

Can You Trust the Numbers?

Consultants and engineers complain about problems with FCC engineering data.

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82 Rms, D.C. Vu

Tony Masiello unveils historic digital facility plans for XM Satellite.

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Radio World

The Newspaper for Radio Managers and Engineers

May 10, 2000



DIGITAL NEWS

Radio Eyes IBOC Timing; Harris Invests in USADR

by Leslie Stimson

LAS VEGAS While low-power FM dominated the political discussions for radio at NAB2000, perhaps the biggest technical topic was the status of digital audio broadcasting.

Station executives and engineers want to know when in-band, on-channel DAB will be ready and whether it will come in time to compete with satellite-delivered DAB services.

The NRSC asked the IBOC proponents if they are ready to take part in

direct comparison testing. Meanwhile, Harris has invested in USA Digital Radio, which continues to add equipment partners and other investors.

Lucent Digital Radio said it had successfully demonstrated its FM multi-streaming form of IBOC. Both Lucent and USADR put IBOC signals on local FM stations for the convention.

Calls for an alliance between the IBOC proponents were repeated here. But it was hard to gauge the effect on the companies developing IBOC DAB.

See DAB, page 6 ▶

Low-Power Leads Buzz At NAB2000

by Leslie Stimson

LAS VEGAS The clash between NAB and the FCC over low-power FM continued during NAB2000 in Las Vegas, and other organizations stepped up their visibility in the fray.

FCC Chairman Bill Kennard chastised broadcasters for opposing LPFM. By the end of the show, the U.S. House of Representatives had passed legislation, 274-110, that would reduce dramatically the number of possible LPFM allocations.

NAB President and CEO Eddie Fritts was pleased with the show, due to the House vote and the 113,000 attendance figure, compared to 106,372 last year.

Exhibitors happy

Many exhibitors called the show a success. Several reported record sales and prospect leads.

"We thought this year's show was tremendous, especially the Radio/Audio Hall," said Tim Schwieger, president of Broadcast Supply Worldwide and the

See NAB2000, page 8 ▶

NAB 2000

PHOTO GALLERY INSIDE



Clearly Digital in Denver



Clear Channel has put the finishing touches on a seven-station digital facility in Denver. See Page 14. From left: Jeff Gulick, Daren McMullin, Jan Chadwell, Karl Schipper and Jack Lambiotte.

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◆ NEWSWATCH ◆

\$8.1 Billion in Public Service

WASHINGTON Radio and television stations contributed \$8.1 billion in public service from August 1998 through July 1999.

That tops the previous figure of \$6.8 billion, said NAB. The figure includes a dollar value for PSAs, charity fund raising and disaster relief collection efforts.

For the first time, NAB included non-member stations in its public service survey. Higher station ad rates and the inclusion of more PSAs in the survey also

help account for the higher figure.

Previously, only 30-second PSAs were documented.

Of the \$8.1 billion, about \$3.8 billion represents radio station public service announcements.

Several organizations credited broadcasters with playing a major part in their public awareness campaigns in the time period, including the Federal Emergency Management Agency, the American Red Cross, the American Heart Association and others.

NAB hired an independent research firm to conduct the survey of approximately 11,000 stations, roughly 2,000 more than participated two years ago.

AFRTS Goes Digital With Audioarts

AFRTS is converting radio studios around the world to digital operations.

The Armed Forces Radio and Television Service is phasing digital gear into 30 studios and five radio production trucks, according to Director of Technology Donald Browne. The Department of Defense recently awarded a contract to dealer SCMS for 38 Wheatstone Audioarts RD-12 consoles and one Audioarts R-17 analog board as part of the six-year project.

Browne said the new studios will be

double-wired to separate digital and analog paths for redundancy. Both paths will be fed into the RD-12.

"The studios will feed digital outputs to DATs, and we'll feed a CD burner to cut CDs," Browne said. Only the mics and phone will be analog.

FCC Updates Tiebreaker System

WASHINGTON The FCC has updated its tiebreaker system, used when two or more noncommercial FM, translator and TV applicants want to build stations on the same frequency or make major changes to existing facilities.

See NEWSWATCH, page 7 ▶

AUDITRONICS 4.0 NuStar

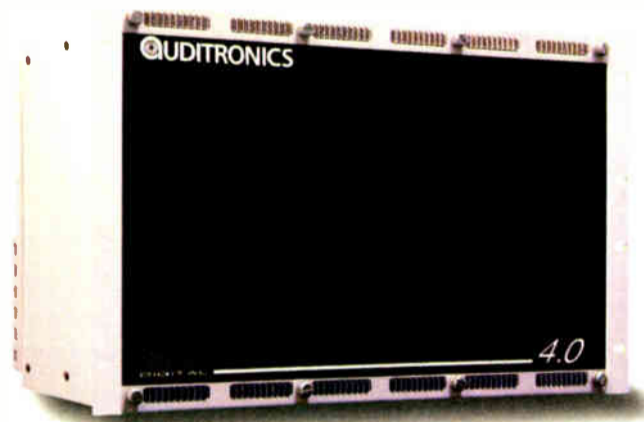
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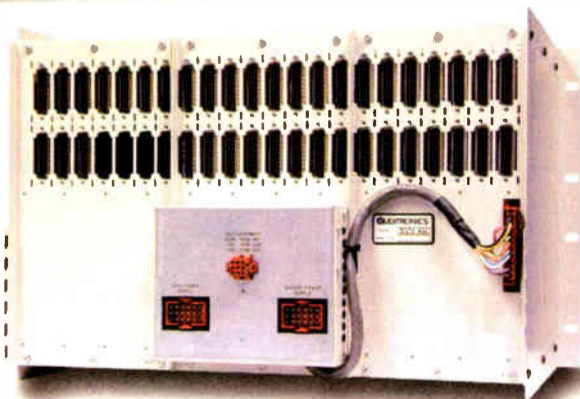
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AUDITRONICS



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READER'S FORUM

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Radio Unwinds at NAB2000

NAB President and CEO Eddie Fritts pointed to the 113,000 official attendance figure with pride for NAB2000, April 8-13 in Las Vegas. Of that figure, more than 26,000 were international attendees. More than 1,650 exhibitors were registered, compared to 1,427 for last year, using about 950,000 square feet of exhibit space.



NAB's Eddie Fritts, left, joins ABC Radio syndicated talk-show host Tom Joyner (center) and NAB Radio Board Chairman Bill McElveen at the Radio Luncheon, where Joyner was inducted into the NAB Radio Hall of Fame.



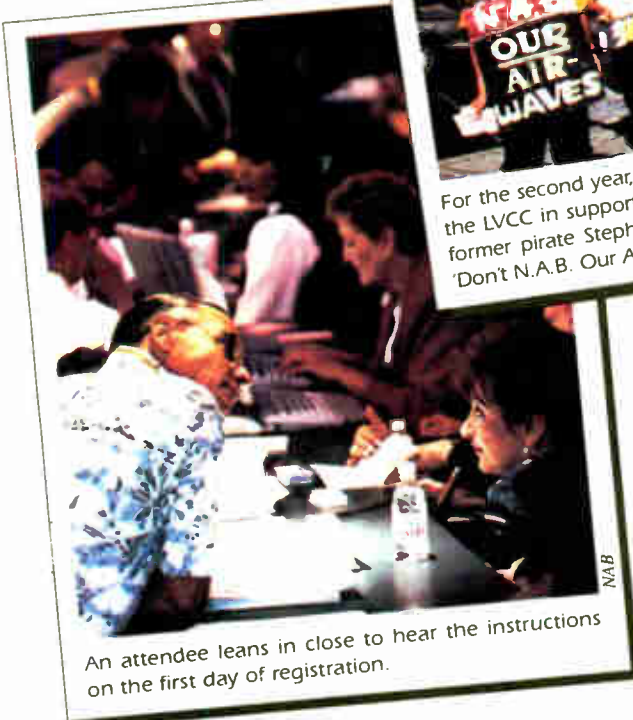
Michael Dorrough, left, founder of Dorrough Electronics, receives the Radio Engineering Achievement Award from NAB Senior Vice President, Science & Technology, Lynn Claudy at the NAB2000 Technology Luncheon. Dorrough was honored for his significant contributions to the art of audio processing and audio monitoring.



Lucent Digital Radio Marketing Director Bill Casey asks, 'What can I do to put you in this van today?' Attendees could listen to both LDR's and USA Digital Radio's IBOC hybrid analog/digital signals on Las Vegas stations KNPR(FM) and KWNRI(FM), respectively, in the LDR and USADR vans and booths.



For the second year, a group of demonstrators gathered outside the LVCC in support of LPFM. One told **RW** he was inspired by former pirate Stephen Dunifer's protest in 1998. Placards read: 'Don't N.A.B. Our Airwaves' and 'I want My Freedom of Speech.'



An attendee leans in close to hear the instructions on the first day of registration.



Exhibitors were pleased with the amount of booth traffic in the Radio Hall at the LVCC.

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NAB2000: A Day in the Life

From the notebook of RW Editor Paul McLane, for Tuesday April 11.

5 a.m. Circus Circus. Can't sleep, still on D.C. time, mulling Monday's events: lunch with Glynn Walden of USADR; the XM Satellite announcements; dinner with Suren Pai of Lucent; the Public Radio Technology Reception.

5:20 Walk the strip and take pix of the azure sky behind the Stratosphere. How Vegas has changed. The weight of the strip moving up toward the airport, leaving empty buildings behind. The sun touches the mountains; what a contrast with the littered flyers of nude women and the neon lights that no one sees at dawn.

6:15 How can people gamble at this hour? Yet there they are, beers beside them. Back to room, grab the NAB Daily News from the corridor, read about Sumner Redstone, "Saturday Night Live," NAB's latest public service estimates. Our IMAS presence here is awesome, more than 100 employees and dozens of freelancers, for 18 publications including the Daily.

6:30 A hot-air balloon visible from room.

6:45 Call office re April 26 "blueline," to make sure we can still get the news in that issue if the U.S. House votes on LPFM tomorrow.

7:15 Breakfast with Mark Durenberger of Group W Satellite Services, long-time friend of RW, a super man. We talk of keeping balance in our lives, and how proud I am of our paper's performance in the latest survey of publications at the show — the *only* radio pub in the top 10.

8:30 Taxi ride to LVCC with Sandy Harvey; thinking of workload ahead; thank goodness for our hard-working staff.

8:40 I spot people with drums, banners and leaflets protesting NAB stance on LPFM. I hop out of taxi, get the interview and pix. Chad Simmons tells me they're not pirates, and that they resent the NAB's efforts. "We're paying attention to what's going on, even though ... the media has control and isn't covering this story."

9 a.m. Stop by the NAB newsroom, the Daily newsroom and the RW booth for press releases and messages. Hit the floor.

9:30 Visit Doug Vernier of V-Soft, talk about his Probe II software and the concerns of some clients over the licensing of translators on second adjacents.

10:10 Here come Lowry Mays, Ray Lockhart and Russell Withers. How about a

photo? I'm tempted to ask Mays to visit the protestors outside with me, but he's already moving on to other booths.

10:30 Getting hungry and thirsty already. Gotta get better shoes next year.

10:40 I pass Orban booth; note to self to check on status of CRL's buyout. (I'm told later by Jay Brentlinger and Bob Orban that the deal is signed and still going through.)

11 a.m. Comrex booth. Lynn Distler shows me the Matrix codec, "a Vector with an attitude." This one already has earned a buzz on the floor. Nice booth dragon, too, but the inflatable monster is smoking from both ends this morning.

11:15 WebPresence booth. David Owen and Geoff Steadman, who is formerly of Orban. Company gets your local clients online, extends

great; must compliment editor Mary Ann Dorsie. No time to eat yet. Pass RW's Leslie Stimson in the hall, racing off to an appointment about DAB. Sounds like the House will vote tomorrow. We'll catch up after the show.

12:30 p.m. Run run, no lunch, starving. So many booths, so little time. Once again I must skip the *bnet* buffet at the Riviera, which is my loss because I enjoy that online group.

12:45 Meet with a source that recently left a major supplier and wants to talk. We huddle in a corner and catch up.

1-2 p.m. Booth visits. Lots of walk and talk. We hear the Sands is busier. Bump into Cool Stuff judges, compare notes. Our voting dinner is tomorrow; awards will be published May 24 (you can get a sneak peak now online at



Editor Paul J. McLane, left, thanks SBE members for their service and presents President Andy Butler with a copy of RW reporting his election.

sales to Web services; coupons, uploadable images, maps, WAP service. Seems like a radio-savvy company; many other dot-coms come and disappear quickly.

11:30 Exhibitors tell me NAB has raised cost to exhibit to \$32/sq.ft. for members. Ever pricier, but suppliers are still lining up, and they report a busy first two days. Are there enough 10x10-foot booths to accommodate all companies? Are too many exhibitors buying multiple booths? Does anyone care?

11:45 Must shuffle plans; I'm already late to visit StarGuide Digital and Aphex; will catch up with Chuck Wagner and Marvin Caesar later.

Noon I see an early copy of the afternoon NAB Daily, full of radio/audio stuff. Looks

www.rwonline.com).

Many readers stop me during the show to comment re recent columns about e-mail and about the late Jesse Maxenchs.

2 p.m. At the RW booth, say hi to engineer Dennis Martin, who is interested in writing more for us. And here's Bill Sepmeier and Barry Mishkind, just back from the *bnet* buffet at the Riviera. Snap a photo of them tossing the neat blinking Orban rubber balls. I love my job.

2:30 To the newsroom, finish writing story about XM Satellite's facility plan in D.C., for tomorrow's morning Daily. Crunch time.

2:45 Ask freelancer Ken R. to hustle over to hotel to pick up the plaque that Marie Cirillo rushed to me via FedEx for tonight's SBE pre-

sentation. Hungry. Lunch turned out to be Tootsie Rolls and a Coke.

3 p.m. Find Bernie Cox and Paul Cogan in the newsroom, assign them to visit several booths where suppliers wish to tell me of their products. I need a doppelgänger.

Bernie is using a loaner Nagra ARES-P solid-state recorder; Ken R. has Denon DN-F20R.

3:15 Meet staff of Crown Broadcast in their booth, including Chairman Clyde Moore; ask about the recent sale of the pro audio part of Crown to Harman; also meet Barry Honel, formerly of Texar, now with Crown.

3:30 to 4:45 Booths; check messages, stop in newsroom. Call Sharon Rae Pettigrew, sick with asthma and bronchitis in her hotel room.

5 p.m. I make my presentation at SBE membership meeting.

"I've been in radio for 20 years, on the air, as a salesman and marketer and as a journalist. I've come to realize that the most under-appreciated asset a radio station has is its technical talent. On behalf of RW and its advertisers and readers, I thank you, the broadcast engineering community, for your contribution to the industry.

"I can't give a plaque to all of the members, but I'd like to present this color-proof copy of the front page of our Nov. 24 issue to your president, Andy Butler, who exemplifies the excellence of your profession."

SBE members give Andy a standing O.

6 p.m. I need to finish my remarks for tomorrow's Ennes workshops, for Rick Farquhar and his attendees; but I need food desperately. Idea: visit the Telos luau across the street.

6:15 Bump into Jim Woods of Harris on the street, ask him about the news that Harris has invested in USADR.

6:30- 7:30 Telos luau, great food at last; chat with Eric Hoehn of WETA, Tony Masiello and Ed Schwartz of XM, our Laura Dely, many others; snap some pix that Frank Foti may regret later. And I recall that Jesse had been at this event last year. We miss you, dude.

7:30 - 10:15 To the newsroom to finish tomorrow's speech. Unsurprisingly, I can hardly think. "Brain freeze." Chat with Carter Ross of RW International about IBOC developments. He, Heather Nicholson and I play a brief game of catch with a soft rubber ball, over the top of our 26 computer stations. Heather starts bouncing the ball off the back of Cristina Strigel's head. Time to go home and get some sleep. Maybe I can think better and finish this speech at 6 a.m.

11 p.m. Back to the hotel. Check voice-mail messages and collapse.

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DIGITAL NEWS

DRM, USADR Integrate AM DAB

by Marguerite Clark and T. Carter Ross

LAS VEGAS "This is a historic moment," said Digital Radio Mondiale Chairman Peter Senger in opening DRM's first international DAB symposium, held at NAB2000.

DRM is a broadcast industry consortium dedicated to developing a digital solution for AM broadcasting worldwide. Since its founding in 1996, it has grown to 52 members, including international broadcasters, equipment manufacturers and government agencies from 23 nations.

Senger said the organization hopes to have an AM DAB worldwide standard set by the International Telecommunications Union by the end of 2001, and for digital broadcasts to be on the air by 2002. Currently, the DRM submission is under consideration by the ITU.

The DRM system is designed for use at

any frequency below 30 MHz, including the long-, medium- and shortwave bands, with variable channel constraints and propagation conditions throughout these bands.

Glynn Walden, vice president, broadcast engineering, USADR, speaking briefly at the conference, said, "We can integrate the DRM and IBOC. The sys-

DRM was formed to compete with the Net, satellite TV and the new FM services that followed the fall of the Iron Curtain.

The symposium gave DRM a chance to highlight its most recent coup, a cooperative agreement with USA Digital Radio Inc., a proponent of in-band, on-channel DAB.

tems can be compatible."

The biggest hurdle to the smooth integration of the DRM and USADR AM DAB systems is that the primarily European-developed DRM system uses a 9 kHz channel spacing, instead of 10 kHz, as in the United States.

During the technical phase of the symposium, speakers said the DRM system could be structured to work within either band spacing.

DRM members came together at a time when international foreign-service broadcasters were looking to boost the audio quality of their short-wave services.

The consortium was formed to compete with the Internet, satellite television

and the many new FM services that came about after the fall of the Iron Curtain.

Designed as a replacement system, DRM broadcasts can be completely digital, using the full 9 or 10 kHz of channel space, or it can use a bandwidth multiple (4.5 kHz or 5 kHz) so an analog simulcast signal can be included.

Digital flexibility

"The system can also adapt to additional channel bandwidths that are not strictly included within the ITU channel-spacing schemes, allowing increased system capacity when interference concerns are not an issue," said Patrick Bureau of transmission equipment manufacturer Thomcast.

To achieve this level of flexibility and utility, the DRM system relies on up to two different source-encoding schemes — a subset of MPEG-4 Advanced Audio Coding and Code Excited Linear Predictive speech coding.

For generic audio coding, AAC is used. In a standard configuration for use on a shortwave channel, ACC could provide 20 kbps of mono audio.

USADR's DAB system also uses AAC for audio coding.

The speech coding, CELP, allows for reasonable speech quality at bit rates significantly below standard rates, for example "half-rate" operation at 8 kbps.

"Although the AAC coder can be used at such low bit rates, still offering reasonable quality for music signals," said Bureau, "the coder provides better quality on speech programming."

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DIGITAL NEWS

DAB: Making Inroads Worldwide

by Marguerite Clark and T. Carter Ross

LAS VEGAS "Digital sound broadcasting is obviously the future, for both the United States and the rest of the world. But much beyond that, these two areas are taking very different approaches to implementing DAB," said Milford Smith, of Greater Media Inc.

Smith was moderator of the NAB2000 session "DAB Worldwide Perspectives," focusing on the development of digital audio broadcasting on an international level.

He said that while many countries have already adopted the European-developed Eureka-147 standard for digital broadcasting in the L-band and VHF band III and a number of stations are on the air, the United States has thrown its support behind an in-band, on-channel system.

Marcus Zumkeller of Sony International kicked off the session by discussing the technical aspects and future of the Digital Radio Mondiale system for digital AM broadcasting.

Effectively an IBOC system for broadcasting in short-, medium- and long-wave bands, DRM provides better audio quality than analog and interference-free reception, he said.

Zumkeller said the technology is available for DRM-capable receivers. Although he did not give any figures, Zumkeller said that in the long term, the cost of the receivers will be reasonable.

Next on the panel, Shuji Hirakawa of Toshiba Corp. discussed the BSS System E being developed for Japanese DAB.

Hirakawa outlined the status of the standardization of the system, which has been designed to optimize performance for satellite-based digital broadcasting in the 2630 to 2655 MHz band.

Also during the session, Oliver Kunz of the Fraunhofer Institut for Integrated Circuits focused on the design of an audio coding scheme for digital broadcasts in the AM frequency bands, particularly the DRM system.

Kunz said the medium- and shortwave frequency bands present a number of constraints, making it difficult to design an effective coding system. DRM primarily is using a subset of the MPEG-4 Advanced Audio Coding algorithm for its audio coding.

USA Digital Radio, one of two IBOC proponents, also is using AAC coding.

AAC is also under consideration for digital distribution of music on the Internet, said Kunz.

"We have the technology at hand," said Kunz, "and we use this to cope with the difficult channel situation that must be taken into account."

Kunz said the developers of the AAC compression algorithm are certain they have struck a balance between coding efficiency and error robustness, applying methods to cope with channel errors and enhance the standard coding schemes to fit the DRM scenario as best as possible.

"I am confident that with the technology we have selected for DRM, we will make digital AM possible," he said.

Also on the panel was Naohiko Iai of the NHK Science and Technology Research Labs, discussing the latest test results of the ISDB-T digital terrestrial broadcasting system, which Japanese public broadcaster NHK is developing.

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'Light Up IBOC' Next Year?

► DAB, continued from page 1

Charles Morgan, president of the standards-setting National Radio Systems Committee, used plain language in calling for an alliance.

"We need IBOC. We need it now. Help!"

Morgan said IBOC development would be easier if the remaining proponents, USA Digital Radio Inc. and Lucent Digital Radio, joined forces. USADR and a third proponent, Digital Radio Express, aligned in late 1999.

LDR's Senior Vice President of Product Management Ben Benjamin said LDR has indeed been cooperating with USADR — through the NRSC process.

USADR's Vice President of Broadcast

Engineering Glynn Walden restated USADR's previous invitation for Lucent to join the USADR coalition.

"We wouldn't rule out joining forces in the future, but it's not in the plan now," USADR President and CEO Robert Struble said later in the show.

Harris Corp. Vice President of Radio Systems for Broadcast Communications Jim Woods said, "An alliance is the fastest, most direct path to IBOC. The industry has to go to the FCC with a solution."

Although Harris is testing its Platinum Z series transmitters with both USADR and LDR for IBOC compatibility, it also has invested in USADR with a stock purchase — the first equipment

manufacturer to do so.

Woods and USADR declined to put a dollar value on the investment, which he said was meant to support IBOC development in general.

Wood said of Harris and broadcasters, "Our job is to bring pressure and clarity to the process to make it happen sooner than later. We need to be lighting up IBOC in a year."

Asked if LDR also is seeking an investment from Harris or from another equipment partner, LDR President and Chief Executive Suren Pai said no.

Pai said Lucent Technologies revenues were approximately \$45 billion last year, so seeking investors "has never been an issue" for LDR, a venture owned by Lucent Technologies and Pequot Capital Management.

USADR continues to add investors and hardware allies. Its new broadcast investors include Allbritton New Media, Beasley Broadcast Group Inc. and Bonneville, giving it a total of 17 broadcast and 12 Wall



USADR's Glynn Walden

Photos by Leslie Stinson

Milford Smith, chairman of the DAB subcommittee.

The NRSC said it is "reasonably probable" that IBOC DAB will perform better than analog with no interference to either the host stations or neighboring stations. But the NRSC said it could not be sure, because it lacks sufficient data from either proponent.

The NRSC intended to send letters to

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Panelists enjoy a laugh at NAB2000. From left: Keith Larson, FCC; Charles Morgan, NRSC; Dwight Taylor, Digital Radio Express and Ben Benjamin, Lucent Digital Radio.

Street investors.

New equipment testing partners for USADR include Sanyo Electric Co. for receivers, and Armstrong Transmitter Corp.

Also, Jampro RF Systems Inc. and Dielectric Communications are working with USADR to develop combiners and filters compatible with the IBOC system, which USADR is branding as "iDAB."

Moseley Associates Inc. is testing studio-transmitter links compatible with the USADR system.

"Having Moseley join our coalition provides the final link in the radio broadcast path," said Struble.

USADR has added to its employee roster. It now has 50 employees, compared to about half that at this time last year, said Struble.

One of the newest additions is Pat Walsh, who was a consultant for McKinsey & Company Inc. He is USADR vice president of datacasting.

New hires also include Jeff Detweiler, formerly of QEI Corp. and Radio Systems, as broadcast business rollout manager of USADR; Russ Mundschien, former CE of WEAZ(FM) in Philadelphia, as field implementation manager; and Tom Walker, formerly of Continental Electric Corp., as a broadcast engineer.

At the show, the NRSC approved evaluations of system data submitted by USADR and LDR in December 1999 and January 2000 respectively.

NRSC members said by adopting the reports, they have completed a milestone in the development of an eventual IBOC standard.

"This is a good day for radio," said

USADR and LDR asking if they would take part in the next step of the development process, so-called Phase Two: direct system comparisons.

The NRSC asked the IBOC proponents to respond by May 8.

NRSC Chairman Charles Morgan said with direct system comparisons, the committee "would then be in a position to determine which system performs significantly better than analog and which one does it best."

With Phase Two tests, the NRSC would have an independent test lab conduct lab and field tests on both systems. Because the same tests would be performed on both systems, the NRSC would have oversight and control over the process.

It did not have such oversight in Phase One, when each proponent conducted its own tests and decided which of the NRSC's suggested guidelines it would test and submit data for.

Another participant in the IBOC development process, the commission itself, has not actually endorsed IBOC over an out-of-band solution, though it has said in its DAB proceeding that it is leaning that way if IBOC works.

The proponents hope the commission will select an IBOC standard by the end of this year. If that happens, USADR and LDR officials agree stations could begin making the digital transition by the end of 2001.

Pressed about the FCC's timetable, Keith Larson, associate chief for engineering in the FCC's Mass Media Bureau, said, "We have to be sure (IBOC) works before we

See DAB, page 7 ►

► DAB, continued from page 6 can support it. I think broadcasters need assurances that DAB won't harm them."

The FCC is reviewing approximately 100 public comments it received on the DAB Notice of Proposed Rule Making.

Both USADR and LDR had a substantial presence on the exhibit floor.

For the first time, LDR brought its demo van to the show, so attendees could hear its live FM IBOC signal via KNPR(FM), Las Vegas.

Lucent Digital Radio said it has successfully demonstrated its FM multi-streaming form of IBOC. LDR announced the results of its system tests on three stations: WJB-FM, Lincroft, N.J.; WPST(FM), Trenton, N.J.; and KNPR(FM), Las Vegas.

This is the data it submitted to the FCC and the NRSC in January.

"Multi-streaming offers a more robust digital signal with no digital dropouts," said Pai.

No 'discernible interference'

When asked whether the Lucent system caused interference either to its analog host stations or to neighboring stations, Benjamin said there was no "discernible interference."

With its multi-streaming IBOC DAB system, audio data rates of 128 kilobits per second are possible, LDR said. Stations would be able to adjust the data rate to deliver high-quality audio and data, according to Lucent.

LDR has pinpointed eight more cities in which it will conduct field tests. The next two will be Washington, D.C., and San Francisco.

USADR aired its IBOC signal live on KWNR(FM), Las Vegas. Attendees could hear low-power AM IBOC demos in the exhibit hall from the USADR booth and that of Harris and Nautel Limited.

For FM, attendees could hear a low-power IBOC demo from the USADR booth, and from the booths of QEI Corp. and Broadcast Electronics.

IBOC DAB questions in sessions and elsewhere carried a sense of urgency this year, as two new competitors to traditional radio detailed their launch plans.

References to satellite-delivered DAB as

"the Death Star" were made — both by broadcasters and by the companies developing the technology, Sirius Satellite Radio and XM Satellite Radio.

Sirius hopes to launch the first of three

non-payment.

Sirius plans to locate about 100 terrestrial repeaters in 46 cities to serve as gap fillers in urban areas where the satellite signal may be blocked.

Both companies said they do not plan to make their systems local, nor can they, given the limits of their FCC licenses.

During one panel, the NRSC's Morgan asked John Worrington, senior vice president of engineering and operations, if XM is really building a terrestrial cellular repeater system fed by satellite.

"No. Nobody in his right mind would try to cover the U.S. with repeaters," said Worrington. "We cannot operate this system as a repeater system only."

Worrington said that his company's satellites are named "Rock" and "Roll." XM Satellite Radio plans a phased rollout beginning the first quarter of 2001, and have full national coverage by May 15, 2001.

XM is building 82 all-digital studios to be completed this summer (see story, page 24). Sirius completed its studios last fall (RW, Nov. 10, 1999).

We need to be lighting up IBOC in a year.

— Jim Woods of Harris

satellites on June 28 and be operational by the end of this year. Executive Vice President of Engineering Robert Briskman said the service is encrypted; each receiver will be addressable so Sirius can turn off service for

XM, in turn, plans to locate 1,700 terrestrial repeaters in 60 cities.

Some broadcasters fear both Sirius and XM eventually will use their repeater systems to transmit local programming.

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◆ NEWSWATCH ◆

► NEWSWATCH, continued from page 2

As it has for commercial applicants, the commission wants to get away from its comparative hearing process for noncommercial applicants, and replace it with a system that uses filing windows and points.

Under the new procedures, non-com applicants will file their paperwork during filing windows announced by the FCC.

To determine tiebreakers, the FCC will use a point system. Points will be awarded as follows: three points if an applicant is local for at least two years; two points if the applicant owns no other stations; two points if the applicant is part of a statewide network providing service to accredited schools (only awarded if applicant does not also claim local ownership); and one to two points based on the technical parameters of the proposed station.

Other tiebreakers include selecting the applicant with fewest existing stations and/or fewest pending applications.

Exhibitors Pleased With Traffic

► NAB2000, continued from page 1
chairman of the Exhibitor Advisory Committee, which counsels NAB on exhibitor concerns.

"The show floor was very busy, especially the first two days. NAB did a wonderful job in promoting the show for radio, with extensive pre-show mailings. We saw many customers at this year's show who have been away for several years. It is nice to see radio/audio hold its own against TV and Internet interest on the show floor."

Other exhibitors said much of the attendance seemed to be in the main hall of the LVCC and in the Sands Expo Center, which was reported consistently crowded.

As suppliers seek larger and multiple booth spaces, all agree that the race for exhibit space and position is an ongoing issue. "Booth space, or should I say the lack of it, is of major concern for exhibitors at future spring NAB shows," Schwieger said.

"With so many companies wanting to sell to broadcasters and the surge of Internet-based companies, exhibitors are hard-pressed to get adequate booth space in the location they desire. We're working on this issue with NAB and hope they heed our advice to solve this problem."

Off the show floor, the debate over whether the commission rushed into set-

ting rules for LPFM reached high levels. The FCC is set to accept the first batch of LPFM applications this month.

Kennard wasted no time getting to LPFM in his speech to broadcasters. He said broadcasters are using up good will at the commission in fighting LPFM and again assured stations the FCC is satisfied LPFM will not hurt the FM band.

