADR were severely battered by the results from the NASA Lewis Lab tests in Cleveland last summer. Problems with host analog interference and second adjacent channel interference, among others, left many engineers feeling let down.

Then, when AT&T/Lucent Technologies/Amati withdrew their

IBOC system from the field tests last month, things started to happen.

First, National Association of Broadcasters President and CEO Eddie

'There are means available to resolve these issues.'

Fritts wrote to both AT&T and USADR offering NAB services for testing purposes "as soon as the technology is appropriately developed."

Next, in a letter to Fritts, Westinghouse

Electric Corp. Chairman and CEO Michael H. Jordan cemented his company commitment to USADR and its DAB systems.

Employees at USADR had been walking on eggshells for months afraid to say too much about what DAB work was being done. Part of the uncertainty came from recent acquisitions that Westinghouse, USADR's primary sponsor, had made.

First, Westinghouse acquired CBS last year; this year the new CBS announced plans to purchase Infinity Broadcasting. With the consolidation, no one was certain what would become of USADR and its IBOC dream.

Fortunately, CBS owns a lot of high profile AM stations. And AM will benefit tremendously if an AM IBOC DAB solution can be found.

In early October, USADR released the long-awaited announcement that with the resources and expertise of Baltimore-based Westinghouse Wireless Solutions leading the effort, it would continue to "develop and fine-tune its in-band, on-channel DAB solution."


"USADR's work over the past five years has yielded a great deal of information on the AM and FM bands and on working in-band DAB systems," stated Westinghouse Electric Chairman and CEO Michael Jordan. "While this work has also raised a series of difficult technical challenges, USADR is now proceeding with a revised technical design of its DAB system."

USADR President Bernee Strom said that USADR recently completed extensive internal and external reviews of both the IBOC concept and of its own technology.

"Third-party review has concurred with our conclusion that IBOC is quite viable and that all technical issues can be addressed to the satisfaction of broadcasters and regulators," said Strom.

Jordan's letter informed Fritts about the independent technical review of its technology and the IBOC concept.

"While the review identified certain technical issues that need to be resolved," stated Jordan, "it concluded that there are means available to resolve these issues."

At the end of the letter, Jordan stated Westinghouse was looking forward to working with the NAB to "insure the U.S. broadcasters are provided an opportunity to implement DAB in an efficient and cost effective manner." 

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Canadian Tests

► continued from page 11


would turn the outgoing signal into garbage.

"The question is how to isolate the receive antenna from the signal you are retransmitting," Voyer said.

"Obviously the easy answer would be not to retransmit omnidirectionally," he said, and he is correct. If the retransmitter was fed the broadcast signal in a direction away from the Place du Portage antenna, it would minimize the risk of feedback.

But such a solution "would not be interesting" for JTCAB, said Voyer. "We want to make life difficult, and then learn from it."

The second big question is how to ensure that a DAB receiver tuned to a distant signal — say the college station available only on a single transmitter — can somehow resist interference from a nearby DAB transmitter.

As Voyer said, "When you are trying to stay tuned to a weak station which is not on every transmitter and you are driving by one whose transmission does not include that channel, then the receiver may end up being overloaded by the energy of unwanted channels from that nearby transmitter." 

Group Touts Multimedia Standard

by Frank Beacham

NEW YORK Calling it the equivalent of the AM and FM standards for radio broadcasting, a consortium of 40 computer makers and software publishers have proposed a new multimedia broadcasting standard for the Internet.

The new data standard, Real Time Streaming Protocol — or RTSP, is a communications framework for control and delivery of streaming media. It supports the on-demand access of multimedia items such as real-time audio, video or any other type of time-based information. It also allows interoperability between client-server multimedia products from multiple vendors and can be implemented across virtually all common computer platforms.

The RTSP initiative was led by Netscape Communications, creator of the best-selling Netscape Navigator Internet browser, and Progressive Networks, inventor of the RealAudio client-server audio broadcasting system. They were joined by 38 other companies including Apple Computer, IBM, Hewlett Packard, Silicon Graphics, Sun Microsystems and Macromedia. Conspicuously absent from the list was Microsoft Corp., a fierce competitor with Netscape over Internet standards.

First draft

The first draft of the protocol specification, RTSP 1.0, was submitted to the

Internet Engineering Task Force (IETF) on Oct. 9. It is expected to go through an intense review process on the path to industry standardization.

"RTSP will do for streaming multimedia what HTTP did for text and graphics publishing," said Rob Glaser, founder and CEO of Seattle-based Progressive

RTSP will accelerate the growth of wireless Internet broadcast.

Networks. "Once you have a standard that allows for interoperability, like RTSP, the development of real-time multimedia on the Web will explode."

Within five years, Glaser predicted, the effects of RTSP will be "profound" with "the Internet starting to have the same number of viewing or listening hours as television and radio." A common multimedia standard, he said, will lead to a new generation of devices such as an Internet "Walkman" and Internet TV receivers.

Netscape co-founder Marc Andreessen sees RTSP as a way to deliver multimedia broadcasting beyond the desktop computer. "The exciting thing is that all of this content can be delivered not only to any PC, Macintosh or Unix (platform) but also down the road to non-PC devices like PDAs (personal digital assistants) or

cellphones," he said. "And this includes a wide range of networks, from low bandwidth 2400 baud on up to cable modems and very high speed networks."

Natural evolution

RTSP evolved from work originally done at Progressive Networks and Netscape, the companies said. It incorporates aspects of the International Telecommunications Union H.323 specification and can be built on top of Internet standard protocols including UDP, TCP/IP, RTP, RTCP, SCP and IP Multicast.

Glaser said among the benefits of RTSP are high reliability using the current Internet infrastructure, efficient delivery of media, security, intellectual property rights protection and scalability. He said bidirectionality enables full stream control so that the end user can tell the server to pause, fast forward, rewind or seek a location in the programming.

"RTSP supports any type of time-based information, not just audio and video," said Glaser. "It can be streaming animation, streaming text like a stock ticker ... anything you want to send where time code is preserved from the server to the client."

The new protocol is not limited to wired networks. Jim Long, CEO of Starlight Networks, said his company is already using a protocol similar to RTSP for corporate Intranet multimedia over satellites.

"We're getting excellent results," he said. "We're delivering video and audio across the United States now and we are starting to do it in Japan and Europe as well."

Wireless growth

Glaser predicted RTSP will accelerate the growth of wireless Internet broadcasting and eventually turn webcasting into a mass medium. "Untethering audio/visual devices is incredibly compelling," he said. "I'm optimistic that in the long term RTSP will play a very powerful catalytic roll in wireless. Wireless bandwidth is still getting shaken out but there's a whole variety of means including satellite delivery and local broadcast spectrum that can be brought to bear on this."

The consortium of RTSP backers were anxious to bring Microsoft into their fold. Glaser, a former head of multimedia at Microsoft, said there's hope that the computer giant will eventually sign on to support the standard.

The universal adoption of RTSP, said Starlight's Long, will benefit all companies. "The thing to keep in mind about these protocols is they are there to help people put solutions together. They are not a panacea. It's how to shake hands, how to say hello on the street. We've seen it time and time again in high tech industries that standard communications methods are the key to market growth. No one should be threatened by standard networking protocols."

□ □ □

Frank Beacham is a New York-based writer and producer. Visit his web-site: <http://www.beacham.com>

BUSINESS DIGEST

Report business news to: Radio World
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PR&E EXPANSION: Jack Williams, chief executive officer of San Diego-based Pacific Research & Engineering, announced plans to expand its traditionally high-end, large market business into the middle to small radio markets in the United States.

Williams expects to have the company's first on-air broadcast console targeted specifically for medium to smaller markets available in January, followed by a line of modular, off-the-shelf technical furniture and cabinetry in early 1997.

PR&E is a San Diego, Calif.-based manufacturer of high-quality broadcast studio products including on-air and production consoles, digital audio workstations, studio systems design/integration services, and custom cabinetry.

SFX ACQUIRES DELSENER/SLATER: SFX Broadcasting Inc. entered into a definitive purchase agreement to acquire privately-owned Delsener/Slater Enterprises Ltd.

The purchase price was undisclosed.

Delsener/Slater is a promoter of contemporary music concerts and one of the five largest concert production companies in the United States. Delsener/Slater will become an independent division of SFX and will retain its current name, management and corporate location.

"This investment is highly compatible with our focus on contemporary music, as it will combine the live music component with our traditional area of expertise, recorded music," said SFX Executive Chairman, Robert E.X. Sillerman.

Delsener/Slater might be best known for the concerts in New York City's Central Park Sheep Meadow and on the Great Lawn.

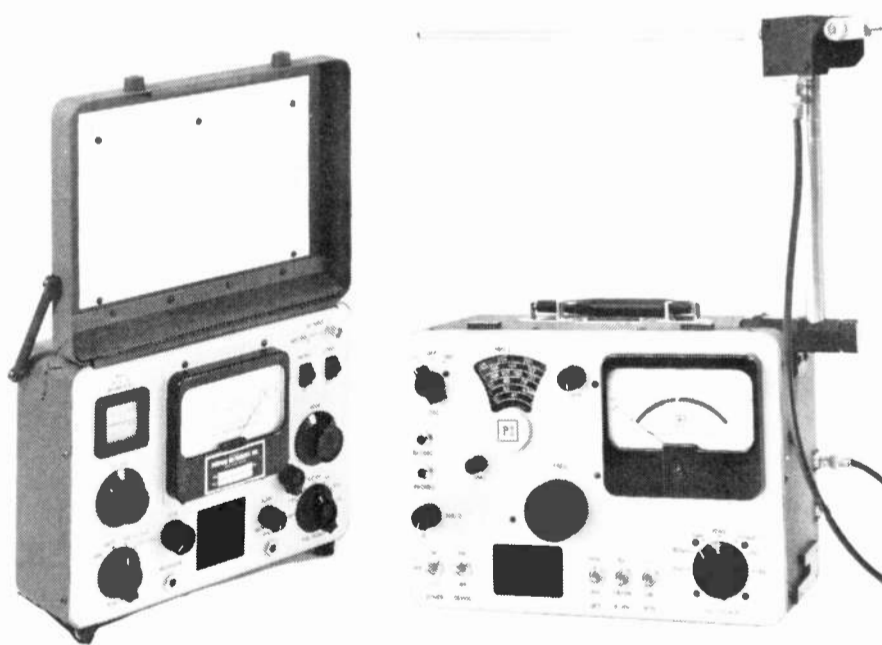
WAVEPHORE AND PBS: WavePhore Inc. and PBS National Datacast Inc. established a new, full service, nationwide datacasting network.

The companies said consumers and businesses will receive a variety of content, including Internet-related news and information, delivered to their personal computers via the vertical blanking interval (VBI) of the television signals of the Public Broadcasting Service (PBS).

WavePhore will distribute digital data and information over the PBS National Datacast network of more than 250 stations.

The new consumer network will be added to the other managed WavePhore networks which include business-to-business data transmission over the VBI through the Canadian Broadcasting Corp., in addition to such technologies as small dish satellite, FM radio subcarriers and television in-band.

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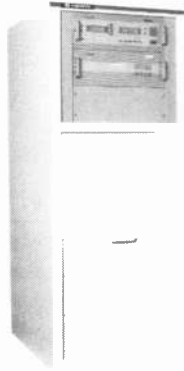
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1996 WORLD MEDIA EXPO

Hardware Is King in Los Angeles

LOS ANGELES Hundreds of radio and audio exhibitors used World Media Expo to introduce new products. Among the most interesting:

The new addition to the **Harris** line of solid-state Platinum Z FM transmitters is the Z10CD.



RF power amplifier modules use the same solid-state devices that have achieved a Mean Time Between Failures of greater than 250,000 hours in Platinum FM transmitters. Features include multiple, hot-pluggable modules that operate in parallel, redundant power supplies to allow on-air servicing. The broad-

band transmitters require no tuning from 87 through 108 MHz. The DIGIT digital FM exciter is standard.

Also on display in the Harris booth was the Sage Endec EAS system. Model 1822 provides six analog inputs, a silent thermal printer, two minutes of digital audio storage and an 80-character display.

For more information about Harris transmitters, call (217) 222-8200. For EAS info, call (317) 966-0623.

Moseley is in the spread spectrum business, allowing its customers to set up stereo remotes without phone lines or license requirements.

The new STARLINK 9001 is a digital RPL that uses 2.4 GHz spread spectrum RF technology and audio source coding. Users enjoy CD-quality stereo remotes over distances of up to 30 miles via easily established point-to-point links.

Open architecture allows the user to choose plug-and-play modules for ISO/MPEG Layer 2 or apt-X source coding, and to select between analog or AES/EBU input and output modules.

Call Moseley at (805) 968-9621 for information.

Marti Electronics came to the show with The Smarti remote telephone broadcast system. This device won the 1996 RW "Cool Stuff" award at the spring NAB show in Las Vegas.

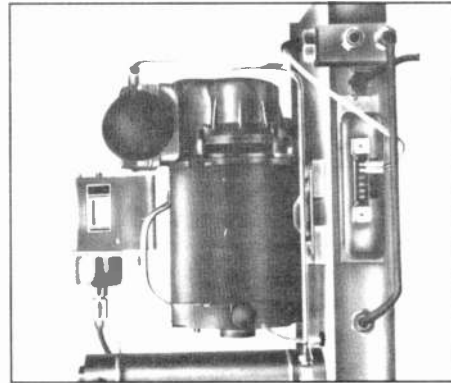
The Smarti is a telephone remote pickup system capable of sending and receiving 7.5 kHz audio over a single standard POTS line. The unit has a built-in four-input mixer for line and mic signals, headphone jacks that allow a mix of program and return levels for the remote talent and a self-contained telephone dialer and interface.

The Smarti automatically adjusts modem transmission speeds to match line conditions. This reduces line noise and provides consistent audio quality.

Call Marti Electronics at (817) 645-9163.

RF equipment manufacturer **Shively Labs** is running a special promotion on its compressor-dehydrators.

Customers can save 20 percent on purchases made by Nov. 30, according to Judith Fawcett, director of marketing



Shively offers dehydrators.

communications.

Shively makes five models of compressor-dehydrators with a broad range of air capacities, for use with different sizes of

transmission line. Features and options include pressure gauges, alarm indicators, automatic operation and rack mounts.

For information, contact Shively at (888) SHIVELY.

Scott Studios introduced WinNEWS, an audio sound bite editor and cart replacement system designed with news in mind. President Dave Scott called WinNEWS a "major new thrust" for the company.

WinNEWS records, plays, cuts, pastes, trims, copies, marks, fades, scrubs and zooms. According to the company, it works with clips, stories and newscasts, and can record and edit satellite feeds, press conferences and similar audio events. On-air talent can see and edit text, too. It is designed to work with BASYS, NewsStar, Wire Ready or any other Windows text editor.

A Cut Stacker feature lets you arrange and audition recordings. Cuts can be sent separately or as a package to Scott

continued on page 17 ►

Marconi Winners

The National Association of Broadcasters closed its Radio Show by saluting the best in radio at the annual Marconi Radio Awards gala held in Los Angeles.

Host Leeza Gibbons presented awards in 22 categories recognizing outstanding stations and personalities in the radio industry. Country music star Randy Travis brought the crowd to its feet singing songs from his hit albums. **Radio World** salutes the winners:

And the winners are:

Legendary Station of the Year: WJR(AM), Detroit

Personalities of the Year

Network/Syndicated: Paul Harvey, "Paul Harvey News & Comments," ABC Radio Networks, Chicago

Major Market: Hudson & Harrigan, KILT-FM, Houston

Large Market: Coyote Calhoun, WAMZ(FM), Louisville, Ky.

Medium Market: Bruce Bond, WNNK(FM), Harrisburg, Pa.

Small Market: Michael H. McDougald, WRGA(AM), Rome, Ga.

Stations of the Year

Major Market:

WFAN(AM), New York

Large Market:

WHAS, Louisville, Ky.

Medium Market:

KSSN(FM), Little Rock, Ark.

Small Market:

WRGA(AM), Rome, Ga.

Stations of the Year by Format

AC/EZ: WLTE(FM), Minneapolis

CHR: KWDB(FM), Minneapolis

Country: KMPS-AM-FM, Seattle

News/Talk/Sports: WFAN(AM), New York

Religious/Gospel: WMBI(FM), Chicago

Spanish: KLTN(FM), Houston

Big Band/Nostalgia: WMMB(AM), Melbourne, Fla.

Classical: WGMS(FM), Rockville, Md. (Washington)

Jazz: KPLU(FM), Tacoma, Wash.

Oldies: WQSR(FM), Baltimore

Rock: WFBQ(FM), Indianapolis

Urban/R&B: WJLB(FM), Detroit



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MDS-302 Full Sized Studio Rack Mountable (Option) MiniDisc Recorder

- Features Jog/Dial for editing and title input, suitable for fast editing and dubbing
- Optical Digital and Analog inputs and outputs
- Wireless Remote Control with 10 Key Direct Access



MZ-B3 Portable MiniDisc Recorder/Player

- Ideal for location interview recording
- Features built-in Microphone and Speaker
- Mono Record Mode for 148 minutes of record time
- Digital VOR (Voice Operated Recording) function
- Remote track mark



MZ-R3 Portable MiniDisc Stereo Recorder/Player

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MD Four-track Digital Recorder with built-in Mixer

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- Writes Disc and Track title
- Offers over 35 minutes of Digital Audio

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World Radio History

SONY

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creator.



Take advantage of the MiniDisc format by taking your cue from Sony. After all, not only did we create an entire MiniDisc product line - we created the MiniDisc. And our latest creations are proof that big ideas come in small packages. Consider the convenience of editing on location with instant access to tracks; being able to re-record over a million times on a single disc (with 74 minutes of digital audio); and having a shock resistant recordable media so small it could easily quadruple your storage space. Frank Beacham of *Radio World* had this to say about the MZ-B3 MiniDisc Portable Recorder: "Its powerful search features could be a lifesaver for radio news reporters trying to access a newsworthy sound clip under deadline pressure... It was indispensable..." And Chris O'Brien, Program Director of WRCY in Washington D.C., said this about the Sony MiniDisc Cart Recorder: "...Everything I needed was all in one place, and I didn't need to rifle through a stack of carts every time I needed a particular sound element." For compact impact at your radio station, make Sony MiniDisc products part of your format — and get on the digital fast track to success.

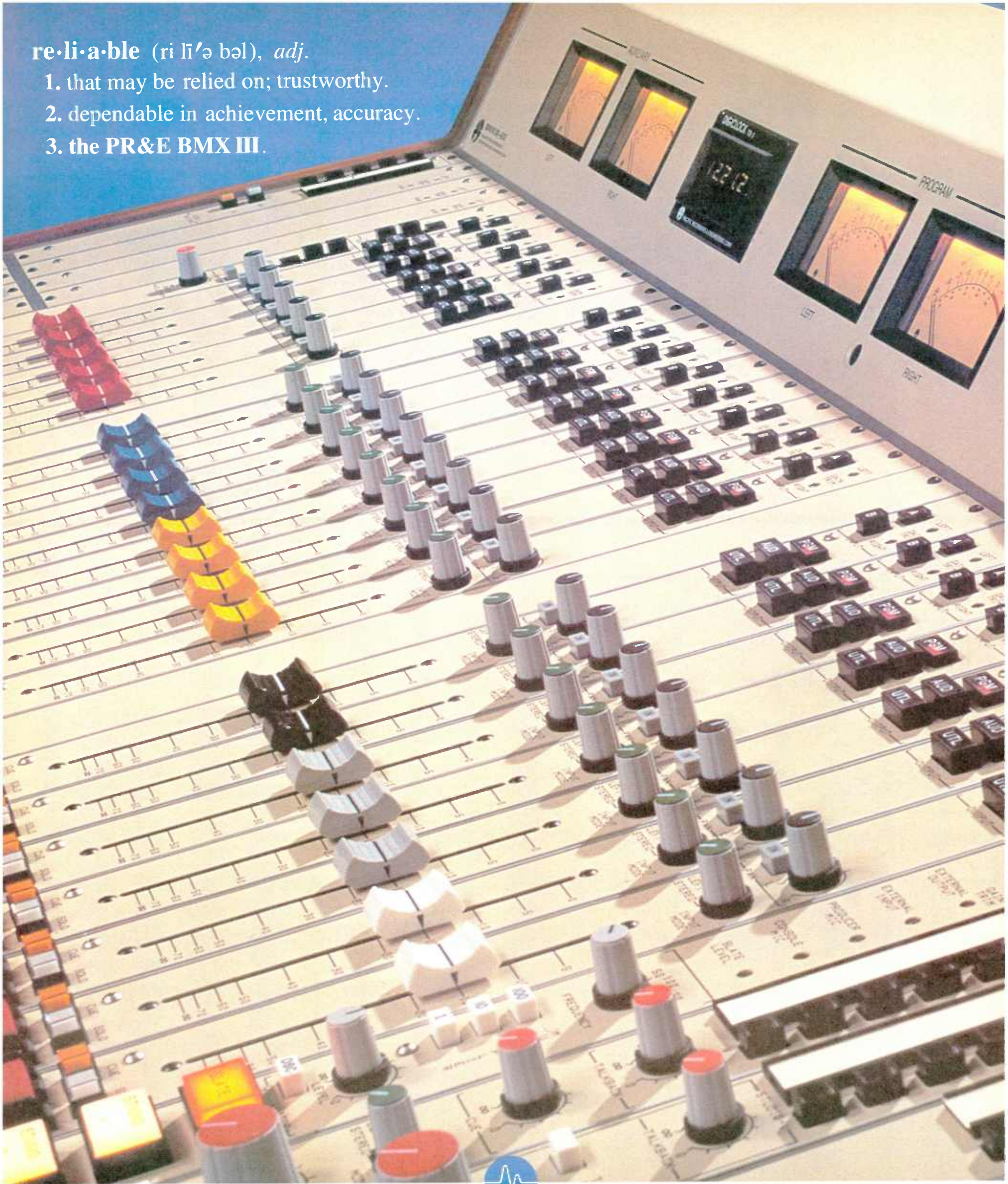


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re·li·a·ble (ri lī'ə bəl), *adj.*

1. that may be relied on; trustworthy.
2. dependable in achievement, accuracy.
3. the PR&E BMX III.



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Circle (108) On Reader Service Card
World Radio History

New Tools at WME

► continued from page 14

Systems in air studios.

WinNEWS is available as software or a complete Pentium computer system. Contact Scott Studios at (800) SCOTT77, and see the related story in this issue's Buyers Guide.

Dorrrough Electronics welcomed visitors to its WME booth with a display of its second generation level meters. The new versions have fully integrated peak-hold functions.

Dorrrough meters include the popular 40-A2 loudness meter, the 40-B2 showing relative loudness to peak modulation, and a series of digital-reading audio meters. The model 280-D and 380-D are AES/EBU reading and come in horizontal and vertical versions.

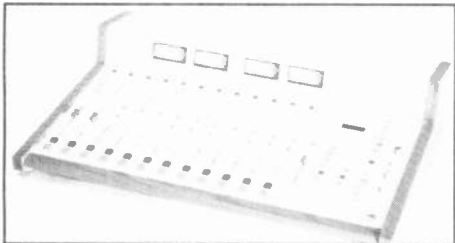
Call **Dorrrough** at (818) 998-2824.

Audioarts Engineering used World Media Expo to introduce the R-5 Radio Console, an analog mixer with "better than 16-bit digital audio performance for a list price of less than \$6,000."

Ray Esparolini, director of sales for Wheatstone Corp., said Audioarts is expanding into new markets, including college and smaller market radio stations.

Features include two inputs per channel, four mic preamps, tape remote controls, illuminated switches and meters, and a standard Simple Phone module that allows easy handling of talk segments.

The new console also has a digital timer, six-source selector, cue speaker, tape remote control, a headphone jack, and dials for cue, studio output level,



headphone level and control room. The mixer is packaged in a slim, surface-mount chassis with oak trim.

For more information, call **Audioarts** at (315) 452-5000.

Prophet Systems, maker of Audio Wizard for Windows, introduced a Call-In Show Interface, a module that allows a show engineer or talent to run a call-in show from any workstation on the network or from a remote modem. The company says the interface can be configured to connect to any telephone interface and delay unit on the market.

Also on display at WME were a local back-up module, to allow a control room computer to run up to four days of logs in the event the file server is unavailable, and a Novell SFT III Hot Standby Mirrored File Server for automatic, continuous operation even if the main file server — or any system hard drive — fails.

More information is available from **Prophet Systems** at (800) 658-4403.

Burk Technology is preparing for EAS compliance with its new Model EAS encoder/decoder.

An 80-character display shows entire commands in one pass rather than scrolling through lines of data. A familiar telephone-style numeric touchpad

makes entry fast and easy for operators. Weekly testing is as simple as one-button operation.

The Model EAS works with Burk ARC-16 transmitter remote controls, also on display, as well as remotes from other manufacturers. One unit can be combined with remote panels for multiple studio/station operation. Plain paper logging records all EAS activity. At press time, the unit is awaiting FCC approval.

Contact **Burk Technology** at (508) 486-0086.

The Street Blimp is a billboard, sales room, meeting area, station limo, rolling studio and stage.

Actually, it's a bus.

The **ExecuCoach** Street Blimp is a 45-foot bus designed to accommodate the needs of a radio station. The Street Blimp can be equipped with a built-in studio. For a contest or promotion, use it to transport contest winners and visitors, or just increase public awareness with the station logo painted on the sides. Park it in any high visibility area.

Inside, ExecuCoach offers a sofa bed, several chairs, bathroom with shower, galley kitchen, dry bar, front and rear AV systems, front executive area and access to the roof, which can be converted to a stage complete with collapsible banisters, canopy and wireless micro-



The ExecuCoach Street Blimp

phone. Broadcasters can buy or lease the bus, which the company says qualifies as a tax deduction.

continued on page 19 ►



Set It And Forget It.

MEET THE SHURE FP410, THE "HANDS OFF" MIXER THAT DELIVERS PERFECT SOUND AUTOMATICALLY. The Shure

FP410 is not just another pretty face. It's a hard working portable mixer that forever solves the nagging problems of multiple open microphones. By automatically keeping

unused microphones turned down, the FP410 dramatically improves your audio quality.

The secret: Shure IntelliMix® — the patented operational concept behind the revolutionary FP410. It thoroughly shatters existing standards for portable mixer performance and ease of operation.

Just set your levels and flip the switch to "Automatic." Shure IntelliMix does the rest.

◆ Its Noise Adaptive Threshold activates microphones for speech but not for constant room noise, such as air conditioning.

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microphones equal to the number of talkers.

◆ And its Last Mic Lock-On keeps the most recently activated microphone open until a newly activated microphone takes its place.

With Shure IntelliMix, you'll get a "seamless" mix that's as close to perfect as you'll find. Providing

the cleanest, clearest sound you've ever heard from a portable mixer. And freeing you from the tedious task of turning microphones on and off.

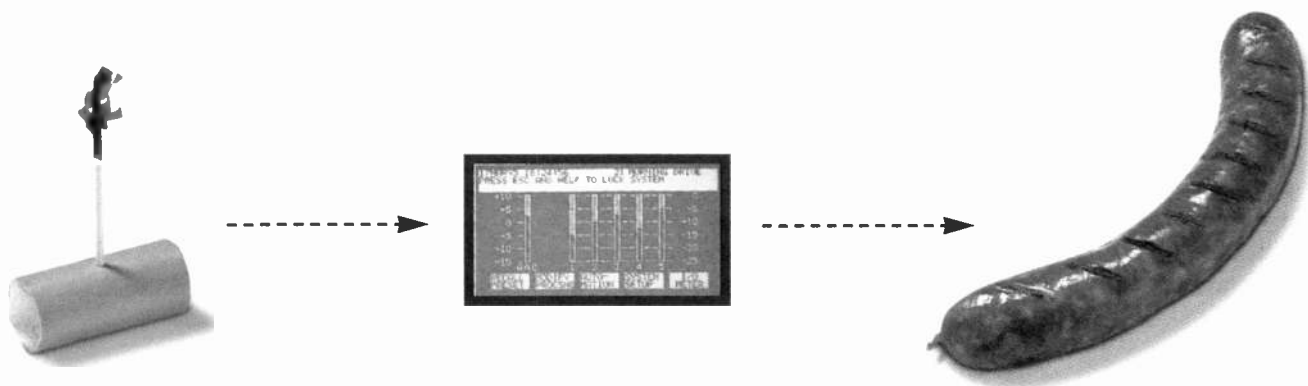
For a closer look at the world's most efficient portable automatic mixer, call for more information, including the article

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OPTIMOD-FM 8200 Processor

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H A Harman International Company

New Tools at WME

► continued from page 17

Call (888) EXEC745 for more information.

JK Audio proves there is still a place for simple, good-sounding remote telephone equipment by exhibiting the RemoteMix 3 line hybrid and handset interface and the QuickTap IFB telephone handset tap.

The RemoteMix 3 is an enhanced version of the company RemoteMix C++ mixer. The new version includes an analog VU meter, two headphone jacks and a built-in monitor speaker. The device works on standard phone lines or can connect to digital PBX telephones.

The QuickTap IFB is one of those handy "black boxes" that makes connecting audio equipment to a phone simple. It goes between the phone base and handset. A transformer-isolated balanced XLR jack provides phone output to an amplifier or mixer.

Contact JK Audio at (815) 786-2929.

RapidFire is a new on-air digital playback system with a live, graphical interface. **Pristine Systems** touts it as the industry's most powerful and fun-to-use.

Operator ease is important, said Kevin Loper, director of technical services.

"A lot of (hard disk) systems today intimidate jocks," he told *RW*. "A jock understands how to use CD players," so the interface emulates them. RapidFire's main screen includes four "decks" that let the operator assign cuts easily. Three sources can play at once, while one records. The Quick Pick feature makes it easy to add or change cuts. Individual jock preferences for songs, bits and liners can be stored in separate libraries. RapidFire uses Dolby AC2 or MPEG cards at 48 kHz sampling, and works with a mouse or optional Touchscreen.

To learn more, call Pristine at (310) 670-7500.

Wall-to-wall codecs at the **MUSICAM USA** display included the company's newest products: the Olympian console-style codec/mixer and RoadRunner portable compact codec/mixer.

The RoadRunner provides 15 kHz mono audio on an ISDN "B" channel or 20 kHz on a full ISDN line. The unit can activate far-end relays with four contact closure buttons. A three-input mixer handles two mics and one mic/line-selectable input.

The new stereo Olympian codec boasts three pannable mic inputs, one stereo line input and three headphone jacks. A thumbwheel menu navigator and four soft function keys speed the user through the menu.

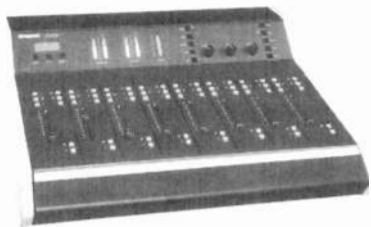
Both units support MUSICAM data compression as well as MPEG Layer 3, and both can send voice-quality audio down conventional POTS lines where ISDN is not available. These products join MUSICAM's new and improved version of the FieldFone and partner component StudioFone.

Call MUSICAM at (908) 739-5600.

The Dynamax console line from **Fidelipac** looks ahead to fully digital broadcasting with the introduction of the MX/D digital on-air audio console. This

board is specifically designed for on-air use, maintaining familiar linear faders and Program/Audition routing.

The console handles analog or digital (AES/EBU or SPDIF) inputs and outputs both balanced analog and AES/EBU digital signals. Internal processors send a 48 kHz-sampled signal to the outputs, although 32 and 44.1 kHz rates are available as options. The console is configured as an eight-input



stereo board with a choice of the IM-D digital input module or the IM-A analog input with precision A/D converter and mic preamp.

Contact Fidelipac at (609) 235-3900.

Along with its popular on-air Navigator application for full live-assist or walkaway automation, **Dalet Digital Media Systems** displayed its Control Panels.

The company's mock morning show demonstrated how these optional keyboards interface seamlessly with all of Dalet's on-air applications. The modular panels can be used for one-button access to the new Carts application, editing with the Dalet Surfer 4-track multitrack editor, or for replacing the keyboard and mouse while on the air.

For information, call Dalet at (212) 226-2424.

Broadcast Supply Worldwide enjoyed plenty of interest in the Shortcut digital editor, made by **360 Systems** and demonstrated in the BSW booth.

Shortcut is intended for quick, easy editing of phone call-ins. A spokesman for the manufacturer told *RW* that the Shortcut should be available in a matter of weeks. BSW also demonstrated the TFT EAS system, the new Arrakis Digilink 4 and other new equipment.

Call BSW at (800) 426-8434.

Circuit Research Labs focused on its new DP-100, a digital audio FM processing system and stereo generator using 32-bit floating point technology. Features include 10 digital signal processors, day-parted programming, custom passwords, noise reduction, numerous factory presets and memories, and inputs for analog, digital and composite.

Other CRL products include on-air processors and SCA and RBDS equipment.

Call CRL at (800) 535-7648 for details.

The recent acquisition of DDS (Digital Delivery System) made the **Orban** exhibit a busy place. Orban began production of DDS in October at the company's California facility, after purchasing the rights from Radio Systems.

The DDS product line combines a user-friendly "analog" feel with an efficient QNX-based multi-user and multitasking operator system. It is compatible with popular traffic systems, making program log importing an easy task. The system supports MPEG Layer 2 audio and multiple

sample rates, and can be expanded as station needs grow.

In addition to the familiar Sound Cube cart emulator, DDS features the Sound Slate, a flat playback control panel that accesses entire sound libraries of effects, jingles and liners. Station personalities can use the Sound Slate to customize their own shows.

Contact Amy Huson at (510) 351-3500.

The breakthrough VS-880 digital workstation returned to the **Roland** booth. The VS-880, a "Cool Stuff" award runner-up in the spring, is a full-featured DAW with internal digital effects, eight primary tracks with eight levels of virtual tracks, time manipulation and an integrated mixer. List price for the VS-880 with an Iomega Zip drive is \$2,995.

Close by, the Roland PMA-5 Personal Music Assistant attracted attention. This synthesizer/sequencer/MIDI module is the size of a personal organizer book and is played with a stylus. Over 300 sampled instruments and 16 drum sets are featured in the PMA-5. Look for a review in *Studio Sessions* in this issue.

Contact Eric Hanson at (213) 685-5141.

Visitors to the **Nautel** booth saw the new XL-12, a modular transmitter for AM stereo or mono, suitable for the expanded band. It comes with dual exciters, with auto switchover to the back-up in the event of failure. Modular design lets the engineer pull a power module without taking the transmitter off the air. Overall efficiency is 84 percent. Broadcast Sales Manager Gary

Manteuffel told *RW* that the XL-12 is the first in a series of AM transmitters up to 60 kW.

Nautel also offers the new NE50, a 50W digital FM exciter with AES/EBU digital



The Nautel NE50

or analog inputs. It is part of the Nautel line of solid-state FM transmitters, built at 4 kW, 7 kW, 10 kW and 20 kW. Manteuffel said the solid-state FM line boasts exceptional efficiency of 65 percent.

Nautel information is available at (207) 947-8200.

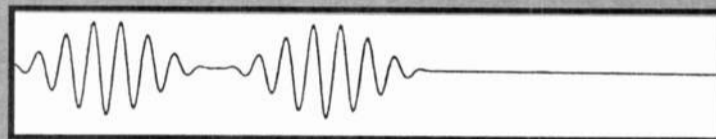
Holiday Industries keeps on eye on your RF exposure.

The new HI-3702 measures RF-induced body currents with a clamp-on sensor fit to your ankles or arms, so measurements can be taken while the user walks or climbs. Readings can be taken in any position, even if body position changes while the user is taking measurements.

Holiday also has the HI-3510 Personal RF/Microwave Monitor, which can detect non-ionizing radiation from RF and microwave sources in the 50 MHz to 2.5 GHz range, and Naptex RF protective clothing, made of fabric with a yarn of

continued on page 20 ►

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New Tools at WME

► continued from page 19

stainless steel micro fibers in a cotton/polyester base.

Learn more by calling Holaday at (612) 934-4920.

Digital audio was the hot topic at the **Continental** booth. The company put together a full digital audio path, including hard disk system, DAT source and the 802D digital FM exciter. All are available from Continental.

The 802D exciter is software expandable and upgradable over a serial cable from another PC direct into the internal hard disk drive. It provides separate analog inputs for stereo composite and SCAs, analog inputs for left and right audio and SCA audio, and optional AES/EBU digital.

Ask for more information at (214) 381-7161.

Telos Systems enjoyed attention at the show thanks to its entry into the audio streaming marketplace, as reported in the Oct. 30 issue of **RW**. Telos announced alliances with Apple Computer and Macromedia, as it begins to compete in the field of webcasting over the Internet.

Telos also demonstrated the new, portable version of its popular Zephyr digital codec, called ZephyrExpress, due to ship by the end of the year. It includes



ZephyrExpress

an ISDN terminal adapter and an audio mixing/monitoring system in a rugged chassis. The company also now offers talk show management software for Windows.

Contact Telos at (216) 241-7225.

Emergency Alert products are the big story of the fall for equipment buyers, and **TFT** spent the show talking to visitors about its EAS 911R4 system. It provides weekly/monthly test reminders and comes with four professional balanced audio inputs.

The TFT system uses illuminated front-panel buttons to prompt the disc jockey or other operator through the alert process. Practice and help keys assist in training.

Call TFT for information at (800) 347-3383 or (408) 727-7272.

For engineers and managers looking for uninterruptible power supplies, **Warner Electric/Superior Electric** now offers the SW Series. These UPS's come with hot swappable batteries to allow the user to make a swap without losing conditioned power to the load. These new supplies are expected to ship this fall.

The company also demonstrated its Stabiline UPS Model SL3000B, a 3 Kva line interactive UPS for 120 V 60 Hz, or 230 V 50/60 Hz, service. Warner Electric/Superior Electric also makes automatic voltage regulators, transient voltage suppressors/RFI filters and power conditioners.

Contact them at (860) 585-4500.

Radio Computing Services (RCS) returned to the radio show with its imported Klotz digital console and VADIS digital switcher, first shown at NAB Las Vegas.



The RCS Digital Console, by Klotz

The German-built Klotz console is custom-designed by the user. All pots, faders and controls are software-assigned rather than hard-wired; board operation and configuration can be reset and changed anytime. The rackmount VADIS audio distribution system can switch up to 1,024 channels and has an intuitive on-screen interface. The VADIS configures itself when modules are plugged in and power is applied.

RCS also offers a Windows version of Master Control, a digital air studio with PD-controllable access to the selector.

Contact Tom Zarecki at (914) 723-8567.

The **Computer Concepts** booth was busy with customers interested in V.T. (Visual Traffic), a new Windows-based, management oriented traffic system set for delivery this fall. The company says its clients have asked for a system that could handle duopolies, LMAs and split sales, with an easy user interface.

Also from Computer Concepts is Maestro, for seamless integration of music, commercials and copy into station operations. The latest version provides for full automation. The company also introduced a Windows version of Newsroom, an integrated computerized news system that works with all text and audio in a radio newsroom.

Call (913) 541-0900 or (800) 255-6350.

A new, affordable digital cart replacement system is available from **Electric Works Corp.**

The AXS PRO CART provides simultaneous operation of log playback, instant play buttons and a cart stack. The software also allows the recording of phone calls to hard disk for editing and playback. With select options, AXS PRO CART can output eight simultaneous audio sources, each with an on-screen fader. A LAN card networks the system to other computers.

AXS PRO CART is run from a user-supplied Pentium computer with Windows 95. The basic software package is \$1,000. Almost any soundcard will work with the software and an optional dual-overlap MPEG soundcard is available. Other options include a production plug-in with LazerBlade editor and MPEG compression.

The company also featured a new audio cassette-to-hard disk dubbing system, geared mainly for religious broadcasters air-

ing a large number of programs per week.

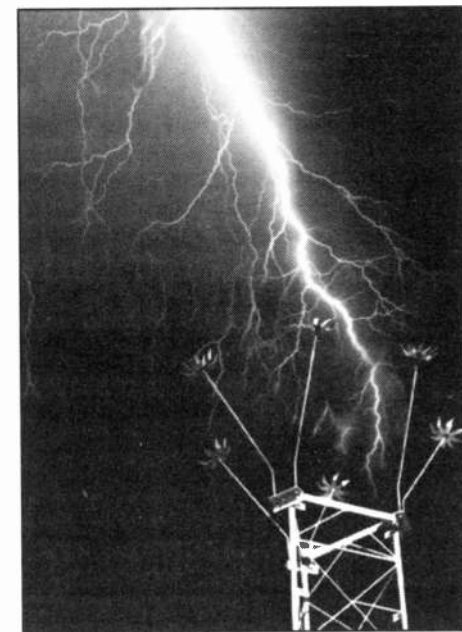
Contact Pete Charlton at (817) 625-9761.

