

*****3-DIGIT 857
 S101903 D08 0002
 BARRY MISHKIND 740
 2033 S AUGUSTA PL
 TUCSON AZ 85710 7905

A Peek at XM to Come
 The satellite radio company shows off its complex to D.C. officials and VIPs.

Pix and Protests
 Our pages are packed with photos from The NAB Radio Show.

Page 14

Inside



Radio World

The Newspaper for Radio Managers and Engineers

October 11, 2000

INSIDE

NEWS

▼ Harold Hallikainen on spectrum for sale or rent.



Page 6

▼ At risk: a dream of shortwave for the visually impaired.

Page 8

ENGINEERING

▼ The first Certified Broadcast Networking Technologists are on the loose.

Page 16

▼ Cris Alexander talks about shared sites. Roy Pressman tends Radio Unica and Marv Collins looks back on 46 years.

Inside

GM JOURNAL

▼ Time to plan those holiday promos.



Page 38

▼ Protect your business secrets from renegade employees.

Page 42

STUDIO SESSIONS

▼ Allen & Heath's MixWizard, Sony's big-dollar reverb, ARP's gerbil-powered AM and Ken's Private PAMS.



Inside

NewsBytes Now
Every Business Day
at www.rwonline.com

iBiquity Steps Forward

NRSC Also Ponders Arbitron People Meter, AM RBDS

by Leslie Stimson

SAN FRANCISCO This fall, the industry will get a look at the technical details of the combined in-band, on-channel digital audio broadcasting system of iBiquity Digital Corp.

In their first public presentation since the merger that formed the company, representatives addressed the DAB Subcommittee of the National Radio Systems Committee during The NAB Radio Show, and said they would submit technical details of their IBOC DAB system this month.

At show time, iBiquity officials said the work of combining the systems of USA Digital Radio and Lucent Digital Radio was about 90 percent done.

The committee's test procedures working group is redefining its

See DAB AT NAB SHOW, page 12 ▶

Dot-Coms Dominate NAB Radio Show

Internet Revolution Is Apparent in Convention Sessions and Booths

by Leslie Stimson

SAN FRANCISCO Digital radio may be coming, but the big story at The NAB

new companies were related in some way to Webcasting, e-commerce, online ventures, Web receivers, ad insertion or other e-spinoffs, and many familiar exhibitors showed products in these areas.

Numerous sessions on Internet strategies drew crowds.

DAB was certainly part of the show, as attendees got a peek at the new iBiquity Digital Corp. Meanwhile, low-power FM



Lowry Mays, right, tells Lou Dobbs he is optimistic for the economy

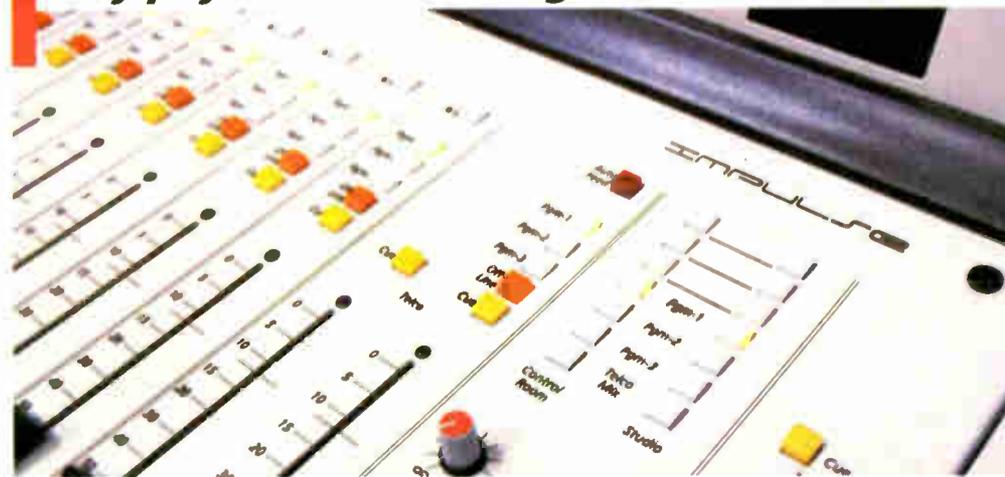
Radio Show was the Internet.

According to NAB, some 91 companies exhibited for the first time, among the 221 or so on hand. Virtually all of the

remained a hot topic. NAB officials downplayed new changes to LPFM rules put forth by the FCC.

See SHOW, page 12 ▶

Why pay extra for analog?



Transition to digital on your timetable with the new Harris Impulse Digital Console by Pacific Research & Engineering. It can accept either analog or digital inputs and reconfigure from analog to digital easily — right in your studio. You can get the benefits of a digital console for less than the cost of most analog consoles. To find out more, call us today. Or, feel free to act on Impulse.

next level solutions
HARRIS

1-800-622-0022 • www.harris.com

NEWSWATCH

Enterprise, Columbine Merge

Enterprise Software Inc. and Columbine JDS Systems Inc. have combined businesses in a stock-for-stock transaction.

The chief executive officer of the combined entity will be Barry Goldsmith, formerly CEO of Drake Automation. Paul Hillyard, formerly group finance director of DAL, will join as executive vice president. Mike Oldham, COO of CJDS and Rob McConnell, CEO of Enterprise will report to Goldsmith.

The combined company will have a worldwide total of approximately 1,000

employees. Existing customers include television, radio, cable and satellite broadcasters, advertising agencies and rep firms.

The combined entity's major shareholders will include Thomas H. Lee Partners, Blackstone Capital Partners III, Chancery Lane Capital, LiveWire Media and Evercore Capital Partners.

— B.M. Cox

Members Honored At SBE Show

WARRENDALE, Pa. Three SBE members were to be upgraded to

Fellow at the national SBE convention in Warrendale, Pa., near Pittsburgh on Oct. 3-4.

The recipients are Ed Miller, Fred Baumgartner and James Bernier Jr.

Ed Miller, CPBE, is the vice president of engineering for ProVideo Systems in Perrysburg, Ohio. He is the immediate past national president of SBE, serving for two terms from 1997 to 1999.

Fred Baumgartner, CPBE, is with the National Digital Television Center in Denver. He has been active in various local SBE chapters and twice served as a member of the SBE National Board of Directors and is Trustee of the Ennes Educational Foundation Trust.

James Bernier Jr., CSTE, is the director of operations and engineering for WGNT-TV in Atlanta. He chairs the SBE Electronic Communication Committee.

For more information, go to the Web site at www.sbe.org

— Paul Cogan

Reiser Retires From FCC

WASHINGTON FCC engineer John Reiser retired from the FCC effective Sept. 2.

Reiser had been with the commission 39 years, most recently with the International

See NEWSWATCH, page 5 ▶

Index

FEATURES

SBE Certification and Your Future by Terry Baun, CPBE	16
Not Pulling Your Leg by Steve Lampen	19
Shared Use of Transmitter Sites by W.C. Alexander	20
It's Been a Very Good 46 Years by Marvin Collins	22
Workbench: Tricks and Treats of the Trade by John Bisset	23
Who's Buying What	24
Protestors Disrupt Show	26
Pressman Presides at Radio Unica by Robert Rusk	27
TWOX12: Putting ISDN to Work by Michael Black	29
LPFM: Political Horsefeathers?	32
Thirty Years of Racing Radio by Paul Kaminski	34

GM JOURNAL

Las Vegas, Beyond Neon & Glitz by Steve Sullivan	36
When Gracie Ran for President by Peter King	38
Ring in the Money: 4Q Promotion by Mark Lapidus	38
Evaluate Your Business Secrets by David A. Milberg, Esq.	42
Ad Dollars Down for 25-54 by Laura Dely	44
Streaming: Options and Cautions by Ken R.	50
NAB Radio Show Photo Gallery	52

STUDIO SESSIONS

A&H Mixer: Lots of Stereo Ins by Alan R. Peterson	55
Saving Private PAMS Collection by Ken R.	55
Playing Rock and Making a Clock by Alan R. Peterson	56
NPR Goes Mobile at Conventions by Rich Rarey	60
Sony Puts Mix in an Actual Hall by Mike Cogan	61
Announcing Textbook for PC and Mac by Alan R. Peterson	65

OPINION

78

AUDITRONICS 4.0 NuStar

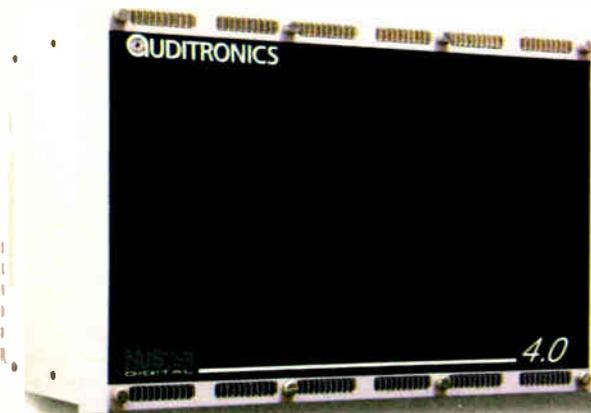
It's the NEW CONSOLE you've been asking for, with the trustworthy heritage you need—featuring a digitally controlled engine for your equipment room, so you can centralize all your electronics.



Modular serial control surface

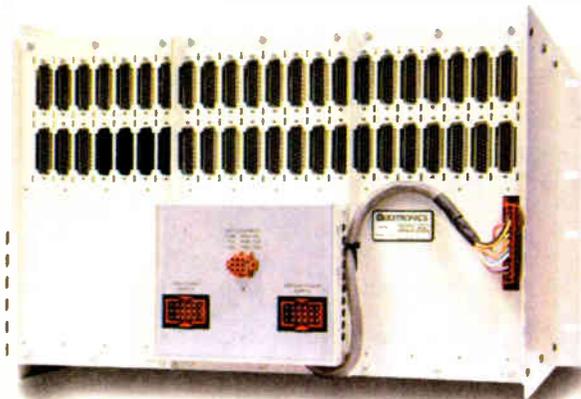
The Control Surface is JUST RIGHT!

Your operators won't need any training here: large brightly lit switches, 4 stereo program busses, and 4 internal mix-minus busses give it power. Each module has a rotary encoder with 8-character alpha display that can select any of the remote sources (up to 128) so you can get any job done.



All engine components are hot-swappable (maximum 128 stereo sources), letting you expand and service your NuStar without disrupting your entire system.

Centralized wiring has insulation displacement DB-25 connections so your installation and prewire go smoothly.



CONTACT US FOR MORE INFORMATION!

600 Industrial Drive, New Bern, NC. 28562
tel 252-638-7000/fax 252-637-1285/sales@wheatstone.com

AUDITRONICS



NAB Radio Show Photo Gallery

For more photos see pages 26 and 52



Peace, Love and Radio



iBiquity Digital Corp.
President/CEO Robert Struble



Retired Gen. Colin Powell gives
industry keynote speech



NAB's Dwight Ellis, right, works the career fair



The entrance to the Moscone Convention Center South

All the Punch without the Price

**Starting below
\$200 / MONTH!**

VAULTXPRESS™ knocks your competition out of the "radio ring" by empowering you to sound like the heavyweights without having to pay a heavyweight price!

VAULTXPRESS™ manages all your radio studio needs in a single nonproprietary PC-driven environment — combining production, automation, news, voice tracking, satellite feed interfaces, audio previewing, voice recording applications and Internet technologies. VAULTXPRESS™ is built around world renowned AudioVAULT™ technology, so your small radio operation will compete with the heavyweights without paying a big price!

**Limited
Time
Offer!**

**CALL 888-232-3268
TODAY FOR A LIVE
DEMONSTRATION!**

**VAULT
XPRESS** VAULTXPRESS™ offers:

- VERY User Friendly Interfaces
- Competitive Upgrade Packages
- True AudioVAULT™ Software Without the Price!
- Pick and Choose the Studio Software You Need
- Completely Open Source Design
- NO PROPRIETARY HARDWARE!
- Seamless Integration With Leading Music Systems
- Includes Software and Computers
- In Depth Training and 24/7 Support!

BE Leaders look to BE!

Producing Broadcast • Quality Service
800 232 3268 • 217 214 1400
www.be.com • www.audioVAULT.com

Postcard From San Francisco

Hi,

Scenery is here, wish you were beautiful. Hah!

No problems on the flight into Shakytown, although getting up at 4 a.m. to make my plane at BWI was a pain ... San Fran was *hot* for the first two days. Cabbies say it's the hottest for this time of September in 30 years ... I'm staying at the Canterbury Best Western, so I can walk downhill to the convention all the way, and take the shuttle back. In this town, that's a great setup ...

San Francisco. Sunrise on the hills; famous Sutro Tower looming; homeless people hitting me up on every block. Artists fleeing town in the face of the Internet money. Fabulous turn-of-the-century architecture.

★ ★ ★

I'm enclosing a copy of this issue of **Radio World** with more about the show. Just think *dot-com* and you can't go wrong.

DAB is in the news again, with this new iBiquity Digital. With only one IBOC player now, maybe the approval and rollout process will move along. Lots of people seem to feel an urgency about DAB, magnified by satellite radio — but other managers I talk to just don't see the need. They certainly don't hear a demand from consumers. We'll see. The answer probably lies in IBOC's long-term data potential.

Meantime, iBiquity is talking to focus groups about how the rollout would work and what it all would cost to implement. I figure we'll hear a lot more about this in the next few months. ...

Speaking of which, did you see the protests on the news? We had demonstrators out front of the show for several days, and marchers reportedly also did their thing at Clear Channel offices.

The tone for the week was set with the cover of the San Francisco Bay Guardian newspaper, which ran stories about "how the NAB and government engineer a corporate media wasteland," "the dark side of Disney: nasty, vicious hate radio" and "how merger mania silenced ethnic radio." ...

Friday was eventful. A protestor was yanked from the podium at an FCC breakfast. Then 50 marchers tied up traffic around the Moscone Center, taunting the police, while four staged a sit-down protest in the lobby.

The cops handled the sit-down very well — they let the kids sit for an hour or two, let them talk to the media, even brought them cups of water (a classic strategy for dealing with protestors — makes them want to go to the restroom).

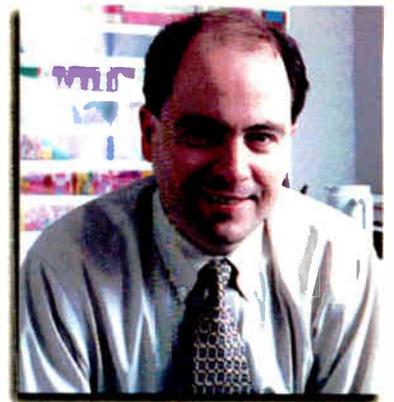
The four on the floor certainly got our attention, but wasted it — they only wanted to talk to reporters who agreed with their agenda. I made no such promises; I was here to cover them, not endorse or debate them. But when I finally got them to talk to me, it was clear they didn't know much about their issue.

One was ranting about how the FCC was in cahoots with the NAB on low power, and he seemed sincerely surprised to learn that the current chairman was the one pushing LPFM in the first place. ...

The cops eventually used power tools to cut the guys loose and then removed them bodily. The kids were cursing and yelling but were smart enough not to resist. According to one activist Web site, five other people were arrested in related protests in town.

There had been some stuff circulating on the Net before the show about how these guys were going to shut down the convention and throw a "Seattle-style" party. I know that some of the exhibitors and speakers had concerns for their safety. The authorities were ready and they handled it right: they let the protests go on outside, but they acted firmly when the

From the Editor



Paul J. McLane

activists crossed into the show space. The marchers, too, were smart enough to throw words rather than bricks and sticks.

My general impression: some of those protesting knew what they were about and had serious things to say about consolidation, radio programming and diversity. But their points were overwhelmed

CRIB SHEET: OUR ALTERNATIVE COLLEGE SURVIVAL GUIDE



A local paper was less than welcoming

with the theatrics of the "Seattle-style" crowd, many of whom had no clue, and were here just for the party.

I'm sending pix on page 26 ...

NAB would rather not have to deal with cops at their front door during the show. But I guess that's the cost of bringing a convention to a town where protesting is an art form.

See you when I get home!

Pablo



With protestors inside, police diverted attendees from the main entrance

A beautiful but expensive place to be.

Another NAB Radio Show. The Wednesday panel I moderated was a hit despite the early hour. I'll send details later. Our engineering friends had plenty to say about the job crisis and radio buildouts ...

Then I was off to speak on a panel hosted by Dalet about how the Internet is changing broadcasting. Cassandra Cummings of Microsoft was the other guest speaker. Another packed room. It looks like attendance has bounced back for this show; certainly there are more people about ...

The San Francisco Giants are ripping it up in the NL West. I had to turn down an invitation to see a game at the beautiful new Pacific Bell Park, because I was working late in the newsroom. Damn. The Giants clinched the pennant the next night, too ... and the A's are in the chase across town.

Ah, baseball in the fall ... if this were New York, though, these A's and Giants fans would be ripping each other apart in the streets. ...

★ ★ ★

if your transmitter
is here....



and you are here...

You're just a phone call away with
the ARC-16 Remote Control System

"Burk Technology's technical support is second to none. They are there when you need them with a fast response to questions. The Burk ARC-16 remote control is ideal for unattended operation. Their products are very user friendly for both the operator and engineer. I'd recommend them to anyone."

Mike O'Shea, WUSF
Tampa, FL

"Buy the company,
not just the box..."

BURK
TECHNOLOGY

Phone: 1-800-255-8090 Email: sales@burk.com
www.burk.com

Libin Kept RFI Down at Political Gatherings

by Randy Stine

LOS ANGELES What worked, what didn't and what would he do differently?

RW posed these questions to the frequency coordinator for this summer's political conventions.

Broadcast engineer Louis Libin oversaw the operation of 1,000 wireless mics, 100 wireless still cameras, about 50 wireless microwave video cameras and 10,000 walkie-talkie radios inside an area no bigger than a basketball arena during the Republican and Democratic conventions this summer (RW, Aug. 16)

Spectrum coordination for the world's two largest RF events ever meant eight months of planning and expecting the unexpected when it came to the ever-increasing use of wireless equipment.

King wireless

"The whole issue of frequency coordination is becoming more difficult when you realize you are working within a limited range of spectrum in a world where wireless has become king," said Libin, chairman of the Broadcast Operations Communications Authority, a private agency financed by news organizations.

He predicts frequency coordination for the 2004 conventions will be more difficult because of this factor.

Libin also had to account for the countless applications for wireless gear, such as headphones for the hearing-impaired and the wireless local area networks used by the media to transmit data. Throw in law enforcement and security frequency coordination, and the job becomes even more demanding.

While interference at both conventions was "kept to a minimum," Libin said there were occasions when broadcasters simply used the wrong channel.

"We also had some equipment brought

in by the media, which had not been checked off with us," he said. The team tagged wireless equipment pre-approved for use from the convention floor.

Libin's six-member team used spectrum analyzers, hand-held scanners and direction-finding receivers to help track down sources of interference from among nearly 15,000 media representatives in both Philadelphia and Los Angeles.

I'm afraid the job four years from now will be much tougher.

— Louis Libin

Intermodulation was another cause of interference, according to Libin. It occurs when different frequencies combine under certain circumstances and create a third signal that interferes with an adjacent channel. The phenomenon caused the wireless headphones for the Republican hearing-impaired in the First Union Center in Philadelphia to receive analysis from the Voice of America, instead of hearing the speeches from the floor.

"That's the type of unforeseen conflict that pops up quite often," Libin said. The problem was corrected easily by moving one of VOA's transmitters.

In Los Angeles at the Staples Center, Libin said electronic wireless ticketing at

the turnstiles posed an interference threat.

"Every turnstile machine has a little antenna and people just scan a card to get in. It wasn't used during the conventions, but the telemetry was left on and just added to the amount of RF in the building."

At both conventions, Libin said the use of wireless LANs became an issue.

LANs are Part 15 FCC rules devices in the 2.4 GHz band, meaning Libin's group had no coordination authority over the use of LANs. "The FCC allows Part 15 devices to share spectrum that literally overlaps with broadcaster spectrum."

The Associated Press and other organizations also used 2.4 GHz for wireless photo transmission. Use of 2.4 GHz also can affect 2.5 GHz and some of the wireless video gear, according to Libin. Most mobile LANs users respected his group's wishes and turned off the equipment during nightly primetime.

A typical day for Libin during the conventions meant arriving at the arena by 9 a.m. and meeting with BOCA team members and the FCC to organize and make a plan for that night's broadcast coverage. Members of BOCA stood guard at the entrances to prevent anyone bringing in untagged wireless equipment. Libin said the FCC was "extremely cooperative" throughout the conventions. The FCC had more than a dozen representatives at both conventions to help monitor the airwaves.

"Things really start to happen when the major networks begin broadcasting in

primetime, so we've had all day to monitor the convention floor and make sure it's clean of interference or any unfiltered equipment," Libin said.

Libin said he expects the challenges for the frequency coordinator in charge at the conventions in 2004 to increase significantly. "With wireless equipment becoming less expensive and broadcasters depending upon it more and more, I'm afraid the job four years from now will be much tougher."

Fewer channels

Libin said broadcasters must organize and work with equipment manufacturers to decide how best to tackle the question of an overcrowded spectrum, especially as wide-band wireless mics are using a lot of the frequencies.

"It's probably time to do what broadcasters are doing with microwave, and that is go digital," Libin said.

With more DTV stations coming on the air there will be fewer channels and fewer places to put the wide-band wireless mics, Libin said.

"If you're using 150 or 250 kHz, you need that much spacing on either side of it for protection. Digital wireless mics would be a good solution, because you can fit 10 digital wireless mics in the spectrum where now you have only one wide-band. I would think it would be very smart for any manufacturer to be the first in with digital wireless mics."

NEWSWATCH

► Continued from page 2

Bureau. He started his career at the FCC in 1961 at the Detroit field office.

Several engineers on the tech listserv at broadcast.net praised Reiser, describing him as an engineer of the "old school" who will be sorely missed.

Senate Bill on LPFM Disputed

WASHINGTON Calling it "a reasonable compromise," NAB President/CEO Eddie Fritts welcomed an LPFM bill introduced by Sen. Rod Grams, R-Minn. But supporters disputed that assessment.

S-3020 is companion legislation to a House-passed bill that would allow frequency allocations for LPFMs, but would retain current channel protections, including those for third-adjacent channels. The FCC intends to drop such protection in order to fit more LPFMs on the FM band.

National Public Radio President/CEO Kevin Klose and International Association of Audio Information Services President Ben Martin also support the legislation and urged the U.S. Senate to act on it.

Meanwhile, LPFM supporters say "in no way" is Grams' bill a compromise on the issue, according to a letter to senators signed by representatives of the U.S. Catholic Conference on Civil Rights, the Leadership Conference, Consumers Union and the Low Power Radio Coalition.

They support S-2989, introduced earlier this year by Sens. John McCain, R-Ariz. and Bob Kerrey, D-Neb., which mimics the FCC plan to drop third-adjacent channel protection.

WorldSpace Begins Service to Asia

WASHINGTON WorldSpace has launched satellite-delivered digital radio service to Asia with its AsiaStar satellite. AsiaStar is the second of three satellites to be employed by WorldSpace. It will soon supply more than 40 programming channels, which can be received on certain receivers produced by Hitachi, JVC, Panasonic and Sanyo.

The first, AfriStar, began commercial service to that continent last October. The satellite serving Latin America is set to launch in 2001.

Quality

Value, Simplicity, Dependability

When I was a little girl,  my mother used

to send me to the store to shop - not (God forbid) to spend too much

 money but still to get the best.  Today, it's

the same with my  son's Radio Systems company. He

makes the best -  not the most

expensive. It's a family tradition!



radio SYSTEMS

601 Heron Drive
Bridgeport, New Jersey 08014
(856) 467-8000 phone
(856) 467-3044 fax
www.radiosystems.com

GUEST COMMENTARY

Spectrum for Sale or Rent

by Harold Hallikainen

I've been studying spectrum allocation policy for the past several years. The challenge is to develop a method of allocating spectrum in an equitable and efficient manner.

Economists agree that the use of market forces results in the efficient allocation of scarce commodities. Leo Herzel first advocated using auctions for the allocation of spectrum in his 1951 article regarding the FCC's attempts at choosing a standard for color television (see the list of resources at the end of this article). Nobel Laureate R. H. Coase further

refined these ideas in 1959.

After about 50 years of discussion, Congress directed the FCC to use auctions to allocate spectrum when mutually exclusive applications are received, with certain exceptions.

Market forces

Even prior to the recent introduction of auctions, spectrum was largely allocated by market forces in the *secondary market*. Once an initial licensee had received the allocation, that licensee generally sold the license to the highest bidder.

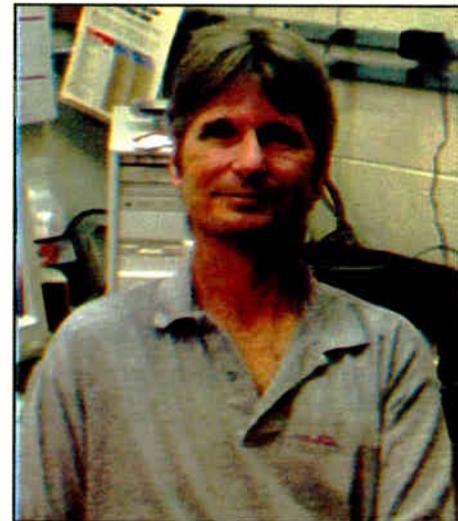
We use market economics to allocate almost all other resources. It should come

as no surprise that its use could be used with the electromagnetic spectrum.

How should an initial licensee get a spectrum allocation, which can then be resold in the secondary market? The commission has used priority-in-use, comparative hearings, lotteries, and, now, auctions.

Earlier methods, especially lotteries, could easily result in "unjust enrichment" of a license winner. We saw this especially in the FCC's attempt at using lotteries to allocate cellular telephone licenses. Thousands of people who had no intention of building a cellular telephone system filed applications in the hopes that they'd win the lottery and make a fortune selling the spectrum to someone who actually wanted it.

If we assume the spectrum is a public resource, as Congress does, it makes sense for users of that resource to pay the owners for that use. In authorizing auc-



Harold Hallikainen

warm. It's a bad idea.

Should government and noncommercial users pay for spectrum use? Should leases be adopted, what would be an appropriate term? What about the public-interest obligation? Should the government maintain reserve prices for spectrum? Should spectrum be zoned, placing

True Digital Performance



Analog Price

Logitek ROC-10 and ROC-5 Consoles Give You All The Flexibility You Need

- ◆ True DSP-based digital mixing and routing
- ◆ Combine analog and digital signals as needed
- ◆ Fully assignable faders allow you to control multiple sources, save valuable space
- ◆ Attractive low-profile design maximizes studio visibility

ROC consoles are ideal for applications where studio space is limited. You get the full functionality of a digital console with a friendly, easy to use control surface. "Mix and match" control surfaces as needed; all mixing and audio routing is done at the powerful Serial Sound Audio Engine.



Call today for more information

5622 Edgemoor
Houston, TX 77081
800.231.5870 (North America)
tel: 713.664.4470
fax: 713.664.4479

Logitek

Digital With a Better Difference

Visit us at www.logitekaudio.com

Congress appears to consider revenue from spectrum auctions as income that can be used against expenses.

tions, Congress recognized these objectives of avoiding unjust enrichment and "recovery for the public of a portion of the public spectrum resource made available for commercial use."

Sale or lease

Congress spelled out that a station licensee has no right to a frequency beyond the term of the license. This appears clear enough: A fixed-term license is auctioned off, and the user has the right to use the auctioned frequencies for the term of the license.

However, Congress also specified that licensees have a "renewal expectancy." So, licensees have no right to the use of the frequencies beyond the term of the license, but the license is generally renewed at no additional cost. Thus, it is not clear whether a licensee has won a "fixed-term lease" or a "fee-simple sale" of the spectrum.

Some economists (such as Thomas Hazlett) prefer a simple sale of the spectrum. I prefer a fixed-term lease with another auction for the next term. I see public benefit in the public receiving continuing compensation for the continuing use of the spectrum.

Since lease payments would be spread over time, they would reflect more accurately the market value of the spectrum than should a bunch of spectrum be dumped on the market at any particular time.

Further, Congress appears to consider revenue from spectrum auctions as income that can be used against expenses. I consider a spectrum sale to be more of an "asset trade" (debit cash, credit spectrum) with no effect on income. The sale of assets to fund ongoing operations is a bit like burning your house to stay

similar uses on adjacent frequencies? What sort of transition to spectrum leases is anticipated?

How *should* spectrum be allocated in an efficient and equitable manner? *RW* invites readers to check out the resources listed here and continue the discussion by e-mailing us at radioworld@imaspub.com

The author spoke on this issue at NAB2000. In July, the "International Journal of Communications Law and Policy" published his paper on the subject.

Hallikainen is chief engineer for Dove Systems in San Luis Obispo, Calif.

Additional Resources

Harold Hallikainen, *Spectrum For Sale or Rent*, www.ijclp.org (2000)

Leo Herzel, "Public Interest" and the Market in Color Television Regulation, 18 *Uni. Chi. L. Rev.* 802 (1951).

Thomas W. Hazlett, *Assigning Property Rights to Radio Spectrum Users; Why Did the FCC License Auctions Take 67 Years*, 41 *J. Law & Econ.* 529 (1998).

R. H. Coase, *The Federal Communications Commission*, 2 *J. Law & Econ.* 1 (1959).

Dallas W. Smythe, *Facing Facts About The Broadcast Business*, 20 *U. Chi. L. Rev.* 96 (1952).

Survey of Broadcaster's Annual Public Service Efforts, www.broadcastpublicservice.org

GUEST COMMENTARY

AM's Problem Is Not Receivers

by Jon GrosJean

The following is a response to a Guest Commentary by broadcast technician Scott Todd, which appeared Aug. 2.

When are AM broadcasters going to stop living in a dream world of thinking that there is a way to make practical AM receivers with audio response which will compete with FM receivers?

I have written papers and participated in seminars for broadcasters explaining why AM receivers have limited audio frequency response, and they still try to blame the manufacturers for some kind of conspiracy to make bad receivers. They still think a mandate by the government (FCC) will fix things for them.

Good AM stereo

It is possible to make a good AM stereo receiver. Motorola makes a beautiful AM tuner chip set, the MC13027. MC13122 with a noise blanker and AM stereo decoder with a variable 10-kHz notch filter, but you need to be in a strong signal area to use it in the wide-band mode.

The problem with the AM band is that the occupied bandwidth is wider than the channel separation.

By strong signal, I mean 5 mV/m or greater and adjacent channel levels at least 40 dB below the desired signal. This almost never occurs with a car radio, so the car radio must have narrow bandwidth to be usable.

The problem with the AM band is that the occupied bandwidth is wider than the channel separation. This is a stupid way to allocate spectrum. No other communication channel is allocated this way. It would be like having a channel separation of 133 KHz in the FM band.

In the current AM band, the occupied bandwidth of a station is 1.5 times the separation. In the FM band, it is approximately 1.28 times the separation. FM car radios typically have a bandwidth of 0.9 times the separation or 180 kHz and do not have as good distortion or channel separation as good home receivers. They also blend a lot to reduce noise and some are mostly in mono mode if the car is moving.

Communications radios typically have a bandwidth of 0.64 times the channel separation to allow for a guard band between channels.

The AM band could be made much better for the listeners if the audio modulation were limited to 4 kHz. The radios would sound the same, but there would be a lot less interference and coverage would be better. Forget about competing with FM music, because it can't be done.

The only way to make it even close is to change the AM band to an all-digital system, and I don't mean some kind of compatible analog/digital system.

When compared to an all-digital system, any compatible system is going to limit coverage. It's simple physics: Coverage depends on the amount of power at the receiver and the required minimum signal/noise ratio.

Digital systems require much less S/N for acceptable reception than AM, but if part of the power is digital and part analog, the digital receiver gets only part of the total power. It can be

set up so the analog and digital coverage are about the same, but the digital coverage would be much greater if it got all of the power.