Interference

"There will be no harmful interference. This is a battle of the engineers," said Kennard.

"With any new service there's some interference," he said, noting that the question is how to define it.

When asked what that meant, he said, "The key to harmful interference is: Is it interference consumers would care about?" The FCC, he said, has proved in the LPFM rule making that the FM band would not be harmed.

Meanwhile, on April 13, the House passed H.R. 3439 despite a request for a delay by Kennard.

The vote fell short of the two-thirds majority needed to override a presidential veto, should the bill go that far.

President Clinton opposed House passage, according to a statement released by the Executive Office of the President before the vote. The administration

expressed confidence in the FCC's ability to handle interference issues that might arise from the allocation of LPFM stations.

The bill requires the FCC to maintain current channel protections, including those for third-adjacent channels, and mandates the commission to have an independent party conduct interference tests.

"This is a great day for free, over-the-air radio listeners," said Fritts.

Fritts thanked National Public Radio, radio reading services for the blind, the Consumer Electronics Association and the National Religious Broadcasters Association for their support.

NPR was singled out by Kennard for its support of the bill.

"Rather than continuing the process of finding common ground and resolving differences, NPR walked away from the table and endorsed the legislation," said Kennard.

He pledged to continue to work with NPR to resolve translator and receiver interference issues.

The bill now goes to the Senate.

Before the show, the FCC and NAB traded accusations about the merits of receiver studies conducted to determine whether new LPFMs would interfere with existing stations.

The debates continued in Las Vegas.

NAB has an audio CD that it distributed to members of Congress with a simulation showing potential interference.

The FCC called that information



FCC Chairman Bill Kennard

new administrator of the Commerce Department's National Telecommunications and Information Administration, FCC Commissioner Michael Powell said the conflicting data from receiver studies was unsatisfying.

FCC Commissioner Harold Furchtgott-Roth said, "The best thing we could have done was ask the National Academy of Sciences to study it. We didn't do that and now we have a great mess."

NAB has appealed the FCC low-power ruling in the District of Columbia Circuit Appeals Court.

Donald Verrilli of Jenner & Block said NAB would know soon if its request for an expedited appeal would be granted.

If so, there could be a ruling before the first LPFM licenses are granted this summer.

How LPFM could affect radio's transition to digital was a hot topic at the show.

USA Digital Radio President and Chief Executive Officer Robert Struble said LPFM would cause some "Swiss

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FCC Commissioner Michael Powell (Right) and NTIA's Greg Rohde During the 'Regulatory Dialogue'

"fraudulent," while NAB said the FCC ignored the rules of physics when interpreting the data from its receiver studies and those submitted by NAB, NPR and the CEA.

According to NAB Senior Vice President, Science & Technology, Lynn Claudy, the FCC has nothing to back up its assertion that radios have improved so much that there's no need for third-adjacent channel protections.

"LPFM stands for 'Less People Get FM,'" said Claudy.

How could the conclusions from the receiver studies be so far apart?

The FCC took a conservative approach to LPFM, said Bruce Franca, deputy chief of the FCC's Office of Engineering Technology.

"We didn't measure distortion. We measured signal-to-noise. That is what will affect receiver performance," said Franca.

Claudly said distortion is a poor indicator of perceived interference.

In a similar LPFM debate with FCC commissioners and with Greg Rohde, the

cheese," or pockets of interference, and USADR has told the FCC where and how big those pockets would be.

LPFM is happening at the same time the companies developing satellite-delivered DAB are closer to launching their services.

Sirius Satellite Radio and XM Satellite Radio are using addressable receivers, enabling them to easily target their audience.

"They'll be able to send commercials in Spanish to Spanish listeners," said Claudy.

Keith Larson, associate chief for engineering in the FCC's Mass Media Bureau, said the rules governing the terrestrial repeater systems for both companies are pending.

The FCC proposal says both companies could only use their terrestrial repeaters to retransmit their satellite signal, he said, adding that a ruling is possible by summer.

That would be in time for the proposed end-of-year launch of Sirius Satellite Radio.

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FCC Database Stymies Engineers

by Lynn Meadows

WASHINGTON What may one day be a shining example of efficiency in government — the Mass Media Bureau's database for station engineering information — is currently a headache for private enterprise.

Engineers use the FCC's engineering database to verify that proposed changes — upgrades, site changes, power increases — and new station proposals do not conflict with other existing stations.

At the end of 1999, the Mass Media Bureau of the FCC brought its new Consolidated Database System online.

"It allows us to locate all information

from one source and it eliminates the requirement to update three separate databases when accepting, granting, dismissing or updating application information."

neering database relied on by radio engineers.

But engineers and consultants accustomed to the old engineering database files



ASSOCIATION OF

FEDERAL COMMUNICATIONS CONSULTING ENGINEERS

said an FCC source.

The new database will allow electronic filing of station applications. CDBS combines three databases, including the engi-

neering database relied on by radio engineers. But engineers and consultants accustomed to the old engineering database files have been frustrated both by the complexity of the new 18-file database and the FCC's strategy in introducing it. At the recent NAB2000 convention, many com-

plained to each other of the headaches they were experiencing.

The structure of the new database was not released until December 1999, giving software writers little time to write or modify programs to work with the new database, said engineers.

Then, they said, the FCC stopped updating the old database in late December before all the information was available in the new database.

"Those who wish to propose station changes (or new stations) are in a difficult position in that the switchover time to the new database structure is essentially 'negative,'" said Joe Davis, partner in the engineering consulting firm of Cavell, Mertz & Davis Inc., and president of the Association of Federal Communications Consulting Engineers.

"The new one doesn't work yet, and the old one is no longer updated."

Asked why the old system was not yet perfect, the FCC source said, "Any new system, particularly a database as extensive as the CDBS, is expected to have some kinks in it."

"If you wait to go live after all problems are resolved, it could be years before we had access to the new system. We could not wait several years to provide electronic filing abilities to the public."

We couldn't wait several years to provide electronic filing abilities to the public.

— FCC Source

But one contract engineer who preferred not to be named said, "The database is the reference, which everybody goes by. Without an accurate reference, everything that is done is tainted."

"We are focusing on the most problematic issues, such as providing access to information via the Internet and making sure critical engineering programs used by FCC staff are working correctly," said the commission source.

Davis expects filing activity associated with digital television, Class A television station protection and low-power FM.

"Changes in the engineering programs and/or the importing of data will be necessary before the new CDBS data can be used," Davis said via e-mail shortly before the NAB2000 convention.

"It is my impression that these changes will take time and substantial effort to implement and satisfactorily debug."

In addition to the software changes, the new database did not include some fields such as the comments field that engineers find valuable. Comments can be anything from "This translator is translating WXXX" to "This FM serves Canada."

The *readme.txt* file on the FCC Web site in the CDBS section stated that "a comments file was in preparation for release probably in February."

The file had still not been added by early April. At press time, an FCC source said that the comments should be added soon.

The comments are important, said Peter Moncure, president of RadioSoft, developers

See DATABASE, page 12 ▶



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World Radio History

Users Share FCC Database Woes

► DATABASE, continued from page 10 of coverage and interference prediction software. Moncure said another critical field missing from the new database is the 73.215 notification. A field in the old database let users know if the station was allowed to short space under FCC rule 73.215.

The new database also affects engineers who use the National Telecommunications and Information Administration Web site. NTIA has programs to calculate interference for High Definition Television and predict coverage for AM and FM stations, but they are written to work with the old database.

Greg Hand, information technology and Local Area Network support for the Boulder, Colo., NTIA office, wrote a pro-

gram last year to automate the procedure for downloading the old FCC database file. He said the new multi-file database requires a rewrite of that program and several other NTIA software programs commonly used by engineers.

Meanwhile, the Mass Media Bureau has not established a timeline for fixing problems in its new database.

"We're doing the best we can and I should also point out the commission is doing the best they can," said Moncure.

"FM is working pretty well," he said in late March, referring to the FM portion of the database. "AM is in much worse shape." But the database problems coincided with the lifting of the filing freeze

for major AM changes earlier this year.

Ultimately, the new database will have several advantages aside from consolidation of all information into one database, said the FCC source. Those include the ability to search and manipulate data not easily accessible in the old databases such as specific ownership information, engineering information for superceded authorizations and call signs of the station rebroadcast by an FM translator.

It has "been a challenge" using the new system, said Charles Cooper, partner in Du Treil, Lundin & Rackley Inc., but he spoke hopefully of the future.

"When all is said and done, I think the CDBS will be a wonderful system."

Industry Changes

Personnel news from around the industry.

Send news to srae@imaspub.com



Clear Channel Communications Inc. has appointed **Jonathan Pinch** to the position of president of Clear Channel International Radio.

He will oversee all Clear Channel radio operations outside of the United States, including more than 240 properties in Australia, New Zealand, Mexico and Europe.

In other Clear Channel news, **Carolyn Gilbert** has been promoted to executive vice president/general manager of wholly owned subsidiary Critical Mass Media.

Gilbert replaces former President **John Martin** who was recently named president, Clear Channel Web Site Services Group.

Broadcast industry veteran **Frank McCoy** joined **American Media Services LLC** as vice president and director of engineering.

McCoy previously served as engineering vice president of **Gulf Star Communications** of Austin, Texas.



Frank McCoy

Itelco has appointed **Filippo Giacinti** as its worldwide marketing and sales director.

Jodi Long has been named vice president/general manager of **Infinity Promotions Group**.

Long will oversee 31 offices nationwide.

Michelle Marino has been promoted to the post of New York sales manager for **Katz Hispanic Media**, a division of Katz Radio Group.

Changes abound at **Metro Networks/Shadow Broadcast Services**.

Ivan Shulman has been appointed senior vice president of sales, while **Sherry Evans** has been appointed to the post of director of operations, Houston.

Mike Laurel is the new news bureau chief in Houston, while **Mark Grant** has been bumped to the post of vice president of sales, Chicago.

Westwood One is announcing staff changes.

Monica Lopez has been named account executive; **Maarifa Roho** has been appointed sales manager, Northwest region.

Peter Hanley has joined **Finger Lakes Productions International** as the member of the board of directors responsible for marketing.

Finger Lakes produces Radio Voyager Network.

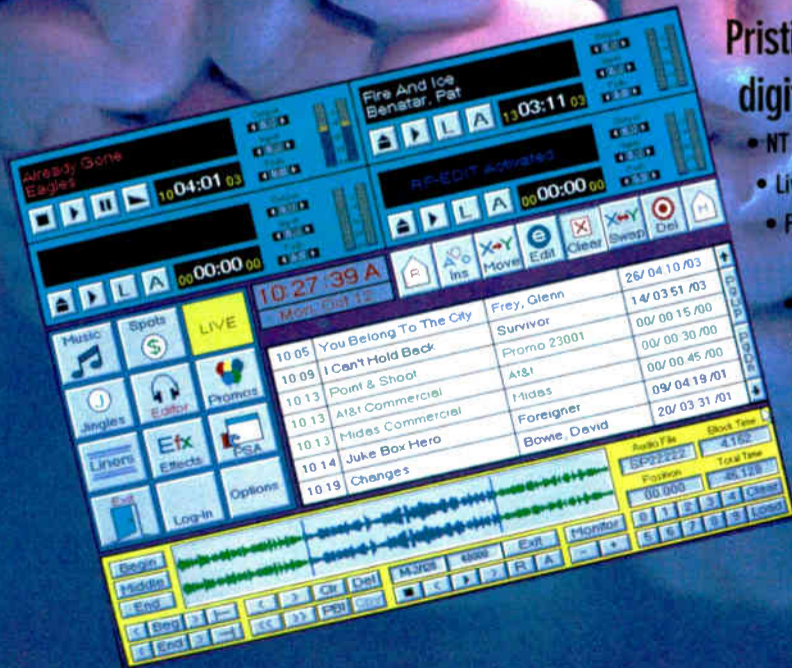
— Sharon Rae Pettigrew

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Digital and Mile-High in Denver

Clear Channel Puts Finishing Touches on Seven-Station, 65,000-Square-Foot Facility

Ted Nahil

The challenge was simple enough: Move seven top-rated Denver radio stations from two separate studio sites in downtown Denver to a new five-story building located south of the city in an area known as the Denver Technological Center (DTC).

Convert the entire operation to digital and keep the stations on the air and the process transparent to the listeners during the construction, conversion and cut-over.

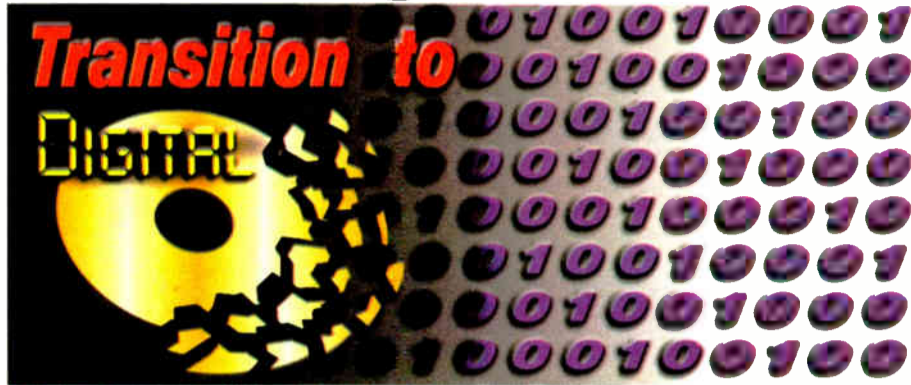
Simple.

The result is Clear Channel Communications Inc.'s 28-studio complex, a monument to modern radio consolidation.

The facility also includes 20 news/sports workstations, a 24-track performance studio and four sports networks including flagship ops for the Denver Broncos, the Colorado Rockies and the University of Colorado's Buffalo football.

The AM stations, KOA, KTLK and KHOW, and the FM stations, KRFX, KHHH, KTCL and KBPI, now have one of the most modern, technologically advanced studio facilities in the country.

"We began the process by forming teams," said Jeff Gulick, Clear Channel's



Colorado director of engineering.

"GMs Lee Larsen and Don Howe located the property, all the Denver engineers began the technical planning considering requirements and requests of the programming departments, and we formed committees by station to consider security, storage and logistics of moving in," he said.

High-tech facility

The Lawrence Group and Lawrence Group Colors of St. Louis, the architects and interior designers on the project, transformed a traditional, four-story office building into a high-tech broadcast facility.

"Clear Channel's goal was to create a well-planned space that allowed for more frequent and easier interaction between the staff," said Lawrence Group President Mary Schanuel.

The project, begun by Jacor, was completed after the Clear Channel-Jacor merger.

Al Kenyon, Jacor's director of engineering, and Jim Ary, Jacor's director of engineering for special projects, worked with the Denver engineering staff, Clear Channel's Jim Smith and the Lawrence Group to draft the final architectural plans for the facility.

The local team in Denver was headed by Jeff Gulick, director of engineering for Clear Channel Colorado, and included Jack Lambiotte, FM chief engineer, Jan Chadwell, AM chief engineer, Daren McMullin, assistant FM chief, Karl Schipper, assistant AM chief, Dave Sawyer, transmitter engineer, and Paul Carman, assistant engineer.

successfully for other projects. (We) saw no reason to take on a task the size of the Denver Tech Center facility with a firm with whom we would need to develop a new working relationship," Kenyon said.

The final location of the studios was determined by evaluating the requirements of the other departments and assessing the ability of the building to accommodate a myriad of HVAC and conduit runs.

Kenyon and Ary suggested centralizing the technical plant in the basement to eliminate computer noise in the studios and to conserve studio space. RDA's experience was valuable in the furniture design, console and cabling run layout.

Lambiotte and Chadwell made trips to St. Louis to refine studio layouts with flexibility and ergonomics in mind.

Company needs

Sam Caputa, RDA's project manager, said his company worked with the client, the architect and SFB, the furniture supplier, to be certain that the custom furniture met Clear Channel needs.

"For a couple of the studio areas, that meant working with full-scale cardboard mockups to be certain equipment was placed properly and site lines were maintained."

The fact that RDA, The Lawrence Group and SFB Creative Carpentry were located in the same city saved hundreds of hours in document revisions, plan modifi-



Control Room A

"The Lawrence Group's knowledge of the technical requirements of broadcast facilities saved us a lot of time," said Lee Larsen, vice president and general manager of the AM stations, in a press release issued by The Synergy Group.

Lawrence Group architects Brent Sasbinder and Chris Tantillo spent many hours observing the current operations and interviewing staff so that they could understand how the stations functioned.

One of the largest obstacles was the day-one functionality of the facility.

"Our old facilities offered a great deal of flexibility to operate all of our seven stations. But all those additions and changes were done step-by-step over the years. Now, we needed all of that flexibility and all of those functions from day one," said Jack Lambiotte, FM chief engineer.

The project began in 1998 and the lease for the new building was signed in January, 1999. The target date for broadcast was originally April, 1999.

"Initially, we were told we were moving seven stations in four months, we had to wait for the buildout. We freaked!" he said.

At this point, RDA Systems and SFB Creative Carpentry, both based in St. Louis, were brought into the project. Jacor had used this same group in the past.

"We ... had used the Lawrence Group

and coordination.

Prophet Systems Innovations, a division of AMFM, had installed its digital audio storage and playback system, AudioWizard CFS, in more than 200 Clear Channel stations prior to the Denver project.

The decision to use PSi was the first step in moving the entire operations of the seven stations into the digital realm.

Prophet supplied 24 control room and production workstations, 16 operations workstations (for traffic, programming and news), 12 audio servers and four digital reel-to-reels (DRRs), networked with Novell 5.0 on HP LH3 RAID 5 central file servers, interconnected by a 100BaseT network.

Antex SX-26 and SX-11 audio cards using a 5.5:1 compression ratio coupled with 167 GB of audio storage handle approximately 1,400 hours of mono record time for all seven stations and the sports networks.

Each talk studio for the three AMs has Wizard monitors so the hosts can see the active control room log during their programs. All of the studios and control rooms have the ability to record and play audio, as well as voice track upcoming program segments. The DRR machines handle automatic recording of delayed events.

"The Denver Clear Channel build-out

See DIGITAL, page 16 ▶

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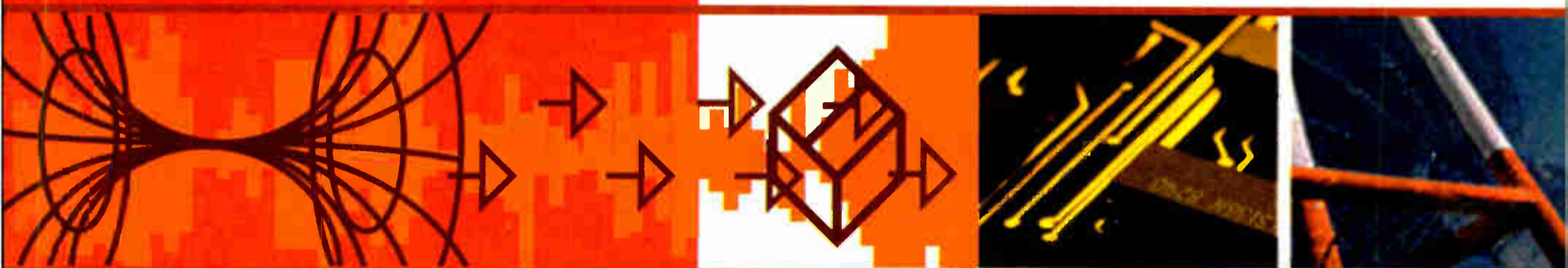
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Digital in Denver

► DIGITAL, continued from page 14

was an ambitious undertaking done in a relatively short period of time," said Kevin Lockart, PSi president and CEO. "It was imperative that the technology we provided them be cutting edge, yet very reliable."

The decision to use Klotz digital consoles was made in December of 1998, after the studio layout had been finalized.

Critical to Kenyon's consideration was his previous professional relationship with Ray Esparolini, vice president of sales and marketing for Klotz Digital America Inc., and the fact that Klotz, a German company, was opening a U.S. office.

"In the end, only Klotz offered a fully integrated solution," said Kenyon.

A 1,024 x 1,024 routing system, based on the VADIS D.C., provides digital processing and distribution of the audio signals as well as their transmission via fiber optic cable. The backbones of the audio distribution are two 1 GHz fibers that connect the basement's VADIS routers with VADIS routers located on third (FM) and fourth (AM) floors.

Benefits

"Where the Klotz benefited us was in less wire runs. If we had to do it analog, we would have needed more conduit, and we didn't have room. Besides, we'd probably still be pulling wires," said Gulick.

The system utilizes three separate "net-

work" paths: One for control requests from the studios using 100BaseT; a return from the VADIS that makes the cross-point connection using RS422; and one for the 20-bit, uncompressed digital audio routed on the fiber.

An Aardvark Aardsync II master sync generator and Aardvark Sync DAs comprise the house clock system using a 1X6 word clock and a standard sample rate of 44.1 kHz.

The original concern of cumulative delays resulting from A-to-D and D-to-A conversions proved to be "negligible," according to Gulick.

The consoles in each studio and control room are actually control surfaces. No audio runs through these devices with the exception of an analog sample used to

Schoning, director of engineering, Klotz Digital America, were also heavily involved in the project.

Two completely separate audio paths were built.

The analog backbone is derived from the analog outputs of the VADIS units in the basement and in each studio. This audio is also a source for an input on the AudioWizard ACU-1 switcher, as is the analog audio from a particular station's AudioWizard audio server.

The analog audio outputs of any audio server can be placed directly on the air, if necessary, to circumvent a problem in the digital routing system. Normally, these outputs feed the back-up STL paths to each station's transmitter.

The digital backbone is derived from the

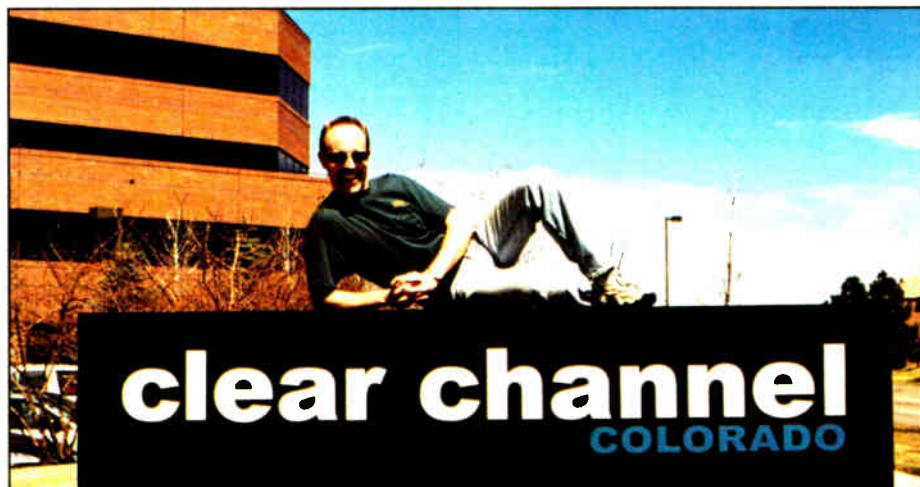


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Jack Lambiotte at the New Building in the Denver Technological Center

drive the VU meters. They route the audio from a source to a destination based on the configuration of the console and the function that is desired.

Each studio has at least one VADIS D.C.; there are "breakout points" on each studio floor for additional inputs and outputs, with the master routing of inputs to outputs taking place in the basement engineering racks.

Two types of consoles were supplied: The Spherion, used in the smaller production rooms; and the DC, used in all the air studios, control rooms and larger production rooms. The final configurations were broken down into branches that represented the "logical choices that a studio will need," according to Chadwell.

Every source and destination is configurable and any group of them can be recalled as a "standard" configuration, or any console can be configured on the fly.

For example, the various talk shows on KOA use different console configurations, depending on who is running the console, how many hosts and guests are present, and what the show needs in the way of remote inputs, talkback, IFB and monitoring.

The talk stations, KOA, KTLK and KHOW, presented the biggest configuration challenge — dealing with telephone lines, incoming audio, network outputs and all of the mix-minus feeds that had to be generated.

These configurations consumed the bulk of Klotz configuration time during the construction. Software functionality requirements were addressed by Gerhard Pehland, head of research and development for Klotz Digital AG (Germany).

Then, thousands of lines of code were written, as configuration files, for each room, studio and control surface. Although some of the code could be reused, a great deal of this work was customized for the Denver site and was done by Klaus Lein, software engineer, Klotz Digital Germany.

Gerd Hollering, assistant head of projects, Klotz Digital Germany, and Karl

AES3 outputs of the VADIS units. One of the sources for these units, located in the basement engineering area, is the digital output from the station's AudioWizard audio server.

Conversion

This digital signal is temporarily converted back to analog to act as a source for the ACU-1 and to be routed through Sage EAS units. Then, the audio is converted back to AES3 where it feeds Harris Intraplex STL Plus or Intraplex DCS-9560 Cross Connect Access Servers for connection to either the T1 circuits provided by U.S. West Communications or the Glenayre 6 GHz spread-spectrum transceivers.

Numerous analog and digital patch points in the signal paths allow quick work-arounds for routing problems.

In order to handle the daunting task of gutting a four-story building, constructing the studios, building the fiber and control backbones, installing HVAC, satellite dishes and the finished studio pieces, and keeping seven radio stations on the air at the same time, more than 25 contractors and sub-contractors were involved in the project.

"We couldn't have found enough people in Denver to do this amount of work as contractors. Nor could we have found enough people in our company that would have been willing to leave their jobs as well (for this project)," said Gulick.

There was no single project coordinator.

According to Lambiotte, "People took pieces and somehow everybody took enough pieces to where we got it done."

"The folks from Klotz and Prophet, as well as all our general contractors, were amazed that we were able to direct them, do our part, and keep seven stations on the air at the same time."

Gutting the existing building took longer than expected. Dealing with permits, materials and visual and aesthetic restrictions associated with the Denver Tech Center caused the time schedule to shift.

See DIGITAL, page 17 ►

► DIGITAL, continued from page 16

These delays, although perhaps inevitable, pushed the project back enough so the original plan of building the basement and roof areas first was abandoned. Due to expiring leases at the downtown location, the sales and accounting areas on floors two and one respectively, were completed first.

Creative construction

RDA, along with SFB Creative Carpentry, constructed the studio and control room furniture and equipment in St. Louis and prewired and tested it.

National Networks Systems Inc., a Denver-based company, pulled the low-voltage wiring, fiber, CAT5, AES3, coax, telephone and computer cable. Clear Channel's National Supervisory Network, based in Parker, Colo., installed three satellite downlinks and the sports network Ku uplink. RDA adjusted its schedule to accommodate the progress in Denver.

The goal was to place the four FMs on the air first. However, in order to test the Klotz and Wizard operation, the entire system had to be made operational. The engineering department was wired with fiber and RS422 cabling and the AM elements were set up there so that all the connections could be tested.

In June of 1999, Jacor and Clear Channel merged. This caused some delays and interruptions in the project as roles at the corporate level changed.

"During the middle of this project, the focus of Jacor and all the people at the corporate level ... was pulled away from this project," said Chadwell.

"A lot of the things we needed to get desperate, fast answers on didn't occur in a timely fashion."

The night that KHIH went on the air from the third floor, there were still workers on stilts finishing the ceiling.

That was Oct. 7, 1999, a Thursday, recalled Jack Lambiotte, and power had been applied to the station only that previous Monday.

"As the studios were put together and power was applied, we were on the air," said Chadwell.

"We didn't have the luxury of a shake-down cruise ... As a result, any technical problems that we've had have been played out right in front of our audience, and that's a disappointing thing for us."

As the stations were turned on and the bugs were worked out, the operators became accustomed to the new facility.

"When the people first moved into the station, they were intimidated by the fact

that they were coming to an all-digital operation," said Chadwell. "I don't think you could pay them enough money to go back and do it in the old analog way now."

The only tape used is for spots produced that will leave the facility bound for agencies or other stations. The news and sports departments use DAT and MiniDisc for local production, in conjunction with software provided by WireReady.

Each of the 20 news/sports workstations were custom-built by RDA Systems and includes a VADIS B-501 switcher, a mixer, telephone interface equipment and a computer running NewsReady and CoolEdit. Any of these stations can be placed on the air, if needed.

Traffic logs are produced using a Columbine JDS AS400 that integrates with the AudioWizard through workstation emulation and reconciles logs

through PowerLink.

A walk down the center aisle of the main rack room in the basement is mind-boggling.

There are 46 racks: 16 contain central audio and routing computers and equipment; 17 racks contain the Prophet and WireReady servers and workstations; and 13 racks contain computer networking equipment, e-mail servers, audio streaming servers and Web-hosting equipment.

The back wall of this room contains the 170 Krone blocks (suggested by Klotz) used for AES connections. Krone blocks are high-density, 110-ohm terminal blocks that allow patch-like connections like normals and bridges to be made at the block.

There is no analog audio on that wall. All video, keyboard and mouse functions are distributed to the studios, control rooms and production rooms using Cybex

See DIGITAL, page 20 ►



In the Rack Room



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The Denver Engineering Team

All titles are with Clear Channel Colorado

Jeff Gulick — Director of Engineering, 27 years experience, 4 in Denver

Jan Chadwell — AM Chief Engineer, 40 years experience, 15 at KOA

Karl Schipper — Assistant AM Chief Engineer, 25 years experience, 8 at KOA

Jack Lambiotte — FM Chief Engineer, 25 years experience, 10 at KRFX

Daren McMullin — Assistant FM Chief Engineer, 12 years experience, 5 at KRFX

Dave Sawyer — Transmitter Engineer, 38 years experience, 6 with Jacor/Clear Channel

Paul Carman — Station Engineer, 6 years experience, 4 years Jacor/Clear Channel

INDUSTRY LEADERS TEAM TO CRE



One of many Spherion Consoles at Clear Channel Denver

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Lobby, Clear Channel Denver

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RDA SYSTEMS

RDA SYSTEMS used its *Pre-completion™* process to successfully implement this historic project ahead of schedule. **RDA** provided the leadership and communication necessary to unite the project team in establishing technical standards and objectives for the new facility. All 28 studios, 4 rack rooms and the 20-station newsroom were assembled and tested in St. Louis prior to shipment. After the delivery of the equivalent of 4 fully loaded semi-trailers of materials, **RDA's** technicians completed the entire facility on site in Denver. As the stations were commissioned, **RDA** provided a complete set of systems documentation, in both printed and electronic form. 24-hour support continues to be provided by **RDA Systems**.



Main Rack Room containing 46 racks of equipment

SFB

SFB provides custom carpentry for the broadcast industry, with over 70 years of experience. At **SFB**, the foundation principles are that a studio environment has to feel good, as well as be engineer friendly. For the Denver project, **SFB** incorporated architectural features and station management's ideals to create the "feel-good" design. **SFB** hand-crafted the furniture in St. Louis and meticulously installed the furniture in Denver. Using the CAD system, **SFB** was able to exceed production schedules and minimize on-site installation time.