Tower protection may not be as flashy as digital audio technology, but it is crucial in getting your signal on the air. **Electronics Research Inc. (ERI)** keeps antenna towers safe with products like the Lightning Spur dissipation system.

The economical Lightning Spur dissipates the lightning charge and diverts it away from protected equipment.

ERI also manufactures the Guy Guard, a galvanized steel attachment that clamps onto guy wires to eliminate ice damage. Sliding ice can damage guy wire grips, causing tower failure. The parabolic flare of the Guy Guard fractures and sheds sliding ice before it does any damage.

On the ground, ERI provides the K-ROD electrolytic grounding enhancement system and MAG-ROD anode ground system to minimize electrolytic corrosion of wires at underground anchor points. Dave Davies of ERI said all are



important in designing an effective dissipation system.

Contact Dave Davies at (812) 925-6000.

EAS was on the minds of visitors to **Broadcasters General Store**, which showed the new HU-961 EAS Encoder/Decoder from **HollyAnne Corp.**

The HU-961 is designed to be programmed with a PC, but does not require it for operations. Three audio inputs and an RS-232 port are standard on the unit. The decoder portion is capable of manual or automatic operation, and automated stations can manage all emergency functions. The HU-961 can be coupled to the RR-962 radio receiver module, providing reception of AM, FM and Weatherband monitoring.

HollyAnne also manufactures EAS equipment for TV and home alerting systems for cable television.

Also on display: the new 360 Systems Shortcut digital editor.

Contact HollyAnne Corp. at (888) 4EASINFO, and Broadcasters General Store at (352) 622-7700.

Dielectric Communications offers the DCPJ FM panel antenna, for omni or

directional radiation patterns, available in arrays of one-to-12 layers. These cross-dipole antennas are designed to provide circularly polarized transmission for single station operation, affordably, in circumstances where optimum circularity or controlled directional characteristics are critical. The antenna is designed for face mounting, three panels per layer, around a triangular tower.

The company also featured its DCCB and DCPC FM antennas, and FM combining systems.

More information is available at (207) 655-4555.

MediaTouch has a new screen for its audio systems called the OpLOG Digital Control Panel.

Multifader control supports external analog sliders, a digital controlled fader box, or on-screen electronic fading of audio or a "jukebox." Interfaces for jukeboxes from Pioneer, Sony and NSM are available. Remote modem control means you can take your station to a remote, with full control, without a studio operator.

The Move feature lets the user select an event, then use function buttons to move the event in the log easily.

Call MediaTouch for information about its digital systems for radio at (204) 786-3994.

Andrew Corp. showed HJ9HP-50 high power air dielectric HELIAX. It is a 5-inch coaxial cable that has the same average power handling capability as 6-1/8-inch rigid transmission line. This new cable is also smaller in diameter and adds less weight and windload than traditional rigid line.

Andrew also showcased its prefabricated shelter product line and displayed its Earth Station Antenna products.

Reach Andrew at (708) 349-3300.

Is it SMART to push the digital button?

SMARTS Broadcast System introduced the Digital Button Bank at WME, describing it as a unique electronic bank of buttons that work in tandem with a SMARTCASTER Digital Automation System. The bank provides a large computer touch screen with more than 900 definable buttons, which can be used to play or record specific cuts, trigger switching, connect to outside news text sources and other functions.

The bank runs with Windows 95. The company says the SMARTCASTER runs in a separate processor, so reliability is not compromised by the Windows environment.

Call for details at (800) 498-0487 or (712) 852-5022.

From **StarGuide Digital Networks** comes the SGII Digital Multimedia Satellite Receiver, a multichannel, multi-carrier unit offering simultaneous digital audio, video and data services on a single receiver platform.

Individual service providers can enjoy the benefits of satellite-based digital delivery without committing to large portions of the satellite spectrum. The receiver tunes instantly to added satellite carriers, creating what the company calls a flexible approach to expanding your network for new revenue opportunities. Receivers are addressable individually and in groups. Optional modules include MPEG Layer 2 audio, 16 relay expansion services, and data and video services.

Reach StarGuide at (619) 452-4920.

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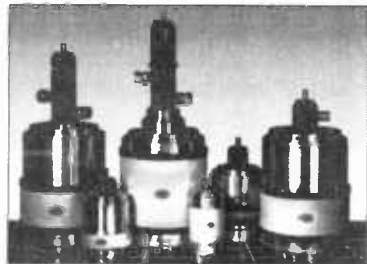
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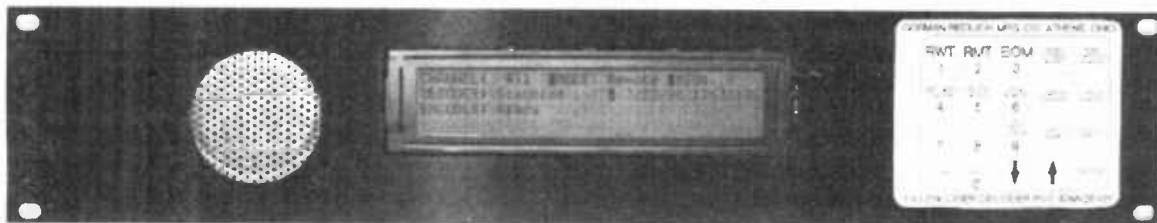
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New Tools at WME

► continued from page 20

BEXT now offers a digital encoder and decoder for use with its Composite LC STL system.

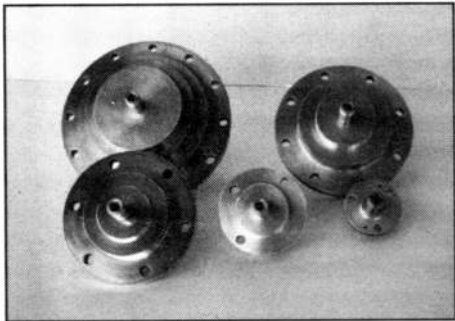
The DE/16 DD/16 comes in two or four channels. Bext's Michelle DeFazio said the system boasts received audio quality that is the same as that leaving the studio, regardless of the number of hops, with signal-to-noise and stereo separation both better than 85 dB, and harmonic distortion of less than 0.01 percent.

Up to four different high-quality 15 kHz audio channels, or two different stereo channels, plus one RDS channel and one 4800 bps data channel can be transmitted through a common analog radio link. Options include AES/EBU interface and RDS and data channel interfaces.

Reach BEXT at (619) 239-8462.

As part of a collaboration project, **Jampro RF Systems** and **Continental Electronics** Broadcast Supply Division released the new RCTR series of Quik Step reducers at the WME conference in Los Angeles. They are made by Jampro, distributed by Continental.

Jampro calls the RCTR-600 the only 6-1/8-inch EIA flanged to type N female transition in existence. It eliminates two



Quick Step Reducers

stages of transition between 6 1/8-inch and type N.

For information, call Continental at (800) 733-5011.

The AC-3 Telephone Autocoupler by **CircuitWerkes** is intended for listen lines, concert lines and remotes. Dry relay contacts provide an interface to external devices including all types of cart machines.

A simple active hybrid lets you send and receive telco audio. The unit answers on a number of rings that you determine. The basic unit carries a retail price tag of \$199. Options include rackmount and a user-programmable access code for an extra level of security.

For more information, call CircuitWerkes at (352) 335-6555.

What goes better with top quality equipment than specially designed furniture?

Wheatstone exhibited a new line of custom, "high-end, high-style" furniture. President Gary Snow said the design is based on a curved style of architecture, with hardwood rounded corners. He called it "extremely refined, the kind an architect would select if he or she were designing the interior of a radio station."

In addition to the U-shaped counter array and kidney-shaped interview

counter, Wheatstone provides storage space, wire raceways and hinged punch block panels, built into a combination of hardwoods and laminates.

Direct inquiries to Wheatstone Corp. at (315) 452-5000.

"Dad" was invited back to the radio show and put on a good performance.

DADPRO from **ENCO Systems** is an on-air, management and production system based around widely available non-proprietary computer hardware and industry-standard network architecture. The system interfaces with all professional broadcast equipment such as multitrack editors, consoles and switchers.

Two ancillary products were exhibited by ENCO: the **DADSAT** satellite-based store forward management system and **DADJR**. The two products work together to "localize" commercials, IDs and scheduling information for station downlink sites.

Contact Larry Lamoray at (810) 476-5711.

Belden Wire & Cable came to WME with super flexible AudioFLEX Snake Cables. These non-kink multi-pair cables use "French Braid Double Shield" design to achieve low microphonic and triboelectric noise. The double spiral/double serve bare copper shield also provides a lower DC loop resistance than single spiral shields, according to Belden.

The company also showed speaker cable (12-, 14-, 16- and 18-gauge) that allows the connection of speakers through drop ceilings or raised floors without conduit.

Contact Belden at (317) 983-5200.

A new digital workstation from **Arrakis** is a plug-in replacement for cart machines. Digilink 4 fits in the space normally occupied by cart decks in a studio, in some cases even compatible with the cables.

"At \$3,495 it is less expensive than the four cart machines it replaces," said Jon Young, vice president of sales. It occupies two rack units, and incorporates three players and one recorder. Digilink 4 uses MPEG Layer 2 compression to store a minimum of 12 hours of audio, expandable to many more, and the user can tie up to 48 studios together for powerful, flexible audio management. An optional jingle box puts a control surface in a desktop or in an Arrakis console.

"Broadcasters are concerned about how and when to replace cart machines. This is the year that the issue is coming to a head," Young said.

For more information from Arrakis, call (970) 224-2248.

RE America and **Pacific Bell** announced a recently signed contract that the company said signifies RE as a major player in the U.S. video transmission market.

The company reported brisk traffic of users within the TV and film industries. RE also reported noteworthy discussions with ABC about satellite distribution of programming.

The company demonstrated its MPEG

Layer II audio codecs and RDS/RBDS encoders.

Reach RE America at (216) 871-7617.

It's a busy year at **ATI**. Audio Technologies Inc. featured the Nanoamp series, a compact series of low-cost mixers and utility amplifiers with XLR connectors, low-noise circuitry and UL- and CE-approved remote power modules.

The new **MXS100** is a miniature, stereo three-channel mic/line mixer with



The MXS100 With Optional Bag

phantom power, for rackmount and belt-pack applications. Expand it with an **XPS100** to add four pannable mic inputs, or the **XPS200** to add two stereo line inputs.

The **L200**, a dual line/buffer amplifier, is an inexpensive, high-performance amplifier ideal as a gain block, attenuator, impedance converter and signal splitter. It can be configured as a stereo to mono summing amplifier with an internal jumper.

Contact ATI at (215) 443-0330.

GEPSCO International unveiled improvements to two versions of audio cable. It introduced **GEP-FLEX**, a highly flexible outer jacket compound for the 618 (22-gauge) and 724 (24-gauge) series multipair audio cable. **GEP-FLEX** has an increased temperature range with cold weather properties to minus 60 degrees centigrade. It provides increased flexibility, but still retains the UL listed-type CM rating required for permanent installation.

For more information, contact Gepco at (312) 733-9555.

New from **Crown Broadcast** is a highly efficient 2 kW amplifier. The company said the broadband unit is 75-80 percent efficient across the band with no tuning required. A responsive protection mode reduces power to a safe level when problems with output devices, over-temperature, high SWR or high current occur. The 500-watt power modules are hot swappable.

The unit is small enough to allow overnight shipping and easy installation. The new amp and power supply can be combined with one of Crown's exciters, or with a user's existing exciter.

Reach Crown Broadcast at (800) 294-8050.

Comrex showcased products revolving around ISDN. It debuted the **HotLine**, a product that delivers high-quality audio over ordinary dial-up telephone lines (POTS). It is ideal for live remotes, news reports or other audio feeds in locations where ISDN is not available.

Two HotLines are required for operation, one at each end of the line. The transmitted bandwidth corresponds to the data rate, producing 4.5 kHz to 10 kHz audio at data rates ranging from 12 kbps to 33.6 kbps.

The **Nexus**, an all-inclusive ISDN product

introduced in early 1996, provides up to 15 kHz bidirectional mono audio over a single "B" channel. Its operating protocol ensures very low coding delay. It employs the ITU G.722 international standard for coding and is compatible with most other G.722 codecs operating at 7.5 kHz.

For more information from Comrex, contact the company at (508) 263-1800.

Shipments are expected this fall of the new **Gentner GSC3000** site control. Gentner said the device will dramatically enhance the remote monitoring of transmitter sites.

Sales manager Gary Crowder said the GSC3000 uses a building block approach, allowing stations to start with a single unit of eight metering, status and command channels, expandable to 256 channels by adding additional building blocks.

The product offers PC and/or voice access to its site control product family via telephone lines or RF links.

Call Gentner at (801) 974-3624.

Register Data Systems unveiled Traffic 32, a Windows 95 or Windows NT-based traffic and billing system designed for single or multiple station operation. The company also introduced the **Replicator** long-form network program record and delay, capable of up to three simultaneous recordings.

RDS also demonstrated its **Phantom** digital audio automation and **Phantom Lite** digital automation.

For information, call (800) 521-5222.

Broadcast Electronics featured several new digital products at the World Media Expo.

The **Predator** is a digital transmitter/exciter with power levels up to 250 W. The Predator can be upgraded as technological advances dictate.

BE also featured the **PowerMizer** and the **Lynx**. The **PowerMizer** is a 1 kW, solid-state AM transmitter designed to fit in a 19-inch rack. The **Lynx** is a digital stereo generator that accepts an AES/EBU digital signal from the studio transmitter link and converts it to composite stereo FM for input to the FM exciter.

For more information from Broadcast Electronics, call (217) 224-9600.

International Datacasting Corp. demonstrated the new **SR253 DataNet PC Card** that installs in a standard PC ISA slot and uses the PC power supply and chassis. Data is available directly on the PC bus or via an optional serial data connector. The unit is compatible with the **DataNet Satellite Data Broadcast System**. It is addressable and under full network control. Aggregate data rate is 256 kbps. Data is output at RS-232 and RS-422 level, at rates of 1.2 to 192 kbps.

The firm also unveiled the **SR263 FlexData PC Card**, with 267 kbps aggregate data rate, and data output at RS-422 levels at rates of 64, 128, 192 and 256 kbps.

EchoCom Plus is a one-way data broadcast system, to distribute any type of PC file including text, audio, graphics and animation, individually configurable for up to 10,000 subscribers. It is Windows 95 and 3.1 compatible, and independent of broadcast channel type — satellite, LAN, FM-SCA, RDS, or cable.

Call (770) 446-9684 for more information.

RW Snoops the Internet at WME

by Alan Haber

LOS ANGELES After three days on the floor at the NAB Radio Show, I finally know what it's like to be famous. I mean, signing all those autographs, posing for pix with radio people. Why, it was downright ... uh, downright ... the other way around, I'm afraid.

I didn't sign too many autographs. Okay ... none. And no pix, either. There wasn't a whole lotta time for celebrity-furtherin' this trip, although I did spend some time yakkin' up a storm with some radio celebs.

I'm afraid I spent my entire time in Los Angeles hunting down the Internet-related goings-on at NAB (rhymes with "gab," as anyone who sat in on Dolly Parton's keynote address at the Radio Luncheon will attest). Yup, my feet were on the floor the whole time I was in L.A. (as opposed to in the air, where they generally are up here at the ever-busy, ever-foot-loose-and-fancy-free global *Haberspace* headquarters).

So, what did I find? Well, in addition to the four cyber-sessions on the NAB plate, and the day long Internet Bootcamp, there was just enough 'net stuff happen-



ing for a show this size (38 long, I believe). May I put in my plea here and now for about a zillion times more Internet coverage at the spring NAB get-together? Hey, I guess I just did!

In this corner

While a very cool thing was happening at the Radio and Television News Directors' Internet & On-Line News Lab — there was a live hookup with CNN "TalkBack Live" that went smashingly well — the number one Internet-related happening in Los Angeles (apart from the big dog-catching incident on Melrose) was Telos Systems' entry into the real-time audio sweepstakes.

Dubbed Audioactive, the system was demo'd at the Telos booth. And being the be-prepared kinda guy I am, *Haberspace* himself, I checked out Audioactive before I made my way to L.A. (you can check it out, too, at <http://www.audioactive.com>). I must say that I was impressed!

There were but a few music samples posted on the Audioactive site when I visited there before the show, but Telos Director of Marketing Neil Glassman told me at NAB that there would probably be some radio stations using the technology within the next month (that's about now, don't you know). There's also some live stuff up at <http://live.apple.com>

Apparently, Telos is aiming itself squarely at RealAudio, the current real-time audio big daddy (<http://www.realaudio.com>).

Hey, RW's own Frank Beacham said so in the very first issue of World Media Expo News: "Telos Systems is staging a David and Goliath marketing battle in an attempt to unseat Progressive Networks' well-established RealAudio as the system of choice for audio broadcasting over the Internet."

Well, I guess the battle's already begun. Check out Glassman's brave prediction:



"I would say a minimum of 10 percent of the stations in the United States are going to be live on the Internet using our stuff within a year."

"Competition is good," said Glassman. "We're not the only telephone hybrid maker. We're not the only codec maker. Our goal is not to take a hundred percent of RealAudio's business. It's a growth area. Competition makes us both stronger."

Speaking of competition, I stopped by Progressive Networks' booth to chat with Brett Goodwin, RealAudio product manager. How do the Progressive folks feel about the Telos entry into the real-time audio marketplace?

"I think with a number of these competitors coming in, it's a bit of a validation that this is a very real and growing and large and important part of the Internet," said Goodwin.

Zeroing in on Telos, Goodwin sounded

off thusly: "I think you need to look along a couple of dimensions. If we take a look at the number of players out there — how many people are using our stuff — we have 10 million players out there ... You look on the content side, we have over 150 radio stations, all the major record labels, media companies, 25,000 hours a week of audio content being produced. Really, it's the content that's very important. If you have great technology but nobody's using your stuff, it's not very compelling."

Goodwin continued: "In terms of our server delivery technology, we're on version 3.0. We understand the Internet very well ... We're down the learning curve in terms of how to deliver the best experience on the Internet." RealAudio is the standard in the industry, he said. And, "The good thing about being the standard is we've got a very high profile. It provides a target for other people to shoot at, but we're not going to stand still."

Hey, target shooting in cyberspace! Cool! Boy, I love a good cyber-fight! Up here in Haberspace, where the only dukes we usually see are the ones in Hazzard County, we're placing our bets that the battle for real-time audio champ is just beginning. One thing's for sher: you'd be well-advised to keep your eyes peeled for more contenders to the throne.

Meanwhile, duking it out be darned, *Haberspace* himself (that's me!) parted the overpowering sea of floor walkers and managed to check out a bevy of cyber-bounty among the exhibitors in the Radio/Audio Hall (all of whom reported solid traffic and lotsa interest from attendees).

First, I bumped into nice guy Richard Faverty at Priv@, who has come up with the radio show "Adventures on the Web," now airing on WMAQ(AM) in Chicago (Priv@ developed the station Web site;

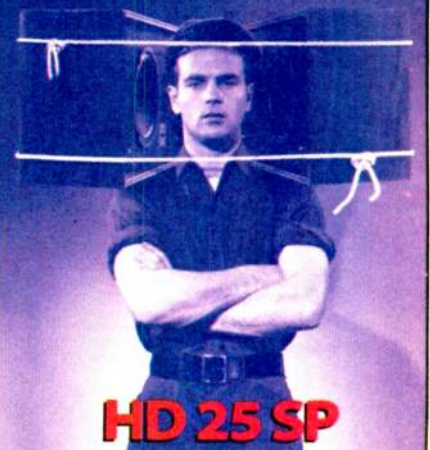
continued on page 24 ►



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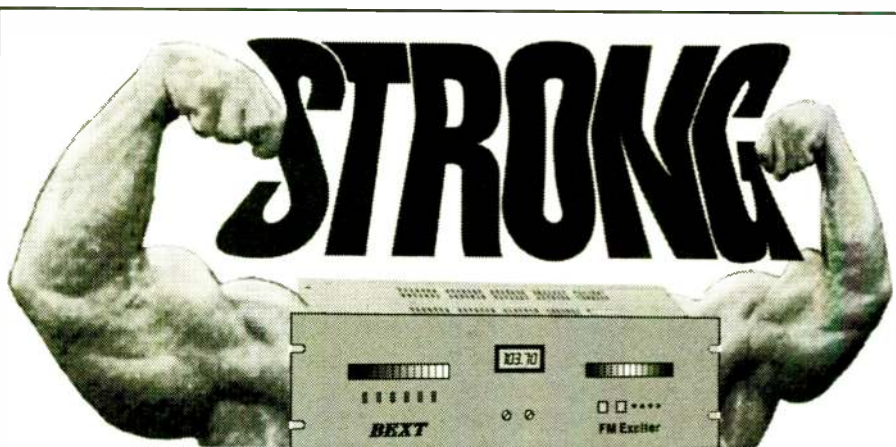
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World Radio History

Use These Radio Cyber Weapons

► continued from page 23

Faverty is Priv@'s Webmaster). The lighthearted "Adventures on the Web," said Faverty, is now being rolled out nationally on a barter basis.

The 90-second show, which runs three times on Saturday and Sunday and keys listeners in on hot sites on the Web, is a neat and nifty educational entity. The show scripts are posted each week on the Priv@ Web site at <http://priva.com> (links are provided to sites mentioned in each show). Good luck in your future adventures, Webmaster Faverty!

We're also sending good luck out to Paul Henry! Henry is the Free Range

Media associate project manager (hey, I've had Free Range's chicken! Mmmmmm-mmmmm!) At the NAB radio show, the company was introducing



its wing-and-feather-free Audio Palette, which, in Henry's words, is "a complete turnkey vertical solution for a radio station wishing to go on the Web."

Want a hot steaming Web site full of info? Free Range, a veteran Web design firm,

"does the whole enchilada," said Henry (they've served up the enchilada for such companies as the Christian Science Monitor and the original NFL site). The company is

committed to serving the radio market, he said. Check out Free Range at <http://www.freerange.com>

Could the NAB Radio Show possibly have had more Web-riffic stuff going on? Well, it did! Radio Data Group (RDG) President (and former NAB Vice President) Michael Rau sat down with me to run down what his company is doing, Internet-wise (for one thing,

RDG is hosting lots of station Web sites). Rau said that RDG, a radio and TV Web developer, has developed software tools "that help radio stations with Web sites integrate their Web site into station operations."

It's all as easy as pie, and I saw the proof: Rau demo'd the updating of a site page by simply typing new copy into a window (and you thought windows were only for getting rid of fish odors from last night's dinner!). Anyone at your station can do this (the updating part, not the fish odor part) — you don't necessarily have to go outside of your four walls and corral some high-priced Web person! RDG is on the Web ('natch!) at <http://www.rdg.com>

Also on the NAB show floor were the super-nice folks at ElectricVillage (<http://electricvillage.com>). The Village has two sites — RockVillage, for classic rock stations, and Earwig, for new rock stations — that provide a whole lot of cool content for radio station Web sites. The Santa Cruz, California-based company kicked off its Web presence on July 1, with Las Vegas station KEDG(FM).

My NAB cyber-agenda included a stop at the Radioinfo booth. The exhaustive company database of radio resources in a wide variety of categories — a year in the making — was

Could the NAB Radio Show possibly have had more Web-riffic stuff going on?

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00:14 03:01 02:07

SW00 :1

BROWN EYED GIRL
VAN MORRISON

Non-stop :40 Kickoff

Queue [Time: 14:20] Artis

09:12	* Non-stop Music Kickoff *	00
	<CHW LOOK AT ME	BRIAN
	M104 FALL IN LOVE	KENNY
	SW05 Yng Cntry/Why U Listen?	
09:21	*** :20 Stopset ***	00
	T333 MILLER LITE	
	T490 PIZZAHUT	
	T004 COKE/DIET	
	T317 MCDONALD'S RESTAURANT	
	Dodge.d1r	
	U701 Voice Track	
09:26	*** 70's Flashback ***	
	J716 KHHT - Legal ID #1	
	J714 KHHT - U/M	
	<73F THE LION SLEEPS TONIGHT	
	J960 KISS FM Jingle	
	<71H SOUL MAN	

Main Screen

70's music | Beats | NFF Beds | NFF Jingles | NFF Promos | NFF Legal ID's | People Effects
YC Jingles | YC Sweeps | YC Wind Sweeps | YC Lyrics | Shotgun Sweeps | Yng Cntry Beds | YC Promos
Edited Country | Unedited Country | Mac Jingles | Sound Effects | Music Beds | KHHT Jingle

Straight Tequila Night	Aren	Drive South	She's Not The Cheatin' Kind	Every Little Thing
Standing Outside The Fire	Ain't Goin' Down Till The Sun Comes Up	Callin' Baton Rouge	Much Too Young To Feel This Ramo Old	One Night A Day
He Thinks He'll Keep Her	Shut Up And Kiss Me	She Dreams	What A Crying Shame	Girls With Guitars
What They're Talkin' About	Pickup Man	Liza Jane	Old Enough To Know Better	Look At Me Now

Cart Express

Audition

Cart Number M104

Description FALL IN LOVE

Length 01:31:06 Intro: 00:15:00 Outro: 01:18:00

Hook Line

Start 00:30:70 End 00:34:56

00:00:00 00:22:76 00:45:52 01:08:28 01:31:06

Audition Window



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on display. The company's Tim Eatman told me that more than 8,000 products and services are listed. He also said that the listings, which can be updated, are free; classified or showcase ads are sold. The web address: <http://www.radioinfo.com>

Finally, without further ado, I also saw RadioLink, the Radio Advertising Bureau marketing resource center (<http://www.rab.com>) on display, and was reminded of how cool and useful an entity it truly is.

Neat-O Product at the Show

Over at Seattle-based Piranha Productions, I saw a couple of eye-popping thingees that stations can add to their sites. These Quicktime VR (for virtual reality) thingees are way cool. The company offers three nodes: a station control room, a virtual prize vault, and morphing clothing (a neat-o way to show Web surfers your fall line of station wear). Hey, the Piranha folks even showed me a demo of a human model turning a full 360 degrees, showing off a nifty piece o' clothing. Definitely cool, and definitely the Neat-O Product at The Show for the Haberspace crowd.

Here comes the hook

Well, they're telling me to hit the road and get back to surfin' the Web for more radio station cyber-goodies, and so I shall. Let me know how you fared at the NAB Radio Show Internet-wise, and keep me up to date on your station 'net adventures: simply e-mail me at zoogang@earthlink.net. Autographs to sign and pix to lens. Outta here!



Multiple Station Solutions? No Problem!

The GSC3000 Site Control System from Gentner takes remote control to the next level. It provides a system that meets the needs of broadcasters who require extensive control abilities. Plus, it accommodates the confines of your pocketbook.

Although still very popular, the VRC and others that model the VRC cannot be expanded beyond the system's basic capabilities.

However, operation with the GSC3000 can cover anything from a single site with minimal requirements



to a large number of sites with extensive requirements—it's whatever you need it to be today and tomorrow!

To accomplish this, Gentner uses a modular approach with the GSC3000. Much like the VRC product line, the GSC3000 provides micro processor-based "smart" units that establish the ability to operate transmitters from many locations. (The radio "walkaway" mode).

For more information on the GSC3000, contact Harris.

1-800-622-0022

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Features and Benefits

- Site expandability that is easy to manage
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Dalet users in the US include:

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Jingles, Talkers and Digital Audio

LOS ANGELES In addition to all the new hardware, the WME booth buffet was laden with plenty of music libraries, databases, sales tools and audio delivery services.

Multimedia company **SpotMagic** announced that Los Angeles station KYSR(FM) will become the first facility to begin experimental broadcasting of interactive visual content on a subcarrier signal, directly to its listeners' personal computers.

The SpotMagic technology is called **IDVMedia**, for Interactive Dynamic Virtual Media. Founder John Armstrong said the system also should find uses in the television, Internet, intranet and CD-ROM industries.

The company said the system also enables a broadcaster to put those visual elements out live on the PCradio screens of viewers, along with content targeted to specific individuals in the audience.

"We're present (at WME) because our technology has the capacity to transform the broadcast industry by allowing radio and television stations to compete in the interactive communications arena," Armstrong said. "With IDVMedia, broadcasters can use their own spectrum to distribute interactive programming," generating audience interest and advertising options.

Call (415) 346-0079 for more information.

The **Talk America Radio Network** has launched its second network.

"The growth of talk radio will continue," President John Crohan told **RW**. "It will begin to differentiate by age and other elements."

The second network is underway with programs including "Prescription for Health" with Terry Lemorond, and "Voice of America" with Robert Namer. Weekend shows include "First Opinion" with Kevin Miller and the "Shooting Bench" with Bill Walker.

But the "linchpin" of the second network, according to Crohan, is newly signed Chuck Harder, who began broadcasting on Talk America in late October. Crohan says at least 60 new affiliates came on board when Harder joined up, and he expected more to follow suit.

TALK AMERICA
Radio Network

Talk America bills itself as "the only national radio network offering live talk programming 24-hours-a-day, seven days a week." Established shows include "The Stan Major Show," Doug Stephan's "Good Day, USA" and "Inside Wall Street" with Michael Cardascia. Talk America broadcast from the show floor and from the Beverly Hills Hilton. Crohan said more than half of the network's 40 hosts came to the show to meet with clients.

Interested stations should call (617) 828-4546.

CBSI demonstrated how its Electronic Log Reconciliation (ELR) system can reconcile logs more easily and virtually error-free.

"It closes the loop between our DeltaFlex Traffic System and (a) station's automation

or digital audio system," said Wes Lockhard, vice president of development for Custom Business Systems Inc. ELR is an automatic system that handles inserted, deleted or missed commercials, and compares aired time to what is allowed by contract. ELR works with CBSI's Log Transfer.

The company also showed SalesLink, which can transfer a TAPSCAN Reachmaster sales proposal into a CBSI DeltaFlex traffic contract, and Dynamic Traffic, which helps the sales staff "sell inventory as if it were never sold out."

CBSI provides traffic, billing and accounting systems for single stations, consolidated operations and superduopolies.

Call for information at (800) 547-3930.

Riding the hottest dance trends is **Planet Energy**, which helps stations tap into the popularity of dance music including pop, house, techno, R&B, reggae, latin, rap and classic disco.

The dance music syndicator can provide a Gold Dance Library, compilation discs, custom bumpers and stingers, ad slicks and marketing campaigns, all targeted to the young adult crowd.

For a demo CD and details, call (888) 34DANCE.

Now with 5,000 stations in its digital distribution network, **DG Systems** announced the availability of its ADvantage Audio Communications Server (ACS) for exchanging music beds, voice tracks or other audio files via the DG Systems network. The company is calling this the DG Studio Exchange.

ACS supports a variety of standard transmission protocols and can send and receive using a single communications line. The service is intended to be offered for a regular monthly fee.

To accommodate last-minute turn-arounds needed by advertisers and stations, DG Systems is inaugurating "DG Priority" one-hour delivery service. This complements the company's same-day and next-day delivery services and guarantees one-hour delivery for the first spot in a multiple-spot send.

Contact Jeff Byrne at (415) 276-6600.

USA Radio Network unveiled two new long-form programs.

"Daybreak USA" is a five-hour morning drive show, a "fast-paced, fun-filled morning magazine program" designed to attract and hold what the company calls the huge, untapped market for listeners tired of screaming all-news headlines, offensive talk and insulting DJs.

The network also introduced "USA Radio Daily," a three-hour conservative talk show featuring Gary Nolan.

Call USA Network at (800) 829-8111.

From **V-Soft Communications** comes INTERDLC for Windows, with coverage mapping, duopoly studies, integrated directional pattern management, and census, tower and airport overlays.

The company also unveiled DUOPOLY, with all licensed contours for AM, FM

and TV, to allow interactive duopoly and LMA studies.

Obtain more information by calling (319) 266-8402.

The **American Stock Exchange** is introducing new broadcast services that will originate

The nice and the naughty shared the floor at WME.



vice and ready to introduce its new rackmount DCI system.

The new terminal fits into a standard rack space, and has an internal color monitor and a slide-away keyboard tray with integrated mouse. DCI will make the system available to subscriber stations in mid-November for a small premium.

from the AMEX trading floor. Customized productions will be available to assist local stations in covering financial news.

Services will include daily market reports, weekly recaps and features created in conjunction with local broadcasters to meet their

DCI also took advantage of the radio show to introduce version 3.0 of the Capella audio codec on a single PC card. The product allows playback of multiple MPEG Layer 2 files for crossfaded or overlapped audio, the capability to

continued on page 29 ►


CLASSICAL. 15:51

"IF YOU DON'T YET OWN ONE AND YOUR COMPETITION DOES, WORRY."

Review in *Line Up - The Journal of the Institute of Broadcast Sound*
February/March 1996

unity

the world's best-sounding FM & AM processors


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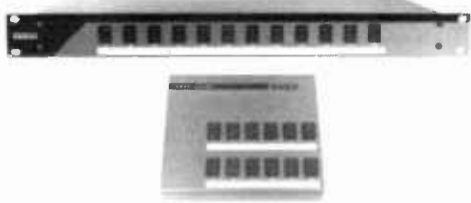
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Products & Services Showcase

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

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- 12 switches with LED monitoring in rack-mount or console models
- Use as a remote switch option with popular EAS systems, or for a variety of remote switching/control applications
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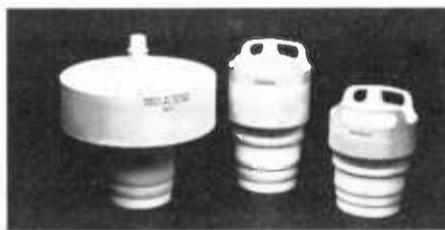
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READER SERVICE NO. 17

The CircuitWerkes TeleRadio Remote Controlled Listen Line



You can find out what's on the air in all of your markets without ever leaving your chair!

With the TeleRadio and a phone, you are ready to check up on your station *and* all of your competitors in real-time. You'll never have to get another station air-check plus you can punch around the dial as if you were right there. When the TeleRadio answers, its internal radio begins playing down the line to you. You control the tuner with the buttons on your phone. The TeleRadio is the next best thing to being there yourself.

The TeleRadio features include:
Ten random memory presets.
Remote scanning, tuning, band change & memory set.
Remote controlled external audio jack lets TeleRadio double as a standard coupler for IFB, etc.
List price is just \$689.

CircuitWerkes

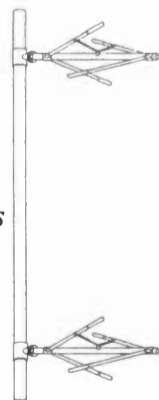
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READER SERVICE NO. 56



Your complete
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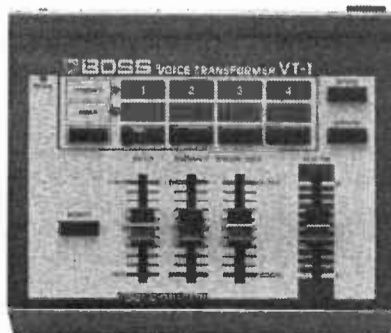
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READER SERVICE NO. 78

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Need a change of voice?

Roland introduces the BOSS VT-1 Voice Transformer, which does exactly what it says. The VT-1 gives you total control over everything you can do with your voice. Because you finally have independent control over pitch and formant. The VT-1 also offers high-quality digital stereo reverb because it's virtually essential for voice processing. Apart from being the ultimate DJ effects unit, the VT-1 can benefit any application related to voice.

PERFECT FOR ANY APPLICATIONS FEATURING VOICE.

Extremely useful for DJs, the VT-1 lets you configure User Patches with completely different voice characters and rapidly switch between them to take on different roles. The Robot button is perfect for use as a vocoder that doesn't need a keyboard, so you can use it for DJing techno and dance music programs. The VT-1 is an ideal tool for broadcasting applications as well as for video narrations.

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READER SERVICE NO. 100

WME Services

► continued from page 27

embed and transmit ancillary data in the MPEG audio stream, and simultaneous compression and decompression for users to record an audio feed while playing back stored source audio.

Applications for the Capella version 3.0 include audio distribution, audio on demand, radio automation and studio production. DCI sees this product as an important advance to operators of ISDN, Internet and satellite networks.

Contact Remy Kozak at (604) 293-6184.

Dataworld used World Media Expo to introduce DATAxpert, "to eliminate hours of research time, know your market and make informed decisions."

The company CD-ROM database modules put broad, useful information at the user's fingertips. The MediaXpert series focuses on the broadcast industry with four modules: FCCXpert,



ContactXpert, MapXpert and AudienceXpert.

Call Dataworld at (301) 652-8822.

G. Gordon Liddy, right, talks with show producer John Popp during WME.

MUSICAM EXPRESS, a joint venture between Infinity Broadcasting, Westwood One and StarGuide Digital, entered the audio delivery market this summer. At WME, the company announced that systems have been installed at 237 stations, and it hopes to place systems in 500 stations in the top 25 markets. The company is providing the equipment and installation at no cost to radio stations.

MUSICAM EXPRESS utilizes the WinDaX store-and-forward delivery system to send spots, music and programming point-to-point with only one digital conversion. It uses either a StarGuide-II satellite receiver or MUSICAM ISDN equipment. WinDax allows program directors to preview shows, spots and music releases, and sequence them with a mouse click for airplay. A JockBox provides a favorable method of playback for the DJ.

Officials said they "intend to be the 'One-Stop-Shop' for radio stations to send and receive spots, network programs and ultimately the newest music via high-quality, instantaneous digital delivery."

For information call (415) 249-4717 or (888) 366-4869.

AXCESS Global, the exclusive provider of wireless messaging services for Panasonic Radio Data System pagers, plans to expand its messaging network to include coast-to-coast coverage.

The current service area encompasses the western United States; the company is courting eligible Texas stations and

plans to organize the rest of the country into three or four service regions.

Matsushita markets Panasonic pagers and equipment; AXCESS Global provides an RDS network of FM subcarriers. The consumer benefits with easy activation, broader areas of service and expanded alphanumeric paging messages. AXCESS also offers other new on-line information services.

Contact Steve Hill at (212) 986-6649 to discuss subcarrier leasing. For info on Panasonic RDS pagers, call Jonas Tanenbaum at (201) 348-7919.

Communications Data Services unveiled RFCAD 2.0, which uses rasterized USGS topographic maps, provides instant coordinate and elevation retrieval, and allows importation and manipulation of multiple map layers. The firm also offers RFCAD 1.3; DEM data on CD-ROM; on-line remote access service; and population data on CD-ROM.

Call CDS at (800) 441-0034.

For both radio and TV stations is **Apple A Day with Dr. Jim Applegate** daily "Healthy-mercials," with segments on seasonal and local topics for 52 weeks. The company also offers **Down and Dirty Home and Garden Tips** for radio and television, featuring week-

ly seasonal segments for eight weeks per quarter.

Call (616) 549-9455.

Strata helps stations improve their sales performance. Sales Pro provides customized presentation pieces which include the station's logo. Features include point and click functionality, tools to show your station's top selling points, quick generation of audience comp break-outs, and qualitative and quantitative numbers within the same program to create a powerful sales proposal.

Reach Strata at (312) 222-1555.

NPR Satellite Services was on hand at WME. The organization specializes in helping create radio networks on satellite Galaxy IV via Single Channel Per Carrier transmission.

NPR Satellite Services also provides uplinking services and Comstream digital equipment.

Call (202) 414-2626 for more information.

BIA Companies unveiled Version 2.0 of MasterAccess Analyzer and MasterAccess Contacts, the updated version of its radio and television database software, featuring more than 500 fields for each station, more power and improved searching capabilities, more flexibility with fields that allow customization, and more analytical capability including built-in reports.

BIA offers several broadcast publications on topics including the state of the

industry and investing in radio and television; database software; consulting services, such as appraisals, business plans, customized financial models, and strategic consulting; and investment banking for broadcasting.

The contact number is (703) 818-2425.

Digital DJ demonstrated its high-speed data service that allows radio listeners to receive information in a mobile, wireless environment while listening to FM.



The Digital DJ Receiver is an AM/FM stereo radio and a data receiver with screen, able to receive alphanumeric and graphic messages. It is addressable so it can display real-time traffic reports on demand, local news and weather, customized sports, stock info, global positioning and other information. PCMCIA cards are also available for computers.

Radio stations can use DDJ to generate profits from their subcarriers. The system uses FM subcarrier to send 1,000 words per second. The basic technology was developed by the NHK Broadcast

Technology Center in Tokyo; backers include Sony, Oki and Sanyo.

For information, call (408) 232-0700.