The author has worked for 22 years as an independent consultant designing audio and radio products, including car radios, AM and FM broadcast receivers, SCA receivers and broadcast monitor receivers. He wrote the application note for the Motorola MC13027/MC13122 AMAX stereo chipset. Reach him via e-mail to jgrosjean@ieee.org

RW welcomes other points of view at radioworld@imaspub.com



Jon GrosJean

Tough Remotes?

Matrix Can Handle them.

- POTS
- PCS/GSM Wireless
- ISDN



No matter where your remotes take you, with a Matrix codec, you've got options.

Call today for details
(800) 237-1776

Comrex Corporation, 65 Nonset Path, Acton, MA 01720
Tel: (978) 263-1800 Fax: (978) 635-0401 Fax-on-demand: (978) 264-9973
Email: info@comrex.com www.comrex.com

COMREX

GUEST COMMENTARY

Shortwave for the Blind in Peril

by Mike Dorrrough

OREGON, Wis. Recently in Las Vegas, I received the coveted NAB Radio Engineering Achievement Award. The joy and honor of recognition was overwhelming, yet as I stood on the stage holding the plaque, in the back of my consciousness was a dull ache impervious to the smiling faces of supportive family and friends.



Consoles with large knobs that have distinctive positioning tabs for visually impaired users

Part of me was still back in the Midwest, with banks of broadcast transmitters sitting cold and dark.

My dream to give something back to the world in return for modest success had been shattered by misguided land developers eating away at Wisconsin's natural beauty.

Shortwave for the blind

The dream was to fulfill a lifelong ambition to be an independent shortwave broadcaster offering programming by and for visually impaired and blind people in North America. Through most of my adult life I have been blessed to have a good rapport with a number of special-needs communities.

As a kid with a rheumatic heart I was also "different." Kids "like us" couldn't be on the football team so our attention focused on creative, artistic pursuits such as music and electronics. In my early days as a recording engineer, I had the privilege of working with many blind and visually impaired artists.

I wondered why radio, a medium ideally suited to the needs of sightless people, wasn't offering more targeted programming. The visually impaired and blind communities are "equal opportunity" minority groups any one of us might someday join through accident, aging or disease such as diabetes.

Installation adventures

Through my adventures installing multi-band audio processors at radio stations across North America, I began to accumulate transmitters, consoles and transcriptions from radio's several "Golden Eras."

Dramas, comedies and musical presentations created before television completely changed the mission of radio and provided the listener with a multidimensional mind's-eye view of the world.

With no visuals available, stage direction and the actions of the characters had to be spoken or conveyed with sound effects. Maybe the broadcast equipment I had been saving from the crusher for historical reasons might be teamed up with the million or so recordings to create a new kind of broadcasting.

Establish service

Tapping the vast talent and energy of the visually impaired and blind communities, we could establish a shortwave radio service operating from the middle of the country to cover all of North America. Three shortwave bands could be utilized to follow the propagation cycle for maximum coverage across the land.

Allocations near the WWV frequency beacons would make finding the stations easy for sightless listeners using even simple analog radios.

Thanks to the business management skills of my wife and partner Kay, we were able to buy the required property in 1995. We had a warranty title in-hand for a slice of Wisconsin farmland and absolute assurances that we would be

surrounded by nothing more than greenery and sweet solitude.

Plans were drawn for a spacious complex complete with a residence, studios and a large outbuilding in which to set up a broadcast museum/archive. The real beauty of the design conceived by Kay and my daughter Susie, was that the facility would appear to be nothing more than a tasteful home and garage/outbuilding.

Mysterious delays

The project was finally complete in 1997. All seemed well with the exception of some mysterious construction delays. Then the modest Rohn 45 towers went up.

Immediately disaster ensued. The seller and the title insurer somehow unilaterally altered my property title. A key land transfer document carried a fuzzy signature next to my wife's social security number that fooled the registrar of deeds!



The house that's now under the antenna system

As a result, a strip of land was unjustly transferred back to the seller for the purpose of connecting a substandard adjacent lot less than one-quarter of the minimum (acreage) required for development to a larger parcel behind my property.

This formed an "umbilical cord" transforming an otherwise useless, undersized remnant into a buildable lot. Within 60 days a rental home was sitting almost directly under the antenna system, rendering the entire investment of years,

money and effort virtually futile.

This appropriation of land happened as the entire Wisconsin legal system totally disregarded my written protests and pleas for help. Officials even ignored the opinions of the leading experts in the field of real estate law.

It seems that some huge title insurance companies and developers are possibly working to subvert environmental concerns and zoning to turn Wisconsin's



Tower bases and underground feed lines toward the rear of the main building

bountiful lands into an endless sea of tract homes. These profit-driven forces are so powerful that local attorneys seem hesitant to take them on.

I can't begin to describe the toll this

ordeal has taken on my family. As much as we have suffered, the most tragic aspect of this travesty is the existence of a radio resource that may never be enjoyed by those who lack sight but share a vision for better radio.

Over the years I have learned the importance of expert feedback in the process of inventing and produc-

ing successful products. I can't help but wonder if any member of the vast **Radio World** readership has ever been in a similar spot and might have some wisdom to share.

All too often these days "being right" is not sufficient to prevail.

I need your help.

Dorrrough is co-founder and president of Dorrrough Electronics. Reach him at (818) 998-2824 or via fax at (818) 998-1507.

PORTABLE ONE

DUAL DOMAIN

SAMPLE RATE

JITTER STATUS BITS

DELAY

True Dual Domain Audio Testing at an Attractive Price Point

- Comprehensive analog audio analyzer
- True digital domain analyzer with -140 dB residual noise
- Independent analog & digital audio generators and analyzers
- Generate and measure interface jitter
- Digital interface analyzer
- View AES/EBU status bits
- Loudspeaker monitor for digital & analog signals
- Internal save and recall of 30 test setups



Audio Precision
 Audio Precision
 PO Box 2209
 Beaverton, Oregon 97075-2209
 Tel: (503) 627-0832; Fax: (503) 641-8906; US Toll Free: 1-800-231-7350
 Email: techsupport@audioprecision.com; Web: www.audioprecision.com

**MILLION DOLLAR
SOUND FOR
UNDER \$4,000***

Introducing Omnia-3, the all-digital audio processor that offers all the clarity, punch and raw power of the original Omnia. At an amazingly affordable price.

Omnia-3 includes standard features not found anywhere else—like 48kHz sampling, three-band processing, digital audio inputs and outputs, integrated composite clipper, and a removable PC card that simplifies software changes.

Impressive features aside, it's the sound that will blow you away. No other audio processor sounds as good as Omnia. That's why leading broadcasters the world over choose Omnia to boost ratings and crush the competition.

For this much power—on the dial and in the marketplace—you'd expect to pay twice the price. But now, you don't have to.

For the name of your Omnia dealer, contact us at +1 216.241.3343 or visit www.omniaaudio.com.

With Omnia, you lead. And others follow.

Omnia
A THORN COMPANY

CUTTING EDGE

101 SUPERIOR AVENUE CLEVELAND, OH 44114
TEL: +1 216.241.3343 FAX: +1 216.241.4103
E-mail: info@omniaaudio.com

CUTTING EDGE EUROPE
JOHANNISSTRAÙE 6 D-85354 FREISING GERMANY
TEL: +49 81 61 42 467 FAX: +49 81 61 42 402
E-mail: info@omniaaudio.com

*\$3,580 (US) MSRP for Omnia-3. Prices may be slightly higher outside the U.S. due to taxes, freight and insurance.

Low-Power Stations Gain in U.K.

by Lawrence Hallett

LONDON The United States isn't the only country implementing low-power FM radio services.

For stations considered low-power broadcasters in the United Kingdom, the wait for spectrum has been worth it.

With the recent publication of the results of a government-sponsored research inquiry into FM spectrum availability, it appears that spectrum space is available for a variety of new services.

Conducted by Aegis Systems on behalf of the Radiocommunications Agency, (a governmental technical enforcement agency), the study received input from the BBC, the Radio Authority, (the U.K. equivalent of the FCC), the Commercial Radio Companies Association (similar to the NAB) and the Community Media Association.

However, the report was emphatically not a blueprint for specific future frequency allocations.

Micro-level services

Rather, in the words of Radiocommunications Agency Chief Executive David Hendon, the document should "identify the scope to meet the further expansion of analog radio, including the demand from specialists and experimental broadcasters."

Using London and Leeds/Bradford as

study areas, the aim was to examine spectrum use with the hope of finding space for new services, ranging from citywide to localized 2- to 3-mile radius operations, with a roughly 4- to 6-mile medium-sized option in between.

It would be possible to find frequencies for a number of new limited-coverage services without adversely affecting existing services.

At the low-power level of 50 W to 100 W stations broadcasting a roughly 2- to 3-mile radius, those compiling the report reached conclusions that will delight those calling for so-called "third-tier" small-scale services.

The Radiocommunications Agency said based on the case studies, it would be possible to find frequencies for a number of new limited-coverage services without adversely affecting existing services.

In London, according to the agency,

at least six new localized services with an aggregate coverage of 500,000 people could be accommodated.

The reason only six new services in London were highlighted was that six was the arbitrary number chosen to

search for within the time and resources allocated for the study. No ceiling was placed on the maximum available allocations.

Because such low-power stations, on average, would not be commercially viable, the report suggested providing licenses to civic organizations, churches, schools, ethnic and linguistic groups, charitable organizations and similar groups.

Uses might include public safety and local information, including news, traffic and weather forecasting.

The agency found these new allocations by using an overlooked frequency resource that is unsuitable for existing larger-scale services.

The idea is to place new allocations in the "shadow" of distant high-power allocations, most notably in the national network bands used to provide coverage for national channels.

The principle, long promoted by community and other small-scale radio campaigners, is that low-power services might receive some interference from their distant high-power neighbors but there would be no interference for the bigger broadcaster.

The report failed to identify easily available spectrum for larger-scale services. In fact, for all but the roughly 2- to 3-mile allocations, some degree of frequency reallocation and/or service area alteration would be required.

Pain for gain

In populous London and Leeds, said the agency, allowing new higher-power services would involve requiring a number of existing stations to change their transmission frequencies and some existing services would suffer a loss in population coverage.

A question for politicians and regulators is whether existing operators would tolerate the necessary level of "pain" to allow for the corresponding "gain" of such new services.

Campaign groups and regulators welcomed the report.

The CMA, a long-standing advocate of small-scale community-based broadcasting, said the report provided a "strong technical foundation" for a new tier of radio services serving neighborhoods and communities on a non-profit basis.

According to Steve Buckley, director

of the CMA, hundreds of community radio stations using short-term restricted-service licenses have demonstrated the value of community broadcasting. He said many restricted service licensees, who are normally limited to 28-day operation, would like to broadcast year-round.

"The report," said Buckley, "clearly demonstrates there are frequencies available for them to do so."

Buckley called upon the Radio Authority to use its existing powers to license a number of long-term community radio services to test the viability and benefits of such services in advance of new communications legislation.

Radio Authority Chief Executive Tony Stoller believes the report gives some valuable pointers to the way that the analog radio landscape could be developed further.

Cornerstone of listening

"While we hope digital radio will ultimately develop to be the cornerstone of radio listening, the analog industry is growing and will remain the main source of listening for a good many years to come," Stoller said.

Sources said that while such comments may not sit well with advocates of a swift move to digital radio, they do represent a pragmatic regulatory view based on how slowly the transfer to digital is progressing, as well as indicate a willingness to encourage new analog developments.

One sticking point to introducing low-power services quickly could be access to frequencies currently used exclusively by BBC services.

The U.K. government will examine the report further under the auspices of the recently established radio policy group, led by the Department of Culture, Media and Sport. The group — whose members include the BBC, CMA and CRCA — is examining future options for radio regulation reform.

In the meantime, if, as the CMA suggests, the Radio Authority has the power to license long-term low-power services under existing legislation, listeners here may have a new local radio option in the near future.

NSN Keeps Your Network UP!

Building the world's most advanced satellite delivery platform available to the radio industry.

Call us to find out why both the small regional and the nation's largest networks utilize NSN.

800-345-VSAT(8728)
303.925.1708
email: sales@nsn.net
www.nsn.net

NSN

A Clear Channel Communications Company

SBE NEWS

Seattle SBE Expo In October

The Seattle Chapter 16 the Society of Broadcast Engineers is holding its annual Electronic Equipment Expo & Conference Oct. 11 and 12 at the Meydenbauer Center in Bellevue, Wash.

The sessions are free to radio, television, production, post-production and audio/video professionals.

Attendees will see more than 200 booths with digital audio and video equipment including cameras, microphones, editing systems, mixing boards, routers, HDTV, distance-learning equipment, audio/video servers and store-and-play systems.

To register, go to the Web site at www.emexpo.org or call (425) 271-6855.

BEFORE YOU BUY A CD RECORDER



CHECK ITS PROFESSIONAL CREDENTIALS

CDR-W33
CDR-W66



DSP

SBM, EQ and Limiter

PC keyboard input
for text entry



Even among professional CD recorders, the Sony CDR-W33 and CDR-W66 stand apart. Three DSP functions fine-tune your sources.* There's a limiter with adjustable ratio. A 3-band EQ. And Super Bit Mapping® circuitry that captures near 20-bit quality on industry-standard 16-bit compact discs. Conveniences include wired or wireless remote operation and even a PC keyboard input for CD TEXT™ entry. Sony's 24-bit A/D and D/A converters help maintain resolution.

The CDR-W33 uses standard unbalanced analog audio, SPDIF and optical digital I/O.

The CDR-W66 (not shown) adds balanced XLR analog and AES/EBU digital I/O plus 2X speed duplication with a second CDR-W66.

The Sony CDR-W33 and CDR-W66 deliver the design and operational capabilities that professional applications require. And you get every last bit of performance without spending your every last dime. To find out more, call 1-800-472-SONY, ext. CDR.

* Analog sources only on CDR-W33.

SONY

1-800-472-SONY ext. CDR
www.sony.com/proaudio

©2000 Sony Electronics Inc. All rights reserved. Reproduction in whole or in part without written permission is prohibited. Features and specifications are subject to change without notice. Sony, Super Bit Mapping and CD TEXT are trademarks of Sony.

DAB at NAB Show

► Continued from page 1

procedures for lab, field and subjective tests. DAB Subcommittee Chairman Milford Smith said credibility is an issue at this point in the development, and that an independent evaluation of the IBOC system is needed.

"We can't take this on faith. We've got

to assure ourselves that this system works," he said.

As part of its standards-setting process, the NRSC issued a request for proposals on IBOC earlier this year. RFPs were due Sept. 29. No new systems had been submitted by late September, making it likely that

plaints once the LPFMs are operating.

"It's clear the FCC is trying to pick off LPFM opponents one by one, but they still haven't addressed the interference concerns of millions of radio listeners, and this order does not change NAB's position," said NAB spokesman Jeff Bobeck.

Foot traffic

In a nod to keynote sponsor iBiquity Digital Corp., Fritts said NAB was "encouraged" by the merger of the former Lucent Digital Radio and USA Digital Radio. He also referred to the pending launch of satellite digital radio, saying it does not sound the death knell for radio.

The keynote speaker, retired Gen. Colin Powell, urged the crowd to join his efforts to support young people.

"You have tremendous power to help in this effort through your ability to communicate to the American people," he said. Powell, who grew up in the Bronx, said his family's network of aunts, which he dubbed "Aunt Net," kept him out of trouble.

He asked the crowd to raise the level of content on the radio today, not through censorship, but by being "careful."

Numerous sessions and exhibit demonstrations were devoted to the Internet.

A study conducted by Arbitron and Edison Media Research charted the increasingly close relationship between radio and the Internet. Also announced during the show was the formation of Local Media Internet Venture, a network of five radio groups aimed at making station Web sites compelling.

Exhibitors who spoke to *RW* generally gave good marks to the show, saying traffic was improved over last year's convention.

Some wondered aloud at the influx of dot-com companies and what it would mean for future shows, given the high turnover among new media businesses.

Several exhibitors spoke of difficulties with union labor during move-in and move-out.

Dave Burns, chairman of the Exhibitor Advisory Committee, said exhibitors had mixed feelings about the show; some were more pleased than others. He said NAB officials should work harder to coordinate engineering staff meetings to be held during the convention, to attract more equipment buyers.

Session moderators reported good crowds for many panels, including 70 to 80 attendees for several engineering panels.

The Oct. 25 issue of *RW* will include a product wrap-up from the show floor.

Paul McLane and Laura Dely contributed to this story.

Show

► Continued from page 1

Demonstrations by LPFM supporters provided a theatrical backdrop (see page 26).

NAB projected an attendance of 7,200 at the show in San Francisco in late September. That compares to 5,600 for the 1999 show in Orlando, Fla., and 6,800 in Seattle the year before.

Lowry Mays, chairman and CEO of Clear Channel Communications, spoke during the convention with optimism about the outlook for radio and the U.S. economy. He said the size of his consolidated company possibly qualifies it as an economic indicator. Following that analogy, he said the economy is "doing fine," based on his business.

He also said he expects to see more radio ads from "normal retailers who will create online retailing opportunities."

Mays objected to those who complain that consolidation leads to a lack of diversity.

"We have created much more diversity since we have consolidated our markets," he said. "And that diversity is not only better for the consumer, it is also better for our advertisers."

NAB President/CEO Eddie Fritts urged broadcasters to support Senate compromise legislation on low-power FM. The Senate bill is companion legislation to a House compromise sponsored by Reps. Mike Oxley, R-Ohio, and John Dingell, D-Mich., that would allow LPFMs but retain all channel protections, including third-adjacent channel rules.

The LPFM rules crafted by the FCC dropped third-adjacent channel protection in order to fit more LPFMs on the FM band.

Interference

"I can understand and appreciate the motivation behind LPFM. But I honestly cannot understand introducing more interference on the FM dial," Fritts said.

"Every engineer, including the FCC's own engineers, acknowledged this proposal will create additional interference for listeners. This is validated by the fact that groups like National Public Radio, Radio Reading Service for the Blind, the National Religious Broadcasters Association and the radio manufacturers themselves all oppose the FCC proposal."

He urged broadcasters to contact members of Congress before lawmakers adjourned in October to campaign.

By the end of the show, the FCC had released changes to its LPFM rules that give greater protections to FMs providing radio reading services and spelling out procedures to handle interference com-

iBiquity's will be the only IBOC system to be considered by the standards body and regulators.

Although iBiquity had hoped the FCC would set an IBOC standard by the end of this year, NRSC Chairman Charles Morgan said he wasn't confident of that timing.

He urged broadcasters to support IBOC development. "If IBOC doesn't work, we'll get satellite radio. ... We need IBOC," he told an engineering panel.

At the end of the show, iBiquity President/CEO Robert Struble said he would like to see a standard in the first half of next year.

Both Morgan and Smith said the FCC wants the industry to present it with an IBOC standard, which the commission would then review.

Struble told *RW* he wants to have IBOC-compatible transmission equipment on display by NAB 2001. He predicted "hundreds" of stations in large markets will be operating IBOC systems in that time frame.

He described iBiquity's efforts at the show as ambitious, with two data demonstrations. One used a live IBOC signal; the other used Broadcast Electronics' demo signal in the exhibit hall. Two San Francisco FM stations, KDFC and KLLC, broadcast their signals using the iBiquity IBOC system.

Struble said elements of USA Digital Radio's blend-to-analog "fallback," which disguises digital drop-off at the edge of a coverage area and provides instant tuning, would be retained. Lucent Digital Radio's multistreaming codec technology also will be kept.

PPMs and AM data

Apart from DAB, the NRSC committee members discussed other technologies.

Arbitron asked the committee to oversee an impartial evaluation of its Portable People Meter technology, now being tested in the Philadelphia and the Wilmington, Del., markets.

In England, the PPM has been tested for long-wave, medium-wave, FM and TV spectrum.

The system would use an encoder to insert station identification data into

iBiquity Signs Data Content Testing Partners

SAN FRANCISCO iBiquity Digital Corp. is teaming up with Associated Press and Accuweather to test wireless data content for its in-band, on-channel digital audio broadcasting system. iBiquity, the newly merged USA Digital Radio and Lucent Digital Radio, has also added a receiver manufacturer to its stable of technology partners.

iBiquity Digital's IBOC technology will enable stations to send a digital signal capable of delivering wireless data to receivers for a variety of consumer applications.

After the wireless data content is incorporated into receivers, it will also be included in non-traditional radio receivers such as personal digital assistants and smart phones all transmitted by broadcasters on an IBOC signal.

iBiquity highlighted AP and Accuweather's content as part of IBOC data technology demonstrations at the NAB Radio Show.

iBiquity has signed a technology and marketing development agreement with Alpine Electronics, which manufactures OEM and aftermarket receivers, to develop IBOC receivers.

— Leslie Stimson

the audio stream. Arbitron wants the NRSC to validate that the encoder does not insert unacceptable noise into the radio signal.

The committee must check with its sponsoring groups, the NAB and the Consumer Electronics Association, before making a decision.

California-based Cue Corp. asked the NRSC to either review or to help develop a test protocol for a radio broadcast data service for AM, as already exists for FM. Cue claims a throughput of 16 kbps. Smith said.

DIGITAL NEWS

Sirius Tests Second Satellite

Sirius Satellite Radio expects to complete in-orbit testing of its second satellite by Oct. 20. It launched Sirius-2 from Kazakhstan on Sept. 5. The solar panels were deployed around noon after a lift-off that occurred just before 6 a.m.

Sirius' third satellite had been scheduled to launch in October, but Sirius expected the launch to be delayed until next month due to a crowded Proton rocket launch schedule.

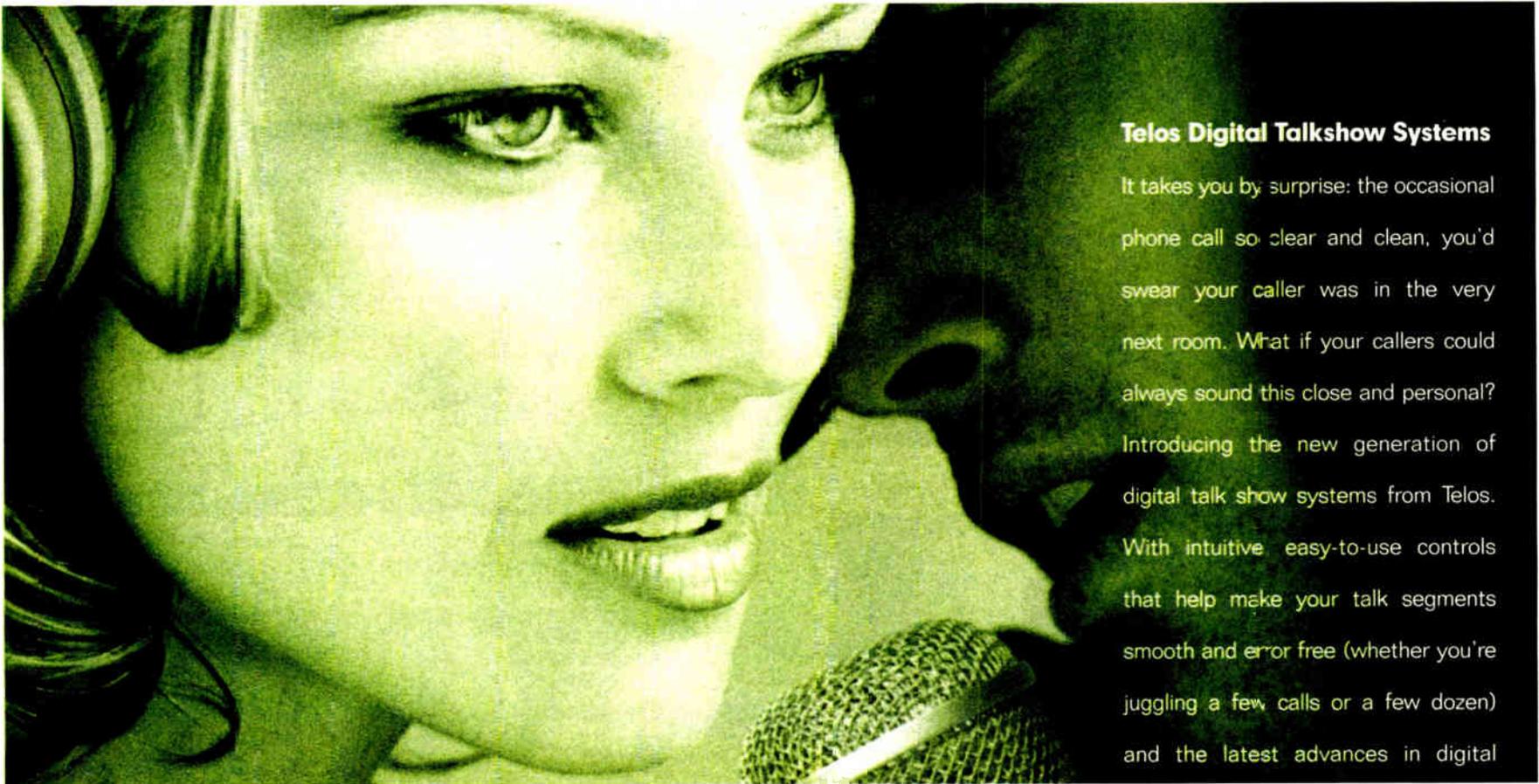
A ground spare, Sirius-4, was to be delivered into storage in December; however, Sirius said the satellite was damaged during assembly at the Space Systems/Loral plant and its delivery would be delayed.

Sirius launched its first bird on June 30 (*RW*, Aug. 2, p. 3).

— Leslie Stimson



September launch with Sirius-2 aboard



Telos Digital Talkshow Systems

It takes you by surprise: the occasional phone call so clear and clean, you'd swear your caller was in the very next room. What if your callers could always sound this close and personal? Introducing the new generation of digital talk show systems from Telos. With intuitive easy-to-use controls that help make your talk segments smooth and error free (whether you're juggling a few calls or a few dozen) and the latest advances in digital phone hybrids from the company that invented them. Never have your callers sounded so consistently loud and crystal clear - it's the next best thing to having them there. Don't just talk to your audience... get intimate.

Talk radio is suddenly intimate

Telos Systems. Connected.



Telos TWOx12™ Integrated Talkshow System

Using POTS or ISDN lines, the TWOx12 handles up to 12 callers on two built-in digital hybrids. The intuitive phone controller tames even the wildest talk shows.

Telos
S Y S T E M S
www.telos-systems.com

TELOS SYSTEMS NORTH AMERICA: +1.216.241.7225 • TELOS SYSTEMS EUROPE: +49.81.61.42.467

DIGITAL NEWS

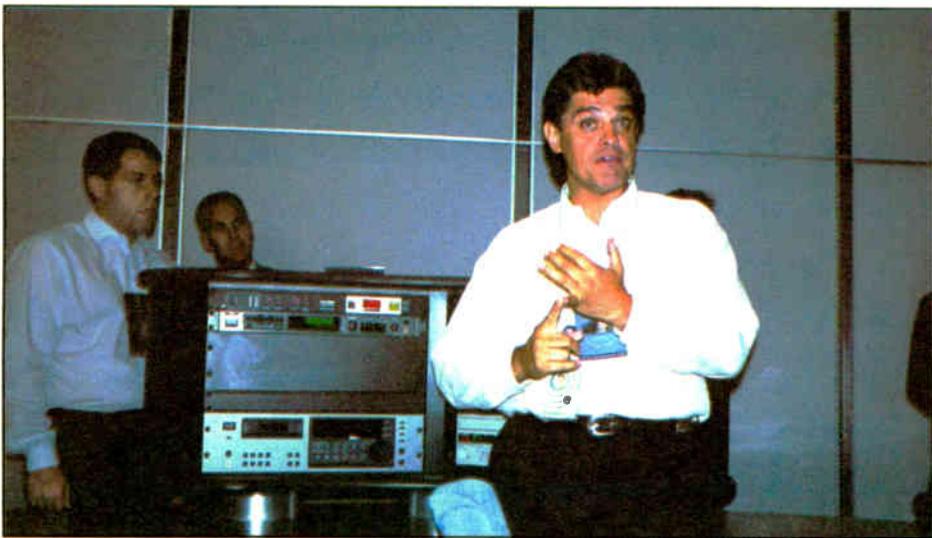
XM Opens Facility to Applause

2,600-square-foot performance studio that can hold a 40-piece orchestra.

The facility is not far from Union Station in Washington, in a neighborhood that the city hopes will be revitalized by new high-tech companies.

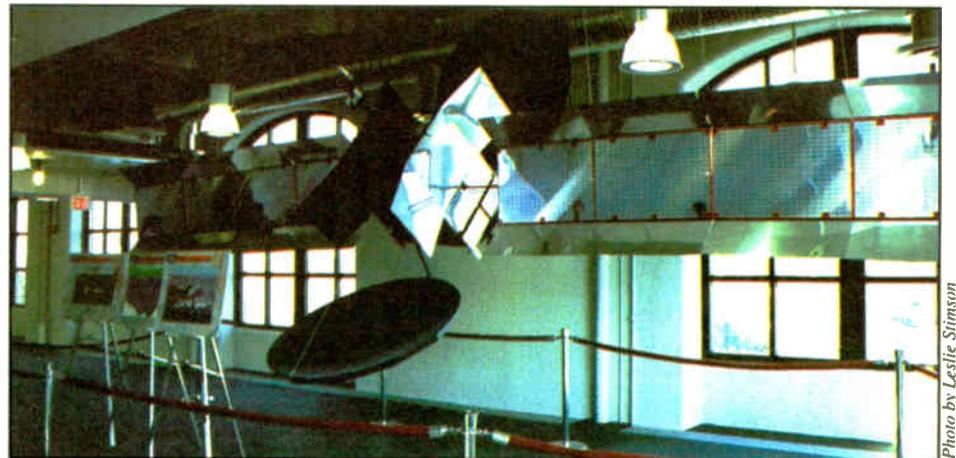
XM is modernizing a 100-year-old printing plant, a facility that came with high ceilings and concrete floors.

See XM, page 15 ▶



XM VP/Program Operations Dave Logan

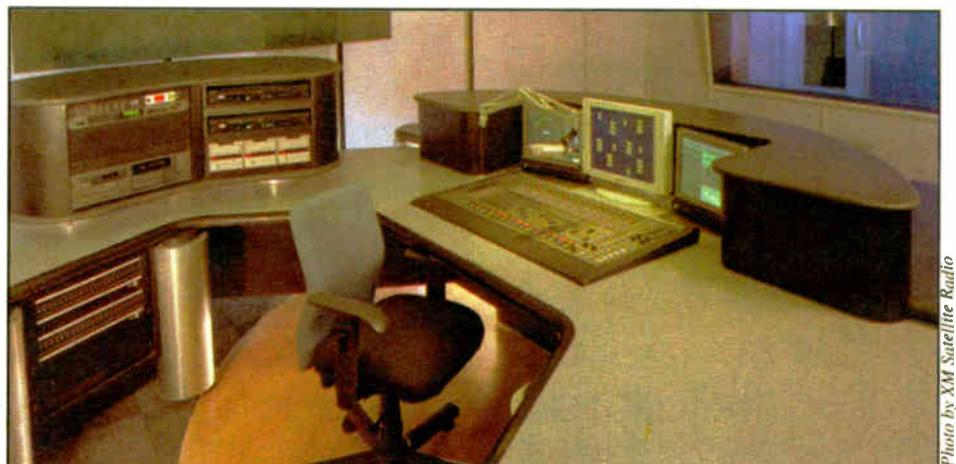
WASHINGTON XM Satellite Radio opened its \$65 million complex in September. Some of its 82 studios are complete; all are expected to be done by the end of the year, including a



A model of XM's two Hughes 702 geostationary satellites. The real ones are four times as large.



A close-up of a Klotz console and monitors with ProTools software at left



An XM air studio



PROGRAM CENTER SCHEMATIC



XM

► Continued from page 14
Those support studios that weigh about 1.2 million pounds.

It is depending on 1,500 terrestrial repeaters to boost its signal in urban areas. Senior VP/Engineering & Operations Jack Wormington said 720 repeater leases were signed by early September, with deployment to begin in Florida and Pittsburgh later in the month.