KOA FM Production Studio

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Clear Channel: Digital, Mile-High

► DIGITAL, continued from page 17
distribution boxes.

Communications in and out of the facility are handled by a variety of telco and microwave equipment. The primary feed from U.S. West is a DS3 fiber, equivalent to 28 T1s. There are nine additional copper T1s, 20 copper ISDN circuits, 24 analog remote loops and 1,100 DID (direct inward dialing) lines.

Analog STL shots provide third-level back-up after copper T1 (secondary) and spread-spectrum T1 microwave links to all the transmitter sites. The Nortel Option 61 switch currently handles 400 internal extensions but is expandable to 3,000.

The Denver I-T department, headed by Brett Inglis, works closely with the engineering departments on a daily basis.

Integration of the digital audio with the mainstream I-T operations has caused a blending of responsibility, especially when problems arise. The solution is that the engineering department responds to computer problems with the Klotz or Wizard systems but the I-T department is called in for server and networking problems.

Daren McMullin, assistant FM chief engineer, said, "It causes problems for the operators because they don't know who to call. They just know that they're off the air and they've got a problem. Most of our operators are still more comfortable

talking to an engineer than an I-T person."

McMullin said, "It used to be that audio and RF were the magic. Computers and the networking are the magic now."

Ultimately, changes in the industry will force I-T and engineering to merge. According to Jack Lambiotte, "The engineers are now going to have to become (I-T) people and the I-T people are now going to have to become engineers. The cream of that crop will end up being the engineer of the new radio station."

Industry future

Based on the experience at Clear Channel in Denver, digital audio and transmission systems and their concomitant dependency on computer and networking technology mean big changes for the future of radio and broadcast engineering.

"We're doing less micro engineering and more macro engineering," said Jeff Gulick. "Our responsibilities are changing."

The Clear Channel facility takes advantage of the latest digital and networking technology.

The stations regularly use WAN links to other Clear Channel facilities for voice tracking with the Wizard system. In addition, manufacturers are learning from broadcasters how best to integrate their digital offerings with the requirements of today's combined operations.



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of the technology.

"Unlike 95 percent of the radio station facilities in this country, this building is built for the future needs of broadcasting including Webcasting and satellite broadcasting. It's truly built to be a master center of broadcasting operations for Clear Channel in this part of the country," said Lambiotte.

"It's an example of how we're going to be able to actually save operating costs and consolidate a lot of operations into this facility. We can produce new streams of revenue that haven't been available, and aren't going to be available, to 95 percent of the other radio stations in this country."

Gulick agreed. "What we have now is what everyone else will have in five years."

Our broadcasting world is changing: Computers, digital audio, digital transmission systems, LANs, WANs and the Net have replaced analog program loops and single transmitters. Facilities poised to take advantage of these technologies will be the most successful. The Clear Channel facility in Denver is doing it now.

Because of the magnitude of the project, the Klotz functionality configurations were done on site.

Constant remotes, ISDN feeds and live telephone segments are not as common in Europe as in the United States. Complex configuration implementations were made, accommodating all the stations' needs. The flexibility of the system makes these changes easy to implement.

Digital, for the sake of digital, is not the objective.

"If you're not getting power and flexibility advantage from going digital, then you shouldn't be doing it," said Esparolini of Klotz. "We use I-T hardware, but we have custom, proprietary software for broadcast apps to make a system work."

This flexibility ultimately means additional sources of non-traditional revenue for stations with the foresight to take advantage

Partial Gear List

Quantity	Item
46	Equipment racks in basement engineering area alone
21	Gentner TS-612 telephone hybrids
4	Harris-Intralex STL-Plus T1 chassis
7	Harris-Intralex DCS-9560 T1 Cross Connect Access Servers
7	Aphex Dominators
12	Aphex 320A Compellers
20	Audiometrics DA1600.b distribution amplifiers
48	CircuitWerkes telephone coupler chassis
10	Comrex Nexus for ISDN
10	Telos Zephyrs for ISDN
7	Telos Audioactive for Web audio streaming
4	Scientific Atlanta 7300 DAT satellite receivers
6	Virtex Starguide II satellite receivers
10	Orban Audicity digital audio workstations
40	P-III 450 MHz computers for miscellaneous workstation and editing functions
102	Cyber PC Extender I keyboard, mouse and video extenders
170	Krone high-density 110 ohm patch/punch blocks for digital audio connections
62	Miles of audio, control, data, CAT5, coax, AES and fiber cable
3	Otis Elevators

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12	P-II 450 Audio Servers
4	P-II 450 Digital Reel-to-Reel servers
40	Control, production, news, traffic and other department P-II 450 workstations
24	ACU-1 Audio Switchers

Klotz Digital Control Layer

16	D.C. series mixing console controllers
8	Spherion series mixing console controllers
22	Rackmounted LCD 24 button controllers
4	Desktop PC controllers
1,056	Outputs for logic/machine control
1,056	Inputs for external devices to control the platform

Klotz Digital Audio Layer

72	Vadis audio-media platform frames
144	Fiber Optic transmitter modules
96	Fiber Optic receive modules
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436	AES inputs
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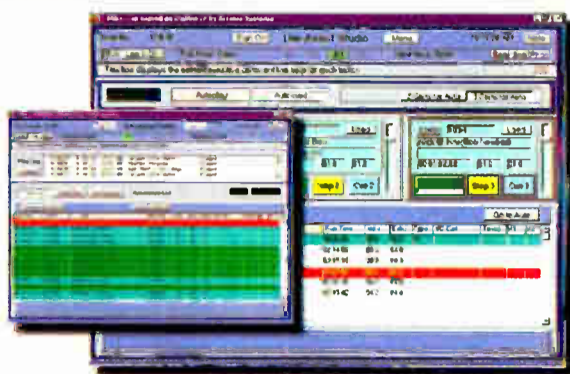


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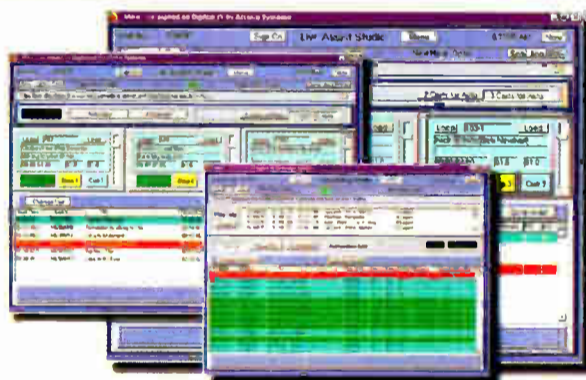
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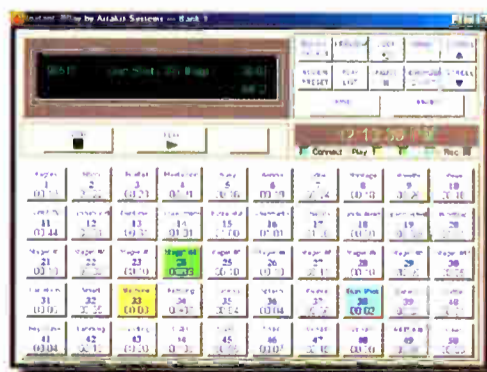
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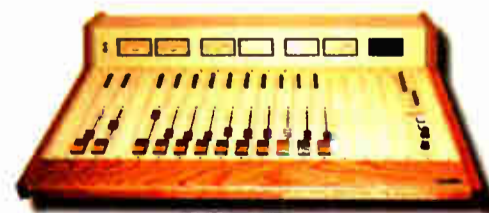
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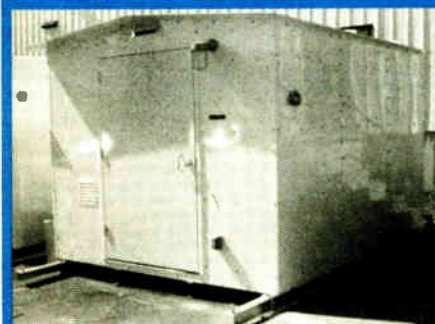
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FEED LINE

Ground-System Tips and Myths

W.C. Alexander

This is the fifth in a series of articles about troubleshooting the various components of a directional antenna system. The previous part appeared April 12.

Let's consider ground systems.

There is a lot of myth surrounding the mysterious and unseen ground system. For the many years I have been in broadcast engineering, I have heard countless times from engineers on both sides of the microphone that "the trouble with the AM's signal is that the ground system is gone."

While that can be the case, a properly-installed ground system is more often one of the most long-lasting, trouble-free parts of the system. Except in rare cases in which a corrosive agent is present in the soil, radials can be unearthed decades after their installation and found to be in excellent condition.

Vandals, acts of God

Ground-system trouble usually takes one of two forms: vandalism/theft or damage from natural occurrences. A thief can convert a \$15,000 ground system into \$30 in beer money in a very short time.

"Out of sight, out of mind" is the best way to protect your ground system from thieves. If they don't know where the copper is, if they can't see it, they may not be tempted to steal it.

Security of the tower base fences is a good way to protect the central point of the ground system where it is easiest to do the most damage. A good, thick layer of rock or gravel covering every scrap of exposed copper in the base area keeps the goods out of sight.

At a site on Santa Catalina Island, buffalo, goats, wild boar and javelina tore up a ground system that was unearthed by erosion.

While not usually malicious, another human source of damage can be agricultural operations. Plowing, planting and harvesting of crops on top of a typical ground system can rip radials to shreds.

If agricultural operations must be conducted above a ground system, the radials must be plowed in much deeper than normal and plowing kept to a minimal depth.

Trenching and other construction work on a ground system is sure to cut radials. Be sure that such work is supervised carefully by station personnel so that cut radials can be located and repaired.

Damage from natural occurrences comes in many forms.

Floods can cause erosion, unearthing radials and leaving them open to theft or damage from the elements. Frost heave can break apart improperly-installed ground components. Roots can tear radials and straps if trees and brush are allowed to grow in the antenna field.

Animals such as cattle, horses and burrowing animals can also cause damage. At the KBRT(AM) transmitter site on Santa Catalina Island, buffalo, goats, wild boar

and javelina tore up a ground system that was constantly being unearthed by erosion.

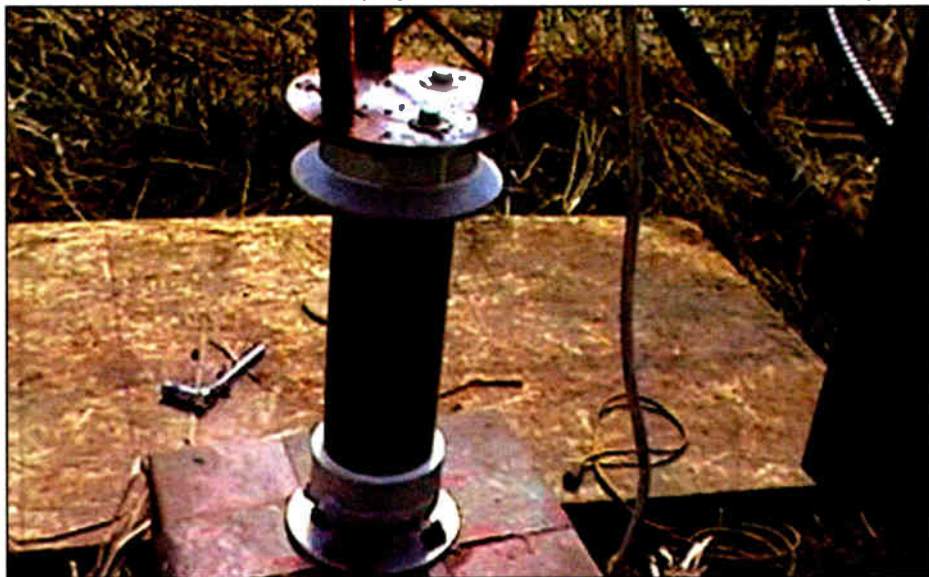
As a rule, the only ground-system problems that will show up on the antenna monitor, base current ammeter or at the common point are those close to a tower base. While broken or missing radials do reduce the overall efficiency of the array, they seldom give any indication in the operating parameters of the array.

Sometimes, however, grounding problems can occur that can cause significant headaches in the operation of an array. The worse the effect on the array opera-

tion line and support posts. Repairing the broken strap cured the problem.

As in this case, the key symptom in most ground-system-related problems is instability. If the array characteristics change significantly from wet to dry, frozen to thawed, look for a broken ground connection. There can certainly be other causes of such behavior, but an intermittent or missing ground is the most likely problem.

Such problems usually are easy to correct once they have been located. Some heat, flux and silver solder usually will



Insulator at AM stations KCMN and KCBR in Colorado Springs, Colo., which are diplexed into one tower and are increasing power to 15 kW each.

tion, the closer the problem typically is to the tower base area.

An antenna tuning unit with no solid ground connection, for example, will produce unpredictable and unstable array

restore normal operation.

Sometimes, grounding problems can show up in ways that don't affect array parameters but do cause significant problems.

Last year at one of our 50 kW three-tower arrays, an arc developed between the outer jacket of a transmission line and the control cable to one of the towers. The arc punched right through the plastic transmission line jacket and the PVC jacket on the control cable, fusing several conductors together in the control cable.

As you can imagine, this caused all sorts of trouble with the array control system. The damage was repaired, but the problem returned a short time later, again wrecking a piece of the control cable.

Our CE deduced that the trouble was coincidental with the freeze-thaw cycle, an indication of a ground problem. As it turned out, a broken ground was responsible.

When the ground would open up, a standing wave would appear on the transmission line outer jacket. At the voltage loop, an arc would develop. When the ground was repaired, the problem disappeared completely.

This problem did not show up on the antenna monitor but it was serious enough to cause problems in the array.

It is a rare thing for towers to give problems that show up in the operating parameters of a directional array. It can happen, though, so if everything else has been eliminated, the towers should be considered in the troubleshooting process.

The best way to determine whether a particular tower has a problem is to measure the self-impedance of the tower. This is done by disconnecting ("floating") all the towers in the system and, one at a time, using the bridge to measure the resistance and reactance at the base of each tower in the system.

If the towers are of equal height, type

See FEEDLINE, page 30 ▶

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'Nation's Largest' Digital Radio Facility

Paul J. McLane

At NAB2000, XM Satellite Radio said its Washington, D.C., Programming Center will include 82 studios when completed this fall. XM calls it the nation's largest end-to-end digital radio facility.

Vice President of Broadcast Operations Anthony J. Masiello said the equipment complement includes a Dalet Digital Media Systems audio storage system, feeding some 300 digital workstations and holding 3.5 terabytes of audio.

The system will use 4:1 MPEG-2 compression and is set up to include song title and artist program informa-

tion in the data sent to the receivers.

Klotz Digital will supply the audio consoles and the digital infrastructure for XM.

The satellite radio provider will employ 120 of the new Omnia-3 digital audio processors from Cutting Edge. Masiello said the processors will be used both for specific format control as well as overall audio level.

CAT-5 installation

XM will use Series 2101 multi-line phone systems from Telos Systems for 192 phone lines — the equivalent of eight T1 lines, according to Masiello.

XM will use Radio Systems

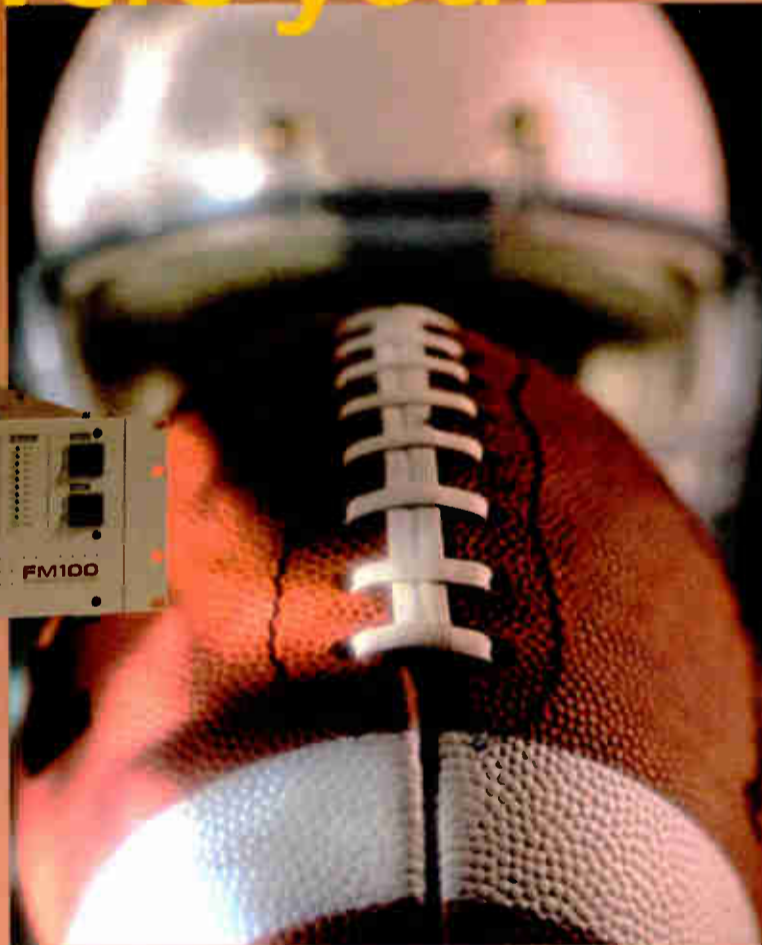


Photo by Paul J. McLane

Major vendors to XM gathered at the show. L-R: Dan Braverman, president, Radio Systems; Thomas Klotz, CEO, Klotz Digital; Frank Foti, president, Cutting Edge; VP of Broadcast Operations Anthony J. Masiello, XM; Steve Church, president, Telos Systems; Edward Schwartz, XM director of broadcast engineering; Stéphane Guez, chairman, CEO of Dalet.

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Image courtesy of AP Digital Studios

Rendering of a
Production Studio at XM

StudioHub CAT-5 wiring, including more than 10,000 premade cables.

Acoustic Systems will provide pre-engineered studios, configured by Northeastern Communications Concepts, which designed the furniture.

Using drywall construction, the XM studios will be prefabricated in Austin, Texas, and assembled on site.

Four-inch-thick steel-clad structural panels will seal out intrusive noise. Acoustic Systems SoundSecure doors and vision panels, integrated cable raceways and a Venturi-type ventilation silencing system will be used.

The installation represents an audio and radio design challenge unlike those faced by most broadcast installation managers.

"At any one time, a few hundred microphones and loudspeakers can be active in our facility," Masiello said.

Each studio structure will float independently on Firestone vibration mounts.

The facility will have more than 250 Middle Atlantic racks and hundreds of Genelec speakers. Other major products and services are from SED Systems, RCS Enterprises and The Whitlock Group.

Beginning in the first half of 2001, XM will beam up to 100 channels of digital programming to vehicle, home and portable XM-Ready radios nationally for \$9.95 a month.

American Mobile Satellite Corp. holds a controlling interest in the company, which is backed by General Motors, Clear Channel Communications and DirecTV.

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Continental Electronics and Harris Corp. signed a global strategic alliance for high-power AM radio projects, as Continental remained for sale. Adil Mina of CEC received a DigiDog from Don Spragg of Harris.



The Comrex booth was **smokin'** — literally — thanks to this inflatable monster, nicknamed Myassis.



Going public: Bud Aiello of NPR interfaces with Doug Vernier of V-Soft Communications at the Public Radio Technology Reception sponsored by NPR Engineering, NPR Distribution and NPR Online.



Mike Starling, are your ears burning? John Folsom, left, and Bruce Rogow, right, of KPBS-FM swap stories with station alum Mike Tosch of Scanz Communications.



Attendees admire one of seven new digital console models introduced by Wheatstone.



It's a lantern. It's a radio. It's a dessert topping. Traci Sibalik holds the LUFO Radio Lamp, a kerosene lamp with self-powered radio.



Probe II Professional Signal Propagation Software is projected onto the face of Doug Vernier of V-Soft Communications.



Cristina Strigel and Heather Nicholson meet a broadcaster from Tupelo, Miss.



Gas was almost \$2 a gallon in the desert.



Frank Foti is very cutting edge in his Cleveland Indians luau shirt and grass skirt.



Now **that's** cool stuff: Bill Sepmeier and Barry Mishkind toss two blinking electronic rubber balls given away by Orban.

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Workbench

Radio World, May 10, 2000

Radio Engineering 'By the Book'

John Bisset

Got a wiring project coming up, and you want to pull wire like the pros? Figure 1 shows an inexpensive spool manager.



Figure 1: Here's a cheap way to manage wire.

An old mail carton was combined with a piece of all-thread to permit the wire to spool out with no twists or snags. Be sure to return the tub to the post office when you're done!

I saw something curious the other day that engineers involved with consolidations should keep in mind.

We'll call this seeing is not always believing.

This low-power station was licensed for nearly a kilowatt of TPO but only about 300 W ERP. This, with a three-bay antenna with nearly 1.5 gain! These figures were right off the license, so you'd wonder "what went wrong."

It seems the transmitter had been moved from one room to another. Rather than extend the feedline into this new room with more 7/8-inch line (the size line that was going out to the tower), a length of 1/2-inch RG-8 was used.

The RG-8 "jumper" left the new transmitter room, went through a wall, then mated up with the 7/8-inch line in the now-forgotten storage closet.

Apparently, the former owners calculated the entire length of line using the loss from RG-8, not the 7/8 which was actually in use.

There was nearly 500 feet of line just to the tower base. Figuring the wrong size line meant plenty more TPO. Using only a short RG-8 jumper and the rest of the line being 7/8, there was hardly any loss, and station was severely *over* power.

As you inspect stations, completing your due diligence, check the size line going up the tower. Weird things can happen under the floors of transmitter rooms! What you see is not always what you get. And in this station's case, he got to reduce power!

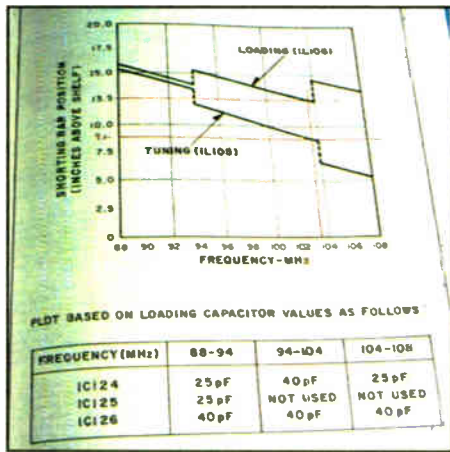


Figure 2: Most transmitter manuals are good reference books.

Another point to keep in mind as your group consolidates, or as you take on a new contract station, is to have adequate tech manuals.

The tuning/loading diagram for the RCA BTF-20E1, as seen in Figure 2, gives you a suggested starting point for setting the transmitter sliders.

When these guidelines are not used, and the sliding contacts are in different locations — as measured with a yardstick in Figure 3 — disaster can strike.



Figure 3: Use a yardstick to place tuning and loading sliders.

Figure 4 (on page 30) shows the arced tube, socket, and burned shelf that resulted from the mistuning.

Avoid a transmission line meltdown by checking your line pressured regularly. If you can't get to your site regularly, purchase a pressure alarm or Phartronics Pressure Sensor. The alarm will provide a contact closure when pressured drops below the trip point.

The pressure sensor gives a DC voltage proportional to the line pressure, and can be monitored by the remote control, triggering alarms if the reading falls outside the preset window.

I received an e-mail asking for tips on handling dry air (nitrogen) at transmitter

sites. What follows comes from a number of engineers, with many years experience.

First, it's a good idea to keep two bottles of nitrogen on hand. The second is a good spare, should you spring a leak.

Two tanks of nitrogen are cheap insurance. If you've never attached a regulator to a nitrogen tank, ask the nitrogen provider to show you how, the next time they deliver a bottle. There are a few tricks that will make the job quick and safe.

If you can't wait to be shown, or just want to check your knowledge, read on.

First, the tank in use should be securely chained to the wall. Install a chain about two-thirds up the nitrogen tank, if none is in place. Use those little screw links or a lock to hold the sections of chain together.

Do not attach the chain to the neck of the nitrogen tank. If the tank slips, the chain could snap off the valve assembly.

Before removing the regulator assembly, turn off the input valve on your gas manifold. No manifold? Then cut the gas at the regulator. The objective is not to allow any line pressure to escape while you are changing bottles.

Close the nitrogen tank valve next. Even "empty" bottles may have some pressure in them.

The gas pressure in these tanks can kill. Never unscrew a regulator assembly without ensuring the tank valve is closed. Once the regulator is off, screw on the metal safety cap, and unchain the bottle.

The metal safety cover prevents contamination of the valve assembly should the

See WORKBENCH, page 30 ▶

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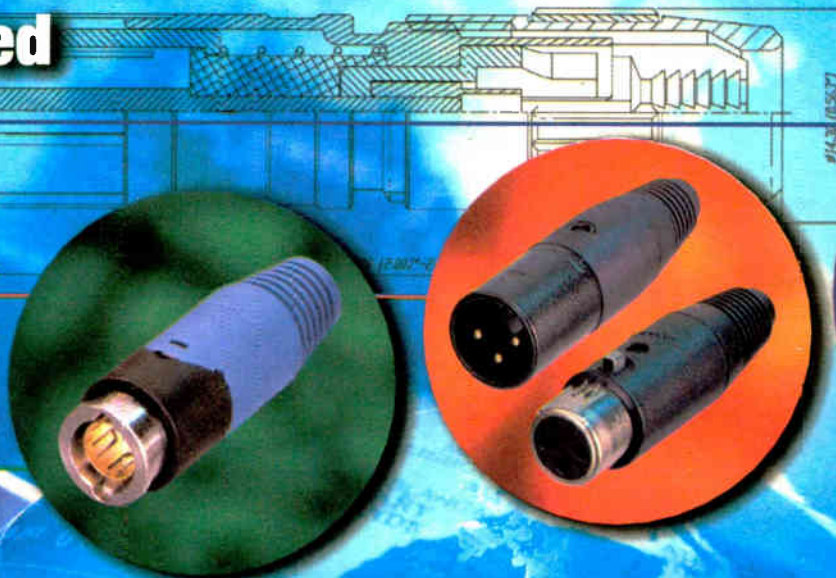
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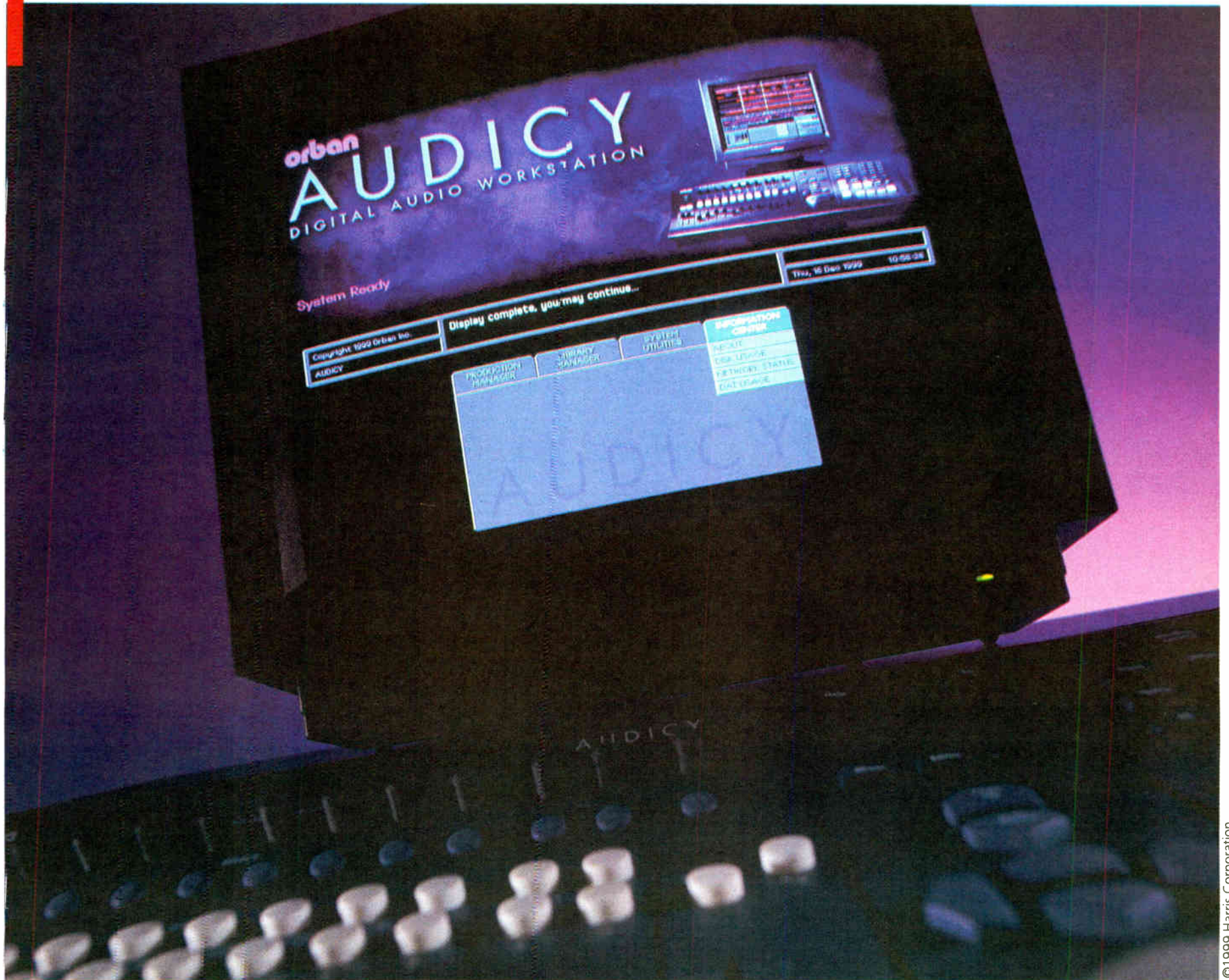
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World Radio History

What's Up Down Under

► FEEDLINE, continued from page 22 and cross-section, they should all exhibit close to the same self-impedance. If one tower is significantly at variance with the others, suspect a problem on the tower.

Where the towers are dissimilar, the results of the self-impedance measurements should be compared to recorded self-impedance data. If those data are not available, you may have to discuss the situation with a consulting engineer to determine if the measured self-impedance is close to the expected value.

If a tower is located with a self-impedance at variance with what is expected, lighting chokes, Austin transformers, isocouplers and the like should be suspected and checked first.

Checklist

Isocouplers in particular are vulnerable to water and lightning damage and should be checked early in the DA troubleshooting process. The best way to check an isocoupler in such a case is to disconnect the transmission line on the ground side (as opposed to the tower side). If the operating parameters return to something close to normal, you have found the culprit.