Thompson Creative introduced Virtual Session for ISDN clients, allowing station managers and program directors to hear their jingles in CD quality without traveling to Dallas.

Thompson Creative also offers jingle ID packages. The firm auditioned a new CD demo, including new jingles for stations in Minneapolis, San Francisco and Chicago.

For information, call (800) RADIO-ID.

TM Century was on hand, telling clients about its Hit Discs, weekly CD updates with the latest releases for AC, Country, CHR, AOR, and Urban, and Gold Discs, full CD libraries for all major formats.

The company also offers custom and syndicated jingles for all formats, production libraries and a comedy service. Other offerings include Ultimate Digital Studio, a digital control room system for live-assist or full walkaway, and CoSTAR, a hard disk studio with full network and redundancy capabilities.

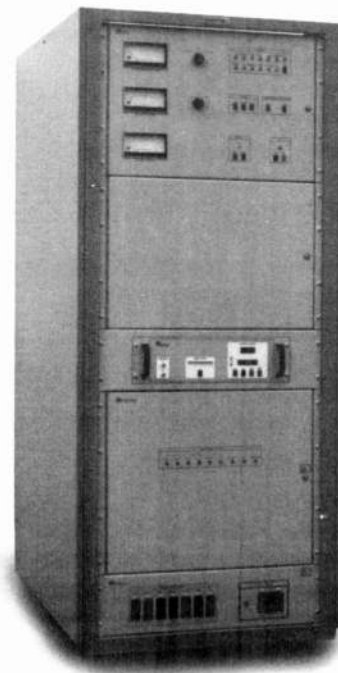
For information, contact the company at (214) 406-6815.

Americalist Broadcast Marketing introduced "Cash Mountain," a promotion package for expanding a station cume and increasing TSL by combining direct mail and other features, and its COREgister program for solidifying listener relationships.

continued on page 30 ►

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Circle (24) On Reader Service Card

WME Services

► continued from page 29

Listeners can win prizes by calling to register and speaking with the company's trained operators, who will develop a database of core listeners.

Call the company at (800) 321-0448.

No one knows the American consumer like the U.S. Census Bureau.

The bureau introduced Profile America, a weekly service to radio broadcasters highlighting the latest information about America, including people, economy, agriculture, even some trivia. Producers said the show turns "stark numbers" into features aimed at telling radio listeners about themselves.

Formerly known as the Census Radio Broadcast Service.

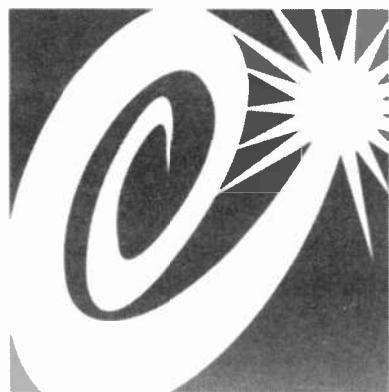
Call (301) 457-2814 for more information.

Network Music exhibited Presentation Audio CD-ROM, a five-disk audio library series designed for the computer-based presentation producer that will work with any Windows-based application. Also unveiled was SPIKE & GLIDE Production Elements.

The company offers production music libraries, sound effects and production elements.

Reach Network Music at (619) 451-6400.

EurekAlert! is an on-line science news service featuring research news from around the world. Launched in May as a non-profit project of the American Association for the Advancement of



EurekAlert!

Science (AAAS). It gives reporters timely access to news and expertise about science and related events, such as the recent announcement that life may have existed on Mars.

Learn more by going to <http://www.eurekalert.org>

Callout, from **On Air Worldwide Media**, is an "all-in-one" software package for doing in-house research on music, comedy, commercials and other material. It includes hard disk recording and graphical output and runs on Windows 95.

The company also showed PC-HotClock, a graphical software package to make the creation of analog clocks easy. The software is written for Windows 95 and can import and export the clocks to music scheduling systems. Build Hot Clocks in a 3D graphic through easy drag and drop.

For information, contact the company at (818) 887-6529.

Radio Netherlands, the Dutch International Service came to WME to announce the opening of a North American office in the New York City area. It will market its English language service.

Lee Martin, manager of client services, said that the regular stream of Radio Netherlands world news, features and radio documentaries will soon be available free of charge via Galaxy IV satellite.

Radio Netherlands also offers a transcription service and music CD services. Call (201) 533-6761 for details.

Who Did THAT MUSIC? Library is a collection of 20 CDs containing 400 themes, with an additional six-to-eight updates per year. "Mindbenders" is three CDs of sweepers and stringers for radio, TV and post production. The company also provides jingle packages.

Call Groove Addicts at (800) 400-6767.

SpaceCom Systems came to Los Angeles to tell potential clients about the benefits of its digital satellite transmission technologies for radio networks.

The company provides satellite services to customers including SW Networks, Jones Satellite Networks, ABC Radio Networks and Focus on the Family.

For information, call (800) 950-6690.

Marketron/Great Plains Invoicing and Accounts Receivable is customized software for broadcast, based on popular PC/Windows financial software. This new program was designed to support multistation operations including invoicing, non-spot revenue, copy script, complete credit and collection, and consolidated A/R reporting.

Also new: Marketron Headquarters Reporting collects detailed station performance info, including revenue vs. budget, average unit rate, station share vs. market, and station DSO reporting, consolidates it for the group and forwards it to headquarters for group analysis.

Call (415) 341-4004 for more information.

Johns Hopkins Medical Institutions told visitors about "Health Newsfeed," a free daily report on health and medicine produced by the respected Johns Hopkins School of Medicine.

Director Jack Sheehan told RW, "We look all over the world at what's happening in medicine, find a leading expert on a subject, and get them to comment. We aim primarily at stations that value health news as part of their information content. It's very popular with the audience."

"We're plugging into a niche for health news, at a time that stations are

looking for content that they don't have to pay for. These are high quality health stories, professionally produced, objectively written, that they can plug into any format."

Call (800) 633-7234 for more information.

One-On-One Sports Radio Network aired two of its weekday sports talk shows live from the NAB convention at WME. "The John Renshaw Show" and "The Kevin Wall Show" broadcast from the west lobby of the convention center.

The network says it is the most listened to sports talk radio network, with more



Chris Brennan, Chairman,
One-on-One Sports

than 8.6 million listeners a week and more than 365 affiliates, including 45 in the top 50 markets. The network began in 1993.

For information, call (847) 509-1661.

Killer Tracks showed its BMG Production Music Library, which it nicknames the "Scoring Library." It includes music from Europe's top film composers. A base of 35 CDs will be added to annually. The library is available with the TuneBuilder self-editing system.

Also introduced: Chronic Trax, a library of underground music; Killer Tracks Production Music, a contemporary production music library featuring acoustic and electronic instrumentation; and Killer Classics, a 21-CD classic and opera collection.

Call (800) 4KILLER.

Tapscan introduced Tapconnect, a private and secure environment to send e-mail, data and orders. It can be configured as a total intercompany e-mail solution that can run on your existing Novell or Windows NT network. It lets you communicate with other broadcasters via Tapconnect, and can connect to the Internet. It also lets you receive system updates and information from Tapscan electronically.

The company offers software solutions for research, media buying, marketing and presentation use in radio, television, agency and cable companies, compatible with the data supplier of your choice.

Call Tapscan at (205) 987-7456.

The Church of Jesus Christ of Latter Day Saints introduced "Family Times," a program designed for the entire family, with solutions to the challenges facing them. "Family Times" is available on a barter basis.

"Times and Seasons/Family Edition" is a radio program with commentary on family-related topics and significant local issues, with programs available in both English

continued on next page ►

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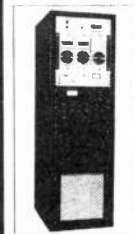
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Call (801) 240-4397.

Dow Jones & Co. introduced "Work & Family," a two hour Saturday morning call-in program for radio, hosted by Wall Street Journal columnist Sue Shellenbarger. The program focuses on critical issues facing working people.

Dow Jones also supplies the "Wall Street Journal Report" (TV and radio); "Wall Street Journal Overnight News"; "Dow Jones Report"; "Dow Radio"; "The Enterprising Manager"; and "Barron's on Investment."

For program information, call (800) 828-6397.

FirstCom Music announced Production Edge, with "edgier rock, torquier promos, hotter country. If other libraries are a skateboard, the Edge is a nitro-class dragster."

The music library provider also unveiled Total Access-The Music Library, with more than 1,000 tracks "loaded with eyeball dilating, ear-magnet production music." Other offerings include new alternative music and production elements.

Call (800) 858-8880 for information.

Metro Networks was on hand in both exhibit halls, promoting Metro Networks News. This service delivers local, regional, national and international



news, sports, weather, traffic and information for radio stations delivered by a local anchor.

The company is well known for its traffic services. Metro Traffic Control produces traffic reporting services for radio and TV stations; Road Watch America produces overnight traffic reporting services targeting truckers.

Learn more by calling (301) 718-4554.

Earth & Space Communications introduced "Sports Health Today," a two-and-a-half minute radio feature hosted by former NBA center Mark Eaton. Topics include a range of fitness and sports medicine subjects, "often strange but always entertaining."

Call (800) 943-5200 for more information.

Broadcast Programming told clients about its range of music programming services.

Dave Newton, vice president of marketing, told *RW* the company "offers our clients consulting, formats and libraries in all categories of music. (WME) is our main show, and it's always been a good show for us."

The company is digitally based, shipping its audio on CD and hard disks.

"But more and more, we're becoming an expertise company. We have six full-time professionals who oversee our formats and consult to clients" with advice, playlists, liners and other elements, he said.

To learn more, call (206) 728-2741.

How Many Managers Are Enough?

by Patrick Martin

LOS ANGELES As duopolies and superduopolies become an even bigger part of radio, some station managers are finding themselves out of a job.

But is it best for one manager to oversee several stations in today's hot climate of consolidation? That topic was discussed by several key industry executives during the NAB Radio Show in Los Angeles.

Bill Stakelin, executive vice president and CEO of Regent Communications

(which was purchased by Jacor Communications during the convention) moderated the session.

"How you struggle with management is a work in progress," Stakelin said, in a post-session interview. He added that regardless of company size, there is no right way or wrong way of putting together a management policy.

It is a matter of finding out what works best for each company. Stakelin, however, is in favor of the "team captain" concept, with an individual president in each market who

can make the final decision.

Panelist Karen Carroll, senior vice president/general manager, EZ Communications (which has been purchased by American Radio Systems) told the attendees that one manager can successfully oversee several stations.

"Our first change when we became a duopoly was to cut expenses. We knew that the major cuts would be done through consolidation. It worked extremely well," she said. "As we continued to expand, we created new systems.

continued on page 32 ►

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Circle (27) On Reader Service Card

Too Many or Too Few?

► continued from page 31

All of our department heads had full plates. One of the major changes was that we moved from single station to duopoly, to superduopoly."

She stressed that the company controller, who works directly with her in St. Louis, is a key to success.

"He was the CFO of a group," she said, "and had experience running multistations. He monitors all expenses and budgets, and developed a team that handles human resource needs, payables, collections, and billings."

Adding to the mix is a series of computer programs that help the stations operate more

efficiently — allowing information about each station to be accessed individually.

"We've been fortunate in this system in creating specific leaders with our director of new business, who works across all stations in developing new dollars — one of the key areas for growth in our superduopoly process," she said.

Carroll also presented an extensive list of "Do's" and "Don'ts" for the successful operation of a superduopoly. Among her suggestions on the "Do" list were: Establish and define key positions; have a clear vision for the market with mission statements for each property and the market; view consolidation as opportunity.

Among the recommendations on the "Don't" list were: Don't assume the future happens — make it happen; don't assume the staff or the market understands each person's role in the new company; and don't assume only one sales staff will be able to position each property — only the best will succeed.

Another panelist, John Gehron, an American Radio Systems executive, who joined the company as co-COO in 1994, said: "We're going through some interesting times in our business.

"I think when you look at management structure, you need to look at core philosophies of how you think radio stations are businesses. (We need to think) how these businesses should operate.

"At American Radio Systems, we don't think that general managers are an endangered species. We like general managers

and think (they) are important to a radio station in providing leadership. If you have the right general manager, the core values are set for the staff — (the manager) sets the direction for the station and becomes the spiritual leader for the staff and the station."

According to Gehron, however, ARS has a variety of management scenarios, based on the needs of each individual market. In some cases, the general managers report to the corporate office; in other situations, a point general manager handles the common elements within a market and works with each station manager.

"We have situations where we set up a market general manager and have a manager run some of the other stations," he said. "Each of these has been set up to address a specific problem that we have had in each market — depending on the quality of people and the challenges we have in each market."

Best job, ever

The final speaker at the session was Steve Dinetz, president and CEO of Chancellor Broadcasting, who argued that the best job he ever had was as a general manager.

"Great general managers are problem solvers and producers," he said. "We don't have enough problem solvers in our business. If there are (managers) who can consolidate up to eight radio stations in a market, and if there are eight problem solvers with a high level of integrity who want to work hard every day, we would be fools as owners to not keep those people in our employ.

"The best return on any investment in the broadcasting business is a great leader and a great general manager," he said.

Gehron was quick to point out that the number of stations that a company owns does not guarantee success. The success, he said, comes from the team each general manager puts together.

"At Chancellor, we have one dynamic that we will not compromise," Gehron said. "In some markets we have three general managers, two general managers, one general manager. But in all cases, we always have one director of sales in a market.

"Our ability to communicate amongst ourselves is tantamount to our success. That's the biggest thing that we have not (previously) had in the establishment of radio.

"If you have three radio stations in a market and have 30 sales people on the streets, your ability to bring back information (comes from) your people. That is invaluable information. General managers and directors of sales who can move information are very important."

Dinetz went on to say that if radio stations don't have strong leaders the industry will not get above radio's 7 percent share of the advertising pie. Showing his enthusiasm for strong managers, Dinetz concluded, "I encourage you — hire 50 of them. If you can find 50 people that can get you to 10 percent of the advertising pie in your market, hire them. That is the most important thing we can do as an industry."

All of the panelists agreed that the decision to operate multiple stations with one, or several, managers is a decision that must be made on a case by case basis.

"There isn't a final blueprint in our business," said Gehron. "We have to continue to adjust as we go along and not find ourselves locked into a pattern that limits our ability to do business in the future."

□ □ □

Patrick Martin is a free-lance writer and former radio on-air personality based in Medford, Ore.



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EAS News & Views

LATE EDITION

HARRIS ANNOUNCES. . .

BUYBACK PLAN

Due to unprecedented demand, Harris Corporation Broadcast Division has announced a plan to solve buyer's remorse.

Those of you who purchased another brand the first time, may now trade in that unwanted EAS system toward the system you wanted all along, ENDEC by Sage Alerting Systems.

If you are in possession of a free and clear certified EAS (not EBS) system in mostly working condition, we will offer a trade-in of \$400 toward a Sage ENDEC system listed at \$2395.

Since everything you need is probably already in there, Harris and Sage make ENDEC an easy choice.

Stations not yet in the queue are still able to obtain delivery before the deadline of this January 1. BUT!, orders or requests for trade-ins should be made before November 20.

If you plan to program the unit (FIPS codes, etc.) you'll want a few days of programming time and "dry running". If you want your ENDEC programmed by us, let us know and give us at least 10 days lead time to accomplish programming for you.

Sage ENDEC has been called "the Elegant Solution." It is the one you want and need to meet January 1 compliance. Let us buy back any mistakes and supply you with the EAS unit that passes the tests of performance, ease of use, and value. ENDEC from Sage Alerting and Harris.



"Since everything you need is probably already in there, Harris and Sage make the ENDEC choice an easy choice."

For more information about making the best EAS decision for your station, contact the Harris Broadcast Sales Center today:

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11th Hour:

Don't let the EAS deadline catch you off guard.

"Ripken's rounding third after belting a long fly ball deep into right field! Here's the throw to the plate — it's going to be a close one! The crowd's on its feet, and the call is...."

"THIS IS A TEST, for the next 60 seconds, this station will conduct a test of the Emergency Broadcast System. This is only a test."

The intrusive two-tone alert signal punctuating Emergency Broadcast System (EBS) announcements has ruined many a ball game over the years. The good news for viewers is that this tired old system has been replaced by a souped-up enhancement that will eventually make the two-tone signal a thing of the past. The bad news for the operators is that, compliance is mandatory and must be on line at all radio stations by this January 1.

EBS is a product of America's "duck and cover" days, designed to create a pipeline over which the president could speak to the public in times of national emergency. By the start of the 90s however, complaints from every corner claimed that the two-tone test signals were a tune-out.

This new EAS system streamlines the process and creates an atmosphere that removes the "cry wolf" syndrome from listener's point of view and significantly reduces the tune-out factor for broadcasters.

The EASy Choice

by
GEORGE L. SOSSON
 CEO/PRESIDENT
 RADIO EQUITY PARTNERS

Running a group of 19 high performance radio stations is a daily challenge. Deciphering the FCC EAS rules and selecting the appropriate equipment to fulfill the FCC requirements is an even bigger challenge. One of the advantages of running a broadcast group like ours is the many talented resources we have at the station level. I asked our station engineering staff to investigate what Emergency Alert System equipment was available and how we could best satisfy the need of Radio Equity Partners while satisfying the FCC requirements. At present, there are only two FCC type certified Emergency Alert System encoders/decoders, the TFT 911 and the Sage ENDEC. We carefully studied them both. My station engineers are a tough bunch to satisfy, and they spent considerable time trying to understand the differences between the available equipment. When it was all over, I concluded that the Sage EAS ENDEC system was the right choice for us.

What were the important requirements of EAS equipment for REP stations? First and foremost, the equipment had to be easy to operate. We have a wide diversity of board operators ranging from superstars doing our shows to part-timers doing the weekend and night shifts. We had to be convinced that every one of them easily could meet the FCC requirements of sending and receiving weekly and monthly tests and relaying emergency messages from the National Weather Service, local civil authorities or even a national alert from the President of the United States. The Sage 4-button ATM design meets our needs. The competitive unit with more than 47 buttons was just too confusing.

Second, the equipment needed to interface easily with our many and

varied studio and transmitter facilities. Sage EAS ENDEC comes standard with six analog inputs and six digital input/outputs, and automatic program line switching for unattended operation which made it extremely versatile for our stations that are live, computer assisted or totally automated. We wanted to be able to operate in manual EAS mode during most dayparts and automatically switch to unattended operation at night when some of our stations are programmed by satellite or computer. The Sage ENDEC made it easy. The competitive unit required us to buy numerous options to achieve this level of performance.



Sage ENDEC

Third, we had to figure out how to deal with our duopolies and triopolies, understanding that the FCC allows co-owned and co-located stations to use the same EAS equipment. We found that Sage ENDEC, when equipped with its options, remote controls and multiple station relay panel, gave us the ability to operate up to three radio stations from a single ENDEC. In some cases, we decided this was a good idea, and, in other cases, we decided to buy and ENDEC for each station.

Fourth, we wanted to be sure that the product would be serviced and maintained properly in the future. We do not expect to be buying new EAS equipment for another 20+ years. Sage has an arrangement with Harris Broadcast Division to market service and stock the Sage ENDEC family of equipment. We have worked closely with Harris for many years, and we know

them to be reliable, credible and responsible folks. This helped our decision as well.

Finally, we need to be sure that we could buy everything we needed for a complete EAS installation from one source. The new EAS rules require that stations monitor two or more sources. We needed additional receivers for monitoring other AM or FM stations or, in some of our markets, VHF and UHF including the National Weather Service, public safety agencies, state emergency management organizations, etc. The Sage multiband modular receiver was just the right unit for our stations. Its modules were well thought out, as was the entire Sage ENDEC design.

It is not easy for non-technical folks like myself to make decisions about something as technical and important as the Emergency Alert System. With the help of my engineers, we were able to home in on the important issues and we decided to standardize with the Sage EAS system. We are expecting delivery shortly and plan to be fully installed and operational way ahead of January 1, 1997, the date the FCC has mandated EAS be ready to roll.

For more information contact Chuck Maines or Gary Hardwick at the Harris Broadcast Sales Center:

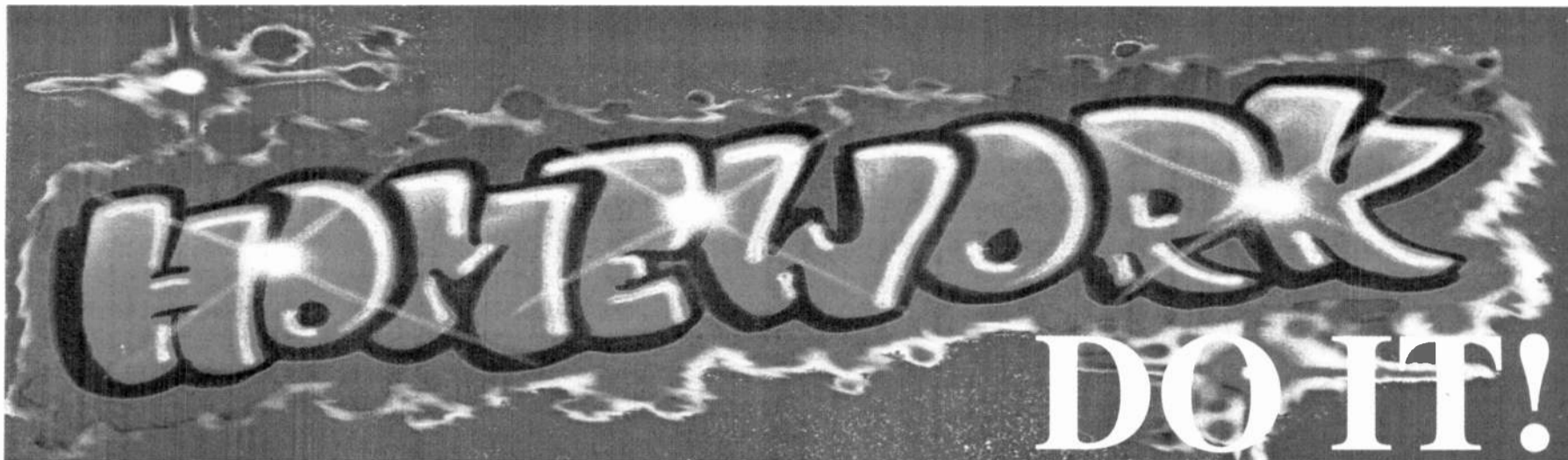
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Give EAS Providers A Pop Quiz.

(Following questions provided by Harris Corporation for your EAS protection)

When you talk to a potential EAS provider, ANY EAS provider, obtain satisfactory answers to these pertinent questions before you buy. . .

- Will the EAS product transmit and receive simultaneously? (so that you don't miss any desired message)
- Will the EAS product protect you and your listeners by NOT bumping one message if another starts coming in? (If a tornado WARNING is in the process of coming in, could it be bumped and lost due to a thunderstorm WATCH that may start coming in on top of the tornado warning in progress??)
- Right out of the box, do you have to buy anything else or hook the basic EAS product up to more than your station receivers to make an automated station fully compliant?
- Does the EAS product come standard with less than 6 monitor inputs? 6 bi-directional serial comports? 3 programmable contact closures?
- Does the EAS product come standard with 2 audio inputs for pre-record capability?
- Is the EAS product fully supported by a reputable, reliable, responsible and world-recognized broadcast leader?
- If I require more than two monitoring inputs, will it be necessary to purchase them extra?
- Can I add codes to the encoder and decoder by myself or will that require factory intervention?
- Can I store my own radio in the unit to preannounce the alert?

For the EAS equipment that makes straight A's across-the-board when you put it to the test, call Harris to inquire about Sage ENDEC.

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HARRIS

EAS Q & A

The 1996 Radio Show in Los Angeles gave Harris and Sage an excellent opportunity to show the EAS ENDEC system to many broadcast executives including group chief engineers, group general managers, and program directors. The response to the Sage ENDEC EAS system was extremely gratifying and we believe that they have clearly addressed the concerns of radio and television broadcasters by designing a unit that is easy to operate, flexible in its interface to existing equipment and a unit which will operate reliably for long periods of time. Here are a number of questions that were asked repeatedly by customers like yourself.

Q Do I need a computer or remote control connected to the ENDEC to make it work?

A The answer to both is "no." The ENDEC can easily be operated from the front panel using the friendly menu-driven software and the 4 Soft-Keys.

The six standard serial ports are definable for all types of equipment from computers to interactive remote controls to interfacing with video character generators and LED signs. It is also possible to use one of these ports with a personal computer to modify and/or save your parameters.

Q Do you have a solution for television broadcasters? Do you support the Chyron CODI™?

A The answer to both is "YES". The Sage ENDEC may be interfaced directly to the Video Data Systems VCG840EAS or to the Chyron CODI™, with or without an additional MasterCG software package.

Q We have unattended transmitter sites all over our state public television network. How do we run the monthly tests that come at night if our transmitters are all turned off?

A The FCC rules say that in alternate months, monthly tests will be run either at 6:00 AM to local sunset or local sunset to 6:00 AM. If a station is signed off the air for any reason during the time of a monthly test, they must rebroadcast it soon after signing on. The ENDEC can be programmed to sense if the

transmitter is in an on or off condition. If the transmitter is off, the ENDEC will hold the message until a predetermined time after sign on and then automatically send the monthly test.

Q Your competitors seem to offer a lot of options for their units. They start off with a basic low priced unit, but by the time you add all the options required for compliance, it costs more than the Sage. What options, if any, are available or required for the Sage ENDEC?

A Our design philosophy was to make a complete unit that would serve every radio and television station in virtually every situation. The Sage ENDEC comes with six monitoring inputs, six serial data ports, two minutes of voice storage, printer, and a stereo program-interrupt built in. There are a few accessories available to complement the ENDEC, but none are necessary for basic operation. For a single FM station, the ENDEC is EAS compliant right out of the box. Just connect two optional receivers for your monitoring requirement, do the 'Quick Start' programming for your ENDEC, connect your program audio and you are EAS compliant.

Q We have more than one broadcast station in our facility. How can we relay and originate alerts for each of them separately with only one ENDEC?

A The ENDEC operating software includes the ability to independently control multiple co-located stations from one ENDEC. The Sage ENDEC has one stereo program interrupt built in for control of your first station. A Sage Multi-Station Relay Panel provides two additional stereo program interrupts and the ENDEC supports up to two MSRPs.

On a case by case basis, you program each station with its individual call sign and responsibilities and the mode in which each station will operate. . . Automatic, Manual, Live-Assist, . . . Basic Compliance or Enhanced Alerting for NWS and other Local Events. With the ENDEC, you are in complete control for each station in your group. There are no compromises, even if one of your stations serves a different operational area, the ENDEC can be programmed to provide your EAS alerts the way YOU want them handled. The addition of the Sage RC-1 Remote Control gives you full manual control of the ENDEC from anywhere in your facility and provides some 'One-Button' macros to expedite any local origination. Multiple station operation is not a problem for the Sage ENDEC.

Q I have heard that the ENDEC is difficult to configure.

A The Sage ENDEC uses an automated teller machine (atm) style of menu driven software. This menu and the four front panel buttons make programming the ENDEC a snap. In fact, the ENDEC has many basic features preprogrammed into it. For your station, you need only enter your call sign, local area (state and county), and tell the ENDEC which time zone you are in.

The ENDEC comes preprogrammed with enough incoming filters and outgoing templates to handle the necessary alerts, guaranteeing full FCC EAS compliance. One ENDEC can work for a radio or television station or a cable system. With all the features that are built into each ENDEC, there are many parameters that you may choose from to custom tailor the ENDEC to fulfill your implementation of EAS.

Q Is there a quick, easy way to get out of an alert which the station originated or an alert originated by another station? I am worried that if the stations upstream do not send the end of message (EOM) signal we could get hung up.

A The ENDEC features an override/abort mode by simply pushing the two right-hand buttons on the front panel simultaneously at any point. This will take you out of any menu and bring you back to the top of the menu stack or abort any transmission in progress. When this feature is used to abort a transmission, the end of message is automatically sent by the ENDEC so as to not hang up stations who are monitoring your station.

On the remote control, the bottom right hand corner button is boldly marked abort and has the same functions allowing an operator to return to normal operation with a single button keystroke.

For more answers to your questions on EAS or the Sage ENDEC, call Harris.

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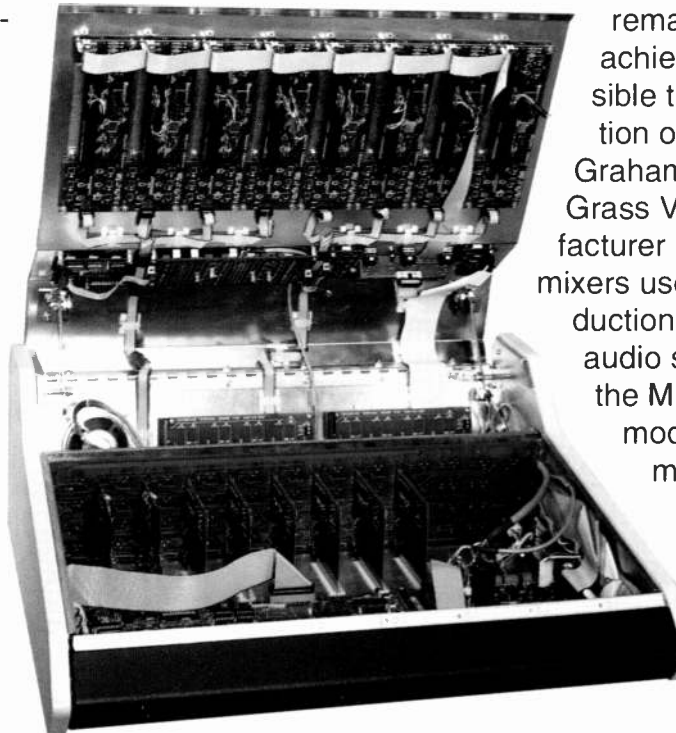
Broadcast Studio Equipment by Fidelipac

DYNAMAX MX/D Digital Audio Console

TRUE ON AIR DESIGN

The new Dynamax MX/D digital console is as familiar and user friendly as its popular cousin, the Dynamax MX Series. Both consoles derive from the same well-built rugged family and share a common mission: ease of installation, straightforward operation, functionality, reliability and solid economic value.

The MX/D enables broadcasters to establish a fully integrated digital signal path at a small cost premium to conventional means. The modest price as well as the



remarkable technical achievement are made possible through the collaboration of Fidelipac Corp. with Graham-Patten Systems, the Grass Valley, California manufacturer of award-winning audio mixers used in video post production. Mixing, switching and audio signal processing within the MX/D are performed by a modified version of the main processor section from Graham-Patten Systems' D/ESAM 200, named "Best of Show" at the 1996 NAB.

MX/D FEATURE SUMMARY

- 8 Channel Surface Offering:
- Selection of analog and digital input modules
- A&B input select switches with LED indicator
- LED lighted buss assignment switches for PGM, AUD, MONO and CUE
- Cue activated via fader detent and momentary cue switch
- Full LED metering for all buss lines
- Count up event timer standard
- VCA monitor, cue and phone level control
- Full monitoring/cueing facilities
- Built-in cue amp with speaker and amplified stereo 8-ohm headphone output
- Independent A/B remote start and stop
- Remote module on/off control
- Mic pre-amp standard with every analog input module
- Lexan overlay on all control surfaces
- Solid steel construction for excellent RF immunity
- Remote power supply

INPUTS: (16 Total)

A/D input modules with 18 bit precision XLR connection
Digital input modules with SRC AES/EBU connection
Accepts SPDIF format
Active balanced analog input levels with independent A/B level control

OUTPUTS: (3 digital plus 3 analog)

Digital AES/EBU output for PGM, AUD and Mono
Analog active balanced output for PGM, AUD and Mono
Active balanced monitor outputs

PHYSICAL CHARACTERISTICS

Height: 9.25" (23.5cm)
Depth: 23" (58cm)
Width: 25.75" (65cm)
Weight: 52 lbs. (23.6kg) excl. power supply

SIGNAL PATH DESCRIPTION

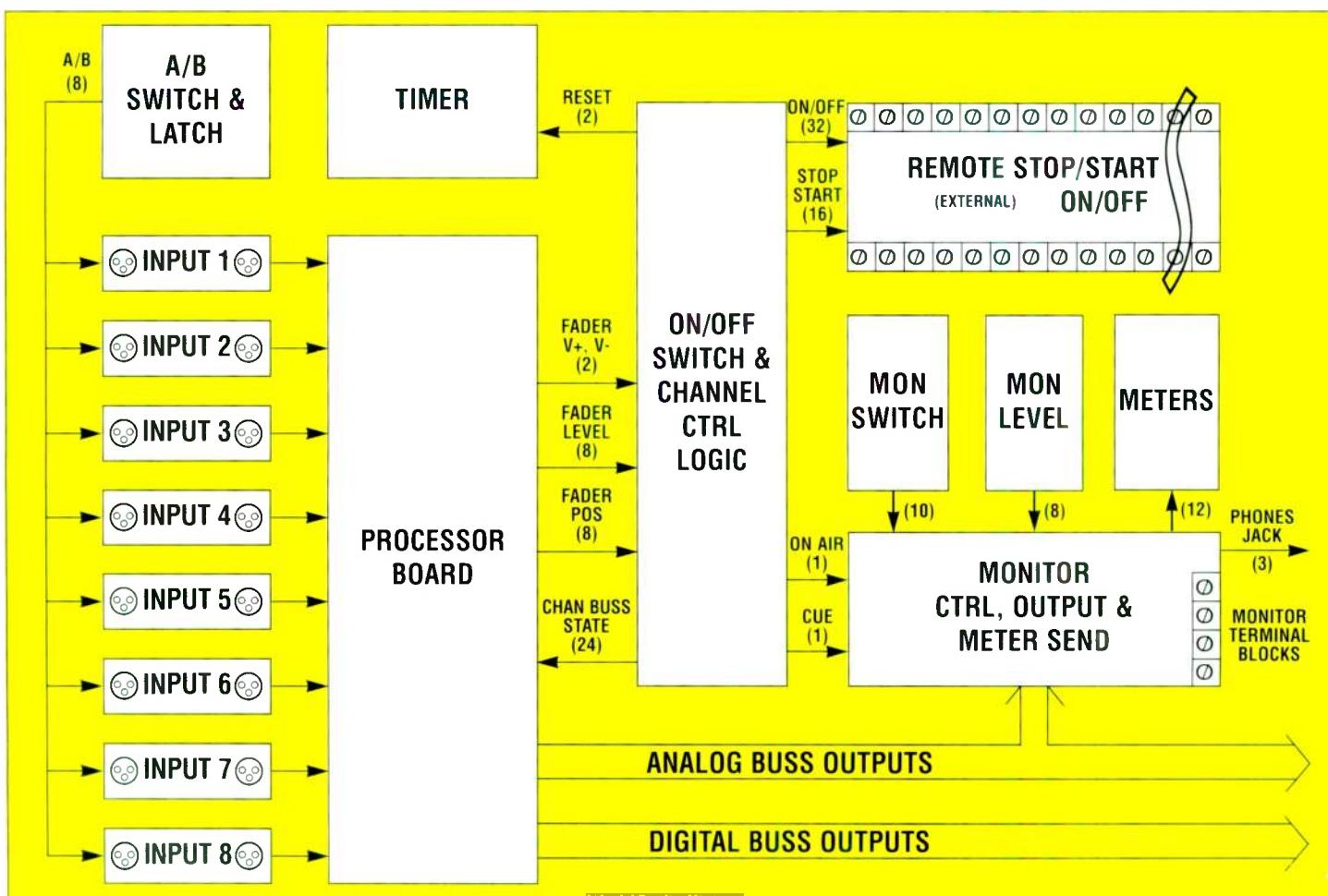
The MX/D On-Air console is equipped with up to eight interchangeable input board modules, each providing two channels backed by separate XLR connectors. Input boards are analog or digital and may be selected in any combination by a broadcaster at the time of purchase. Analog modules digitize incoming audio and convert that signal to the MX/D mixer's internal data format. Digital modules convert all incoming digital signals to a common sampling rate and synchronize data with the internal matrix.

With all signals homogenized in a common internal format, the GPS main processor board uses the latest in DSP and microprocessor technology to perform mixing, switching and audio signal processing in a single 24 bit data stream.

Three digital channels plus three analog channels are available for the MX/D console's output. Both digital and analog outputs support program, audition and mono. Digital output is provided at a 48 kHz sampling rate although upon request this rate can be preset to 32 kHz by the factory prior to delivery; 44.1 kHz also is available as an option.

Future flexibility is permitted by the interchangeable design of the input modules which can be augmented or reconfigured with relative ease by a station engineer. The new Dynamax MX/D digital console is designed to ensure maximum long term performance and value for many years during times of rapidly changing technology.

SYSTEM BLOCK DIAGRAM



MX/D Technical Specifications

AUDIO OUTPUTS

Program	Stereo Analog and Digital
Audition	Stereo Analog and Digital
Mono	1 Analog, 1 Digital ¹
Cue	1 Analog, 1 Digital ²

DIGITAL OUTPUTS

(AES Digital Format, 20/24 bit)

Number	1 Output: Program L & R 1 Output: Audition L & R 1 Output: Mono & Cue
--------	---

MAIN ANALOG OUTPUTS

Number	1 Output: Program Left 1 Output: Program Right 1 Output: Audition Left 1 Output: Audition Right 1 Output: Mono
Coupling	DC-Active Balanced
Impedance	30Ω
Level @ 0 dBFS ³	+14 to +24 dBu ⁴ into 600Ω or greater
S/THD+N @ 0 dBFS	>90 dB
S/THD+N @ -20 dBFS	>70 dB
Signal to Noise Ratio	>100 dB @ Digital Silence
Frequency Response	±0.1 dB, 20 Hz-20 kHz ±0.05 dB, 50 Hz-15 kHz (typical)
Crosstalk @ 0 dBFS	>94 dB

AUXILIARY ANALOG OUTPUTS

Number	1 Output: Cue
Coupling	DC-Active Balanced
Impedance	60Ω
Level	+14 to +24 dBu into 4 kΩ or greater
S/THD+N @ 0 dBFS	>85 dB
S/THD+N @ -20 dBFS	>70 dB
Signal to Noise Ratio	>100 dB @ Digital Silence
Frequency Response	±0.1 dB, 20 Hz-20 kHz ±0.05 dB, 50 Hz-15 kHz (typical)
Crosstalk @ 0 dBFS	>94 dB

AUDIO INPUTS

Number	16 Max. Analog and/or Digital (in stereo pairs)
--------	--

DIGITAL AUDIO INPUTS

No. of channels	2 per module (1 stereo pair)
Format	AES/EBU (2 Channel, 20 bit) SPDIF Consumer level
Impedance	110 Ω - Optional Transformer
Sampling Frequency	24 kHz to 50 kHz asynchronous ⁵
Faculties	Sample repeat on parity error or bi-phase coding violation. Mute on loss of phase lock. No emphasis or sample rate detection.

ANALOG AUDIO INPUTS

Resolution	18 bit
No. of channels	2 per module (1 stereo pair)
Impedance	Bridging (>10 kΩ) or terminating
Level @ -20 dBFS	-10 dBu to +8 dBu (line level mode) -50 dBu to -48 dBu (mic. level mode)
S/THD+N @ -20 dBFS	>70 dB
Signal to Noise	>90 dB
Frequency Response	±0.1 dB, 50 Hz-20 kHz ±0.25 dB, 20 Hz-50 Hz
CMRR	>60 dB to 1 kHz
Crosstalk @ 0 dBFS	>95 dB @ 1 kHz >85 dB @ 15 kHz
Faculties	Input A/B level trim switching.

PROCESSING

ACCURACY

Internal Audio	
Data Transfers	24 Bit Precision
Internal Calculations	56 Bit Precision

SIGNAL DELAY

Digital IN to Digital OUT	104 μs ±20 μs
Digital IN to Analog OUT	790 μs ±20 μs
Analog IN to Analog OUT	1.17 ms ±20 μs
Analog IN to Digital OUT	480 μs ±20 μs

SYNCHRONIZING INPUTS⁶

Number	2
Format	1 Word Clock (BNC) 1 AES/EBU ⁷ (XLR)

TIMING

Input	Depends on Input Module
Output	Not Specified

OUTPUT SAMPLE RATE

Standard	48 kHz/32 kHz (jumper select) ⁸
Optional	44.1 kHz

¹Appears on the left channel for the Mono/Cue AES/EBU digital output.
²Appears on the right channel of the Mono/Cue AES/EBU digital output.
³0dBFS = digital clipping
⁴0dBu = 0.775 Vrms
⁵At 48 kHz nominal operating frequency.
⁶Optional. System will free-run at nominal sampling frequency if no synchronizing input is supplied.
⁷If both synchronizing signals are supplied the AES input takes precedence.
⁸Auto-sensing if synchronizing input is supplied.