Photo by Leslie Stimson

XM President/CEO Hugh Panero

President/CEO Hugh Panero said chipset manufacturer STMicroelectronics has begun making two custom chips for AM/FM/XM receivers. The satellite broadcaster displayed prototype chipsets and a prototype receiver using a Pioneer head unit at the unveiling of its facility.

XM says it has tested its signal successfully.

XM uplinked a music signal to a Ku-band satellite, downlinked it to a terrestrial repeater and finally received the S-band signal in a prototype radio in a vehicle traveling at 65 mph on I-95.

While WorldSpace, a technology partner of XM, has developed



Photo by XM Satellite Radio

Several on-air studios

receivers for a satellite-delivered digital audio service, XM President/CEO Hugh Panero says WorldSpace is focusing on fixed and portable L-band

advertising, auto, radio and investment and consumer electronics industries. Mayor Anthony Williams declared Sept. 13 "XM Satellite Radio Day."

XM Satellite Radio says it has tested its signal successfully.

DAB units, while XM is focused on mobile DAB units for the U.S. market.

XM's opening drew representatives from the District of Columbia government as well as from the high-tech,

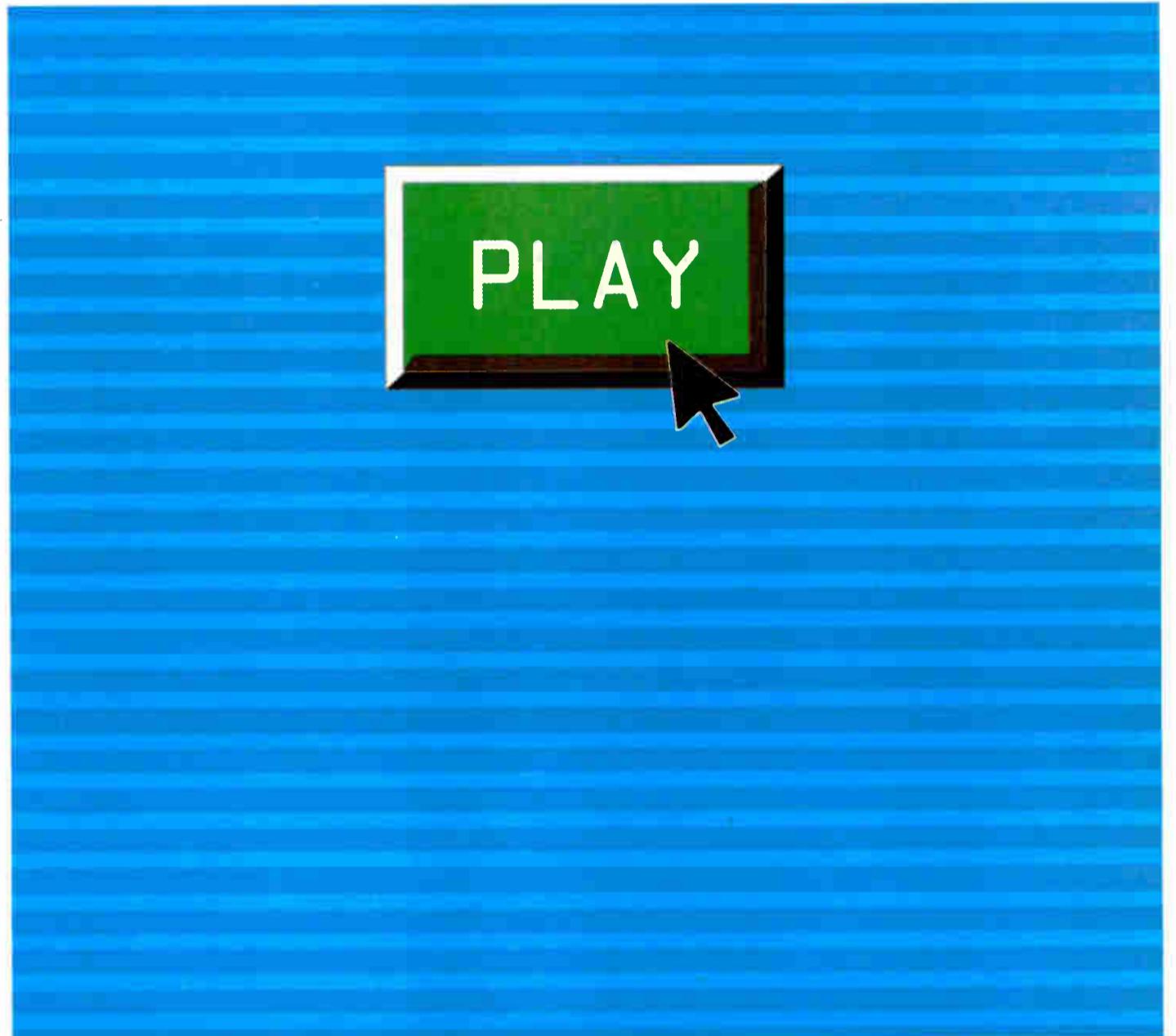
The company has 130 employees and plans to grow to about 350 by next summer.

— Leslie Stimson



Photo by XM Satellite Radio

One of XM's two seven-meter uplink satellite dishes located at the facility



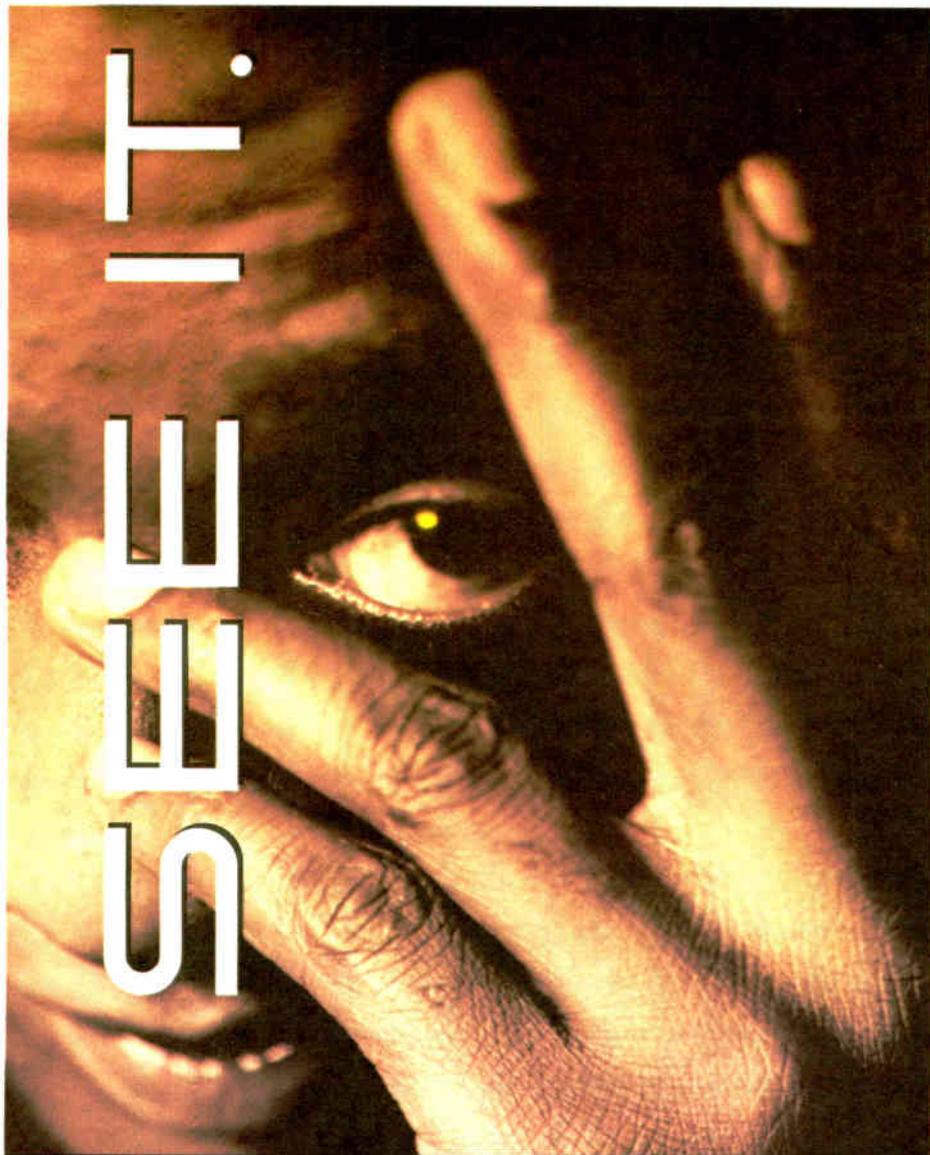
Yes, it's really this easy.

Intuitive, intelligent digital delivery—
DAD_{HD}32. Easy to learn, easy to use. Simple to expand as you grow. Looking is hard, the choice is easy. DAD_{HD}32—from ENCO Systems.



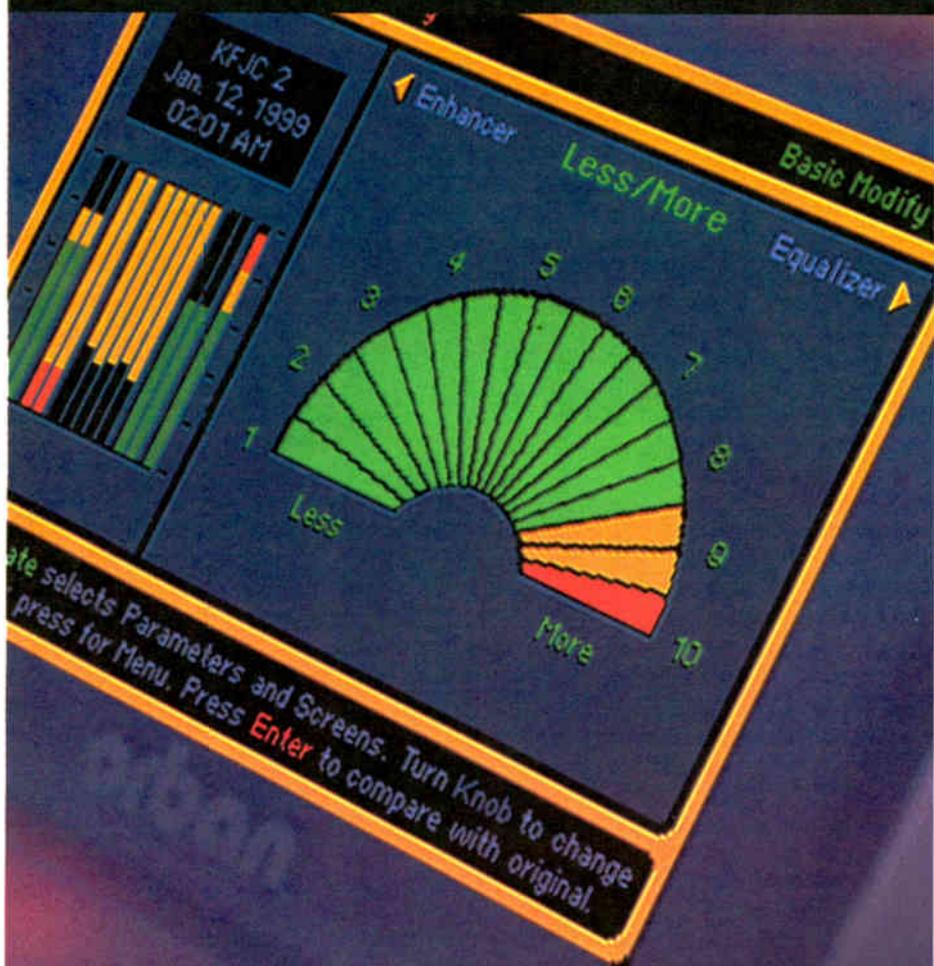
800. ENCO.SYS

www.enco.com



OPTIMOD-FM 8400

Call your dealer for a demonstration.



orban®

WWW.OPTIMOD8400.COM

SBE NEWS

SBE Certification And Your Future

Terry Baun, CPBE

The author is the certification committee chair of the Society of Broadcast Engineers. Radio World provides this space to the SBE as a service to the industry.

There are 4,288 engineers who hold one or more levels of SBE Certification. Considering that the SBE membership base is approximately 5,000, that is a remarkable number — but it is not enough.

Our goal is to double that number within three years, because SBE believes that our broadcast industry, both radio and television, will require the proof of knowledge that only certification can provide.

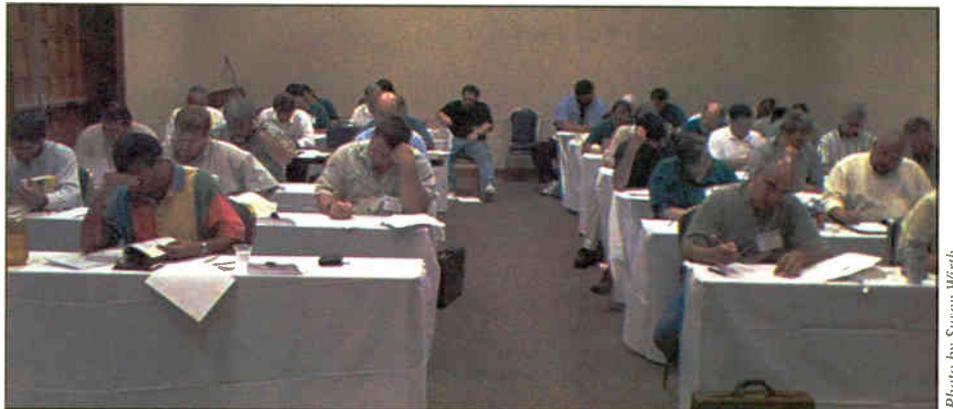
Pardon me if you are already tired of the word "convergence," but I'm afraid I will be using that overworked term once again.

just over one year's time.

That included determining the scope of the examination, preparing and analyzing several-hundred examination questions. Then we entered them into our computer database, prepared applications, a reading list and a complete computerized study guide, after which we administered beta tests and fine-tuned the question database prior to the April deadline.

By the way, this level of certification is applicable to both audio and video network installations. To a network, there is no difference between audio bits and video bits.

It seemed obvious from the beginning that broadcast engineers who have already achieved certain levels of computer network certification should be allowed to receive the CBNT, akin to the way in which holders of First Class,



Forty Cumulus chiefs take the CBNT Exam at the group's engineering conference in San Antonio in August

We are entering the age of media engineering, where the stock in trade consists of not only RF and antennas, but numerically controlled equipment, pixels and LANs. Understand, we're not going to be given a choice about learning these things; the marketplace will simply set the standard and exact the price.

Certification is the means by which we can help set our own price tag.

This is not something "extra" that we do to improve our self-image or add another set of initials to our signature. This process is the benchmark by which we can show the level of our education and experience as we move into the fully digital 21st century. It is also an essential part of the SBE mission to contribute to the advancement of broadcast engineering and to the career development of our members.

Here is a brief update on the program that I think you will find interesting as you consider whether to invest the time and energy in the pursuit of certification.

CBNT update

In April, we administered the first examinations for Certified Broadcast Networking Technologist (CBNT). This is a certification level that I believe marks the first step in bridging the worlds of broadcast engineering and information technology.

Some may ask why such an obvious linkage took so long to become reality. The answer to that is that our certification committee and certification department took this idea from proposal to reality in

General Radiotelephone and Amateur Extra licenses may be granted certification as Certified Broadcast Technologist without further examination.

That determination came at the April certification committee meeting where it was determined what other levels of achievement may qualify applicants to receive the CBNT directly:

- Holders of Network+ Certification
- Holders of Novell CNE Certification
- Holders of Microsoft Professional Certification, when such certification includes passing the Network Fundamentals examination or its equivalent.

Other certifications granted by other industry vendors or trade associations may also be considered for equivalent recognition. However, the committee has established that any such certification must involve actual network *engineering* and not merely *administration*.

The core idea of the SBE CBNT is network hardware installation and engineering, and the test does not include questions on software or administrative issues. In all cases, applicants applying for CBNT by prior certification must also have two years of continuous satisfactory service in broadcast engineering or media-related technologies prior to the date of application.

Persons desiring to take advantage of this "no test" provision should contact the certification director prior to application.

See SBE, page 17 ►

SBE

► Continued from page 16

The CBNT also provides SBE with a new and exciting opportunity to bring certification directly to our members. At the request of National Public Radio, SBE recently provided a full day of networking tutorials, followed by administration of the CBNT examination, at the NPR Technical Conference.

In August, over half of the entire chief engineer complement of Cumulus Broadcasting (40 engineers) participated in the same tutorial and test. More than 95 percent of the participants achieved the CBNT certification.

We are hoping to provide this program to other major broadcast groups as well as at major industry exhibitions.

Test anxiety

Another area of interest is in making the testing process for certification more palatable for our members. Now we are not talking about making the tests easier, just fairer and less stressful. In this regard, the committee has developed two new test procedures that may be of interest to you.

For those of you who take the senior-level certification examination for radio or TV, an important part of the examination is the essay question, chosen specifically by a committee member based upon the employment history contained in the certification application.



application and test administration process is handled at the National level and does not involve the local chair or anyone else at the applicant's chapter.

This provides 100-percent privacy for applicants who desire it and eliminates the possibility of anyone else in the local chapter knowing about either the test administration or outcome.

Applications and instructions for this private proctoring option are now available for all upcoming examination sessions.

Certification promotion and you

The committee is also working hard on promotion of certification.

We are in the early stages of our 2001 development plan, which will involve a closer liaison with the state broadcast associations. We are investigating the possibility of holding one-day seminars to

Certification is the benchmark by which we can show the level of our education and experience as we move into the fully digital 21st century.

While we go to great lengths to choose what we think is an appropriate question, it is sometimes difficult to be certain that the question selected truly draws upon the strengths of each applicant. Therefore, we now provide a choice of three different essay questions for each senior certification exam.

The applicant may choose any one of the three to answer. While this involves more work for the group, we feel it is a fairer and more logical approach for our applicants — and should reduce the “exam anxiety” that applicants sometimes feel. We have substantially increased the essay question pool in order to accommodate this change.

The committee has addressed yet another area of “exam anxiety.” We believe that some engineers are reluctant to sit for certification exams because their local certification chair and fellow test-takers will know of their attempt at taking the test, even though under our existing certification policy no one except the applicant is ever informed of an examination failure.

Because some applicants may be more comfortable taking the test in private surroundings, we are now offering private proctoring of examinations for any applicant who completes a special application and pays an additional fee. The entire

train chief operators at the state broadcast conventions held throughout the year.

Certification Director, Linda Emerick and I will be meeting at The NAB Radio Show in San Francisco with the executive directors of various state broadcast associations to get this idea rolling. We may also consider providing CBNT tutorials and exams as well.

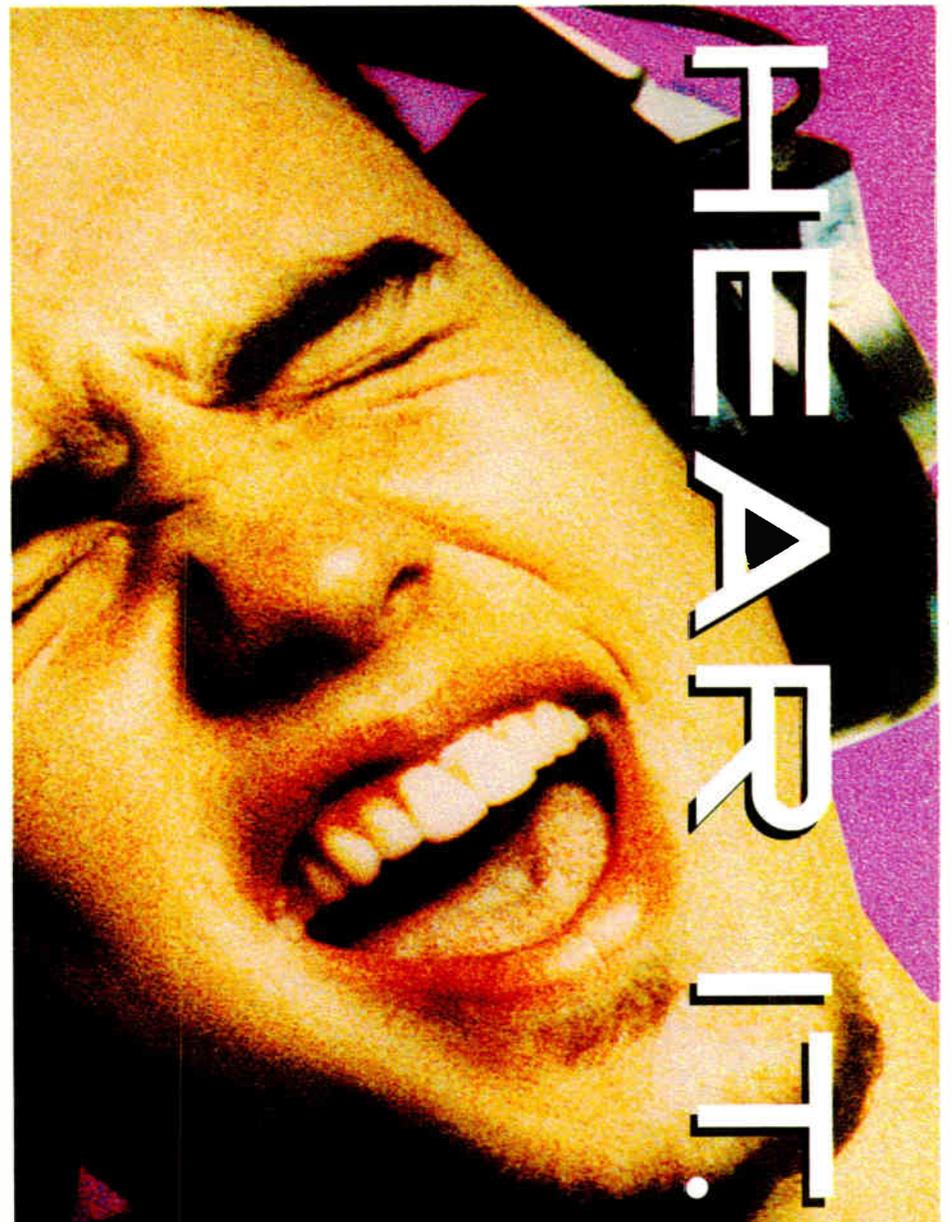
If there is one message that has been loud and clear from the state broadcasters, it is that there is a definite need for more qualified engineering help. I intend for SBE Certification to be responsive to that need and to lead the way in recognizing the achievements of our membership and advancing their value to a rapidly consolidating industry.

I hope our brief overview of the program has started you thinking about your career and what certification could do to enhance it. Our certified members are a select group who proclaim to the world that they believe in investing in their future and improving their value to their employers.

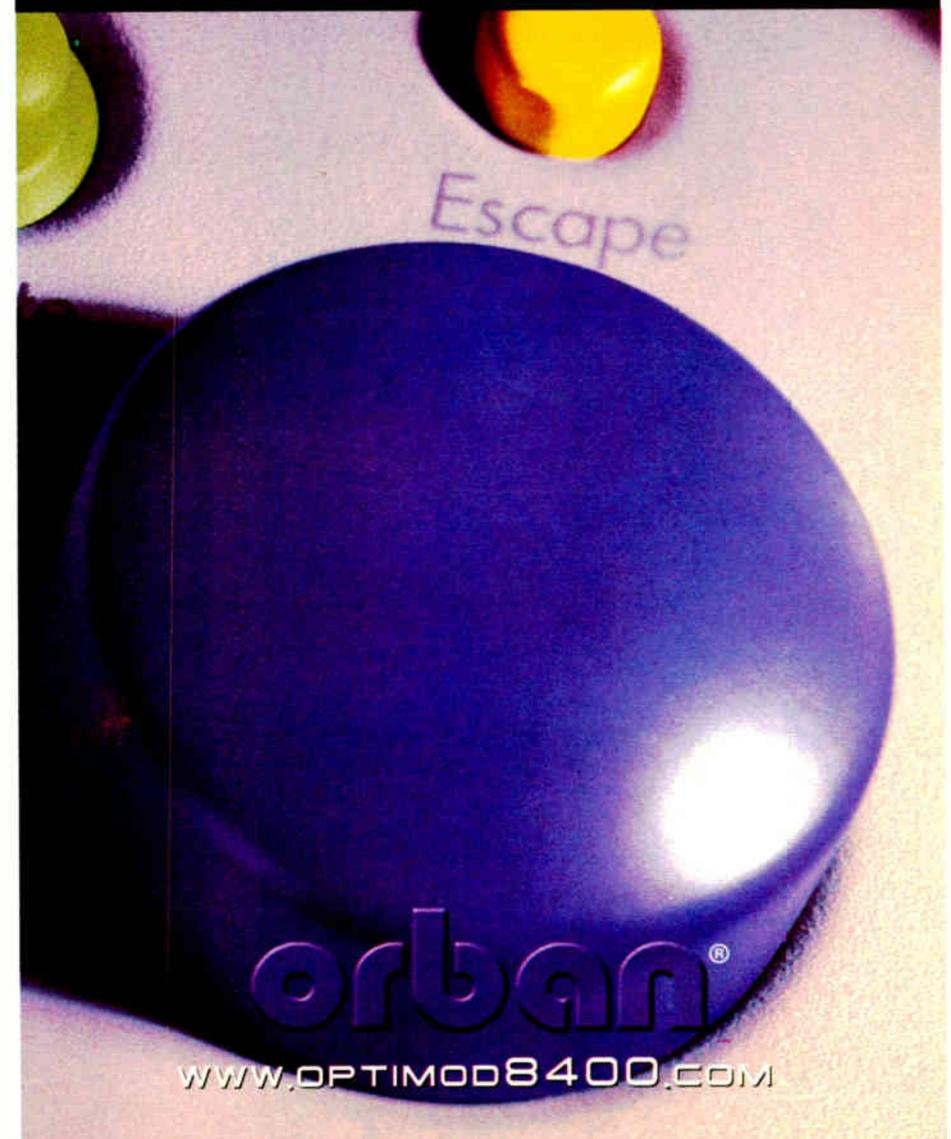
Certification reflects your self-confidence and your respect for your profession. Remember, that certificate is worth more than you know, because you can't truly put a price on you!



RW welcomes other points of view.



OPTIMOD-FM 8400
Call your dealer for a demonstration.



IMAGINE

A RADIO STATION

WHERE THE PAST MERGES SEAMLESSLY WITH THE FUTURE. WHERE TECHNOLOGY ADAPTS TO YOUR CHANGING NEEDS WHETHER YOU'RE

ON LINE

CoSTAR

CoSTAR – An automated radio solution that scales from the private Web station to the enterprise environment.

Powerful software to manage Music, News and Multimedia content for broadcasting, webcasting and On Demand radio.



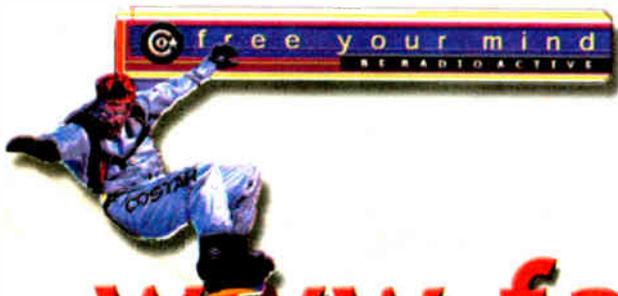
..... OR

ON AIR

FUSION – Professional Digital Radio Broadcast mixer and router that's intuitive and simple to use. Expandable central DSP frame and flexible configuration software combine to create the most versatile and powerful On Air Studio.

Fairlight

IMAGINE no more – CoSTAR and FUSION provide the tools to create future radio today. Make a decision today that will still be valid tomorrow. Contact Fairlight On Air.



www.fairlightonair.com

USA - +1 323 465 0070 • The Netherlands - +31 (0)26 3684925 • Australia - +61 8 9479 1711

World Radio History

WIRED FOR SOUND

Not Pulling Your Leg

Steve Lampen

Last month we ended talking about the "installation from hell" during which I participated in a cable pull that required almost 800 pounds of pulling strength to get bundled audio cable through a conduit. Believe me, we used every trick in the book. We used as much pulling lubricant as we could squeeze in with the cable.

But there were other options my friend might have considered if he had had more time. One was going to unjacketed pairs. If you've been playing with snake cables longer than 10 years, you probably remember these old cables.

In those old snake cables, still being made, each wire had color-coded insulation and each had a foil shield, and drain wire, wound around that.

Foil shields are really two layers, one of foil, which is the silver-colored side, and one of polyester, the colored side. The polyester side of the foil faces out so the foils don't conduct with each other. This allowed manufacturers to color code the foils with different colors.

A team can easily jerk a cable beyond its maximum pull strength in a second and break some pairs.

So it was a combination of the color of the foil and the color of the pair that told you which pair you were on. This was, and still is, a cumbersome and complicated way to tell what is what and mistakes are very easy to make.

Jackets

It is no wonder that the individually jacketed snake cables now being manufactured account for the vast majority of snake installs. The individual pair jackets can be color-coded, often with the resistor color code. And the pair jackets also have the number of each pair printed on them.

Gage (AWG)	Strength (lbs.)
26	3.5
24	5.5
22	7
20	12
18	19
16	30
14	48
12	77

Some snake cables even have the word for that number printed on them, and a few even have that "print legend," the number and the word for that number, printed one direction, and the next time upside down in the other direction. That way, it doesn't make any difference which way you hold the cable; you can always read the writing on the jacket of each pair.

And, as I often say, having the jacket color-coded with the number, having the

number, and having the word for the number, and having it run in both directions, you would have to be a color-blind alien from the planet Tralfamadore to screw up that installation. And compared to the old foiled-pairs, this cable is a god-send ... except for the size.

How do you know when you've reached the pull strength of your cable? Consider buying a fish scale.

The overall diameter of those old foil-pair snake cables was dramatically smaller than the new individually jacketed pair snakes. And there's a lot less plastic in those old foil snakes, which is why most plenum multipair snake cables are still that old foiled-pair design.

There's just too much plastic in an individually jacketed snake. Even made with the best fire-resistant plastics, the individual jacket design can't pass the Steiner Tunnel test that plenum cable is required to undergo before it earns that magic "P" added to the NEC code.

And, if my friend had had the time, going to these old designs, especially in non-plenum ratings, might have gotten him back to 40-percent conduit fill.

Pull strength

So how hard can you pull? Shown is a chart giving the pull strength of each conductor.

For each pair, multiply the strength by three, because you have a twisted pair and a drain wire. Check whether the drain wire is the same gage as the twisted pairs. Often it is not; in that case, use the chart to determine the pulling strength of the pairs by themselves and add the drain wires separately.

For multipair cable, jacketed or unjacketed, or for bundled loose pairs, multiply the two or three wires by the number of pairs to find the entire pulling strength.

In case you're interested, those pulling numbers are 40 percent of the breaking strength of the wire, which is probably how my friend's cable managed to work after 770 pounds of human flesh were hanging off it.

In fact, one reason was that he was running analog audio. I'm sure he changed almost every dimension in the cable. But analog is amazingly forgiving. As long as you have continuity, and the

pair remains twisted, it will probably work just fine.

If this had been AES/EBU digital cable, or worse yet Category 5 data cable, the outcome would not have been happy.

OK, so the pull strength of your 24-pair 24 AWG snake cable (with 24 AWG drain wires) is 24 pair x 3 wires x 5.5 pounds = 396 pounds.

How do you know when you've reached 396 pounds? There are specialized pulling tools that you can set to a

big flabby guy, before I lost 85 pounds. (Now I'm a thinner flabby guy.)

Be sure your "pull reader" calls out the pull strength every two or three seconds as you are pulling. A team can easily jerk a cable beyond its maximum pull strength in a second and break some pairs.

Next month, we'll conclude our series on pulling through conduit with a discussion of insulation, voltage and some coming changes in the NEC code. Stay tuned!



Steve Lampen is technology specialist, multimedia products for Belden Electronics Division in San Francisco. His book "Wire, Cable, and Fiber Optics for Video and Audio Engineers" is published by McGraw-Hill. Reach him at shlampen@aol.com

The Resistor Color Code

I am surprised how many people working in audio didn't come up through the "electronic" ranks and were never exposed to the resistor color code. Still used as a system of stripes on resistors to indicate the resistance value, the resistor color code is also used in other components, including wire and cable.