From time to time, tower section joints can lose their electrical connection due to corrosion or loose hardware.

Such joints on AM towers usually are tack-welded to ensure good long-term connections, but such welds can break. Bolt-together towers, "wind-charger" towers and other non-welded designs are the most likely to give this kind of trouble. Welded towers usually give discontinuity trouble only at the joints.

I have seen situations so bad on non-welded towers that the only way to fix the problem was to run copper strap up each leg of the tower. This provided good electrical continuity all the way up, but it produced its own set of problems, such as arcing between the strap and tower structure. It was a temporary fix at best.

An easy way to determine if tower sections are not making good electrical connection is to have someone shake the guy wires while you watch the null meter on the bridge. If the impedance changes significantly when the tower is shaken, there may be a bad joint. An inspection of every joint on the tower will be required to isolate the problem.

It may well be impossible to locate the exact source of a discontinuity on the

tower. Current distribution measurements on the tower itself (using a portable loop and meter) may be telling, showing a distinct change when the area of discontinuity is crossed.

Insulator problems

More likely, the only way to deal with such a problem is to have a tower crew tack weld across every joint on at least one leg of the tower.

Base insulators are one more area that should be checked. If arcing is the problem, look for cracks or carbon traces on the outside of the insulator. Many older insulator designs were hollow with weep holes in the bottom for drainage. Plugged weep holes can allow such insulators to fill with water, effectively shorting out the tower.

Some years ago, I saw such a situation

at a non-directional site. The symptom was low base current and weak signal. When I got to the site I was surprised to see bubbles coming out of the hole in the base plate of the tower.

The RF energy was boiling the water in the base insulator! A piece of 1/2-inch garden hose taped to the end of a shop vac hose was small enough to be inserted into the base plate hole and evacuate the hot water. On that tower, the weep holes were hopelessly clogged so every time there was a heavy rain the engineer had to repeat this procedure.

In the next part of this series, we will deal with control systems. The control system is responsible for transmitter and pattern switching as well as interlock safety. When something goes wrong here, a station can find itself just as dead in the water as if a tower had fallen.

■ ■ ■

Cris Alexander is director of engineering for Crawford Broadcasting.



Array of KLIV(AM) in San Jose, Calif.

Photo by J.T. Anderson

Tricks Around Tanks

► WORKBENCH, continued from page 26 tank be dropped in dirt. It also protects the valve from breaking off, should the tank be dropped on something hard. Full nitrogen tanks have a volume of 2,200 to 2,400 psi. Tanks can take off like a rocket if the valve stem breaks off.

A fire marshal told me about a tank that shot through two cinder block walls, after falling and breaking off its valve assembly. Because of the high pressure, it's just as important to keep your face, eyes or

hands away from the valve port. It's no joke to "shoot" someone with a blast of gas — in fact, it can cause an embolism!

After the new tank is chained in place, remove the metal safety cap. Clean the end of the assembly before using a wrench to snugly tighten the regulator assembly onto the tank. Don't force the assembly. It should screw on easily.

Slowly turn on the tank valve. The regulator "volume" meter will jump to 2,200 psi (or thereabouts). This is the

amount of gas in the tank. Write it down.

As the gas is used, this number will decrease. By keeping a log, you can determine when the next tank needs to be changed. Now, open your manifold valve.

The regulator valve is opened by turning the valve counter-clockwise. As you turn the valve, it depresses a bellows that opens to permit gas flow. Turn this valve until the "flow" gauge shows 2 to 3 pounds of pressure. Don't make the mistake I did the first time I installed a tank and turned the valve (the wrong way) until it came off in my hand!

Talk about scared! I imagined gas leaking out of everything, and I'd screwed up big time. A consulting engineer friend calmed my fears, explained what I did wrong, and had me screw the valve back into the assembly. No harm done!

I made it a practice to keep a tank wrench on a string next to each tank at each station. This way, if a tank needed changing fast, I wasn't searching for the right tool. You can buy tank tools at welding or gas supply shops.

■ ■ ■

John Bisset has worked as a chief engineer and contract engineer for more than 30 years. He is a district sales manager for Harris Corp.

Submissions for this column are encouraged, and qualify for SBE recertification credit. Fax your submission to (703) 323-8044, or send e-mail to jbisset@harris.com



Figure 4: Misadjusted transmitter controls can literally cause a meltdown.

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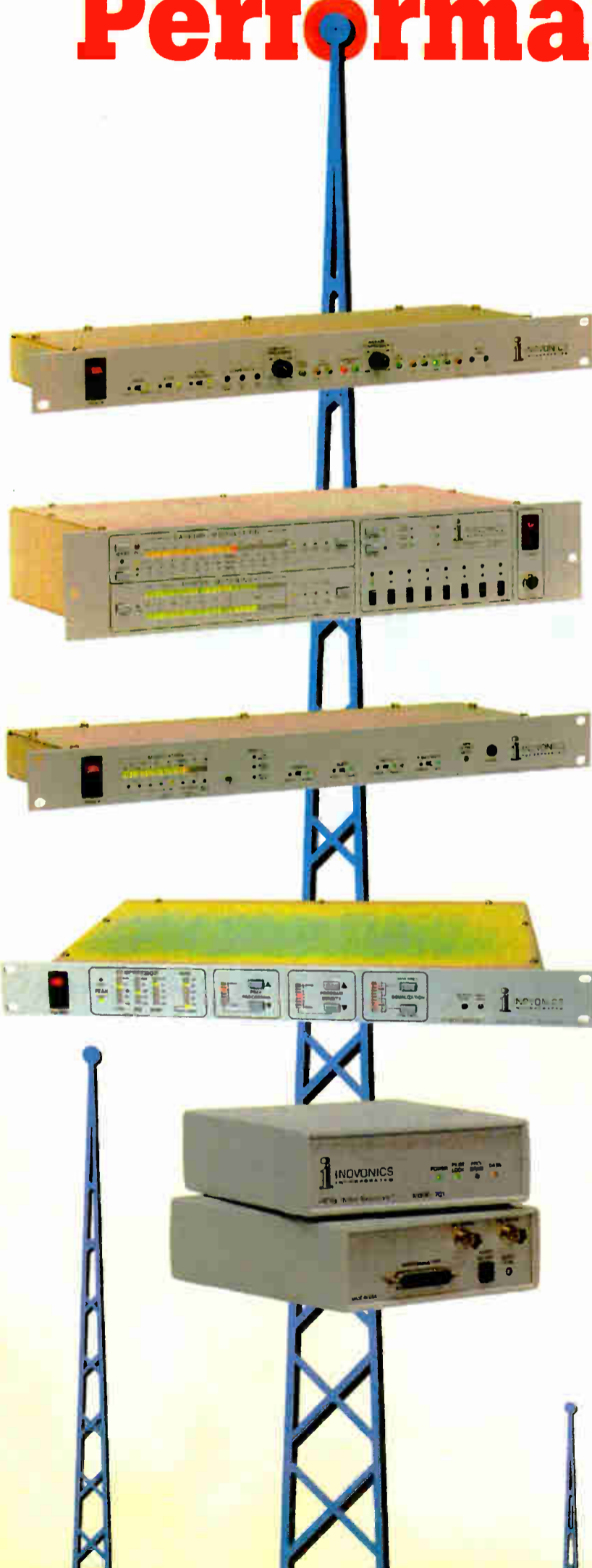


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See Page 44

Radio World

Resource for Business, Programming & Sales

May 10, 2000

NEWS ANALYSIS

Is Clear Channel/SFX a Smart Deal?

Steve Sullivan

If you look at the pending acquisition of SFX Entertainment (NYSE: SFX) by Clear Channel Communications (NYSE: CCU), you would be inclined to say that it is a comfortable fit.

Then why is everyone so jumpy?

On Feb. 29, Clear Channel, which will be the largest station group operator upon completion of its AMFM deal, announced plans to spend more than \$4 billion to buy SFX Entertainment, the world's largest diversified promoter, producer and venue operator for live entertainment events.

Following the announcement, Wall Street was so unimpressed that Clear Channel's stock dropped 11 percent in one day.

Some analysts even reported that the move was merely a defensive one for Clear Channel, made only to keep SFX out of the hands of rival Infinity Broadcasting. Others said it was too big of a deal on the heels of another even bigger deal — Clear Channel's pending merger with AMFM.

Clear Channel stock, which was already down 25 percent for the year, dropped from an open of \$75 to close at \$66.875 the day of the announcement. SFX shares rose 50 cents to close at \$38.50. As of April 19, Clear Channel traded at close to \$65 per share.

Tight-lipped

Neither Clear Channel nor SFX has had much to say about the deal since it was announced, although both companies have historically been tight-lipped when it comes to discussing business.

However, in a statement issued at the time of the deal, Clear Channel's Chairman and CEO Lowry Mays said, "This transaction allows Clear Channel, through SFX, to gain immediate leadership in the highly attractive live enter-

tainment segment, while taking advantage of the natural relationship between radio and live music events.

"It leverages the marketing and promotional strength of Clear Channel's broadcasting and outdoor advertising platforms and adds a new component to the marketing solutions, which Clear Channel can provide to its customers to help them sell their products."

He said it also creates an "exceptional platform" for Clear Channel to pursue initiatives relating to the Internet and music.

Some analysts seemed to agree with Mays' comment. Within a couple of days

of the announcement, the buy ratings for Clear Channel began to pop up.

Senior Broadcasting Analyst William Meyers of Robertson Stephens said the initial reaction by investors and analysts was unwarranted.

A natural fit

"Wall Street overreacted. (Clear Channel) has a tremendous platform and they have tremendous reach into their markets. There's also a very big overlap between Clear Channel's media properties and SFX's venues, so it's really a natural fit."

See CC/SFX, page 37 ▶



Lowry Mays

AMFM Launches New Format: Tech

Bill Mann

It's the first commercial terrestrial radio station that runs on Internet time.

CNET Radio signed on in San Francisco Jan. 27, and its trailblazing

high-tech format sounds unlike any radio station before it. Its talk shows are different; even its business and market updates sound unusual.

CNET Radio is a joint venture between Internet technology content

company CNET and AMFM Inc. When the new station finally signed on after several delays earlier this year, its critical morning-drive show sounded seamless. That's because CNET Radio had already existed for over four years — online, as a Webcast.

It may be the first time ever that a Webcast has preceded a radio station's commercial broadcast — it's usually the other way around.

There are many unusual aspects of CNET Radio, and one paradox is that the high-tech, futuristic-sounding station's home is on commercial radio's oldest spectrum — AM.

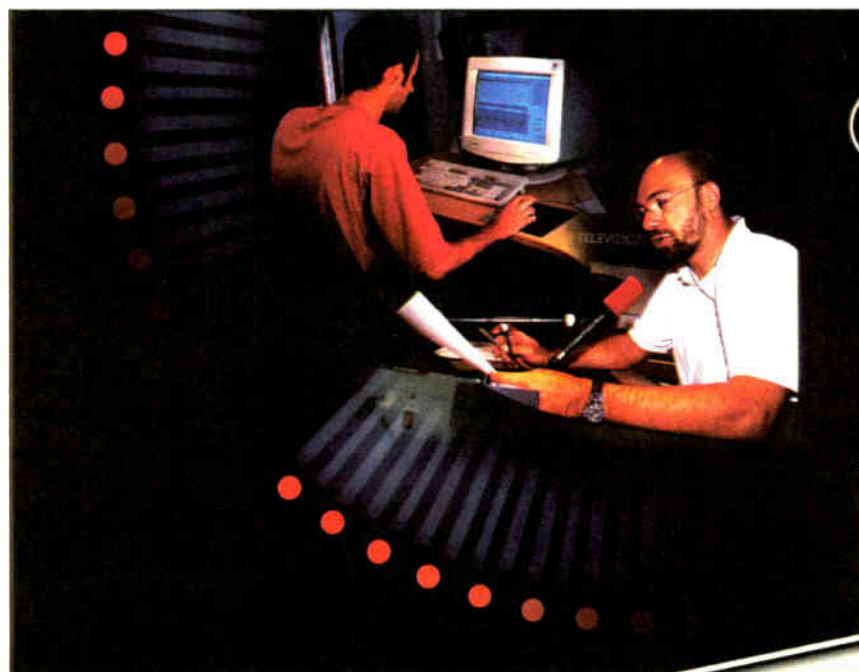
CNET broadcasts at 910 kHz and, although they're only used in station IDs, the station's apropos-sounding call letters, KNEW(AM), have been retained.

"This is the mothership," said CNET's tech-savvy director of operations and morning man, Brian Cooley.

See CNET, page 42 ▶



Brian Cooley in the CNET Radio Studio



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Passport to the Shortwave World

Tom Vernon

Since 1984, radio hobbyists have awaited the latest edition of "Passport to World-Band Radio."

"Passport" has become a one-stop information center for all things related to shortwave listening. The guide sells for \$19.95.

The first section, titled Radio's World, includes a world map that shows station locations and time zones.

This is followed by several feature articles about radio in Afghanistan and Central Asia, as well as a list of what the "Passport" editors consider to be the 10 best English-language programs out

of hundreds broadcast weekly to North America.

Shortwave programming is always in a state of flux.

Many of the modifications are a result of political changes or budget cuts in the country of origin. Others are the result of the whims of program planners, whose decisions often run contrary to what listeners might prefer.

VOA

The Voice of America, for example, has scrapped many of its musical programs in favor of a "rolling news" format amid howls of protest.

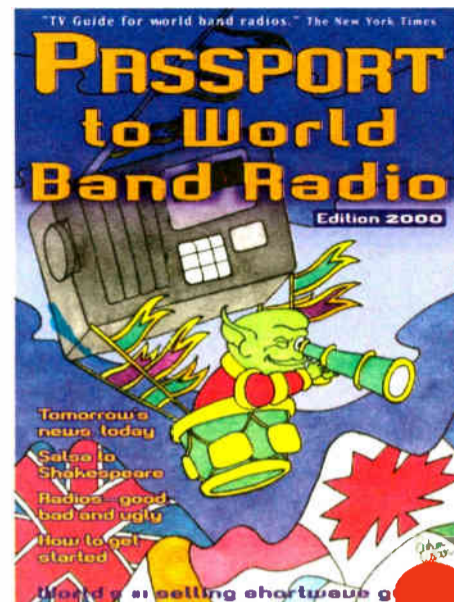
The BBC recently cancelled many of its

entertainment programs in favor of a format that favors news and cultural affairs.

Deutsche Welle took some budget hits, and may have to disband its English news section.

On the positive side, Radio Canada International's "Global Village" has become the premiere world music program, the BBC's "Health Matters" takes the unique position in its examination of clinical medicine and health issues from the patient's perspective, and the VOA's "Talk to America" is a call-in show that doesn't shy away from controversial issues.

The "Complete Idiot's Guide to Getting Started" provides reams of useful



advice for the novice.

World-band radio is a bit more complicated than domestic broadcasting, and three "must" tips are advanced to help the beginner: first, understanding world time; second, knowing how to find stations; and third, understanding how to pick the right world-band receiver to suit your needs.

A quick guide recommends best times and frequencies for listening in North America. What type of world-band receiver you select can make the difference between an enjoyable hobby and a frustrating experience you'll soon lose interest in.

Within the pages of "Passport" is a section that may best be described as the Consumer Reports of world-band radios. Reviewers test virtually every model on the market. Receivers are assigned from one to five stars. Truly outstanding models may also be recognized by the "Passport's Choice" designation.

White papers

More lengthy discussions of select receivers also are available for purchase as white papers. There are separate categories for portable radios, portatop receivers, tabletop units, world-band cassette recorders, PC-controlled radios and emergency radios.

As is the case with other technologies, consolidation is taking place in the shortwave receiver market. There are fewer manufacturers. Panasonic, for one, has dropped out of the race, while Sony and Grundig seem to be gaining market-share.

There are also fewer high- and low-end models. Most companies focus their efforts on midrange portables in the \$150 to \$450 bracket.

A basic checklist of points to ponder includes: how much money you can spend, where you are located, what features on the radio make sense, where to purchase a receiver and how easy it is to get repaired.

While you generally get what you pay for in a world-band radio, there are variations in a given price range. Some use old technology, some misapply new technology, a few have it all together.

Surprisingly, one of the best portables is a receiver designed by Sony 15 years ago and still in production.

Depending on your needs, you might want to look up shortwave programs by time of day, by country of origin, or by frequency. "Passport" lists this essential information all three ways.

Most notable are the blue pages, covering all the shortwave frequencies

See PASSPORT, page 44 ►

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Quantum 20/20

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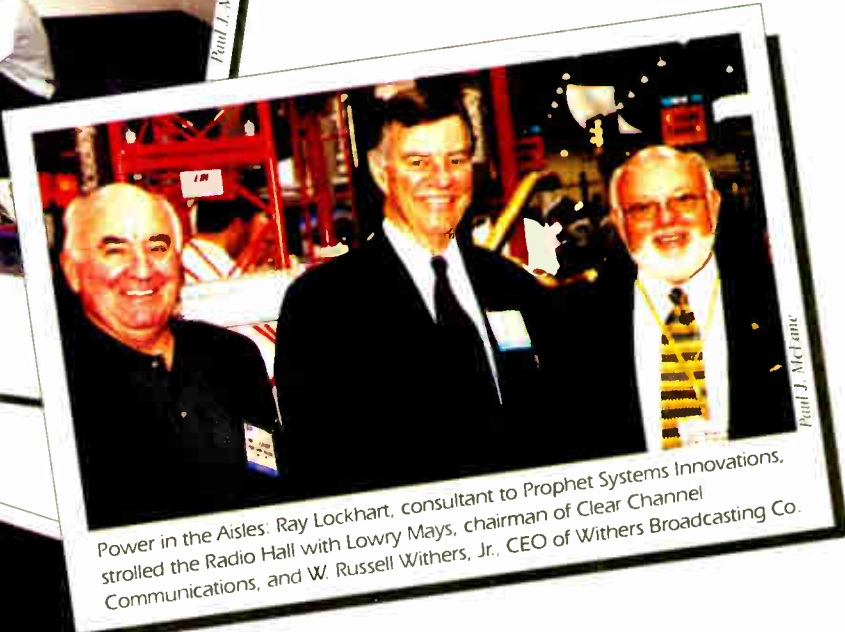
That's What Broadcasters Give Annually To Public Service



On hand to congratulate broadcasters on the record amount given in public service were (from left) Lt. General Matthew T. Cooper, Toys for Tots; Jane Massey, March of Dimes; Edward O. Fritts, NAB; John Moulden, National Commission Against Drunk Driving; and Michael Armstrong, Federal Emergency Management Agency.



Visitors came from around the world. Two attendees from Xiamen 202 Transmitting Station in China work out their next stop.



Power in the Aisles: Ray Lockhart, consultant to Prophet Systems Innovations, strolled the Radio Hall with Lowry Mays, chairman of Clear Channel Communications, and W. Russell Withers, Jr., CEO of Withers Broadcasting Co.



The Las Vegas Convention Center



'Saturday Night Live' veteran Garrett Morris said a few words following the show's NAB Hall of fame induction.



At every hotel and meeting site, NAB busses queued to take attendees up and down the 'strip.'



Dwight Ellis of the NAB Career Center confers with visitors to the NAB/BEA Career Employment Seminar.



Exhibitor registration was brisk — 'an NAB record,' although the association said it did not have exact numbers as of late April.

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CC/SFX: Huge Internet Potential

► CC/SFX, continued from page 32

The cross-promotion potential for events at SFX venues present the biggest opportunity for synergy. It also seems to be causing the greatest concern.

Two senators, Mike DeWine, R-Ohio, and Herb Kohl, D-Wis., the leaders of the Senate Judiciary Committee's Antitrust, Business Rights and Competition subcommittee, have urged regulators and antitrust officials to scrutinize the deal closely.

In a letter to FCC Chairman William Kennard and to Joel Klein, assistant attorney for antitrust for the Justice Department, DeWine and Kohl wrote that Clear Channel "would have the potential to use its radio stations to favor performers associated with its concert promoters, or playing at its own venues, while withholding airplay from others."

Many observers said the Senator's concern is understandable, but given the heavy scrutiny, this is an unlikely scenario.

The company will have considerable promotional clout. Upon completion of the deal, the company will own more than 800 radio stations and 19 television stations across the United States. Also, it will operate more than 120 live entertainment venues in 31 of the top 50 markets. Clear Channel already operates more than 500,000 outdoor advertising displays.

Internet opportunities

Perhaps the most intriguing part of the deal involves the online potential for the two companies.

Clear Channel has yet to make a public announcement about its Internet strategy, but plans to do so at a meeting of analysts and shareholders in May. In mid-February, the company named John Martin as president of its Web site Services Group, which oversees its stations' online operations.

practice, it's much more difficult.

Among the most active cybercasters is House of Blues, which has built in the technical infrastructure to Webcast audio and video from six of its venues in the United States.

In 1996, its first year of operation, the company produced about 100 events for the Internet. By the end of this year, House of Blues is shooting for 800 to 1,000 cybercasts.



Philip Fracassi

Even with all its experience, the company has only just reached a point where it feels it has the technology and expertise in place to actively promote the events.

Philip Fracassi, senior vice president of programming for House of Blues Digital, said that its event audiences range in the hundreds, not thousands. But he expects that to change dramatically thanks to a promotional relationship with MTV Interactive announced in March.

"To date we've really been working out the kinks in the technology on the back end or we've continually been

at what they do, but Clear Channel doesn't have any more expertise at Webcasting than SFX does. It's a completely different kind of broadcasting medium."

But Clear Channel may have some time to learn the craft. The online listener — or "streamie" — audience is small but is expected to balloon over the next two years. And it is a group that is coveted by advertisers.

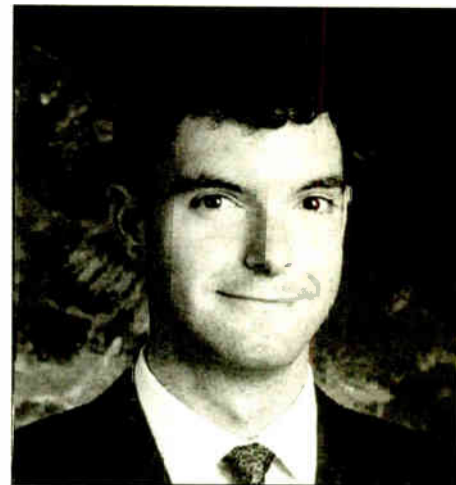
In February, a study released by Arbitron Internet Services and Edison Media Research reported that 79 percent of online radio listeners are likely to visit a Web site advertised on their favorite station, and 60 percent have made a purchase from a Web site.

"We recommend that Webcasters enhance the value of their sites by attracting streamies, because they're worth their weight in gold," said Jason Hollins, director of survey research for Edison Media Research.

Broadband research group Kinetic Strategies estimates that as of the end of February 2000, there were more than 2 million cable modems in use in North America and that cable services were adding 5,000 new customers each day.

Another aspect of the CCU/SFX deal came into play in late March when Lowry Mays confirmed that he had been in discussions with National Basketball Association Commissioner David Stern about participating in a developmental league for the sport.

The league, which has a targeted launch



William Meyers

of autumn 2001, would be made up of eight to 12 teams in non-NBA markets.

Meyers sees this as another opportunistic relationship for Clear Channel and SFX.

"They'll have the SFX arenas for sporting venues and the radio stations to help drive traffic to those venues. I think all those things could relate."

A basketball league would also let Clear Channel work in the sports marketing and management group it inherits from SFX. Additionally, SFX has an agreement with Ticketmaster for sales and distribution of tickets to its events. Ticketmaster, which is a unit of USA Networks, also provides ticket services for all but two of the NBA's 29 teams.

The deal is expected to close sometime early in the third quarter. That gives Clear Channel ample time to roll out its Internet strategy and address the antitrust concerns.

Webcasting is a completely different kind of broadcasting medium.

— Philip Fracassi
House of Blues Digital

"I'm sure there's a way to incorporate almost anything with the Internet, in terms of any sort of media," said Robertson Stephens' Meyers. "I really don't see Clear Channel going out of the media/entertainment business, and as long as they stay within those general confines, there will be a role — and a meaningful role — for the Internet to play."

In June 1999, SFX announced a broadband Internet strategy that included an aggressive effort to produce live cybercasts from its concert venues.

Cybercasts seem like a terrific opportunity for the two companies. Clear Channel could use its promotional strength to sell tickets to an event when an artist comes to play at one of its venues.

However, once the venue is sold out, promotions could simply drive fans to listen and/or watch the concert live on the Internet, giving the company the potential for a limitless audience for the event.

In theory, it's an ideal situation. In

adjusting our bandwidth. We expect once all our promotional relationships are set and our engine gets running, we'll average in the high thousands per event by the end of the year."

House of Blue's cyber-event revenue comes directly from ticket sales to the online event. They charge \$7.99 per ticket for high-speed connections, but because of quality issues at low-bandwidth connections, they give free access to those accessing the events at 28.8 and 56 kb.

Fracassi is less concerned about possible competition from Clear Channel cybercasts than he is upbeat about the positive exposure it would bring to the concept.

"I think it would be good for us as a business. It would draw lots of attention to Webcasts in general. But it's damn hard to do this and do it cost-effectively.

"SFX has been hinting at this Webcasting model for over a year and a half, but we've yet to really see anything. I think both of these companies are excellent

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WEB WATCH

What Should the Web Cost You?

Carl Lindemann

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NAB sues RIAA over licensing fees — Should radio stations streaming their signal over the Internet pay additional "public performance" royalties to the recording industry?

The NAB filed suit on March 27 in United States District Court, Southern District of New York, seeking a declaratory judgment on the matter.

Traditionally, broadcasters have been exempt from such royalties, but they pay an annual fee to music publishers.

With the advent of the **Digital Millennium Copyright Act of 1998**, certain categories of Internet-only broadcasters have been subject to paying "public performance" royalties. At issue is whether broadcasters will be required to pay for both their station on-air and online signal.

According to the filing, the NAB suit follows a breakdown in negotiations with the RIAA following the RIAA's petition to the Library of Congress and the Copyright Office to clarify the issue and to set rates for licensing.

Dennis Wharton, NAB senior vice president, Corporate Communications, said that the exemption should extend online.

"The RIAA has asked the Library of Congress to determine that the Internet has changed everything — that the exemption from performance rights royalty fees do not apply to online streams of station signals.

"Congress clearly recognized that playing music over the air promotes record sales. The same exemption should apply here," Wharton said.

Steven Marks, RIAA senior vice president, Business Affairs, sees that these aren't added fees. Instead, he said, it's about treating all Webcasters equally.

Marks said, "We've lived in an unfair world. Sound recordings have been the

only works capable of being performed that didn't have a performance right.

"The exemption granted (for broadcasters) for sound recordings should be treated narrowly — it's a 'carve-out' for treating retroactively this one business that had never paid performance rights. Going forward, all businesses using digital technology should pay for them," he said. ...

Is "universal" enough? — As the NAB and RIAA get set to duke it out, a new round in the contest between **Microsoft and RealNetworks** to establish dominance in downloadable music has begun.

In the latest turn, RealNetworks has licensed Windows Media Audio for its **RealJukebox player**. With this, both companies claim that they have come closer to establishing themselves as "universal." But is the online audio universe big enough for both?

For RealNetworks, supporting their chief competitor's format allows them to become the "first universal digital music system." According to company statements, "Once the Windows Media Audio format is available, consumers will be able to use RealJukebox exclusively for one-click access to virtually all of the audio content available on the Internet."

This simplifies things tremendously for end-users who once had to download and install different players for different formats. WMA joins eight other formats already supported including AT&T's **a2b, Liquid Audio and MP3**. RealNetworks' strategy is based on the notion that consumers are more wedded to the RealJukebox software interface than the codec.

For Microsoft, licensing WMA to RealNetworks establishes the format once and for all. Meanwhile, the company continues to sign additional content. On March 14, **Spanish Broadcasting System's LaMusica.com** announced it adopted the Windows Media format in exchange for a listing on WindowsMedia.com.

But Microsoft's interests go beyond

codecs. The company has also introduced **Windows Media Player 7** — a freebie that includes many features that RealNetworks charges consumers for. This scenario evokes a sense of déjà vu reminiscent of the "browser wars" between **Microsoft and Netscape**.

However RealNetworks fares against Microsoft will shape both the downloadable and streaming audio industry. All else being equal, it could suffer the same fate as Netscape. The wild card is how the **Department of Justice** settles its antitrust case against Microsoft. A kinder, gentler Microsoft may ensure lively competition in the online audio world.

Department of NTR — In principle, Cyberspace is infinite. Yet desirable "dot-com" addresses are increasingly rare — and expensive.

David Sams, chairman and CEO of SamsDirect Internet saw that demand for domain names would quickly outstrip the supply. The solution? Find another **top-level domain** that could rival "dot-com."

The search took him to the **Cocos Keeling Islands**. This protectorate of Australia (population 600) had the right stuff — political stability and a willingness to bargain for the rights to their domain names. The easy-to-remember "dot-CC" was a bonus. The next challenge was marketing "dot-CC" as an alternative to "dot-com."

"I approached **Clear Channel** because the initials made it the obvious choice," said Sams, a veteran of 25 years in television marketing. "We started this all out on Feb. 5 after testing in Orlando, Fla., Houston and Miami. With every station, every DJ pushing this, we've signed up over **72,000 domain names** already through our Web site, 'Spot.cc,'" he said. **At \$100 each** for a two-year registration (\$50/year after), this has already achieved the unthinkable in the Internet world: "We've been **profitable since day one**," Sams said.

Sams is quick to credit this success to his relationship with Clear Channel's top executives.

"**Randall Mays** engineered this, and **Randy Michaels** has been behind it all along. The implementation has been phenomenal."



Steven Marks



Dennis Wharton



It has also informed his TV background with a new appreciation of radio's branding power. According to Sams, the initial success only hints at the potential. Of the 15 million domain names currently registered, nearly two-thirds are "dot-coms."

Projections show that registrations will grow to 140 million by 2003. At \$100 per, a small percentage of this makes for monster sales.

Sams likens "dot-CC" addresses to buying up real estate in his hometown, Beverly Hills. "It may not be Rodeo Drive, but I'll take a bunch of property on Olympic Boulevard." ...

Clear Channel will be pitching more than "dot-CC" in 2000. It has also started the rollout of a national marketing campaign to promote the online classified ads of **BuySellBid.com**.



Jay Shepard

"We are absolutely delighted to begin the execution of our marketing campaign involving our equity partner Clear Channel and to making them a cornerstone of our rapidly growing locally focused advertising network," said **Jay Shepard, CEO of BuySellBid.com**.

In case you are wondering, **BuySellBid.cc** is already taken. ...

Stock slide — With **NBCi** stock taking a big hit along with most other Internet stocks in the first quarter, it was time to make changes.