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Radio Museum Is a Nice Surprise

by Jerry LeBow

JONKOPING, Sweden Radio is unpredictable. You can never tell what your competition is going to do, and you can never tell what the next technological advance will bring. And so it follows that you never know where you will find the treasures of radio.



Would you expect to find them in Jonkoping, Sweden? Such was the pleasant discovery I made during a recent trip to Scandinavia. The trip began in Copenhagen with a planned drive to Stockholm.

The distance between Copenhagen and Stockholm is about 400 miles and Jonkoping on Lake Vattern is just about in the middle.

What was supposed to be a very short overnight stay in Jonkoping turned out to be one of the highlights of this trip. There, in a beautiful old factory warehouse, was the best radio museum I have ever seen. I, a "radio junkie," I have visited many radio museums in the United States and abroad. Most of them are "famous" and I often made special trips to see them.

Step back in time

The history of this radio museum in Jonkoping goes back to 1923 when, at the age of 15, Erik E. Karlson built his first radio receiving set at his home in Svärna. It was a one-tube, non-regenerative radio designed for long-wave reception. In 1924, Karlson built his second radio with two tubes, and was unable to receive experimental broadcasts from Sweden, Germany and Britain. It wasn't until March 1925, three months after the Swedish Broadcasting Corporation officially commenced operations, that Erik E. Karlson decided to quit school and open a small radio shop. At the age of 17, he was running a full-time business, making and selling sloping pants at his little radio shop. He soon began to import radios from other countries, including Strauss and Berliner and Telefunken radios from Germany.

Through the years, Karlson moved to larger and larger shops until 1929 when he opened a shop in Jonkoping. It was his main shop until 1973, when he retired. In the 1920s, when AC-powered radios hit the market, Karlson's primary brand was Phillips from the Netherlands, along with a variety of Swedish and German radios.

From 1923 on, Karlson kept a collection of old radios. To increase his collection in the 1940s and 1950s, Karlson held competitions all over Sweden offering to

exchange brand new radios for the oldest radio in town. That effort yielded approximately 2,000 radios dating from the 1920s to the 1950s.

Walk with me

It's truly a walk down radio memory lane. When you enter the museum, on the left aisle, are old hand-made crystal sets

which evolve, in the second aisle, to early battery operated tube radios from the early to the mid-1920s. Each of these units is in mint condition and many still

function. As you walk through the museum, you see a continuing evolution, from home-made to factory-made radios, from battery operated to AC-operated, from wooden box and cathedral shapes to furniture consoles with turntables and tape recorders. By the time you get to the fourth aisle, you are looking at early television and fairly modern AM/FM short-wave radios. Radios such as RCA, Stromberg Carlson, Marconi and Emerson are complemented by Blaupunkt, Grundig and Telefunken.

Karlson's collection is not just old radios, but also an exquisite collection of old radio broadcasting equipment including a Brush wire recorder, an original Telefunken Magnetophone, old Kleinschmidt teletype machines, and a wonderful glass cabinet filled with receiving and transmitter tubes from the 1920s to the 1980s.

If a picture is worth a thousand words, the pictures I took tell it all.

I was warmly welcomed by the local citizenry who now operate and maintain the museum for Karlson. I was told that Karlson still comes into the museum once or twice a month (he's 88) and still helps with the organization and display of the collection. There are still a thousand more radios in the warehouse, waiting to be put on display.



It was arguably two of the best hours I have ever spent in radio, and at a most unexpected location. If you ever get to Sweden, I guarantee you a memorable day at the Swedish Radio Museum in Jonkoping. Their phone number is 36-71-39-59. The museum is open Monday to Friday, 10 a.m. to 5 p.m., and Saturdays 10 a.m. to 1 p.m.

□□□

Jerry LeBow is president of Sage Alerting Systems, Inc. Contact him at (203) 357-1464. This is one in a series of occasional articles about museums that feature radio.

The Transition to Transistors

by Ronald Pesha

QUEENSBURY, N.Y. The decade of the fifties witnessed the transition from vacuum tubes to transistors. But not overnight. The early transistors were expensive, noisy, limited in frequency response, and most of all we did not understand them.

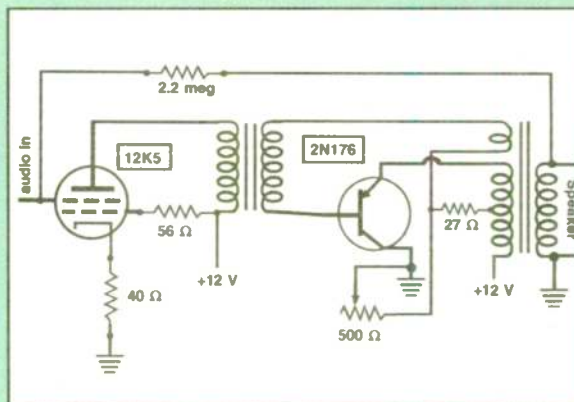
The automobile receiver made a natural application for transistorization. Transistors operate nicely from a storage battery's 12 VDC, but tube plates required at least 100V.

The first solid state auto receivers, AM only, were hybrids. A power transistor drove the speaker, and vacuum tubes functioned in the high frequency RF circuits. An unusual type of tube was developed especially for this service which operated with only 12 V on the plate. This avoided the problem of a voltage step-up circuit. Relatively low plate voltage was common on the vacuum tubes of the 1920s, and AM portable receivers of the early post-World War II era used tubes that ran on 1.5 V heaters with as low as 22.5 V on the plates. This eased the battery weight for pocket radios.

How's that?

Take a look at the schematic, which shows only the audio stages. Four preceding tubes, not shown, are in the RF amplifier, converter, IF amplifier, and detector stages of a conventional AM superhet. All of these are the special tubes which operate with 12 V on the plate rather than the usual 100-plus voltage. One of these 12 V tubes drives the output transistor.

But hold on. What is this? The incoming audio is fed to the screen grid? And the control grid has the full 12 V on it? Well, not exactly. According to Tung-Sol, the manufacturer, the cathode and the first grid take advantage of the space charge principle to function together as a large cathode. The second grid becomes the control grid, so the tube really operates as a low- μ triode with an 800-ohm plate resistance. With only 12 V on that plate, it could deliver as much as 50 milliwatts drive to the output transistor.



That output stage looks conventional for a single-ended Class-A amplifier with transformer coupling. Designers were still transformer-happy in those days. Of course a transistor is a current-driven device, and a high-impedance vacuum tube plate circuit makes an inadequate driver. So that required a driver transformer for the transistor. Note that power transistor, with the collector grounded and the emitter at the full 12 V positive.

Nearly all transistors available in the late fifties were pnp types, so the polarity shown in the schematic is correct.

The nominal design voltage is 14. An automobile storage battery fully charged supplies 12.6 V, but with the alternator running, voltage to the radio increased. That single Class A output transistor provided perhaps 10 W (at 10 percent distortion) to the speaker, marginal at best. The additional volt and a half at highway speeds probably offered a small but noticeable increase in available audio power.

Those of us weaned on vacuum tubes sought solace in the weaknesses of transistors, such as the poor linearity compared with tubes. Class A audio stages need good linearity for tolerable distortion.

This hybrid receiver factory set that variable 500 ohm resistance for 480 ma. of emitter current, an idling current about half of that at signal peaks. And look at those feedback paths!

Tube people claimed that feedback is an excuse for poor design, but its widespread use is second only to the transistor itself for the solid state revolution.

This auto circuit developed feedback from a tertiary winding on the output transformer, and also took voltage feedback from the speaker winding. Note how the tube's grid resistor is grounded through that winding.

Hybrids survived but a few years. Car radios became fully solid state by the early sixties.

□□□

Ronald Pesha is Associate Professor of Broadcasting at Adirondack Community College, Queensbury, New York. He can be reached at (518) 743-2200 ext. 567, or by fax at (518) 745-1433.

FEEDLINE

AM Patterns Depend on Elements

Part VI

by W.C. Alexander

DALLAS In the previous installment of this series, we looked at simple, two-tower directional antennas. This time, we will look at more complex directional arrays and how the addition of elements to an array affects the pattern.

Let's start with a simple two-tower array with a 315-degree tower line, 90-degree spacing and 106-degree phasing. This will result in nulls at 280 and 350 degrees or 35 degrees either side of the tower line (see Figure 1).

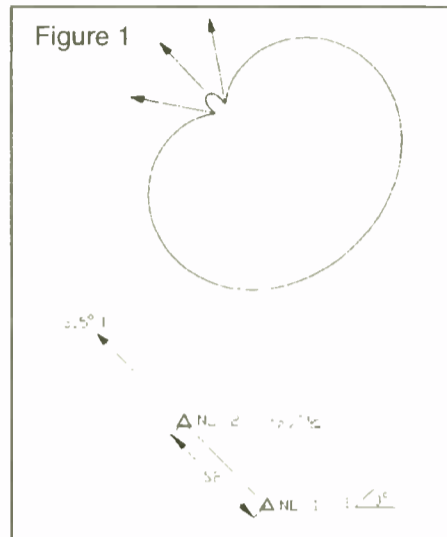
Now let's suppose we need additional nulls at 345 and 105 degrees. A two-tower pattern with a 45-degree tower line, 180-degree spacing and 90-degree phasing will produce the pattern shown in Figure 2.

This pattern was selected to show that with a wide-spaced array, maximum radiation does not occur on the azimuth of the tower line. This type of pattern is often useful in daytime protection of a distant station, where radiation toward that station needs to be suppressed without necessarily placing a null in that direction.

We can combine these two patterns — multiply them, if you will — to achieve a four-tower parallelogram array that pro-

duces a pattern with nulls at 280, 345, 350 and 105 degrees (see Figure 3). The nulls at 345 and 350 degrees combine to produce, in effect, a broad single null, which is useful in protecting a large contour or a national border.

We multiply patterns through the use of vector arithmetic. Because we already know what the parameters for both of the two-tower patterns are, we have the para-



meters for towers 1, 2 and 3.

All that remains is to find the tower 4 parameters. As shown in Figure 3, simply multiply the field ratios of towers 2 and 3 and add the phases of towers 2 and 3 to find the parameters for tower 4. The parameters for this parallelogram array would then be:

Tower	Ratio	Phase	Spacing	Orient
1	1.000	0.0	0	0
2	1.000	106.0	90	315
3	1.000	90.0	180	45
4	1.000	196.0	201	18

So far, for simplicity of illustration, all the patterns shown have equal radiated fields, or field ratios of 1. We can fill the nulls of our patterns by making the currents unequal. As we fill the nulls, we

also reduce the size of the pattern major lobe. The amount of energy in a pattern remains the same, regardless of the depth of the nulls or the size of the lobes.

The size of a pattern is found by integrating the hemispherical energy flow (the power radiated on and above the horizon in all directions). For a given power input and loss, this will remain the same, regardless of pattern shape. We can liken this to a balloon filled with air. You can squeeze it in the middle, but the ends bulge out. As you reduce pressure in the middle, the ends return to their normal size. Squeeze both ends and the middle bulges out. Still, no matter where or how hard you squeeze, the total size of the balloon does not change.

It is easy, particularly with more complex patterns, to wind up with a good bit of energy being radiated above the horizon and into space. This power is, for most intents and purposes, lost, and in the case of most nighttime antennas, it is harmful as it causes skywave interference to other stations. Because the total hemispherical energy in a pattern never changes, by keeping an eye on the size of the horizontal pattern, the designer can generally tell if he has a vertical radiation problem. If the horizontal pattern size or RMS begins to shrink, that power is going somewhere, and that somewhere is up.

There are many tricks to the trade that simplify the pattern design process. Computer directional antenna design programs are a big help and time saver, but it is entirely possible (and even easy) to design a terrible pattern with one. The computer cannot substitute for knowledge of the craft.

Faced with the adjustment of an array, without a good understanding of the designer's intentions, the adjusting engineer may well find himself in an iterative trial-and-error situation that may never produce the proper pattern. A good understanding of vector arithmetic and antenna design principles will speed the process by allowing the engineer charged with adjusting the array to make educated decisions as the tuneup proceeds.

Anyone who has ever looked at the FCC

continued on next page ►

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license for an AM directional station has probably seen that there are two sets of directional antenna parameters listed. One set is theoretical; the other is operating parameters. There are usually significant differences between them.

The theoretical parameters indicate the radiated field ratios and the phases of the radiated fields. If the towers are of equal heights, the theoretical loop current ratios will be equal to the radiated field ratios; if the tower heights are different, they will be different.

Assuming sinusoidal current flow, a current maximum or loop will occur 90 electrical degrees below the top of a vertical radiator. If that radiator is less than 90 electrical degrees tall, this loop will exist at the tower base. If the tower heights are the same, the theoretical parameters which are shown on the station license are those the designer used to mathematically create the pattern and they reference this current loop. When the towers are of unequal height, these ratios reference the radiated fields.

The operating parameters, on the other hand, indicate the values shown on the antenna monitor when the array is properly adjusted to produce the correct pat-

tern. The operating parameters often deviate significantly from the theoretical parameters, and this is due, in large part, to sample system errors and to the mutual coupling between towers.

Standard patterns

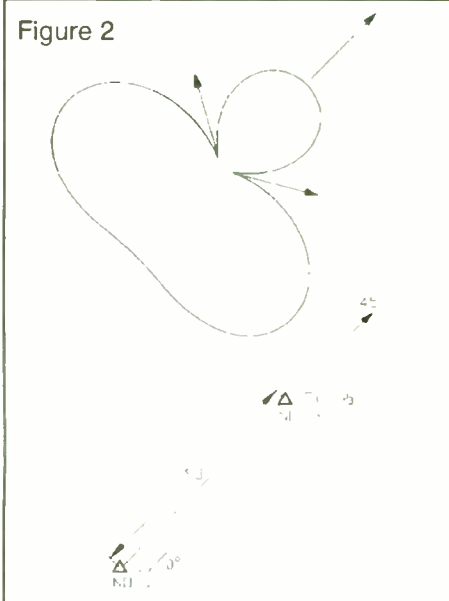
In all the examples we have used so far in this series, on certain azimuths, the vectors from the array elements completely cancel one another and the resultant radiation on that azimuth is zero. This is difficult to achieve in the real world. Reradiation, scatter and drift in the phasing, coupling and sampling systems limit how close to zero the radiation on a null radial can be adjusted and maintained. In January of 1981, the FCC instituted the standard pattern, which increases the size of the theoretical pattern (or

calculated pattern) by a specific amount.

When the standard pattern was instituted, the FCC calculated the standard pattern for all existing stations and authorized them by modification of each station's license. Today, when the FCC authorizes a directional pattern for a station, it is the standard (and not the theoretical) pattern that is authorized. The FCC proscribes radiation that exceeds the standard pattern value on any azimuth. The designer must use the standard pattern as he designs a pattern to fit a particular application as the FCC requires use of the standard pattern in all calculations of interference and coverage.

□ □ □

Cris Alexander is director of engineering at Crawford Broadcasting. Reach him at (214) 445-1713.



tern. The operating parameters often deviate significantly from the theoretical parameters, and this is due, in large part, to sample system errors and to the mutual coupling between towers.

Inevitable errors

No matter how careful the installer is, there will be errors in the sample system. It is difficult to make all the runs of sample line exactly the same length. Differences in the values of antenna monitor terminating resistors, differences in the sample loops or current transformers, even slight differences in the locations of the sample pickups all contribute to sample system error.

Mutual coupling, on the other hand, distorts the assumed sinusoidal characteristics of the current flow on each tower. There are two on-frequency current components in each element of a directional array — the current that contributes to radiation, and the current induced by mutual coupling from other elements. The current that contributes to radiation tends to be sinusoidal, but the effect of the induced current tends to distort that sinusoidal current distribution. The position of the current loop can be quite a distance from where sinusoidal current distribution would place it.

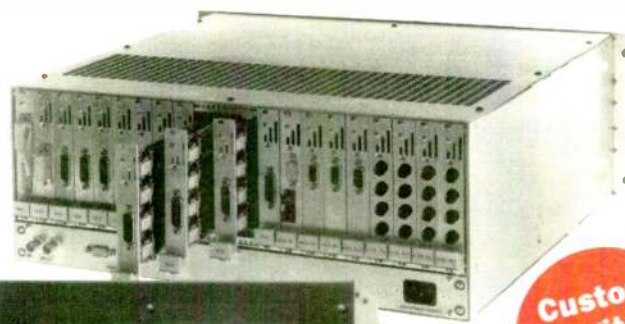
There are many methods of determining the correct operating parameters for a directional array, but all, to one degree or

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Stars Came Out for FDR in '44

FDR's Final Push for White House Buoyed by Radio Hour Featuring Hollywood's Brightest Celebrities

by John Montone

NEW YORK Was a star-powered hour of radio responsible for Franklin Delano Roosevelt winning an unprecedented fourth term as president of the United States?

FDR thought so.

He called the election eve broadcast the most decisive event in the campaign and believed it transformed a close race between him and Republican Thomas Dewey into an easy win. Roosevelt beat Dewey by more than two million votes, a substantial margin considering that the total number of votes cast was less than 48-million.

Radio role

To understand the role radio played, return with me to the night before the 1944 presidential election. Millions of Americans gathered in their living rooms and kitchens, met at corner taverns or drove in their cars riveted to their radios. It was not uncommon back then for people to stare at the lighted dial as they listened.

On most nights they had a choice of programs, but this night was different. The Democratic Party had bought an hour of time on all four networks: CBS,

Mutual, NBC Red and NBC Blue. America was a captive audience.

The radio show they heard, produced by the great writer Norman Corwin, known as "The Poet Laureate of Radio," featured such glamorous figures of the day as Humphrey Bogart as host, Edward G. Robinson, Judy Garland, George Raft, Charles Boyer, Jimmy Cagney, Lucille Ball, Irving Berlin and Jane Wyman. Corwin called it "The Roosevelt Special," a studio produced campaign train complete with all the bells and whistles and clacking and grinding of great steel wheels.

The magic of sound effects allowed the candidate to create the sense that he was out and about traveling the vast country.

Well-engineered

Professor Gary Yoggi who teaches history at Corning Community College in upstate New York and sits on the board of "The Friends of Old Time Radio," said the show is one of his favorites.

"The engineering was marvelous," he said of the program that was broadcast live from three locations: New York, Los Angeles and Washington. Quite an accomplishment in those pre-satellite days.

The body of "The Roosevelt Special" consisted of music. Judy Garland sang

"We Gotta Win this War." Many of the songs were parodies — including one to the tune of "That Old Gray Mare," called, "That Old Red Scare, Ain't What It Used to Be," an allusion to the Republican Party practice of labeling Democrats as Communist or Socialist sympathizers.

The famous entertainers also took turns ripping Tom Dewey on such issues as crime and welfare.

Sound familiar? They suggested he be sent back to Albany and that he was too inexperienced to lead the nation. Professor Yoggi said the political digs were mild by "contemporary standards."

"But," he said, "they infuriated the Republicans."

The GOP did not ignore the vast American radio audience. The party bought an hour of its own following the Democrats, but the radio gods betrayed the Republicans that night.

Crucial moment

As the Democrats' hour ran down, Corwin learned that Jimmy Durante would be unable to perform. The sponsor of Durante's own weekly show supported Dewey and gave Durante an ultimatum. That put Corwin on the spot and his reaction may have changed history.

"Corwin filled the final three minutes with nothing but organ music," said Professor Yoggi. "A lot of people turned their radios off and missed the Republican hour."

In fact, Yoggi claims almost 10 times as many people listened to the Democrats.

Roosevelt wired Corwin after the election and called the improvised ending "brilliant," believing it to have been a pre-planned master stroke.

But Yoggi said it was really FDR who carried the night. The president, speaking live from the White House, read a prayer from the mother of a young soldier who had been killed in the war. It was an emotional moment from a public official who intuitively understood the power of the medium.

As he did in his "Fireside Chats," FDR "spoke as one person to another. From across the table or the living room. Each listener believed the president was talking to him. That was his genius. Arthur Godfrey later got credit for that style, but Roosevelt was doing it long before Godfrey.

Yoggi, who has listened to tapes of Roosevelt's contemporaries, claims no one came close.

"Dewey sounded insincere on the air," he said. While Truman was "shrill," Yoggi described FDR's voice as, "strong, clear and vigorous," and called Roosevelt, who was wheelchair bound and in ill-health, "the perfect radio candidate," as polished as JFK and Reagan later were on television.

The advent of the little screen a few years later changed the way Americans got their news and spent their leisure time. It also made election eve 1944 the only one of its kind in the annals of American political history.

A night when a large portion of the nation tuned in, listened and decided who should lead them for the next four years.

□ □ □

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

ROOTS OF RADIO

Some Shows Of Summer Survived

by Richard W. O'Donnell

PORT RICHEY, Fla. In the 1930s and '40s, the autumn was the time when most of the big-time stars returned with their shows after summer vacations.



Eve Arden

Bergen and McCarthy, Lux Radio Theatre, Fred Allen, Jack Benny, Fibber McGee and Molly, Bob Hope, Bing Crosby and other big names, all well-rested, were back for 39 more weeks. But during the summer, replacement shows took over, and programmers tested new shows to learn if they were ready for fame.

"The Aldrich Family" got its break in 1939, when the family comedy replaced the Jack Benny Show on Sundays for a summer run. Until then, Henry and his family had been featured in short sketches on the Rudy Vallee and Kate Smith Shows. The characters originated in Clifford Goldsmith's Broadway play "What a Life!"

Ezra Stone was Henry, House Jameson was his father, Katherine Raft played the mother, and Jackie Kelk was Homer.

The half-hour show remained on radio until 1953. Television later revived the Aldrich clan, but the show never came close to matching its success on radio.

Whiz Quiz Kids

"The Quiz Kids," featuring a lot of youngsters who knew all the answers, was a summer replacement for "The Alec Templeton Show." The latter had itself been a warm-weather substitute one year earlier for "Fibber McGee and Molly" and gained a regular spot on the NBC schedule.

The Quiz Kids ranged in age from about four to 12. Their program was first heard in June 1940 and lasted until 1953, quite a run.

Joe Kelly was the long-time host of "The Quiz Kids." His unshaven panelists included Richard Williams, Harve Fischman, Mary Ann Anderson, Gerald Darrow.

continued on page 42 ▶

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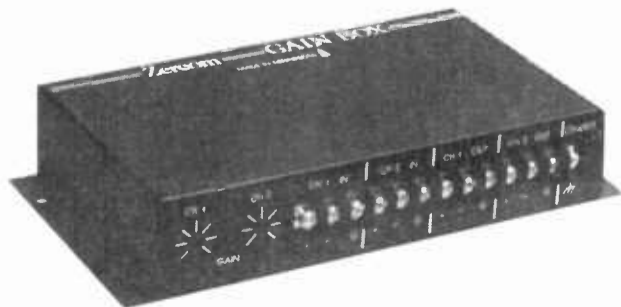
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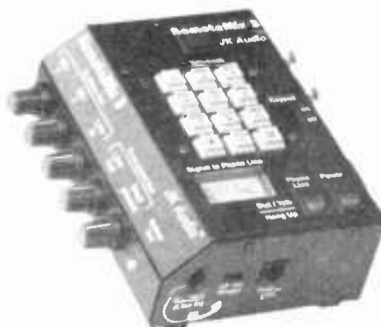
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HTML Code Makes the Web Work

by Richard Mertz

FAIRFAX, Va. Web pages are written in a computer language called HTML or HyperText Markup Language. HTML is actually a text file where the text is surrounded by special coding. The codes direct the browser software, typically Netscape or the Microsoft Internet browser, as to how the text and pictures are to be displayed.

The actual final presentation of your Web page on a surfer's computer screen will vary depending upon which browser is used to visit your Web site.

If you want to see the full Web page described above, it can be found at www.cmpconsulting.com

Writing commands

All HTML codes are bracketed by < and > at the start of an attribute or command and </ and > at the end of the attribute or command. For example, at the start of the desired command you would have <format or attribute> and at end </format or attribute>.

OK! Now in English. Say you want to bold the text for the line "Welcome to WXXX's Web Page."

In HTML Code you would have the line:

```
<<BOLD>Welcome to WXXX's Web Page</BOLD>
```

The first bracketed "BOLD" turns on the bold text attribute that your browser interprets accordingly, and presents the text bolded. The closing bracketed "/BOLD" turns off the attribute.

With the basics out of the way, we now move on to the basic format for the HTML page (your home page). The home page and its linked pages are set up in the basic format of:

```
<HTML>
<HEAD>
<TITLE> The WXXX Web Page
</TITLE>
</HEAD>
<BODY>
Text and pictures
</BODY>
</HTML>
```

This should give you the flavor of HTML. Here is an abbreviated version of a Web page with which I am intimately familiar. To give you an idea what each section does, I will annotate the various lines following the colons below.

```
<HTML> :This tells the browser that the file being sent is an HTML file.
<HEAD> :This is the beginning of the initial or header area of the HTML document. The data contained here is used by browsers and servers to aid in indexing or keep track of the document.
<TITLE>:The Cavell, Mertz & Perryman, Inc. Home Page </TITLE>:The title of the Web page is just that, the title. It is the information you see at the top of the screen in most browsers.
</HEAD> :The termination of the "HEAD" or header area of the document
<BODY>: This is where the main body of the Web page begins.
<BODY BGCOLOR = "#FFFFFF">: Sets the background color for the page, in this case white.
```

The older versions of the browser soft-

ware cannot read this code and will give you the typical cyan background.

```
<H1 ALIGN = Center><B>Cavell, Mertz & Perryman, Inc.</B></H1>:This is the title of the home page presented in large bold letters at the top of the page. The "H1" code tells the browser software that the following text is to be displayed in a predetermined size.
```

HTML provides for six levels of headings in descending font size. The "B" code turns on the bold type attribute. The "ALIGN = Center" code tell the browser software to align the following text in the center of the screen. Finally the "/B" and "/H1" codes turn off the bold type attribute and tell the browser software that heading one is finished.

```
<P><P ALIGN = Center><I><B>WELCOME!</B></I></ALIGN></P>: Here we have the "P" or paragraph command. This code say that the text that follows is to be displayed in a paragraph format.
```

The "PALIGN = Center" code aligns the text in the center of the page. The "I" and "B" turn on the italic and bold attributes. The "/B" and "/I" codes turn off the bold and italic attributes. Unlike the heading centering codes, paragraph codes require the alignment code to be turned off.

Finally, the "/P" code signals the end of the paragraph.

```
<BR><IMG SRC="tower1.jpg"
```

```
ALIGN=Right WIDTH=240 HEIGHT=360>: "BR" is a code that enters a line break. Next is the code for a graphic (in this case a picture of a tower) to be displayed. The "ALIGN = Right" codes put the graphic on the right side of the page. The width and height codes determine the size of the graphic. The Web browser software will wrap the text that follows around the graphic.
```

```
<P><B>Cavell, Mertz & Perryman, Inc.</B> is a professional services firm created to assist in innovative design and management of communications and broadcast facilities. And so on ... </P>: This demonstrates a typical paragraph with the company name in bold text.
```

```
<BR> : A line break
<P ALIGN = CENTER><A><A HREF = mailto:rmertz@cmpconsulting.com>To e-mail to Richard Mertz</A><BR>: Here we have the typical paragraph center alignment. "A HREF = mailto:(e-mail address)" is a line to a formatted e-mail page. The text that follows this code is in the customary light blue text. Clicking on the blue text calls up the e-mail page.
```

```
<P><P ALIGN = CENTER>Thanks for visiting</P>: Try this one yourself.
</BODY> :Alerts the browser software that the body of the page is finished
</HTML>: Signals the end of the HTML page.
```

As you can see, HTML is not a difficult programming language. However, in the age of graphical interfaces and WYSIWYG word processors why bother?

I am writing this article using Corel WordPerfect 7. One of the features of this word processor is an HTML editor. Using the Save As command will save a file in an HTML format.

Take a trip to your local software emporium and you will find a plethora of programs whose sole purpose in life is to create Web pages. Quicksite is one program I have tried. It contains automated features that make it easy to set up a simple Web page.

Microsoft markets Frontpage which is its entry in the Web authoring software arena. If you have ever put together a presentation with text and graphics, you can author a Web page using Frontpage.

If you are interested, a beta version of Frontpage '97 is available at www.microsoft.com/frontpage.

If you view the Web page with Netscape, click on the View command and select Document Source. Doing this will permit viewing of the Web page HTML code.

For those less adventurous, check your local paper for Web authoring services. Gee, what a great idea for a cottage industry!

□□□

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Some Made It to Fall

► continued from page 40

Cynthia Cline and Joel Kupperman, who reportedly had a 200-plus I.Q. He was a whiz at mathematics. (The American Heritage Dictionary, in fact, states that the informal noun "whiz kid" is an alteration of the name "Quiz Kid" that applied to panelists who appeared on this program.)

Then there was "Dr. I.Q.," who handed out silver dollars on Monday nights to movie fans at film palaces across the land. The good doctor would visit a movie house in one city for a few weeks, then move on to another town. He seemed to be everywhere. Lew Valentine and Jimmy McClain took turns playing the man with the questions.

The doctor had assistants in the movie audiences, and they would place a mic under an individual's nose. That meant the lucky person would have a chance to win from five up to 50 silver dollars for the right answer to the question. The program debuted in June 1939 as a replacement for some long-forgotten show, and it lasted a decade, mostly on NBC.

"Information Please," a snobbish quiz show, also dipped its toes in the summer waters before wading in for a long swim. It was launched by NBC in May of 1938 and lasted until 1948. Clifton Fadiman was the moderator, and the deep thinkers on the panel included sports columnist John Kiernan of the New York Times, who knew all there was to know about everything, Franklin Adams, a New York Post writer, who knew even more, and pianist Oscar Levant, yet another heavy thinker. A fourth chair was usually occupied by a guest brain. Listeners received two dollars for sending in questions that

were used on the show, and a hefty five dollars if they baffled the brains. Without a doubt, "Information Please" was loaded with snob appeal, but the peasants must have enjoyed it or it would not have survived for a decade.

Paar, Benny and Blondie

"The Jack Paar Show" was a summer substitute for Jack Benny. It arrived in June 1947, and lasted until Rochester's boss returned. After that, it was gone forever. Later, Paar would hit it big as



Fred Waring had a summer show.

the TV host on NBC's "Tonight Show." Radio just wasn't his medium.

"Blondie," the comic strip that became a successful movie series, also was a summer replacement. When it was first tested on CBS in July of 1939, programmers were grooming it for a long run. Penny Singleton and Arthur Lake, who played Blondie and Dagwood on screen, were also the stars of the radio

series. Over the years, "Blondie" appeared on other networks, and Penny Singleton was replaced by Ann Rutherford and other actresses in the title role. "Blondie" lasted until 1950.

"Escape," perhaps radio's greatest adventure show, debuted on CBS during the summer of 1947. Unfortunately, the series never received the credit nor the sponsors it deserved. It lasted until 1954, a great deal of the time on a sustaining basis. Only after it went off the air did critics and listeners really begin to appreciate the program. The show was narrated by William Conrad and Paul Frees and featured countless major radio stars.

Orson Welles' Mercury Theatre was a substitute in 1938 for the Lux Radio Theatre. Did you ever hear of "The Hour of Mystery," a summer replacement in 1946, or "The Theatre Guild on the Air"? This mystery show may have had the greatest list of summer guest stars ever. They included Laurence Olivier, Frank Sinatra, William Holden, Franchot Tone and David Niven.

Other popular shows that either debuted or were tested in the summer include "The Adventures of Sam Spade," "Topper," "The Thin Man," "The Alan Young Show," "Counterspy," "A Date With Judy," Lucille Ball's "My Favorite Husband" and Eve Arden's "Our Miss Brooks."

Summer radio listeners also heard "Suspense," John Nesbitt's "Passing Parade," "Ellery Queen," "The Fred Waring Show," and "The Life of Riley" starring William Bendix. This comedy started out on a Sunday afternoon and went on to become a prime-time favorite.

□□□

Dick O'Donnell is a free-lance writer living in Florida and an old-time radio buff. Reach him at (813) 842-6638.

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KEYBOARD CONNECTION

Care and Feeding of a Web Page

by Barry Mishkind

TUCSON, Ariz. It does not take long. Once you have gotten on the Internet and browsed about a bit, the range and depth of sites to visit can be overwhelming. Among the sites of interest to broadcasters are the hundreds of radio and television stations that have joined the ranks of Web publishers. If your station or organization is not yet on the Web, perhaps you are planning something even now. (As Richard Mertz reports on page 42, HTML helps you get started.)

It is a natural progression to put up your own Web pages. It makes your station

more "visible" to your listeners and others who might be seeking to find a station with your format. It can even make money for you. However, as in any promotional effort, in order to succeed you must do more than just "put something up there."

You would never think of playing one song on your station over and over. The audience would disappear in a hurry. The same applies to your Web site.

Just having a page with your call letters and logo is worse than useless. I have seen some where you cannot even find a phone number or any other information about the station. Not only is this not

informative; it frustrates potential listeners. That is not good.

What should be on Web pages? Clearly, there is no set "rule" for content. However, here are some categories you might consider: program schedules, photos of the station, sports events and local sports scores, special events, air staff, a coverage map, recent awards received, listener suggestions and a history of the station. Pictures help, but do not make the files so big that they take forever to load.

Nevertheless, two things you should include on your home page, the first page visitors will see, are your e-mail address and phone number. Let visitors know

how to contact you. When listeners call your station, someone answers the phone. If you have a Web site, expect to get e-mail; but do not forget proper courtesy and acknowledge and answer your e-mail. (I will not name some of the stations that have failed to respond to e-mail sent to them, but you can be sure they have disappointed many listeners.)

Finally, make a plan to update and change sections of the Web site on a regular basis to keep your listeners coming back. Would you buy a newspaper if it was exactly the same every day?

There are many Web authoring tools available to assist in building your site. A couple of the more flexible ones include WebAuthor from Quarterdeck and Spider from Incontext. WebAuthor comes with an especially good utility, WebImage, which helps optimize the graphics you set up, which in turn allows your pages to load faster.

Another way many stations are adding to their Web "presence" is to use one of the audio streamers and "broadcast" via the WWW, as RW readers are well aware. Using RealAudio or Streamworks, for example, anyone in the world with a multimedia computer can listen to your station. Audio quality is not yet "hi-fi" and without a fast modem it can be downright hard on the ears, but the dozens of audio sources already available range from rock to national newscasts.

Regardless of the direction you take, there is one more important consideration: How will you get listeners to find you? Just as you tell your clients when selling airtime on your station: advertise.

You can advertise your Web site in many ways. A good start is by talking it up on the air, and listing the URL in your print advertising, even on bumper stickers. Another is to ensure your site is registered with the various Internet search engines.

Where is the money?

By now, you may be wondering about the headline on this article and how you can make money on the Web. Again, the same plan of action you use for your air product will work on the Web.

For example, you could have local or regional advertisers "sponsor" a page on your site, or place a small "banner" ad on the home page. Some stations have even sold national spots that run on the audio feed on the Web, but not on the local off-air signal. As an alternative, aural or print Web ads can be used as a bonus for an on air spot buy.

Advertisers will want some indication of the number of impressions you can provide them, not unlike your Average Quarter Hour. The higher the "hit count," the more you can charge for the advertising. Some site operators charge thousands of dollars a month for a small banner ad.

Because the Web is a visual medium, it allows you to augment the advertising campaigns of your clients with their own special pages, including "coupons" that visitors can print out and take to the client. This is a tangible way of showing how effective your Web site (and your station) are for them.

By bringing your programming and sales departments together, you will discover many great ideas for maximizing your presence on the Web and developing additional income.

□ □ □

Call Barry Mishkind at (520) 296-3797. He invites e-mail to barry@broadcast.net. You can find his home page at <http://www.broadcast.net/~barry/>

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Combiners Solve Big Headaches

by James F. Pinkham

HUDSON, N.Y. Thanks to the changes in the FCC rules regarding power output of Class B and Class C FM stations, a high-power Class C FM station must have an Effective Radiated Power (ERP) equivalent to 100 kW at a Radiation Center Height Above Average Terrain of 300 meters, or 984 feet. Stations failing to perform according to these specifications could lose their Class C status and be reduced to a lower-power Class C1 or Class C2, and be unable to recover their former full output power authorization.

Clearly the number of antennas that can be "candelabra mounted" atop a single tower at the optimum HAAT is limited, and cities are discouraging large antenna farms of multiple towers. Not every city is as lucky as Colorado Springs, with a mountaintop that accommodates more than 400 antennas, as does Cheyenne Mountain. The solution in many cities has been a tall tower with a special, multistation combined antenna. In Miami one such system serves 11 stations. With a combined antenna, all the participating stations have the same center of radiation above the same average terrain. This article touches on some of the planning required by such a facility.

Combiner design

The engineers designing the combining system will determine the power input to the multiplexer. Each station will have its own transmitter room and, in many instances, auxiliary antennas located lower than the top of the tower. Auxiliary power for emergencies is often part of the plan. The rooms themselves are usually large enough for two transmitters, main and alternate or auxiliary. The antenna multiplexer usually is centrally located, on the same level or a level below the transmitters. You may also find larger rooms for UHF TV transmitter installations with waveguide to a UHF pylon located above the FM antenna. The combined antenna usually uses a large rigid transmission line. The multiplexer consists of pass/reject filters for each of the stations.

When planning your transmitter room, give careful consideration to equipment grounding, which must be connected directly to the main ground of the antenna multiplexer and thence to the main tower station ground. If possible, install these heavy-duty, 4- or 6-inch wide copper ground straps in the floor of the building, in trenches if provided, before the concrete floors are poured.

Most rooms provided are rectangular, and the best layouts put the main and alternate main transmitters side by side, with sufficient space to allow cabinet rear doors to open. These rooms are usually air conditioned. It may not be necessary to duct air out of or into the room. Fully filtered air conditioned air flow is the best environment for the modern FM transmitter. Plan on rigid transmission line from your transmitter output flanges to your coaxial switches or patch panels. Bear in mind that, if you have planned electrically operated coaxial transfer switches, you do not need patch panels.

Build a framework of two-by-fours or four-by-fours to support both transmitters. Measure precisely to ensure that the

two transmitters fit properly on the framework. Bring over electrical conduits from the disconnect switches, along the wall. Install support hangers from the ceiling or overhead beams to support the transmission lines.

Cable trays extending the full length of the transmitters provide raceways for control cables and exciter power supply circuits. The cable trays should extend over to the equipment racks with an

The essence of the matter is planning. You need not be an architect.

elbow or tee section. You can secure cables to the tray with lacing cord or long tie-wraps. Leave adequate space from the front of the transmitters to the face of the equipment racks to allow all cabinet doors to open and for pull-out drawers such as exciters to extend fully for proper access.

The transmission lines may be run one above the other, toward the end of the room where the transfer switches will be located. Keep the number of elbows to an absolute minimum. The selection of this location depends greatly on the location where the antenna lines must leave the transmitter room. Equip the equipment racks with plug-strip, at least one circuit per rack, 120 VAC, 20 amp rating. Mount terminal boards on half-inch or three-quarter-inch plywood in the lower-back of the control rack where the remote control equipment is located. Mount the coaxial switch controllers in the same rack. Try to place the modulation/frequency monitors in the center rack. If space permits, also try to remove the exciters and drawer slides (if used) from the transmitters and mount these devices in the vibration-free environment of the control racks. This is beneficial, but not essential. Exciters have internal blowers and thus require no additional ventilation.

Mount the coaxial transfer switches in one of several convenient positions. One desirable arrangement puts the ports of the switch in a vertical plane for the first switch (Transmitter I/II), with the second switch (Main/Aux. Antenna) above the first. You can construct a framework of "unistrut" from floor to ceiling, braced off the wall for stability. Most electrical contractors will be familiar with this material and with cable trays. Another option places the transmitter transfer switch above the transmitters, with short line lengths, and puts the antenna transfer switch conveniently at the place where the antenna lines exit the room. Other details vary slightly.

Planning saves you money

Program lines and remote control circuits, STLs and related special conditions vary with every station. In all probability you will need a dehydrator for the coaxial line to the auxiliary antenna, even if the feed lines to the multiplexer system do not require pressurization. Consider strongly a manifold system with valves and gauges and pressure-loss alarm, tied to your remote control. Also give serious thought to installing VSWR alarms.

The essence of the matter is planning. You need not be an architect to understand

the needs of a transmitter room.