Here is the basic color code. For cable manufacturers, because there is no pair Zero, they often use black to indicate Pair 10.

Color	Number
Black	0
Brown	1
Red	2
Orange	3
Yellow	4
Green	5
Blue	6
Violet	7
Gray	8
White	9

specific strength and that will separate at a given pull strength. In this example, you might want to set it to 375 pounds so you don't exceed the maximum accidentally.

But these pulling strength meters are expensive. Unless you are an installer and will be doing this weekly, it may not be cost-effective.

Go to a sporting goods store and buy a large fish scale. One that will go to 750 pounds is perfect. When you are pulling the cable, attach this fish scale between your pull rope and the actual snake. Be sure it is a spring scale, so it doesn't matter whether you're pulling vertically or horizontally.

Assign the weakest member of your install crew to read off the numbers while you're pulling. I say weakest because this person will be the least missed from doing the actual pulling. And if you've ever done cable pulling, you know that the weakest definitely doesn't mean shortest, smallest or lightest. There are a lot of small guys or gals who can out-pull a big, flabby guy. I know! I used to be a

Proven Performer

Model 530 - \$2500

FEATURES, PERFORMANCE AND PRICE—A REMARKABLE FM MOD-MONITOR VALUE

Inovonics' 530 offers dependable off-air monitoring of your own signal, and 8 station presets allow quick comparison with others in your market. High-resolution bargraph metering shows carrier deviation, pilot level and demodulated program audio; signal strength and multipath distortion readouts aid receive antenna alignment. Composite MPX and balanced audio outputs are provided, plus alarm outputs for loss of carrier and loss of program audio. In continuous, "sellout" production since 1995, the 530 has earned a reputation for value and reliability the world over.



Inovonics
 1305 Fair Ave. • Santa Cruz, CA 95060
 TEL: (831) 458-0552 • FAX: (831) 458-0554
 www.inovon.com • e-mail: info@inovon.com

**FOR AM/MEDIUM
WAVE ANTENNA
SYSTEMS
COME TO THE
CHOICE OF RF
ENGINEERS
AROUND THE
WORLD**

KINTRONIC

LABS, INC.

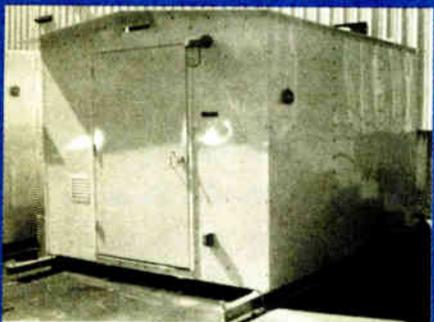
**FROM CONCEPT
TO OPERATION**
KINTRONICS OFFERS THE
STATE-OF-THE-ART DESIGN
SERVICES AND TOP QUALITY
PRODUCTS TO PUT YOUR
STATION ON THE AIR WITH
THE COVERAGE YOU NEED
ANYWHERE IN THE WORLD



**CUSTOM HIGH POWER AM
DIRECTIONAL ARRAY DIPLEXERS**



**RACK MOUNTABLE MAIN/AUX/DUMMY
LOAD TRANSFER SWITCHES**



**ALUMINUM CONSTRUCTION, CLIMATE-
CONTROLLED PRE-FAB ANTENNA
TUNING HOUSES OR TRANSMITTER
BUILDINGS**

KINTRONIC LABORATORIES INC.
P.O. BOX 845
BRISTOL, TENNESSEE 37621-0845
PHONE: 423-878-3141
FAX: 423-878-4224
EMAIL:
KTL@KINTRONIC.COM
WEB SITE:
<http://WWW.KINTRONIC.COM>

FEED LINE

Shared Use of Transmitter Sites

*The Effects of RF
Radiation on Shared
Sites and What Can be
Done About Them*

W.C. Alexander

This is the second in a series of articles about shared use of transmitter sites. The previous part appeared in the Sept. 13 issue.

These days, vertical real estate is scarce and in demand. We often have no choice but to double up and share sites with other FM and TV stations.

Let's consider how potential intermod and RF radiation might affect the decision to share a site.

Whenever transmitting antennas are located in close proximity, unwanted products may exist. The FCC has set limits on the relative amplitude of off-frequency products.

These limits are not difficult to meet with good engineering practice. Good antenna and power amplifier design and well-maintained equipment are the best means of preventing unwanted products.

In some cases, it may be necessary to use filters and traps to prevent the RF from a nearby antenna from entering the power amplifier of another transmitter and mixing with it. Such traps, which must be rated for the full power output of the transmitter, are expensive. As a result, these traps are seldom installed as a preventive measure.

The need for such equipment usually is determined in the field by using spectrum analyzer measurements of each station's output to see if any unwanted products are being generated. Other means of eliminating products, such as power amplifier tuning and changing transmission line length, usually are exhausted before filters and traps are ordered and installed.

Sites that use master antennas will incorporate pass and reject filters in the combiner. These filters are generally more than adequate to prevent any intermod products from occurring in the transmitter power amplifier stages. This cannot be taken for granted. Consider making measurements after installation and tune-up to insure spectral purity.

Care should be used when using a spectrum analyzer to check for intermod at a site. Just like any receiver, the front end of a spectrum analyzer is subject to overload.

Trap the fundamental frequencies out of the front end to get an accurate picture of products being generated. The best way to do this is to use an in-line trap for each fundamental frequency.

These traps are supplied with a graph showing the attenuation across a wide range of frequencies. The response of the trap should be taken into consideration when calculating the level of any potential product.

Intermod products aren't always generated in the transmitters. They can be generated at any non-linear electrical connection. Dirty, loose or corroded hardware on the tower can be a source of this signal.

A poor guy-to-tower electrical connection, for example, can act as a diode in the presence of strong RF fields and mix the two signals. The long guy wire then becomes a pretty efficient (and high) radiator of the unwanted product.

Such hardware-related problems can be

difficult to track down and fix. The best means of avoiding them is good and regular tower maintenance. Prevent problems by keeping the tower painted and the hardware tight and removing unused antennas and lines.

In the presence of strong RF signals, intermod can be generated in receivers. Several years ago, the late Robert Greenberg wrote a paper on a case study of such receiver-induced effects.

Studying the signal

In the case study, the strong signals from two stations sharing a tower in Rochester, N.Y., were being mixed in the front ends of receivers and producing a product on the same frequency as another FM station in that market. The result was punching a "hole" in that station's coverage.

The emissions from both contributing stations were clean. The problem was simply one of RF overload. Inserting pads in the antenna leads of affected receivers fixed the problem, but how do you get listeners and potential listeners to install these pads?

Problems can be prevented by keeping the tower painted and the hardware tight, and removing unused antennas and lines.

The short answer is, you don't. Those listeners go away to another station that they can hear without interference. It is interesting that the same company now owns all three of these stations (you can guess which one).

The way to avoid receiver-induced intermod is to study carefully the potential products from a site and avoid co-locating with a station wherein a product on another local station's frequency is likely to be produced. Believe me, you will save yourself years of grief and possibly litigation if you look for another site.

Computer programs are available that compute all the second-, third- and fifth-order intermod products possible from a given site.

The results can then be evaluated against a list of stations in the area with which the potential signal might interfere.

The mere fact that a potential intermod product falls on another station's frequency does not mean that it will exist and cause interference. It does, however, reveal the possibility of such interference.

Signal strength of the station on the frequency the potential product falls is a big factor. The stronger the signal, the less likely it is that interference will occur. A relatively weak signal, on the other hand, is likely to receive interference.

One of the worst such situations I have seen is in the St. Louis market. A suburban station there, which otherwise has a full-market signal, has a rather substantial hole in its coverage as a result of receiver-induced intermod.

The two co-located FM stations near the edge of the suburban station's coverage area and the resulting receiver-induced signal cause interference within several miles of the shared site.

Thoroughly investigate all the possible products and where they will fall. If one or more falls on another local station's frequency, it may be better to find another site.

In the old days, we never worried much about RF radiation (RFR). FM antennas were routinely mounted on relatively short towers, putting the bottom antenna bay close to the ground and producing a high RF power density (RFPD) around the tower base. In recent years, however, we have been forced to take a hard look at RFR and ensure that our sites are safe.

In most cases, compliance with FCC guidelines is not enough. Some local governments set their own standards that may be a fraction of the FCC maximum.

A Colorado homeowners' group on Lookout Mountain effectively has blocked construction of a new DTV tower over RFR concerns. That group calls itself "the most irradiated community in America."

A thorough RF radiation study of the shared site should be conducted before too much consideration is given to co-location. It could be that the RFPD is already so high that adding another FM station would push it over the FCC or local limit. Sometimes, measurements are necessary to determine the RFPD if calculations show that the site will not be in compliance.

Give thought to the procedure for protecting workers on the tower. How can a tower worker safely climb the tower? What will the procedure be for powering down or removing excitation in such an event? How will your station stay on the air?

These questions may be more important for tower owners than tenants. The exact procedures, responsibilities and liability should be spelled out in detail in the lease agreement. The last thing you want is a tenant telling you that your tower crew will have to paint between midnight and 5 a.m. because those are the only hours he is willing to power down.

If the tower is at an antenna farm, RFPD on the ground and your own tower may not be the only things to consider when devising the safety procedure.

You may need to look at the tower next door, a part of which may be in the main vertical lobe and thus receiving maximum radiation from your antenna. Are there places on such adjacent towers that will be affected by the addition of your antenna to a tower?

You may find it necessary to use an odd element spacing to reduce downward radiation. Other measures, such as replacement of existing antennas on the tower with shorter element spacing, may also be necessary to keep the site in compliance when an antenna is added.

You should be prepared to take whatever steps are necessary to keep the site in compliance. Still, a unworkable situations may crop up in which additional radiation from the tower will exceed the RFPD limit.

Next time, we will look at sharing an AM site between stations. The option exists to use a single tower or directional array for more than one AM station, or even an FM and AM station. We will discuss cases in which tall FM or TV towers are skirted and used as AM radiators as well. If you are contemplating such a joint site use, stay tuned.



**YOUR LINK
TO NEW MARKETS
...GO BEYOND**

VADIS

A/D - D/A
Mic preamp
Routing matrix
Digital I/O interfaces
Fibreoptic network
On-air codec management
Automatic gain control
Compressor/limiter/gate
Digital mixing console
EQ (graphic/parametric)
Time switching
Level meter
Mix-minus
Delay

**KLOTZ DIGITAL - THE ARCHITECT OF
THE OPEN AUDIO-MEDIA PLATFORM
FOR INTERACTIVE BROADCASTING,
PRODUCTION AND PUBLIC-ADDRESS.**

**THIS PLATFORM COMPLETES THE LINK
TO NEW MARKETS AND INNOVATIVE
COMMUNICATION SERVICES.**

OUR EXPERIENCE FOR YOUR SUCCESS

Eliminate wiring

- reduce installation cost
- save installation time
- earlier to production & on-air

Share resources and equipment

- reduce capital investment
- cut operating costs
- greater efficiency
- powerful flexibility

Unlimited functionality

- integrate all audio functions
- combine operator tasks

KLOTZ DIGITAL AMERICA Phone: +1-678-966-9900
KLOTZ DIGITAL FRANCE Phone: +33-1-48874681
KLOTZ DIGITAL ASIA Phone: +60-3-5193233
KLOTZ DIGITAL AUSTRALIA Phone: +61-2-95187430

KLOTZ DIGITAL AG HEADQUARTERS
Hans-Stiessberger-Str. 2A
D-85540 Haar/Munich
Phone: +49-89-462333-0
e-mail: info@klotz-digital.de
www.klotzdigital.com


KLOTZ
DIGITAL

FIRST PERSON

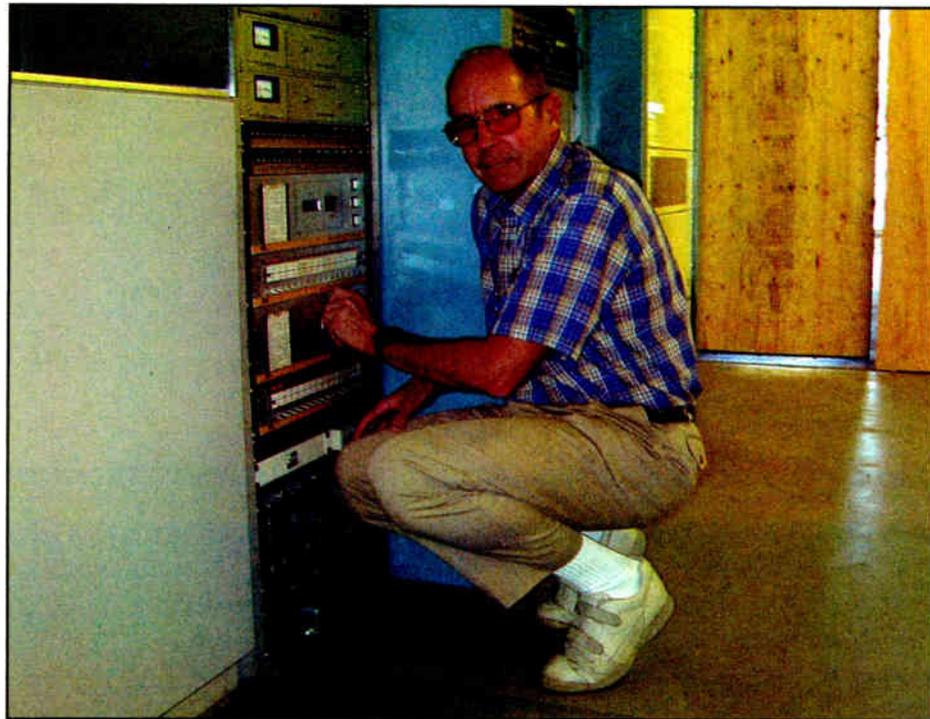
It's Been a Very Good 46 Years

The Retired Chief Engineer of KFI/KOST In Los Angeles Looks Back on His Career

Marvin Collins

Now that I have retired, I have been asked by **RW** to reflect on my career, and who or what caused me to enter engineering.

I remember as a child, of about 6 or 7 years of age, thinking it would be fun to talk to one of my childhood friends via radio, without any wires. I have no idea where that desire came from at such a young age.



Collins calibrates the KOST remote control system at its transmitter site on Mount Wilson, Calif., earlier this year

The summer of 1953, after graduating from high school, my father took my sister and me to a movie theater on Hollywood Boulevard in Hollywood. By chance there was a former high school friend sitting in the row behind us.

He told me he was working for a fellow by the name of Paul Schafer, who made remote control systems for radio stations and who needed additional help. I thought this might be an interesting job while attending college.

At the time Schafer Custom Engineering was located in Paul's garage. In the garage was an FM radio playing background music from KUTE(FM) in Glendale. This was my first exposure to FM and I thought it sure sounded a lot better than AM.

I wanted to visit the station and one evening I tried my best to find the station on the side of Flint Peak in Glendale but could not get there. A short time later I was able to get my former high school buddy to take me up there on his motorcycle by going around a locked fire road gate.

The KUTE announcer on duty, Jack Lansdowne, told me of another FM station going back on the air in Beverly Hills. A few days later I was able to drive to KCBH(FM) 98.7 in Beverly Hills. The owner, Art Crawford, was on duty himself that Saturday afternoon

and told me he wanted someone to run the place on the weekend so he would not have to do it.

I told him to hold that thought while I quickly finished obtaining my First Class Radiotelephone license.

High on the mountain

A few weeks later, I started working Saturday and Sunday at KCBH. The station was only on the air from 3 to 11 p.m. This was a perfect job for me, still a teenager, while going to college and I was hooked by the beautiful mountain-top site above Los Angeles as well as the glowing and humming General Electric tube type 10 kW transmitter.

Three years later, in 1957, I moved to KPOL(AM), where I felt I had hit

interested. While discussing the KRLA situation with the KRLA general manager, he told me that KRLA was about two weeks away from going dark.

This was the push I needed to make the move to KFI and take a \$100 a week cut in pay. I did not know it at the time, but looking back now I can say it was a good move. Though I can remember the time several years later when I became dissatisfied with KFI and KOST(FM), and started looking to make a change. KFI had purchased KOST four months after I started working at KFI.

It was 1980 when I visited my friend and the director of engineering at KNX, Eric Disen. When I asked Eric about a job at KNX he paused as if not sure of what to say and then he told me that I was being considered for chief engineer at KFI/KOST.

New job, dead rat

I did not know what to think after the conversation with Eric. Several weeks after this meeting, my wife Herta and I and our daughter Karen went on vacation. The day I returned to work after vacation KFI/KOST General Manager Jim Wesley called me to his office and asked me if I would like the position of chief engineer.

I had been CE for KFI/KOST for less than a year when the worst day of my career happened. It was mid-morning when KFI dropped off the air and we could not put either the main or standby transmitters on the air via remote control. Upon arrival at the transmitter site we found the fire department putting out a fire in the Southern California Edison power vault that is located in front of the transmitter building.

It was then discovered that there was also a fire inside the KFI transmitter building. A rat had entered the Edison power vault and caused an arc from primary to secondary of one of the Edison transformers. Instead of KFI receiving the usual 480 V power feed, the high primary voltage of many kilovolts entered the KFI transmitter building, vaporizing the transfer switch for the diesel generator.

The generator was running but no place for the power to go. KFI was off the air almost eight hours that day and I figured my career at KFI was probably at an end. I found the rat that caused it all, put it in a plastic sealed bag and the next day took it to the office of Program Director Biggie Nevins. He understood and never mentioned it again.

I remained at KFI/KOST.

Remotes and remote control

Another difficult day was during the Los Angeles Riots when we had the KFI hosts do their shows from my living room table for eighteen hours. This was the subject of a front-page article in **RW** in May of 1992.

Over the years there have been several projects that gave me great satisfaction. KFI and KOST needed a better remote control system. A very user-friendly remote control system based on a TFT remote control was implemented and is in use today.



Marvin Collins at the Telekomunikacja Polska (Polish Telephone Company), where a last-minute change of plans caused the 1994 remote broadcast to originate from a modified phone booth

Another project was to build an STL system for KFI where KFI did not have a line-of-sight path. A two-hop analog stereo system was installed that had so much fade margin that it never has faded in its almost 20 years of use. The 10-foot dishes used on each end of the second hop are still working well.

A few years ago the KFI STL was converted to a digital system that solved the problems of keeping stereo channels balanced in the older analog system.

Exotic places

Over the years there have been remote broadcasts from exotic places that bring back fond memories. Two in particular stand out in my mind.

In 1994, morning host Bill Handel took his show to Munich and Warsaw. That trip was a real adventure and was also the subject of an article here in May of that year.

Another remote broadcast that was certainly a challenge was KOST from the Sun Princess cruise ship using a Lynxx transportable satellite system that I had never tried on a moving ship before (**RW**, July 24, 1996).

Radio broadcasting will have some interesting challenges ahead. As a child I can vaguely remember when the founder of KFI, Earle C. Anthony, owned KFI and KECA and was forced to sell the latter because of a new FCC rule limiting station ownership.

Now the pendulum has swung the other way, and station ownership has become concentrated in a few large companies. It would not surprise me if the pendulum were to swing back, and the large companies may have to reduce their station ownership as was the case for Earle C. Anthony.

Soon radio is going to have to compete with digital services, satellite and wireless Internet. IBOC will help radio but is not the real answer.

To keep radio successful, good local programming is going to be necessary. Even though I retired recently, I plan to stay involved with radio to see how it all shakes out in the not too distant future.

■ ■ ■

*Marv Collins retired in September. His friends at **RW** wish him well.*

Workbench

Radio World, October 11, 2000

Tricks and Treats of the Trade

John Bisset

Can you identify the item in Figure 1? You can tell from the cobwebs it's not used very often. I'll give you one more hint: the photo was taken inside a tower fence.

Read on for the answer.

At a recent state conference, one attendee candidly spoke of his recent forfeitures for violating FCC rules. His incident stemmed from a wooden fence slat that was missing from the rear of the AM tower fence.

Because it pointed away from the building, no one really noticed it. But the inspector did, and the citation cost the station several thousand dollars.

I wonder if the fine would have been levied had the owner driven to the hardware store, bought a board and screwed it in place while the inspector was on site.

The second fine was for incorrect base impedance. Seems several antenna leases were written for this tower and the base impedance shifted with each new antenna mounted. The result was a severe over-power condition that no one knew about.

The jocks continued to write down the "licensed" base current, which was figured using the base impedance before the leased antennas were installed.

This is just another area to watch for, and another reason to involve the engineer in any decision to lease tower space.

In an unrelated case, I was visiting a customer who was complaining of an increase in VSWR and coverage loss for his FM. Of course it was easy to blame the problem on the antenna or the transmitter. One look at the new leased antenna col-

umn mounted below the FM antenna — protruding up through the bays — and the cause of the problem was apparent.

Had the owner discussed the new lease with his engineer? No. Had the owner discussed the location of the new antenna with his engineer? No, again.

The owner saw a big check every month and didn't look beyond the money. I pondered whether that monthly check would have offset the fine for the unlicensed "directional" FM antenna, caused by the new lease arrangement. Fortunately, the leased antenna was remounted lower on the tower and the problem was corrected.

This same problem can occur when a radio station sells his tower to a consolidator or tower management company. For the most part, these tower management companies do a good job. But placing leased antennas within the aperture or to the sides of the FM bays invites trouble.

Remember, it's the tower management company's business to load that tower with leased antennas. It must be understood from the beginning that the AM or FM signals will be protected. This not only protects your listeners and revenue stream but it can prevent a costly fine.

I had the good fortune to talk with Joe Husnay when he spoke at the Virginia News Network Affiliates Conference. He is a resident agent of the FCC Enforcement Bureau in Chesapeake, Va.

He mentioned an interesting site for every broadcast engineer to peruse. It's the FCC's Public Notice of Enforcement Bureau Field Operations List of Actions Taken. It's a mouthful, but it's an interesting monthly news release compiled by

the commission.

Found on the Web at www.fcc.gov, this monthly summary describes the notices of apparent liability, notices of violation and citations issued nationwide.

The June summary included three pages of EAS-related violations and six pages of tower-related violations. One thing that lessens the blow is that many of the tower violations were for non-radio broadcasting companies, such as wireless companies. It's nice to see that the radio broadcaster isn't being singled out for inspections. The rules apply to

every licensee.

The FCC inspection checklist is at this site. It's the same one the agents use when they inspect your station. Print out a copy and perform a self-test. Better yet, find out if your state association provides an alternative inspection program. These programs use contract or consulting engineers to perform a thorough inspection of the station.

When you comply with the areas inspected, the station receives a certificate of compliance, and so does the FCC enforcement bureau.

Unless there is a specific complaint about the station, the certificate will postpone an FCC inspection for three years.

See WORKBENCH, page 24 ▶



Fig. 1: A useful engineering 'tool'

NEW! DigiStor II is here!

An all new digital audio recorder with dozens of uses!

DigiStor II is ideal for network news delay, traffic reports, translator IDs, weather reports, call-in telephone info lines, message-on-hold, news & actuality lines, travelers information radio, sound effects....

DigiStor II has all the features of the "original" DigiStor and a lot more!

- MORE MESSAGES...8 messages with random access
- MORE TIME...8 or 16 minute recording capacity
- MORE AUDIO...6.5kHz B/W, 60dB S/N, 1% Dist.
- MORE USES...with auto-answer telco coupler



www.henryeng.com
Tel: 626.355.3656
Fax: 626.355.0077



We Build Solutions



NPR's "Jazz from Lincoln Center" recently chose 40 channels of True Systems Precision 8 microphone preamps. Location engineer Sandy Palmer-Grassi and senior producer Steve Rathe spent several years searching for the perfect preamplifier.

"At the beginning, we simply hired remote recording companies, but that became less cost-effective as our workload increased," Palmer-Grassi said. "We start with a Decca tree using Neumann TLM 50 mics. Then, we close mic to complement the picture captured by the Decca tree. From that point, we rely on a great preamp, and mix straight to two-track with a DA-88 backup, avoiding processing." Neumann USA is the distributor of the preamp. ...

Adonai Radio Group station KAEZ in Amarillo, Texas, installed a new digital automation system from Prophet Systems Innovations. The station upgraded from its Prophet XPS gear to the AudioWizard radio programming control center. Adonai, based in Wichita, owns stations in Kansas, Oklahoma and Texas and uses PSi equipment throughout. ...

Fanfare Electronics said the Canadian Broadcasting Corp. chose to include the Fanfare FT-1A monitor/demod in its replacement program for off-air monitors. Over the past year, Fanfare has shipped six of the FT-1A units to various CBC regional monitoring sites in Canada. ...

The CBC also awarded Harris Corp. contracts for 12 new FM transmitters for its four national radio networks. Harris was chosen to supply solid-state Z Series transmitters, in power levels ranging from 3.5 kW through 20 kW, for sites across Canada. ...

Greater Media Inc. purchased its second AudioVault digital studio system from Broadcast Electronics. It was the second stage of a four-station system in Philadelphia, and will take advantage of Wide Area Network connectivity to enhance redundancy. ...

Three stations in Manitoba, Canada,

owned by Golden West Broadcasting, opted for Wheatstone to complete its first major facility upgrade in 42 years.

The stations moved into a new building and selected the Wheatstone A5000 and two Audioarts R-60s to program the stations. ...

IDT teamed up with TV-Radio.com to provide broadcast sound for a recent Webcast. A prototype version of the DVP @ NET processor was provided for a Webcast from a convention in Paris. ...

Stagetec sold its first Cantus digital mixing console into the North American broadcast and radio market.

The RAI Corp. in New York, the American division of the Italian broadcaster RAI, bought a Cantus digital mixing console. The system, including two units of Nexus audio routers, is for the main radio studio of the radio and TV complex, where it will be used for feature productions as well as for dubbings. The RAI complex in New York is undergoing refurbishing. ...

Impreza has signed a Web site development agreement to build sites for three Infinity stations in Baltimore. ...

JazzWorks, a partnership of WDUQ(FM) in Pittsburgh and Boise State Radio, ordered a digital satellite audio system from ICP.

The company selected the DCR-974 DigiCeiver satellite audio system because of its flash-memory store and forward capability which allows for customization of affiliate stations' local content by national program hosts. This also enables radio stations, without automation equipment, to operate unattended while broadcasting local current content.

"Who's Buying What" is printed as a service to our readers who are interested in how their peers choose equipment and services. Information above is provided by suppliers.

Companies with news of unusual or prominent sales should send information and photos to: Radio World Editor, P.O. Box 1214, Falls Church, VA 22041.

Workbench

► Continued from page 23

Considering the alternative of forfeiture, the cost is a real bargain.

The Burk ARC-16 is a good work-horse remote control system, writes Bob Hawkins, CE at WENS(FM) and WNOU(FM) in Indianapolis, Ind.

One thing that has irritated Hawkins, though, is how quick on the trigger the call-out alarm system is. I agree that not many of us want to be awakened at 2 a.m. to find out that there was a 50-millisecond power interruption at the transmitter site.

This same call-out eagerness makes the call-out alarm unusable for AM stations where a pattern change occurs!

Hawkins has talked with Burk but said they have not offered a solution. The good news is that he found an answer with Radio Shack.

Attaching a large electrolytic capacitor across the metering input will keep

or above will be adequate.

There's even a side benefit to this "mod." The meter readings will show more stability. Minor fluctuations will be ironed out, making the parameter easier to log.

Imagine never hearing another operator telling you that the output power is jumping from 100.1 to 100.4 percent and wondering which one to log! A big thank you to the "Shack."

(Ed. Note: RW also touched base with Burk about this question. General Manager Anita Russell replied, "We are responsive to customers' comments and have a solution for this problem in Engineering. All of our current users will be notified when it is available.")

Well, have you given up on guessing the use of that engineering "tool" we described in Figure 1?

Figure 2 shows Ray Fantini placing the hood over the photocell for the tower light, to check operation. The cardboard hood beats covering the photocell with a rag or electrical tape and is much simpler to remove.



Ray Fantini places the hood over the tower photocell light

the metered signal from dropping for a few seconds. This is long enough to keep the call-out from being activated but still allowing faults longer than a few seconds to alert you.

The value of the capacitor will vary depending on the impedance of the metering sample, but Hawkins suggests arming yourself with a few values between 470uf and 4700uf. Any voltage rating of 12 volts

John Bisset has worked as a CE and contract engineer for more than 30 years. He is a district sales manager for Harris Corp. Reach him at (703) 323-8011.

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

Dependable Modulation Monitors for AM & FM

520 AM Mod-Monitor

- Built-in, tunable preselector for accurate off-air measurements
- Easy-to-read, peak-hold modulation display
- Alarm and RS-232 data outputs
- Companion active antenna option



530 FM Mod-Monitor

- Off-air operation with 8 station presets
- High-resolution displays for deviation, audio, pilot, RF signal and multipath
- Accurate and affordable



Download full spec sheets at www.inovon.com

Inovonics
1305 Fair Ave. • Santa Cruz, CA 95060
TEL: (831) 458-0552 • FAX: (831) 458-0554
www.inovon.com • e-mail: info@inovon.com



Burn Rubber.



Short/cut 2000
PERSONAL AUDIO EDITOR

You want speed? YOU GOT IT!

360 Systems' new Short/cut 2000 Editor features split-second edits for news, call-ins, and live events. Plus, you'll get industry-wide file interchange, a full slate of editing features, and unparalleled ease of use.

Call your favorite **360 Systems** dealer now — and put the pedal to the metal.

Easy Upgrade!

Now you can upgrade your existing **Short/cut editor** to the speed and power of **Short/cut 2000**. To turbocharge yours, call **(818) 991-0360**.



Accelerate over to
www.360systems.com
for full details!

360 Systems®

PROFESSIONAL DIGITAL AUDIO

Corporate Office: 5321 Sterling Center Drive, Westlake Village, CA 91361
Tel: (818) 991-0360 Fax: (818) 991-1360 Website: www.360systems.com email: info@360systems.com

World Radio History

Protestors Disrupt Show

The NAB Radio Show in San Francisco attracted demonstrators on several show days. One group blocked traffic, rushed a podium and staged a sit-down in the main lobby of the Moscone Convention Center.

Protestors spoke out on several issues, some against the NAB's position on low-power FM and the influence of consolidated radio groups, others on media messages about sexuality.

Early in the show, members of the National Organization for Women gathered outside the convention.

"Low-power FM, micro-radio is high on (NOW's) agenda," said Patricia Ireland, president of the National Organization for Women. "(One of) our goals is to get government visibility about how many independent voices there are and can be reached through community radio."

Representatives from NOW joined San Francisco's Media Alliance and the National Association of Brainwashers at the protests. Some carried signs that read "Stop Racism Now," "Advertisers Lie" and "Love Who You Are."

Fairness and Accuracy in Reporting, which calls itself a media watchdog organization, helped to gather representatives from groups including the Rainforest Action Network and San Francisco Liberation Radio.

Another group of protestors descended on the show on Friday morning, using more aggressive tactics.

During the FCC Policymakers' Breakfast, NAB President/CEO Eddie Fritts was pushed aside from the podium as he finished introducing Commissioner Harold Furchtgott-Roth.

A security guard hauled the woman from the podium and covered her mouth. Another protestor shouted, "Free speech for public radio!" as she too was led away.