"When **Chris Kitze** (NBCi's CEO) came to us and said he wanted to relinquish his operating responsibilities and take a larger role on the board of directors, we immediately thought of **Will (Lancing)**," said **NBCi Chairman**

See WEBWATCH, page 46 ▶

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CNET Radio: All-Tech, All the Time

► CNET, continued from page 32

Cooley is a five-year CNET veteran with prior experience as a newsmen on two San Francisco commercial broadcast stations, KMEL(FM) and KPIX-AM-FM.

"This is the broadcast that will go out to the rest of the country."

AMFM and CNET intend to export the format and the broadcast around the country.

"We're hoping to have five to 10 affiliates by the end of this year," said Cooley.

"That's why, while we don't hide the fact that we're based in San Francisco near Silicon Valley, we don't sound like a local station. Our product will sound just as good in Boston or Washington. News

about Cisco or Oracle or Web browsers or ISPs is just as relevant there.

"When we do get to other markets," said Cooley, "we don't want to have to undo what we're building here."

Cooley said, "We're looking at AMs that need a lot of help."

Brent Osborne, the AMFM San Francisco exec who originally approached CNET with the idea and now oversees the joint project — he's the general manager at KIOI(FM) — said, "We have four affiliates waiting to go right now that we'd like to get up and running in the next 90 days.

"Our two major problems are, A, developing an affiliate agreement, and B,

developing a morning show for our East Coast affiliates. Obviously we can't have Cooley start at 2:30 a.m. here. He's working hard enough," said Osborne.

On one of several "Tech Checks" each morning during his fast-paced morning-drive show, Cooley, who comes to tech naturally — he's the son of a computer parts salesman — will give just three or four selected stock quotes in a selected area, such as chip stocks (Intel, Advanced Micro Devices, Novellus). Why not a litany of tech-stock quotes?

"Those Tech Checks are meant only to take the temperature of a single index or technology sector. We aren't here to bore people with a lot of business in a



Brian Cooley

void. We do about six Tech Checks an hour, so in that hour we've given a lot of tech quotes."

Cooley is the driving force behind the new station — as director of CNET Radio Online, he's done CNET's Webcast for four years, which he calls "a long shakedown cruise."

That's why the "new" show sounds so polished.

Cooley takes pains to point out what CNET Radio is *not*: "We're not a business station, which have traditionally tended to be boring. Business stations tend to cover business in isolation, but CNET covers business as a reflection of the tech news we are covering.

"As a result, you won't hear about the S&P 500 because that isn't very tech-related. And you won't hear a slavish recitation of Microsoft/Oracle/Intel unless those companies are actually in the news that day.

"Here, it's basically a matter of tech news driving the business information — as opposed to business news living in a ghetto."

Interviews with tech newsmakers in the fast-paced Internet world are something Cooley uses often — even in morning drive.

"We have the luxury in this format of doing five-minute newsmaker interviews often. The big news and talk stations here, KGO(AM) and KCBS(AM), simply don't have the time."

On one recent morning, for example, Cooley interviewed an exec from a tech company introducing a product that will allow a consumer equipped with wireless Web access to comparison-shop on the Web while standing in a retail store.

On another day, CNET interviewed a doctor who owned 63,000 shares of red-hot tech stock Qualcomm last year, but had sold only 16,000 shares and continues to work full-time.

The anesthesiologist told CNET's audience "I did my homework and researched Qualcomm." He advised other would-be tech investors to do the same before buying any stock.

Cooley also has taken pre-emptive measures just to make sure his long-time CNET Radio on-line audience doesn't desert him.

"They're saying, 'I want my on-demand.' So we're posting sound files of CNET Radio shows they can download and listen to at their leisure."

Cooley admits the new terrestrial broadcast does have one big advantage besides wider availability. "No drop-outs," Cooley said, regarding the disruptions commonly experienced on streaming audio.

Cooley said CNET's target audience consists of "people in their 30s and 40s.

See CNET, page 43 ►

MPX5 & MaXIM

With impeccable reliability and a sound that remains clean whether set to loud and punchy or open and transparent, MPX5 and MaXIM are the combination of choice for stations worldwide wanting the very best analogue processing equipment. MaXIM provides precise peak level control using split-band limiting and intelligent program-dependant control to utilize every last drop of available modulation without degrading already processed signals. MPX5 is a very high specification stereo generator with DSP filtering and advanced overshoot compensation allowing increased modulation allied to superb sonic performance.

FM10 & FM30

For a complete low-power broadcast solution or as exciters for higher power systems, FM10 and FM30 share sbs' renowned ultra-linear modulator and a wideband design that allows direct frequency setting - no tuning required. They are engineered for many years of trouble-free operation at full rated power (10W for FM10, 30W for FM30), and are fully protected against faults in the antenna system. Comprehensive input options include composite / multiplex, mono, stereo - with an integrated stereo generator/processor section for true "plug and play" operation - and AES/EBU digital.

TX400 & RX400

The complete package for STLs and remote broadcasting. Available on any permitted frequency from 48 to 1300 MHz, and with a wide range of options - mono or internal stereo generator; limiters, AES/EBU, wide or narrow band FM - a TX400 system will suit every application. The matching RX400 completes the link, delivering high-quality balanced audio or composite / multiplex signals, and can also be used alone for demanding off-air monitoring or as the receiver for a translator system.

PA125 & PA250

Because the Power Amplifiers are one of the most important links in the transmission chain, the PA125 (125W) and PA250 (250W) FM power amplifiers have been engineered for ultimate reliability. Load and internal operating conditions are continuously monitored, protecting the transmitter; keeping your station on-air and reporting potential problems via the telemetry interface. The innovative "fresh-air-tunnel" design eliminates short-lived air filters, whilst the generously rated power supply combines high efficiency with rejection of mains-borne spikes and surges.

Guardian2 & ACU3

Intelligent management of the whole transmission chain for total peace of mind. Guardian2 dynamically monitors both audio and composite / multiplex signals, switching seamlessly in the event of a fault to the reserve STL, secondary processor or, as last resort, an on-site source. ACU3 responds to problems in a dual redundant transmitter system, selecting between main and reserve chains (up to 100 W internally or higher power with an external relay). And with a full telemetry / control interface fitted to both units, you always remain in the picture and in control.



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► CNET, continued from page 42
We are *not* just getting techies; that's not our goal. We're after people who use computers and technology in their lives and/or invest in tech stocks. We pick up some listeners in their 20s and 50s."

Cooley said that CNET seems to be drawing many of its new listeners not from local news and talk radio stations, but from the local NPR affiliate, KQED-FM, which bills itself as the highest-rated public radio station in the country.

"We don't know exactly where our audience will come from just yet," said Osborne, whose goal is 30 or 40 affiliates nationwide. "It's too early. We're putting reasonably compelling programming on the air for people who listen to a lot of different stations."

Far-flung ops

Cooley, who operates with a staff of 15, also has to deal with a far-flung operation: His on-air studio is in one location near Fisherman's Wharf, his traffic is in another and CNET's sales are in a third.

The station now carries original content from 5:30 a.m. to 7 p.m. (PST) each weekday, and picks up the syndicated "Online Tonight" out of Washington, D.C., from 7-10 p.m. (PST) nightly. It then carries the CNN Headline News audio feed overnight and weekends.

"It's a joint project," Cooley said. "Basically, CNET provides the content, AMFM provides the signal. On the sales side, AMFM and CNET collaborate on the sales, with each bringing a different set of clients to the table."

Osborne agrees. "Basically, CNET

provides all the content. We treat CNET as our programming department."

Cooley laughs. "Now I have two GMs — Brent Osborne, and my CNET boss, Dan Sexton."

Sexton is CNET's director of television and radio.

Talk shows fill weekdays between morning and afternoon drive, and Cooley and CNET have attracted much of the talent from news and talk station giants KGO and KCBS.

The mid-morning show, for example, "is largely a show about how tech affects people's lifestyle," Cooley said.

It's co-hosted by Kim Foster, a former newswoman at KGO, along with self-admitted "tech nerd" Desmond Crisis, who co-hosted CNET's nationally syndicated TV show.

On one recent show, for example, Crisis went on at some length about why MP3 and other players spell big trouble for record companies. Another discussion on the call-in show involved listeners' stories about their use of Palm Pilots and other personal digital assistants.

CNET Radio is promoted mainly through an hourly mention on the other six AMFM stations in San Francisco — all music outlets — although Osborne said, "We have other plans, like a barter arrangement with the newspapers here."

"As far as I know," said Cooley, "AMFM is the first company ever to launch a new station with this kind of 'sister support.'"

Prior to its sign-on, KNEW(AM) had been simulcasting Osborne's KIOI adult-contemporary format.

Cooley characterizes initial advertising support as good.

"We're about half sold out." Osborne agrees and said, "Now we have to approach the dot-com companies down the road directly as we build come."



CNET.com
The source for computers and technology."

Osborne said, "I don't know anybody who has access to the amount of content Brian does, through CNET and other sources."

About on-air content, Cooley said his new radio station breaks the traditional rules in another way.

Where many radio news departments generally avoid or distrust corporate PR people, Cooley actively uses their press releases and guest pitches.

"For a tech format like ours, much more real news comes from the commercial sector, especially about the kinds of new products we're interested in," Cooley said.

"So PR information is genuinely more useful to us. Murders, fires and carjackings don't have press releases advertising them — but new technologies and adverts often do. So we're not afraid of them, and we do due diligence and shake things out to see what's real and to see what's hype."

The tech-savvy Cooley calls CNET the first "pre-branded radio station."

"Most stations aren't known by an external brand. Typically a station only has an internal brand — 'The Big 610,

106 KMEL.' So we're in new territory.

"CNET has always understood the value of content brand — when the brand represents high-quality and original content. And CNET is a highly visible brand of technology information. And so when someone hears there is a 'CNET radio station,' they probably also know what it's all about.

"The same can't be said for a new station like The Bone (a just-debuted San Francisco hard-rocker formerly known as KSAN-FM), which has to start from scratch imbuing that name and dial position with meaning, relevance and a brand promise."

Cuts across demos

Cooley said that, besides ratings (it's too early to tell yet) and sales, the CNET Radio experiment has a third criterion of success: "Can we create a new media space?"

"We're creating a new kind of listener," Cooley said, "one who realizes that news on the radio can be personally useful and is about them, as opposed to being about others whose lives don't relate to the listener. We talk about and explain the news, not just recite it.

"The fact that we're super-serving a common need in many listeners' lives, rather than a specific demo — that's also rather unusual and refreshing."

In aggregate, Cooley said, these are the traits of a station that borrows liberally from the successful online players."

"All we have to do right now," said Osborne, "is get the word out about CNET Radio. We're the place to find coverage of the new economy."

DJ Dave... I am sorry to bother you at home, but I've detected a fault in spot number 321. It may be missing. Perhaps you should look into it.



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STATION SERVICES

NBG Syndicates 'Ground Zero'

NBG Radio Network now syndicates the science fiction/horror radio program "Ground Zero."

Hosted by Clyde Lewis, "Ground Zero" covers UFOs, alien abductions, comic books, sci-fi films and ghosts.

"I screw up people for a living," said Lewis in commenting on his program, which has been on-air at Salt Lake City's KBER(FM) for six years.



Clyde Lewis

"I challenge their thinking — I'm a heretic and I commit heresy in the first degree every Sunday night."

"Ground Zero" is broadcast live Sunday evenings from 9 p.m. to midnight Eastern Standard Time, and is streamed on the Internet at www.ClydeLewis.com

The program is offered on barter. For more information contact Ollie Holmes, affiliate relations, in Oregon at (800) 572-4624.

Kim Komando Goes Global

"The Kim Komando Show" will soon be available via the WorldSpace satellite system. WestStar TalkRadio network and WorldSpace Corp. announced recently.

The WorldSpace agreement will enable "The Kim Komando Show" to reach an audience of an additional 4.6 billion people in Africa, Asia, India and the Middle East.



Kim Komando

WorldSpaceVP of Audio and Multimedia Entertainment Janet Lynn said, "Having Komando on the WorldSpace international audio service complements our mission of bringing ... knowledge and information to emerging world markets."

Komando is also a columnist for RW. For more information on "The Kim Komando Show," contact Phil Lovas in Phoenix at (602) 381-8200 or via e-mail at PHILL@WestStar.com

For more information on WorldSpace Corp. services call (202) 969-6259 or via e-mail ereich@worldspace.com

Gnarley Show Available



Gilbert Gnarley (aka Gary Burbank)

Gilbert Gnarley, of St. Pia Zadora Golden Buckeye Retirement Community, will be available to radio stations across the country on a syndicated barter basis, according to Burbank Creations Ltd.

Gnarley, a veteran of Cincinnati station WLW(AM), will feature his kindly, "slightly confused" telephone interviews with important people in the news in his nationally syndicated program, "The Gary Burbank Show."

Past phone interviews include calls to Pope John Paul II at the Vatican, "60 Minutes" Correspondent Ed Bradley and the White House, as well as many corporations including Procter & Gamble, Johnson & Johnson and Pillsbury.

Gary Burbank, Gnarley's creator, said, "The difference between Gilbert and any other phone bit that disk jockeys do, is that Gilbert is never mean-spirited, and usually ends up the butt of the joke. He would never think of ambushing the unsuspecting recipient of his calls."

Gilbert Gnarley is packaged with another comedy feature developed on the Gary Burbank Show by his former sidekick Kevin "Doc" Wolfe.

"The U.S. Senseless Survey" features Wolfe as Riley Girt, "a senseless government inquisitor," according to his press material.

For more information contact Rick Consolo at (440) 247-9136 or by e-mail at rconbbe@aol.com

'Passport': A Guide To World-Band Radio

PASSPORT, continued from page 34 from 2,310 kHz to 25,820 kHz. Included is info on transmitter location and power, target zones, alternative frequencies, program language, days of operation and whether the program is jammed.

You might want to send a reception report to your favorite station. You may receive a QSL card for your efforts.

"Passport" lists postal and e-mail addresses for virtually all international broadcasters, plus Web sites, phone and fax numbers, contact names, plans, items for sale, free gifts and summer and winter times for each country.

Information about international postage is included.

Many tongues

"Voices from Home" is a country-by-country guide to native-language broadcasts. This section may be of interest to those seeking to learn a foreign language, or to overseas visitors anxious to hear voices from home.

Because most of these programs aren't beamed to North America, signals tend to be weaker, meaning you'll need a better receiver and more patience.

Regular users of the "Passport to World-band Radio" may notice that the 2000 edition is thinner than the 1999 edition, and conclude that it has fewer pages. Not so. In fact, the current edition has more pages, but is printed on thinner paper.

This turns out to be a plus, as "Passport" will easily lie flat where ever you open it, without having to

resort to cracking the book's spine. The smaller size also makes it easier to pack when traveling.

We Americans have come to take information overload for granted, and sometimes it's easy to forget that much of the world's population is without domestic radio or television, much less computers and Internet access.

For them, shortwave broadcasting is the only source of news, and a vital link to the outside world.

Fat lady silent

Those who predict the demise of international broadcasting as a function of Webcasting or direct satellite broadcasting might do well to consider this: In America, shortwave listening offers an alternative to domestic broadcast programming, which many consider to be bland and unimaginative.

"Passport," now a classic, is the only guide you'll need to get in on the action.

Sadly, the companion book "Passport to Web Radio" was not published this year. While the first two editions received rave reviews, overall sales lagged.

Perhaps Webcasting listeners are more responsive to online directories and references.

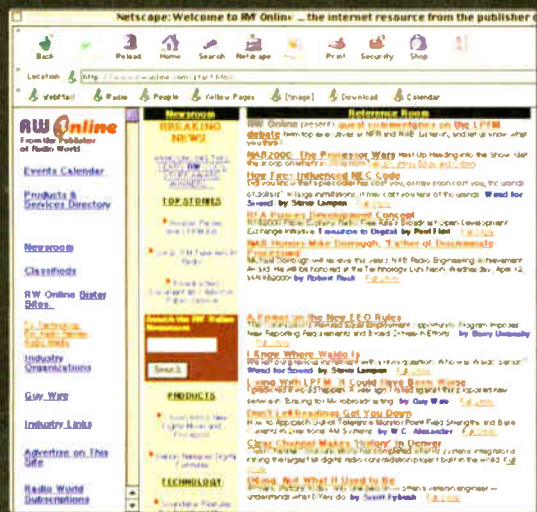
For more information about the 2000 edition of "Passport to World-band Radio," visit the International Broadcasting Corp. Web site at www.passband.com or call (215) 598-9018.

Tom Vernon is a multimedia consultant working in Philadelphia.

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WEB WATCH

► WEB WATCH, continued from page 39
Bob Wright.

According to Wright, Lancing "understands how to grow companies and reach new markets. He turned around Prodigy, moved Fingerhut into the Internet space, and was a pioneer in interactive marketing at McKinsey," he said.

Lancing comes to NBCi after a turn as chairman and CEO of Fingerhut Companies Inc. Prior to that, as vice president of corporate development at GE, he reported directly to GE Chairman Jack Welch — who also sits on NBCi's board.

Unfortunately for outsiders wanting an "in," NBCi.cc is also taken. ...

Blue House — House of Blues Digital Inc.'s HOB.com began hosting a live stream of KCRW(FM)'s "All Music Channel" March 13.

The programming is available through both HOB.com and KCRW.com. The All Music Channel was created especially for the Web by KCRW and includes many programming staples drawn from the Santa Monica, Calif., radio station's on-air broadcasts.

As a major NPR affiliate in Southern California, KCRW produces a great deal of in-house programming. HOB.com will also offer an archive of more than 500 hours of KCRW's eclec-

tic in-studio performances and interviews from the station's library.

Nic Harcourt, KCRW's creative music director and host of the stations weekday music program "Morning Becomes Eclectic," said, "Connecting with the interactive team at HOB.com presents a great opportunity for us to spread the word. KCRW.com is now available worldwide 24/7 and the association with HOB.com helps us bring that message to an even wider, high-quality audience." ...

Three weddings (and a funeral) — WebRadio.com, a subsidiary of GEO Interactive Media Group Ltd., has



(L to R) WW1 Senior VP Peter Kosann, WebRadio.com's President Hamid Kohan, WW1 President/CEO Joel Hollander and WebRadio.com's CFO Joseph E. Budenholzer

entered into a multi-year agreement with Westwood One.

Under the terms of the agreement, WW1 will be granted a 6-percent stake in WebRadio partially to be paid for by advertising monies. WebRadio.com will offer discounted pricing and e-commerce opportunities including banner advertising, impulse CD sales, digital downloads, movies, video games and lifestyle merchandise.

Additionally, WW1 will be granted up to a 4.5-percent stake in return for marketing WebRadio to radio stations. The deal was announced on March 22. ...

After four years as an online media and streaming provider, **Magnitude Network** was absorbed into iCast Music. Both have been majority-owned operating companies of CGMI Inc.

"We are excited about becoming part of iCAST Music," said **Todd Schmidt, president of Magnitude Network**. "It will allow us to offer our radio station partners, both present and future, exciting new products and services. We now have the distribution, content and streaming expertise to provide radio broadcasters a comprehensive package."

"With the addition of Magnitude Network we will considerably extend the selection of broadcast radio offerings to our audience," said **Margaret Heffernan, president and COO of iCAST**. "We are also creating a tremendous opportunity for Magnitude's affiliate partners to reach new listeners and build a strong presence online." ...

Sonic Loves Warner — **Sonic Foundry** continues to grow beyond its beginnings as a software developer with a strategic business relationship with Warner Bros.

Online and Entertaindom.com.

Sonic Foundry will provide its software and full-scale media deployment technology as well as consulting and training services to help move Warner Bros. catalog of traditional media online. Entertaindom.com and Warner Bros. Online will collaborate on cross-promotional opportunities in marketing Sonic Foundry's software and technology. ...

And Sonic loves SpotTaxi, too — As does **Scott Studios, Broadcast Electronics** and **Orban**, SpotTaxi.com announced as RW went to press.

SpotTaxi said the alliance with the four will simplify radio station spot preparation and distribution, which is the sole interest of the company.



SpotTaxi aims to speed radio distribution by using the Net to deliver spots from the production house to the radio station.

The company launched its new Internet courier service April 10 at the Microsoft Partner Pavilion at the NAB show in Las Vegas.

"The current method for radio distribution is a logistical nightmare," said **Peter Barnes, president and founding partner of CMI**, the parent company of SpotTaxi.com.

SpotTaxi will integrate Microsoft's Windows Media into its service, the company announced at NAB2000.

Microsoft will in turn provide development, marketing and promotional "support" to CMI and SpotTaxi.

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NAB HONORS

The NAB Radio Luncheon featured Tom Joyner's induction to the NAB Broadcasting Hall of Fame. The host of ABC Radio's "Tom Joyner Morning Show" received a standing ovation from the crowd that packed the hall at the Las Vegas Hilton.

Joyner, who noted his show's voter registration activism, was thankful for the HOF recognition.

"I've gone from dreaming, to DJ-ing, to fly-jocking, now cyber-jocking. I don't know what's next, but the moon sounds good to me."

Also at the NAB luncheon, 10 stations were honored for outstanding community service with the NAB Crystal Radio Award.

Selected by a panel of judges representing broadcasting, community service organizations and public relations firms, the winning stations are KDWB-FM, Minneapolis; KNOM-FM, Nome, Alaska; KSDR-FM, Watertown, S.D.; KVFD(AM), Fort Dodge, Iowa; WDSN(FM), Dubois, Pa.; WGMS(AM-FM), Washington, D.C.; WICO-FM, Salisbury, Md.; WJBC(AM), Bloomington, Ind.; WTMX(FM), Chicago; and WZZK-FM, Birmingham, Ala.



Tom Joyner



The NAB 2000 Crystal Radio Award Winners

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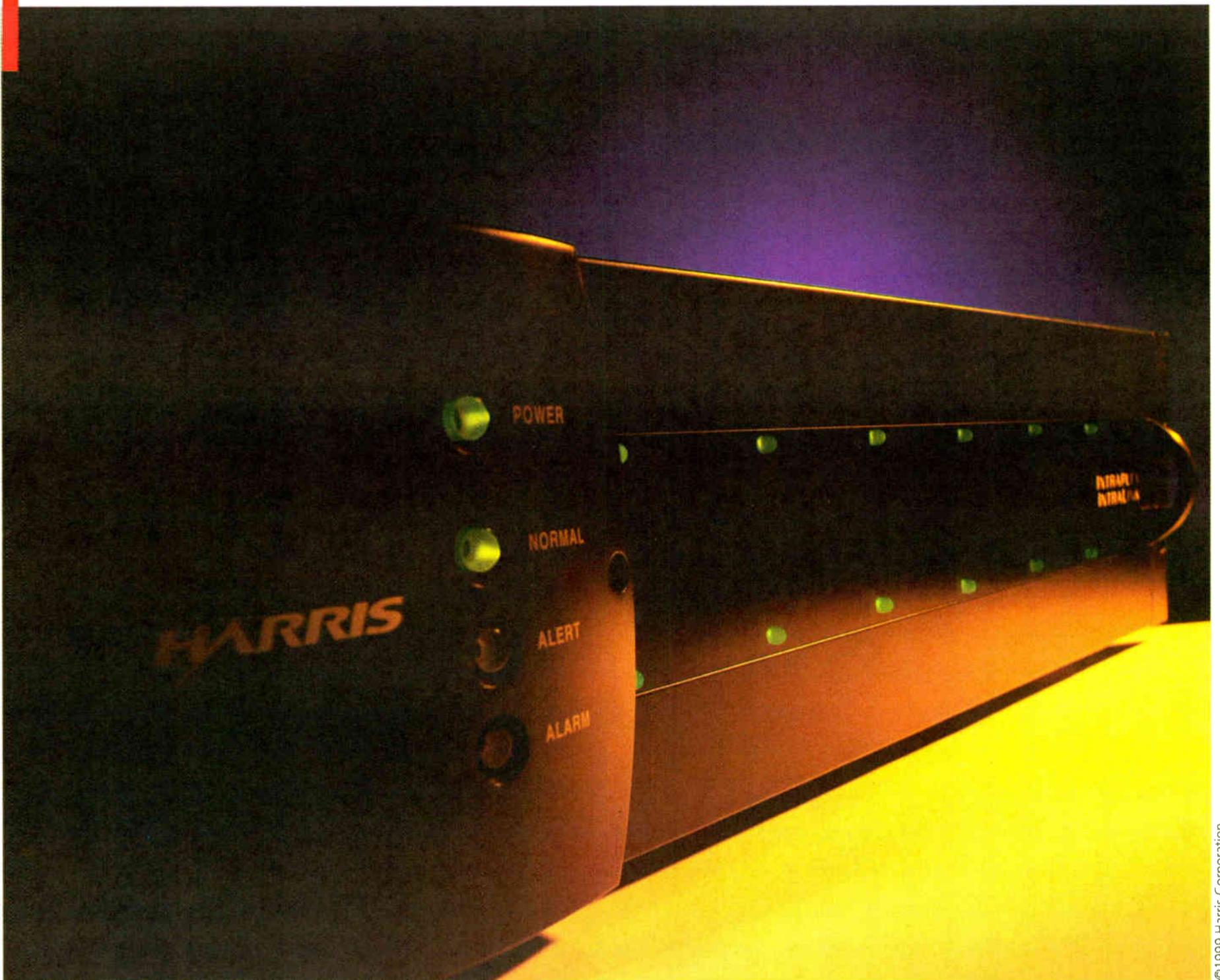
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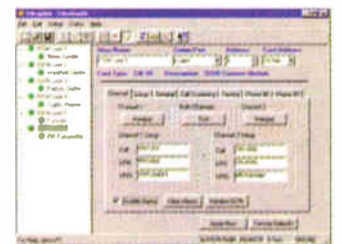
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See Page 58

Radio World

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May 10, 2000

PRODUCER PROFILE

Moore Screams KSJO's 92 Rock

Ken R.

Upon hearing Clear Channel station KSJO(FM) in San Jose, Calif., the listener will realize fast that it's not the easy listening station in the San Francisco Bay.

Screaming rock and brain-frying guitars manned by guys with tattoos and

"We actually run it as a network with cutaways for local spots," said Moore. While there are local avails for each frequency, spots are all played from KSJO's main studio.

"Even though much of the production is done elsewhere, the four sets of local spots create a lot of work," said Moore.

people and then a group of us writes the copy. There are usually three major promotions and a few minor ones on the air at any one time," said Moore.

"All the production people in the building are ex-jocks, but when we need extra voices we sometimes grab the sales people and even the secretaries," said Moore.

The station is non-union and the production people prefer to run the board for all promos and commercials.

"None of the jocks do production here," said Moore.

Tools, tricks and toys

There are three air studios and three-and-a-half production studios within the building.

"After the morning show on KCNL(FM) is through, we turn their air studio into a production room, too," said Moore. "KUFX(FM) and KCNL have their own production people."

The main workhorse in the production room is the Pacific Recorders ADX 8, an 8-channel digital workstation. The board is a Pacific PMX-28.

"The neatest thing is Flying Faders," said Moore. "You can physically move them and then the automation remembers the moves."

Outboard processors include the Valley Audio 401 for compression and a Yamaha SPX900 multi-effects processor for reverb and flanging. EQ is handled on the board and Audio Technica AT4033 mics are used.

"We usually save all the production pieces for complicated spots right in the Mac-based ADX," said Moore. "Then when we have to go back and change a tag or an address a year later, we have the work parts."

Finished spots are sometimes saved to DAT as well.

See KSJO, page 53 ▶



KSJO Creative Director Steve Moore in One of the Production Rooms

pierced body parts are the rule. The morning jocks call their fans "the most brutal audience in rock and roll."

Steve Moore's challenge as creative director is to make production sizzle with the same intensity as the rest of the station.

"We concentrate on our No. 1 client, which is KSJO," said Moore. "In the old days when San Jose was a small town, we cranked out a lot of commercials. But now that it's a huge market, many spots come to us from agencies."

KSJO is carried on four frequencies in the San Francisco area: 92.1 MHz in Concord, 92.3 in San Jose, 92.7 in Alameda/San Francisco and 92.7 in Monterey. Thus the moniker "92 Rock" is used collectively to identify the stations on the air.

After stints in Yuba City, Sacramento and San Francisco, Moore has held the production reins at his current place of employment for 15 years. "A lifetime in radio days," said Moore.

When he arrived at the station, his first job was playing oldies in the morning on KHTT(AM), which the company no longer owns.

Moore said the GM discovered that he could also voice-track the FM station and still handle production. He no longer handles an air shift, but he does work with the whole KSJO lineup of announcers on spots and promos.

A typical day at KSJO starts with a 9 a.m. meeting to map out the promotional strategy for the upcoming weeks.

"We go over requests from the sales

CMS: Solving Content Management

Tom Vernon

While predicting the future of technology can be risky, the radio stations that will thrive will be the ones where managers see themselves as providers of content, rather than simply as holders of the license to operate a station.



Chris Strachan, CEO of the Bulldog Group

Streaming audio on the Internet is a start. But listeners also expect a station's Web site to be a clearinghouse for different types of information, from local events to new music and recording artists promoted on the station.

Increasingly, station Web sites will be mixtures of audio and video, text, graphics and image files. In information science lingo, these are known as assets.

As the Internet becomes more

See CMS, page 56 ▶

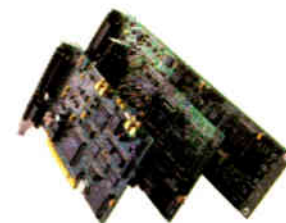


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PRODUCT EVALUATION

New C 3000 B Shows Improvement

Paul Kaminski

AKG has been noted for its high-quality condenser microphones. Whether in a studio or out in the field, AKG mics are used around the world. The redesigned C 3000 B should find its way into broadcast operations needing a quality condenser announce mic at a reasonable price.

A C 3000 B was lent to Motor Sports Radio Net studios for a test. This was my first experience with a large-diaphragm condenser. I assumed using a higher-end mic on my relatively untrained voice would be like casting pearls before swine.

The C 3000 B is a side-address, cardioid-pattern condenser microphone that requires phantom power. It has a 10 dB pad and a 6 dB per octave bass cut filter that kicks in at 500 Hz.

Optimum performance

The mic was designed for optimum performance at 48 volts but worked well with any voltage from nine to 52 V. Any good mic preamp or outboard processor should have enough power to fire up the mic. With my Mackie 1202 VLZ, I simply flipped the phantom power switch on and I was in business.

I knew I had a sensitive mic when I

saw the levels soar into the stratosphere when I started to adjust the channel pre-amp. A few judicious turns of the trim pot and the level was in the proper range.

With the microphone, I did not have to crank the trim so high to get a proper level, thanks to the published spec of -32 dBV sensitivity at 1 kHz, give or take two dB.

The mic was so sensitive that I could hear the hard drive and fans on my computer when I was silent with the mic open. Hum from the monitor was not picked up.

With a spec of 80 dB S/N ratio A-weighted, the sensitivity might cause a rearranging of the radio studio and



The AKG C 3000 B Microphone

soundproofing.