In one station in the Washington suburbs, the owner contemplated building alterations that would have involved serious loss of air time. The building housed a two-tower DA-D at 5 kW that was in need of a new phasor, complete tune-up and proof, and a second-rate 20 kW FM transmitter, in need of replacement and lacking alternate or auxiliary. The property was 11.2 acres of prime

tower was modified and reinforced, additional sections added, and a pole-mounted RCA four-bay directional antenna placed on top, to a new height of 508 feet. The old antenna remained as the auxiliary at its original elevation on the tower.


The most remarkable part of the planning that went into this package was the savings of \$85,000 to \$100,000 in unneeded building improvements. The only unimproved part of the facility was the existing 5 kW Bauer AM transmitter. The preparations for the first RCA FM took a couple of months, with careful planning and installation of the RF plumbing. We installed and activated the first RCA before we shut down the old FM transmitter. We secured temporary authority to operate the new FM antenna at 508 feet, at reduced power, because the old heliax transmission line was leaking. We removed the old FM transmitter, which was donated to a local university, eight days later the second RCA BTF-20E1 was on the air on test. At an NAB convention soon after I met the manager of the company that made the old FM transmitter. He asked me how the old transmitter was doing. I told him that it was the best transmitter I ever gave away. He did not get the joke!

□□□

James F. Pinkham has been a control systems designer and consultant since 1960, associated with Multronics, Inc., Mullaney Engineering, Inc. and other manufacturers. Contact him at (518) 822-9425 or via e-mail at JIMPINK@aol.com

real estate. The antenna was a Jampro four-bay directional, which had suffered lightning damage, on a 408 foot main tower.

Using a scale plan of the building and cutouts for the pieces of equipment, I found that I could fit two RCA BTF-20E1 transmitters with external power supply cabinets and overhead cable trays to the existing audio and control racks. I would install the RCAs one at a time, with Delta (Andrew-style) coaxial switches for transmitters 1 and 2 and for the main and auxiliary antennas. The package included a new Multronics phasor in an RCA-style cabinet which matched the FM transmitters. The No. 1



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WORKBENCH

Sharp Failure Leaves Bad Taste

by John Bissett

SPRINGFIELD, Va. For engineers juggling seemingly hundreds of projects, priorities and assignments, a good organizational tool is paramount. Many have chosen computers, some a pocket notebook, and others — like myself — one of those electronic organizers. My choice was a 64 kB model by Sharp.

For more than a year, this device kept track of appointments, client's numbers and project notes. Its three telephone memories allowed room for personal, business and remote control telephone numbers. The ability to add personal comments to the telephone number section meant the dial-up remote control commands for each station could be listed, so no matter who was off the air, their remote control could be accessed quickly using the data stored in the organizer.

As much as you learn to depend on electronic organizers, so can your life be turned topsy turvy when the device fails — in my case, wiping the memory clear through no fault of my own. I called Sharp, hoping some ingenious engineer had programmed a "secret" code that would permit me to retrieve what had been erased. No code, no data ... gone forever.

When I expressed my displeasure in the product, I was warned to back up everything I put in the electronic organizer, and "these things sometimes happen." No consolation for trying to remember appointment dates, or recreate a telephone directory of numbers entered while on the run.

I begin this month's column with this story, so those of you with these organizers realize they can and will fail, even with "backup batteries." I hope you will avoid the chaos the Sharp failure has caused in my life. To others that called

my office, left a message and haven't heard back from me: Please leave another message. Your number vaporized, along with the Sine Systems and Burk remote control commands for a dozen stations. Understand that I'm not ignoring you!

Finally, because this is an information exchange column, if any of you have had really good luck with an electronic organizer, tell me about it. We'll share the experiences with everyone, good or bad. I won't say that I've given up hope on these newfangled gadgets, but I'm not running out to buy a Sharp product any time soon, and am willing to share other's experiences.

★★★

Speaking of information exchange, in the Oct. 16 RW, we asked for feedback on ways to measure the propane level for a generator's storage tank located at a remote transmitter site. Carl Zimmerschied from KSIS(AM) and KSDL(FM) in Sedalia, Mo., faxed a very simple suggestion, gleaned from his childhood years.

While living on a farm, using propane bottles for the cookstove, he learned to monitor the level by heating a teakettle of water and pouring it slowly down one side of the tank. You should do the same. Then, slide your hand down the wet side of the tank. The empty part of the tank will be warm. When you get to the level where the liquid propane is, you'll know. The empty part of the tank acts as an insulator, so it will be warm. The portion of the tank with propane will absorb the warmth from the teakettle water, and the tank will be cool from this point on down. In warm climates, this test works best early in the morning, after a cool night.

★★★

Pete Deets spent 11 years in radio, and now works for

WMTV television in Madison, Wis. He, too, has been around ITC 3D and SP machines, and sends the following tips. When you shotgun the capacitors in the playback amp, change the 5 mFd caps to 10 mFd (C-102, 105, 121 and C-111, 114, and 125). This smoothes out the normally lumpy response between 25 Hz and 500 Hz. It won't be perfect, but the change will certainly help. Pete also suggests that, if your machine develops a nasty hum on playback, try the machine with no cart in place. Close the cart-in-place switch, and put the machine in play. If the hum is still there, check the chassis mount electrolytic capacitor, C-2, which filters the pinch roller solenoid. When this cap dries out, the solenoid induces hum into the playback head quite nicely. Pete can be reached at 15.pd@madison-business.com in Madison, Wis.

★★★

Here's a request from another Workbench reader, Gordon Canaday works at KMBI in Spokane, and is looking for inexpensive solutions to heating their 12-foot Prodelin C-Band Fiberglass dish for less than \$500. The station already has a vinyl cover for the dish, and Gordon is considering a forced air heating system beneath the cover, or a gas-fired infrared heater aimed at the cover. I've seen engineers use those heat tapes, the kind you wrap around exposed water pipes to keep them from freezing; but these were in exposed dishes without covers. If you can share your experiences, fax your submission to (703) 764-0751, or send your suggestion on-line to wrwbench@aol.com

★★★

If you subscribe to the IC MASTER, Hearst Business Publishing's cross reference of integrated circuit information, you might not be aware that the reference is available both on CD-ROM as well as floppy disks. For more information, circle Reader Service 111.

★★★

While we're on the subject of information, because more engineers are moving toward maintaining the station's telephones and computers (also known as improving job security), you'll want a copy of the Viking Telecommunication Peripheral Products Catalog. It's a mouthful, I know, but it's chock full of really slick boxes like call sequencers, digital announcers, add-on message waiting lamps for older style telephones, inexpensive paging amplifiers and toll restrictors. Their new catalog will be available by the time you read this column, so if you'd like a copy, circle Reader Service 106.

John Bissett is a principal in Multiphase, an engineering services company based in Washington. Reach him at (703) 323-7180. Tips for this column are encouraged, and published submissions qualify for SBE recertification credit. Fax them to (703) 764-0751, or send e-mail to wrwbench@aol.com

65 Years Ago

Reprinted from Radio World
(November 14, 1931).

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

HARVARD AND OXFORD AGREE TO AIR DEBATE

Oxford University accepted the challenge of Harvard to the first international collegiate radio debate. M. H. Aylesworth, president of the National Broadcasting Company, invited the English and American university debating teams to a transatlantic broadcast debate.

Short wave transmission will be used to carry the American debating team's voices across the Atlantic for rebroadcast in the United States. The National Broadcasting Company has invited the British Broadcasting Corporation to rebroadcast the debate in England.

The subject to be debated and the date of the contest are being negotiated.

Audience to Judge

While international debt cancellation and also the dole were tentatively proposed as subjects by Harvard undergraduates interested in debating, Mr. Eckles doubted whether either of these subjects would meet with the agreement of the debating clubs of the two universities.

The debate will last one hour. The first week in December has been provisionally agreed upon by both Harvard and Oxford.

Plans to have one English and one American judge appoint a third judge for the debate have been dropped in favor of permitting the millions of listeners on both sides of the Atlantic to register their own decisions on the outcome of the contest.

Marks a Resumption

The event will mark the resumption of debating between the two great American and English universities, which have not met in verbal conflict since 1925. At that time, Harvard won by upholding the negative side of the question, Resolved: That the growth and activity of the Socialist movement are detrimental to human progress. The 1925 debate was held in Symphony Hall, Boston.

New Book Deals with Writing for Radio

"How To Write For Radio," has just been published by Longmans, Green and Company, of New York City. Katharine Seymour, assistant continuity editor of the National Broadcasting Company, and J. T. W. Martin, radio writer of the staff of Batten, Barton, Durstine and Osborn, an advertising agency, are co-authors.

"How To Write For Radio" explains the fundamentals of radio writing. Because of its joint authorship, it presents the points of view of both network and agency.

The chapter headings are: Opportunities for the Radio Writer; Early History of Radio Writing; "Straight" Continuity; Dramatic Radio Writing; Radio Adaptations; Production (of Musical and Dramatic Programs); Sound-Effects, the "Props" of Radio; Radio Advertising Writing; Properties of the Air.

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Circle (30) On Reader Service Card

Studio Sessions

Bruce Bartlett Gives
Three-to-one Odds
See page 60.

Equipment and Applications for Radio Production and Recording

From France: The Digigram PCX-11

by Val Davis

EMMETSBURG, Iowa One thing that makes writing for RW cool is getting to review products like the Digigram PCX11.

The PCX11 compares to most audio cards like a Ferrari compares to most family cars. This is one nice card.

When I was first asked to review the card I was shocked and offended to hear that it retails for around \$2,000. I thought, man, they've got some nerve!

With lots of good audio cards available for under \$1,000, I thought the price was totally unjustified. Well, I was wrong.

Untouchable

While the industry is saturated with less-expensive audio cards, none can touch the PCX11. You can find cards as good, but they start at \$6,000 and go much higher.

The PCX11 is a half-length PC/AT bus board. It has four RCA phono connectors for left and right analog I/O; none of that eighth-inch stereo plug stuff here.

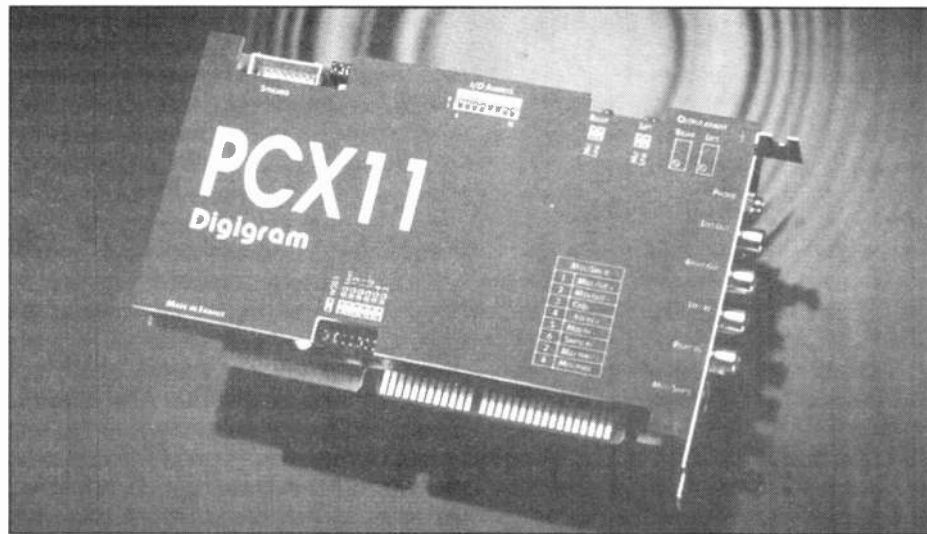
There is one eight-pin mini-DIN connector for MIDI/SMPTE and a connector for linking cards together.

The card uses 16-bit AD/DA converters and will sample at 8, 11.025, 16, 22.05, 24, 32, 44.1 and 48 kHz. The latter works best.

The PCX11 is available with digital inputs and outputs in AES/EBU and SPDIF formats with a separate synchronization input.

The specs on this card are breathtaking. At 48 kHz, frequency response is 20 Hz-20 kHz, +0.6 dB. Signal to noise ratio in both record and playback, >79 dB. Distortion + noise @ 1 kHz (record + play), <-78 dB. Phase difference between channels (record and play) 20 Hz - 20 kHz: 0.2 / 2 degrees.

For stations running automation, the card will perform simultaneous record and playback. You can download different drivers which allow access to a number of different types of processing. Compression is available from 1:4 to 1:24 and is software-controlled.



The Digigram PCX11 Soundcard: High-end Audio From Europe

The card does an amazing job with ISO/MPEG Layer 2. It will real-time mix up to 18 MPEG Layer 2 mono tracks at 128 kbps, or nine stereo tracks at 256 kbps. In addition, you can synchronize several cards together for a BIG multi-track setup.

For stations using a PC-based digital editor, the card offers several software functions like time stretching, pitch shifting, noise reduction and format and frequency conversion.

I am using Samplitude from SEK'D. This is a PC-based multitracking package that can run up to 16 tracks. It utilizes time stretching, pitch shifting and all that good stuff the PCX can do.

When I installed the card under Windows 95, it was pretty much plug and play — or "plug and pray" for those of you who know Windows 95. I selected the appropriate driver and was ready to fly.

The card is full-duplex, which means you can listen to the tracks you already recorded while you are recording additional tracks.

Tweak time

I have found every card-and-software combo requires a little tweaking. A card might work fine with some software, and another will lock up your system.

This card seems to record best at 48 kHz. I would like to set the resolution lower to conserve hard disk space, but I get the smoothest operation at the higher sample rate.

For production people creating their own music or doing video post production, the MIDI/SMPTE input is great for linking up to other devices like video machines, analog multitrack recorders or controlling a MIDI setup.

But here is the best part. This is the most amazingly clean-sounding card I have ever heard.

I can usually "hear" a digital audio card. There is just something in the ambiance of the cards that I hear or feel, but I do not hear it with this card. I could be fooled by the PCX11.

If you are a radio station owner looking

for good audio, look no further. The PCX11 will do everything you need. It sounds good on-air, performs great production and compresses your audio with MPEG Layer 2.

If you run a recording studio, the PCX11 will provide you with great sound, the MIDI and SMPTE compatibility you need and virtually endless expandability.

In addition, Digigram has released two PC boards for external synchronization of a digital audio source: the PCXS and PCXC.

PCXS synchronizes one or several PCX audio boards to an external reference source. The external reference can be LTC timecode, video, AES/EBU synchro or an RS-422 link. PCXC inherits the programmable counter section of the PCXS board for simple synchronization applications.

Cascaded with one or more PCX boards, it replaces the local oscillator and generates a programmable, sampling frequency for the application.

Digigram also produces the PCX9/PCXi9 (two-in/two-out analog and digital), PCX80 (eight-out/two-in with a single board), and the PCX20 (MPEG and PCM playback board).

In short, the only real problem I see with this card is the price. But for a radio station on-air purpose and especially for the production room, the PCX11 is expensive but worth every penny.

The Digigram PCX11 is imported from France, but for information domestically, call (202) 293-2790 or circle Reader Service 92.

Val Davis has been passionately involved with radio since 1974. He can be reached at vdavis@worl.netins.net

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Making Music
with MIDI
Module.
See page 50.



The Roland PMA-5: A Band in Your Hand

by Alan R. Peterson

WASHINGTON I had stated some time back that MIDI is on the back burner for a little while at radio stations until the conversion to digital audio and computerized playback is complete.

Happily, this does not stop me from checking out MIDI toys that make production fun and interesting. Such a device is the Roland PMA-5 Personal Music Assistant; a self-contained MIDI module, sequencer and auto-arranger in a package no larger than your daily organizer booklet.

Easy to use

The battery operated PMA-5 is ideal for roughing out musical ideas for jingles and production music, but is equally at home in creating those

tracks for actual use. The sounds are good, the arrangements are effective and the device is as easy to use as a tape recorder.

The PMA-5 has a touch-sensitive

You don't even need to be a musician to sound good.

LCD screen which makes it look like a Sony Watchman television. You input your performance data with a small plastic-tipped stylus. Use this pen to pick a musical style from the listing

shown on the screen.

Grab an Intro, tack it onto a Verse or its variation, enter the chord patterns to build the structure of the piece, then stick on the ending. Play it all back by touching the pen to the Play icon. The PMA-5 has tape-style transport controls to operate sequence and pattern playback.

Of course, if you really wish to use your keyboard, there are MIDI jacks in and out of the PMA-5 as well as a serial port for direct connection to a PC or Mac.

The 28-voice polyphony of the PMA-5 means that many notes can sound at the same time without dropouts or the "stolen note" syndrome lesser units are famous for. The unit is configured for General MIDI

(GM) and GS compatibility, so arrangements made on another similarly-configured module will sound the same on the PMA-5 without scrambling instruments.

No knobs

Hope you are not a knob-twiddler. You will only find three actual controls on the PMA-5: a volume pot, a power switch and a selector switch for the serial output jack.

Everything else is controlled through the screen; including tempo, mix and balance, track select, octave select and effect mix. This kind of control may be somewhat bewildering at first but you speed through your mix decisions very quickly after only a short while.

Note too, the cute little virtual keyboard in the window. You play this with the pen as well, recording a melody line to match the rhythm track you entered earlier.

An especially slick feature of the virtual keyboard is the ability to bend a pitch or add vibrato. Touch a note, then drag the pen off the keyboard while keeping it in contact with the screen. This activates the modulation. The further off the keyboard the pen goes, the more pronounced the effect.

The tiny stylus and small screen precludes playing the PMA-5 with any aggressive thrash stylings. The darn thing is just too tiny to "get into" playing hard. This could be a good thing.

A small region at the bottom of the screen reads "Ad Lib." Players of air guitar will love this; drag the stylus back and forth across this region and the PMA-5 plays solo notes appropriate to the chord in play at the moment. With the Ad Lib feature, you don't even need to be a musician to sound good.

Hundreds of sounds

The Roland PMA-5 has more than 300 instruments and 16 drum sets, much of it based around its successful Sound Canvas line of products.

While the device sounds great, I think Roland is overdue for a new GM sound library. The six-year-old GM samples inside are becoming way too familiar and the Effects bank is being used to death. I have even heard it included in clown acts at the Clyde Beatty-Cole Bros. Circus.

The time may be right for Roland to consider introducing a new General MIDI sound library with its next incarnation of synthesizer products, retiring the original Sound Canvas family instead of just adding to it.

The PMA-5 is primarily designed to be battery operated. There is a port on the side for a separate power blob but the PMA-5 does not come with one. You will have to buy one.

In spite of this, the Roland PMA-5 is a clever device with definite applications in the production room. Whether you want to begin scoring original production music or if you just get fed up with the production CDs at the station and want to add a spicy musical arrangement to a spot, the inexpensive (\$600 list) Roland PMA-5 is a nice place to start from scratch.

For information, contact Roland at (213) 685-5141 or circle Reader Service 88.

Here's a typical digital audio question:

Can I make it play music on the air, take requests, record Rush, Limbaugh, automate overnight switch, 24 satellite networks, switch transponders and satellite receiver, channel, still the time, tell the temperature, start the coffee pot and let out the cat and a lot of other stuff?

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**DN-951 FA CD Cart Player
DN-961 FA CD Player**



DN-2000F MKII Double CD Player

CD Labelmaker Is Simply Neato

by Read G. Burgan

LAKE LINDEN, Mich. Peter Tracy is founder and president of MicroPatent, a company that publishes patent information on CD-ROM.

The company takes tapes from foreign and domestic patent offices and extracts data that is then put on CD-ROM and sold to customers around the world.

You want what?

Occasionally a customer wants to buy an entire 20 years worth of CD-ROM patent information adding up to about 2,000 CD-ROMs.

Commercial pressing would cost almost

a million dollars in master fees and leave tons of surplus duplicate discs. Instead, MicroPatent purchased eight Sony CD Recorders in 1993 and pressed them into 24-hour-a-day service.

"We made about 16,000 discs in a month and a half," Tracy said. "But how on earth do they get labeled?"

MicroPatent began to call disc makers. The answers it got were anything but encouraging.

"You can't write on them with a magic marker because that eats away the dye," said one. "And you can't put an address label on one side because it will throw the balance off."

When further pressed for an answer, the

professional CD makers said, "We don't know. It's your problem!"

Potential solutions, like small labels that could be placed on the inside ring of the CD were wholly inadequate, Tracy related.

One manufacturer had a \$4,000 machine, but that required custom-coded CD-ROM drives and special printers. And there was no guarantee the labels would be centered on the disc or would not bubble or crease.

MicroPatent decided to take the bull by the horns and make its own labeler.

It began with software. A circle was drawn on a computer monitor, followed by artwork. Then some circles were die-cut on pressure-sensitive labels for printing the computer artwork. But the real problem was applying the labels to the CD.

The first problem was centering. No matter how steady your hand, it is difficult to apply a label consistently centered on a round CD. Even if you do, the label will bubble or crease. So how do you deal with this problem?

Coffee helps

Someone at MicroPatent looked beyond their caffeine addiction and noticed the Mr. Coffee filter base was almost exactly the same diameter of a CD.

They got together and cut a circle in the base approximately the diameter of a label inner circle. Some experimentation enabled them to place a printed CD label



Figure 1: Neato—What You See Is What You Get.

print-side down.

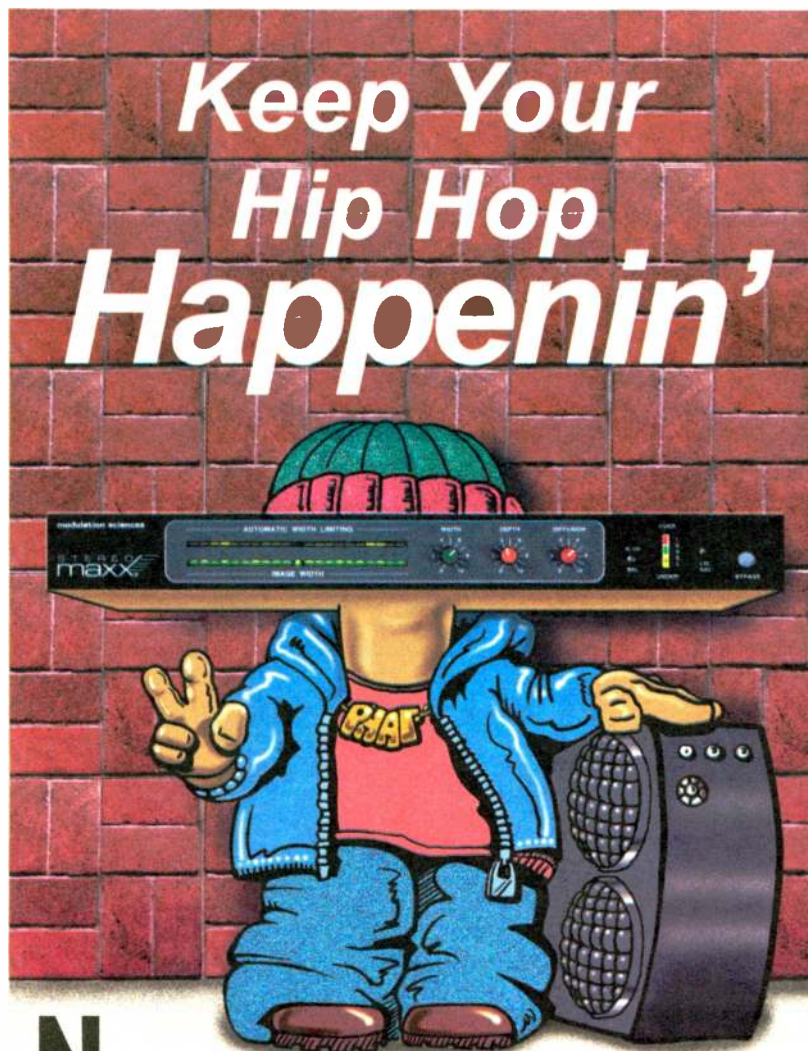
A plunger was used to hold the CD and align both disc and label. A tapered cone on one end provided the correct alignment when the plunger was pushed through the hole in the Mr. Coffee base.

The plunger was lowered and the CD was brought into perfect alignment with the label first time, second time, every time. The jury-rigged Mr. Coffee CD labeler was used on more than 40,000 CDs. Such was the humble birth of Neato.

Curious customers began asking how they could get their own labeler. So in June 1994, MicroPatent made a totally new CD labeler out of aluminum and applied for a patent.

Ads in a CD-ROM professional magazine netted orders for about a hundred of the big clumsy devices. Nonetheless, the MicroPatent phone was ringing off the hook.

continued on page 57 ▶



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Circle (61) On Reader Service Card

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(his on-air phones work!)

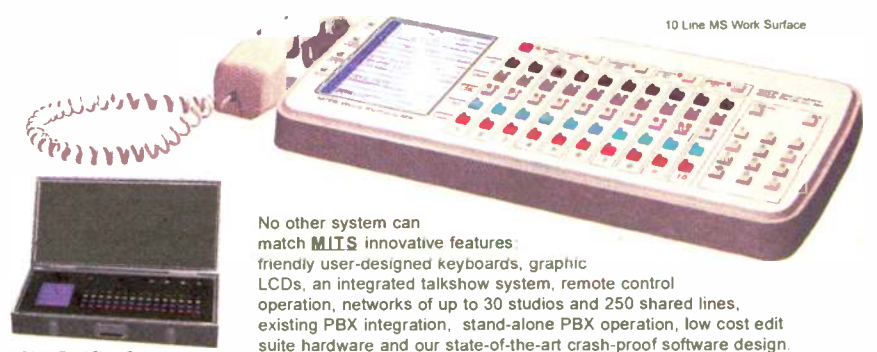
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EAS Case Studies

The FCC's deadline for mandatory EAS compliance is rapidly approaching. Many broadcasters are beginning to feel the heat—especially since the FCC continues to maintain there will be no extension beyond the deadline.

Since the scramble for equipment began several months ago, many broadcasters have asked how the Sage ENDEC can address their special problems.

CASE 1 Our area's LP1 (primary EAS station) and an LP2 (the backup) have different philosophies on alerts. The LP1, an all-news station, carries all important watches and warnings from the National Weather Service and local authorities. The LP2, a music station, carries the most severe warnings. If the LP1 is off air, the LP2 will carry warnings the LP1 would carry. Can ENDEC accomplish this automatically?

Yes, if the LP2 has ENDEC's Modular Receiver. The receiver has outputs to indicate the presence of both the carrier and modulation on the station being monitored. If ENDEC's manual override is set to the LP2/LP1 function, the following happens: As long as the LP1 is on the air with modulation, the LP2 carries only the alerts it has agreed to run. If the LP1 goes off the air or loses modulation, ENDEC senses the condition and switches the profile of the LP2 to the LP1. This enables the LP2 act as a full backup to the LP1, carrying all significant warnings and alerts.

CASE 2 A triopoly (three stations in the same facility) has an automated news and talk program on AM and two live music programs on FM. How can one ENDEC and the relay panel get appropriate alerts on the AM first, without delay, then allow the two FMs to run the alerts at an appropriate time?

By using ENDEC and a two-station relay panel, the unit can independently switch the audio of three radio stations. The first station is directly into the ENDEC and the second two stations are on the relay panel. By programming the profile of each station separately, ENDEC can be commanded to automatically put the appropriate alert on the AM immediately upon receipt, and then allow the two FMs to preset which will carry the alert next. This ensures that the alert will get on the AM immediately and fit into the programming of the two FM music stations during appropriate commercial breaks.

CASE 3 A totally automated FM music station wants to carry appropriate EAS

alerts for its area but doesn't want to constantly cut into its music format to put the alerts on the air. Can ENDEC do this?

Yes. With ENDEC's commercial tally function, it's a snap. The ENDEC has a number of programmable relay functions that allow closures, latching closures, and pulse closures at every stage of an incoming or outgoing alert. In the case of this automation system, a relay is programmed so that it closes in an appropriate sequence when a valid incoming message is stored in the ENDEC. This tells the station's automation system to make the next event the emergency message stored in the ENDEC. The automation system sends back a relay closure or voltage to the ENDEC, holding off transmission of the alert until the next event is ready. At that time, the ENDEC automatically interrupts the program line, sends the alert, then returns control to the automation. The result is perfect program continuity in a totally unattended automated station with the alert getting on as quickly as possible.

CASE 4 An AM news and talk station has four studios, any one of which could be on the air at any time. How do you control the ENDEC in the manual or timed relay mode from all of these locations if the ENDEC is mounted in the control room rack near the STL?

ENDEC can support up to five full-featured remote controls simultaneously, allowing access to all of ENDEC's functions from up to five independent locations. In this case, the ENDEC was installed in the engineering space about 150 feet away from each of the four studios. Each studio is equipped with a remote control that is mounted on the side of the console where the operator can easily read the 8-character display and activate all the buttons. Once one of the studios has seized control of the ENDEC to send or relay the alert, other users purposefully are locked out until those functions are completed. At this time, all of the stations can again control the ENDEC. The remote control makes it possible to push a single button to listen to the message stored in ENDEC, to send weekly and monthly tests, and to put an alert on the air immediately. With the remote control, you also can store dozens of area-specific messages—one to a button—on the programmable keypad.

CASE 5 The National Weather Service in our area sends a lot of watches and warnings on the NOAA Weather Radio System. Our station is the news and talk authority of the town. We pride ourselves on keeping the public up to date on all important

events. However, the announcer at the National Weather Service is just awful. His pronunciation and diction sound awful on the air. How can we take these messages, get them on the air, but replace the audio with our own announcer?

ENDEC makes it easy to replace audio on an incoming stored message. Once the message is received, the operator can read the text on the printout or the display screen. The operator can also listen to the audio and make notes about the alert. By connecting a non-program output of the console (cue or audition) to ENDEC's encoder, it is possible to replace audio in storage with audio from a local announcer yet still retain the digital codes and end of message sent by the Weather Service.

If you are using the remote control, you simply hit the record button and send audio from the console to the ENDEC via the encoder in connection. This will replace the audio stored in the ENDEC, even if lengths of the original message and your replacement message are different. When you re-send the alert, the digital data will be exactly what was sent by the National Weather Service, but the voice will be your announcer doing the alert in a clear and concise manner.

CASE 6 Our TV station has three newsroom areas and a master control. All areas need to know about incoming alerts and warnings. However, since we only control ENDEC from master control, we don't need remote controls in newsroom areas. How can we get information out to all these locations?

ENDEC supports up to five multicolored LED signs that crawl the text of incoming and outgoing messages as long as the alert is valid. Designated colors give news crews and operators information about a message's urgency: Green indicates tests; orange is used for watches, and red indicates warnings. Signs can even be made to beep when a message arrives! Signs come in many sizes, and are ideal for radio stations as well as TV stations.

If you have special EAS case that you need addressed, call Harris today.

**1-800-622-0022
FAX: 317-966-0623**

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HARRIS

EAS Installation

Sage ENDEC Installation is EAS-Y

For any configurations you need to provide some basic information to your ENDEC.

Power up your new ENDEC, it will perform a self-test routine and provide the menu screen. Install the printer paper, program your call sign or group name, location and time zone information, per the "Quick Start" section in the manual. Your ENDEC is now capable of basic operation.

For a Single Radio Station:

You will need the Sage ENDEC and receivers to meet your level of involvement in your State EAS Plan. (Two sources, minimum) The Sage RM-3 receiver frame provides 1 AM, 1 FM and 1 NWS receiver in a double shielded, very selective, 1 rack unit package.

Set your receivers for your monitoring requirements, hook the receiver audio to the ENDEC Monitor Audio Inputs, plug your program audio through the built-in Program Interrupt, Set Levels and you are done with the physical installation.

The programming to the ENDEC's Incoming Message Filters and the locally originated Outgoing Message Templates comes next.

For basic EAS compliance, you must Auto-forward any National Level messages, relay the Required Monthly Test within 15 minutes of receipt and initiate a Required Weekly Test in the weeks that a Monthly Test is not scheduled.

The Incoming Message Filters are configured at the Menu Selection "Presets". These Filters allow you to be in complete control of how your ENDEC functions during alerts. On a file by file basis, you will prioritize any incoming alerts and tell the ENDEC how to handle them.

If you plan to locally originate any alerts you may configure Outgoing Message Templates. The "Presets", "Outgoing" Menu selection prompts you to enter all the necessary information for your Operational Area. With these Outgoing Message Templates in place, it is simple to originate an alert. The operator will pick the appropriate Template, assign an event duration time and place the alert On-the-Air.

Outgoing Message Preset Templates allow your operators to quickly and accurately originate any local emergency alerts.

With the Filter and template programming complete, your ENDEC is operational. Let's look at some ways the Sage ENDEC may be implemented to satisfy multi-station requirements.

For two (or more) stations at one location, simulcast;

Program and setup the ENDEC as described for a single station application. Then connect a contact closure from the ENDECs' rear panel (Encoder Active Relay) to your stations simulcast switch control, causing the ENDECs output to drive both stations. Need a different audio level for the second station? Not a problem! The ENDEC provides an additional alert audio output on the rear terminal strip.

For two (or more) stations at one location, independent control;

Use multiple ENDECs. You may distribute the receivers audio to the individual stations. Then program the ENDEC in each station for that stations own requirements. This is moderately more expensive (for a two station application) than the next scenario, but provides absolute independent control and redundancy.

For two (or more) stations at one location, independent control;

Program and connect the ENDEC as before for one station, then add the Sage RP-2 Multistation Relay Panel for two additional stereo program interrupts. (or one stereo, and two mono interrupts) Add Sage RC-1 remote controls in the air studios of stations 2,3, & 4, to provide independent control of the ENDEC. With the MSRP (multi station relay panel) option enabled from the Menu, you may now program Incoming Message Filters for stations 2,3 & 4 to custom tailor the ENDEC operation for each station in the group. Each additional stations programming is identified by its' own call sign, so it is easy to verify each stations operation on the printed record.



SAGE ENDEC



**SAGE ENDEC RC-1
REMOTE CONTROL**

For more information, contact Chuck Maines or Gary Hardwick at Harris:

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For an independent viewpoint read the SBE EAS committee report titled "EAS equipment operational characteristics" in the 7/24/96 issue or look it up on their web site at <http://www.sbe.org>.

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Circle (38) On Reader Service Card

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World Radio History

Neato Labelmaker

► continued from page 52

Tracy began to see dollars, lots of them.

"Maybe we have a tiger by the tail here," Tracy said. "Let's have a mold made and make this thing much lighter and easier to ship."

Before long, Microvision was contacted. It had a graphics arts program called Design Express; an abbreviated version of which was bundled with the CD Labeler. The current kit also includes 8 1/2 x 11 sheets of self-adhesive labels each with three die-cut CD labels.

What started as a solution to a MicroPatent problem has taken on a life of its own. "This should eclipse our entire other business," Tracy predicts.

The Neato Labeler kit includes the plastic cylindrical base, positioning cone, a design software CD-ROM and self-adhesive sheets with circles die-cut to match software output.

That leaves just one small question: Why "Neato"?

The only instructions are contained on one side of a 5 1/2 x 8 inch sheet of paper. The software installs in Windows. When you open the software, you're greeted with a sample design sheet like the one in Figure 2.

Click and type in your title and associated information in place of the sample copy. You can click on the bottom of the screen to move through a choice of five layouts and four background accents.

The pre-designed template lets you curve your titles around the CD label, create shadows and special fill effects in the fonts and create various blends of background color. You can also import photos and graphics.

The die-cut self-adhesive sheets work in laser, inkjet or dot matrix printers. The output is as stunning as your printer can provide. In the case of my Epson, the output was full color.

CD with ap-peel

How you peel the label off the self adhesive sheet is important. Most of us hold a sheet label-side up and pull the label off the sheet. You don't want to do that.

Instead, place the sheet label-side down. Loosen an edge and peel the sheet towards you while holding the label firmly against the surface you are working on.

If not, the label will curl and make it difficult for you to place it flat on the cylindrical base.

The label is then placed print-side down on the base. The CD is placed on the neck of the cone, label side down. The cone is lowered through the hole in the cylindrical base until the CD contacts the label. It will automatically move the label so that it is correctly centered on the disc.

Finally, place the CD on a flat surface. Lightly rub the label to eliminate any air bubbles and ensure it is firmly adhered to the disc.

Register your labeler so you can go to the Microvision Web site and download

the upgrade that provides templates for labeling the CD jewel boxes. The templates give you options for both the front and back areas of the jewel box, and for even creating a four-page booklet of information.

Labels are currently available in white, gold and silver. But MicroPatent is testing a new series of metallic base labels that will resemble the actual surface of a CD. The company also expects to have a clear label soon.

The great mystery

That leaves just one remaining question: Why "Neato"?

Tracy said every time someone used

the labeler for the first time, "they would look up, smile and say, 'Neat!'" Ergo, a 1950s expression is reborn in a 1990s product.

The Neato Labeler is available directly from MicroPatent for \$79.95 in a kit that includes 100 CD labels. Additional labels are available in 100 and 300 label packs for \$22.95 and \$59.95 respectively. That works out to about 20 cents per label.

Contact MicroPatent, 250 Dodge Avenue, East Haven, Conn. 06512-3358. Phone (800) 984-9800, fax (203) 466-5178, or at <http://www.micropatent.com>

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



Fig. 2: Designing the Label With Design Express

No manual required but we'll send you one anyway



If traditional audio production is analogous to walking, a digital audio workstation is the equivalent to flying

Unfortunately, a lot of audio production software can seem like the equivalent of 747 cockpit controls: serious technoid overkill when you're just trying to get from point A to point B

That's why we developed the Express™ software interface for our Prisma™ workstation hardware. So you can enjoy workstation speed and maneuverability instead of logging frustrating hours just trying to get the thing off the ground

Express is the creative tool for radio broadcast production with a clean interface so simple that even your program director could learn it. Everything you need is on a single screen — cut/copy/paste buttons, snapping/grid controls, faders & pans, a transport that is very familiar, a pull-down sound library list, and the ever popular 10-level undo/redo. And the best part is, it works the way you work — quickly and intuitively. So you don't have to spend endless hours inside a manual deciphering cryptic icons, memorizing multiple keystroke combinations, and struggling with computerese.

Not that we cut out any feature you might need, we just took out all the stuff you hate about digital workstation software. Like nested menus, tricky hardware set-up, and way too many screens piled up on top of each other

But Express isn't just some kind of "dumbed down" product. Lurking underneath this deceptively simple interface lies a tremendous amount of power and capability that allows you to accomplish even the most difficult editing tasks. Powerful tools like time compression/expansion, normalization and one-touch submix.

Prisma systems also work well in groups, with Internet-compatible network audio transfer between systems in different rooms or across the planet. You can even send a spot you've created in Express directly to one of several popular digital on-air delivery systems — all ready to play.

And if you really want to get going fast, we'll build you a complete turnkey Prisma system, so all you need to provide is some desk space and a power outlet

So don't just sit on the runway reading the manual. Grab the controls and fly. Express for Prisma. Get it done while you're still young.



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- Easy head and tail trim
- Directly draggable fades and crossfades
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- Complete turnkey Prisma workstation systems available
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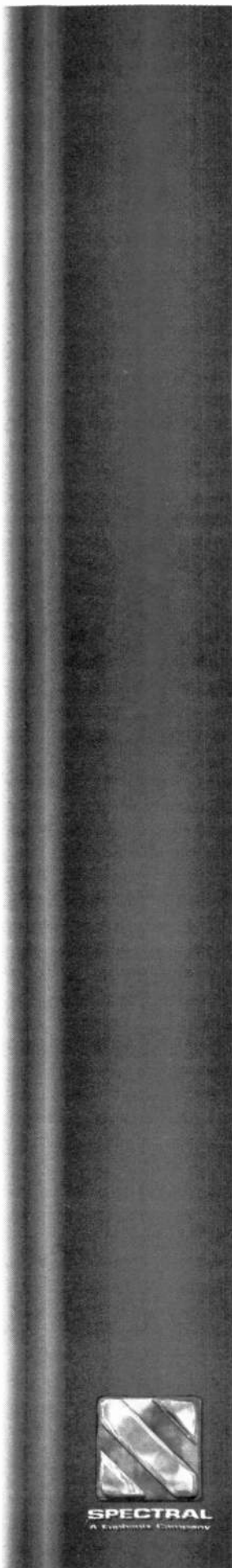
Here's the Really Fine Print

Express is just one of three compatible software interfaces for Prisma — it's not the only product line. Turn to Spectral's other studios for more information on local audio workstation and connectivity solutions. Call fax or e-mail for complete feature information on our practical approach to enhanced productivity in the new digital audio world.



I've always known my Prisma system was speedy. Then I got my hands on the new Express software. It's simple interface and intuitive tools make virtually every task project complete and it's fast. It makes my life and my job a lot easier. Dave Green, Director of Product Services, Prisma Communications, Orlando

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DIGITAL DOMAIN

The Logistics of User Interfaces

by Mel Lambert

LOS ANGELES There is one very useful expression that should be pinned to all of our walls: "Form follows function."