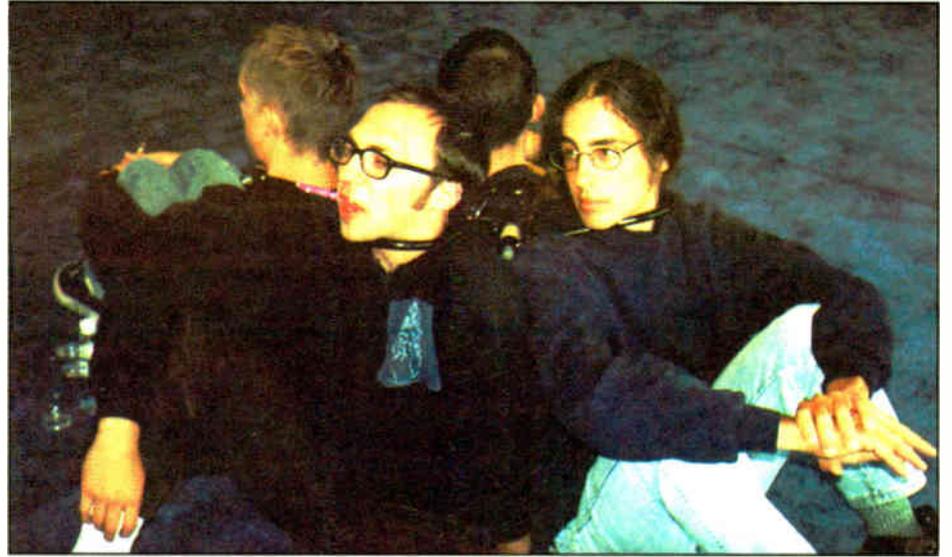
That morning, four protestors entered the show lobby, apparently breaking a door in the process, and locked themselves together by the throat with heavy bicycle U-locks. They sat in protest, saying they intended to stay until 5 p.m. Attendees were directed to nearby side entrances; show traffic was not seriously impeded.

Approximately 50 protestors stood outside, chanting "Corporate media, we say no. NAB has got to go." The larger group then marched around the center, blocking four lanes of traffic.

Police allowed the four to stay in the lobby and speak to the media for a short time, then erected a screen and used power tools to cut them loose. They were carried to a van and removed. Police said they would be arrested for trespassing.

NAB spokesman Dennis Wharton said, "We respect their right to peacefully assemble. Beyond that we are not commenting."

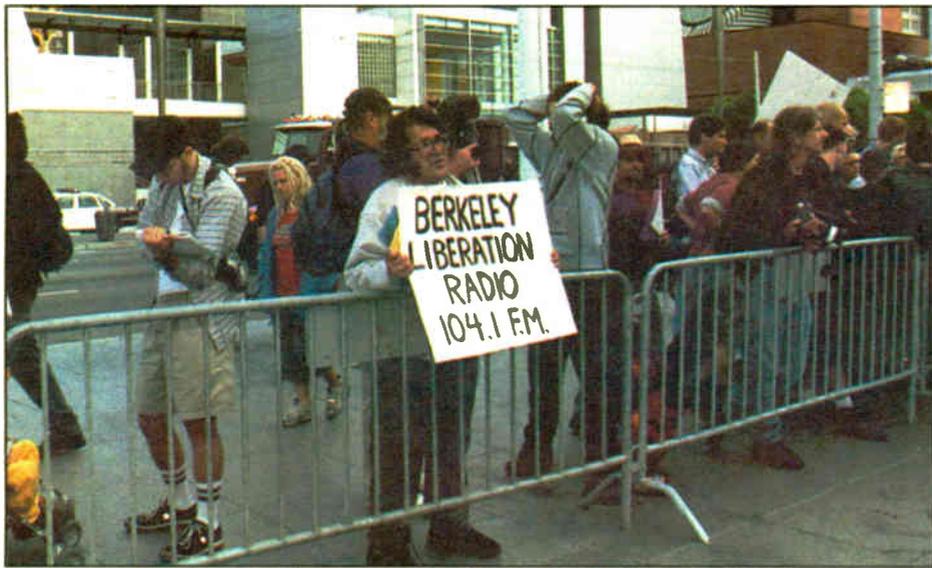
Paul McLane, Leslie Stimson, Bernie Cox and Lyssa Graham contributed to this story.



Four activists locked themselves together at the neck with bicycle locks and sat on the lobby floor until police cut them loose and removed them.



Police remove one of the protestors from the lobby



On the protest line



Marchers blocked traffic and chanted anti-NAB slogans



LPFM supporters gathered outside the convention center



Clear Channel's market dominance was a protest target

ENGINEER PROFILE

Pressman Presides at Radio Unica

Robert Rusk

At first glance, Gloria Estefan, Ricky Martin and Roy Pressman may seem to be an unlikely trio. But look closer and you'll see that all three are in the same business: bringing entertainment to the fast-growing U.S. Hispanic population — and all three even share the same city in their address: Miami.

But while Estefan is busy "Falling in Love" and the hip-swinging Martin is pre-occupied with shakin' his bon-bon, Pressman is content to be at his workbench located at the corporate headquarters of Radio Unica.

The company bills itself as the nation's only 24-hour-a-day, seven-day-a-week Spanish-language network. He has been with the network since it launched in 1998.

I like to refer to our equipment as tools that allow us to accomplish our goals.

— Roy Pressman

At 46, he has been in radio engineering for about 25 years, and is the head of engineering at Radio Unica's network operations. His official title is senior vice president/technical operations, which means he oversees technical expansions at the network's owned-and-operated stations.

Daily challenges

"We're doing a number of projects simultaneously — transmitter build-outs, improvements and studio work," said Pressman. "One of my biggest challenges is to keep all of this on track, while making sure that we keep our standards high."

For example, he said, "At all of the network installations that we build out, we're looking for a very long timeframe for the facilities to stay up and running without any major (technical) problems. So that means we have to design the right systems with the right equipment."

"The advantage of that, obviously, is we'll need limited personnel to maintain the equipment. We try to build what we call 'bullet-proof' facilities. That doesn't mean they aren't going to suffer through some technical difficulties. But what it does mean is they will need a minimal amount of maintenance."

Pressman said, "We're typically dealing with very small staffs at all of our facilities, with the majority of the engineering (assistance) coming out of Miami."

Specifically, he said, "We have one operations person (OP) — and that's not an engineer — at most of our

facilities."

He explained that an OP's duties cover "what a chief engineer used to do. They do everything that involves technical matters with the radio station, including: making sure that the computers are running properly, editing audio, and overseeing our Dalet systems."

The OP's routine duties include other daily responsibilities, as well. Indeed, Pressman said, "They wear a lot of hats."

While most of the OPs are men — not surprising in a job area that traditionally has been dominated by males

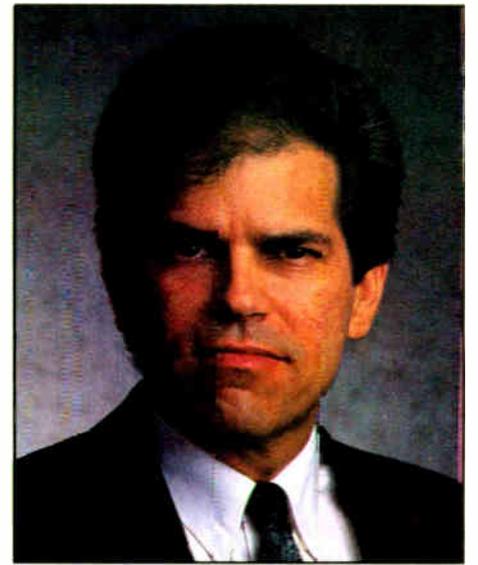
— Pressman said, "In New York, we have two people who oversee technical operations. One is male and the other is female. We do have a number of female employees."

Assistance

Assisting him is a network-based operations director who oversees OPs at the O&O stations. He also has a staff of four engineers based at Radio Unica headquarters in Miami, who travel to affiliates on an as-needed basis.

"I typically travel twice a month and stay as long as I'm needed in a

See PROFILE, page 35 ▶



Roy Pressman

Introducing AXS3: Scott Studios' Affordable New Digital System

AXS (pronounced ax'-cess) 3 is the *third generation* of the most popular digital automation for radio! AXS is in its *second decade* as the *premier* satellite system and digital cart replacement.

AXS 3 is also radio's first *affordable* music on hard drive system with *triple overlap to three separate console faders*. Your live jocks get the ultimate in level control and mixing ability. For unattended operation, AXS 3's voice trax auto-fades music under voices smoothly, bypassing the console.

Air Studio Production Bonus: AXS 3 also gives you *another* stereo production output and record input. You can record and edit phone calls or spots and auto-delay news and audition them in a cue speaker while playing triple overlap on the air!

Premium Hard Drives: The 3 also tells you that AXS 3 gives you a *3 year limited warranty* on hard drives. AXS 3 uses *exceptionally reliable and fast 10,000 RPM 18GB (or 20GB) hard drives* from top quality suppliers (like IBM, Seagate, Western Digital and others you trust) to keep your precious commercials, jingles and other recordings *always* at your fingertips. Other systems cut corners with slower and less reliable drives that sometimes choke and sputter with triple overlap and music from hard drive. AXS 3 won't jeopardize your cash flow with unreliable drives that might crash.

Awesome Sound Quality: AXS 3 uses only the best *non-proprietary +4 balanced digital audio cards* by Audio Science. These are also sold by most of the major brands of digital systems, but only in their top-of-the-line models costing *lots more* than AXS 3. Scott Studios uses premium audio cards in all our systems, although AXS 3 software will work with any good Windows sound card. Of course, if any card develops a problem, we'll replace it under warranty. You'll also be able to get these non-proprietary audio cards from us, the manufacturer, and several other vendors of high end digital audio systems.

Easy to Use: AXS 3 was *designed by jocks*, for jocks. It's 100% intuitive. AXS 3's big on-screen intro timer and separate countdown timers on every deck make pacing a snap.

If you know how to work cart decks, you know how to work AXS 3. It's so simple, everyone can run it! AXS 3 has *big* buttons. Other systems use complex multi-step mouse mazes. AXS 3 gets things done with one simple touch.

MP3 Import: AXS 3 plays MP3's, MPEG II and uncompressed (linear) recordings.

The Music's Easy: AXS 3 is delivered with *your* music library already pre-dubbed for you at no extra charge. AXS 3 also comes with Scott's time-saving TLC (Trim, Label & Convert) CD Ripper software. It runs in your Program Director's computer and uses a CD ROM drive to digitally transfer 5 minute songs to hard drive in 15-30 seconds.

The Best Voice Tracking: AXS 3 works with Scott's optional Voice Trax. Announcers hear surrounding music and spots in their headphones in order to match their voice to the moods and tempos of the music.

The Best Air Studio Recording: AXS 3's built-in recorder has a graphic waveform editor for ease of recording and editing phone calls, spots, news or announcer lines. AXS 3's log editor lets you add new items to your schedule.

Quality Hardware: You get an industrial Pentium III rack mount Windows computer and a 1RU (1-3/4") tall case is available when space is tight. Jocks can use a keyboard or mouse, or optional button box or touch screen for fast control.



Jocks love AXS 3, (shown with Scott Studios' 1RU rack mount case and optional flat panel touchscreen). AXS 3 works with three cart players on the right side of the AXS 3 screen. The program log (at left) automatically loads the decks, or you can insert anything from pick lists. The far left of AXS 3 has 12 Hot Keys that can play any time at a touch of a Function key.

The Best Tech Support. Toll-free emergency phone support is available 24 hours a day, 7 days a week (including holidays). Software updates with new features are available for AXS 3 customers several times per year to stations on our annual support plan.

Easiest to Install: AXS 3 comes with a pre-wired connections to CAT5 LAN cables for snap-in installation on the AXS3 end of the wiring. Satellite control logic is also a plug-in snap. Your first two satellite audio connections for music format and news network, as well as another for your production console, are built into AXS 3 so interface cards or external switchers are not required.

LAN and WAN: AXS 3 and other MPEG and uncompressed WAVE Scott Systems use the same recordings. You don't have to dub the same spot several times for several stations.

The Best Production Studios: AXS 3 is compatible with popular multi-track systems you may already have, like Sound Forge, Vegas, Cool Edit Pro, Fast Edit and others. Simply add our time-saving \$500 no-dub instant LAN spot upload option.

AXS 3 is Affordable: Satellite AXS 2 systems start at \$7,995 including built-in GPI and switcher. Triple overlap AXS 3 includes AXS 2 and adds 18GB of music on hard drive for only \$9,995 delivered. For details, check scottstudios.com or axs3.com or call 800-SCOTT-77.

(972) 620-2211 FAX: (972) 620-8811

(800) SCOTT-77

See AXS3 at NAB
Booth 1736

Scott Studios
13375 Stemmons Freeway, Suite 400
Dallas, Texas 75234 USA

You know this audience.



But do you know *this* audience?



MeasureCast Streaming Audience Measurement Service™

now you know

Call us today at **877-840-6800**, or visit us online at **www.measurecast.com**

USER REPORT

TWOx12: Putting ISDN to Work

This story was intended for the Sept. 27 Buyer's Guide section of RW. The author, Michael Black, is general manager of WEOS(FM) in Geneva, N.Y., and executive producer of the NCAA Lacrosse Radio Network.

We all know of what ISDN is capable. Those great sounding remotes, stereo, mono, splits, bidirectional audio ... all on one copper pair from Ma Bell.

However, most broadcasters, at least in the United States, look at ISDN as just that: a remote broadcast mechanism, and not much more.

Instead, ISDN is a phone line just like our POTS lines we have used forever to place callers on the air for contests, talk shows and remote broadcast situations. Even if we acknowledge the fact that basic ISDN gives us two separate POTS phone lines, it was not likely we would be using our audio codecs in these situations, as most are really not set up to handle that kind of situation easily, or we lack the control we desire.

In addition, it would be nice to mix ISDN and POTS lines in the same environment, with one control mechanism.

Flexible

Enter the Telos TWOx12, based on the new Telos Two Digital Hybrid. This new "on-air" phone system, gives us the ability to use ISDN the same way we would use POTS, with each ISDN line giving us two phone lines per copper pair.

The system consists of the rack mount hybrid/controller, capable of mixing ISDN and POTS lines in the same unit, giving the end user the ability of up to 12 lines, and the user control surfaces that feature combined telephone, speaker phone and control capabilities.

previous Telos control surfaces are included, including remote contact starts for record or dumping a delay device, the ability to mash calls, and the "all busy" function.

Two, count 'em two

The guts of the TWOx12 is the Telos Two hybrid, which is integrated into the system that provides the control features all in one two rack space box.

The Telos Two hybrid is two hybrids,



not one. Each hybrid is independent, and through menu soft key selection, a variety of operating modes can be selected, depending on your situation. For large studios, where you can provide separate mix-minuses, the Telos Two behaves as two separate hybrids.

However, you can provide one mix minus to the unit, and it will provide a truly independent mix minus internally for the seconds hybrid, thus saving a bus on your console. No more funky sounding mix-minus bleeding or separation loss that some hybrids provide in creating their own mix-minuses.

Instead, the callers are not only sepa-

between the Telos TWO, a Telos Delta, a Telos One and a hybrid from another supplier. We made test calls to phone numbers both long distance, and local, with each hybrid, multiple times to the same numbers, to allow for different paths.

In all cases except one, we found the Telos TWO to be superior to all the hybrids on the ISDN calls. We had slightly better performance from the Delta to one local number that we know is always bad (poor phone company line and \$9 phone).

On the POTS lines, we found the Telos TWO to sound better or as good as the Delta, and better than the competition.

I would be remiss in not adding that the Telos TWOx12 allows for integration with remote control software, for call screening and production, including the Telos Assistant Producer, which

works nicely, and does not require a server PC, as other phone systems. Instead, it uses a LAN 10BaseT connection, and can be controlled via TCP/IP from the remote computer.

It can even run over a corporate LAN or WAN from a distance, which has many applications in today's remote environment. In addition, the same LAN connection is used to upgrade the software of the unit.

With a couple of menu button selections, the operating software is upgraded and stored in the unit. Not to be caught with a bad software, the older software is preserved, so that you can revert back to it, in case there is any difficulty. The software upgrade ability of the unit, and capability to add features with data and control ports on the unit, are pluses for the TWOx12, allowing for future enhancement, and the ability to handle AES/EBU audio now, allows for easy conversion to an all digital environment.

I have been pleased with the performance and ability of the Telos TWOx12. It is priced similar to other Telos and competitors' phone systems, with similar capability, but takes advantage of the better performance of digital phone circuits, increased hybrid isolation, and the resulting better sounding phone calls.

If you are building a new studio or looking for a phone system for on air use, especially for talk programming, the Telos TWOx12 should not be overlooked.

■ ■ ■

For information about this product, contact Telos Systems in Ohio at (216) 241-7225 or visit www.telos-systems.com

The Telos TWOx12 allows for integration with remote control software.

Each "line card" can handle two ISDN lines, or three POTS lines, depending on the configuration. The control surfaces are flexible, and can be configured based on its desired function, with simple soft key menu selections, to act as a talent control surface — punching the calls up on air, or as a producer/screener phone. This makes for less workspace clutter in the control room by not having a separate screener phone, but still provides a lot of flexibility in operations.

The control surfaces also are striking in design, and the icons and menu screen are bright and easy to read in both dark or bright control room environments. The double row of buttons allow for assigning the calls to each hybrid independently, or for selecting which call is next, depending on how the surface is configured.

Muting control is provided to kill the ringer upon opening a mic, or the volume of the ringer can be controlled from very loud to silent. A lot of the functions on

rate, but sound clear and crisp. You also have the option to mix both outputs together, so that both hybrids can be brought up on one fader.

One special mode allows the Telos TWO to operate without a mix-minus bus available. The feed-through mode allows the hybrid to operate in series with the console, and still provides optimum performance. It is like the audio equivalent of the down stream keyer in a video switcher, and does not tie up any fader inputs.

This may be ideal for tight installations, last minute remote broadcasts, or those add ons at the last minute. Additionally, the Telos Two gives you a lot of "handles" on the quality of the sound, including the processing, AGC, over levels, EQ and more. Those readers familiar with Telos DIM or 1A2 interface know that you have to add hybrids to the phone interface. Not the case with the TWOx12, as this is all included. As for hybrid performance, we did a comparison



RADIO FREQUENCY SYSTEMS

RFS Broadcast




Total Systems Solutions for FM Radio



- Complete RF Systems for FM Radio
- Broadband or Single channel
- Feeders, rigid line, switching units, pressurization equipment
- Range of combiners from Starpoint through to Balanced
- Horizontal, vertical and circularly polarized applications

RFS Broadcast
59 Dodge Ave
North Haven CT, 06473

tel +1 203 239 3311
 fax +1 203 239 9260
info@rfsbroadcast.com

LAUGH AT LIGHTNING!



UNINTERRUPTIBLE
POWER SYSTEMS

1-800-356-5794

WWW.BESTPOWER.COM

THE LPFM EXPERTS
LPB can help you:
FIND a frequency APPLY with the FCC
BUILD your station

LPB

www.lpbinc.com
LPB Communications, Inc.
877-572-2666

MANUFA

DESCE

RALEIGH

Gentner®

800-945-7730
www.gentner.com

orban

Experience the newest technology
popular manufacturers at Cindy's
South East regional trade show.

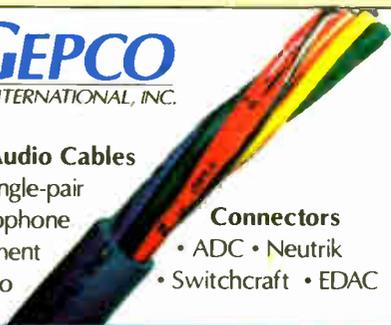


Audio Cables

- Multi-pair • Single-pair
- Speaker • Microphone
- Guitar/Instrument
- Digital Audio

Connectors

- ADC • Neutrik
- Switchcraft • EDAC



Quality Audio and Video Cable Products

360 Systems®

Please visit us at our website:

www.360systems.com

Ph: 818-991-0360 Fax: 818-991-1360



SIERRA AUTOMATED SYSTEMS



WATCH US GROW!

New Phone: 800-262-8912

New Fax: 877-262-8910

HARRIS

Call Cindy
800-
Fax: 82
Email: cedw

27 EXHIBITORS!

SESSION TOPICS

- Gentner (new) VRC2500
- Comrex (new) Matrix
- Orban (new) 8400
- Dielectric Skytiller
- SAS Switchers

World Radio History

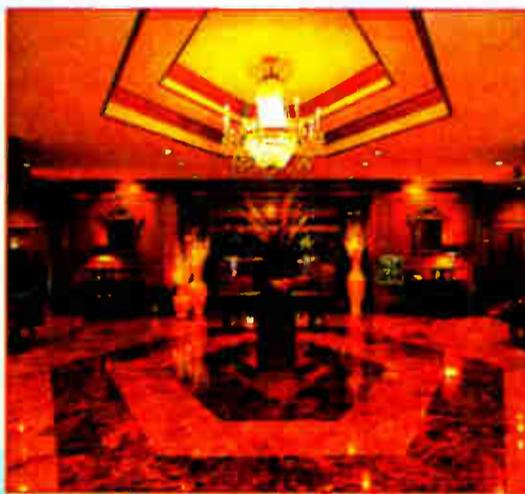
FACTURERS

ND ON

DURHAM

from the most
Expo, the Harris

Cindy Edwards
869-7623
869-2691
cedar05@harris.com



Radisson Governors Inn
Raleigh/Durham, NC

**WHAT,
WHERE AND WHEN?**

- Cindy's Expo
- Free Admission
- Complimentary Breakfast, Lunch and Dinner
- October 25, 2000
9 AM to 8 PM
- Radisson Governors Inn in Raleigh/Durham, NC
- To register call Cindy Edwards at 800-369-7623 or at

www.broadcast.harris.com/roadshow/12th-annual-expo-nc.html

Symetrix

Make Sure to Check
Out the NEW 506E Headphone Amplifier!

Ask Cindy About Our "SHOW HEADPHONE AMPLIFIER SPECIAL"

www.symetrixaudio.com

COMREX

STOP BY OUR BOOTH TO
SEE WHAT'S NEW!

800-237-1776

WWW.COMREX.COM



Dielectric
A Unit of SPX Corporation

For all your FM needs
Antennas...single and multi-station
Combiners...Filters...
Switches...Transmission Line...

For information contact:
Matt Leland
1-800-341-9678
email: matt.leland@dielectric.com

**ADL
SYSTEMS**

HARRIS



**Orban Audicy
Digital Audio
Workstation**

**Intraplex
STL Plus**



**Harris Z
Series**



PR&E Impulse Digital Console



Joaquin Araya

LPFM: Political Horsefeathers?

RW welcomes other points of view. Write to us at the address on the inside back page or via e-mail at radioworld@imaspub.com

Dear RW,
Let's face it folks, regarding LPFM, this is purely big dollars doing all the "thinking." The big boys and their big dollars are what are driving these decisions, not common sense.

I'm disgusted by how lobbyists give

the money to Congress — when it's not in the public's interest, only the companies' interests, and Congress helps them all out.

The cell phone industry is one example of this corporate greed. Don't impose security standards on the cell phone industry — instead pass laws to limit the radios that Radio Shack can build that can eavesdrop on cell phone conversations.

Now the NAB is showing off their muscle. Truly no public interest here, folks. LPFM is more political horsefeathers.

*John Pavlica
Engineer
Toledo, Ohio*

Dear RW,
Attention high-paid suits who can't stop whining: Somewhere in my childhood I learned that for whatever action, there's an equal reaction of some sorts.

It took another two weeks before he was fired again, and only after he started saying bad thing about station management.

Finally let me relate to you a recent event in which my power was out for eight hours, and, I discovered after I ventured out, two city blocks were closed ... closed for 12 hours due to a humongous traffic accident where a car smashed into a power pole. Think this would make news? *No!*

Every station in my community has escaped to the next largest community, down the road. While my so-called news station continued to broadcast some New York satellite program that discussed sexual problems, traffic began to pile up, and I got more and more steamed, because my community of 2,500 citizens is too small for the dozen or so currently licensed stations to care about. Even in an emergency!

So you'll pardon me, but if a low-power broadcaster manages to sandwich in a station that represents *me*

allotment limited to 2.0 kW ERP and 107 m HAAT or the equivalent toward channel 252A in Cabano, Quebec — Accepted by Canada 960911.

WCXX(FM) 102.3 Madawaska, Maine
Specially negotiated, short-spaced allotment, limited to 3.0 kW ERP and 100 m HAAT or the equivalent along the 70.9 degree azimuth toward channel 271A in St. Quentin, New Brunswick and along the 278.3 degree azimuth toward channel 273A in St. Athanase, Quebec and along the 307.6 degree azimuth towards channel 272A* in St. Francois Assise, Quebec — Accepted

See LPFM, page 35 ▶

THE LPFM EXPERTS
LPB can help you:
FIND a frequency
APPLY with the FCC
BUILD your station



www.lpbinc.com
LPB Communications, Inc.
(610) 644-1123

PRODUCTS for EVERY
BROADCASTER

from the
Specialists in Practical Precision Engineering™



Toll free (800) 281-2683
Local (805) 684-5415
Document Server (800) 391-0017
Web Page www.rdinet.com

Does your company offer a product or service related to LPFM?

Place your ad on this page.

Call the Radio World Ad Sales Department today (800) 336-3045, ext. 154 for more informatio

Eddie Fritts and the NAB, you should be ashamed of yourselves. You are a disgrace to broadcasting.

— William C. Walker

When a few dozen corporations decided that they should have control of every radio station in the entire country, program them all the same, and fire or otherwise not hire people who wanted to broadcast, you created a bunch of people with no alternative than to broadcast without a license.

These "pirates" would not be so if they had a legal outlet. *You created* this "mess," and I really wish you'd stop whining!

You say pirates are loose cannons? Let me remind you of an announcer I call "Mad Dog" who was fired from one station in San Francisco for demanding that all Asians be deported. He was immediately rehired on another "hate-talk" station and incited telephoned death threats against an elected official.

and my community, even if he interferes with one of your monolith stations, it's got to be better than this!

*Allan Murphy
Forestville, Calif.*

Dear RW,
Mr. Eddie Fritts has been very worried about interference from potential LPFM stations to existing full-power broadcast stations. Upon further review it would seem as though he has very little to worry about when you consider how many short-spaced stations that are either on the air or have applied for special consideration for new stations. Examples:

New station, 98.1 Van Buren, Maine
Specially negotiated, short-spaced

GOLDENEAR. know the TRUTH about LPFM



AUDEMAT
by AUDITEM

www.audemat.com
Ph: 978-392-2110
Fax: 978-392-2287

World Leaders in Low Power FM



For full details of the complete sbs low power FM product range
Contact:
Broadcasters General Store
(352) 622 7700

CCA Turn-Key LPFM Systems



- Transmitters
- Mixers
- Mics
- Transmission Line
- Antennas
- Wireless Feeds

3 YEAR WARRANTY

Simple-Affordable-Reliable
Phone: 770.964.3530 Fax: 770.964.2222

THE REVOLUTION

Radio



365

Thirty Years of Racing Radio

MRN Brings Sound of NASCAR to Fanatical Supporters Around the Country

Paul Kaminski

Three decades ago, NASCAR Winston Cup racing enjoyed a cult following in the Southeast.

Part of its transformation into a mainstream sport can be traced to William H. G. "Big Bill" France, the founding father of NASCAR and International Speedway Corp. In 1970, he decided to win more media exposure for the sport.

France's decision to broadcast races from the International Speedway tracks on what was then called the Motor Racing Network made Sunday afternoon more enjoyable for racing fans. The action also provided local stations with alternative programs for a growing base of NASCAR fans.

From that start in 1970 with a launch of less than 100 affiliates, the network now known as MRN Radio grew to an affiliate base of 650 stations. The company aired lap-by-lap coverage of NASCAR's Winston Cup, Busch Grand National and Craftsman Truck series for more than 80 events a season.

The network also produces other broadcasts, including "NASCAR Live," a weekly talk show hosted by Eli Gold; "NASCAR Today," a daily NASCAR news show; and "Ned Jarrett's World of

Racing," the longest-running daily syndicated racing radio program featuring NASCAR racing personalities.

MRN Radio's headquarters are located at Daytona USA in Daytona Beach, Fla., with a state-of-the-art broadcast and production studio overlooking the exhibits. The network fields two tractor-trailer-sized production units and is building a third.

It can connect from its permanent fiber-optic uplink in the Daytona International Speedway infield or use a portable satellite trailer that follows the MRN production vans to each venue.

In its 30th year, MRN recently added a program for Sunday mornings called "NASCAR USA: Country Music at the Speed of Sound." Described as America's tailgate party for Winston Cup races, the program calls upon the talents of one of its most recognizable voices, pit reporter Jim Phillips.

Phillips is a veteran broadcaster with WNPC-AM-FM in Newport, Tenn. and a former crewman on the L. D. Ottinger NASCAR Busch Series team. It's that experience with Ottinger that gives him insight into what the crew chiefs are doing.

"They can't throw me too many curves," he said. With Winston Kelley and Marty Snider, he patrols pit row for the MRN race broadcasts.

Phillips got his start with the network in the 1988 season when MRN was looking for two pit reporters to replace Dr. Jerry Punch and Ned Jarrett and the Ottinger team was leaving the Busch Series.

He brings his racing experience and 30 years of country music programming to the show.

Veteran anchor Barney Hall provides a flashback segment, while Joe Moore and Winston Kelley bring live race-day updates from the pits and garage area at the Winston Cup events.

Delivering history

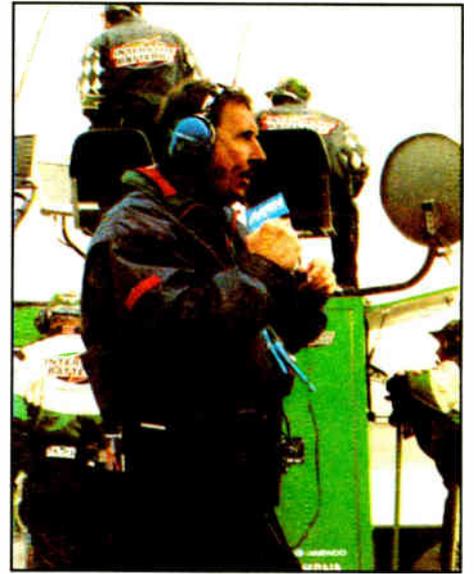
Thanks to the deep MRN archives, Hall can talk about a pivotal moment in a race and back that up with a clip from the race. Then Phillips will play a country song that was popular during that time.

"It (the show) isn't like most similar shows, because it's sent live via satellite, and not on CD or tape," said Phillips, who thinks that, with the addition of Moore and Kelley's live updates, gives "NASCAR USA" an edge over similar programs.

Nearly 100 stations joined MRN Radio for the launch of "NASCAR USA" in February.

Moore stated one of the sport's most recognizable names is a big country music fan — seven-time Winston Cup Champion Dale Earnhardt.

"He likes the traditional country along



Veteran MRN pit reporter Jim Phillips works the pits of Joe Gibbs Racing driver Bobby Labonte at Darlington Raceway

with modern country," said Moore of Earnhardt. "And Sterling Marlin (driver of the 40 Sabco Chevrolet) likes his country, too."

Next year, the Winston Cup Series expands to two new venues: Kansas City, Kan. and Joliet, Ill. With that, MRN will be poised to bring events from those two new venues, part of a 36-race schedule, which traditionally begins with the Daytona 500 in February.

■ ■ ■

Paul Kaminski is the news director for the Motor Sports Radio Network and gets to watch MRN's crew work regularly.

One Question, Three Answers

An actual email thread, June 8-11, 2000 on broadcast.net

Thursday, June 8, 2000
To: bsi-i@broadcast.net
Subject: BSI Experiences?

We are a small AM station considering implementing BSI software to automate our station. It seems to have all the functionality that we would need. Is this a good solution? Thanks for your input.