The case for the C 3000 B is diecast metal and is not imposing, with a length of only 6.4 inches and a 2.1-inch diameter. The large diameter does not mean you can "eat" the C 3000 B like an Electro-Voice RE-20/27.

I had to listen and adjust my distance to find the sweet spot. If the talent tends to have plosives in his or her delivery, like popping Ps and topping Ts, the talent might get frustrated using this mic at first.

If the talent can't be bothered to change technique, then the benefits won't be apparent.

The C 3000 B gets unnerved with pops and tops and the results can be heard on the recordings or on-air.

Proper technique and a pop shield should solve this problem. AKG has an optional W 414 external windscreen for the mic.

The specs show a frequency response of 20 Hz to 20 kHz. When looking at the linear frequency curve, I noticed a slight 1 dB or so dip in the 1 to 3.5 kHz range.

My voice tracks sounded sufficiently full, bright and clean, once I figured out the right distance and angle of attack within the sweet spot.

A trained voice talent could take advantage of this mic. As for me, it took my voice and turned it from a sow's ear to a smooth, silk purse.

The C 3000 B comes with one of the simplest and most elegant shock mounts I have seen for a mic.

The H-100 spider mount has a friction ring that holds the body of the microphone. It uses bungee-styled cords, which are fabric-covered elastic, to isolate the mic from mechanical bumps and nudges.

The microphone has a safety flange that fits nicely in the mount. So whether hanging upside down or right side up, the mic is secure. It comes with a brass adapter for either type of mic stand and has a slot that holds the mic cord for strain relief.

AKG lowered the price of the previous C 3000 models. The list price of the C 3000 B is \$520, and I suspect it can be purchased for less.

I would also suspect that the C 3000 B See AKG, page 51 ▶

Do More, Spend Less

"Scott Studios Saves My Stations \$45,000 per Year"

Doug Lane, owner and GM of WWDL (FM), WICK (AM) and WYCK (AM), Scranton and Wilkes Barre, PA says he "saves more than \$45,000 per year with Scott Studios' Voice Trax automation. While the investment was major for a small family company like ours, *the pay back was fast and real.* And the savings are year after year after year.

"Unless we are running evening baseball or Friday night high school football, we close the building at 6PM and operate unattended until 5:30 the next morning.

"We use several independent announcers to record Voice Trax for us, along with our regular staff. Even me! We operate both live assist and automation."

Normally, each announcer records a fresh show every day. Scott's exclusive Voice/Music Synchronizer guarantees every song plays only with the correct voice track. If a jock gets too busy and doesn't do their show in time, Scott's unique Voice Trax System automatically airs evergreen standbys that sound right! Doug says, "No one but Scott Studios has this great fail-safe feature. Scott Studios' System provides a separate specific generic Voice Trax for every track for every hour and every day of the week in case someone can't track their show in time."

Scott's Voice Trax recorder is the industry's easiest to use: most tasks are done with just one button. The mouse and keyboard are seldom touched. Voice Trax take only seconds per cut to record. Scott's AutoPost makes announcers sound better and minimizes Voice Trax re-cuts. Experienced jocks don't waste time checking their work because they hear their voice and surrounding music and spots in context while recording.



Doug Lane, Owner and GM, WWDL, WICK and WYCK, Wilkes-Barre and Scranton, PA
Doug's stations have used Scott Studios' Voice Trax systems for many years.

On-Air 2	I Knew I Loved You Savage Garden :11/4:24/F HIT DA3468 7:43 #1 for 2 weeks in March, 2000	Half A Minute Basia L 6:28 2p N 7:10 3p	Hands Jewel L 7:15 5p N 7:13 6a	Hang On Tight Ric Ocasek L 7:2 3a N 7:9 3p
Start 3	Show Me The Meaning Of... Backstreet Boys :17/4:13/F HIT DA5204 7:48	Happiness Vanessa Williams L 7:9 4p N 7:12 7a	Happy Girl Beth N. Chapman L 7:6 11a N 7:18 8p	Harbor Lights Bruce Hornsby L 7:4 2a N 7:12 7p
Start 3	Backstreet Boys Backsell Doug Lane :00/0:13/C VT JU1094 7:52	Harvest Moon Neil Young L 7:7 4p N 7:10 2a	Have I Told You Lz Rod Stewart L 7:2 7p N 7:13 8a	Have You Ever Re Bryan Adams L 7:1 5a N 7:8 10p
Start 3	Dodge Trucks Q: Your Dodge Dealer :00/0:60/F COM DA2215 7:53	Have You Ever Brandy L 6:30 5a N 7:13 9a	Having A Party Rod Stewart/R. W. L 7:2 8p	He'll Never Leave Kathy Troccoli L 7:4 3a N 7:11 5p
Start 3	Kozy Kitchen Q: Kids Eat Free Tonight :00/0:60/C COM DA1234 7:54	Healing Wynona Judd/M. E. L 7:2 9p N 7:15 4p	Hear Me In The Ha Harry Connick Jr. L 7:1 9p N 7:15 3p	Heart Don't Fail M Rita Coolidge/Lee L 7:1 3p N 7:13 3a
Start 3	WWDL Fast Jingle Q: WWDL :00/0:13/C JIN DA4315 7:55	Heaven And Earth Al Jarreau L 7:4 10a N 7:12 5i	Heaven Knows Luther Vandross L 7:1 9p N 7:20 10a	Here In My Heart Chicago L 7:2 2a N 7:14 3p
Stack	Here There & Ever Celine Dion L 7:5 8p N 7:13 5a	Hero Mariah Carey L 7:3 1p N 7:17 9p	Hero's Dream Jim Brickman L 7:1 1p N 7:12 5a	Hey Girl Billy Joel L 7:1 1p N 7:12 3p
Auto	High Sierra Trio (Harris, Ronst) L 7:6 1p N 7:14 8a	Higher Ground Barbra Streisand L 7:4 12n N 7:15 9p	Hold On My Heart Genesis L 6:27 1p N None	Hooked on a Mem N. Diamond/Kim C L 7:1 10a N 7:15 9p
ABCDEF	Holdin' On George Benson L 7:9 2a N 7:10 7p	Home Sheryl Crow L 7:2 3p N 7:16 6p		

The Scott System is radio's most user-friendly. You get instant airplay or audition of any song simply by spelling a few letters of its title or artist. You see when songs played last and when they'll play next. You also get voice tracking while listening to music in context, hot keys, automatic recording and graphic waveform editing and scrub of phone calls, all in one computer!

a compressed price) and a week of Scott School training of your whole staff at your station. You get Cart Walls for instant requests, a phone recorder with waveform and audible scrub editing, the ability to record Voice Trax in your air studio while listening to your music in context in headphones, title and artist displays for your website, time announce and Cat. 5 audio wiring for fast installation. Scott's SS32 System can feed different spots to webcasts or second stations, run satellite formats and ABC's LocalMax. Scott Studios offers optional auto-transfers of spots and Voice Trax to distant stations over Internet or WAN, wire capture and newsroom editors, unattended school closing reports and 24/7 live support via toll-free cell phones.

Scott Studios' unequalled money-saving features mean more U.S. stations use Scott than any other digital air studio systems (5,500 workstations in 2,250 U.S. Stations and nine of the top ten groups). See our web site and toll-free phone at the right.

See Scott's NAB Radio Booth R4093 and Video Booth L2506 at the LVCC.

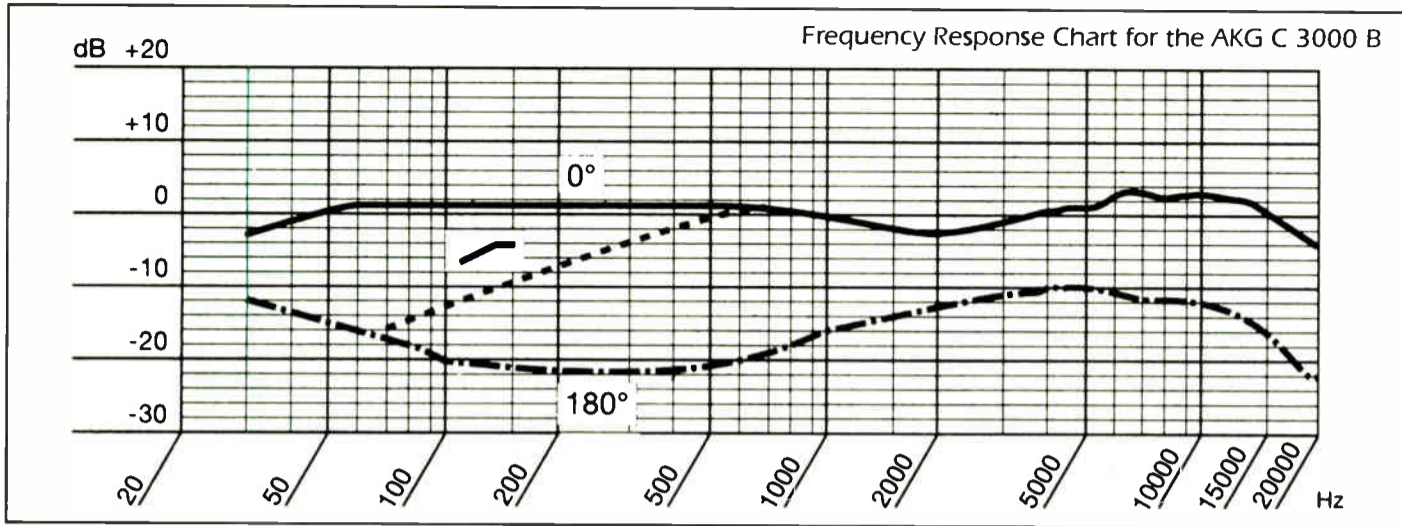
Stations can lock the door and go home with confidence. Scott has exclusive watchdog circuits that make our systems more self-healing and reliable than others. Scott predicts many problems before they occur, usually as soon as logs are done. Scott also pages people who can make last minute adjustments off-site by modem (if needed).

After a year of trouble-free operation, Doug Lane says, "It was fun to get five calls at the studio over the Holidays from out of town PD's and GM's wanting to speak with me because they heard me 'on the air'. Guess what? I wasn't even there! They were amazed at our Voice Trax and Scott's accurate Time Checks too. Actually, they were 'very impressed'!

Doug is now installing Scott's automated temperature announcer. He says, "Scott's features are great. The savings are even better! I wouldn't want to run my stations without Scott Systems!"

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Thumbs Down
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For more information contact the company in Tennessee at (615) 360-0499 or visit the Web site at www.akg-acoustics.com

► AKG, continued from page 50 would find its way into project studios and in operations where the air talent takes the time to work the mic properly. If the talent cannot be bothered to change technique, then the benefits will not be apparent.

of processing to give the voice a rich, bright and clean sound.

Paul Kaminski is the news director for the Motor Sports Radio Network. Reach him in c/o RW.



If you decide to spend some money to upgrade the announce mic, the AKG C 3000 B delivers major-league results for minor-league money. With proper technique, the mic does not need a lot

Hurry Up And Weight

Often in microphone reviews, you come across the term "A-weighting" or "A-weighted."

It is easy to cook up a painful punch line about a Brooklyn, N.Y., cop asking a guy what he is doing loitering, to which he receives the answer, "Ay! Waiting!"

Measuring the response of a mic with A-weighting makes it relevant to the intended purpose.

Mic evaluation

A weighting filter is used when evaluating a microphone. It is variably attenuated as a function of frequency, to simulate the typical response of the human hearing system.

A-weighting filtering is generally used, which also goes under the name ANSI S1.4, IEC Recommendation 179.

With A-weighting, measurements taken of a microphone resemble the way a human ear would detect the same sound.

Naturally, other letters of the alphabet fall into place. Not at all popular for professional microphones is *C-message weighting* as it is a standard based on human hearing and the response of the typical telephone receiver, mostly used for noise measurements in the telephone industry.

Readers of RW would not take *C-message weighting* into account when shopping for a mic.

Thanks to "The Audio Measurement Handbook," written by Bob Metzler and published by Audio Precision Inc., Beaverton, Ore., in 1993 for this information.

— Alan R. Peterson



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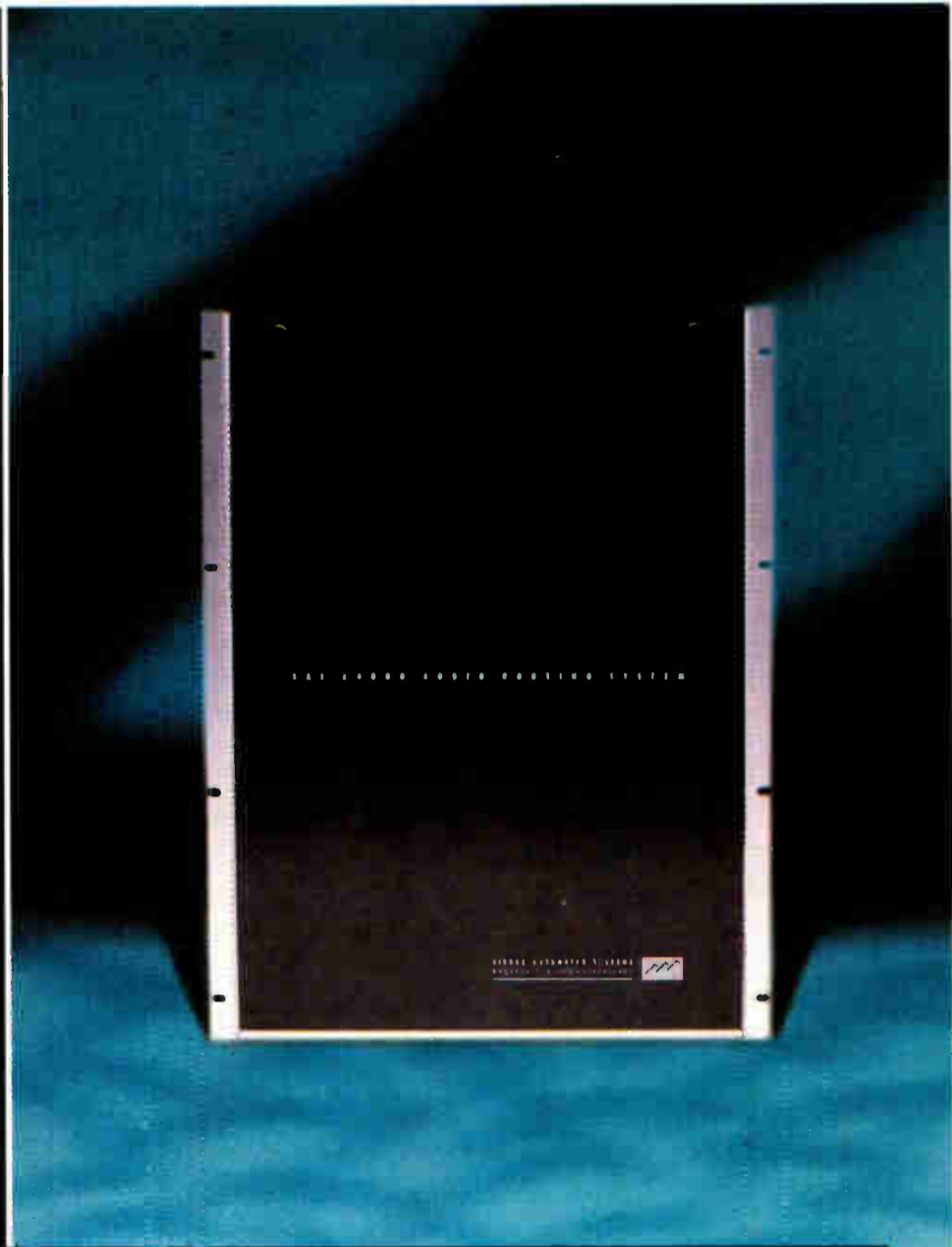


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SIERRA AUTOMATED SYSTEMS
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Sittin' by the Rock of the Bay

► KSJO, continued from page 49
 "In the old days, you had a lot of production tricks and shortcuts because you had to work with reels and cart machines," said Moore. "But now there really aren't any tricks, it's just a matter of manipulating sounds in the mix. I'd much rather create a stutter by clipping pieces of audio than playing with a sampler."

Secrets

Moore has a few cats he doesn't want to let out of the bag.

"We have some very old funky libraries we use for production, and we have some new cutting-edge ones too. My boss doesn't want us to name them, but we always try to get them with an exclusive in the market and on a buy-out basis."

The station uses an odd mix of retro sound bites and 2000-sounding sweepers and liners, all presented with a wry sense of humor and a wink at the audience.

"When we find a very contemporary library, we grab it because there really aren't many companies making them today," said Moore.

"One type of promo that has worked well here is the singing jingle," said Moore. "You can sing to a classical song or a current tune with goofy lyrics pertaining to your promotion."

Moore is always surprised at how many people in the building can pull it

off, from the operatic style to an artist sound-alike.

In the latest Arbitron ratings, KSJO was No. 1 in the 18-to-49 demographic, ahead of monster news/talk KGO(AM) and CHR KYLD(FM).



Steve Moore in Action Behind the Board

It is not easy getting into a production job in the big markets and Moore has only two words of advice for young men and women trying to break in.

"Good luck. But seriously, I think creative writing is the key. You can do whiz bang production and that's great, but today you really need less production and

more creativity," said Moore.

When it comes to deadlines, Moore believes in trying to be realistic.

"But sometimes sales people and clients aren't. And once you break a guideline, you've set a bad precedent," said Moore.



Steve Moore in Action Behind the Board

Steve Moore is married with two children who are probably too young to appreciate KSJO fully.

Ken R. is a former radio personality and manager and a former jingle producer who now writes full-time. He can be reached at kenr5367@aol.com

KSJO on the Web

We suggest that if you are easily offended by scatological or sexist material, do not visit www.ksjo.com

It's crude, hilarious and updated frequently with demographic-appropriate contests, artist information, news items and tasteless audio.

KSJO 92 "The Rock" does an excellent job of relating to its intended audience of young males and brave women.

This site is stimulating: everything moves, everything blinks and you're invited to dig into layer after layer of entertaining content.

A rather attractive woman with a hockey stick guards the entrance to the site where an "adult" warning is posted.

Once you get past her you may see an unpleasant picture of a cellulite-riddled posterior, Windows Media Player audio clips from the "Lamont and Tonelli Morning Show" or an opinion poll regarding the advisability of their associate producer's impending "boob job."

It is also possible to keep up with the song that is currently playing on the air by viewing a bar at the top of the welcoming page.

Another feature is called "nail someone," in which the Web viewer is invited to suggest ways of embarrassing his/her friends with a practical joke to be cooked up by the morning crew. After one fills out the form, one need only click on a button which says "start reaming."

Webmaster Sean King is the responsible party and he is located within the KSJO building.

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- WBBX Kingston, TN
- WERT VanWert, OH
- KSAR Salem, AR
- GINEN Port-Au-Prince, Haiti
- WRRE Juncos, PR
- KJSA Mineral Wells, TX
- KKSA San Angelo, TX
- KCLE Cleburne, TX

ECO USERS

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- KOXE Brownwood, TX
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- WBEU Brookville, PA
- APPLIED Caracas, Venezuela
- KPCL Farmington, NM
- WMRT Marietta, OH
- KJDY-FM Canyon City, OR
- KKIK Daingerfield, TX
- KFCM Cherokee Village, AR
- KSAR Salem, AR
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- WSOR Naples, FL
- INSULAR Phillipines
- CATH. DIOCESE Haiti
- WQLT Florence, AL
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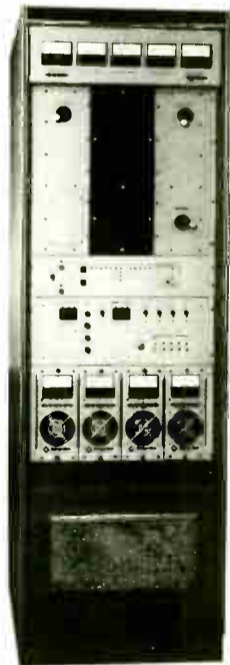


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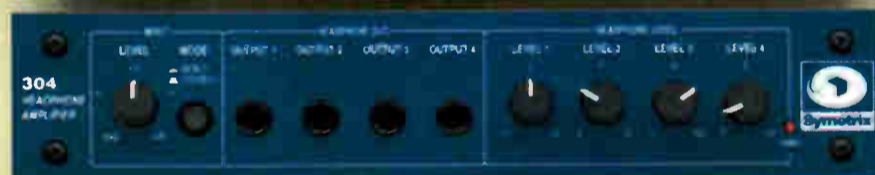
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LINE OUT

Tips for On-Location Recording

Bruce Bartlett

Perhaps the most exciting type of recording is to tape musicians who are playing live in a club or concert hall. Many bands want to be recorded in concert because some musicians feel that is when they play best. Classical music is almost always recorded on location.

Your job as an engineer is to capture that performance on tape and reproduce it in a different environment. Fortunately, a new breed of compact mixers and multi-track recorders have made on-location recording easier than ever.

I will offer a few tips on remote recording gleaned from experience. These apply not only to concerts, but also to award shows, sporting events and live radio broadcasts.

Preparing for easier setup

You will want to make your setup as fast and easy as possible. Here are some suggestions to help this process.

Mic cables can be stored on a cable spool available in the electrical department of a hardware store. Wrap one mic cable around the spool, plug the end into the next cable and wrap that one. This solves problems associated with tangled cables.

Mount your console and recorders in protective carrying cases. Install casters

word of caution is to keep tapes separated from magnets, such as in headphones, monitor speakers and dynamic mics. However, tape erasure is less of a problem with digital media like DAT than it is with analog tapes.

You might want to build a mic container — a big box full of foam rubber with cutouts for all the mics. Or you might want to construct a wheeled cabinet with drawers for mics, DIs and speaker cables.

If you will be recording a singing guitarist, take a short mic mount that clamps onto the mic stand for the vocals and put the guitar mic on the short mount. Also, bring some short mounts to clamp onto drum rims and guitar amps. This eliminates the weight and clutter of several mic stands.

Imagine you are at a remote session and you are trying to mix the program live to two-track. Often, it is hard to hear the mix clearly because of sound leaking into your headphones or monitors.

Also, you are stuck with whatever mix performed on the spot. Consider renting MDMs like an ADAT or DA-88s, if you don't already own some, and mixing down the tracks later.

Here is one way to do it: Feed the PA mixer insert sends to the MDMs. This is an easy way to record and it offers good sound quality with minimal equipment. One drawback is that the sound quality

that do not click in the half-normal position can create loud pops in the house PA if the plugs are bumped.

You will need several cables between the mixer and MDM. Figure 1 shows three ways to wire cables based on the type of insert jack.

What if you want to record several instruments, such as a drum mix, on one track? Assign all the drum mics to one or two output busses in the PA mixer. Plug the "bus out" insert jack to the tape track input. Use two busses for stereo.



Bruce Bartlett on Location

Remember, you don't want to hassle the PA operator in mid-show.

The recording levels are set with the PA mixer's "trim" or "input attenuation" knobs. This affects the levels in the PA mix, so be sure to discuss the trim adjustment in advance with the PA mixer operator. If you turn down an input trim, the PA operator must compensate by turning up that channel's fader and monitor send.

If the PA operator changes the input trim during the show, these changes will show up on your recording. Set recording levels before the concert during the sound check, if there is one. Or, ask the operator to wait until a break between songs.

It is better to set the levels on the lower side than too high because you can reduce noise but not distortion during mixdown. A suggested starting level is -10 dBFS, which allows for surprises. Do

not exceed 0 dBFS.

Also, if you set the recording level conservatively, you are less likely to change the gain trims during the performance. Remember, you do not want to hassle the PA operator in the middle of a show.

It helps to keep a tape log as you record, noting the counter times of tunes and sonic problems. You can refer to this log when you mix.

Stereo miking tips

Suppose you are doing a remote broadcast of an orchestra in a concert hall. You have set up your main stereo pair — coincident, near-coincident or spaced. Before the musicians arrive, record yourself speaking from various positions on stage while announcing your position like "left side," "half-left," "center." Play back the recording to judge the localization accuracy of your chosen stereo array. Recording this localization test at the head of a tape is an excellent practice.

If you would like to know more about on-location recording and broadcast practices, check out the book I wrote, "On-Location Recording Techniques," published by Focal Press, available at www.focalpress.com or www.musicbooksplus.com

Other topics covered in the book include planning remote sessions, mixing and editing a live gig tape, building a recording truck, stereo mic techniques, binaural recording, and surround miking.

Bruce Bartlett is a frequent contributor to RW.

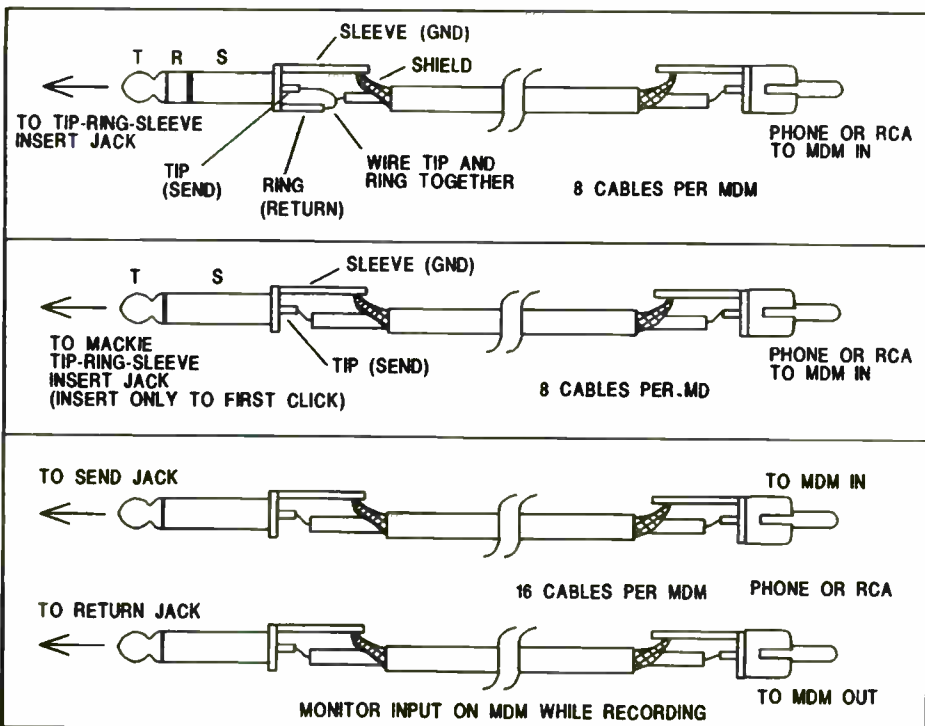


Figure 1

or swivel wheels under racks and carrying cases so you can roll them in. Rolling is much easier than lifting and carrying.

You might permanently install the modular digital multitracks or MDMs in SKB carrying cases that act as racks. When a remote job comes up, just grab the cases and go.

A helpful item is a dolly or wheeled cart to transport heavy equipment into the venue. Consider buying some lightweight tubular carts. Being collapsible, they can be stored easily in a car or truck.

The Rock 'n' Roller is an equipment cart that has advertisements in the Musician's Friend catalog at www.musicianfriend.com

Another cart is the Remin Kart-a-Bag available at www.kart-a-bag.com

Pack mics, headphones and other small pieces in trunks or milk crates. A

depends on the quality of the preamps on the PA mixer.

For connecting the MDMs to the board, find the insert-send jacks on the back of the PA mixer. Connect the jacks to the inputs of one or more MDMs. Insert jacks are usually pre-fader, pre-EQ, so any fader or EQ changes that the PA operator does will not show up on your tape.

If some insert jacks are tied up with signal processors, you must use those channels' direct-out jacks instead, which are usually post-fader, unless they can be switched to pre-fader.

Some boards have a single insert jack for send and return. By not pushing in the plugs that feed the MDMs all the way in to the inserts, which is called "half-normaling," you can get only the send feed. Some board will "click" in the half-normal position, but others will not. Boards


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Get a Jump on Managing Data

► CMS, continued from page 49
multimedia-rich, savvy Webmasters will weave these assets together.

That's where the problems begin.

As the amount of content increases, organization becomes a Herculean chore. Content Management Systems, or CMS, organize, store, search, retrieve and distribute media content across private networks or the Internet.

Organizing content

Asset management systems, as they are also called, are customized solutions that can be implemented as a work group solution. If configured well, the systems are scalable and extensible — meaning they can start small and hardware can be added as the needs grow.

CMS also allow media to be repurposed; the audio track of a music video may also be incorporated onto a CD or distributed as an MP3 file automatically by the system.

An example of content management in action took place right after Princess Diana died.

Television networks were faced with pulling the Fergie "Weight Watchers" spot where she is chased by the paparazzi.

The first step was a database search to find out if the stations had any sensitive spots scheduled pertaining to the situation and then replacing them quickly. The digital storing and retrieving of commercials avoids situations in which the tape

is lost or does not arrive on time.

Also, program schedules can be linked to the database for spots, teasers, promos and logos and can be accessed and sent in minutes, rather than the hours involved with

back end is where files are stored, accessed and updated. The advantage of having a CMS to help is that no technical expertise is required to organize and structure files.

The content delivery application, or



Shown is a screenshot example of a game on Open's interactive service.

locating and sending physical materials.

Some implementations also track individual airings for billings, scheduling, payroll and financial information.

Similar to database applications, the CMS has a front end and a back end. The

End User Interface (EUI), is the front end of the system, where the media are available to the consumer. The level of service required for this may be high, as consumers might use commercial TV as a comparison. In some instances, the front end is an interactive service with users controlling the application.

One-stop search

The CMS is a one-stop search engine for all file types, regardless of file format or platform. Users can search by text, keyword and indexes while viewing thumbnails. Without it, a Webmaster or producer would spend considerable time searching the digital management system for audio files, another database for text files, yet another one for graphics or video.

While CMS can make life easier for media producers, the ultimate goal may be to automate much of the media assembly process.

Chris Strachan, CEO of The Bulldog Group, an asset management solution provider, explained CMS would affect all broadcasts as we move toward all digital formats.

"Broadcasters are going to need to create the association between the actual music and video streams and the collateral material that goes with those streams: music videos, artist bios, album liner notes and the song lyrics," said Strachan.

While some sites currently offer this level of interactivity, the material is assembled manually. CMS makes this type of interaction possible without a lot of human intervention.

CMS can provide new competitive advantages for broadcasters.

John Carlson, senior director of marketing for Magnifi, a company that makes content management systems that run on an application service provider, said, "The real power in a content management system is having an institutional memory of assets. With it, you can conduct data mining for historical purposes or to brainstorm new ideas."

Carlson said many Magnifi customers use CMS to track responses to ad cam-

paigns so the ads can be tweaked and improved over time.

Two other motivations for implementing asset management are cost reduction and revenue opportunities.