I have referred to its importance before, but for one design challenge it reaches Olympian relevance.

For broadcast automation systems and digital audio workstations, a computer is the only way to go. It can memorize complex sequences and take care of a myriad functions simply and easily: it is what a microprocessor was designed to do, after all, day in and day out.

By now, hardware is so reliable that we are often forced to obsolete a system long before it even begins showing its electronic age. Software development has also reached a stage where we seldom fear that a manufacturer is offering anything less than a mature, stable product.

Almost perfect

No, the vast majority of these systems are just what the doctor ordered. What I take exception to, however, is the sometimes inadequate job the designer does of fully understanding the exact needs of the intended user.

Specifically, that the user interface

shows little comprehension of the way in which we need to use such systems for prolonged periods of time. This is a theme I have made more than passing reference to before in these columns.

It is almost as if these manufacturers have emulated the early typewriter. Recall that in those dim and distant days, it was felt that the complex mechanism of pads, levers and keys would not withstand the rigors of fast typing.

To reduce the speed of the operator, the keys were placed in such a way that would hamper and slow down the typist, rather than assist him or her! Odd, but true.

I would hazard that some designers

could benefit from watching individuals use workstations and automation controller systems before they are offered for sale. Take touchscreens, for example.

I remain unconvinced that pointing at a screen with a prehensile digit makes any sense for repetitive actions. Your arm and wrist can become very tired in a very short period of time.

Okay, if the screen is laid horizontally, we might reduce the fatigue factor, but then we end up stealing a lot of valuable real estate at the operator's working position.

Having looked at the various possibilities, my vote still goes for the CRT and surrounding softkeys. Or, if space is tight behind the screen display, one of the newer-generation flat-screen displays.

If it ain't broke

The on-screen display and icons can be programmed to suit the display or interrogation functions being undertaken, and decisions extracted from the user. Now, instead of pressing a glass surface and hoping for a sound confirming your finger's presence on the CRT, we can use conventional switches that offer a familiar travel and mechanical response.

For added confirmation, lamps within the buttons can light to show that an action has been initiated, with or without an accompanying aural backup.

In a similar way, I remain unconvinced that the QWERTY keyboard and function keys offer anything more than a familiar means of labeling sound cues or replay events in a programmed sequence.

Sure, we can use keyboard shortcuts to achieve a number of pre-defined editing and librarian commands, for example. But, after a very short period of time, you wonder why the 46-odd keys, plus modifiers, provided on a normal keyboard are being pressed into service for a task totally unconnected with word processing.

Instead, I favor designs that provide a dedicated control surface, with keys that are designed to provide simple-to-understand tasks.

Mousing down

For example, move the selected sound segments to the Now line, then use the internal sync point as a reference (rather than the head or tail). Or implement a pre-determined crossfade profile between the two selected sound segments.

Or add the selected event to the current programming stack, but place the end at two seconds before the top of the hour, and then display the count-up time in minutes and seconds.

Sure, all of these commands can be mapped to function keys or Alt-Shift-H. But if the system is designed to offer a speed advantage over the competition, we have reached a time when hardware designers can move beyond the obvious and provide tools that give every indication of being thought through from beginning to end.

This is infinitely better than simply mimicking the current and often flawed design paradigm.

Next time, take a close look at some of the new remote-audio systems designed to offer enhanced quality over POTS phone systems and 28.8/33.6-kbps modems without the need for expensive ISDN lines.

□ □ □

Mel Lambert has been involved with production and broadcast for 20 years and is a principal of Media&Marketing in Los Angeles. Reach him at (818) 753-9510 or mediapr@earthlink.net

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15:05	Station ID		00/00:12/01
15:05	Like A Virgin	Madonna	07/02:59/02F
15:08	Linger	Cranberries	47/03:15/05F
15:11	McDonalds		00/00:30/00
15:11	Home of the Hits Jingle		02/00:09/02
15:12	Dreams	Gabrielle	01/03:41/04F

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Circle (5) On Reader Service Card

World Radio History

Ghostwriters Brings Back the '80s

by Alan R. Peterson

MINNEAPOLIS An interesting thing happened during Those Fabulous '80s: the world made the transition to compact disc as the playback media of choice for broadcast music.

However, not all the music of that era completely survived.

If you were to visit any number of stations today, you may yet find lots of power oldies and lunar rotation music being played back from carts. Some of those tunes were dubbed directly from vinyl to cart before Ol' Man Cue Burn had a chance to attack those records.

It is a good bet some pre-1985 tunes like "Our House" from Madness, "New Moon on Monday" by Duran Duran or Nena's "99 Luftballons" exist at your station only in vinyl form. Most likely in a condition that prevents them from being redubbed or even aired at all.

That is where Dave Dworkin comes to your rescue with a collection he calls The "A" List.

But where's Mr. T?

No, don't confuse this collection with "The A-Team," although both date back to a similar time.

Dworkin heads up Ghostwriters; the company that sells those nifty \$89 CD sound effect collections nobody should be without. He recently set up a deal with

The collection is a time capsule of the decade.

Swaitek a/v Productions, allowing him the distribution rights to hundreds of hits from the '80s in a collection he call The "A" List.

All of the music is familiar and cleanly dubbed. The discs feature medium and up-tempo pop vocal artists and guitar bands appropriate to the times.

Best of all, the collection sells for only \$599, with free shipping. This means 765 hits for lots less than what you spent on the computer that will play it back: about 79 cents a song.

A special price break is in effect until Dec. 31. Jump ahead to the end if you want to know those details now.

Oh wow!

This collection really does have Wow factor. The "A" List includes tunes that were transitional from 1979 into the '80s so there are plenty of opportunities to stop your listeners in their tracks with an "I haven't heard that song in years" reaction.

Among those tunes, "Pop Musik" by M. "Greatest American Hero" by Joey Scarbury (wonder where he is today?), Bruce Cockburn's "Wondering Where the Lions Are" and "Let's Go" from the Cars.

The artists that shaped the music of the '80s are well-represented, as are those performers who hit a streak and stayed on top throughout the decade. Madonna, Bruce Springsteen, Michael Jackson, Hall and Oates, Billy Joel and Huey Lewis all have multiple hits on The "A" List.

The Wow factor kicks in when several

forgotten songs wander back into your consciousness. When was the last time "Special Lady" from Ray, Goodman and Brown came up in rotation?

What about "Walk the Dinosaur" from Was (Not Was)? "Der Kommissar" from After The Fire? Have you already forgotten "Rock Me Amadeus" or "One Night In Bangkok"? It's all here.

I like this collection because I was doing CHR mornings when most of these songs came out. So when I took Dworkin's discs and put on Chaka Kahn's "I Feel For You" and "Suddenly Last Summer" from The Motels, I felt 10 years younger. "Ghostbusters" and "Spirits in the Material World" had a

similar effect on me.

What's the snag?

Depending on your format, there are a number of songs you may never want to touch. The collection is not meant to be a prepackaged plug-and-play format, but a time capsule of the decade. Treat it as such.

For instance, hot adult contemporary stations would be wise to leave alone Olivia Newton-John's "Suddenly," just as a light hits FM would pass on Motley Crüe's "Girls Girls Girls."

Similarly, there are songs that were appropriate for their time but were overplayed and burned out. "Key Largo"

from Bertie Higgins comes to mind, as does "Jesse" from Carly Simon and Paul McCartney's "Ebony and Ivory."

The collection does not pass judgment on what music was included or left out, but I did note the absence of "Don't Worry Be Happy." Dave Dworkin may yet save western civilization as we know it.

Snag number two will be the conditions of purchase: you have to be a radio station. Ghostwriters is not authorized to sell the collection to private users; the license was arranged for the compilation to be marketed only to authorized broadcast stations who make payments directly to ASCAP and BMI.

Lest you think you can make up a set of fake calls and send a check to Ghostwriters for The "A" List, save your

continued on page 60 ▶

250 Programmable 5-band Processor

Gated AGC, 5-band Compression and EQ, split-spectrum Limiting—all with colorless gain control. Manually pre-program 4 processing presets or place entirely under RS-232 remote control.

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World Radio History

LINE OUT

Lend Me Your Comb Filter: 3:1 Rule

by Bruce Bartlett

ELKHART, Ind. Suppose you are recording a jazz trio in mono for radio broadcast.

For simplicity, we will say one mic is on the drum set, one is on the piano, and one is on the bass.

The drums sound funny, like they were being filtered. What's happening?

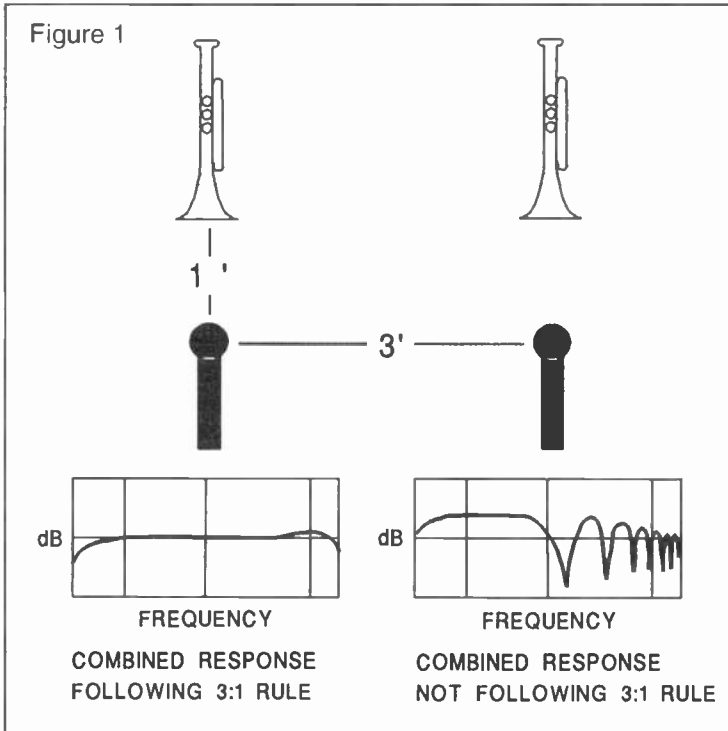
The piano mic is picking up the drums at a distance. The drum mic is picking up the drums up close. So there are two drum signals in the mix: One is direct and one is delayed.

When you combine a signal with its delayed replica at equal levels, certain frequencies cancel out, depending on the delay.

There appears a row of notches in the frequency response where the sounds cancel. This is called a comb-filter effect, because the frequency response looks like the teeth of a comb.

In general, if two microphones pick up the same sound source at different distances, and their signals are fed to the same channel, this might cause phase cancellations. These are peaks and dips in the frequency response caused by some frequencies combining out of phase.

The result is a colored, filtered tone



quality that resembles mild flanging, although some have described it as sounding like a length of roof gutter pipe.

To reduce phase cancellations between two mics, follow the 3 to 1 rule: The distance between mics should be at least

three times the mic-to-source distance.

For example, if two mics are each one foot from their sound sources, the mics should be at least three feet apart to prevent phase cancellations. See Figure 1.

Tech Talk

How was the 3:1 rule determined? It started with the following phenomenon:

When you add a signal to its delayed replica at equal levels, you get severe

comb filtering with deep notches. But when you mix direct and delayed signals at different levels, you get less deep notches.

Specifically, if the delayed signal is 9 dB less than the direct signal, the comb-filter notches are only 1 dB, so for all practical purposes they are inaudible.

How do we make sure that the delayed signal, picked up by a distant mic, is at least 9 dB below the direct signal picked up by the closer mic?

Put the distant mic at least three times farther from the source than the close mic. Due to the inverse square law, the level drops about 9.5 dB when the distance to the source is increased three times.

So the 3:1 rule ensures that the level at the distant mic will be down at least 9 dB, so the mixed signals will have comb filtering of ± 1 dB or less.

A ratio of 4:1 or more is even better. The 3:1 ratio is the minimum to avoid audible comb-filter effects. Suppose you have a close mic and a distant mic. The distant mic is either used for reverb pickup, or to pick up another instrument. You set its gain to get a normal recording level for that mic's sound source.

Suppose the close mic is picking up a loud piano, and the distant mic is picking up a quiet acoustic guitar. You've placed the mics following the 3:1 rule.

But you have to turn up the guitar-mic gain a lot because the guitar is so quiet. If so, you might negate the 9 dB separation. That is, the piano signal in the guitar track might be less than 9 dB below the piano signal in the piano track, because the guitar-mic gain is so high.

So there is more to it than just the 3:1 placement. The idea is to get at least 9 dB difference between track levels for the same instrument. You want at least 9 dB

continued on page 61 ▶

'80s Music Library

▶ continued from page 59

effort. The company is obligated to cross-reference your calls against an active database of licensed stations and will raise questions if everything does not jibe.

I personally applaud this condition. Agreements like this keep prices reasonable, licensed users happy and stations competitive. The onus is on stations to legally and accurately log the music they play.

Non-licensed users can always order the K-Tel collections from TV or buy cutout CDs at the record store. The rest of us can call Dave and order the collection.

Act now!

If you plan to update the '80s core at your station, cut a check soon.

Ghostwriters has lopped more than a third off the price of The "A" List until Dec. 31. This means Dworkin and the gang will send you those

Dave Dworkin comes to your rescue.

765 songs on 50 CDs for only \$399, but for a very short while.

They are going to wise up and hike the price back up to \$599 in January. Get it now and put it into your station CD jukebox while the price is still low.

Ghostwriters also has a service for cutting custom CD oldies libraries. Pick from a list of 31,000 titles and have custom CDs burned with your selections for \$158 per 30 songs. The price gets better when more songs are selected.

Ghostwriters is at 2412 Unity Ave. N., Minneapolis. Reach them at (612) 522-6256 for information on products and services or circle Reader Service 123.



Introducing Spotboxx™ from NSN - the reliable way to send and play spots, news, ID's and more for radio station groups, networks, and translators. Spotboxx™ records spots and short programs sent through any satellite audio system and plays them back with the touch of a button. The "Black Box" design with single button playback helps eliminate local DJ error.

Spots can be sent to individual stations, logical groups, or all sites on your network. For live program delivery with localized affiliate breaks, Spotboxx™ sends the program direct to air and runs stored spots during breaks. For localized network newscasts Spotboxx™ automatically

inserts the local break and sends an EOM closure at the end of the news segment. A second button allows playback of required spots without playing the newscast.

The network controller works with any readily available Windows audio editor. Addressing and downloading are performed on the same server PC. Logs are sent through the satellite system data channel. Affidavits of performance can be retrieved by modem at the network control center at any time.

Spotboxx™ is compatible with any satellite audio delivery system that has a data channel, digital or analog. No audio transcoding problems.



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PRODUCT GUIDE

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

Waves Plug-in

Waves Ltd., introduced the PS22-StereoMaker plug-in for the Digidesign TDM/SDII system.

The PS22 StereoMaker creates rich, spacious stereo imaging from mono sources and enhances the spread of stereo sources. It can be used on single tracks of a mix — such as main announcer tracks — or for stereo enhancements of backing music tracks or effects.

The PS22 is designed to avoid problems common with stereoization processes. It has virtually no "phasiness," very low coloration, high tonal accuracy and good mono compatibility. These features make the PS22 sound natural and free of fatigue.

Every sound in the mix can be spread around its original stereo position, creating a virtual acoustic reality where all sound sources have a size and not a single point of origin.

The PS22 is available worldwide at a suggested retail price of \$1,169.

For more information, contact Waves Ltd. at (423) 689-5395 or circle Reader Service 104.

New BASF Cassettes

BASF Magnetics introduced the Reference Maxima TPII line of cassettes; a full line of analog reference cassettes for professional recording



studios and production houses.

Features include a three-piece molded shell able to withstand temperatures of up to 203 degrees F. A special control element and newly designed azimuth pins minimize high-frequency losses due to azimuth errors.

The tape is a ferro-cobalt formulation, offering outstanding record level headroom with minimum distortion. The smooth back-coating reduces modulation noise. Tape hubs are marked to make in-cassette cueing or editing easier.

The tapes are available in lengths of C-10, -20, -30, -60, -90 and C-100.

For more information, contact BASF at (800) 225-3326, ext. 4197, or circle Reader Service 71.

Grace Design Preamp

Grace Design presents the Model 201 two-channel microphone preamplifier.

The unit is based around circuitry of the flagship Grace Model 801. Each channel is equipped with phantom power, phase



reversal and a 20 dB attenuator. Gain controls are 24-position gold-contact switches accompanied by a 10 dB output attenuator knob.

The Model 201 is designed to deliver a new level of clarity, subtlety and detail to tape or hard disk with no coloration.

For more information, contact Grace Design at (303) 443-7454 or circle Reader Service 70.

Improved Voyetra Sequencer

Voyetra Technologies is shipping Version 2.1 of Digital Orchestrator

Plus, its powerful and inexpensive MIDI/digital audio sequencer.

The program allows digital audio to be seamlessly edited and synchronized with MIDI tracks in the same PC. Jingle composers and producers of advertising-specific music can utilize digital audio in their work without a significant investment in software.

Version 2.1 supports SMPTE and MIDI Time Code (MTC) in all frame rates, has Tap and Fit Time Transforms to allow freeform material to conform to musical beats and can record up to eight 22 kHz mono tracks on a 90 MHz Pentium PC.

Effects include digital delay, chorus, gate and compressor control and WAV reversal. Full drag-and-drop digital audio editing are also provided. Unlimited bouncing of tracks is possible without increased noise or signal degradation.

Suggested retail price of the Digital Orchestrator Plus 2.1 is \$159.95.

For information, contact Voyetra Technologies at (914) 966-0600 or circle Reader Service 74.

Laserfile CD Box

Laserfile introduced a new type of CD packaging as a next step past the standard CD jewel box.

The easy-to-open Laserfile carrier has a black tray that slides halfway out of the clear case, then tips down. The disc is held inside by the edges only, avoiding scratches to the disc surface.

Benefits include more graphic space on the case for artwork, three printable spine areas and a "booklet grabber" that can

transport a 32-page booklet or promo materials. The case has no breakable hinge tabs and no rosette that can snap off when removing a CD.

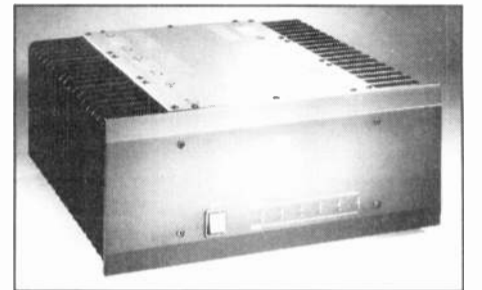
Laserfile manufactures the CD case to the same dimensions as a conventional jewel box and also has a 5.5 x 7.375-inch version of the case for digital video discs (DVDs). Prices and a sample of the new box are available on request.

For information, contact Laserfile at (201) 567-8998 or circle Reader Service 93.

ATI Multi-channel Amplifier

Amplifier Technologies Inc. (ATI) introduces a new line of multi-channel audio amplifiers.

Shown is the six-channel AT1506 with a rated power output of 150W into 8



ohms, or 225W into 4 ohms. With channel-bridging capability, the 1506 can be a six, five, four or three channel amp as needed.

ATI backs the amplifiers with a 7-year warranty and FedEx module replacement service.

For information, contact ATI at (818) 343-4777 or circle Reader Service 124.

The 3:1 Mic Rule

► continued from page 60
of separation, not exactly 9 dB of separation.

Tips

Here are some ways to increase separation:

- Mic close to your sound source.
- Spread instruments farther apart.
- Put a gobo (acoustic panel) between them.
- Record in a deader room. This reduces reflections into the front of each mic, which can degrade separation.
- Use a pickup on the guitar instead of a mic.
- Use directional mics, and aim the null of each mic polar pattern at the other mic.

If the close and distant mics are two cardioids aiming in opposite directions, the mics can be closer than 3:1 and still get enough separation.

Another tip to prevent phase interference: Do not use two mics when one will do the job.

For example, use just one mic on a lectern. If you must use two mics mixed to the same channel, place them so their grilles touch, one above the

Do not use two mics when one will do the job.

other.

That way, there is no delay between their signals, and no comb filtering.

□□□

Bruce Bartlett is a mic engineer, writer and recording engineer, and the author of "Practical Recording Techniques" published by Howard Sams. He can be reached at (219) 294-8388.

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Small Stations Dream Big and Win

by Chris Hamaker

LOS ANGELES Small market broadcasters can thrive by targeting revenue from local schools, churches and, surprisingly, even the printed word.

Danny Fletcher likes to work with institutes of higher education. Through contact with the universities in his area, Fletcher, of KFYO(AM), Lubbock, Texas, hires college students to conduct listener research. Paying students minimum wage to ask customized questions of several listeners, Fletcher ends up with 1,800 interviews per ratings period, all of which Fletcher said costs \$1,000 a week less than Arbitron research.

Establishing a rapport with students during their college years can lead to further benefit later on.

"Some students graduate to become excellent employees," Fletcher said.

Fletcher also has advice for full-time sales staff and how best to pitch potential clients.

"We have to quit being spot sellers. We have to start being marketers," Fletcher said. "The real issues (for potential advertisers) are results, not ratings."

Money is the motivator for most sales staff, according to Fletcher.

"Salespeople are salespeople because they like to make money. Let them. Offer incentives," he said.

Barb Spencer of WBIW(AM), Bedford, Ind., advocates a "relentless pursuit of revenue," which she said is best achieved by targeting local industry for advertising dollars.

"Any sound business has discretionary money to get its message out," she said, cautioning stations to always use the term "message" when presenting sales proposals rather than "commercial" or "advertising," both of which carry too many negative connotations.

Spencer said she books \$26,000 to \$27,000 a year from local churches. She cited as an example of church-supported radio spots several recorded abstinence

testimonials from local church youth, during which the kids speak for 28 seconds. A seven-second space is reserved for sponsorship.

Another income-generator is a "scholar salute," a brief spot airing during drive-time that highlights a particularly high-achieving student and allows sponsors to ingratiate themselves with area schools, thereby boosting their community image.

The printed word

Steve Samet is "hoppin' mad at the newspaper," Samet, of WZOE-AM-FM in Princeton, Ill., said the local paper is his leading rival for ad revenue. His solution to the rivalry: publishing his own!

"You can start a newspaper anytime. Newspapers can't start a radio station," Samet said.

Samet distributes both a one-sheet daily news page and a thicker quarterly paper to 1,200 restaurants, truck stops

and other gathering places. Content includes articles supplied by two companies based in New York, clip art provided by other companies, and radio station tie-ins, such as answers to trivia questions asked on the air.

Charging \$8 a day for a three-month minimum commitment, Samet nets \$32,000 a year. "(Advertisers) will line up to buy it. It's print, after all," Samet said.

Roger Utneher, of Nicolet Broadcasting, Inc., Luxemburg, Wis., offers another unique approach to boosting station revenue.

"We try to be the Wal-Mart of radio," he said. "We sell a lot of ads at a low rate." Utneher emphasized attitude as the element that best determines a station's success, telling attendees to project an image of success, declare their stations "negative-free zones" and to encourage their sales staffs.

"Affirmation is radio sales' missing ingredient," Utneher said.

The small market broadcasters offered these tips during a Radio Advertising Bureau session at the recent NAB Radio Show.

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To Understand FM, Start With Those VUs



Part II

by Ed Montgomery

This is the second installment in a multipart series intended "to make the new generation of FM broadcast station managers aware of the equipment for which they are responsible and to help them periodically review how the equipment is operating."

You can receive continuing education credit from Northern Virginia Community College for completing this course; all information will be published in RW. Complete the registration form shown on page 68 and return it to NVCC by Dec. 1.

ALEXANDRIA, Va. It is important to understand the components of any radio station and how each part contributes to the final radio signal.

The system can be divided into two primary sections, audio and radio. Most of the equipment found in production rooms and studios is usually audio in nature. The only exception would be a signal received from a remote source via a microwave system or a signal received from a satellite feed. Often a receiver for these signals may be located in a studio with some sort of indication either from a meter or light-emitting diode indicating they are on and operating.

Look over the equipment in your broadcast facility. Familiarize yourself with its technical operation and relate the content of this series to it. The audio console or board receives all audio sources and combines them with any other locally produced material or live voice for final transmission to the city of license. Signals from microwave remote broadcasts or satellite services are demodulated or converted to audio signals before they enter the studio board.

Most audio consoles manufactured today come with a set of multiple VU meters. These meters are designed to measure the average level of audio a sound source is producing. VU, or volume unit, was a measurement

continued on page 68 ►

PROMO POWER

Use TV to Target Your Message

by Mark Lapidus

WASHINGTON Because of the "Fall Book," thousands of radio station commercials are appearing on television around the country.

A friend recently asked me, "Why do most TV commercials for radio stations seem the same?" My knee-jerk answer: "For three reasons: first, fewer than 10 companies produce most radio commercials.

"Secondly, radio is a copycat industry. When something works, many attempt to mimic the success.

"Thirdly, most commercials have the same elements: the name of the station, the frequency, the type of music they play, the morning show, and a reason to listen."

Then he asked the question that has been hotly debated after years of trial and error: "Do they work?"

Yes, I believe that television spots do work and that they are the most effective method of promoting radio listening and more importantly, recall for diaries.

TV 101

What I'm about to discuss may be TV 101 for many readers, but reviewing the fundamentals of any game is a worthwhile endeavor. How much more so, when there is so much money at risk?

Advertising works. If you don't believe it, you don't belong in radio. I remember the first time I did a remote at a furniture store, it offered "instant credit for anyone in the military, E-1 and up!" I was scared to death nobody would walk through that door. In half an hour, the place was packed. The reason? Radio and television attract cume. Television attracts numbers that most radio stations only dream about.

In major markets, one hour of prime-time viewing could be larger than a radio cume for an entire week. Like radio, television is targeted. Sure, the target is less defined, but, nonetheless, even the worst media buyer can tell you what most of your target audience watches.

What's not to like? For starters, the expense is not for the faint of heart. If you cannot be competitive with others in your market, pick another medium. If your agency is not offering a competitive analysis of what other stations in the market are buying in TV time prior to your entering the game, they're not looking out for your best interests.

The reason some agencies don't like to obtain market "competitives" is because you may realize that even though you've budgeted \$250,000, you do not rank in the top five of radio spenders. This could cause you to switch media, thereby costing the agency a hefty commission. *If you can't pay, don't play.*

What are the most important elements to a successful campaign? 1) A great-testing spot. 2) A large, compressed schedule. 3) An excellent sounding radio station that delivers on the promises made by the television commercial.

Great spots

The best television commercial strikes an emotional chord and gives viewers a genuine reason to listen. It is also simple to understand. Too many elements complicate the message. There is one airing in my hometown that explains the music format, mentions the morning show and tells

you how much big money you can win.

Instead of just picking one element, like the contest, they did what most stations do: they produced a spot that will make everyone at the station happy. The morning guy is satisfied. The program director likes the artist videos that explain the format. And the promotion director is pleased about the contest, although the spot doesn't tell you how to play or when to listen.

Will it work? Probably not. I doubt they tested it. I've never seen a focus group that could recall that much information from a television spot.

Why test a television spot? Because if it doesn't work, you don't want to air it! I

once asked a promotion director to pre-test a spot and he informed that he did not want to because if the spot tested poorly, he would have nothing to air. He figured a bad spot was better than nothing. Wrong!

Laugh if you want, but even the big production companies do not test most of the spots they syndicate. Instead, they wait for stations to act as guinea pigs. I cannot fathom how a station can place a schedule for even \$50,000 and not pretest a spot. It is the most common industry error. It happens because stations don't budget any money for a couple of focus groups or a re-cut of the spot. Also, poor planning leads to incredibly tight timetables. Don't

forget that if you are buying syndication, you have the unique ability to pretest a spot even before you buy it.

Scheduling rules

I could spend an entire article on television spot schedules, so here are just a few basic thoughts. Read "Radio Advertising's Missing Ingredient: The Optimum Effective Scheduling System," by Steve Marx and Pierre Bouvard, available from the NAB at (800) 368-5644. Next, have your agency read it. It will teach you the fundamentals of squeezing your points to get the best frequency and reach.

After your schedule is placed, spend an hour very carefully reviewing it. Do not avoid prime time simply because it is expensive. It costs more for a reason: it works. To get your own staff and clients

continued on page 67 ▶

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you beam

the game.

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World Radio History

The "Super Duopoly" System...

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Live Show Interface

Since its release, our Live Show Interface has met with extreme raves. D-Js are excited about the power and flexibility this new interface gives them for their live shows.

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- Drag and Drop of commercials and songs
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There is absolutely no other system that can match our ability to run multiple stations out of one system. Audio Wizard for Windows was designed specifically for the needs of the Super Duopoly. Our state-of-the-art designs allow 4,6,8, or even 10 or more stations to be run out of one system. With numerous multiple station sites running successfully for years, you can count on Audio Wizard for Windows for stability and to provide leading-edge technology that has been thoroughly tested and perfected.

Call-In Show Interface

This innovative module allows a show engineer or talent to run a call-in show from any workstation on the network or even from a modem at a remote site! Our contact closure interface can be easily configured to connect to just about any hybrid and delay unit on the market. If your stations depends on call-in shows for high-dollar revenue then you should depend on Audio Wizard for Windows.

1	Clear Line	Bob Omaha Taxes	On Hold	DUMP DELAY
2	Clear Line	Jill Lincoln Taxes	On Hold	
3	Clear Line	Mary Lincoln Football Team	ON AIR	
Next 4	Clear Line	Mark Denver DIA Airport	On Hold	
5	Clear Line	Bobby Grand Island Gambling Laws	On Hold	
				Delay Unit ON
				Hybrid Run by audio5
				Clear All Lines



Audio Wizard™ for Windows™

The *Flexible* Digital Automation System featuring Windows and Novell Technology

Windows is a Registered Trademark of Microsoft Corporation. Novell is a Registered Trademark of Novell, Inc. Intel is a Registered Trademark of Intel Corporation.

...the standard by which all others are judged.

Quality

Most systems still use slower 486, and even outdated 386 computers. Audio Wizard for Windows uses only name brand Pentium computers on every workstation, as well as the fastest and most reliable hard drives, controller cards, network hubs and modems. In fact, every piece of equipment is the best available on the market today!

Expandability

The system is designed with expandability in mind. You can quickly add more hard drives as your storage needs grow, up to 70 gig or more. And Audio Wizard for Windows can support 100 or more workstations...no other system can even come close to our ability to expand and grow with you!

Unsurpassed Flexibility

Audio Wizard for Windows legendary array of features, extremely easy to use interface and the ability to handle any format, even news, sets the standard that no other system can match. Our Digital Reel-Reel, VoiceTRAC System, On-line Copy Module and the industry-leading Music Automation System are second to none. The multi-track Wizard Editor is the easiest to use editing software available and has an unlimited record length! When you need a true multi-user, multi-station system with an impressive live sound, there is no other choice except Audio Wizard for Windows.

Satisfied Customers

The measure of any system is how satisfied it's customers are. Customer support has always been priority one and we provide exceptional support by having fully trained support experts with radio industry experience. Twenty-four hour emergency support is available 365 days a year to cover any situation you may encounter.



24-Hour Support



**NOVELL SFT III
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Audio Wizard for Windows leads the way in equipment and data reliability and backup redundancy. All commercial spot drives are mirrored as a standard feature, plus drive mirroring is available for all system drives. The ultimate in redundancy, the hot standby mirrored file server provides automatic and continuous operation even if your main file server or any system hard drive experiences failure! Our innovative Local Backup module allows a control room computer to continue running up to four days worth of logs in the event the file server is unavailable and, for permanent archiving of spots and songs, a high-capacity optical drive is available. Plus, all of our name brand computers carry a 3-year warranty!

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MANAGER'S NOTEBOOK

Check Your MBOs and Your PMPs

by Sue Jones

SPRINGFIELD, Va. This is the time of year when owners and general managers begin to think about next year and develop the plan and budget. Surprisingly, a performance management program (PMP), sometimes known as Management By Objectives (MBOs), may give you the best overall performance.

Advocates of PMPs claim they boost a company's bottom line by linking employee activities and compensation to specific organizational goals. Critics say PMPs encourage mediocrity by rewarding those who set easily attainable goals.

Worse, they say, PMPs often create conflict between supervisors and employees. My managerial experience has been just the opposite. Management should review and approve the goals. Adjust them if they are too easy. I have also seen staff members improve their performance after they are aware of the goals and do what they can to help achieve them.

A new study strongly suggests that companies that use PMPs perform better financially than companies that do not. The research was conducted by Hewitt Associates, a Lincolnshire, Ill., consulting firm that specializes in human resources management, and Abbie Smith, a professor

of accounting at the University of Chicago's Graduate School of Business.

The researchers looked at three key financial indicators. They found the companies with a PMP had significantly higher performance in all three key areas and overall had a 30 percent higher financial performance. They also found that investors had greater confidence in the ability of management teams using PMPs. Those numbers are hard to ignore.

The research suggests that these programs encourage employees and managers to channel their time and energy toward defined strategic goals. Understanding and

aligning with the goal is important because it clarifies the direction the station is heading and what part the employee plays.

Working with department heads and employees to set goals, coaching them, and giving them feedback about their performance creates an opportunity for managers to help employees focus on the kinds of activities that will help the station realize its objectives. When employees can see the bigger picture and understand how their contribution fits with the greater goals of the station, they will do a better job.

Meeting the goals will be even more important to staff members if their compensation and bonuses are tied to achieving them. The broadcasting environment increasingly is competitive and is changing so fast that stations cannot afford not to have people focusing on the right kind of work — work that adds value and contributes to the strategic goals. The overall benefit to the station is stronger financial results.

The most successful PMPs share several characteristics.

Implement at the top. Owners, general managers and department heads should help design and implement the program. If general managers and department heads are not committed to a PMP and it is not used at the top level, it will be tough to get the staff to use it.

Make the PMP process simple and integrate it into the daily work process. Some successful PMPs use only single-page forms, keeping the evaluation process short and relatively painless.

Set a reasonable number of attainable goals, perhaps only four or five. Include bonuses and incentives to reward those who achieve their goals. If your business manager meets a goal of reducing overall operating costs by 10 percent, you gained on the bottom line. If your engineers improve the sound of the station, you have retained/gained listeners. If your promotion manager develops programs that generate more listener calls or better turnout at remotes, you have improved market share.

Give continual feedback. Annual PMP reviews are inadequate because they don't allow for mid-year or quarterly adjustments. Make them as needed. This can be the difference in falling short of your goal, and achieving or exceeding it.

Frequent goal reviews also reinforce and focus the staff's attention to the strategic direction of the station. If your goal is to increase sales by 15 percent and the first quarter performance is only 12 percent, the staff knows they have to work a little harder and smarter to achieve the goals and get an annual bonus. They also receive this information early enough to make adjustments. November or December is too late to take corrective action in your annual performance.

Quarterly reviews are also an outstanding time to recognize top performers and pat them on the back verbally and present them with other valued rewards.

Managers must be committed to the time and energy PMPs require. Coaching the staff is critical to its success. If you fall short of your goal in one quarter, you will get better performance and improvement if you give the staff some recommendations of how to improve rather than berating them. Once a PMP is in place, managers must continually evaluate it.

Even with the challenges that PMPs present, they are worth the effort. The proof will be on your bottom line and hopefully not on those of your competitors.

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COLE'S LAW

DOJ May Put Brakes on Consolidation

by Harry Cole

WASHINGTON Did you ever see those horror movies where some evil alien/disease/mutant/etc. is loosed on an unsuspecting public, often by well-intentioned but careless scientists? And just when it looks like humanity and civilization as we know them are about to be completely destroyed, the aliens/diseases/mutants/etc. start to die off for some totally unexpected reason.

(The classicists among you will recall the plot of H.G. Wells' "The War of the Worlds," where the aliens were felled by bacteria to which humans were immune.)

Well, it looks like something along those lines may be playing itself out in the wild and crazy world of radio ownership.

Where we were

When last we visited this subject, Congress had passed the Telecommunications Act of 1996, the FCC had codified the new ownership rules, and the ranks of radio licensees were shrinking faster than Red Sox pennant hopes in any given

September. While nattering nabobs of negativism (such as the armies of researchers and writers who comprise Team Cole's Law) may have carped about some of the less-than-perfect aspects of the new ownership "limits," such carping had, frankly, no apparent effect at all. Consolidation continued unabated on its rampant course.

Now, however, it looks like the governmental equivalent of common cold germs may be choking off the spread of consolidation fever: the Department of Justice has begun to review a number of the major radio ownership deals.

The purpose of the review is to determine whether those deals run afoul of the antitrust laws.

Antitrust laws? You may have forgotten about those. After all, during the 1980s it was most unfashionable to think that antitrust violations might occur anywhere. While the antitrust laws remained on the books, enforcement of them was pared back dramatically. The notion that "bigger is better" — that is, the antithesis of conventional antitrust philosophy — tended to rule. And governmental intervention into private commercial deals, intervention based on antitrust concerns, became an extreme rarity.

That was then. This is now. And now, for whatever reason, the antitrust folks at DOJ are flexing their muscles in the direction of radio deals. Published reports indicate that DOJ is looking at a number of the more prominent consolidations. Already, the Jacor incursion into Cincinnati has been modified at the behest of DOJ (with Jacor being forced to divest one of its FMs).

And DOJ has threatened to sue American Radio Systems in connection with its effort to buy up much of the Rochester market. Consolidation activities in a dozen or more other markets are also under scrutiny.

While DOJ interest in particular transactions may be understandable (if some-

what unusual, given the lack of any significant antitrust enforcement over the last, say, 10 years), the DOJ interest apparently extends even beyond the metes and bounds of the individual purchase/sale deals.

According to The Wall Street Journal, DOJ is also looking closely at local marketing agreements (LMAs) and joint sales agreements (JSAs) to see whether those devices themselves run afoul of the antitrust laws.

Wrap your mind around that. Two business arrangements — LMAs and JSAs — which have, over the last five-six years become absolutely standard in the broadcast industry, may not be 100 percent slam-dunk legal! But what about the fact that the FCC has expressly blessed LMAs (and, somewhat less expressly, JSAs)?

That appears not to be a matter of overriding concern to DOJ.

Indeed, DOJ seems to be taking the position that implementation of a premerger LMA may constitute a separate, actionable violation of the Hart-Scott-Rodino Act. That act generally requires entities about to engage in a substantial merger or consolidation of interests to so advise DOJ and then to maintain the premerger status quo while DOJ reviews the proposed deal to assure compliance with the antitrust laws.

What's doing

Now, you are probably familiar with the general modus operandi associated with many license assignments these days: the parties enter into a purchase/sale agreement and, simultaneously, an LMA (or maybe a JSA). The idea is that, while actual change of ownership must await FCC approval, the buyer can, through the LMA, begin to operate the to-be-acquired station immediately.

To the uninitiated, execution and implementation of an LMA might appear to be a completely innocuous exercise. After all, by its own specific terms an LMA

invariably provides that ownership and control of the LMA's station remains in the hands of its licensee. But DOJ appears to be leaning in the opposite direction, i.e., that notwithstanding the lack of any actual change in ownership, an LMA may still be an event triggering Hart-Scott-Rodino reporting and stand-still requirements. If DOJ does in fact come to this conclusion and attempts to enforce it, it will doubtless come as something of a disappointment to anyone caught in the thus-extended reach of the law — particularly when they get wind of the fines of \$10,000 per day of violation for which they could be liable. Ouch!

It is not clear where all this will end up. After all, Congress itself (with the imprimatur of the president) enacted the Telecom Act, which certainly seems to encourage precisely the kind of consolidation activity in question. Why, if the president signed the Telecom Act, is the president's law firm (i.e., DOJ) seemingly trying to undermine the effects of that act?

These are the kinds of mysteries you run into in Washington. Presumably, there are various agendas at work, some of them public, some of them hidden. Ultimately, we will probably never be fully let in on what is causing this situation. Suffice it to say, though, that if you are planning to consolidate or be consolidated — whether through a sale, a formal merger, an LMA, JSA or whatever — you should be alert to the fact that your deal may be subject to a lot more bureaucracy than just the FCC.

If you have any questions about the applicability of the antitrust laws to your plans, you would be well-advised to consult first with your communications counsel.

(P.S. — On an unrelated topic, as mentioned in my last column, we are still looking for stories about broadcasters' experiences regarding local public inspection files; send 'em on in.)

□□□

Harry Cole is a principal in the Washington-based law firm of Bechtel & Cole, Chartered. He can be reached at (202) 833-4190 or on the Internet at coleslaw@erols.com

Radio on TV Sells

▶ continued from page 63

excited about the campaign, distribute exact channels and times for the first few days.