- John

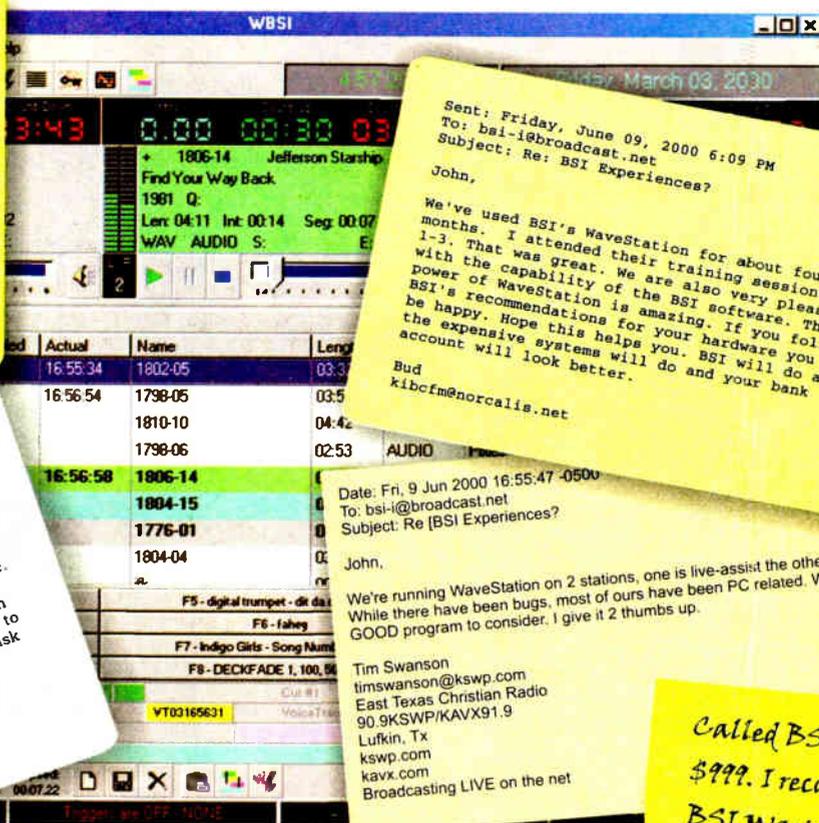
Sent: Sunday, June 11, 2000
To: bsi-i@broadcast.net
Subject: Re: BSI Experiences?

John,
We started using WaveStation in January and are extremely pleased with it. It's been running glitch free.
We use it weekdays in live assist to play our spots, PSA's, etc. and on weekends in full-automation. At 1p.m. both days, we lock the door and leave. WaveStation plays programs recorded earlier, picks up some programs live from satellite...joins news live at the top of the hour...records a couple of sports updates for playback a few minutes later...fades programs out...runs fill music...fades fill music, etc.

We currently have only one computer set up for WaveStation. We will probably purchase a second one in the not too distant future.
Perhaps it's a sad commentary on life, but WaveStation is much more reliable and dependable than the human beings we used to use...and "Wave Station," as we call the system here, doesn't ask for vacations or pay raises.

By the way, we are a small town AM station also.

Bob Ketchersid
WYXI, Athens, TN



Sent: Friday, June 09, 2000 6:09 PM
To: bsi-i@broadcast.net
Subject: Re: BSI Experiences?

John,

We've used BSI's WaveStation for about four months. I attended their training session June 1-3. That was great. We are also very pleased with the capability of the BSI software. The power of WaveStation is amazing. If you follow BSI's recommendations for your hardware you will be happy. Hope this helps you. BSI will do all the expensive systems will do and your bank account will look better.

Bud
kibcfm@norcalis.net

Date: Fri, 9 Jun 2000 16:55:47 -0500
To: bsi-i@broadcast.net
Subject: Re: [BSI Experiences?]

John,

We're running WaveStation on 2 stations, one is live-assist the other fully auto. While there have been bugs, most of ours have been PC related. WaveStation is a GOOD program to consider. I give it 2 thumbs up.

Tim Swanson
timswanson@kswp.com
East Texas Christian Radio
90.9KSWP/KAVX91.9
Lufkin, Tx
kswp.com
kavx.com
Broadcasting LIVE on the net

- More than 2500 systems installed worldwide
- Software or complete systems starting at \$999
- Windows 95, 98, NT or 2000, free upgrades
- Four-track audio editing
- Traffic & Music import
- SayTime & SayTemp
- Remote VoiceTracking
- Multiple stations on one PC
- Dynamic web page generation
- Linear and/or compressed audio (WAV, MP2, MP3, BWF)

Called BSI... it's only \$999. I recommend we get BSI WaveStation. Plus their tech support is free!

JS



888-BSIUSA1
WWW.BSIUSA.COM
Broadcast Software International

LPFM

► Continued from page 32
by Canada 940207 — specially negotiated, short-spaced allotment limited to 3 kW ERP and 100 m HAAT or the equivalent along the 70.9 degree azimuth toward channel 271A* in St. Quentin, New Brunswick and along the 278.3 degree azimuth toward channel 273A* in St. Athanase, Quebec and limited to 10.7 kW ERP & 100 m HAAT or the equivalent along the 307.6 degree azimuth toward channel 272A* in St. Francois Assise, Quebec.

WOZI(FM) 101.9 Presque Isle, Maine
Specially negotiated, short-spaced allotment limited to 2.7 kW ERP and 416 m HAAT or the equivalent along the 62 degree azimuth towards 270B* in Allardville, NB and 3.6 kW ERP and 328 m HAAT or the equivalent along the 18.1 degree azimuth toward 271A* in St. Quentin, New Brunswick. Accepted 980930.

These are just a few examples. I suspect that many more of these stations exist throughout the country.

Proponents for LPFM need to have their technical engineers research these stations and others just like them to determine the effect that they are having on other nearby stations. I doubt that any adjacent channels are experiencing any interference as a result of these lower-power FM stations getting shoehorned into the dial.

LPFM is more political horsefeathers.

— John Pavlica

If the NAB really believes that these 100-watt and 10-watt Low-Power FM outlets are going to interfere with the higher-power stations then they should do something about the existing crop of short-spaced stations that are already on the air. They may be causing interference to existing stations based upon the NAB theory. What a sham!

Eddie Fritts and the NAB you should be ashamed of yourselves.

You are a disgrace to broadcasting.

William C. Walker
Proprietor
KWAQ(AM)
Lee's Summit Mo.

Profile

► Continued from page 27
market, depending on what we're doing there," said Pressman. "Right now we're completing our new studio facility in San Antonio, and I'll be there for about a week to oversee that." The station is KZDC(AM).

He said, "We have a design for studio and transmitter facilities that's a cookie-cutter approach. It's very redundant and resilient, and most problems can be rectified from our central office in Miami."

On his shopping list of equipment, Pressman said, "There aren't a lot of toys — but we do use the best equipment available. I like to refer to our equipment as tools that allow us to accomplish our goals."

At all of the network installations that we build out, we're looking for a very long time frame for the facilities to stay up and running without any major (technical) problems.

— Roy Pressman

Explaining the main facility in Miami, Pressman said, "This is not a single radio station, it is a network headquarters. We have 14 state-of-the-art studios, with technology that works now and will serve us for the next five years."

Pressman's specific building blocks include Pacific Research & Engineering consoles, Neumann microphones and the Dalet Digital

Media audio management system.

"Aside from dealing with computer-based storage," he said, "we're using Sony DAT, Denon CDs, can record CDs with a number of different burners, and use a system that allows us to burn six CDs simultaneously for sending out audio or whatever is needed to our affiliates."

Radio Unica generally sends one show a week on the road and for those remote broadcasts, Pressman said, "We use the Comrex Vector. We back that up with the Comrex HotLine. And when available, we use the Telos Zephyr."

Additionally, Radio Unica uses the Telos digital hybrid equipment at network headquarters in Miami.

"We have also built our facility in Los Angeles to mimic what we have in Miami," he said. "That way, if a hurricane — for example — was headed toward Miami, we could use the L.A. facility."

For Pressman, working with all of the latest technology is a far cry from



the cumbersome reel-to-reel tape he used back in the 1960s — when, at just 11, he became a ham radio operator and was quickly hooked on engineering.

"I eventually found myself working with bigger and bigger radios," he said. "At Radio Unica it's been a great opportunity to build an entire network from scratch."

Radio Unica Network Roster

Radio Unica stations reach about 80 percent of the U.S. Hispanic population, with owned-and-operated stations in the top Hispanic markets, including New York, Los Angeles, Chicago and San Francisco.

Pending FCC approval, the network will acquire a station in Pittsburg, California (near Oakland) and move its base of operations to Sacramento, Calif. Under the proposal, the network's San Francisco station would then "significantly increase power."

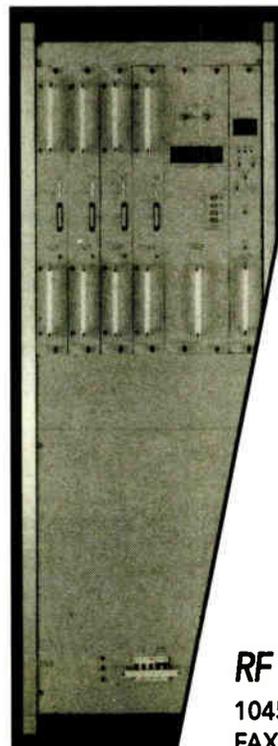
In addition to the O&Os, Radio Unica has affiliates in Hispanic markets throughout the country, ranging from Washington, D.C., to Portland, Ore.

For more on Radio Unica log onto the network's Web site at www.radiounica.com

Value is what you get

What are your hot buttons?

-  Performance
-  Reliability
-  Sound quality
-  Digital broadcasting
-  Multiple hardware options
-  Solid state or tube options
-  Software based control
-  Hot pluggability
-  Redundancy
-  Efficiency
-  Ease of service
-  24-hour support
-  Volume-based rebate



Price is what you pay

And why pay more:

Looking for a new transmitter, and think you'll have to settle for tube-type? Bext can offer state-of-the-art solid state FM transmitters at tube prices.

In fact, we'll beat anyone else's price for any-sized FM transmitter of comparable quality.

So call Bext whenever you're getting quotes for that new main or backup transmitter, and give yourself an opportunity to get the value you deserve, at a price you deserve.

Bext. Specialists in RF. And a whole lot more than a great price on well-designed, well-built RF equipment with all the bells and whistles.



RF innovations for the broadcast world since 1985

1045 Tenth Ave San Diego CA 92101 • USA • 619-239-8462
FAX: 619-239-8474 • mail@bext.com • www.bext.com

GM Journal

4th
Quarter
Promos

See
Page 38



Radio World

Resource for Business, Programming & Sales

October 11, 2000

MARKET WATCH

Las Vegas, Beyond Neon & Glitz

Steve Sullivan

Welcome to a top-40 market where the soft sounds of yesterday rule the airways. A place with a name that sweetly translates to "The Meadows."

Here, a craft show draws tens of thousands of people. It sounds so doggone nice you'd think you were in Pleasantville.

Exploding volcanoes, roller coasters, bungee jumps and circus acts are some of attractions that casinos and big hotels have added in the past decade. And the rest of the country has noticed, according to Las Vegas Review-Journal's David Mirahadi.

Some hotels, like Circus-Circus, even market themselves as a family destination. But Las Vegas residents, with fami-

"When you ask Las Vegans to come out for a cause, they show up. We helped sponsor a blood drive that brought record donations. And when we co-sponsored a craft fair, more than 50,000 people turned out."

Sales are good in Las Vegas. Ranked the 40th market by population, it is 38th when it comes to revenue. Estimated revenues grew at a 17.2 percent rate between 1993 and 1998 and are expected to top \$86 million this year.

Infinity led the way in revenue in 1999, having posted \$24.6 million in sales, followed by Clear Channel's \$18.5 million.

Positive revenue growth

Clear Channel's Ginsberg said he's seen positive revenue growth in each year he's been in the market.

"In most cases, it's been double-digit growth. Like everywhere else, automotive is big for us. But the biggest difference here from other markets is that our real moneymakers are the hotels and casinos."

Ken White, media reporter for the Las Vegas Review-Journal, said that it's not just the establishments on the Vegas Strip that you hear advertising.

"I'm not sure how many tourists listen to the radio, and most of the locals don't go that often to the big casinos. But there are lots of casinos located in the neighborhoods, and you hear lots of commercials for them."

Ginsberg has worked in the market for 12 years, during which time Las Vegas has been the fastest-growing city in the United States.

"No other city in the nation grew as fast as we did during the past decade. Every month more than 10,000 people move to Vegas," Ginsberg said.

And new Las Vegans, Ginsberg said, are of two easily identified groups.

"People come here because the cli-



From left: Joseph Cannella, general manager of the Longhorn Hotel and Casino; Ben Eilermann, winner of the 2000 KQOL-FM 'Rib-Eating Contest' at the Longhorn; and KQOL-FM morning man, the Big Kahuna

But we're talking Las Vegas — America's Playground; The Strip; Sin City.

Las Vegas built its reputation on the gaudy gambling casinos, bright lights and big-name entertainment that it markets loudly to the rest of the world.

While those images figure heavily into what makes this radio market unique, there are other, somewhat surprising characteristics of the city that help define Las Vegas radio.

lies or not, find other entertainments in Sin City, said Mike Ginsberg, market manager, vice president and general manager for Clear Channel's four stations in the market.

"The Strip is our 'mill' district," said Ginsberg. "We go there to work, but we don't play there."

Ginsberg said the listening audience is part of an active and caring community with diverse interests.

Las Vegas

Market Rank: 40
Market Revenue Rank: 38
Number of FMs: 17
Number of AMs: 12

Estimated Revenue (in \$000's):
1996: 45,700
1997: 53,700
1998: 63,100
1999: 72,600
2000: 86,400

Revenue Growth:
'93 - '98: 17.2%
'98 - '03: 13.7% (projected)

Local Revenue: 85%
National Revenue: 15%

1998 Population: 1,286,700

Per-Capita Income: \$17,418
Median Income: \$35,351
Average Household Income: \$44,940

BIA Financial network

Background: The Luxor Hotel

mate is good and the taxes are affordable. And the people who are coming here are, in large part, blue-collar workers and retirees."

The Las Vegas radio market, as Ginsberg puts it, is "an oldies war zone."

That's not surprising if you look at two things. First, when you consider the big-name performers associated with Vegas, names like Elvis and Sinatra quickly come to mind.

The second factor contributing to the popularity of the oldies sound is an unusual demographic predominance.

"If there's a single unique characteristic of the listening audience, it's that we've got so many retirees moving here."

See VEGAS, page 46 ▶

It's a Whole New Ballgame

Well-Rounded Systems and Technologies
for 21st Century Broadcasting

Software Hardware Support
Integration Customization Consultation

MANAGEMENT DATA
MEDIA SYSTEMS INC
mdata-us.com

6193 Finchingfield Road Warrenton VA 20187

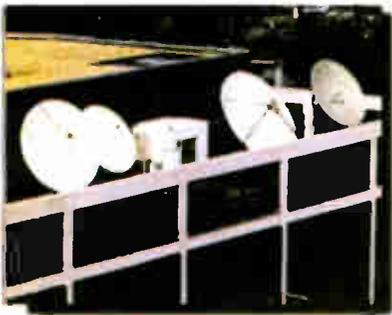
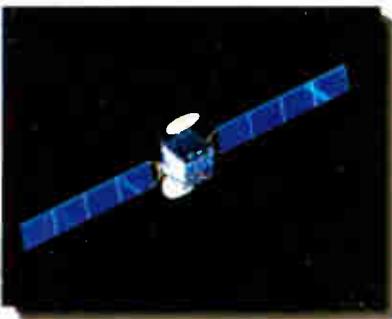
Tel 540-341-8550 Fax 540-341-8565

One-size-fits-all Satellite.

Some vendors think it's great. But it can really squeeze you, the broadcaster.



WE TAKE A DIFFERENT APPROACH.



We offer C- and Ku-band receiver alternatives under \$1,600 that let you customize your network. Long-term space commitments at a set price. Personalized packages that leave *you* in control



NPR Satellite Services

THE RIGHT FIT IN SATELLITE BROADCASTING.

202 . 414 . 2626

www.nprss.org/this

HOLLYWOOD

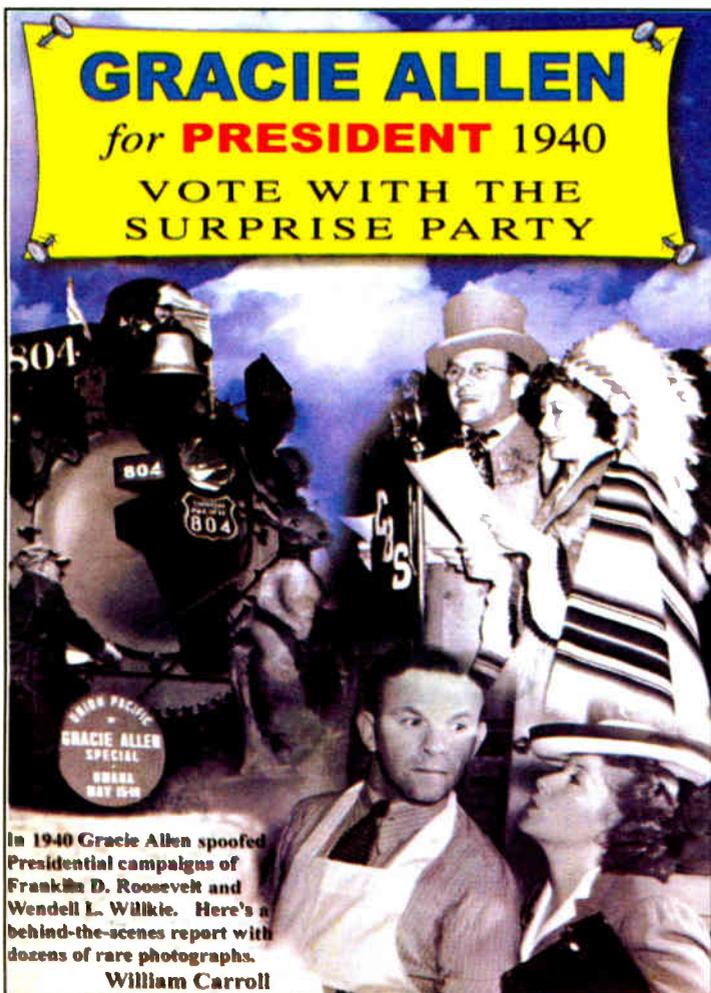
World Radio History

When Gracie Ran for President

Peter King

What started as a joke on the "Burns and Allen Radio Show" became a huge publicity stunt that gathered momentum during the spring 1940 whistle-stop train tour of the western United States for presidential candidate Gracie Allen.

Yes, *that* Gracie!



In 1940 Gracie Allen spoofed Presidential campaigns of Franklin D. Roosevelt and Wendell L. Willkie. Here's a behind-the-scenes report with dozens of rare photographs.

William Carroll

Allen, with husband George Burns at her side, really did run for president, in an eight-day, 34-city whistle-stop tour, a campaign that proved more successful than those of many of the so-called professionals who've run for the office in subsequent years.

While she never posed a "serious" challenge to incumbent Franklin D. Roosevelt or GOP challenger Wendell Willkie, her campaign was certainly different than those of the pros.

Photographer William Carroll documented the tour, and many of his previously unpublished photographs are contained in his book, "Gracie Allen for President 1940" (\$20, Coda Publications).

Carroll said there are several versions of the campaign's origin, but the most credible comes from a writers' meeting for Burns' and Allen's radio program.



Photo by William Carroll

Gracie and George in the Omaha Council of Whisker Clubs' torchlight parade, 1940

One writer voiced the opinion that they could get some mileage out of running Gracie for public office. Another suggested running her for governor, and a third writer reportedly said, "Governor? Hell, let's run her for president!"

In an early cross-promotion, Allen not only appeared on her radio show, she made guest appearances on other popular programs.

From Jack Benny to Fibber McGee and Molly and Dr. IQ, Allen answered hosts' questions with zany quips that have remarkable resonance to current-day politics.

Imagine George Bush or Al Gore using this one: "I can man-

age the White House — and I won't be taking in any roomers!"

Allen ran on the "Surprise Party" ticket. Her slogans? "Down with common sense, Vote for Gracie and Vote Often."

Her mascot was a kangaroo, with yet another slogan, "It's all in the bag."

The campaign wasn't just about fun and games; it was good business for Allen and sponsors involved in the tour. The "Gracie for President" tour was transported from city to city via a special train arranged by the Union Pacific Railroad.

And the tour meant higher ratings and sales for the sponsor of the "Burns and Allen" show, Heinz Honey and Almond Cream.

The train left Los Angeles on May 9, 1940, and made 34 stops on its way to its destination, Omaha, Neb.

Great campaigner

Who needed FDR or Wendell Willkie when they could vote for Gracie? Some 300,000 people turned out to hear and see Gracie (and George) in action in her eight-day campaign.

Carroll said entire towns would shut down.

"Businesses would close an hour before the train would get there. The schools would close, and (everyone) would cluster around the railroad tracks waiting for this train to come in."

What they heard was a 10-minute "speech" by Allen, whose typical remarks included, "My political platform is only temporary, I'm going to have it built by stage technicians because I know I won't need it after I'm elected president."

Or: "Presidents are made, not born, because very few people are born at 35 years of age. Wake up, America needs me and I can be had!"

But what role would George Burns have in an Allen White House?

"Allen told her faithful fans if she were elected president, George wouldn't have to work because it wouldn't be dignified.

"People would be whispering that I can't support him," Allen said.

Local politicians couldn't wait to get in on the act. In Omaha, Mayor Dan Butler became part of a lengthy routine on a half-hour "Burns and Allen" remote broadcast on May 15, 1940, from the city's AK-Sar-Ben Coliseum. (That's Nebraska spelled backwards.)

The exchange was taped. Here's a snippet of the mayor's interview with Miss Allen, spring 1940.



Photo by William Carroll

Nebraska Governor Leroy Cochran (left), William M. Jeffers, president of Union Pacific Railroad and presidential candidate Gracie Allen at the 1940 Surprise Party caucus luncheon in Omaha, Neb.

Butler: I would like to ask Miss Allen a few questions about her platform.

Allen: Why, Mayor Butler, is it showing?

Butler: Miss Allen, are you in favor of treaties with Europe and Asia?

Allen: No, I'd rather have treaties with sugar and cream.

Butler: What do you think of Senator Wagner's latest proposal?

Allen: Oh, I turned him down, *you're* more my type (laughter).

Butler: I know you won't have any trouble with the senate after you're elected, but will you be able to manage the house?

Allen: Oh, Danny Boy, for you, I'd even scrub floors!

Bill Carroll said the success of the campaign was a testament to the power of radio and the country's affection for Gracie Allen. He calls the response a "massive love affair" for a woman who was admired and loved almost universally.

"(Listeners) knew her voice, they knew the way she thought, she spoke for them. She came out and absolutely charmed them," he said.

Could something like this happen today? Probably not, said Carroll, because we've all become too skeptical and serious for anything like this to happen again, and most people "couldn't be bothered."

PROMO POWER

Ring in the Money: 4Q Promotion

Mark Lapidus

You're exhausted. During the past four months you squeezed in more than 50 appearances, 10 major concerts, four races and three huge trade shows. There's only one thing to do: prepare for the coolest promotions of the year — the Thanksgiving-to-New Year's period!



Jingle Bell shirt logos from the 1999 Roanoke, Va., Jingle Bell Run/Walk

Don't miss this annual opportunity to do good, make money and pull in more listeners. It's not too late to shake the tree and pull out one of these chestnuts of years gone by.

For example, the "W— \$10,000 Shopping Spree," which qualifies listeners to win a shopping spree at a local mall. The twist is that they must spend this money in the mall on the busiest shopping day of the year — the day after Thanksgiving.

They aren't allowed to cut in line. They must run every gift back to a central area. And oh ... did I mention that they had to do it in a very limited amount of time? Do this right and you'll have TV camera crews chasing a winner wearing your station T-shirt.

Allow the lucky shopper to donate any money they can't spend to their favorite charity.

Jingle Bell Run — Find out if the Arthritis Foundation has one going in your area. If they don't have a radio partner yet, or if they've never even heard of the concept, you're in business.

Here's the deal: It's a regular 10K race, except participants run with bells on their shoes and bright red Santa hats above their rosy cheeks.

I say rosy because it's cold outside! Unless, of course, you're reading this article on the beach in a year-round warm climate, in which case the runners wear bathing suits along with the hats & bells. (Perhaps this will give at least a few of them a different kind of rosy cheek.)

Proceeds benefit the Arthritis Foundation (or another group you've

See PROMO, page 44 ▶

Feeling locked in by your present hard disk delivery system?

MediaTouch is the key to freedom.

We set you free with standard "off the shelf" computer hardware, and we use industry-standard file formats like MP3, MPEG-II, and PCM.

MediaTouch's original Card Independence Technology gives you the freedom to choose any Windows compatible audio card for any workstation. This allows computers all over the radio station to share audio and work together without breaking the bank. Imagine your sales department auditioning commercials, and your program director inputting music from their desktops on any sound card.

MediaTouch's MAIN Solution lets you choose the Music, Automation, Internet, and News components your radio station needs. As your needs change, simply plug in the solution that fits.

Free yourself and move up to new Windows technology from MediaTouch



Broadcasters General Store
800 636 0123



MediaTouch

888 665 0501 World Radio History www.mediatouch.net

RADIO **broadcast** products

1200 Console

- NEW - redesigned in 1999
- 5, 10, or 15 channel models
- Fully DC controlled for reliability
- Ultra high audio performance
- Easy connectorized installation
- Modular internal electronics
- 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
1200 - 10S	10 channels	\$3,495
1200 - 15S	15 channels	\$4,495

(call factory for options)

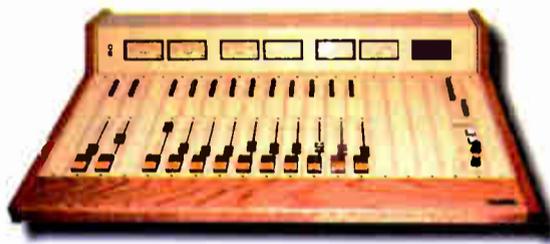
DL4 System II

- NEW - On Air & Production System
- Live On Air, Hard Disk Automation, Satellite Automation, Production, Jingle Box, Segue Editor
- Complete - just add 2 PCs
- Only **\$7,995**

The NEW DL4 System II comes complete with 105 hours of audio storage, 7 input play software for On Air, and DL4-SCHED for Production. This powerful 2 studio system requires only 2 customer support

12,000 Console

- NEW - redesigned in 1999
- 8, 18, or 28 channel models
- Fully modular design
- 3 stereo output buses
- VCAs remove audio from faders
- Telephone talkshow module option
- Monitor for control room & 2 studios



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.

Standard Configurations

12K8 - 6	6 channels	\$4,350
12K18 - 12	12 channels	\$7,075
12K18 - 18	18 channels	\$8,755

(call factory for options)

DL4 System III

- NEW - dual On Air & Production System
- Live On Air, Hard Disk Automation, Satellite Automation, Production, Jingle Box, Segue Editor
- Complete - just add 3 PCs
- Only **\$16,995**

The NEW DL4 System III comes complete with 210 hours of audio storage, two 7 input play software packages for On Air, and DL4-AUTO software packages for Production. This powerful 3 studio system requires only 3 customer support

Digital Console

- NEW - Revolution Series
- Digital & Analog Radio Console
- Console, Touchscreen, or Mouse Control
- 3 Program & 2 Telephone Mix (-) outputs
- 12 CH, PC Control \$3,995
- 12 CH Console \$7,995
- 18 CH Console \$12,995



A breakthrough in features, performance, and price, this is a black box digital audio console controlled by a familiar Console -or- PC computer. Powerful, flexible, and designed for ease of use, installation, and service, the Revolution is a Colorado Digital Product.

Available April

DL3 Workstation

- #1 selling Digital workstation
- Live On Air, Satellite Automation, Hard Disk Automation, & Production
- NEW - now includes:
 - Trak*Star editing software
 - Network card and software
 - Large 78 hour drive

From the #1 selling Digital workstation family in the world, the NEWLY configured DL3 requires only 1 PC for On Air, and another for Production, then simply install the software

DL3 - 78	78 H
DL3 - 150	150 H



Instant 3-Play

- NEW - Instant 3-Play
- Triple Play & Record Jingle Box
- Control from 1, 2, or 3 PCs
- One PC has triple play -or- three PCs have a single play
- Only **\$2,995**



Just connect 1, 2, or 3 PCs running our INSTANT 3-PLAY software to our rack mounted digital workstation and you are ready to go. The workstation has 3 simultaneous plays with record. Software setup assigns play control to the PCs. 3 times the power of other Jingle Boxes, the Instant 3-Play provides access to the SAME jingle from 3 places.

Studio Furniture

- NEW - Modulux FLEX-Studio
- One size fits ALL modular design
- Highest quality laminates & wood
- World famous Modulux cabinetry
- In stock, ready for delivery
- Only **\$4,995** list price
(call for other configurations)



The Modulux Flex-Studio is a complete modular studio package that can be configured in dozens of different ways to meet nearly any studio design. It can be assembled left or right handed as well as in all of our standard configurations: 'Short L,' 'Long L,' and 'Unbalanced U.' Complete with racks, access doors, interview table, and much more.

How to Buy

Domestic Dealers for Arrakis products are:

- | | |
|---------------------------------------------------|----------------|
| • BSW (Broadcast Supply Worldwide) | (800) 426-8434 |
| • CROUSE-KIMZEY | (800) 433-2105 |
| • BGS (Broadcasters General Store) | (352) 622-7700 |
| • SCMS (Southern Coastal Marketing Service) | (800) 438-6040 |
| • BRADLEY BROADCAST | (800) 732-7665 |
| • CONTINENTAL ELECTRONICS | (800) 733-5011 |
| • RF SPECIALTIES (contact their regional offices) | |

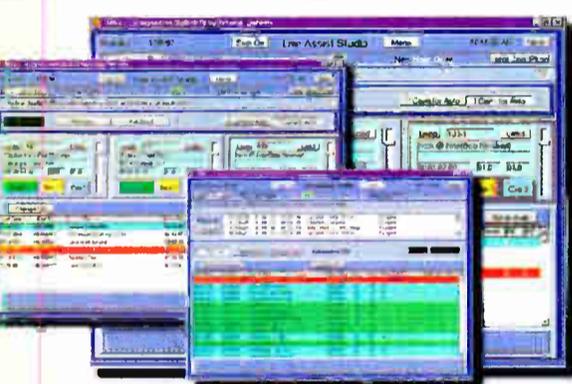
For more complete information on any Arrakis product, visit our website at: www.arrakis-systems.com or email: sales@arrakis-systems.com

ARRAKIS SYSTEMS INC. FORT COLLINS, CO (970) 224-2248

prices effective Feb. 15, 2000



with a triple play & record DL4 workstation, 7 input record switcher, DL4-AUTO Production and Scheduling. This powerful 2 PC workstation requires 2 PCs and installation.



with a 6 play & dual record DL4 workstation, 2 record switchers, two 7 input record switchers, (2) DL4-SCHED for Production and Scheduling. This workstation requires 3 customer supplied PCs and installation.



in Radio with thousands on air around the world. NO options. Order one or two for On Air, and you are ready to go.

- 1 Channel Wrkstn \$9,995
- 2 Channel Wrkstn \$11,995

Evaluate Your Business Secrets

And Do It Before a Renegade Employee Walks Out the Door to Your Competition

David A. Milberg, Esq.

Your general sales manager announced she's jumping ship to another station in your market to target your demos. She has your client list and knows about your secret negotiations to buy the standalone AM down the street.

Or your music director is taking a job across town at another local FM that is modifying its music mix to match yours. He has seen your consultant's recommendations for format tweaks for which you just paid big bucks.

He is even in a position to execute before you can get it done. Think "T.S." — trade-secret law. It is your key to protecting your "B.S." — the business secrets you are entitled to keep.

"Making sure your business secrets don't follow exiting employees out the door is the job of owners, general managers and other senior station staff," said Linda Stevens, an attorney who practices trade-secret and departing-employee law at Schiff Hardin & Waite in Chicago.

Trade secrets

"Anything that has value and that a competitor wants to know but cannot find out through proper means likely could be a trade secret, so long as it is protected."

Stevens points out that a court will not protect you from anyone, including ex-employees misappropriating your business secrets, unless it is convinced that there are *bona fide* trade secrets involved.

Station managers and owners should evaluate their business secrets to determine whether they fit the definition of a trade secret.

According to Stevens, many states have adopted a version of the Uniform Trade Secrets Act, which will protect

business information as a "trade secret" only if it meets these three requirements: "(1) has value from not being generally known; (2) cannot easily be learned by someone else by proper means and (3) has been covered by reasonable secrecy procedures."

The trade-secret law is your key to protecting your business secrets.

The first requirement speaks for itself. The second requirement is based upon common sense — for instance, if you can find it in the telephone book or a broadcasting industry directory, it is not a trade secret.