On the cost-reduction side, users can decrease the cost of production by centrally storing and archiving all materials created for programming. Revenue opportunities exist as new distribution channels open up. These channels may be satellite, targeted Web sites or broad bandwidth ITV applications.

Digital backbone

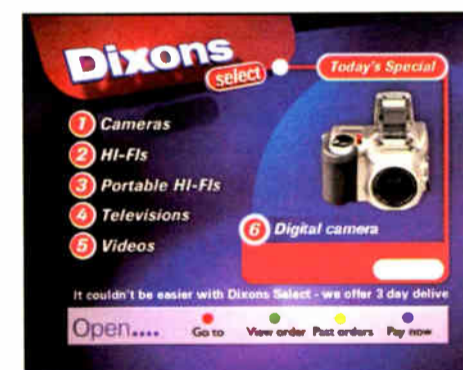
Content management provides the digital backbone for broadcasters to distribute their content into these new channels.

Strachan said, "Music companies want to create a complete digital infrastructure so they can have their content moved out digitally on demand to retail, online and other distribution channels. Once the library is created, there are opportunities to generate revenue in many places without having to rescan or handle it manually."

While motion picture, music and broadcast companies have relatively fixed content that may be administered by a CMS, many Internet sites have content that is quasi-stable. It may have a lifespan of a few days to a few months. For these users, determining which assets to archive and which to discard become key issues.

The next generation of broadcast media may have a different relationship with its content than we are used to. One model for the future is being tested in the United Kingdom.

"Open" is the free interactive digital TV service created by British Interactive Broadcasting Services. The service includes home shopping, banking, information, games and e-mail. It is delivered via satellite and interfaces with the TV via a set-top box in the home of the customer. Subscribers communicate with Open via phone lines or cable connections.



An Ad on Open's Interactive Service

Currently, Open has 2.6 million customers and offers 46 services. The business model of Open is dependent solely on interactivity with the user, and may easily be transported to other countries. Open is in negotiations with several distributors outside the United Kingdom.

The scale of this interactive operation makes manual intervention almost unthinkable. Open receives hundreds of assets in varying formats from several sources, including Woolworth's design network, U.K. media design agencies, international design groups, several Internet-based design firms and the content providers.

Open uses content management to track and distribute the assets from point of ingest to their use by Open's design team.

The next step for Open is to integrate asset management handled by Bulldog with Oracle's Service Creation

See CSM, page 59 ►

Perhaps you've heard the buzz around Cool Edit Pro, the complete software multitrack recording studio. Why is it so popular?
It's so easy to use!

As one user said in Radio World, "When it comes to broadcast production, it is doubtful you will find an easier interface that is as inexpensive yet as powerful as Cool Edit Pro." — March 17, 1999

See for yourself.
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- Mix minus phone interface



A rugged design with heavy aluminum panels, solid oak trim, 5M operation On/Off switches and full DC control, the 1200 is ideal for On Air, Production, or News applications.

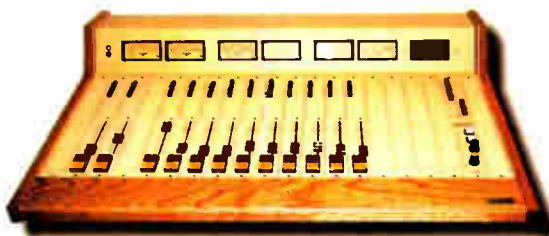
Standard Configurations

1200 - 5S	5 channels	\$2,295
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(call factory for options)

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Modular, reliable, flexible, and powerful, the 12,000 is found around the world from Tokyo to Paris to New York. The 12,000 is perfect for any size market or any radio application.

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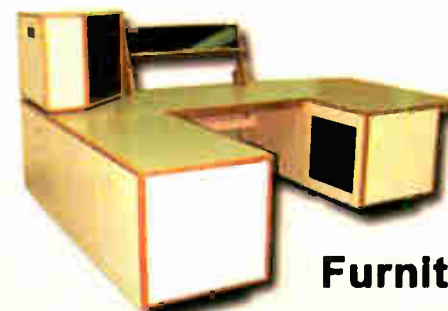
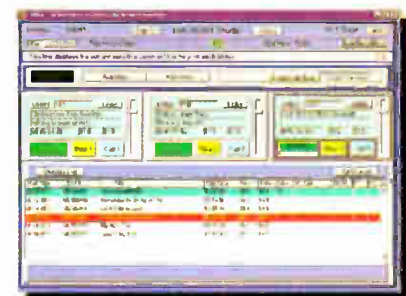
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FIRST PERSON

Doing Voice-Overs From Anywhere

Jeff Laurence Gill

Picture this: It was 8 a.m. at the Don CeSar Hotel in St. Petersburg Beach, Fla.

I was called by one of my clients for an early morning voice-over session.

A radio station in Baltimore had finished a contest and needed a promo

The laptop seemed like all I would need. That changed when I needed to get scripts over the Web.

The company E-Fax solved that problem by providing, free of charge, a separate personal phone number for clients to send faxes. The faxes arrive as e-mail attachments that I print out on my Canon BJC-50, a battery-operated bubblejet printer.

Getting audio into the computer

Computer manufacturers do not make high-quality audio a selling point. So, nobody makes a machine with a built-in audio card that functions as well as my CardDeluxe. Excessive noise and poor quality had made my dream nearly impossible.

Digigram saved the day with a new version of its popular, but pricey, PCX audio card that I purchased through BSW. The PC Pocket is the closest card to CD quality that I have heard. It has an interface cable that has two XLR inputs, two XLR outputs and digital RCA in/outs.



The author makes a living while on vacation.

The Hardware

Here is a list of the gear that Jeff Gill put together to allow him to do voice-overs from any location with a telephone.

Compaq Presario Laptop Computer with Celeron Processor, 64 MB RAM, 4 GB hard drive, 56k V.90 modem and Digigram PC Pocket audio card.

AKG C 1000 S self-powered condenser mic and stand.

Canon BJC-50 portable bubblejet printer — don't forget paper and a few extra ink cartridges.

Assorted cables, headphones and plenty of batteries.

ASAP to highlight the winner to continue on to the next phase of the contest.

I recorded the promo on my laptop computer and sent it to the station over the Internet. I still had my pajamas on — I was on vacation! Life was good.

MP3 audio transfer plays a major part in building my station-imaging business. In a previous article (RW, Feb. 17, 1999), I presented readers with some of the basics of MP3 recording and delivery over the World Wide Web.

I have a home in the remote mountains of North Carolina, where I have a setup that encompasses the staples of any reasonably equipped studio. The majority of my business deals in voice-only product.

I found myself wondering if I could compact it into a couple of briefcases and hit the road with my wife, Carol, and see the world. Could I enjoy life and still get the job done?

I wanted to be able to transfer high-quality audio over standard phone lines from anywhere — hotel rooms, restaurants or even the back seat of a Jeep on a cell phone.

The Software

Cool Edit 2000 is available from Syntrillium Software at www.syntrillium.com

Cute FTP at www.globalscape.com

E-Fax free fax e-mailing at www.efax.com

be the ultimate traveling voice talent.

I have always been able to build my studios from the ground up, so I never had to worry about room acoustics or noise. Now, I am faced with a different studio every day, which means daily room size changes and extraneous noises.

In general, I find the more expensive the hotel room, the brighter it is. High-end accommodations usually offer more space, but in this case, more is not better.

Accommodations

For example, the beautiful Union Station Hotel in Nashville, Tenn., is a former train station and has huge suites with 24-foot ceilings with full-length glass windows. If I were recording concert spots or tractor-pull promos, I would be eager to capture all the reverb that poured from the walls.

For this particular project, I was looking for a dry sound — warm and intimate, definitely not here.

Carol emerged from the closet with a fluffy, terrycloth hotel bathrobe, the kind you'd like to steal. In the armoire, I found extra pillows that helped with a quick solution.

I hung baffles on the wall and baffled lamps, and set out to record my spot. After several playbacks, I heard the distinct ambiance of air conditioners and general roominess.

Syntrillium's Cool Edit 2000 has several utility programs to deal with such problems. In this case, I needed to eliminate the open-room sound. The noise-reduction feature is perfect for this task.

I recorded a few seconds of the room "sound," and the No-Noise program analyzes it and saves it as an .xmf file.

After my spot was recorded, I ran the file through the Noise Reduction

See JEFF GILL, page 62 ▶

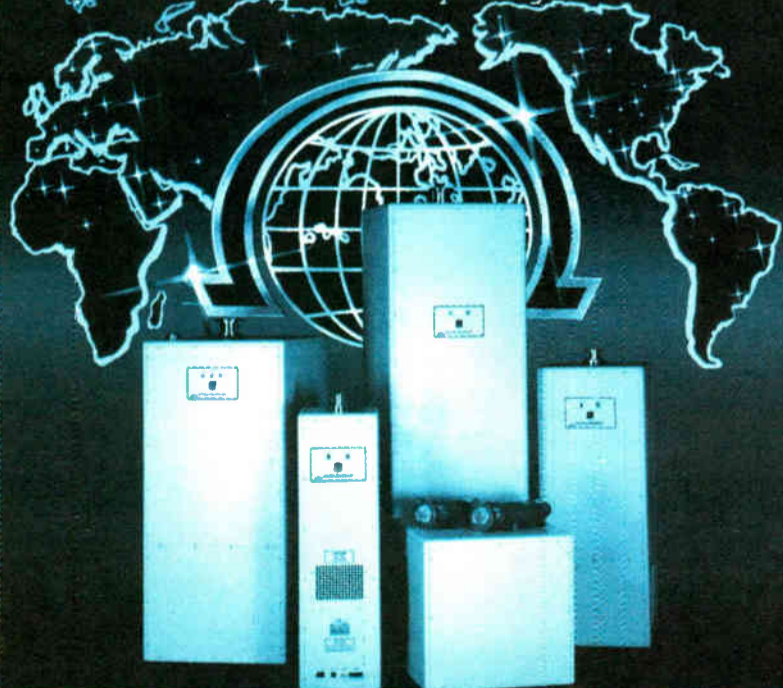
**In the armoire,
I found extra pillows
that helped with a
quick solution.**

Next I needed a microphone that could withstand the rigors of travel and still sound good. I chose the AKG 1000S, a self-powered condenser mic that, when EQ'd properly, sounds near-Neumann quality.

Now I'm ready. After a few tests on the kitchen counter and unanimous approval from several client stations, I was ready to

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CMS Ties Radio With Other Sources

► CMS, continued from page 56

Environment, an application that creates Open's interactive services based on a set of electronic assets that the service creator identifies. This step should improve time to market of product and boost productivity by reducing time spent locating, identifying and retrieving content or assets.

As resources are tweaked and businesses processes are implemented, Open plans to introduce more content providers and increase revenue with less operational overhead.

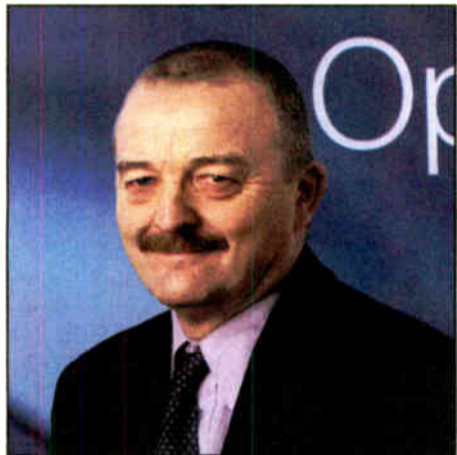
Alec Livingstone, Open's chief engineer, noted that the short lifetime of their program content makes Open's relationship to a content management system different from that of conventional users.

"The key driver at Open is integrating asset management more seamlessly with our scheduling system," Livingstone said.

While content has a short life span at Open, British regulators set forth an interesting challenge. Because prices and special offers in interactive commercials change frequently, customers need to be protected.

Open is required to be able to recon-

struct the service on a given day for about three months after it aired. The interactive and dynamic nature of maintaining 46 services means that a CMS is the only practical way to meet this stipulation.



Alec Livingston, Chief Engineer at Open

Another perspective

Another perspective

While broadcasters see content management as a media solution, information scientists see it as an object-relational database problem.

From that perspective, a file is simply an MP3 recording of a song. An asset is all of the associations that go with that file — the artist, song title, lyrics, music video, logo and associated text. CMS manages all of these as one object.

Media is a prime arena for use of CMS, but it is also important to understand that CMS is a horizontal solution with other applications.

These might include storage and management of 3D satellite images as files along with associated assets such as population density, areas of economic growth and pollution. Ultimately, the satellite image may be displayed with different layers for each of these additional items.

There is one warning about the purchase and use of content management systems. As broadcasters become distributors of a greater range of content and develop new EUIs to handle this, there is

Implementation

John Phillips, general manager of Bulldog in the United Kingdom, notes that broadcasters should plan on implementing a CMS sooner rather than later to avoid these types of problems.

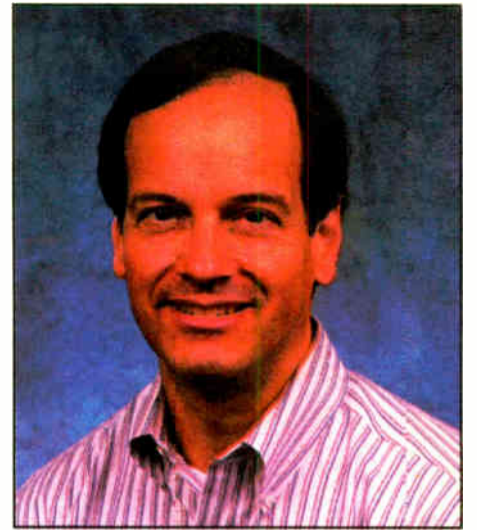
"It's like building a house with no plumbing. Adding the pipes after the house has already been built can be quite difficult. On the other hand, adding plumbing to a new room when it's already in the house is relatively simple,"

said Phillips.

Much of the attention in the media has been directed toward streaming, MP3, automation and digital workstations. The less-glamorous subject of administrative chores has been largely neglected.

For broadcasters transitioning to all-digital media, the resources needed to handle basic tasks like managing assets and organization should not be underestimated. CMS has become a core infrastructure application with the same importance as a payroll or scheduling applications.

Ultimately, purchasing and implementing a CMS may become a "pay-now-or-pay-later-with-interest" situation.



John Carlson, Magnitude Senior Director of Marketing

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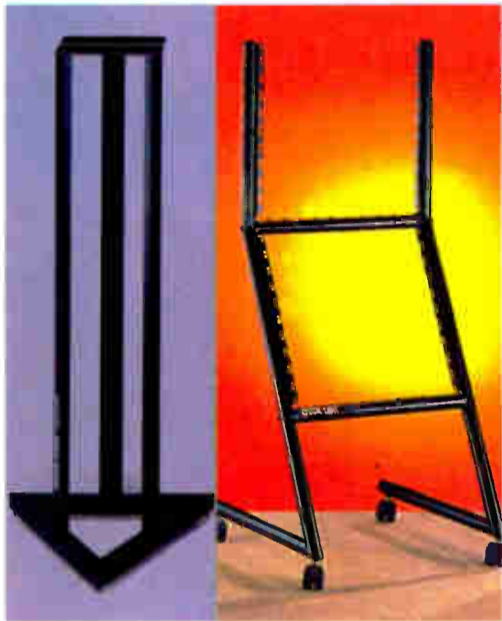
Quik-Lok makes products to keep studios neat.

One product is the BS336 speaker stand, which is 36 inches high and retails for \$149.95. The company also makes the BS342, which is 42 inches high and retails for \$159.95.

The base of the stand is a triangle and the back leg is hollow so cables can be run internally. Three optional metal spikes can be screwed in at the base to isolate the stand from the floor.

Another useful product is the RS954, a rolling 20-space rack for \$189.95. The rack rails are welded into a frame with the lower 10 rails angled and the top 10 vertical. All Quik-Lok products are easy to assemble.

For more information contact the company in New York at (516) 352-4110 or visit the Web site at www.quiklok.com



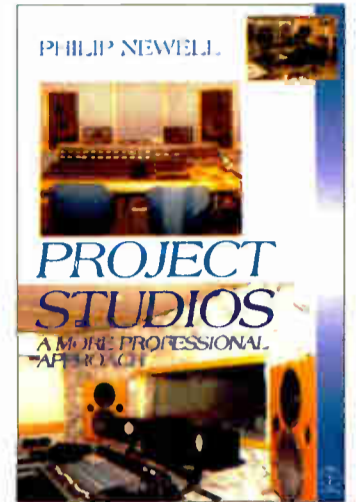
A Pro Approach to Project Studios

The line between home studios and professional studios is becoming blurred, and project studios lie between these extremes. What is often missing from home studios is the experience in front-line recording.

Focal Press has a new book called "Project Studios, A More Professional Approach" by Philip Newell. It retails for \$47.95. Newell is a studio designer with more than 30 years experience.

Newell conveys what he knows with an emphasis on the problems of loudspeakers and acoustics. The inexperienced studio operator will find tips and answers for getting professional results.

For more information contact Focal Press in Massachusetts at (800) 366-2665 or check out the Web site at www.focalpress.com



Raxxess Your Gear With New Products

Raxxess has added several items to its product line.

The Etude is designed as a studio keyboard workstation or learning center and lists for \$599.95.

Both feature eight to 20 rack spaces with additional spaces for \$1.50 per space, per pair. The racks extend 20 inches from the frame and are capable of rotating 90 degrees in either direction. Both racks have a cable-management system and a rear seven space rack rail.

The ROTR-2 has a 150-pound capacity and retails for \$499.95, while the ROTR-4 has a 300-pound capacity and retails for \$569.95.

Both units lock in the closed



position with a black anodized security panel.

Raxxess has also introduced the WMK-10 two-piece wall-mount rack, which allows access to the rear of the unit for \$349.95 list. It features an 18-gauge mounting pan with key-hole slots for easy wall attachment.

The rack section is constructed of 16-gauge steel with a black powder-coat finish.

It is supplied with knockouts for cables on top and bottom as well as a larger rear knockout. It is vented on both sides with a locking front door that can swing left or right.

For more information contact the company in New Jersey at (800) 398-7299 or visit the Web site at www.raxxess.com



It is 55 inches wide, to accommodate a full 88-note keyboard, and 16 inches deep. The height is adjustable in one-inch increments up to five inches. The frame is constructed of 16-gauge tubular steel with a black powder-coat finish.

Raxxess also has two new rotating racks.

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Making a Living on Vacation

► JEFF GILL, continued from page 58 and the annoying tone was gone. I save the noise profiles from every environment and apply as needed.

Audio aggravation

Of course, there are times when the source of audio aggravation cannot be squelched with any of electronics.

The couple in the very next room on their honeymoon comes to mind, as does the noisy ice machine at the Rodeway Inn, and my favorite are the screeching seagulls at the Holiday Inn in Florida.

In the case of natural or uncontrollable unwanted noise, I have to wait

for the right time to record.

After finishing the edits and EQ using features of Cool Edit 2000, I'm ready to send the track to the Web site for downloading by my client. CE saves the files as an MP3, eliminating the need for an external encoder.

The chore of downloading is performed using the "Cute FTP" client program from globascope.com that dials up the Internet, then uploading the goods directly from the hotel room.

There are cellular modems that can transfer these files on the road, which I would love to get. Then I could be able to do a promo while camping.

The possibilities are endless.

The sound quality is superb with the Digigram PC audio card, but it is not a replacement for a full studio setup.

It does come so close that, with a little tweaking and a few minor changes, I might be able to stay on the road for months at a time and still keep working.

Now, if I can only figure out where to have the checks sent.

■ ■ ■

Jeff Gill has more than 30 years' experience in broadcasting. His company, Autumn Hill Studios, specializes in imaging for radio, TV and infomercials. He can be heard Saturdays from 7



Gill takes a coffee break at 'work.'

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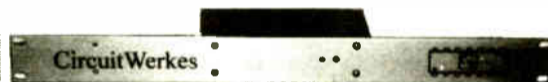
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Buyer's Guide

Tech Updates



Inside

Radio World

AM Transmitters

May 10, 2000

USER REPORT

Entercom Installs Nautel

by Ken Wolf
Chief Engineer
Entercom

KANSAS CITY, Kan. We had a requirement for a 25 kW AM transmitter for one of our stations in Kansas City. While we have had experience with Nautel transmitters in the past, we had not yet looked at the XL30.

In our evaluation, we found a number of features in the XL30 that provide increased reliability.

The XL30 offers power modules that are hot-pluggable while the transmitter stays on-air. The low-level circuits in the exciter section are fully duplicated with automatic changeover.

The transmitter was submerged halfway under water.

Also, redundant brushless DC-powered fans mounted in removable trays provide ventilation. Finally, the XL30 offers excellent overall efficiency and its unique redundancy features keep us on the air.

"We've had very good results with their equipment through the years," said Martin Hadfield, vice president of engineering for Entercom.

"Nautel AM transmitters have been an excellent product for us. They pay for themselves in power consumption savings and they are highly reliable."

So we selected the XL30 and installed it at our station KKGM(AM) in Kansas City. It has been running smoothly ever since.

In the past, I have had first-hand experience with Nautel's rugged, reliable construction.

A while ago, I had a Nautel 1 kW
See NAUTEL, page 72 ▶

USER REPORT

Building the Perfect AM System

by Michael G. McCarthy, CSRE
McCarthy Radio Engineering

CHICAGO I recall the first time I heard of Tom King and Kintronic.

I was working with another engineer on a blown-up isocoupler. We pulled the defective device, shipped it to the factory, and had it back within five days.

Fast-forward about 10 years. I have since installed two fairly large systems employing Kintronic phasing and antenna tuning equipment and have contracted at several stations that also employ Kintronic equipment.

Consultant's word

One point I need to stress before construction begins on any project: Obtain the design consultant's word about component rating. Afterwards, confirm the selection with Kintronic's technical staff to ensure the device voltage and current ratings are sufficient to survive the great stresses encountered during maximum modulation and static discharges.

I have found Jim Moser and Bobby Cox most resourceful in this regard. They suggested not reducing the values and they have not failed me yet.

The most recent exercise involves a station which rebuilt the entire plant, including towers, ground system and transmitter building.

The mission directive from the owner was to design a stable, reliable, robust yet cost-effective system. They saw the end product of a system shortchanged from

During the design process, I met with Moser, the senior staff engineer, Cox, the chief RF design engineer, and King, the president of Kintronic, to generate pro-



Kintronic Custom-Built AM Transmitter

the start and did not want to pour precious resources into a new system destined to the same fate.

With that commitment in mind, my decision was easy. I knew Kintronic follows that same philosophy.

ject specifications.

This site is unmanned most of the time, improved reliability and resistance to outside environmental factors are priorities. Previous experience with installing

See KINTRONIC, page 68 ▶

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USER REPORT

Radio Systems, ISS Fortify Community

Pescadero's Emergency AM Radio System Slides Into Action During Seasons of Storms

by Linda Folland
Information Station Specialists

ZEELAND, Mich. Located along the central California coast, the secluded town of Pescadero in San Mateo County is a bedroom community for San Francisco and Monterey.

Its proximity to state parks, redwood forests and other tourist attractions made this town a perfect setting for a Travelers' Information Station, or TIS.

Rain, rain and more rain

February of 1998 brought the "worst storm in 15 years," said San Mateo County resident Lary Lawson.

This dramatic episode prompted Lawson and his fellow volunteers from the Pescadero Emergency Preparedness Committee (PEP) to try to devise ways to keep the community "afloat at least 72 hours, until the Red Cross, FEMA, SBA and other rescue agencies could reach the area."

Flooding of Pescadero's silt-like, erosive soil caused mudslides to overrun and wash out back roads, bridges and main thoroughfares, such as the well-known Pacific Coast Highway. Reinforcing this call to action, heavy rains in 1999 snapped locals once again into disaster

mode. The people of San Mateo cleared roads with their own tractors, set up

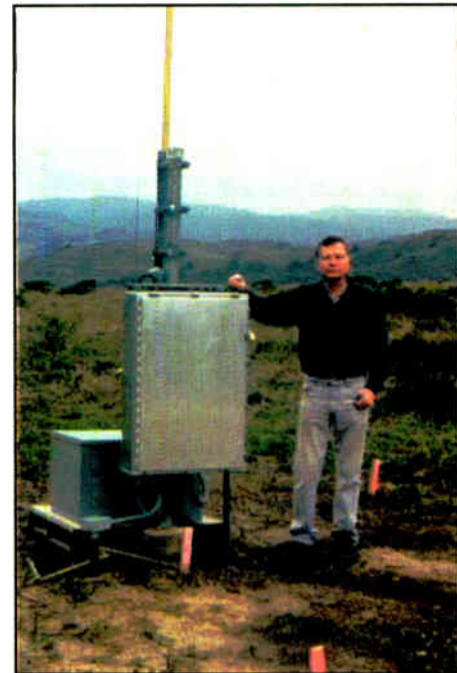


One of the Devastating Mudslides in the Town of Pescadero, Calif.

"phone trees," stocked the high-school emergency shelter and prepared to combat power outages.

But ham radio operators —adept at

getting information from point to point — could not effectively broadcast emergency information to the general public, due to the relative inaccessibility of ham frequencies to most people.



Larry Lawson stands at the WPPD(AM) transmitter site.

Department, impressed by the citizens' determination, promised to sponsor them, if the group could raise most of the money for the project. County officials further researched the TIS option and decided on **Information Station Specialists**.

Concurrently, the Pescadero Municipal Community Council facilitated project approval and licensing. The Peninsula Community Foundation agreed to fund the project.

"Supervisor Rich Gordon helped us secure a spot on county land ... and the county built the station for us," said Lawson.

ISS chose **Radio Systems TR6000** AM transmitter to install at the site.

The TR6000 AM transmitter was designed for limited area AM broadcasting. Its RF amplifier operates on the Class-D design, is digitally synthesized and can accept synchronization signals from GPS receivers for multi-transmitter operation.

It features remote control operation,

See RADIO SYSTEMS, page 72 ▶

"It was at this point," Lawson said, "someone suggested getting a Travelers' Information Radio Station we could use for emergencies."

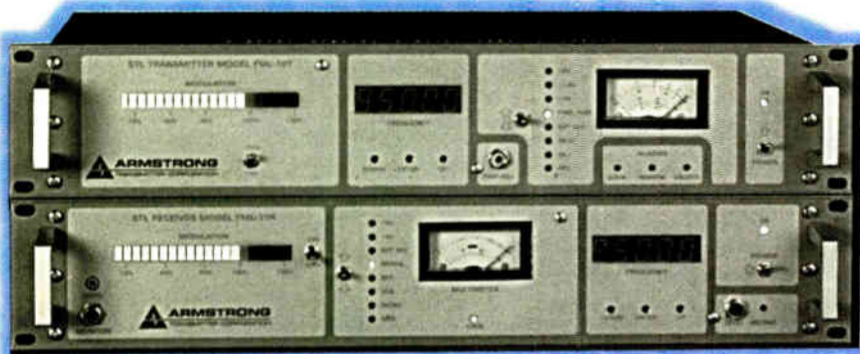
Information to the people

Spurred by the knowledge that annual rains would likely be a continuing problem, citizens of the PEP decided to research the radio-station idea and spent much energy gathering information and talking with suppliers.

"In this effort," said Lawson, "they learned that the FCC requires TIS stations be owned by government agencies. So we approached San Mateo County for help."

The County Information Services

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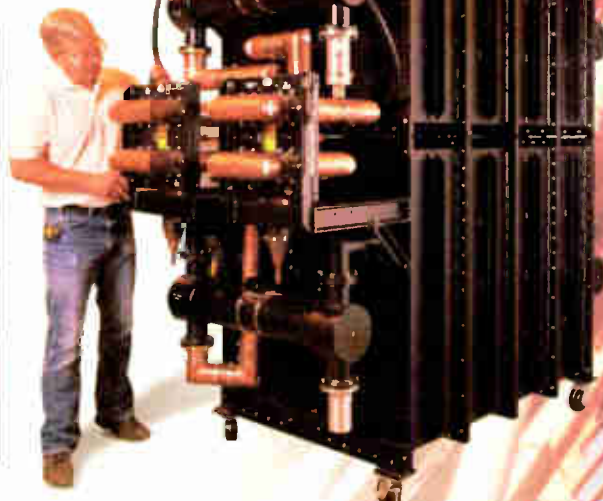
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USER REPORT

WFAM Makes Gains With Transmitter

Broadcast Electronics' AM-6A Improves Signal Coverage at Christian Radio Station

by **Bob Halvorsen**
Station Manager
WFAM(AM)

AUGUSTA, Georgia WFAM Radio is a Christian station that broadcasts ministry, teaching and southern gospel music. The station is part of a six-station network owned by Wilkins Communications Network, headquartered in Spartanburg, S.C. It has a coverage area with 1.2 million listeners.

In April 1998, we replaced an old Gates transmitter with **Broadcast Electronics'** solid-state AM-6A transmitter, which generates a 5,000-watt, multi-directional signal.

Our old 5,000-W transmitter was limited to a radius of 25 miles from the tower. BE's transmitter has increased our radius to 60-70 miles. As a result, we have had a tremendous increase in our coverage area.

Asked about this performance, Richard Hinkle, director of RF engineering for BE, replied, "The AM-6A will improve coverage over older-style radio transmitters for the following reasons: When modulation is applied to the AM-6A radio transmitter, it allows modulated power to be present in the sidebands of the channel. This increase in modulation information in the sidebands allows an increase in coverage. From what we understand, this was limited in older-style transmitters, thus the difference in coverage area. Please note there is no increase in effective radiated power."

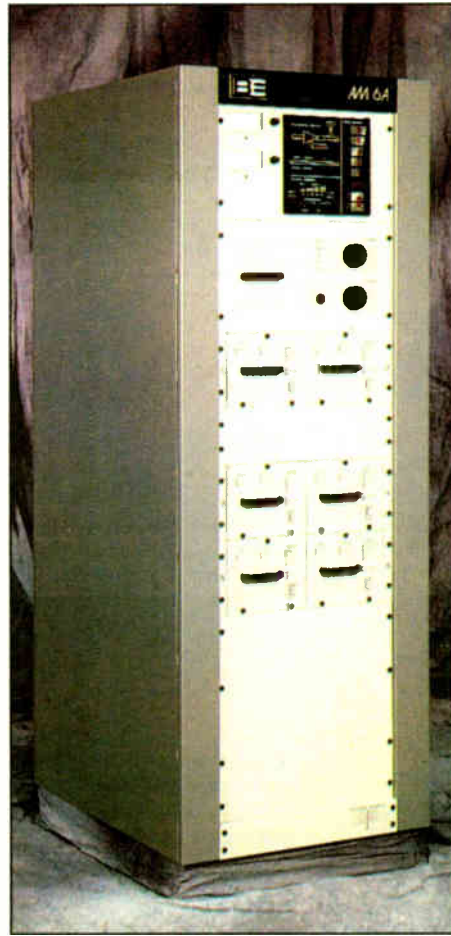
We have gotten responses from people we've never heard from before. And in this business, the name of the game is listeners.