Have your agency do overnight reviews every day so that make-goods can run within the schedule. A final thought about agency selection: consider picking an agency out of town or allowing your corporate marketing person to take care of the entire selection process.

When you select an agency from among your own client base, you lose. Although you'll make the one agency happy, you'll make many others into enemies. You will also discover that the local agency you selected will gradually do you fewer and fewer favors in getting you buys.

Deliver!

Before you even consider television, your team must agree that the radio station product is sounding terrific. If you cannot reach agreement on this fundamental, you are not ready for prime-time.

Lastly, you have to deliver on whatever promise you make on television. If you promise 20-in-a-row all day, you cannot just do this feature once in awhile — you have to do it all day.

Don't make promises you can't keep. See you on TV!

□□□

Mark Lapidus has held positions as corporate vice president/marketing, program director, promotion director and DJ. He is a marketing geek. For consultant services, call (703) 764-3994 or e-mail to: lapidus@erols.com



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Know What Those Meters Are Saying

► continued from page 62

developed in the early days of electronic communications by the telephone company.

If you study a VU meter, whether it is an old analog meter or the new series of light-emitting diodes, you will notice that its numbers vary in distance with each other. The distance between -3, through 0 to +3 are nearly the same, but the numbers beyond -3 down to -20 get closer and closer together. This is because you are looking at a logarithmic measurement rather than a linear measurement.

The volume unit was based on logarithms because human hearing was found to be logarithmic in nature. If you double the output sound of audio, you do not double the perceived sound in the human ear.

The optimum operating level for the VU meter is located at "0." This corresponds to a specific output level of the console and a specific input level to the equipment it feeds: some form of audio processor or limiter, a tape recorder, a computer.

It is important to know what the output level of a piece of broadcast equipment is, as well as its operating impedance. Also important are the input level and impedance of the equipment it is feeding.

At this point it is important to consult with an engineer.

Mismatched outputs can result in low signal levels, high signal levels and distortion. The equipment manual will specify what the operating level is.

Properly prepped

The VU meter is important when preparing audio for broadcast. The audio sources of today's radio station include turntables, compact discs, tape decks, cart machines, phone lines, microphones and computer harddrives. Satellite feeds need to be set at proper operating levels as well. When material is recorded for future playback or is being played back through the board in real time, it is important to monitor the output level of the signal.

Most of the audio signal should measure around "0" on the VU meter. Vinyl discs, compact discs and tapes are manufactured with the optimum levels recorded on them. These test recordings can be used to set audio levels throughout the station. One note of caution: Analog audio tape levels can change from tape manufacturer to manufacturer, and from different types of tape made by the same manufacturer.

Tape machines can be adjusted to increase or decrease the magnetic field recorded on the tape. This information is supplied by the tape manufacturer. Programs received from satellites, or telephone remotes are usually preceded by a 0 VU level tone. This permits optimum operating levels as the signal travels through the local station console.

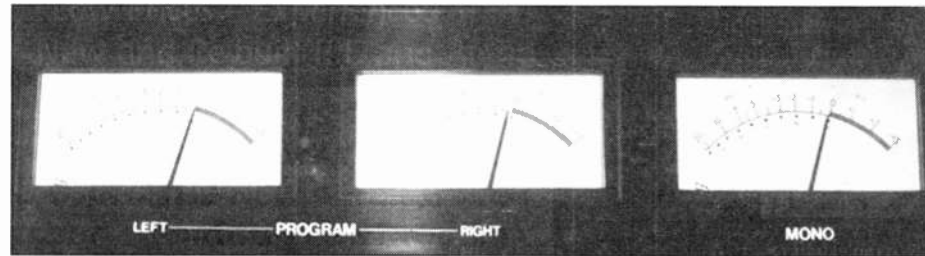
Usually, audio console attenuators (volume controls) have an optimum level set on them. Most consoles also have screw-driver trim attenuator adjustments to trim the output level to a specific location on the attenuator. An engineer can set these levels for pre-recorded sources so that the attenuators

only need to be adjusted for voice-overs or slight level changes of recorded music.

If music or voice is being recorded onto some computer memory system within the station, monitor the record-

the console as in a source.

Most of the stereo consoles manufactured today come with a mono VU meter. This is a very important feature that can be used to determine what the signal sounds like. It is likely that

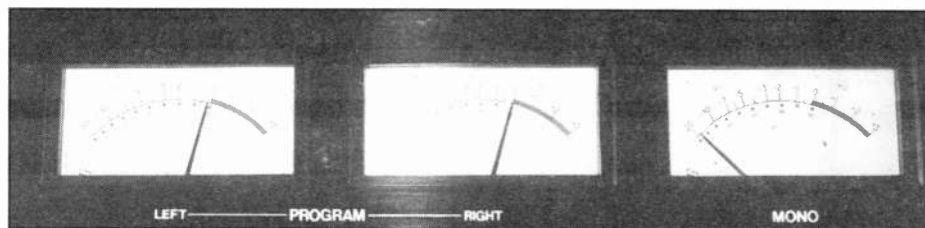


Audio is in phase.

ing and make sure that the signal does not continually exceed the "0" VU level. The numbers above this on most VU meters are in red. They indicate, in decibels, of the signal above the optimum operating level. Occasional

many of the radios tuned to your station are monophonic, such as clock radios, portables, etc.

Even in this age, the possibility arises that some recorded material will arrive at your station with the channels



Audio is out of phase. Note mono meter.

peaks of "+1" usually do not cause much of a problem.

Most people can not detect a change of 1 dB. However, depending on the characteristics of the equipment, operating above the "0 VU-level" can cause distortion. Some equipment has been designed with headroom permitting higher levels of signal without distortion. Material recorded above optimum level can result in loss of dynamic range in other audio processors in the audio chain.

Dynamic range is the ability to reproduce the entire range of sound as close to the original sound as possible, capturing the low and high audio levels as they sounded in their original form.

Broadcasting stations using some form of automation or assist from pre-recorded material need to record all levels uniformly. If not, the station audio will be poor with very high levels followed by very low levels or voices that are at the same level of the music or sounder beds they are recorded over.

The unattended studio can also produce out-of-date news, weather and traffic if someone does not update files periodically.

Human touch

No system can run independently of a human hand. Unattended or operator-assisted broadcast systems should never sound as though the light is on, but nobody is home.

VU meters can also indicate possible problems within the audio chain. For instance, if a VU meter will not return to its resting place, it may indicate hum or noise in the system. Track this down by removing all audio from the board and turning up the audio monitor. Increasing and decreasing the levels of the individual channels can locate where the problem might be, either in

this by producing a very low level while the stereo meters will be operating normally (see photo). The operator or manager can immediately detect this by monitoring and knowing what the VU meter reads.

Stereo monitors in the studio will not necessarily detect the out-of-phase condition. The immediate solution to transmitting an acceptable program would be disconnecting, or turning down the output of one of the channels, often the right side. The engineer in charge of station maintenance could fabricate a device with a switch to correct the phase or the station could buy an audio processor that would automatically correct the phase.

If phasing errors do occur, determine if they were due to an external source or originated in your own production room. Audio phasing problems should be written down and forwarded to the engineer or company responsible for technical maintenance or the production of the program aired.

The stereo signal with all its separation is very nice to listen to, but it does not reflect what the listener is hearing. There are program directors who want the disc jockey or individual responsible for operation to listen to the air monitor. This allows the personality to hear exactly what the listener hears from the transmitter. This can greatly assist in the mix of voice and music. It is probably even better to listen to the "air" in mono, to detect any phase cancellation immediately.

□ □ □

Ed Montgomery is lab director at Thomas Jefferson High School for Science and Technology in Alexandria, Va., and a part-time radio engineer.

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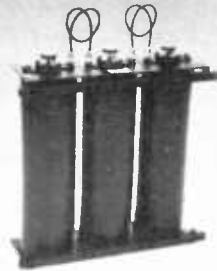


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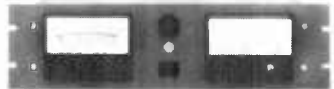
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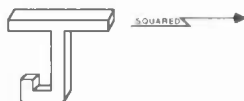
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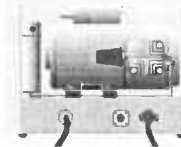
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USER REPORT

Instant Replay to the Rescue

by Marvin Collins
Director of Engineering
KFI(AM)-KOST(FM)-KACE(FM)

LOS ANGELES Instant Replay is an entirely new breed of digital recorder from 360 Systems that places a whole audio library at your fingertips. Its unique design stores 1,000 cuts on an internal hard disk, and offers instant access via hot-key presets. The result is an exceptionally powerful and convenient way to manage an on-line audio library.

In September 1994, KFI Inc., the owner of KFI(AM) and KOST(FM), purchased another Los Angeles station, KACE(FM). It was my intent that two old studios would be renovated into one new modern studio for KACE in the KFI-KOST building. As it turned out the budget did not permit this. Instead, the two studios were torn out, a wall removed, and an existing console and associated equipment were brought over from the old KACE studio location.

This immediately caused a series of maintenance problems. The biggest one was how to keep the commercial playback system operating well. KACE had been using a floppy disk-based system which seemed like a good idea, but as a practical matter the floppy disk drives intended for computer use could not stand up to the frequent insertion by disc jockeys in a hurry.

Problem solved

There were times when the manufacturer could not supply replacement floppy disk drives fast enough. What to do? We were not ready to convert the entire KFI-KOST-KACE studio complex to a large digital storage system. KFI and KOST have been using Tomcat cart machines, which are no longer manufactured, so that was not an option.

While struggling to keep the KACE floppy disk reproducers operational, I attended a Society of Broadcast Engineers meeting where Steve Gordoni of 360 Systems in Thousand Oaks, Calif., gave a demonstration of the new Instant Replay unit. As he was demonstrating the unit I was trying to imagine how it might fit into the KFI-KOST operation. I had not thought about it for KACE until he mentioned that it could store 480 minutes of stereo material. I discovered we had less commercial time than that to store, so I suggested the Instant Replay as a commercial playback unit.

We bought two units and installed them both in the KACE on-air studio. Both machines would be loaded with the commercial and jingle libraries. With two machines, we could make cross fades from one Instant Replay to the other. Also, having redundant machines in the studio would provide a good backup in case of an Instant Replay failure. After 18 months, there have been no failures.

In addition, we bought a 360 Systems DigiCart for the KACE production studio. Now the KACE production director can produce commercials on the DigiCart and then feed the completed commercials to the two Instant Replay machines in the KACE air studio via the 360 Systems D-Net. D-Net is



Kim Amidon of KOST(FM) using the Instant Replay at Disney World in Florida.

a coaxial cable between the KACE production studio and the KACE air studio.

During music sweeps when the Instant Replay machines are not in use, KACE production director Mark Drummond can initiate a D-Net transfer of his completed commercials. He said this is better and requires less effort than a sneaker net. Mark has complained that because the D-Net is a one way network there have been times when a transfer has not been completed properly. This usually happens when the disk drive is full

or an announcer uses the Instant Replay for a commercial break before the D-Net transfer is complete. This causes the D-Net transfer to be aborted but no error message is reported back to DigiCart.

Also, there seemed to be an intermittent problem that would occur when the disc jockeys would build a playlist in the Instant Replay for automatic segue through a commercial break. 360 Systems provided firmware upgrades that seem to have cleaned up this bug.

It should be pointed out that the unit does not have some of the bells and whistles for managing a large commercial inventory that some of the larger digital storage systems by other manufacturers have. But the data compression used to store so much audio on the hard drive is transparent.

The Instant Replay sounds excellent. Every cut has a name and ID number, so it can be readily located when needed. A convenient "find" feature can be used to quickly locate any cut just by typing its name or ID number. Alternately, scroll arrows can be used to find a particular cut, or to browse through the entire directory.

Of course, there are other applications for the Instant Replay. When the KOST morning team of Mark Wallengren and Kim Amidon saw the unit, they wanted one for storing and playing sound effects, background music and jingles.

Two Instant Replay machines were purchased and installed in the KOST studio and now Mark and Kim each have their own.

The Instant Replay is so small they take it out on remote broadcasts. I am writing this review in my hotel room at Disney World in Florida where we are broadcasting the KOST morning show in celebration of the 25th anniversary of Disney World.

Yes, the Instant Replay is with us performing with Mark and Kim.

Here is some last minute good news. The prices and availability on hard drives have become so good that the Instant Replay are now available in eight- or 16-hour models.

For more information from 360 Systems, contact the company in California at (818) 991-0360; fax: (818) 991-1360; or circle Reader Service 90.

USER REPORT

How I Learned to Love VoxPro

by Bob Rivers
Morning Drive Disc Jockey
KISW(FM)

SEATTLE A year ago, our chief engineer brought in a VoxPro digital phone recorder from Audion Laboratories and I was more than a little reluctant about it. I am an old school guy who has edited tape for 25 years. Just looking at a computer keyboard was intimidating. Just give me Stop, Play, Record, Rewind and Fast Forward and I am a happy camper.

My engineer told me to look at the VoxPro control panel, an 8- by 13-inch box that sports the familiar Stop, Play, Record and Fast Forward-rewind keys. I was thinking, well, it looks simple. And, it was. I warmed to the idea, but asked him to keep the tape machine just in case. I have not touched it since.

Frankly, what scared me about digital recorders was the big eight-track machine our production guy uses. I could have done it three times faster with tape. But VoxPro was different. Way different.

Mission accomplished

The thing I like about VoxPro is that it is simple. It is obvious all VoxPro

wanted to do was replace tape machines with something as simple to use. I can honestly say that they have accomplished that and more. It has all the advantages of tape and none of the drawbacks. I can now edit almost as fast as I think. For instance, I record a lot of interviews with VoxPro. I know some guys say they do not like to tape interviews because it ruins the spontaneity. But if you are like me, sometimes spontaneity sounds awful. With VoxPro and the Record-Insert button I can go in and delete my lame question and Insert-Record a new one, sounding as smooth as Larry King.

At first our engineer was reluctant to install VoxPro because the 14-inch color monitor would take up space. But it soon became evident that of all the things we needed, space for this was at the top of the list — right next to live promos and scripts.

No other piece of equipment is used more in the control room and it deserves the priority.

I am thankful the monitor is there and is big as it is because I can see the entire list of recordings at a glance, bringing them up in an instant while on air. I think that is where I appreciate the VoxPro simplicity most; operating it

while on air is a major bonus.

VoxPro is a software program that comes to you already installed so all you have to do is plug and play. It is designed to record and edit phone bits, contests, actualities and sound effects on the fly. Because it is a computer driven software product it is easily upgradeable with the ease of a floppy disk. The control panel also features 10 "cart" keys that can be assigned to anything recorded. Once a recording is assigned, pressing the respective key will play that recording instantly. I am a busy guy and I learned VoxPro quickly. So will your jocks.

Specs

The editing technology is proprietary automatic playlist assembly (non-destructive). Resolution: 16-bit (input and output). Sampling rate: 44.1 kHz (no compression). Frequency response: 20 Hz to 17 kHz, plus or minus 2 dB. Headroom: adjustable from 6 dB to 18 dB steps. Nominal input and output level: +4 dBv@600 ohms.

For additional information from Audion, contact the company at (503) 632-4548, or its distributor, Harris Broadcast Corp. at (800) 622-0222; or circle Reader Service 84.

USER REPORT

Effective Learning With Marantz

by Chief Engineer
Radio/Sound Department
Columbia College in Chicago

CHICAGO Columbia College is one of the premier audio educational facilities in the country serving the broadcast, theatrical, recording, sound reinforcement and film industries.

The Marantz CDR610 compact disc recorder has made quite an impact on the Radio/Sound Department of Columbia College. Our college radio station is a learning tool for our students, so we need to stay current with new technology and expose them to the equipment they will be using in the commercial job market.

Versatile unit

In our broadcast program we use the CDR in three areas. We build custom CDs for our classroom studios. We make individual CDs of jazz, blues, urban contemporary, rock, and others that are edited down to 60-90 seconds.

This enables students to do an hour's rotation in 15 minutes, thus the teaching assistants do not have to haul large lazy Susans full of carts from classroom studio to classroom studio.

Another use of the CDR610 is building our specialty programming library in one-fifth the space of analog carts.

In the on-air studio we have three designated CD players, one for PSAs, one for station promos/drops and one for music. We burn individual CDs for each CD player, so we burn a CD for station promos, one for drops and one for PSAs. The result is that we have lessened our dependence on the analog carts and all the problems associated with them. Our massive music library is being transferred to CD.

Our current on-air studio is conventional analog, however, we are moving to digital. The CDR610 has made the transition easier and more cost effective. The move to digital is a two-step process, with the interim step (adding the CDR610) being one that we could later interface with a hard disc and other digital sources.

At the college's Audio Technology Center we have a CDR610 located in a central patch/transfer studio, which can be accessed from any of our eight studios. The eight studios include analog multitrack, digital multitrack, audio sweetening for video, and film sound mix theaters. Students and instructors can record class presentation materials and class projects to CD, which has obvious advantages over cassette.

The Marantz CDR610 has made the lives of our engineering staff easier. We are responsible for the maintenance of a tremendous amount of equipment, but the CDR610 has needed very little attention. That is due to our preventative measures. We have a "no food, no drinks, no smoking" policy and a very effective HVAC filtration system to cut down on air borne particulates. These measures help keep the lasers transports very clean and the Marantz CDR610 performance bullet proof.

Reasonable cost

The cost of operation is reasonable. I purchase blank CDs for seven dollars. Carts cost between five and six dollars, but hold

a small amount of material compared to the CD. Students can purchase blank CDs that are superior to analog cassettes, both in quality and archive life, adding to the

instructors and staff to understand and use. As chief engineer of the department, I view the Marantz CDR610 as an excellent cost-effective and time efficient

As chief engineer of the department, I view the Marantz CDR610 as an excellent cost-effective and time-efficient product.

value of the student's education.

I selected the Marantz CDR610 after being shown that it would be an easy recording medium for our students,

product. It is our archive media of choice, both in-house and as a release medium.

The CDR610 is a standalone unit with a

16-key wired remote control, a nine-pin GPI interface and complete Red/Orange book compatibility.

Marantz has since replaced the CDR610 with the CDR620. The CDR620 features a SCSI-2 interface, a built-in sample rate converter, high speed copying, auto track incrementing from DAT/DCC/MD, improved level meter accuracy (from 3 dB to .5 dB), fade-in/fade-out and index capability.

Another standalone unit, the Marantz CDR615, has the same specs and features as the CDR620 except it does not have a SCSI-2 interface, AES/EBU output and high speed copying. The remote control is optional with the CDR615.

For more information contact Superscope Technologies Inc. in Illinois at (630) 820-4800; or circle Reader Service 45.

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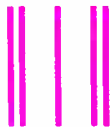
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004	030	056	082	108	134	160	186	212
005	031	057	083	109	135	161	187	213
006	032	058	084	110	136	162	188	214
007	033	059	085	111	137	163	189	215
008	034	060	086	112	138	164	190	216
009	035	061	087	113	139	165	191	217
010	036	062	088	114	140	166	192	218
011	037	063	089	115	141	167	193	219
012	038	064	090	116	142	168	194	220
013	039	065	091	117	143	169	195	221
014	040	066	092	118	144	170	196	222
015	041	067	093	119	145	171	197	223
016	042	068	094	120	146	172	198	224
017	043	069	095	121	147	173	199	225
018	044	070	096	122	148	174	200	226
019	045	071	097	123	149	175	201	227
020	046	072	098	124	150	176	202	228
021	047	073	099	125	151	177	203	229
022	048	074	100	126	152	178	204	230
023	049	075	101	127	153	179	205	231
024	050	076	102	128	154	180	206	232
025	051	077	103	129	155	181	207	233
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TECHNOLOGY UPDATES

TASCAM

MONTEBELLO, Calif. The Tascam DA-60 mkII synchronizable four-head timecode DAT recorder retains the features that made the original DA-60 a success, such as confidence monitoring, memory start and rehearsal. It also has several enhancements that will optimize the DA-60 mkII for the film and video post production environment.

The audio quality is improved. The clean, natural and transparent sound is the result of the next generation A/D and D/A converters incorporating differential power supplies. The A/D converter uses 64x oversampling one-bit Delta-Sigma technology, while the D/A converter employs 8x oversampling 20-bit Sign-Magnitude technology.

These improved converters enable the recorder to capture program material more faithfully and upon playback, virtually eliminates zero-cross distortion during conversion and ensures optimum sound reproduction.

For video professionals, the unit includes an improved servo system, improved signal-to-noise ratio, extended dynamic range and built-in chase lock synchronizer supporting Sony P2 protocol.

The built-in chase lock synchronizer is now standard, enabling the DA-60 mkII to behave like a common VTR in the video environment. This capability permits it to be closely integrated with a wide variety of professional edit controllers and hard disk editing systems.

The DA-60 mkII improved servo system allows continuous timecode recording in the assemble mode and jam sync recording of timecode. This allows the operator to record timecode where it previously stopped, providing a seamless continuation of the numbers being read by either the built-in or external synchronizer.

For more information from Tascam, contact the company in California at (213) 726-0303; or circle Reader Service 52.

PANASONIC

CYPRESS, Calif. The SV-3800 from Panasonic retains all the features of its predecessor, the SV-3700, and improves on them. For analog recording, the SV-3800 uses a Sigma-Delta type one-bit converter to achieve high linearity. The high oversampling rate of this feature produces less group delay in the high frequencies, assuring outstanding phase characteristics. Additionally, the unit provides L/R independent recording level controls and a selectable sampling rate of 44.1 kHz and 48 kHz.

The SV-3800 circuit configuration has been redesigned with an improved grounding layout for more effective noise suppression, minimizing RF interference and hum noise from connected equipment.

Its ergonomic design and front panel selectable features accent its user-friendly controls and operational processes. Convenient cueing to desired portions of a tape is achievable by start-ID or program number (PNO). It can also be set to skip unwanted portions of the tape with the skip-ID function.

The single program play function is ideal for post production and broadcast applications. This function plays program material up to the next start ID, then stops until the play key is pressed again. If skip play cancel is turned off, the unit will automatically skip unwanted portions of the tape.

Digital I/O facilities are provided as standard equipment. In addition to AES/EBU professional format XLR terminals, the

SV-3800 also has IEC 958 consumer format coaxial and optical input and output connectors. Four combinations of digital output termination formats (AES/EBU, IEC 958, coaxial, optical) are user selectable, enabling communication with many digital interfaces. Digital I/O options are easily selectable via the front panel control.

For more information from Panasonic, contact the company in California at (714) 373-7277; fax: (714) 373-7903; or circle Reader Service 53.

HENRY

SIERRA MADRE, Calif. Radio stations using "call-in" weather reports and phoned-in actualities (school closings, traffic

updates, news stories) can replace their aging cart recorders with TeleStor from Henry Engineering.

TeleStor is a digital recording device that automatically records phoned-in actualities for delayed broadcast. It can store up to five-and-a-half minutes of audio sent in via a regular dial-up phone line.

TeleStor operates unattended, so that the caller, can phone in and record a news report without any human assistance. TeleStor automatically answers the call, then waits for the four-digit password that starts the recording process. The password also prevents unauthorized use. It stores the audio report in digital memory where it is ready for playback on the air. There are no carts or erase or reload, just push the play button for instant playback. The output is balanced audio at +4 dBm.


TeleStor is ideal for use with broadcast

automations systems. It interfaces to the system or studio console, just like a cart machine. There are remote start facilities, so audio playback can be started from any external contact closure. There is also a remote play indicator output, and an "EOM" pulse that is generated when playback ends. The EOM pulse can be used to trigger an automation system to start the next program event. TeleStor is an easy way to increase overall reliability while also reducing operating costs. It eliminates a cart machine — with its high maintenance expense — and eliminates the need to have a human operator tend the process of recording phoned-in reports and actualities.

For more information from Henry Engineering, contact the company in California at (818) 355-3656; fax-on-demand (request document #119); (818) 355-4210; or circle Reader Service 128.

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USER REPORT

News-Talk Wins With Scott Studios

by Rick King
Maintenance Supervisor
WMAL(AM)

WASHINGTON Just the thought of making a major change in the operation of any business usually sends shivers up the spines of those chosen to implement those changes.

In the case of a radio station, engineering, traffic, news and programming personnel will all find much to learn. When audio delivered by computer from hard disk is the objective, reliability and ease of use must be prime considerations. It pays to remember that for all its great advantages — speed, excellent audio quality and economy — it is a computer.

With this in mind, the staff at WMAL(AM), a news-talk radio station here, began looking at microprocessor-based audio delivery systems. The Scott Studios radio studio controller plays recorded material from hard disk and presents the operator with a clear-cut visual platform. That sounds easy enough, but we must retain enough versatility to fit any format, yet keep it simple. The Scott Studios Radio Studio Controller gave us great flexibility in configuring our new audio delivery system.

The main screen of the Scott System shows the operator six items on the left half of the screen which are scheduled for airing in the order shown. The items have touchscreen start buttons in addition to board-operated start switches. The scheduled events can be changed in order, or may be played in any order by using the touchscreen "move up" or "start" buttons. If the operator chooses to use the board start switches, the scheduled items will play in order. An auto/manual button allows the Scott System to run in an unassisted mode.

Customized scheduling

The schedule is prepared through a link to the station traffic computer. This computer allows uploading of commercial elements as well as log preparation. After the traffic log is assembled and sent to the studio computers, individual entries can be changed and the log reloaded. In addition, an air log is stored of all events played on the system along with diagnostics to aid in troubleshooting.

At WMAL, the news-talk format works best with the system operated in the manual mode. Our personalities can add program elements chosen from a quickly accessible "wall of carts" by pressing the buttons at the top right of the screen. Once in the chosen category, simply touching the rectangle surrounding the "cart" and returning to the main screen allows the element to be inserted anywhere in the line-up of events to air.

Any of these "carts" can be placed on 17 "hot buttons" on the news booth screen. The WMAL news department will use the "hot buttons" on the news booth screen to expand the schedule to include news cuts. All newscasters will have a hot button with their name on it. When this button is pressed, the Scott System allows the insertion of as many elements the newscaster has prepared on a newsroom workstation.

The newsroom workstations have two programs operating under Windows. The first is a program called Winnews and is

similar to the Wave. Winnews is a cut-and-paste editing program that allows recording of news elements, uploading for general on-air use and use on other



Charlie Warren, WMAL Production Director

newsroom workstations, and the preparation of a cut list that automatically inserts the news cuts in the on-air schedule at

newscast time. The second program is a terminal emulator that permits the newsletter to use the same terminal to access the Basys newsroom editor. A keystroke allows quick movement between the two programs.

One of the big pluses of the Scott System is the ease of building a redundant system with very few common or shared pieces of hardware. Rather than relying on a server and local area network (LAN) for delivering audio, we liked the idea of having the audio for each studio stored on its own hard drive.

Although audio can be uploaded from any of the 12 newsroom workstations, or any of the five additional production locations, it only travels across the LAN when it is uploaded to the four

independent on-air computers. The audio files, schedules and computers in the four on-air studios are identical, but independent. If the network fails or any studio hardware becomes inoperative, playback from one of the remaining three is assured. Local area network failure only inhibits uploading, and system diagnostics are excellent.

Speedy service

In the first months of operation we suffered a fault in one of the computer motherboards, and a corruption of a drive file allocation table. Both of these failures stopped the operation of only one of the four on-air computers. The technicians at Scott Systems had us up and running in a matter of hours.

The WMAL on-air staff has learned this system very quickly and has high praise for its clear cut features. The Scott System hardware is off-the-shelf and readily available. Scott Systems provides a three-year warranty on its equipment, free upgrades during this period and very good technical support.

For more information from Scott Studios, contact Dave Scott in Texas at (800) 726-8877; fax: (972) 620-8811; or circle Reader Service 91.

USER REPORT

Fidelipac: Golden at KIIM-FM

by Robert Malsbury
Chief Operator
KIIM-FM-KCUB(AM)-KHYY(FM)

TUCSON Two-and-a-half years ago, our company decided to remodel the KIIM-FM control room. KIIM-FM is Tucson's heritage country station and has been the number one station for more than five years. The company president is unique in the radio business, he not only wants things done right, he wants them to look and sound right, too.

He has the kind of "golden ear" you dread. We needed something that would make him happy and keep life simple for us. We had no need to change our music from CDs, but everything else needed to be perfect for our resident golden ears.

Knowing that analog audio was on the way out, I wanted a digital solution. Because most of our DJs were not computer literate, a computer-based hard drive system did not seem like the answer. Also, a computer-based hard drive system, when it fails, could produce an unacceptable result "on-air."

Recovering from such a catastrophic failure has always been a major concern of mine. Making hard drive systems adequately redundant can be not only daunting, but expensive as well. Most hard drive system makers have always assumed that it would be the hard drive that failed, not allowing for keyboard, monitor, power supply, LAN or CPU failure. We needed a system that when it failed recovery would be possible in a few seconds.

At that time, there were several manufacturers using a digital cart approach. We eliminated the ones that required the operator to select which cut he wanted to use. After all, one of the reasons program directors liked carts so much was that they prevented the DJ from playing the wrong cut, something that happened often when vinyl records were used. Finally, we decided to go with the Fidelipac DCR-1000. The

layout of control functions was similar to a cart machine.

The system records on standard 2 MB floppy disks, a 50 cent item. We have about 400 of the diskettes in each studio and everyone, including the program director and the DJs, absolutely loves them. We have six players in each control room. Removing one at a time for servicing is easy during the day instead of late at night.

Each production room has a record/play unit with a keyboard and printer. Names, numbers, outcues, killdates, secondary and tertiary cue functions can all be added or edited at any time.

After we first installed the system, all went amazingly well.

The push of a button sends all the pertinent information to the printer and a perfect label is printed in seconds.

After we first installed the system, all went amazingly well; it was an easy transition. However, we began to notice we were not getting the media life we expected. We were using the 13MB NEC drives and the 13 MB TD diskettes. Fidelipac always replaced the disks under warranty, but soon we realized that all was not well. NEC, the maker of the drive, had not realized the mean time between failure (MTBF) stated in its literature. We were using the 13MB disks and a 44 kHz sample rate. Eventually, we decided to use standard HD (2 MB) diskettes and replace our 13 MB drives with 2 MB drives. Fidelipac "bought back" our 13 MB drives and our 600 TD disks, some in war-

ranty and some out. In other words, Fidelipac did not leave us hanging.

Our frequency response was limited to about 13 kHz. At first, we were concerned that this would be audible and not acceptable. Unlike analog cart machines whose frequency response rolls off as the frequency increases, digital machines have a ruler-flat response out to the cutoff frequency and then it drops like a rock.

Before we made the transition to the 2 MB drive and media, we upgraded one of our machines so that we could perform an A/B comparison. Although we could hear a difference during the A/B comparison, we were impressed by how small the difference was and we became believers. And our resident "golden ears" has never noticed a difference either.

Should you feel that you need more time or would like to put music on the media, Fidelipac has an option to use magneto-optical (MO) drives and media. Of course, the MO approach is more expensive. But it may be worth it, if you prefer to stay in the digital domain and use AES/EBU input/outputs and 44.1 or 48 kHz sampling rates. The MO drives have a maximum capacity of 230 MB and will allow you to have up to 99 cuts per cartridge.

The service manual is well done and the circuitry well-documented. However, service is pretty much left to just periodically cleaning out the drive. Even in the dusty environment of the desert, these machines and the media have held up. After switching to the 2 MB diskettes, none of our 800 diskettes have failed. Should a drive fail, or should I say when a drive fails, it can be replaced for about \$50 and that is certainly cheaper than any cart machine play head and pinch roller.

For more information from Fidelipac, contact the company in New Jersey at (609) 235-3900; fax: (609) 235-7779; or circle Reader Service 73.

USER REPORT

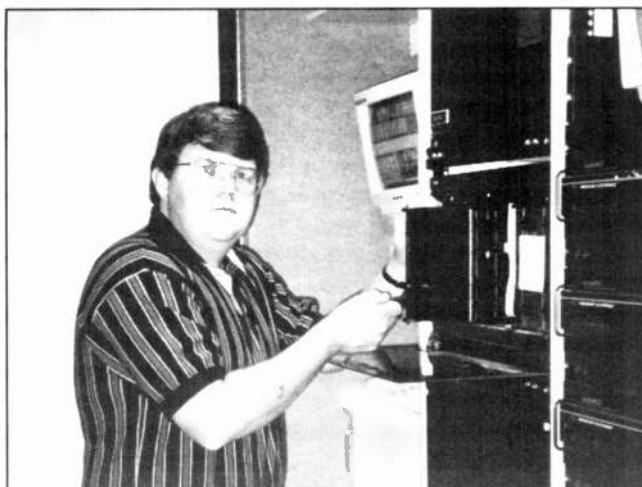
KWOL(AM) Cranks Out the Oldies

by Roger Lundeen
Chief Engineer
KWOL(AM)-KFMW(FM)
KXEL(AM)-KOKZ(FM)

WATERLOO, Iowa In the summer of 1993 KWOL made a commitment to an oldies format and new digital studio equipment. I began the process of shopping for a digital storage system and a CD automation system. At that time there were not any proven "music on hard drive" systems on the market, but several manufacturers had CD automation systems.

After evaluating many systems, we thought that the Broadcast Electronics AudioVault and CORE systems would be the best fit for our needs. The next decision to be made was what were we going to use for CD players. BE had hardware/software interfaces available for three different CD player configurations. One configuration required several Pioneer six or 18 disc players, one was the Sony 60 disc jukebox, another was the NSM 100 disc jukebox, and they were just working on the software interface for the new Pioneer 300 disc players. We were making our choice based on several factors including dependability, redundancy, failure rate and interface with the CORE.

At that time, I had not heard much about NSM in the broadcast industry, but I checked them out anyway. I found out that the units had a great reputation for low failure rates and well-built construction. Not to mention the fact that several thousand commercial establishments in



Roger Lundeen and the NSM 3101AC Jukebox

the world were using them. After evaluating the situation from music scheduling, programming, and technical viewpoints, we purchased four NSM 3101AC jukeboxes.

The 3101AC has two removable magazines that each have individual trays for 50 discs. The transport lift assembly mechanism moves vertically between the magazines, pulling trays from the magazines and placing them on the Phillips CDM-4 drive at the bottom. The CDM-4 houses the laser/optics and the motor. The average cue time is between five and 12 seconds. The magazines are located behind a lockable smoked glass door, keeping both the discs and optics very clean. The unit has both optical and coaxial (SPDIF) digital outputs, as well as unbalanced analog audio outputs. The 3101AC has no user controls physically

on the unit; it is totally controlled by RS-232 serial data. We normally control the jukeboxes via the BE CORE software, but they can also be operated via a PC with NSM software.

When we considered using 100 disc players, our program director had concerns about being able to maintain our proper music rotations, as you must segue from one set of 100 discs to the next. We wanted to make sure that we were

able to schedule our music without regard to which player contained any particular disc. The KWOL AM Stereo oldies format requires about 150 TM/Century Gold Discs, and a small number of consumer-type CDs. We could have easily fit the library in two CD 3101AC boxes, but to ensure we could go from any music title to another, we purchased two copies of each Gold Disc, as well as four jukebox units.

The software engineers at BE wrote software for the CORE that allows each jukebox to have a duplicate jukebox or "shadow." Each shadow jukebox contains exactly the same discs as each main one. If one disc is on-air and you want to play something else from the same player, the CORE will automatically find the needed disc in the "shadow" jukebox. This allows us to actually play songs off the "same disc" back to back at any time.

The CORE software has a music database that contains all of the needed information about each track in the library. In the database we are able to set audio levels and "cue in" points for each track. This allows us to cue a track tighter at the beginning if necessary. We are also able to set an EOM point for each track by either selecting an "index" point from the Gold Disc or by using a time-based EOM. The time-based EOM is necessary for playing consumer CDs and is helpful because we use the CD 3101ACs for our weekend syndication programs that are distributed via CD.

Each week we use a consumer-type CD player and scan through the syndication CDs and note the actual running times for each program segment. We then input these times into the database, place the discs in the jukeboxes, and the CORE and NSMs take it from there. It takes us about 10 minutes each week to prepare each four hour syndicated show, and they play perfectly on the air, without any operator "baby-sitting" the shows. Because the 3101s are controlled via RS-232, the players are able to "talk back" to the CORE controller. Anytime a disc is missing or unable to cue the proper track, a "source not ready" alarm triggers there is a problem to our operators.

Low maintenance

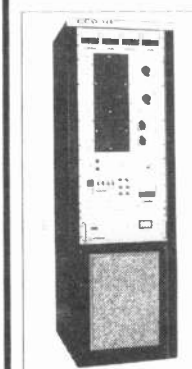
I was a little concerned about maintenance and reliability three-and-a-half years ago when we were first considering the 100 disc players. Because we were going to be depending on all four players around the clock, I was concerned that we were going to be in real trouble if one of the players failed. So far that has not

been a problem. Over the first three years we have only had two minor problems that have caused us to remove a unit from service. They were easily corrected. When we take one unit out, we simply do some quick "hand editing" of the imported playlist files from our music scheduling software so that we can operate with the three remaining units without the need to play tracks out of the same player back to back.

The 3101ACs require almost no routine maintenance. They are very sturdy, well built boxes and exceeded my expectations with regards to reliability, durability and low maintenance.

For more information from NSM, contact the company in New York at (516) 273-4200; fax: (516) 273-4240; or circle Reader Service 102.

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Circle (14) On Reader Service Card

USER REPORT

Kicking the Paper Race

by Ken Cardosa
Chief Engineer
WOCT(FM)-WWMX(FM)

BALTIMORE WWMX(FM) and WOCT(FM) form a duopoly in this market. We have two air studios and four production rooms all using the AudioVault from Broadcast Electronics. The system is networked with Windows '95. AudioVault provides us with the versatility and reliability that major market radio stations require.

AudioVault provides us with the versatility ... (we) require.

All music, commercials and produced elements for both stations come from the AudioVault hard drives. This allows us to automate overnights and some weekend shifts. Our jocks can voice track a shift and the system makes it seem as if they were live. You can automate and still sound live. The air sound is more consistent with the elimination of analog carts. This fits well into our plans for a paperless, all-digital studio.

The music log and commercial log are imported from their respective machines and merged into a program called "Core Scheduler" to do this. I

found this program a bit clunky and complicated. We use a third party program from Power Link that does the job simply and accurately. BE will soon be releasing an updated Windows-based AVScheduler that solves all the problems of the old Core scheduler and adds slick new features.

The production screen is easy to use. The cut and paste editor leaves a lot to

be desired, but a new 32-bit editor is in the works. Being a duopoly means we share inventory between the two stations. We only

need to dub spots in once. They are then called by the respective stations events logs as needed. Changing start dates, end dates, cart numbers, even deleting old spots can be done from the traffic director's computer.

AVAir is used in the control rooms operating in a live assist or an automated mode. In the live mode, the operator loads the decks from the merged event log. We can start each deck from the console, with the touchscreen or the mouse. The decks can trip each other, allowing the jock to automate sweeps.

continued on page 80 ►

USER REPORT

Audiometrics Customizes KOST(FM)

by **Marvin Collins**
Chief Engineer
KOST(FM)-KACE(FM)-KFI(AM)

LOS ANGELES The on-air CD player has come a long way since the early days. Stations that once had to turn to consumer models to handle their music now have reliable, professional CD players that have the ease and feel of cart machines without the maintenance problems.

Our three stations in Los Angeles, KOST(FM) and KACE(FM), along with KFI(AM), each have unique formats and personalities. But all three are equipped with the **Harris Audiometrics CD10** cart machines.

At KOST, the popular AC station, we have four CD10s plus one or two more for production. We make full use of the machine capabilities and even press our own CDs to customize the music format.

Personalized CDs

The music starts out on CD which our program director dubs to DAT tape and adds features such as EQ. He then uses a Sony CD recorder along with a Sonic Solutions with a Mac computer to edit the cut and create a custom CD. The KOST CDs contain multi-cuts, making full use of the disc's ability to hold a large amount of music.

The editing software allows us to index

the discs properly and even add a cue tone of sorts to allow the on air talent to talk over song intros.

We also create two identical CDs to

the disc. After our stations' experience with players that do not use cases, this is a welcome change.

For example, when our R&B station,



The Audiometrics CD10 From Harris

allow the talent to do smooth segues and crossfades of songs. And best of all, we record station jingles and promos onto compact discs.

The feature everyone at the station seems to appreciate the most is each disc is played from its own plastic "jewel" case, so there is never any handling of

KACE, was first purchased by our group, the jocks had been using CD players designed for broadcast use, but without the cases.

We replaced those with the Audiometrics and the talent was amazed at how their CD problems disappeared. The cases also mean that the inside of the

player is less likely to be troubled by dust, dirt or another handling-related problem.