The third means that if you do not treat your business secrets as a trade secret, courts will not either. It is not that courts require "top secret/CIA-national security-level" secrecy, but instead, *reasonable measures*.

What is reasonable? It depends. "Courts look at factors such as a company's size, its resources, the type of information involved, and the degree to which it is used in day-to-day business operations," Stevens said.

That is why it helps if your station already is "business-secrets compliant." This means having an existing business secrets protection program.

Stevens suggests that stations restrict such information on a "need-to-know

basis," use computer pass-codes, keep business secrets files locked up and protected, and use employment and confidentiality contracts.

She emphasizes the importance of the last trade secret tactic — confidentiality contracts.

"One of the questions most commonly asked by courts in considering whether an employer took the required *reasonable measures* is whether a confi-



Linda Stevens

difficult time suing an ex-employee for trade secret misappropriation."

David A. Milberg is director of marketing & communications for the law firm of Schiff Hardin & Waite, and has been a licensed attorney for more than 20 years. He enjoyed a simultaneous 25-year radio and television career that included on-air and senior management positions.

Steps to Secure Business Secrets

Linda Stevens has developed a "Trade Secret" checklist to protect your business as your executives change their call letters of employment.

Do the work now to ensure that you'll weather the turmoil of employee turnover without losing more than human resources.

• Recover keys and stop access.

Get back all keys, keycards, identification cards, telephone cards, etc. Change computer and security door passwords.

• Cancel access.

Cut off ex-employee access to paper and electronic files, e-mail, voice mail, computer network, and station facilities.

• Review any employment contracts.

If you have advance warning that an employee is about to leave, locate all contracts, signed by the about-to-be-ex-employee. These can include non-compete, confidentiality and employment agreements.

Also find out whether the future "ex" signed any of these types of agreements with other employees, vendors, or suppliers to your station. Note where any of these agreements cover your business secrets.

• Begin an information inventory.

Look for files kept at the "ex's" office, and find out whether he/she had any at home or could access them by way of a home computer. Depending on the situation, it might be worthwhile to have a computer expert investigate computer-stored information.

• Hold an exit interview — these are some of the things you should discuss.

- His/her duties, status of projects and location of relevant files.
- Detail and start date of the new job. And find out why he/she is switching stations.
- Written contracts with your station and/or the new one. Confirm (*in writing if possible!*) the employee's contractual and common-law duties of confidentiality to your station and the company that owns it, as well as any non-compete obligations.
- The return of all station property documents, files, equipment and any other property, including home and laptop computers and electronic files, and confirm that the future "ex" has not held onto or given anyone copies of any information.

• Monitor "exes" after they exit.

Keep track, without violating the law yourself, to see if they are violating their obligations to keep your business secrets confidential.

• You might send some letters, too. Here are some of the people who could be on your list:

- To the "ex," with a reminder of his/her common-law and contractual obligations to keep your T.S./business secrets confidential.
- To the new station, informing it also of the employee's T.S./business secrets obligations to your station and providing a copy of any signed agreements with your company that still are in force.

The Wizard™ has gone STEREO!

The new DIGITAL FMSA-1 gives The Wizard System unmatched stereo monitoring capabilities. . .



Superlative stereo performance. Linear-phase filters that reveal the true performance of your audio processing. The stability of digital stereo demodulation. The sophisticated graphical presentation of The Wizard. And—with the RS-232 port—operation on site or off.

Contact Belar today for more details on what should be your next modulation monitor

BELAR ELECTRONICS LABORATORY, INC.
119 LANCASTER AVENUE • P.O. BOX 76 • DEVON, PA 19333-0076 USA
(610) 687-5550 • FAX (610) 687-2686
Call, write or FAX for more information on Belar AM, FM, Stereo, SCA, and TV monitors.
www.belar.com

Put Callers On The Air

 **Gentner**



Gentner TS612 Telephone Systems Now on Sale at BSW!

The popular Gentner TS612 multi-line telephone system makes it easy to manage call-in broadcast programming. The TS612 contains two digital hybrids that provide a high-quality interface to six telephone lines (expandable to 12). The dual hybrids allow the TS612 to operate as a single-studio telephone system able to conference up to four callers simultaneously or as a two-studio system able to conference two callers to each studio. The TS612 supports a dedicated "phone-like" call-screening control surface. An off-air screener takes incoming calls and places them in a screened-hold queue. The on-air talent or producer presses the NEXT button on the main control surface and the call is immediately on-the-air. The integrated mix-minus provides superior audio quality and simple installation. Automatic gain control (AGC) provides consistent audio levels on all calls.

Gentner TS612-6 (6 Lines) List \$3,149.00

Gentner TS612-12 (12 Lines) List \$4,195.00

SALE \$3,859.00

Features/Benefits

- Split-Caller mode brings the two hybrid outputs to the audio console independently
- Split-Hybrid mode brings the two hybrid outputs to the console independently and returns your program mix to the TS612 onto two separate channels
- Previous-Hold places calls on hold automatically when you select another line.
- Two-Button Hold allows you to place a single call on hold when two or more lines are conferenced together
- Two-Button Off allows you to disconnect any line by pressing the OFF button
- 6 lines (expandable to 12)
- Auto Mix-Minus
- RS-232 control (Enhanced)
- Drop-in console panels
- Optional on-air screening software
- Aux I/O control (Enhanced)
- Held audio input for callers on hold



Know who is calling and why with the optional Screenair on-air screening software



Call BSW 1-800-426-8434

Visit us at www.bswusa.com

Let BSW Work to Your Advantage

We offer a best advertised price guarantee*, same day shipping of in-stock items*, sales professionals with real-world experience and sales hours from 6:00 AM to 6:00 PM Pacific Standard Time.

Promo

► Continued from page 38
chosen). The money angle is in selling a title sponsorship, registration locations, signage opportunities, the t-shirts and on-air promotional mentions.

For extra fun, have a costume contest prior to the race. Note: If you do not affiliate with the Arthritis Foundation, you may wish to use a different name for the race ... they may own the rights to the "Jingle Bell Run" name in your state.

Christmas Wish — This is your chance to do something truly wonderful for kids that have nothing.

Hook up with the agency that places children in local foster homes. You're going to interview these kids to find out what presents they'd like for the holidays. This can be done on tape by your morning show and if you want, promoted across the board in every daypart.

It sounds like this:
Announcer: "W— presents Christmas Wish. ... We're talking with Jimmy Jones. Jimmy's five years old and lives in a foster home. Jimmy, if you could have two presents for Christmas this year, what would you want?"

Don't miss this annual opportunity to do good, make money, and pull in more listeners!

Jimmy: "I'd really like a Pokémon sweatshirt and my first two-wheel bike."
Announcer: "If you can find it in your heart to give Jimmy one of these gifts this year, please call the WWW Christmas Wish line now at 999-9999 or e-mail us at christmaswish@radio.com"

You then air the calls and read the e-mails from the listeners who wish to grant the wish, thanking them for their generosity.

There are three methods of gift collection. Have listeners bring them by your station; have them drop by a check or credit card number with the amount of the present and you buy it; or have them do it via a secure area of your Web site.

It's nice to have a wrap-up party at a child-friendly restaurant where kids get to meet the folks that made the donation. Be sure and have lots of sweets, a Santa and games.

Carefully work in a client this way: "W— Christmas Wish is presented in part with a grant from (Sponsor)."

Twelve Days of Christmas — Each day, increase the number of gifts you're doing on the air. On the first day, you give away one. On the second day, the winner receives gift one from yesterday and the gift for today. On the third day, the winner gets the first, second and now third present.

This continues until day 12, when the winner receives everything you've given away during the whole contest!

If you're operating a sports station, a great hook is to call this the "Twelve

Plays of Christmas," airing mystery play-by-play pieces that listeners have to identify to win.

If you want an additional straight sales angle, have people register at a sponsor location or by phoning and e-mailing the station. Announce a name at a selected time. You must be listening to win.

The grand prizewinner takes all 12 gifts. The client gives you the gifts along with a big schedule.

Food Drive — Method One: In many markets, the Boy Scouts collect food from Thanksgiving to the first week in December.

Tie in with the largest grocery chain. The Scouts drop off plastic collection bags at the door in your hottest zips. One week later they come back and pick 'em up, taking all the food to a central location where you're doing a live broadcast.

A sponsor can go on the bag, on the air and in any print ads you develop. A week later you may wish to invite listeners down to the local food bank to sort the collected food so that it then can go to the shelters.

Food Drive — Method Two: Have a DJ do an on-air marathon from inside a huge box in a mall or store or from a truck.

The jock stays until the area is filled with food. The first year you do this, have a back-up plan where you're able to bring in a lot of the food yourself.

Tie in a newspaper or TV station for additional coverage.

Food Drive — Method Three: At a series of blockbuster holiday movies create a "Canned Film Festival."

Listeners pay a reduced amount to get in and drop off cans of food.

The Christmas Diamond — This only works in a cold climate where it eventually warms up. Have an ice sculptor build a huge display with your call letters outside in a high traffic location. Freeze an expensive diamond in the middle of the sculpture. The person who can guess when that diamond hits the ground wins the diamond.

You need: 1) Twenty-four hour security; 2) A heavy press push; 3) A diamond client with a lot of money and a good sense of humor.

This may be fun to Webcast.

Video Conference Home — If you have a lot of immigrants in your audience, offer them a free or inexpensive way to video-conference their families far away.

There are many office copy centers that sell this service.

Cruisin' Christmas — What do a lot of people do just prior to Christmas? Drive! Make it easy for 'em with a gift they'll remember you for ... free gas, plus a CD-ROM road map of America customized with your call letters.

Both presents can be sponsored.

Charge It for Christmas — On Christmas Day, give away mass quantities of batteries on-air. Make sure the bunny will be busy today by giving kids what they need after they get the gift.

Naughty & Nice — Works best for blue morning shows. Using highly descriptive verbiage, the morning show gives away hard-core lingerie to callers who describe the nice things they've done that should entitle them to something naughty.

Gloves or Coats for the Homeless — Set up locations at clients where listeners can drop off old gloves or coats.

Trees Please — Either give them away before Christmas or collect them for recycling after the holiday.

The W— Virtual Mall — Yes, it's pure sales on your Web site. However, if you've got your call letters on it, you've got to make certain your merchants have quality products and that they take care of your listeners.

Remember, this is like sending a friend

of yours to a store you like. Don't disappoint somebody who trusts you!

Also, make sure you've got a daily contest on the site giving away the products you're selling.

If you don't like any of these promotions, try twenty minutes of holiday brainstorming. To trigger ideas, make sure to decorate the room with holiday stuff.

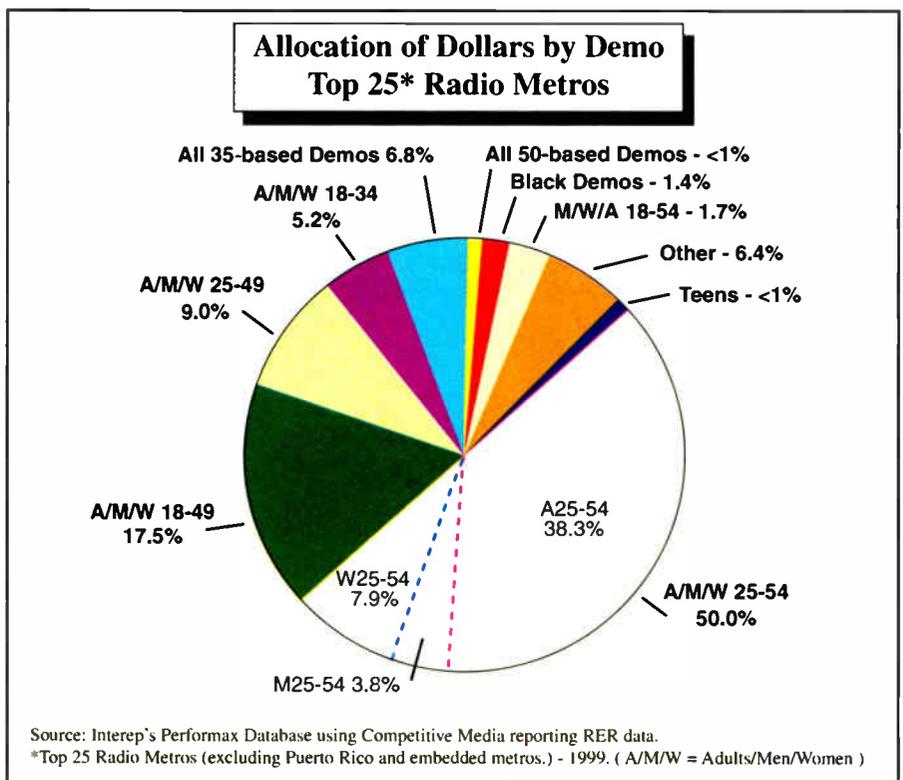
A few pints of holiday cheer probably wouldn't hurt either!

■■■
Mark Lapidus is president of Lapidus Media. Contact him via e-mail to marklapidus@yahoo.com

Ad Dollars Down for 25-54

The percentage of ad dollars aimed at adults, men and women, aged 25-54, was down to 50 percent in 1999, according to Interep Research. The company recently released its annual analysis of national spot radio advertising dollars by demo in the top 25 radio metros.

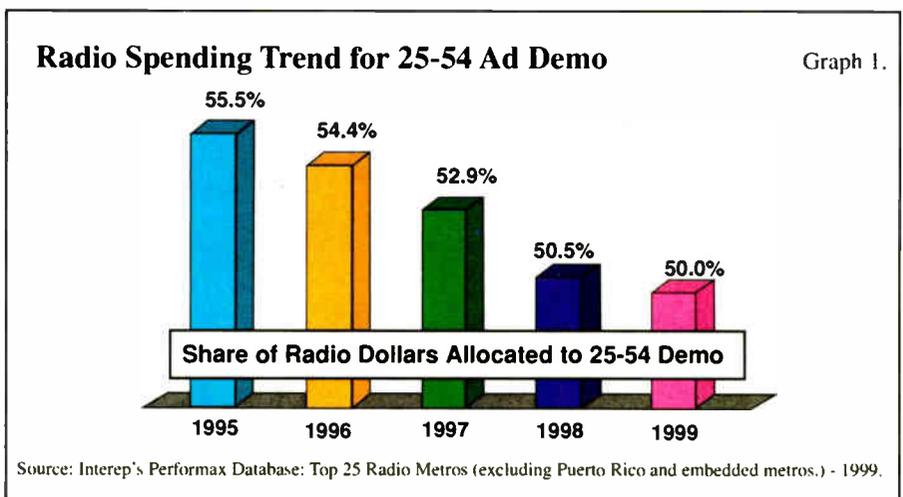
According to the survey, the percentage of dollars aimed at those aged 25 to 54 last year was down only slightly from the year before, but the adults, women and men demos have continued to decline each year since 1995, when the percentage was 55.5.



The Adults 18-49 demographic placed second among all segments, receiving 17.5 percent of radio dollars.

By gender, women 25-54 edged out men (7.9 percent, women; 3.8 percent men).

Collectively, the top 10 metros showed no statistically significant decline in 1999 in the percentage of radio dollars targeting adult women and men 25-54. Advertisers allocated 49 percent of radio ad dollars toward the 25-54 demo in the 10 largest metros.



While there was no significant decrease from 1998 to '99, a five-year trend shows a significant decline of radio ad dollars targeted to adults, 25-54 across all top 10 metros, from an average of almost 61 percent in 1995 to 54 percent last year.

Pittsburgh (57.8 percent) and Tampa (56.9 percent) had the highest percentage of radio dollars allocated to 25-54 buys, according to the survey, while Minneapolis-St. Paul (38.4 percent) and Los Angeles (42.2 percent) showed the lowest percentage.

— Laura Dely

"Our web clients rely on us to deliver the highest quality streaming audio. That's why we chose the Aphex 2020."



Andrew Rosenberg - Director of Studio Engineering
John Patti - Director of Audio/Video Services
Casey Fuller - Assistant Audio Engineer
Westwind Media.com - Denver, CO



Westwind Media.com is a leading digital audio provider for Internet communities such as Lycos, iVillage.com, Fidelity Investments, TheStreet.com and PeopleWeb. These clients demand the best, and Westwind's audio engineering department ensures that level of performance...even on connections as slow as a 28.8 dial up!

"We've tested other processors and nothing comes close to the consistently high audio quality and loudness of the 2020".

The Aphex 2020 is a digitally controlled analog processor that is configurable as the high quality, cost-effective, one box solution for FM, Satellite Uplink, Mastering and Webcasting.

"It was no surprise to us that the number one FM station in town also uses the 2020- it's the best sounding processor on the air and on the Web."

**FOR THE FINEST PROCESSING FOR FM, SATELLITE UPLINK, MASTERING AND WEBCASTING
CALL APHEX TODAY OR VISIT www.APHEX.COM TO SCHEDULE A DEMO**

APHEX
SYSTEMS

*Improving the way the world sounds*SM

11068 Randall Street, Sun Valley, CA 91352 U.S.A
818-767-2929 Fax: 818-767-2641 www.aphex.com
World Radio History

RW NEWS BYTES

Did you see these breaking stories?

Demonstrations Staged At NAB Radio Show

Nearly 500 More Apply for LPFMs

iBiquity Signs Data Content Testing Partners

Scott Studios, Computer Concepts Marry

Radio News Seen As Less Credible

Shure Releases New Mic Preamp

Get your daily diet of

NEWS BYTES

by visiting us on the web every business day.

www.rwonline.com

RW NEWS BYTES

from the editors of

Radio World

Vegas

► Continued from page 36
said the Review-Journal's White. And the U.S. Census backs up White's and Ginsberg's observations.

In the 1990 Census, Las Vegas reported a population of more than 741,000. Of that, just over 145,000 were 55 or older, or about 20 percent of the total population.

According to the bureau, the area grew at a rate of 55 percent between 1990 and 1998.



KSNE-FMs annual Love Songs Cruise, a Valentine's Day event at Lake Mead

The U.S. Census currently estimates the Las Vegas population to be more than 1.3 million, with approximately 455,855 falling into the 55-and-older range. That represents over a third of the total population.

For most of the past year, the market's ratings leader has been KJUL-FM, one of three Las Vegas stations Centennial Broadcasting is about to hand over to the Beasley Broadcast Group.

The station's ratings have steadily climbed from an 8.0 share (12-plus, Monday to Sunday, 6 a.m. to midnight) in the Winter 2000 Arbitron survey to 9.9 during the Summer Phase I ratings (also 12-plus, Monday to Sunday, 6 a.m. to midnight, as are all Arbitron statistics reported in this article, except where noted otherwise).

KJUL-FM categorizes its format as "heritage classic adult contemporary," which mixes songs from artists such as Nat King Cole, The Beatles and Frank Sinatra with contemporary hits from the likes of Celine Dion and Kenny G.

In addition to KJUL-FM, there are two other full-time oldies stations among the 29 commercial stations in the market, as well as two classic rock stations.

Mature radio market

One of those classic rockers is Lotus Broadcasting's KXPT(FM), also known as Point 97. KXPT's morning man Mike O'Brian, who currently has the longest tenure in the market of any morning show host, has seen the Vegas radio market mature over the past three decades.

O'Brian debuted as morning man for KLUC-FM in 1986, then moved to Point 97 in 1994. But his first taste of Las Vegas radio came in the late 1970s, when he handled a night shift for KLUC-FM.

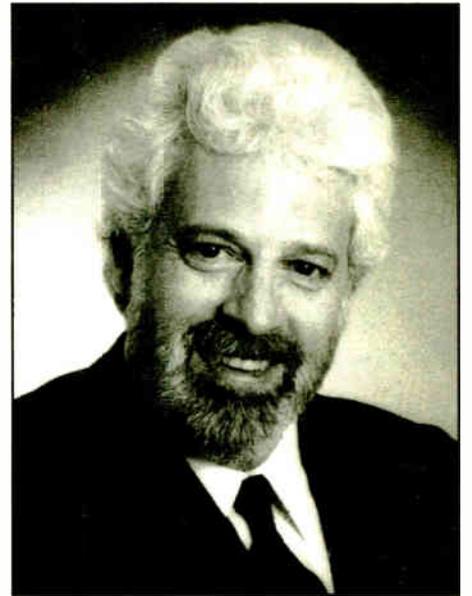
"When I first got here, KLUC-FM and KENO(FM) — now KOMP(FM) —

were the only two FM stations. There was some talk and a country station on the AM side. But we were still a relatively small town back then."

After his first four years at KLUC-FM, O'Brian left Vegas and did stints in Grand Junction, Colo., and Lowell, Ind.

"When I came back in '86, the market was still kind of naïve when it came to morning radio. But it started heating up in the late '80s and has since become one of the most competitive places around, especially in the mornings."

O'Brian and his morning partners, Greg Hodges and Carla Rea, compete in



Clear Channel's Mike Ginsberg

see this as a market they want to be in. That said a lot about the city, and the talent too."

Infinity, with its six stations is the cluster ratings leader, posting a 26.2 share in the Summer Phase I book.

Clear Channel's four stations combined for a 22.8 share, followed by the soon-to-be Beasley stations with a 14.4 share.

Other national groups that have staked claims in the Vegas market are Los Angeles-based Lotus and Dallas' Hispanic Broadcasting.

A station with a twist to revenue generation is privately owned, standalone KSHP(AM), or K-SHOP. A sports station for most of its schedule, it runs the "Radio Shopping Show" from 7 to 9 a.m. and 3 to 6 p.m. Monday through Friday and from 9 a.m. to noon on the weekends.

Trade-outs

On the show, local businesses offer deeply discounted products and services in exchange for publicity and advertising. Listeners can call in and purchase items such as restaurant certificates.

See VEGAS, page 48 ►

the market not only against other local talent such as KJUL-FM's Scott O'Neil and Clear Channel's singularly named Melanie at KSNE-FM, but also go head to head with syndicated powerhouse Howard Stern, carried on Infinity's KXTE(FM).

"Competition makes for good radio," said O'Brian. "It keeps you on your toes. It's good to see that the big companies

Las Vegas Commercial Radio Market Overview				
Station	Owner	BIAfn's 1999 Est. Station Rev (\$000s)	Format	Spring '00 Rating
KJUL(FM)	Beasley	2,950	Nostalgia	9.7
KSNE-FM	Clear Channel	5,800	Soft AC	7.5
KLUC-FM	Infinity	7,100	CHR	7.4
KWNR(FM)	Clear Channel	6,100	Country	6.0
KQOL-FM	Clear Channel	2,800	Oldies	5.4
KMBX(FM)	Infinity	5,600	Hot AC	5.3
KOMP(FM)	Lotus Corp.	4,900	AOR	5.0
KXTE(FM)	Infinity	5,100	Modern Rock	4.4
KXPT(FM)	Lotus Corp.	3,400	Clsc Hits	3.9
KFMS-FM	Clear Channel	3,800	CHR	3.6
KXNT(AM)	Infinity	1,300	News/Talk	3.6
KKLZ(FM)	Beasley	5,575	Clsc Rock	3.2
KISF(FM)	Hispanic	3,300	Mexican	3.1
KMZQ-FM	Infinity	5,500	AC	3.1
KVBC-FM	Entravision	1,300	Spanish AC	2.6
KSTJ(FM)	Beasley	2,175	Hot AC	1.6
KDWN(AM)	Radio Nevada	700	Nws/Tlk/Spt	1.4
KSFN(AM)	Infinity	N/A	Oldies	1.3
KENO(AM)	Lotus Corp.	850	Sprts/News	1.2
KNUU(AM)	CRC Broadcasting	800	News/Talk	0.9
KLSQ(AM)	Hispanic	1,600	Span/AdStd	0.7
KDOX(AM)	S & R Broadcasting	950	Spanish	0.6
KBAD(AM)	Lotus Corp.	350	Sprts/Talk	0.5
KLAV(AM)	Gore-Overgaard	650	Nws/Tlk/Spt	N/A

BIA Financial network

Stations are ranked in order of Arbitron Spring 2000 12+ share. Copyright 2000 The Arbitron Company. May not be quoted or reproduced without the prior written permission of Arbitron. Other information provided by BIA Financial Network through its MEDIA Access Pro Radio Analyzer Database software.

Oldies 101.5
WMJZ fm GAYLORD

WSNQ
AM 900
GAYLORD

May 10, 2000

Mr. Rafael Arreaza
OMB America
3100 N.W. 72nd Ave.
Miami, FL 33122

Dear Rafael:

I writing to tell you how happy we are with our new OMB 10,000 watt transmitter and OMB antenna system. **It is fantastic!**

I have owned many brands of transmitters and antennas in the past. Some have worked better then others. The performance of your OMB transmitter, exciter and antenna has been as good or better then any other equipment I've ever owned.

The transmitter has been rock solid, we set it and it does not deviate, it works great. The same can be said for the exciter and power amplifier. Your antenna system also works great and provides fantastic coverage for our listeners.

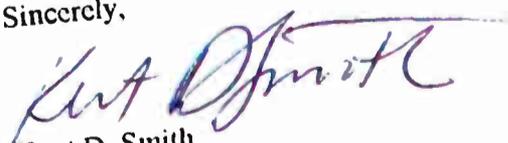
I am especially happy with the simplicity of your systems. In today's complex world, everyone seems to be trying to complicate everything. **The simplicity of your equipment is a breath of fresh air.** It makes installation and maintenance easy and I'm sure it plays a part in keeping your equipment affordable.

I can't forget affordability. It was one of the major reasons I considered OMB when I started my decision making process. I did a lot of research and came to the conclusion that **OMB would provide me more for my dollar.** OMB did just that and more. Your products and customer service have far exceeded my expectations.

In closing, I recommend OMB to any broadcaster and my doors are open to anyone who would like to see your products in action.

Thanks for all your help and your great products.

Sincerely,



Kent D. Smith
President
Darby Advertising Inc.

650 E. MAIN ST. • P.O. BOX 1766 • GAYLORD, MI 49734-1766 • (517) 732-2341 • FAX: (517) 732-6202



DON'T GET #IT.....
WE HAVE PARTS

www.omb.com

World Radio History



3100 NW 72 Ave #112
Miami, Fl. 33122
305-4770974 / 73
Fax 305-4770611
ombusa@bellsouth.net

Vegas

► Continued from page 46

hotel packages and auto service.

"We sell advertising like everyone else, but the Radio Shopping Show is where we make money," said K-SHOP's General Sales Manager, Brett Grant.

"Anywhere from 75 to 90 percent of our overall revenue comes from the show. It's terrific for us, plus the local restaurants, hotels and other merchants love the publicity they get from the tie-in."



KLUC-FM's Mike O'Brian

The curious aspect of KSHP's pre-dominant sports programming is that while Las Vegas doesn't have a major sports team of its own, it does have legal gambling.

That means there is a high interest in sporting events of every sort. The station mixes programming provided by the SportsFan Radio Network with a heavy schedule of play-by-play action of professional teams in various sports, including the Anaheim Angels, Denver Broncos, Sacramento Kings and Anaheim Mighty Ducks.



Fremont Street Experience

Like oldies, there is no shortage of sports radio in Vegas. Lotus owns the other two all-sports stations in the market — KBAD(AM) and KENO(AM).

Another station that once was part of the sports mix was KSFN(AM). In 1996, with the call letters KXNO(AM), the station was known as "Casino Radio," which broadcast tourist-guide information about the local gaming parlors, hotels and entertainment venues.

In 1996, American Radio Systems, a group that ultimately became part of Infinity, bought the station. The station's call letters were changed in 1997 to KSFN(AM) and the casino news format

was switched to sports.

Infinity decided to sound the final gun on its all-sports radio station in 1999 and changed the format to that Vegas favorite — oldies.

Spanish-language stations are beginning to exhibit some clout in the market, which has an estimated 13-to-15 percent Hispanic population, according to the U.S. Census.

Key demos

KISF(FM), owned by Hispanic Broadcasting, has consistently performed well in key demographics. In the Winter 2000 Arbitron survey, the station tied for second in the 18-34 adults, Monday through Sunday, 6 a.m. to midnight category and placed fourth in the 25-54, Monday through Sunday, 6 a.m. to midnight range.

In the Spring survey, the station was competitive: number five in adults 18-34, Monday through Sunday, 6 a.m. to midnight and number 8 in adults 25-54 in the same daypart, Monday through Sunday.

Clear Channel is the only group that has run country music formats in this market in recent years. Heading into 2000, the group had two stations — KFMS-FM and KWNR(FM) — playing country hits.

However, early in the year, KFMS-FM switched to a contemporary hits format, leaving KWNR alone to do country.

The result allowed KWNR to pick up former KFMS listeners, boosting the station into fourth place in the Spring and Summer Phase I ratings, and providing them with strong showings in key demographic categories.

While only one station plays country music, no station in the market devotes itself to jazz.

"There is some soft AC in the market and one station tried a new-age format a few years ago, but nobody seems to be able to make jazz work as a format on its own," said the Journal-Review's White.

"Even though no one is doing it full

time, a few stations have jazz shows scattered throughout their schedules."

Among those stations devoting portions of their schedules to jazz are KUNV-FM, the public radio station licensed to the University of Nevada, Las Vegas, and Lotus Broadcasting's KXPT(FM).

"One of the highest-rated shows we do is a Sunday morning jazz show," said KXPT's O'Brian. "But as much as people seem to love jazz, it just doesn't seem to work on radio by itself."

The leading noncommercial station in the market is KNPR-FM. The station is the primary National Public Radio outlet in Las Vegas and the market's only class-



The Hotel Paris under construction

cal music station.

One of KNPR's most popular offerings is "Guess Who's Playing the Classics," an hour-long program featuring celebrity guests who join host Nate Tannenbaum to play their favorite classical selections.

Now in its tenth year, the show has featured an eclectic assortment of guests, including the mayor of Las Vegas, comedian Tommy Smothers and conductor John Williams.

"We're trying to profile a wide variety of people who come on and play their favorite classical music," explained station General Manager Lamar Marchese. "It's shows that there is some breadth of interest in classical music. It's not just your Ph.D. in musicology that likes this kind of music."

KNPR is also exploring an opportunity to fill what many feel is an underserved niche in the market by adding more news to its programming.

News bite by bite

No fewer than five AM stations in the market list news as part of their format. But those stations primarily run brief news updates inserted between robust blocks of local and syndicated talk shows.

"Commercial stations have pretty much abdicated news to the television stations," said Marchese. "They can tell you if there was a shooting last night at the 7-Eleven. But what we're talking about doing is the kind of in-depth, quality news that people expect from NPR."

The station has hired a consultant to analyze the station's schedule and the market's appetite for news. Although

Marchese sees this as a potentially good opportunity for KNPR, he also expresses some concern on how it might impact his schedule and his budget.

"Unlike many other markets where you might have another station doing classical music, there's no such thing here. To the extent that we would do more news, we'd have to do less classical music. So we're in the process of constantly weighing and balancing any decision we make."

Additionally, Marchese, who manages an annual operating budget of \$1.7 million, worries about the financial burden of producing news.

"News is very expensive to do well. If you're trying to match NPR quality, you have to hire two or three people, and that's about a couple hundred thousand dollars by the time you've paid salaries and benefits."

The station's last fundraiser this past April netted approximately \$145,000 in pledges.

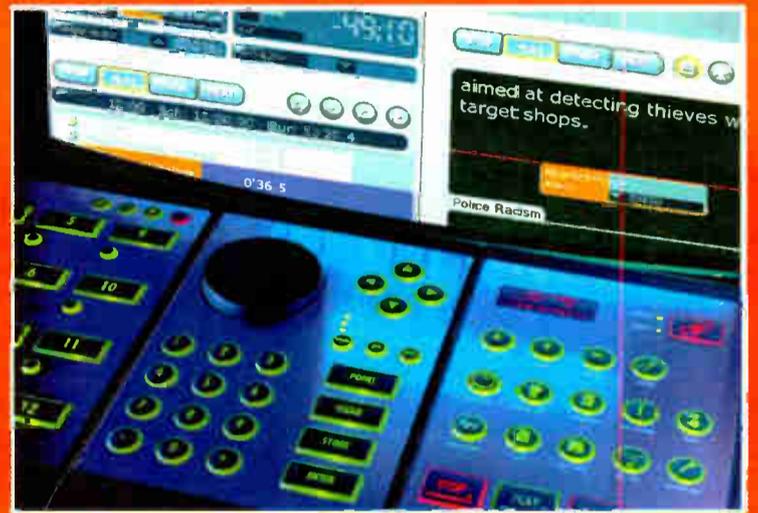
"Public radio does very well in highly educated markets. Las Vegas is not that. According to Arbitron, only about 14 percent of the county have college degrees. That's about seven percent below the national average. We're a very blue-collar town. But we are where we are and we have to work a lot harder for members."