The old transmitter had lots of tubes. With the new transmitter we've cut out electrical costs by 30 to 40 percent. We are running so much more efficiently now. The super cooling system of the AM-6A makes sure the transmitter main-

tains a constantly cool temperature, ensuring an extended life for the unit.

With the new transmitter, we don't see our engineer nearly as much as before.

In the past I had always been involved in the non-technical side of the broad-



BE's AM-6A

casting industry. This has been my first experience with the technical side and the BE support staff has been very accommodating.

We recently had a small problem with the transmitter's power supply. We contacted BE directly. The problem was identified and resolved quickly and they sent us a new power supply overnight.

We were lower in power for less than 36 hours because of the problem, but we were never off the air.

The reason is BE's patented class E power modules. They are designed for power economy and operating efficiency, and are used throughout the BE AM transmitter line. They allow RF redundancy.

When one module fails, the transmitter will operate at reduced power but

will not go off the air.

The solid-state transmitter operates at five user-defined power levels, as low as 5 watts. This allows me, at the push of a button, to reduce or raise power as appropriate for our mandated FCC power levels.

The people in service were helpful and responsive. I didn't have to talk to a machine and I didn't have to talk to six different people to get my problem resolved.

John Morton, customer service engineer, offered good technical assistance.

The BE staff is one of the few remaining manufacturers I have found that provides 24/7 service support.

■ ■ ■

For more information contact Broadcast Electronics in Illinois at (217) 224-9600, fax (217) 224-9607 or visit the Web site at www.bdcast.com

USER REPORT

Omnitronix Delivers Customer Service

by **Lee Afflerbach, P.E.,**
and **Michael Afflerbach**
CTC Media Group Inc.

COLUMBIA, Md. Our association with Omnitronix dates back to 1992, when we purchased our first transmitter from them.

As absentee owners of a small radio station in North Carolina, we needed a low-cost, reliable transmitter to replace an aged, unreliable tube unit. Omnitronix delivered and installed the transmitter at our New Bern, N.C., site.

The transmitter has performed flawlessly over the eight years, requiring minimal routine maintenance and adjustment. It provides the same high-quality signal it did eight years ago at the time of installation. The Omnitronix transmitter's reserve power and modulation makes it stand out among other transmitters in the same class.

Five years later, we purchased a 10 kW transmitter for our radio station in Camp LeJeune, N.C. The Camp LeJeune site had a variety of site problems, including line power surges, and was twice hit directly by lightning. The Omnitronix engineering staff worked closely with us to resolve these problems and to restore operations to the system quickly.

They went the extra mile by making their engineering staff available to us to help in resolving non-transmitter problems relating to the system's site. This transmitter purrs along at 10 kW with a clean and effective audio sound that makes listeners say, "That's how AM broadcasting should sound."

Directing traffic

More recently, we have worked as consultants for the state of Delaware in the design of a new all-traffic radio station in the Wilmington, Del., area. (Ed. Note — This station will be the subject of a story in an upcoming issue of *RW*.)

We had a need for a highly reliable transmitter that could provide output powers ranging from 50 to 500 watts in a single transmitter cabinet. We wanted a fully redundant system in a single rack. Omnitronix came to our

aid by proposing a dual 1 kW transmitter using a hybrid-coupling network to interconnect the transmitters and provide a reliable system.

The hybrid coupler provides a means for directly interconnecting both transmitters without the need for mechanical switching. Further, it provides additional isolation between the transmitters and the antenna system to provide greater protection from the affects of lightning and any anomalies in the antenna system.

We are now working with the Omnitronix engineering staff to use similar technology to operate two separate AM stations from the same tower in New Bern, N.C. By originating the two signals from the same location, our transmission and operational costs and logistic headaches surely will be lessened.

The Omnitronix staff works with our challenges and makes them their own. While our experiences with their "off-the-shelf" transmission equipment has been excellent, the staff's ability to create custom solutions for each unique broadcast situation (and any broadcast engineer will surely tell you that every situation is unique) has been the overwhelming reason that we continue to place our business with Omnitronix.

What differentiates Omnitronix from other suppliers has been their focus on customer satisfaction. Whether assisting our non-technical radio staff in resolving minor technical problems or working with us on engineering problems like the Delaware DOT transmitter, Omnitronix has committed the necessary resources. It is like having extra engineering resources on our staff, but not on the payroll.

■ ■ ■

Lee Afflerbach is the owner and operator of Columbia Telecommunications Corp. (CTC) Media Group based in Columbia, Md. Michael Afflerbach is the engineer for Columbia Telecommunications and is based in New Bern, N.C.

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Kintronic Builds Transmitter

► KINTRONIC, continued from page 63

Kintronic gear allowed me to envision the results of any specially needed features.

Jim and Bobby proposed a cost-effective (for the project), yet elegant approach to a pretty complicated system. The result was an appealing, workable and maintainable design.

We opted for the standard mechanical switching and control system due to a preference in minimizing exposure to lightning damage.

Jim and Bobby designed a control system, which met my desire to minimize control facilities located in the ATUs, isolate AC circuits for all RF contactors and provide the necessary remote access and status features needed to monitor the site effectively.

I also opted for ISO-9000 type barrier blocks instead of the standard cinch-type terminal strips. The reasoning is simple — over time, we all have had to replace terminal strips due to corrosion, lightning strikes, lug burnout or simple component failure.

The ISO type blocks are rail-mounted and can be individually replaced as needed. Installation time is saved because lugs are not needed.

Another nice feature on the ISO barriers is a banana socket for DVM/VOM probes, which have banana-type ends. If you don't have a banana connector, you can use a clip lead and not worry about it

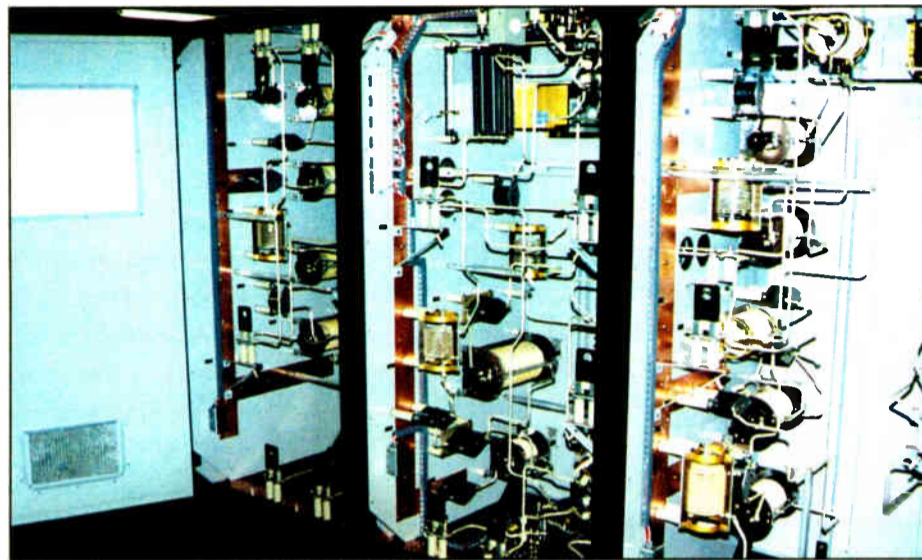
falling off a terminal block screw head.

One activity that I attempt to repeat on major projects is inspecting equipment purchases at the factory prior to shipment.

I made the sojourn to Bristol, Tenn., at a point when the ATUs were built and the

Tennessee in a nondescript building, the hustle and bustle inside would have led me to believe the factory was anywhere but the seemingly laid back foothills setting.

The trades employed ranged from machinists, who craft many of



Shown are the inner workings of the Kintronic custom-built AM transmitter.

phasor was in progress. On a complicated system, a day trip is worth the effort.

My first impression of the facility was profound indeed. Aside from the fact the plant is nestled in the low hills of eastern

Kintronic's custom metallic parts and assemblies, to sheet metal workers, welders and painters.

Other than the tube, coil and strap silver plating, little work is farmed out due to the specialized nature of constructing custom precision HF/MW tuning equipment.

Many of the craftsmen have been with Kintronic a long time, which leads to consistent quality and insight towards solving complicated mechanical challenges. This is heartening in these days of merciless cost-cutting mass production.

It appeared to me many of the tradesmen consider their work an art form of sorts and a great deal of pride is part of the end product. As each project is a custom build, the only items common to all the products are the stainless steel hardware used in everything.

Everything else is custom. And believe me, I had some very custom build items on the specification list.

During the inspection, I identified a slight fabrication misunderstanding on the sampling cable bulkheads in the ATUs. A brief constructive dialogue with Jim and the fabricator led to a simple factor-installed modification prior to shipment.

The simple modification, made in a controlled environment with a proper inventory of parts and tools, saved me at least a week of corrective fieldwork had the issue gone undetected before shipment. On a tight time line, that week could have proven costly. Thus, the trip was worth the effort.

I walked away from the inspection with a high comfort level knowing the installation side will go forward as planned and I can focus on other more pressing matters, such as stacking towers, trenching cables and plowing radials.

When we took delivery, we experienced a fabrication hiccup with the phasor.

The coaxial cable bulkheads entering the bottom of the cabinets were located several inches deeper from the rear than what we designed. With the site master plan and equipment already in place, moving the cabinets back was not possible.

Jim and Tom arranged for some replacement parts, covers and tools to be shipped and they picked up my time to make the modification. They even sent up

a real cool drill/tap tool (which I broke) to speed the installation. I have yet to encounter a manufacturer who will accept that level of responsibility for a fabrication faux pas. That was refreshing indeed.

The actual component mounting is ergonomically laid out for the most part so as to allow simple extraction of a device should repairs or replacement become necessary. Other fabricators require the person making the repair to be a gymnast with three hands in order to access equipment in a deep cabinet. This is where the deep 40-inch cabinets pay off.

As was expected to some degree, the shipping date was moved back several times after the deposit was mailed due to complications with a project ahead of ours.

Fortunately, we were equally delayed and the ultimate delivery timing worked out. However, going into the next project, I will press both sides of the project to nail delivery dates further in advance. Hopefully, through better coordination we can prevent any misunderstandings if time is tight and the project is ready for delivery of the parts.

Fruits of labor

As I am writing, the latest project where I am using Kintronic gear is just about complete. The eight ATUs and two iso-coils are hung and the three cabinet phasor in place. We are pulling control and coaxial cables through fiber ducts to the towers and making the final connections.

I will then go through and check every nut, bolt, and related RF conducting fastener to make sure they are all tight after a season of thermal cycling. I have found a couple loose nuts during the initial install thus far but that may have occurred during transit. Nonetheless, a good practice before the consultant arrives.

A standard feature is the laminated schematic mounted on the wall of the door to the ATUs and the phasor. This is handy if you are working on a station where you are unfamiliar with the layout. Another nice standard feature is the inventory of spare hardware and standoff insulators shipped with the system.

In every shipment, at least one stand-off insulator breaks and needs to be replaced. Having the spares sent as standard practice saves the headache of calling and wasting their time shipping up one or two pieces.

They also send spare relays, tubing, coil tap clips and silver plated coil tap strap — basically everything you will need to maintain the system for years.

The spares are handy if you need to make some changes during the tuneup or later. Again, saving time and effort for everyone involved.

The previous Kintronic-equipped installations that I have executed or maintained have survived some daunting conditions.

From lighting, to floods, to fires (not caused by the phasor or ATU), the gear has survived and required little remedial attention outside of the work necessary restore operation after those events. Even the occasional mouse, snake or skunk.

Sure, Kintronic might cost a little more than some other fabricators. But in mission critical situations, I need equipment vendors/fabricators I can count on to deliver equipment that will survive. From personal experience, I know Kintronic will deliver that performance.

■ ■ ■

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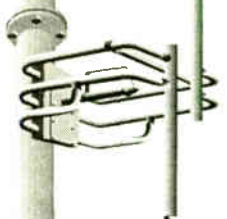
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USER REPORT

BTE Feels the Pulse With Energy-Onix

by Greg Case, Owner
Broadcast Technical Engineering

FORT WAYNE, Ind. Once again Energy-Onix has impressed us with a great product.

The Pulsar AM solid-state transmitter proves to be straightforward and solid as a rock. AM has never sounded this great, with a 145-percent positive peak capability. Station coverage has improved significantly with FM quality sound.

Our firm Broadcast Technical Engineering has been in business for more than 10 years. We are constantly trying new products for our clients. Many

of them are searching for simple, reliable and easy-to-maintain transmitters.

Seven years ago, we installed one of our first Energy-Onix transmitters at WXKE(FM), in Fort Wayne, Ind. Since then, we have installed Energy-Onix FM transmitters and STL systems to the satisfaction of our customers. Based on our experience with almost every major transmitter manufacture to date, we believe that when it comes to FM, Energy-Onix builds one of the simplest, most reliable FM transmitters.

Satisfaction

Recently, we were searching for an AM transmitter as a main replacement transmitter at many of our AM plants. We have had the opportunity to install other solid-state AM transmitters.

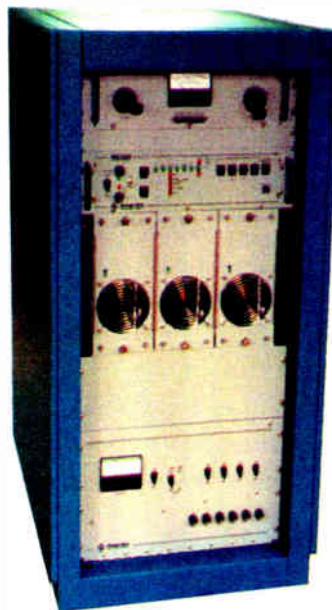
When we heard about the new Energy-Onix Pulsar AM models, we hoped we would be as satisfied with the AM line as we are with the FM ECO Series Transmitters.

WERT(AM) in Van Wert, Ohio, was one of the first to receive the new Pulsar AM 250. Chris Roberts, WERT owner-operator, ordered the Pulsar along with an ECO-4 FM transmitter.

Broadcast Technical Engineering has installed many ECO-4s and installation

has always been by the numbers.

Generally, AM is another story. Usually most AM sites are older than FM sites, with outdated tube-type transmitters running into aging AM arrays. Most engineers have experienced difficulties



Energy-Onix Pulsar 250

with a poor match between solid-state transmitters and the older arrays.

The WERT site was more than 48 years old, but in good condition. The old Gates had served them well, but was well past its prime with poor modulation capabilities compared to today's standards.

Weathered duty

The Pulsar installation was straightforward. In about four-and-a-half hours the transmitter was wired and ready to go. The manufacturer's start up procedure was a breeze and we were broadcasting immediately.

Audio quality was excellent and making station power was not a problem. Tuning and loading was simple and precise. Power was set easily for the levels required for WERT's application.

About a week and a half after installation, the owner called with bad news that the new Pulsar transmitter had been hit by lightning. The owner had purchased a spare PA module with the transmitter. After replacing the PA module himself, he brought the transmitter back on the air.

The WERT tower is a non-grounded tower. After further analysis, we determined the spark gap at the base of the tower was too large, causing the premature failure of the main PA module in the Pulsar transmitter. The spark gap has been corrected and there have been no additional problems with the Pulsar.

Our goal for our customers is to recommend a solid-sounding AM transmitter regardless of price. The Energy-Onix Pulsar is a reasonably priced, high-quality, great-sounding AM transmitter.

We will definitely continue to review all major transmitters in the future, but for now the Energy-Onix Pulsar is on the top of our list with this outstanding product.

Gregory J. Case is the owner of Broadcast Technical Engineering. BTE provides contract engineering services to stations in Indiana, Ohio and Michigan.

For more information contact Energy-Onix in New York at (518) 758-1690, fax (518) 758-1476 or visit the Web site at www.energy-onix.com

TECHNOLOGY UPDATE

Continental Electronics K5-A30

The K5-A30 AM transmitter by Continental Electronics features solid-state power circuits using HEXFET-type transistors and a PWM modulation system. All power modules and their parts are interchangeable and compatible for the transmitters in the series.

The output configuration has a nominal power of 28,000 watts, four power levels (minimum operation, 25, 50 or 100 percent) and an output impedance of 50 ohms. The transmitter features a frequency range of 530 kHz up to 1700 kHz, a frequency stability of (5 Hz or better and a frequency response of less than 1 dB at 30 Hz to 10 kHz. The K5-A30 also has a harmonic distortion of 1 percent THD at 90 percent modulation from 30 Hz to 10 kHz.

The unit currently is not for sale in the U.S. market.

For more information contact Continental Electronics in Texas at (800) 733-5011, fax (214) 381-3250 or visit the Web site at www.contelec.com

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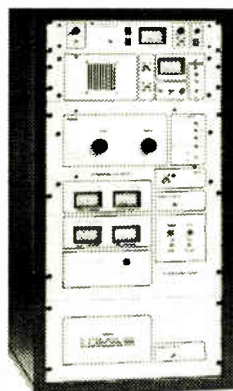
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TR6000 Helps Town Dig Out

► RADIO SYSTEMS, continued from page 64 which is an option not found on previous generations of TIS transmitters.

WPPD481(AM) 1680 in Pescadero went on the air the first week of January of 2000, just before winter storms hit — not a moment too soon, as it happens.

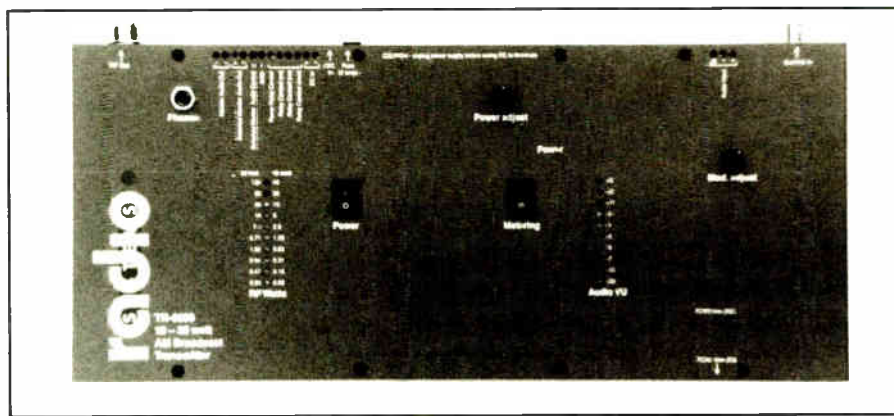
To date, Lawson said the Pescadero area has endured 31 days of flooding, with the main road and three alternate routes closed due to mudslides, creek erosion and downed trees.

In the beginning, Lawson was the only station operator. With many Spanish-speaking residents in the area, he enlisted a neighbor's help to translate. Eventually he found five other operators and several translators.

Those involved publicized the station by word of mouth, notices at the post office and their Internet Service Provider, Southcoast.net, at the high school.

Radio messages from the new station informed locals "which way to return home based on road conditions, if and when the emergency shelter would be open, school closings and National Weather Service information."

The system has a four-day battery backup, but because power outages often last longer, it will share a back-up generator with the sheriff's department. The system depends upon the operation of the reliable Radio



Radio Systems' TR6000 Transmitter

Systems TR6000 transmitter, which combines the high efficiency of a Class D power amplifier with 21st century audio processing.

Diversification, celebration

According to Lawson, most of the year the weather is great in Pescadero, so the station is used for other community information needs. It has become the "verbal bulletin board" for three diverse San Mateo County communities. School sports events, adult classes, organization meetings and bookmobile and health clinic visits to each town are announced. Church information and interviews about happenings affecting everyone are discussed.

Because FCC rules dictate no commercials, no business names or music are broadcast. Rather, points of interest for tourists are given.

Lawson said, "This radio system is invaluable to our community. We just love it."

■ ■ ■

Linda Folland is the marketing manager for Information Station Specialists.

ISS provides Highway Advisory (HAR) and Travelers Information (TIS) radio system products and services.

For more information contact Radio Systems in New Jersey at (856) 467-8000, fax (856) 467-3044 or visit the Web site at www.radiosystems.com

TECHNOLOGY UPDATE

Harris

Harris Corp.'s digital AM transmitter, the DX Destiny, features a 50 kW power level, Direct Digital Drive technology, Digital Serial Adaptive Modulation, Parallel/Serial Intelligent Control and hot-pluggability, hot-serviceability.

Harris said it improved signal



accuracy and energy efficiency of the DX Destiny through its Direct Digital Drive technology. Each power amplifier module is driven directly by a low-level digital signal, eliminating the intermediate power amplifier. This design conserves energy and allows for more control over, and reproduction of, the final transmitter signal.

Harris has also developed a series of technologies to make the DX Destiny auto-serviceable.

The Digital Serial Adaptive Modulation continuously monitors each serial modulation encoder and RF power amplifier module in the transmitter and makes automatic adjustments if a failure occurs. As many as eight modules can be lost, without affecting transmitter output power, signal accuracy or full modulation capability.

Parallel/Serial Intelligent Control provides another level of redundancy. A full logic-level parallel control system is overlaid with a micro-processor-based serial control system to provide metering and control of the DX Destiny via a VGA screen at the transmitter.

Additional options will allow transmitter control through a PC or network, or over the Internet. Either control system can independently run the transmitter if the other is out of service.

Finally, the Destiny takes the principle of hot-pluggability (online service) and extends it to most major components of the transmitter. In addition to hot-pluggable power amplifier and modulation encoder modules, the Destiny is available with optional redundant digital exciters, low-voltage power supplies and binary amplifiers.

The DX Destiny will let the station engineer know if a problem occurs and stay on the air at optimum functionality while the engineer decides how and when to service the problem. The unit will then operate continuously during actual maintenance.

The Harris DX Destiny is a winner of a 2000 Radio World Cool Stuff Award, presented at NAB2000.

For more information contact Harris Broadcast Communications in Illinois at (217) 221-7442 or visit the Web site at www.harris.com

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Nautel XL30 Is Reliable

► NAUTEL, continued from page 63 AM transmitter in Missouri that actually went underwater, twice. During the floods of 1993 and 1995, the transmitter was submerged about halfway under water.



Nautel's XL30 AM Transmitter

Each time, we rinsed off the cards and allowed them to dry, then plugged them in. The transmitter started right up. After that experience, I'm just pro-Nautel.

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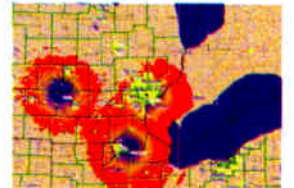
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EV 635L mics, \$95; Altec salt shaker mics, \$295/ea. W Gunn, 760-320-0728.

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is looking for a Full Time Chief Engineer. Candidate must have a minimum of 8 yrs broadcast experience or AA Degree. Must have good RF, audio, computer & telephone experience. SBE Certification a Plus. Novell experience a plus. Candidates should send resume with cover letter and salary history to: Personnel Directory #16-00, Entercom Rochester, 500 B Forman Bldg, Rochester NY 14604. Entercom Rochester Inc is an EOE, encouraging qualified minority & female applicants.

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Full of potential, trained rookie searching for a start. Eddie, 817-244-8115 or 817-313-2155. Audio clip at www.radioschool.com.

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◆ READER'S FORUM ◆

Montana market

Dear RW,

What a great article on Billings, Mont., (RW, March 1). That certainly is a market and community that few people give much thought or attention to. It makes me want to pull up stakes and move there!

William C. Walker
Proprietor
KWAQ(AM)
Lee's Summit, Mo.

Engineering the mouse

Dear RW,

I thoroughly enjoyed the article on Harry Simons and Radio Disney (RW, March 1). They are bringing some well-produced innovation to the AM band, and I hope that it succeeds.

Here in Southwest Florida, I can clearly hear WMYM(AM) 990 out of Miami, and catch myself listening to it frequently.

One thing bothers me though, especially considering Mr. Simons' background with the NRSC and AM stereo, and that is the absolute lack of AM stereo among the Disney AM stations! They have even turned the stereo off at stations that were in stereo.

I am the ops manager for two stereo AMs on Marco Island, Fla., and am impressed daily by the quality of the stereo.

My two BE transmitters came equipped with C-QUAM exciters, so it was a no-brainer. Anticipating the usual comments about coverage penalties, I have found none. The expanded-band WMIB at 1660 covers a large part of this corner of the state and keeps the stereo light lit in quite a bit of it!

I am a firm believer in doing the absolute most one can to keep AM alive. I am proud of the way my two stereo AMs sound, and can't imagine any AMs programming music not doing so in stereo.

I just wish the powers-that-be at Disney felt that way about their otherwise excellent AM stations.

Phil Beckman
Operations Manager
WMIB(AM)/WODX(AM)
Marco Island, Fla.

Tubeless talk

Dear RW,

I loved Jim Withers' article "A Screen Primer for the Tubeless" (RW, Oct. 27, 1999).

It took me right back to 1958, when as a then newly licensed WA2HVK, I found I could not afford a transformer to AM modu-

late my 6-meter home-built transmitter, so I did the "down-and-dirty" thing all kid-hams did: I went with screen-grid modulation — more precisely "controlled-carrier" screen-grid modulation using a type 6SL7 twin triode as a two-stage R/C preamp and a type 6SN7 as a control amp/cathode follower tied to the screen of my type 6BQ6 final amp thru an SPST "tube-up" switch.

The 6BQ6 was fed from a 6AB4 triode using 8.XXX Mc (not MHz back then) crystals and tripling to about 25 Mc and the final amp doubled to 50 Mc.

It worked — kind of — but let me get on the air as the last-ever member of the B-R-A-T-S — the Brooklyn Radio Amateur Teenage Society — which disappeared as each of us discovered that there was more to life than ham radio (girls).

Bill Pasternak, WA6ITF
Writer, Producer, Editor
Newline
Los Angeles

Sound Blaster sound off

Dear RW,

This is regard to the Dec. 8, 1999 article "Sound Blaster Eases Workstation Overload."

Many of the stations in our group are using low-end sound cards in PC DAWs with good success. We have found that even if the sound quality is not as perfect as our high-end work stations, they still have their place in the newsroom and studios, and are a far cry better than our noisy worn-out cart tape decks and tape stock.

Most small-market stations have been replacing their cart decks and analog tape with budget systems for less than the price for a new stereo cart deck, and getting better performance than any analog product.

I have created several "home-brew" audio delivery programs and many are available that utilize the full duplex (simultaneous) record and playback capabilities of a standard sound card.

We are using Cool Edit Pro in our newsroom to record our newscast, while simultaneously playing the actualities from a WAV player that resembles a stacked cart deck.

The WAV player utilizes the playback half of the sound card and Cool Edit runs from the record half during this process. The sound card usually has mixer settings that prevent the WAV output from going back into the record side of the card, thus allowing you to route it through a small mixer, via the line-in and -out jacks.

Mackie makes a small 14- or 16-channel mixer for less than \$500 that is small and easy to figure out. These mixers have audio

Emergency Alert Procedures: Inform Your Staff

Thank you for the great help. A few weak areas have been updated. If you can think of any other weaknesses, let me know.

"A WINTERWATCH book is now in place. The green notebook is located on the board. The book contains announcement times, procedures, passwords, cancellation sheets and other important information. The directions on updating the online winterwatch (Web) page are also in the notebook. Please review prior to your shift. Please call with any questions."

RW sends out a great big YEEHAW! to this operation. How many times has a weekend overnight part-timer been trapped, clueless, in the studio during a severe thunderstorm, or tornado, or winter storm warning, with the EAS alarm blaring, demanding immediate action on the part of the jock to relay this possible life-or-death information to listeners?

Not only should a procedure book be in place, but all studio personnel — even the guy or gal who works once every six months — should be required to know (and bark back at the PD when quizzed) EAS procedures.

Like the American Red Cross says, "Help Can't Wait" — and neither should you. If you are a radio station GM, PD or engineer, implement emergency operation measures immediately, and make sure all air staff are aware of proper procedures.

— RW

The following memo appeared in the mailboxes of all on-air staff at a central-Virginia, medium-market country radio station in January:

"WINTERWATCH UPDATE: We survived our first blast of winter.

specs better than some of the equipment in our air chain.

I have replaced tube-type reel-to-reels and 1960s-70s vintage tapecasters with what most other engineers would consider cheap junk (when it comes to sound cards) with sonic improvements that have made the staff think that they had died and gone to heaven.

With all the ad hype and poor hardware reviews, small-market managers have been convinced that it won't work and will sound terrible unless it is expensive.

Once the audio is squashed in the processor, the average listener won't know if it's a \$100 Sound Blaster Live! or a \$3,000 Whatever. After the audio makes it through "any" processor, there will be no measurable or listenable difference in distortion from the Sound Blaster Live! 0.03 percent THD and the Antex 0.003 percent THD.

Granted, I would never use a \$25 Chinese generic card in a broadcast application, and a few Sound Blasters that don't cut it, but I have used the AWE64 and SB16 with good success.

In a recent RW review of the SB Live card, the author mentioned that this card was better than other "humm-ridden" cards he had worked with. I have never had a problem with a sound card "generating" hum.

I've heard other power-supply related noises. There are many excellent IHF-to-balanced in/out converters out there (one is by Henry Engineering), even a S/PDIF to AES/EBU converter that works great with the SB Live!.

One thing that I've noticed about the SB Live!, is that because they use a 24-bit A/D converter and then interpolate 16 bits from

that, the SB Live! accepts a wide range of signal without generating a real noticeable crackling distortion. Instead, it is soft and subdued. I've paid over \$500 for worse.

Jason Walther
Chief Engineer
River Valley Radio Group LLC
Russellville, Ark.

In memory of Jesse

Dear RW,

Just wanted drop a note on the great tribute Paul McLane paid Jesse Maxenchs in his March 1 editorial column.

Jesse has touched many lives in his career both inside and outside the industry. Jesse was true a class act and a great man. He will always be remembered and has truly had an impact on my life. I'm thankful to have had the opportunity to know Jesse.

Scott A. Beeler
Director, North American Radio Sales
Harris Corp.
Mason, Ohio

Write to Us

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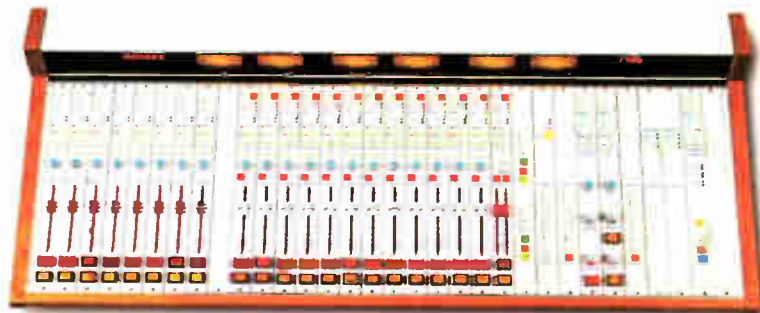


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