The CD10 is easy to cue and our staff adapted to it quickly, because it duplicates the user-friendliness of a cart machine.

It even features a front panel digital display to countdown the time of each cut. The CD10 lets the jock search for a cut by time or frame. They can also pre-select cuts with track keys. A fly wheel method is also possible, but we chose to use the keys.

The start time is virtually instantaneous (the specs say 200 ms). The machine has a very good digital to analog converter and the quality of the sound is always top-notch.

Dummy-proof

Best of all, the CD10 is as dummy-proof as it can possibly be. Its autolock feature prevents a jock from accidentally removing a CD while the music is still playing. A flashing indicator can be programmed for up to about 30 seconds of "early warning."

CDs are not the expensive medium they were when they first became a part of radio gear. Not only can we customize and store a vast amount of music on a disc, but they provide consistent quality and require less maintenance than cart machines.

KACE uses four CD10 players for its music format, although they are commercial CDs, not custom-recorded as they are with KOST. KFI uses a CD10 in its production studio.

We keep a spare CD10 around in case a problem should arise, which happens very infrequently, especially considering the amount of use each one gets.

When there is a problem, if we can not fix it ourselves, we send it back to Harris which remedies the situation quickly.

When CDs first started to be used on the radio, there was an underlying feeling that stations preferred to play music and spots on one type of digital medium, the way they always did with tape carts. KOST and KFI — a talk-formatted AM — still play their commercial spots from carts while KACE uses a digital spot system, the Instant Replay.

We find CDs are a convenient way to play individual music cuts without having to worry about losing the entire library to a computer problem.

These days, tape cart machines are less available than ever, and of course there are always the related problems — degradation of quality and maintenance problems — with both the machines and tape carts. Our stations now have room to spare in the studios, where there used to be rack after rack of cart storage.

Hard disk switch

I suspect that eventually we will switch to a hard disk system for commercials and still rely on the Audiometrics player for our music, jingles and promos. Overall, I would have to say that the CD10 has meant fewer equipment problems and on-air glitches.

Our talent accepts them as standard equipment now in the on-air and production studios. Because I rarely hear anything about the CD10 players from the jocks, I know they are happy with them. This time, no news really is good news.

For more information from Harris Broadcast Corp., contact the company in Illinois at (217) 222-8200; fax: (217) 222-8501; or circle **Reader Service 103**.

USER REPORT

Denon Serves up Winning Numbers

by **Mark Hoerath**
Media Production Supervisor
Virginia Lottery

RICHMOND, Va. Six days a week the Virginia Lottery broadcasts the midday drawing show to 50 radio stations throughout the state. All production and network connections take place from lottery headquarters. **Denon MiniDisc** cart machines were the medium of choice to support our broadcast operations.

Placement of the midday show on radio

Denon 995R. The show is recorded 1:50-1:51, with feeds starting at 1:56.

In the few minutes between end of record and first feed the recording is cued and divided and re-cued to the exact top of the 10-second countdown prior to program start. Precise Search, Cue and Divide of the recorded track in limited time is a feature of the MD recorder. The program is then fed every two minutes for a total of five feeds. The MD allows instant start of a cued program.

There have been thousands of shows and feeds with no missed feeds due to operator or support equipment error.

was a win/win situation for both the stations and the Lottery. Stations are able to sell adjacency advertising and have listeners tune into a constant feature. The Lottery gets product visibility on a commercial venue. While the audience cannot see the random number selection process, it hears those actions and accepts the show for what it is — a live random selection of winning numbers.

An ISDN feed to ABC Radio Networks and an 8 kHz analog feed to Virginia Radio Networks begin the broadcast day. ABC feeds about 35 SEDAT and VRN feeds 15 analog stations. A tone/ID/tone is fed to net originating from CD. The 60-second midday show bed originates on the Denon 980F Mini-Disc and is mixed with voice and recorded on the

There have been thousands of shows and thousands of feeds with no missed feeds due to operator or support equipment error. However, there have been three missed feeds due to MD malfunction, one player and one recorder. The MD player/recorder does exactly what it is supposed to do 99.9996 percent of the time. To achieve 100 percent, a backup MD recorder has been purchased and will record the program in parallel.

The one complaint we have is that over the past 18 months both recorder and player were sent back to Denon for factory service. Simple questions like, "Will you call to acknowledge receipt of the machine?" "When will the machine be looked at?" and "Will you call to let us

know when the unit is coming back?" have not been answered.

Also, payment for repair must be received before Denon ships the unit back, which is a problem for companies in a time crunch. In summary, service operations and communications to the end user could be improved. However, Denon did replace the Lottery's out of warranty recorder with a new unit in one day. But only after wasted wrangling time.

Manufacturer's reply: Denon Professional Products is deeply concerned with product performance, service and most importantly, customer satisfaction. We sincerely regret that this end user had an unsatisfactory experience with the Denon service department. Denon is currently in the process of reorganizing the procedures within the service department and we would like RW readers to know that this customer was given a loaner unit.

With regard to the customer's "wasted wrangling time," Denon Professional experienced complete changeover in management and personnel during the last 12-18 months. Our new staff specializes in prompt problem solving and customer relations. Most assuredly, this problem was investigated as soon as the new staff became aware of it.

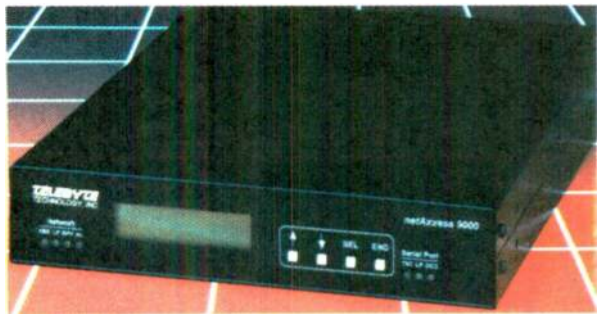
*For more information from Denon, contact Chris Ishoy, for customer/technical support, at (201) 882-7467, Mark Kaltman, national sales manager, at (201) 882-7469, or John Casey, marketing manager, at (201) 882-7475; or circle **Reader Service 122**.*

MARKETPLACE

Recently Introduced Products for the Radio Broadcast Professional

HHB MiniDisc

HHB Communications Inc. debuted the HHB MD74 professional MiniDisc at the



AES convention held in Los Angeles last week.

The 74-minute MiniDisc features a precision sputter coated recording layer to ensure a low block error rate and high carrier-to-noise, even after more than 1 million read/write cycles. A rigid, heat-resistant shell is used for maximum durability.

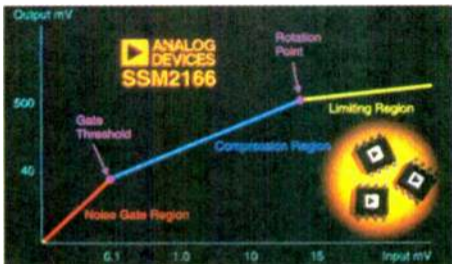
Long term security is possible due to the "non-contact" magneto optical format, unaffected by magnetic fields or physical damage from repeated head contact.

For more information from HHB Communications Inc., contact the company in Maine at (207) 773-2424; fax: (207) 773-2422; or circle Reader Service 63.

Smart Signal Conditioning

Analog Devices' new SSM2166 smart preamplifier system-on-a-chip features variable compression and automatic noise gating to give microphone-level signals up to 20 kHz a higher degree of intelligibility; i.e., it can recognize and compensate for poor signal level conditions for improved fidelity.

With a single, user-selectable, external resistor, the compression ratio can be customized (from 1:1 to 15:1) to produce



an essentially steady, undistorted audio output level, though signal inputs vary.

For more information from Analog Devices Inc., contact the company in Massachusetts at (617) 937-1428; fax: (617) 821-4273; or circle Reader Service 105.

Harris 20-bit Converter

Harris Broadcast Division's A/D and D/A converter provides a great connection between analog and digital audio equipment.

The unit, the Harris A2D2A, not only



brings 20-bit conversion technology to broadcast and production studios, but it is priced at less than half of its nearest

competitor. The A2D2A also can perform A/D and D/A conversions simultaneously.

The LED indicators for left and right channels show exactly where to set the analog input controls to optimize the analog to digital conversion process for low noise and a wide dynamic range. Sample rate conversion allows you to permit from 3 rates, 48 kHz, 44.1 kHz or 32 kHz.

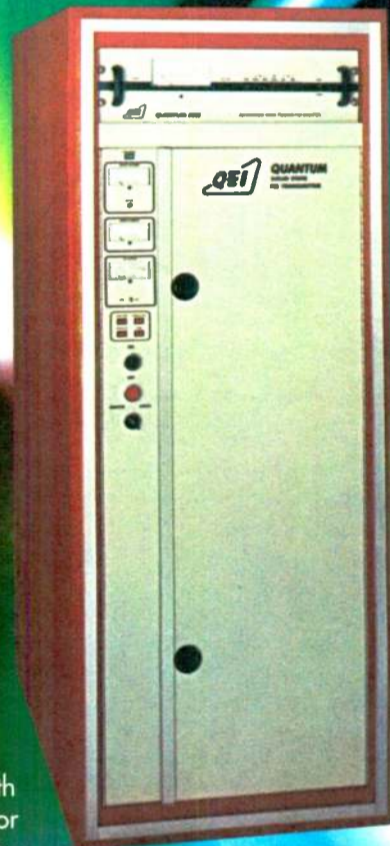
For more information from Harris Broadcast Division, contact Dave Burns in Indiana at (317) 962-8596; fax: (317) 962-0671; or circle Reader Service 94.

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Circle (33) On Reader Service Card

Stations Go Digital

► continued from page 77

Inventory tabs are used to display and sort different audio elements. You can sort and search by any characteristic of an audio cut. Need a song with a 20-second intro? You can find it in less than a minute.

In AutoMode, AVAir plays events as listed in the merged log. Segues are controlled by the trip tones on the elements. We place updates at the top of each hour that control what songs are dropped and keep the system running on time. Voice tracks are added during automated shifts, so it appears that the jock is live. It sounds remarkably good. This function proved invaluable during this year's blizzards when we had to operate for days

with only a few people.

The system is incredibly easy to use and learn. I gave each of our jocks a 45-minute lesson in small groups. After the

Voice tracks are added during automated shifts, so it appears that the jock is live. It sounds remarkably good.

first hour using it on air, they all commented how easy it was.

I was surprised because many of our jocks had no prior computer experience. From a technical standpoint, our system

was designed with redundancy in mind. We tried to ensure that any failures had a minimal effect on operation.

Our system uses dual servers with 32 GB of hard drive space on each server. This means that if any one server fails for any reason, I still have two outputs available to me. AVAir will automatically

react to the loss of an audio card(s) or server by not allowing these decks to be used. The decks will automatically be put back into service when they become available again. The only way you have

dead air is if the song on the air is being played from the card that dies.

With any digital storage system, a UPS system is a must. Servers tend to take several minutes to reboot.

You do not want your system down for several minutes because of a 10-second power glitch. Our UPS powers all workstations as well as the servers and only needs to carry the system until the generator starts.

AudioVault will automatically copy items from one server to another. This happens in about one-half real time. When a hard drive fails, a new drive can be inserted and the system will make sure all data is copied back to that server. All drives and data are checked and verified each night by the system and potential problems are corrected.

I still recommend a SCSI tape backup for the system. Having a separate copy of your data is always a must when dealing with any computer system.

Another important consideration is how the system handles digital audio. AudioVault cards are located in the servers.

This means the PCs in the studios only control the cards, they do not play the audio.

No audio is transferred over the network. I do not have to worry that network bottlenecks will interrupt what is on the air, no matter how big my system gets.

The cards and hard drives can be accessed from any studio by placing a copy of AVAir on its PC. You will also need to route the audio to the studio. I currently do this manually with a patch panel. AudioVault will interface to several routing switchers, and can route audio to different studios automatically. I hope to do this soon.

The most important thing to me is the system's reliability and serviceability. I chose AudioVault because of the system design, networkability and commitment to service.

For more information from Broadcast Electronics, contact the company in Illinois at (217) 224-9600; fax: (217) 224-9607; e-mail: future@bdcast.com; or circle Reader Service 101.

TELLING IT LIKE IT IS ...

...about DAD^{PRO}, the Digital Audio Delivery system that's ideal for both Production and On-Air, whether Live Assist or Automated, small market or large



"In our pre-purchase research, we found that the most common compliment paid to competitive units was that their technical support staffs were always there when the system crashed. When we talked with DAD users, they hardly knew anyone at ENCO since their systems had never gone down. That's the kind of compliment I was looking for! DAD's segue editor feature revolutionizes automation. We pre-program the entire station, then the talent previews and customizes their breaks to give us a totally live feel. Plus, we simulcast both stations and DAD lets us easily set up separate spot schedules. It's major market ready, and built like it."

Philip Urso, GM
WDGE/WDFG,
Providence, RI

"We've had five DAD workstations in action for over a year, and I really don't know how we could get along without the system. It allows all three of our stations to present a consistent on-air sound and frees the talent to concentrate more on communicating with the audience. We're still finding new and innovative ways of using the system a year later. In my opinion, if you're planning on automation, you can't do it RIGHT without ENCO!"

Chris Andree, Asst. PD
WWKL/WYMJ/WCMB,
Harrisburg, PA

"We're a news programming provider and deal with a large number of actualities every day, so speed in production and getting it down the line are paramount. DAD allows us to bring information in, and seconds later it's ready to go. The greatest feature is the ease of editing and file transfer between our four workstations. On-air is a breeze."

Dane Wilt
Radio News Company,
Las Vegas, NV

"Way cool. The greatest thing about DAD is that it acts and thinks like a cart machine and doesn't intimidate the talent. We use touchscreens, and the learning curve is about 2-1/2 hours before they're up and running. From an engineer's standpoint, it's great because DAD uses off-the-shelf hardware, so maintenance is a snap."

J.R. Rogers, Asst. CE
KSON/KIFM,
San Diego, CA

"The DAD system was on the cutting edge of systems we looked at, and there was some initial reluctance to enter the digital arena. After having the system in-house for a month, the entire production and on-air staff felt like they could never do without it again. Now our news staff has a system of their own, and we're getting a third system for our sister TV station."

Chuck Whitaker, PD
WSBT, South Bend, IN

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AMPLIFIERS

Want To Sell

Altec 1589B 2-input mixer/amplifier w/one balanced line xlr input each, excl buffer/isolation amp, \$50/both + shpg. C Ware, Blue Ridge Audio, 10011 Villa Lea Lane, Houston TX 77071.

Hafler DH-200 stereo power amp (2), 100 watt per chnl, rackmount unit w/front-panel stereo level control, excel cond. \$285; Kenwood KA-5700 stereo amp & loudspeaker system w/(4) Radio Shack Minimus-7 loudspeakers w/mounting brackets, speaker cables & road case for all \$345. R Streicher, 545 Cloverleaf Way, Monrovia CA 91016. 818-359-8012.

WANTED
HiFi/Commercial tube amps, compressors, mixers, horn speakers. Altec, McIntosh, JBL, EV, WE, Tannoy, Marantz, Ampex, etc. 405-737-3312 FAX: 3355

Phase Linear 400 amp (2), working. \$250, non working, \$50. D LeVan, Narwood Prod. 211 E 43rd St #603, New York NY 10017. 212-983-3320.

Want To Buy

Distribution amp, mono 1, 600 ohm input, 4 or more outputs. A Slaugh, Ski Areas of New York, 2144 Currie Rd, Tully NY 13159. 315-696-6550.

McIntosh MC-60 pwr amp, single or pair, MC-30 pwr amp, R Cobb, Solid State Rcds Srvs, 1044 Ligh61foot Rd, Wimauma FL 33598. 813-634-1940.

Two 3-1/8" 90 degree elbow connectors, want 3-1/8" coax switch; high power FM CP antenna on 93.1 to 93.5 Mhz. E Moody, KJEM, 216 N Main, Bentonville AR 72712. 501-2-73-9039.

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FRE 37 CP 12 gd cond w/heaters 97.9 MHz center fed w/face mounts for 24" tower face, \$5000. G Gibbs, KSEZ-FM, 1113 Nebraska St, Sioux City IA 51105. 712-258-0628.

Pyrod 208' lighted guyed tower, located at Quanset Point, North Kingstown RI, geographic center of state. 401-295-7160.

Shively 3-Bay antenna tuned to 96.9 Model 6810 high pwr, BO, M Powell, WBAY Radio, 410-968-9696.

Wincharger Type 150, 300", 18.75" width, tower, w/beacon & obstruction lights, u pick up, \$4000. K Bowles, KGNN, POB 87, Washington MO 63090. 314-239-0400.

ERI FML-3E, tuned to 100.5 MHz, \$1995. Max, KCIF, Box 551856, Dallas TX 75355. 972-722-0006.

280' tower, 13 sections of 20', 1 section of 10', on the ground & ready to ship. Matching top beacon also avail, BO, D Lacy, Mtn States Bldg, Bolorado Springs CO. 719-636-2470.

500 point Stainless tower dissipator, \$400; Potomac 19 2 tower monitor, w/remote meter panel, \$1000. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

Andrew 3-1/8" Heliac, about 260 pt, excel cond. \$2500/BO/trade. D Dellaard, KDLR, 488 4th Ave NE, Sioux Center IA 51250. 712-722-0885.

ERI 37 CP 12 in gd cond w/heaters, 97.9 MHz ctr fed w/face mounts for 24" tower face, \$5000 +shpg. G Gibbs, KSEZ, 1113 Nebraska St, Sioux City IA 51105. 712-258-0628.

Jampro JA-6-B, six bay FM antenna, tuned to 95.5 Mhz, center feed, face mount, \$500. G Gibbs, KMNS, 1113 Neh St, Sioux City IA 51105. 712-258-0628.

150 foot radio tower for removal/sale. Bid opening: 11/25/96. Phone 409-732-2604.

NEW & USED: 1-5/8" & 7/8" coax cable, on spools, will cut to length, guaranteed. Goodrich Ent, 11435 Manderson St, Omaha NE 68164. 402-493-1886.

Want To Buy

CP, 2-3 bay, light weight for 90.3 Mhz. 501c3 organization, K Bowles, POB 87, Washington MO 63090. 314-239-0400.

Used tower, 200'-350', reasonable & any cond. L Koch, Box 130, LeRoy MN 55951. 507-324-5746.

AUDIO PRODUCTION

Want To Sell

Ampex MX-35 4-chnl tube mixer, excl cond w/all knobs, good tubes, excl faceplate w/pwr cord & manual, \$350 + shpg; Rane PE-15 parametric EQ, new cond, \$150; Shure SR-107 graphic EQ, vgc, \$100; DOD-Digitech R-831-C graphic EQ, new, \$100; DOD-Digitech R-855 4-chnl mixer, excl cond, \$100. B Leslie, Pro Recording Service, 13708 Mapleleaf Dr, Cleveland OH 44125. 216-662-1435.

PATCHBAYS

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Audio Village, Palm Springs 619/320-0728

Audio Arts 4200-A stereo EQ, Drawmer 201 Gate, Panasonic 3500 DAT machine, Gates M-5576 vintage tube line amp, Eventide H-949 Harmonizer, Telefunken V-72, Altec plug-in transformers, T Coffman, 619-571-5031.

Fostex 3180 stereo spring reverb unit w/pre-delay, will swap for UREI Cooper time cube; AKG R-25 remote cntrl w/30' cable & connector, trade for Tascam RC-70 remote cntrl unit; Koss/Optimus Pro 90 stereo headphones, like new in box, will trade for old pair AKG D-141 stereo headphones, must be working. J Roper, Imperial Sound, 383 N Studio St, Terre Haute IN 47803. 812-877-2663.

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Magnafax/Rawdon Smith multi-tape 6-copy high speed tape duplicator, 1 4" mono, excl cond, \$400/BO. Mic Mix MR11 Master Room echo chamber, mint, \$125/BO. S Cronen, Starbeat, 9 E Larkdale Dr, Deerfield IL 60015. 847-945-9500

McMartin 802 stereo, 8-chnl cntrl board, needs TLC, spare parts, \$250. M Taylor, KNEO, Neosho MO. 417-451-5636.

Orban 111B (2), \$175/ea or BO; Aphex AX Type C aural exciter, \$75/BO. T Payne, KTMC, POB 848, McAlester OK 74502. 918-423-1400.

Otari MX5050 (2) MK-3 1/2" 4-trk, excl cond, \$1500/ea; CB116 autolocator, \$350; Wheatstone SP-5 prod console, 24 ch, 8 bus, stand, PS, lots of extras, \$2800, 618-374-5078 or mrr@prin.edu.

Audio Arts 4200-A stereo EQ, Drawmer 201 gate, Panasonic 3500 DAT machine, Gates M-5576 vintage tube line amp, Eventide H-949 Harmonizer, Telefunken V-72, Altec plug-in transformers, T Coffman, POB 17203, San Diego CA 92177, 619-571-5031.

Burwen TNE 7000A 2 chnl, transient noise eliminator rack mountable, BO/trade. J Roper, Imperial Sound Studio, 383 N Studio St, Terre Haute IN 47803. 812-877-2663.

Dolby 361 type-A NR, 2-chnls, mounted in sturdy road case, complete package, \$850; Optimus SCT-50 CD player/cassette rcd in one compact deck, excel cond, \$300. R Streicher, 545 Cloverleaf Way, Monrovia CA 91016. 818-359-8012.

Custom 4-way 75-ohm distribution box for DAT/video dubbing. 5 RCA jacks, int./ext. power, \$125. Sunear, 415-457-2741 (PST)

JBL 4333A 15" speaker, \$950/pair; Vintage recon tube mic pre's & mixers, \$300-\$700; ADC new patch bays, 1/4" 52 points, \$169; ADC TT bays, \$129 up; ADC new TT or 1/4" TRS cords, \$9; Furman 1/4" to 1/4" patchbays, \$95 ea; like new tape, 1/2"x2500' 456, \$15 ea; 1" 456, 226, 250, \$25 ea; Rane ME15 graphic EQ, \$150; Digitec 3.6 sec delay, \$150; new pwr dist/filter rack mt, \$75. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Want To Buy

Neve, API, MXR, Lexicon, Mic Pres, EQs, delays, compressors, harmonizers, reverbs, T Coffman, 619-571-5031.

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Soundworkshop 40 console or modules, A Polhemus, Excalibur Sound, 750 8th Ave, New York NY 10036. 212-302-9010.

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Schafer 903-E automation system w/4 Carousels, 6 Audicord E-31-R PB carts & manuals, \$4000/BO. R or B Lorence, WADJ/WYSN, Somerset PA. 814-443-1330.

Gates RA1 controller, \$50; SMC 352 Carousel, \$100; Schafer 903E, \$500 ea; SMC ESP1 pwr supplies, \$100 ea; CSI touchtone decoder, \$200 ea; Gates 5S cart player, 1 rack, \$200. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

CART MACHINES

Want To Sell

Cart rewinders (2), \$50. M Taylor, KNEO, Neosho MO. 417-451-5636.

ITC Delta 1 (3) mono, play only, triple tones; (3) BE 3100P, mono, play only, triple tones; ITC Delta PD II, mono, play only; (2) ITC Delta PD II, mono, play/rcd; wood cart racks 100 capacity, Fidelipac carts, Kevin, 406-232-5626.

ITC 3D, mono, w/tones, manuals, test tapes, tools & parts, excel cond, also carts & racks, \$650. P Wahl, WWIB, Hwy 53, Chippewa Falls WI 54729. 715-723-1037.

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ITC upgrade pb to record, amps only, no deck, 3 tone, stereo, \$175, or mono, \$125. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

SMC 792 stereo recorder, \$100; Audicord 520 R/P mono, \$300; BE 3200P mono cart player, \$150; Audicord R/P stereo E26, \$300; Sparta 4525 stereo player, \$100; Sparta 4525, \$200; ITC Premium delay record, \$500. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

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ITC Delta - new pinch rollers: Mono playback (2), record/play (2), stereo record/play (1). MOTIVATED! Spotmaster series 2000 record (1), Wes, 818-798-9128.

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STL alignment carts: C0030-FI (NAB), C0031-F1 (IEC), C0234-2-FI (stereo IEC), X1235-1-FI (3150 Hz flutter), unused, \$30 ea. M Crosby, 408-363-1646

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Harrison Pro 790 12 chnl 4 drop-thru stereo SVB/returns 2 master stereo, P&G faders automation ready clock/counter VU's, all balanced I/O, \$850 +shpg. J Kloth, Trackwork Orange, 610 N Fairbanks 2nd Fl, Chicago IL 60611. 312-649-0900.

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Spotmaster 5 chnl mono, \$300. J Parsons, Parsons Sound, 2781 Fayson Circle, Deltona FL 32738. 904-532-0192.

Tascam M5, \$350; M35, \$400; (2) Sescom 4-chnl -10/+4 line amps, \$50. D LeVan, Narwood Prod, 211 E 43rd St #603. New York NY 10017. 212-983-3320.

Soundcraft 600, 32x16, w/patch-bay, mint, \$6950; Tascam 512, 12x8 mixer, \$750; Tascam 520, 20x8x16 mixer, \$1750; Allen & Heath SYNCON 28x24, great sound, \$8000; Ramsa 820 mixer, \$2200. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Want To Buy

Marantz mdl 1, audio console preamp, single or pair & mdl 6 stereo adapter. P Chance, Imperial Analog, 925 Clinton St, Philadelphia PA 19107. 215-574-8147.

Shop service manual for Sparta AS-30B 5 chnl stereo audio mixer. Dick, KEYZ, 120 E Main, Sidney MT 59270. 406-482-5090.

DISCO-PRO SOUND EQUIPMENT

Want To Sell

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Soundtech 15-C pair of 2-way mobile loudspeakers for music PB/sound reinforcement, 15" cast frame woofer & compression driver/horn, black road carpet covered, corner guards, handle & rubber feet, 400 W pwr handling, compact, lightweight & excl cond, \$195/ea. B Fisher, KPOK Radio, POB 829, Bowman ND 58623-0829. 701-523-3883.

Crown 200A cardioid mics, \$140 ea, \$400/(3); Crown PSL-2 pre-amp, \$465; Crown GLM200 lavali-er, \$175; Crown CM 100 hand held PZM, \$145. J Helmuth, Sound Support Ltd, 2229 Roys Ave, Elkhart IN 46517. 219-522-5340.

Portable DJ outfit, 2 CDs, 2 cassettes, mixer, speakers, \$1000. D Rose, KUDC, POB 432, Barstow CA 92312. 619-256-2068.

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UREI LA-3A pair, racked w/link switch added, \$1800/pr. M Schackow, Mark Schackow Rec, 307 4th Ave E, Lemmon SD 57638. 605-374-3424.

Audiomax 4450A, \$200; Harris MSP90 AM AGC, \$300; Inovonics 270 mono, \$300. D Rose, KUDC, POB 432, Barstow CA 92312. 619-256-2068.

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Pacific Recorders Multimax 3 band AGC, need stereo, pair must be in operating cond. M Krehel, Houston R & D Corp, 11604 Arrowwood Cir, Houston TX 77063. 713-783-9050.

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Altec M-54 condenser mics (pair), \$250 pair. R Cobb, Solid State Recd Svcs, 1044 Lightfoot Rd, Wimauma FL 33598. 813-634-1940.

Countryman TVH tie-clip mic, miniature hypercardioid condenser, requires phantom power, \$165; AKG D-140 dynamic cardioid mics (3), \$115 ea; Schoeps Colette cable KC5L w/Lemo connector & adaptor, like new cond, \$335. R Streicher, 545 Cloverleaf Way, Monrovia CA 91016. 818-359-8012.

EV 7151 (2), \$50 ea; (6) EV 666 & cables, \$75 ea; (3) AKG D1000E & (3) AKG D202E1, \$75 ea; SM 53, needs repair, \$25. S Ross, Gold Star, POB 2144, N Hollywood CA 91610. 213-849-5137.

Shure SM-7. T Coffman, POB 17203, San Diego CA 92177. 619-571-5031.

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RCA RT-11 transport only, for parts, BO B Leslie, Pro Recording Service, 13708 Mapleleaf Dr, Cleveland OH 44125. 216-662-1435.

Tascam MSR16 less than 50 hrs, dbx NR, \$2500. M Schackow, Mark Schackow Rec, 307 4th Ave E, Lemmon SD 57638. 605-374-3424.

AKAI GX77, \$250; Inovonics 375 record amps (2), \$300/both; Teac 305 tube type 2 chnl, \$300; Ampex AC440, new heads, 1/4 trk, \$550, J Parsons, Parsons Sound, 2781 Fayson Circle, Deltona FL 32738. 904-532-0192.

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Tascam 234 4 trk cassette, dbx pro NR, sounds like r-r, excel cond, BO. P Wahl, WWIB, Hwy 53, Chippewa Falls WI 54729. 715-723-1037.

Tascam 122 stereo, 3 heads, 1-7/8 & 3-3/4 ips, VU meters, rack mount, 5-15/16Hx13-9/16D w/full manual, no head wear, immaculate cond, \$450; Marantz PMD 360 stereo, 3 heads, 1-7/8 ips, VU meters, full manual, no head wear, low mileage, 120V or battery operation, immaculate cond, \$250. S Lawson, KAK Prod, 928 Hyland Dr, Santa Rosa CA 95404. 707-528-4055.

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New & used Ampex 350 style tape transports, motors & parts, various prices. M Crosby, 408-363-1646.

Otari MX70 16 trk 1", like new, 150 hrs, \$5950; MX70 video layback system, \$900; gd used 1/2"x2500' 456 tape, \$20; 1"x2500' 996 & 250, \$35; Nagra III sync rcd w/SLO resolver, \$695/both; Nakamichi 550 great port cassette, \$250; new 2" MRL short test tapes, \$229. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Revox A77 recdrs (2), both need work, \$50/ea. M Crosby, 408-363-1646.

Otari MX70's 16 trk 1", mint, 150 hrs w/video layback system, \$6950; Tascam ATR60-2 in stand, \$1200; Tascam ATR60-8, \$2750. Tascam 58 8 trk, \$1950. Tascam 38 8 trk, \$1650 Otari 5050-8 Mk III, \$2200. Ampex 440C-8 1" \$2900; Ampex 1200 PURC cards, \$400 ea; nakamichi 550 portable cassette, \$250. Custom locator for ANY deck, \$495 W Gunn, Box 2902, Palm Springs CA 92262 619-320-0728.

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Comrex LX-T encoder for single line freq extension, seldom used, like new cond, \$500. A Slauch, Ski Areas of New York, 2144 Currie Rd, Tully NY 13159. 315-696-6550

Giant Radio, Iveco 18-14 euro-turbo diesel flatbed truck w/white boombox structure attached, 8'x5' mobile studio w/2 counters, equip rack, pneumatic mast, cellphone, heat/AC & pwr set between large speakers Enclosures incl speaker cabinets, Homelite 6200 gen, mounted FM antenna, ample storage. Overall length is 30', weighs 15,000 lbs. Has been well maintained & road ready, \$20,000/negotiable, must sell before winter. Jonathan, 603-436-7300.

Moseley SCD-8 subcarrier demod 185 kHz, \$200; Moseley TR55A 101.7 telemetry rcvr, \$200; Burk TC8 remote w/relay panel, \$700; Moseley 303 STL, \$800. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

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Gates FM-5G w/5S Bext exciter, currently on air, avail Nov 1, includes some spares & instr manual, delivered to your site, \$9900/firm, Max, KCIF, Box 551856, Dallas TX 75355. 972-722-0006.

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*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

Broadcast Equipment Exchange

PO BOX 1214, Falls Church, VA 22041 • Tel: 800-336-3045 • Fax: 703-998-2966

Radio World

5827 Columbia Pike, 3rd Floor Falls Church, VA 22041 • PHONE: 703-998-7600 • FAX: 703-998-2966

Select from these categories for best ad positioning:

Acoustics	Computers	Receivers & Transceivers	Tax Deductable Equipment
Amplifiers	Consoles	Recorders	Test Equipment
Antennas & Towers & Cables	Disco-Pro Sound Equip.	Remote & Microwave Equip.	Transmitter/Exciters
Audio Production (Other)	Financial Services	Repair Services	Training Services
Brokers	Leasing	Satellite Equipment	Tubes
Business Opportunities	Limiters	Software	Turntables
Cart Machines	Microphones	Stations	Positions Wanted
CD Players	Miscellaneous	Stereo Generators	Help Wanted
	Monitors	Tapes, Carts & Reels	

Classified Advertising Rates Effective January 1, 1996

	1x	3x	6x	13x
1-9 col inch (per inch)	\$65	62	58	52
10-19 col inch (per inch)	59	56	52	47
Distributor Directory	100	95	90	85
Professional Card	70	64	59	53
Classified Line Ad		\$1.95 per word		
Blind Box Ad		\$15 additional		

To compute ad costs: Multiply the number of ad inches (columns x inches) by the desired rate schedule for your per unit cost. Example: a 3" ad at the 1x rate is \$195, at the 3x rate \$186, at the 6x rate \$174, at the 12x rate \$156, etc.

HELP WANTED

For details on space availability contact Simone at 1-703-998-7600 Ext.154

Customer Service Technician

Due to the rapid growth in our field service organization, we are looking for an individual who can provide RF technical support to our customers. This individual must possess an understanding of broadcast antenna systems and the ability to troubleshoot these systems. The technician will be responsible for maintaining a high level of customer satisfaction through telephone and field support, and communicating customer needs to both the product development organization and sales organization. The successful candidate should have a minimum of 5 years experience as an RF technician. Extensive travel may be required. This position can offer the right person the opportunity for advancement! Please send your resume with cover letter and salary history to:

Shively Labs
Personnel Department
P.O. Box 389
Bridgton, ME 04009 E.O.E

BROADCAST ENGINEER-RADIO. Full time position for Marconi award-winning AM-FM radio station in Pennsylvania. Minimum 5 years experience with strong computer and RF skills. FCC or SBE certification a plus. Send resume to Chief Engineer, Box 104, Harrisburg PA 17108.

Small New Hampshire based communications and media firm seeks marketing professional to break new territory—your resume is your ticket. Highly disciplined and focused individual who can craft his/her goals and become an integral part of the management team. Compensation is performance based. Fax resume to (603) 668-6470.

Sales Engineer

Nationally recognized manufacturer of RF products is seeking an engineer to represent our products to our customers, distributors, and consultants. This position requires an individual with enthusiasm, tenacity, and some understanding of RF. The candidate should possess an electrical engineering degree or another four year degree and comparable experience with the RF industry. Spanish, Portuguese, or Chinese speaking ability is a plus! Are you prepared to accept the challenge and rewards of this position? If the answer is a resounding yes then send your resume with cover letter and salary history to:

Shively Labs
Personnel Department
P.O. Box 389
Bridgton, ME 04009 E.O.E

Chief Engineers
EZ Communications' KYKY-FM, KSD-A/F, KEZK-FM, KFNS-AM are seeking "Best of Industry" Chief Engineers to build solid multi-station Engineering Department. Successful candidates will have several years experience & proficiency with AM/FM transmission systems & studio systems. Must be capable of troubleshooting & repairing equipment. Studio build-out experience a plus as well as PC and digital equipment knowledge. This is a terrific opportunity for highly motivated engineers to work for a solid, growth oriented company that cares about quality engineering. Good salary and benefits. EOE. Resume in confidence to:

Paul Barzizza,
Dir. of Engineering
3100 Market Street
St. Louis, MO.63103

POSITIONS WANTED

Air Talent, News & Production announcer, 10 yrs exp, wants reentry as announcer after 15 yrs in eng. Alex, 513-777-8423.

Congenial adult bdctr would like to join adult or christian format small/medium mkt station, 17 yrs radio, 12 yrs muzak, Western states in clear air. EJ Puchalsky, 11 Tenn St119-E, Redlands CA 92373.

Enough talk, back to music, ex-KPIX announcer gives knowledge, experience & unique style for AA, AC, or AOR music, demo on call. Brian B, 415-255-7807.

Experienced station mgr, 40 yrs plus total, retired owner avail small or medium mkts, prefer GA or Southeast. Low Banks, POB 2551, Newnan GA 30264. 770-254-1830.

Morning duo avail! She's knowledgeable/classy w/seductive British accent, he's quick, humorous w/penchant for the absurd, together unbeatable, in major mkt. 216-846-2985.

Morning AT/PD Cahones & Phones! Topical, ballistic & Italian, needs challenge, no wimps! Country/oldies/AC. Mike, 510-432-6300.

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This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

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ABOUT OUR EMPLOYMENT SECTION

HELP WANTED

Any company or station can run "Help Wanted" ads for \$1.95/word or buy a display box for \$65/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 \$15. Responses will be forwarded to listee, unopened, upon receipt. Call 800-336-3045 for details.

POSITIONS WANTED

Any individual can run a "Position Wanted" ad, FREE of charge (25 words max), and it will appear in the following 2 issues of Radio World. Contact information will be provided, but if a blind box number is required, there is a \$15 fee which must be paid with the listing (**there will be no invoicing**). Responses will be forwarded to the listee, unopened.

Mail to: **BROADCAST EQUIPMENT EXCHANGE,**
PO Box 1214, Falls Church, VA 22041
Attn: Simone Mullins

Publisher/CEO	Stevan B. Dana	Ad Traffic Coordinator	Kathy Jackson
Chief Operating Officer	Carmel King	Production Assistants	Kns Willey, James Cornett
Production Director	Lisa Stafford	Ad Coordination Manager	Simone Mullins
Production Manager	Lisa Lyons	Circulation Director	Eleya Finch
Publication Manager	Heather Heebner	Circulation Manager	Robert Green
Classified Coordinator	Alex Frosini	Accounts Receivable	Steve Berto
Showcase Coordinator	Vicky Baron		

Advertising Sales Representatives

U.S. East: Skip Tash	703-998-7600	Fax: 703-998-2966
U.S. West: Dale Tucker	916-721-3410	Fax: 916-729-0810
U.S. Midwest: Sandra Harvey-Coleman	317-966-0669	Fax: 317-966-3289
International: Stevan B. Dana	+1-703-998-7600	Fax: +1-703-998-2966
Latin America: Alan Carter	+1-703-998-7600 ext 111	Fax: +1-703-998-2966
Europe: Dario Calabrese	+39-2-7030-0310	Fax: +39-2-7030-0211
Japan: Eiji Yoshikawa	+81-3-3327-2688	Fax: +81-3-3327-3010

Free Subscriptions are available upon request to professional broadcasting and audiovisual equipment users. For address changes, send current and new address to RW a month in advance at P.O. Box 1214, Falls Church, VA 22041. Unsolicited manuscripts are welcomed for review: send to the attention of the appropriate editor.



ADVERTISING SPACE IS AVAILABLE!

CALL NOW!

Call **800-336-3045**
Ext.154
for more information!



CALL NOW!

QUINTESSENTIAL



The 801 Series in Every Way

When you need the Best Audio, Auditronics has it. The 801 Series has just what you need. Extremely Versatile and Flexible and yet Simple to operate. Absolute Top of the Line quality in every detail with Buses, Logic and Features galore.

- ◆ 12, 18, 24 Input Position mainframes
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- ◆ Stereo Utility bus and pot mix stereo Auxiliary bus
- ◆ 2 Mono Mix/Minus buses
- ◆ Options include:
 - ◆ Mono/Stereo Equalizers
 - ◆ Compressor/Limiter
 - ◆ 10 position Line Selectors
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The 801 has the most extensive logic control system in its price range and console specification exceed those required for Digital Audio Broadcasting. Get your Best Audio from Auditronics, with 30 years of Customer Commitment and Service.

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 **AUDITRONICS**

3750 Old Getwell Road, Memphis, TN 38118 USA
(901) 362-1350 FAX: (901) 365-8629
GSA Contract #GS-03F-4032B

 Compliant

Circle (6) On Reader Service Card

World Radio History

Some Countries Have It ALL!




WSIX - Nashville, Tennessee "Country Music Station of the Year"

A-500 Studio Furniture delivered March 1993
A-500 Console S/N 20789 delivered April 1993
A-500 Console S/N 20792 delivered April 1993
A-6000 Studio Furniture delivered March 1995
A-6000 Console S/N 22536 delivered March 1995
R-16 Console S/N 22557 delivered March 1995
SP-5 Console S/N 22593 delivered April 1995

1995 Academy of Country Music Award
1995 Marconi Country Music Award
1995 Billboard Country Music Award
1995 Country Music Association Award
1995 Country Music Association SRO Award
1995 Gavin Country Music Award
1996 Gavin Country Music Award
1996 Academy of Country Music Award

Wheatstone Model A-6000 Audio Console shown

 **Wheatstone Corporation**
tel 315-452-5000 / Syracuse, NY.

Circle (69) On Reader Service Card

World Radio History