As Marchese debates how much of a balance to strike between news and music, perhaps he should keep this in mind: in an "oldies war zone," classical tunes are the ultimate oldies.

■ ■ ■

Steve Sullivan is co-founder of the Advanced Interactive Media Group LLC.

BROADCAST THE WORLD



Professional Production Tools



Rich Media Webcasts



Multimedia Applications Desktop

The Internet, satellite, and DAB are changing the rules of broadcasting. Being "digital" is no longer good enough. Dalet has responded by incorporating the latest technologies into our digital automation system. Our multimedia content database is now coupled with an Internet broadcast engine, professional multimedia production tools, and integrated workflow management. For broadcasters, this means streamlined operations, greater audience retention, and new revenue sources including e-commerce.

Customers including ABC, CNN, NPR, CBS, and VOA already trust Dalet with their programming and operations. So whether you broadcast news, music, or talk, contact us to find out how we can help you make the most out of your content.

www.dalet.com

Visit our website or call us at 212-825-3322



ARTWORK GRAPHIC

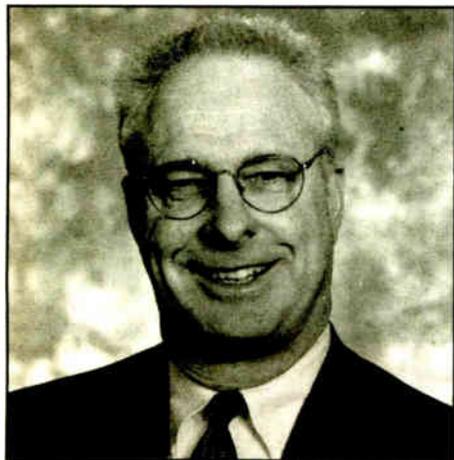
Streaming: Options and Cautions

Ken R.

Radio station Web sites can be as basic as a plain screen with few pictures of the jocks, a phone number and a sponsor banner.

More inventive owners have developed elaborate sites with pages of colorful graphics and many innovative ways to touch their community.

These sites may include multiple audio streams, click-throughs to advertisers, interviews with recording artists, moving video of recent concerts, games and archived morning show bits.



Jerry Hinrikus

"Now that we have the ability to stream audio on the Web, what do we do with it?" asks Jerry Hinrikus, vice president and general manager of KSAL(AM), Salina, Kan. (RW, July 19).

Hinrikus decided that his home page would have to serve his listeners, gain new listeners, and provide non-traditional revenue.

"As a small-market broadcaster, we use separate audio streams for church programs, college speeches and sports play-by-play," said Hinrikus. "We're looking at leasing channels out to third parties as well."

KSAL in fact recently began streaming local American Legion baseball games.

There are as many reasons to put audio on a Web page as there are broadcasters.

"Some stations are just 'vanity streaming,' others are making money," said Howard Freedman, president of iRADIO, a California-based company that publishes a newsletter devoted to radio and the Internet. He and others quoted here took part in a panel at this spring's NAB2000 convention.

"Many broadcasters are just adding streaming audio to their pages because everyone else is doing it," said Freedman.

While streaming technology has been available for several years, some operators are more likely to use it than others.

Freedman said the biggest users of this technology are public stations and country-formatted commercial stations.

"One would think that alternative rock stations, which are supposed to be on the cutting edge, would use streaming extensively. The truth is that the more traditional broadcasters have jumped onto this bandwagon more readily."

What business?

Freedman said some broadcasters don't take the Web seriously because they don't feel that they are "in that business."

"Why do you find McDonald's restaurants in Wal-Marts? Starbucks in airports? Safeguard soap in hotel rooms? Their product is the same, but they are changing their mode of distribution," said Freedman.

"It's the same reason TV stations have



Gordon Bridge

changed their tune about appearing on cable. Instead of thinking of it as streaming your audio, think of it as 'broadcasting.' If you think your core business is just AM and FM, don't stream."

Gordon Bridge is chairman/CEO of SurferNetwork, an Internet marketing and content distribution company. Bridge said stations must learn to "repurpose" their ads for the Web.

A commercial for a local flower shop, for example, would mean little to a listener 2,000 miles away.

"Sell ads on the Web separately. Put different spots on your Webcast than the ones heard on your regular on-air broadcast," said Bridge.

The endless possibilities of streaming represent a blank slate, and many broadcasters are using "out-of-the-box" thinking.

"We don't even play our music on the Internet," said Hinrikus. "The strength is in local content. There are thousands out there playing your music so why bother?"

The number of people who listen to radio on the Web today is small, but these souls seem to be looking for unique content. Stations playing a blend of music that is uncommon, such as Irish folk, Hawaiian, New Orleans jazz, polkas and other non-mainstream offerings, seem to find their niche on the Internet.

Bridge said each station should develop its own "franchise."

"Go for that loyal listener and use the Internet to extend your reach."

Bridge also said sound quality on today's Internet is unacceptable. "That dropout and bad fidelity must be fixed for people to take us seriously."

While programming on the Web is suffering growing pains, the non-music elements found on the Internet are also in need of upgrading.

"Banner ads are stupid because listeners can easily minimize the screen when they are listening," said Bridge. "You need to have audio ads and a click-through opportunity to make it worthwhile. E-commerce is the Holy Grail of the Internet; it's worth thousands of times more than a plain radio ad. With a click-through sale, a station should be entitled to at least 5 percent of that revenue."

Ben Ivins is senior associate and general counsel of the NAB. He cautions that the Internet is a unique domain that requires distinct handling.

"Think of streaming as starting all over from a copyright standpoint," Ivins said. "If you didn't create the content you'll have to make sure you have the rights to everything you stream, especially the music."

Ivins pointed out that whenever a station plays a song on the air, there are actually two legal elements to consider.

"There are the usual ASCAP, BMI and SESAC performance rights which most people know about, and then there are the recording rights owed to the artists,"



Mike Powers

Ivins said.

Stations can obtain minimum Web performance licenses from ASCAP for \$264 per year, BMI for \$250 per year and SESAC for \$50 for each six-month period. These fees are based upon minimal revenue reported by the station for its Web page. At such time as the station begins to earn more money from its Internet site, the fees increase.

"The recording payments, however, are a muddy area which the Recording Industry Association of America is trying to define in federal court right now. Over-the-air broadcasts are exempt from these fees, but we don't know about the Internet."

Another legal issue is e-commerce liability. "If you run separate commercials on the Web, the law sees you as repurposing your broadcast," said Ivins.

He said this means that if you have a copyright problem, theoretically you can be sued in every jurisdiction in which your Web page is available.

"While stations merely streaming their air signal are not liable, obviously this could be a nightmare," said Ivins.

Mike Powers, author of the "Guide to Radio" prepared for About.com believes that online advertising spending will grow from \$2.8 billion to \$22 billion by 2005.

STATION/STUDIO SERVICES

Business Boosters from Grace Broadcast Sales • ORDER TOLL-FREE! 1-888-GRACE-88

Selling ads is good.
...Selling more ads is better.

How Many of Your Local Merchants
Are Losing Customers to "Out-of-Town" Stores??

— BE A HOMETOWN CHAMPION! —

...the expanded new GBS "SHOP YOUR HOMETOWN" CAMPAIGN!

\$299 COMPLETE - RESERVE NOW FOR YOUR MARKET!

(You'll get more, larger advertising commitments during the holidays and all year long!)

For DEMO visit www.gracebroadcast.com

BALSYS

TECHNOLOGY GROUP, INC.

PROFESSIONAL BROADCAST
ENGINEERING SERVICES

Analysis - Installation - Support

7141 Tallowtree Lane

Orlando, FL 32835

Tel: 407-822-7055

Fax: 407-296-2587

www.balsys.com

sales@balsys.com

ATTENTION PROVIDERS!

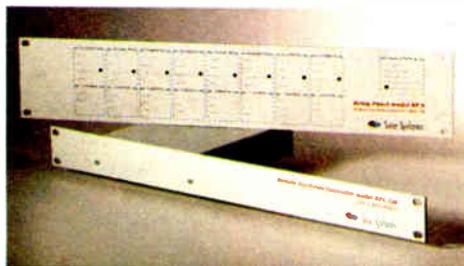
Promote your services to
Radio World's readers.

Reach Radio Station and Recording
Studio owners/managers and
engineers with your message.

For information on
affordable advertising
call **Simone** at **1-800-336-3045**,
ext. 154.

Model RFC-1/B Remote Facilities Controller

It's the most affordable, fully-featured transmitter remote control system available. It's flexible. It's expandable. It has a well-deserved reputation for being very reliable. And it's not difficult on the eyes. What other reasons do you need?



FEATURES

- transmitter control from any telephone
- 8-64 channels of telemetry and control
- programmable control by time and date
- automatic adjustments based on telemetry
- optional printer and modem adapters
- programmable telemetry alarms
- full-featured, affordable, reliable
- integrated rack panel

Sine Systems

visit our web site for more information on our products

nashville, tennessee • 615.228.3500 voice • 615.227.2393 fax-on-demand • www.sinesystems.com

Radio Daze

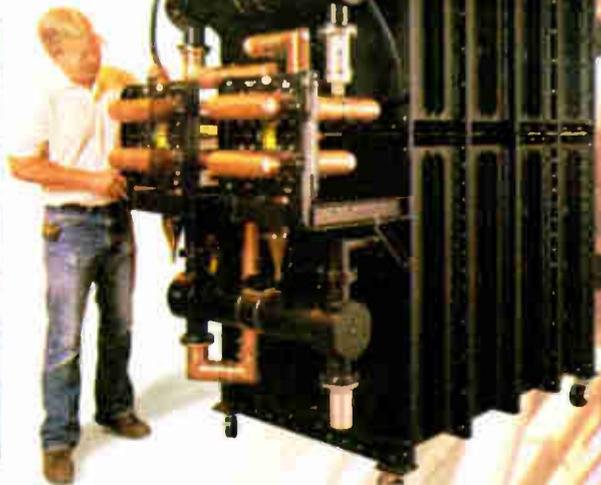
Clarify the dazzling array of engineering choices with a Dielectric FM Antenna System.

Choose an engineering partner who guarantees the quality and reliability of your new FM Antenna System. We offer a 5-year warranty for our complete Dielectric-built FM systems, covering everything from the transmitter output through the antenna, including transmission line, switches, filter and combiner. Select combiners with a clearer signal now and digital capabilities later; advanced antennas with variable bay spacing for better control of elevation and azimuth patterns; and patented transmission line that offers greater power handling and broader bandwidth than other manufacturers. With single source responsibility from Dielectric, you not only get the finest engineered broadcast equipment, but peace of mind as well.

Dielectric Communications • 22 Tower Road • Raymond, Maine 04071
800.341.9678 • 207.655.4555 • www.dielectric.com

Dielectric
COMMUNICATIONS

Engineering Excellence Since 1942



Let's work together. Call 800-341-9678.

NAB Radio Show Photo Gallery

For more photos see pages 3 and 26



NAB head Eddie Fritts takes part in the dot-com discussion



Lee Abrams of XM Satellite Radio



Eddie Fritts



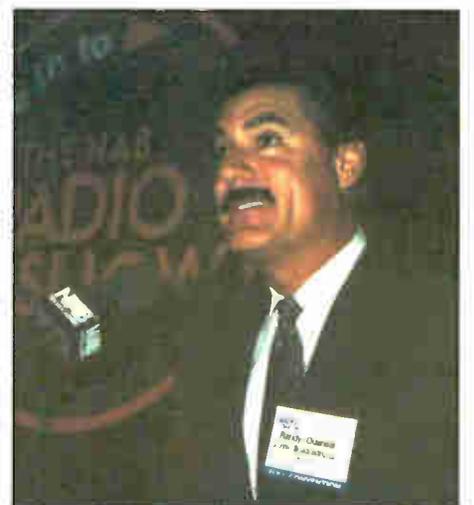
Harris Corp. presented the 'Radio Station of the Future' display



The U.S. Census Bureau thanked broadcasters for their support



Elana Sofko of Sirius Satellite



Randy Odeneal of Sconnix



Milford Smith updates engineers on DAB discussions at the NRSC



Attendees converge on the registration desk

No Tradeoffs

No Risks

Only Top Performance...

...at a cost savings means real value in any broadcast market.

But don't take our word for it or let our 25-plus years in the business cloud the issue. Try these or any of our first-quality products at your station at no risk with our no-fault, 30-day return policy,



"David-II" FM PROCESSOR/STEREO-GEN

Famous the world over for surprisingly competitive and clean audio at a budget price. Digital synthesis design gives great specs and terrific sound.



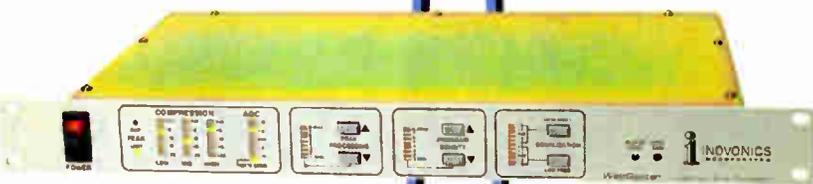
FM MOD-MONITOR WITH PRESELECTOR

Off-air modulation measurement with easy-to-read display, 8 station presets, alarms and multipath indicator. A companion tunable subcarrier monitor/demod is also available.



OFF-AIR AM MOD-MONITOR

Features a built-in, tunable preselector, two sets of peak flashers, program and carrier-loss alarms and an RS-232 interface. An active outdoor antenna is optionally available.



WEBCASTER INTERNET PROCESSOR

Designed from the start for the limited bandwidth and throughput of current 'streaming' audio services. Crisp for audio dial-up modem connections.



RDS/RBDS "MINI-ENCODER"

Quickly program it with any PC to transmit station call letters, format and other identifiers, translator frequencies, promos/slogans, phone number, etc.

Visit us on-line: www.inovon.com

Inovonics, Inc.

1305 Fair Avenue • Santa Cruz, CA 95060
TEL: (831) 458-0552 • FAX: (831) 458-0554



Now You're Connected



Easycon®

Available with gold tuning fork IDU or solder contacts. Made of only 3 pieces — and no set screws — Easycon is the fastest way to terminate a cable with an XLR connector on the market today.



Minirator®

Professional hand held audio tone generator. Pink noise, white noise, sweeps, sine, square wave and polarity tests. Capable of remembering settings when turned off and on. Automatic off helps save battery strength. Balanced XLR and unbalanced RCA inputs.



Minilyzer®

Hand held, battery operated, light weight. RCA unbalanced, XLR balanced, headphone output for aural diagnostics, built in mic for polarity tests. Provides Level RMS or Relative, THD + N in dB or %, PPM or vu meter (multinorm), 3rd octave analysis, signal balance error, sweep recording, scope mode. Auto ranging, auto scaling. Measurement speed of 3 readings per second. Compatible with NEUTRIK Minirator.



BNC

Two new versions now available; push pull and rear twist — these are the first in a series of BNC connectors that will include bayonet and friction fit styles, chassis mount and PCB receptacles. Features include an ergonomic straight push-pull lock / release operation. Ideal for high density applications.

www.neutrikusa.com
info@neutrikusa.com
732-901-9488



NEUTRIK USA

CONNECTING THE WORLD

Studio Sessions

Sony's
Top-End
Reverb



See Page 61

Radio World

Resource for Radio Production and Recording

October 11, 2000

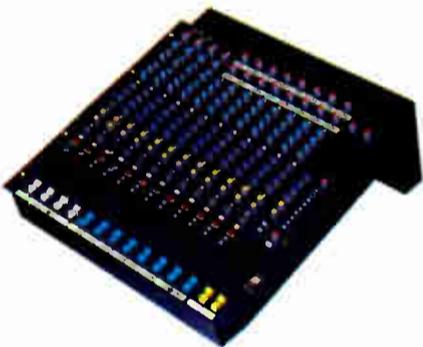
PRODUCT EVALUATION

A&H Mixer: Lots of Stereo Ins

Alan R. Peterson

This mixer was worth the wait.

Some months ago, British mixer manufacturer Allen & Heath came out with the WZ20S stereo-source audio board. The lads over there did something that, in my opinion, makes this board a better choice for smaller production rooms and remote mixing than most mini- and mid-sized consoles available today — put in more stereo channels than mono channels.



Most comparable general-purpose mixers have only a couple of stereo line inputs compared to an abundance of mono mic channels. It makes sense as those boards are intended mostly for live mic mixing with the occasional stereo source such as cassette or CD.

Allen & Heath took that philosophy and flipped it over.

When a typical mixer, like a Mackie 1202, 1404 or some variation, is mounted in a production studio or workstation booth, it must accommodate multiple stereo sources but cannot always do so.

Usually, these boards are wired up where two mic/line channel faders are brought up together for a single stereo source. It works, but it is a clumsy process for radio production. Multiply this by several sources and that mini-mixer rapidly becomes a headache to mix on.

My basement studio has a single microphone. But it also has a PC audio editor, four stereo synthesizers and two sampling modules, a CD deck, a DAT machine, a reel-to-reel deck, a cassette machine and a second PC for combined MIDI and audio purposes. A Pinnacle digital video editor is a future consideration for me, which will require yet another stereo

See A&H, page 58 ▶

Saving Private PAMS Collection

Ken R.

The typical listener who turned on their transistor radio in the 1960s remembers The Beach Boys and the British invasion.

Those of us in radio back then also remember "Let's Go, America (The All Americans)," "Radio A Go-Go" and "Sonosational." These were some of the classic jingle packages that shaped the sound of great AM powerhouses like WABC in New York, WLS in Chicago, KLIF in Dallas and WFIL in Philadelphia, among others.

The company that created those fondly remembered jingles and then syndicated them around the world was Production Advertising Merchandising Service, or PAMS as it was more commonly known, in Dallas.

Between 1961 and 1972, PAMS provided many memorable themes and even broke new ground for its client stations; most were top-40 formatted.

PAMS invented "Music Power," "Fun Vibrations," "The Station with the Happy Difference" and many other catchphrases.

However, by 1978, the party was over for PAMS. The IRS stepped in and carted off thousands of multitrack master tapes, reference copies of original jingle packages, desks, filing cabinets and office furniture for nonpayment of taxes.

A padlock was placed on the door at the historic 4141 Office Parkway location. Like the ending of a song, PAMS just faded away.

The Toledo connection

I always loved jingles. So, when I had the chance, I entered radio in the late 1960s.

After being involved with different facets of radio, in 1980 I decided to switch gears. I was running a small jingle studio in Toledo, Ohio, cranking out little ditties for car dealers and shopping centers.

In the summer of 1980, I received one of those calls "that changes your life." A friend in radio asked me if I had heard that all the PAMS tapes were in a warehouse in Plano, Texas and that someone wanted to sell them off.

I called the number in Texas, which my friend gave me. I told the guy who picked up the phone "Don't do anything, I'll be there tomorrow." I grabbed my checkbook and a toothbrush and hopped on the first flight for Dallas.

The warehouse which held this treasure of tapes was tucked in among a number of nondescript industrial buildings just outside Dallas.

The man who purchased all the PAMS tapes from the IRS pointed me to a door and said, "Take a look."

I swung open the door and stepped into a room approximately the size of an airplane hanger. In that musty room, piled to the ceiling in hundreds of wobbly stacks, were all the tapes that were painstakingly created by the greatest jingle company in the world.

I spent three days pawing through the cardboard crates, looking over the discarded master tapes.

I found reels marked "BBC Custom 1971," "KHJ Experiments," "Watermark: Casey Kasem American Top 40" and hundreds of other mind-boggling titles.

I do not remember if I ate any meals during those days or even if I slept. But I do know I was having a great time.

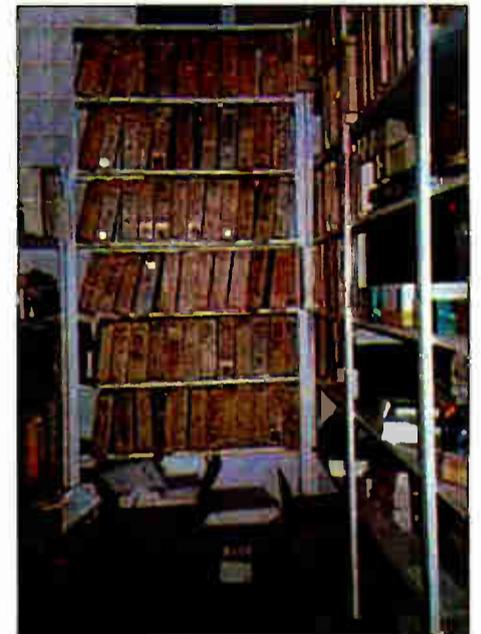
Now what do I do?

One would think that because I was the only potential buyer, I would have been able to name my own price, but, it did not work out that way.

Using my shrewd skills as a negotiator, I managed to bid up the price way above what common sense would dictate was practical, probably because I was drooling.

After we struck a deal and a check was written, I casually asked the seller

See PAMS, page 72 ▶



A familiar sight: shelves filled with analog tapes

You'll find endless features and more than forty cool effects in every box of Cool Edit Pro!

Engineer tested—industry approved!

The complete multi-track recording solution for Windows 95

P.O. Box 62255
Phoenix, AZ 85082 USA
cepro@syntrellium.com
1-888-941-7100
(toll-free sales, USA and Canada)
tel: +1-480-941-4327
fax: +1-480-941-8170

...good sound stuff!

Syntrellium
SOFTWARE CORPORATION

WWW.COOLEDT.COM

Playing Rock and Making a Clock

Alan R. Peterson

Some people like to collect classic microphones. Many search high and low for early broadcast mixers and transcription turntables while others are content with souvenir ashtrays or postcards.

Lots of jocks from my era have kept their first pay stub. My esteemed editor keeps a slice of the KDKA(AM) tower on his desk. Jackets and T-shirts, pens and pins — the fountain of radio station memorabilia both old and new seems impossible to cap.

As for me, I want the clock.

In the course of assembling my little Part 15 AM'er in my basement, it occurred to me how appropriate it would be to have a classic animated radio station clock as part of the general ambiance. Owing to the scarcity of those clocks, it became necessary for me to design and make one (a job not without its pitfalls and moments of silliness).

When we last left our hero ...

If you are joining late, here is the story so far.

After reviewing a 100 mW license-free transmitter a few months ago, I decided to buy it to put up a signal with a four-block coverage at 1170 kHz in Annandale, Va., a suburb of Washington, D.C. Neighbors think it is a novel idea, two nearby schools are interested in its possibilities and my family thinks I have taken leave of my senses.

My favorite one hung years ago in the lobby of WTUE(AM), Mineola, N.Y. Now airing a religious format, the station broadcast country music and community news from a cramped transmitter building back when I was a teenager. The clock was pretty old then and did that tower trick with the energy bolts. Oh, if only that receptionist had looked away for a moment...

Station clocks from the '70s were sleeker, with bold, frosted plastic faces and minimalist artwork, or dozens of fiber-optic filaments that made the call letters shimmer and dance. But only those older clocks would be right at home here in the basement of Annandale

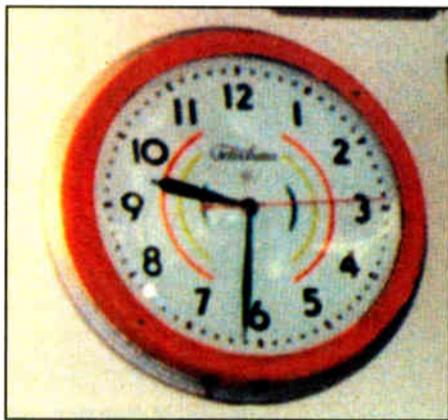


Fig 1: The original Gas Station Clock From Hell, a repainted Western Electric classic in the studios of WLAD(AM), Danbury, Conn., circa 1992

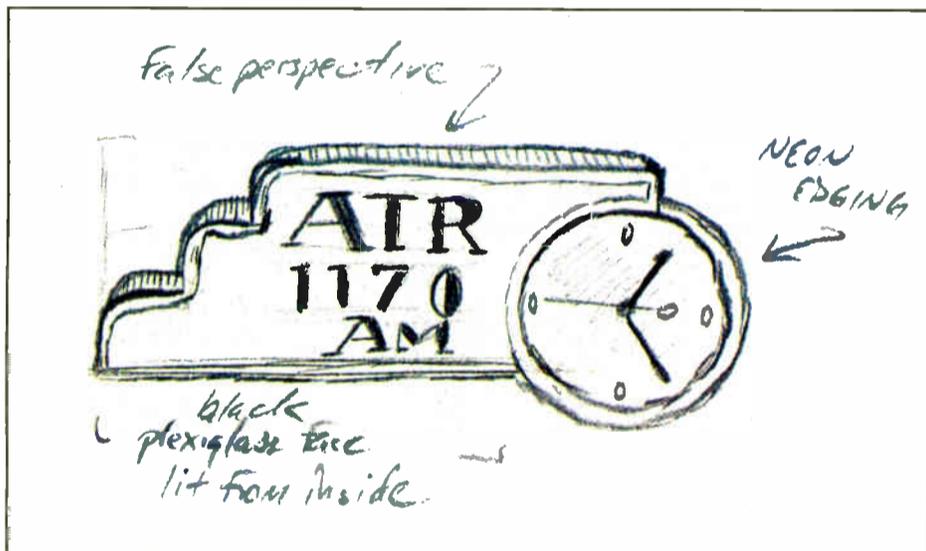


Fig 2: The raw pencil test of what will eventually be the ATR studio timepiece

The neighborhood I live in was built around 1955 and maintains a distinct Ward and June Cleaver feel to this day. Some houses have not changed much; many kitchens still sport old Formica surfaces with that space-age "boomerang" motif of the era. There may even be a fallout shelter or two around town.

It is that sense of nostalgia that turned my mind towards Ye Radio Station Clocks of Olde Tymes.

You know the ones I am talking about. Some had color wheels or polarized filters that put on a little light show behind the clock dial. Some had neon tubes that could be seen from blocks away. Others had endless belts of colors and sparkles behind a masking that animated the station call letters or launched bolts of energy skyward from the figure of a four-legged tower. Almost all were from the '50s and '60s; some were earlier but none were later.

Terrace Radio (ATR), that clunky construction so typical of the time, mixed with post-war innocence and the optimistic "Vision of tomorrow" imagined five decades ago.

I came close a few years back while upgrading the studios of WLAD(AM) in Danbury, Conn. The team I was working with painted over an old Western Electric studio clock we had knocking around (see Figure 1). We called it the "Gas Station Clock from Hell," and while it came close, it didn't nail it exactly.

ATR is not going to be a nostalgia station. But the flavor of the neighborhood, mixed with my own reminiscences of what a lobby clock should look like, dictates what must go up on the wall.

Classic radio clocks on eBay are too expensive. I can't gut a beer clock and rebuild it, as few today are animated and the old ones are valuable. Department stores sell neon clocks that run on a 12 V

adapter, but the step-up circuits are cheaply made and buzz with a high whine.

If I wanted a station clock, I would have to make it.

A visit to the local home improvement center set me up with a quantity of lightweight sheet metal that was normally meant for HVAC ducting, some acrylic sheet plastic and a pop-rivet tool. Building a metal frame with a plastic face would be possible.

Chemistry experiment

Neon tubing? Years ago in high school, I tried to make a mercury light with Pyrex glass pipe, a drop of pure Hg and a train transformer. Mercury was approached cautiously back then, but still could be obtained from the chemistry department with a knowing wink.

I don't even want to think of what health hazards I subjected myself to back then, which is why I won't be building my own tubes anymore. Fortunately, the Spencer Gifts emporium revealed several inexpensive neon novelties that I could cannibalize for tubing and power supplies.

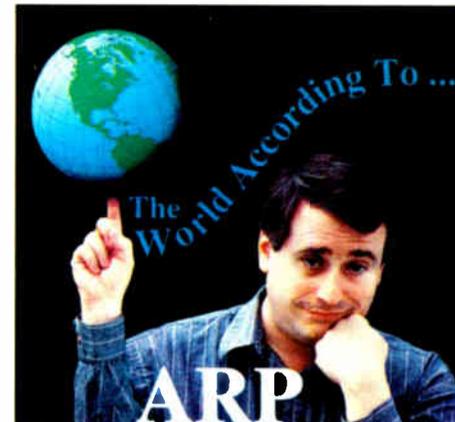
Color wheels and belts are not easy to come by. Putting call letters into motion would be an interesting challenge. A trip to Barbizon Lighting for Professionals, a distributor of theatrical and TV lighting, might net me some cutoffs of lighting gels, with which I could cobble up my own wheel or belt.

But then what? I still needed a design to work with.

During a Labor Day break in Florida, I took my sweet time in the sun doodling and sketching possible clock designs. There was a lot of Deco influence ending up on paper with lines and curves reminiscent of Jazz Age Manhattan and Miami Beach.

I drifted farther and began sketching "bank clocks," my name for that square, Danish-influenced teakwood style seen in furniture designs of the '50s and, of course, in banks built during that era.

I even cheated a little and dabbled



with some fancy animations using LEDs and fiber optics. The thought was strong enough for me to consider pulling out old IC manuals once I got home and see what was needed to make a sequential "theater marquee" circuit.

Then I came up with the design in Figure 2, inspired by a dive luncheonette I half-remembered from early photographs taken by my parents.

There was something familiar and pleasing about it, something that screamed "Studebaker" and "Ed's Soda Shoppe" and "Ballantine Beer" all at once. All the pieces fit together in a rhythmic way. The design is definitely from the '30s, with roots in Art Deco design that already was outdated by the '50s.

Still, it remained a prominent style during that era until the fashion of the Atomic Age took over. I showed it around to the gang and they all agreed this was the one.

It's time to start cutting some sheet acrylic for the basic framework. Now, should I do the color wheel thing, stay with the neon or add some LEDs? I'll tell you how things are going during our next meeting.

■■■

Send us photos of your own cool custom projects to the address on the inside back page.

Al Peterson is now CE and an instructor at the new campus of Connecticut School of Broadcasting in Arlington, Va., down the street from the old Washington studios of Mutual Broadcasting. Reach him at alanpeterson@earthlink.net

PRODUCT GUIDE

Wireless Access to Internet Broadcasting With Kima

Akoo.com is offering Kima, a wireless technology that allows users to access Internet broadcasting away from a PC.

Comprising a base and receiving unit, Kima wirelessly sends audio signals from a PC to any home stereo or portable radio up to 1,000 feet away. Kima can be used to access digital audio delivered by satellite and cable television sources. It is compatible with RealPlayer, RealJukebox, Windows Media Player and MP3.



Kima is manufactured by akoo.com Internet entertainment network.

Akoo.com says it combines audio and video entertainment with proprietary technology to simplify and automate Internet broadcasting.

For more information visit the Web site at www.akoo.com

THE RESULTS ARE IN:

Three out of four of the highest billing radio stations in the U.S. use Omnia.*

Four out of five of the top-rated radio stations in New York City use Omnia.**

Five out of six of the most listened-to radio stations in the U.S. use Omnia.**

AND... two out of the three top stations in Los Angeles use Omnia.***



■ For the name of your Omnia dealer, contact us at 1 (216) 241-3343 or visit our web site at www.omniaaudio.com.

*Source: *Duncan's Radio Market Guide*, 1999 edition

**Source: *The American Radio* by Duncan's American Radio; based on Arbitron Spring 1999 12+ TSA Cume, Mon-Sun, 6:00am-12 midnight

***Source: Arbitron Fall 1999 12+ TSA Cume, Mon-Sun, 6:00am-12 midnight

A&H

► Continued from page 55

connection. It is easy to see that I outgrew my old mixer not long after I bought it.

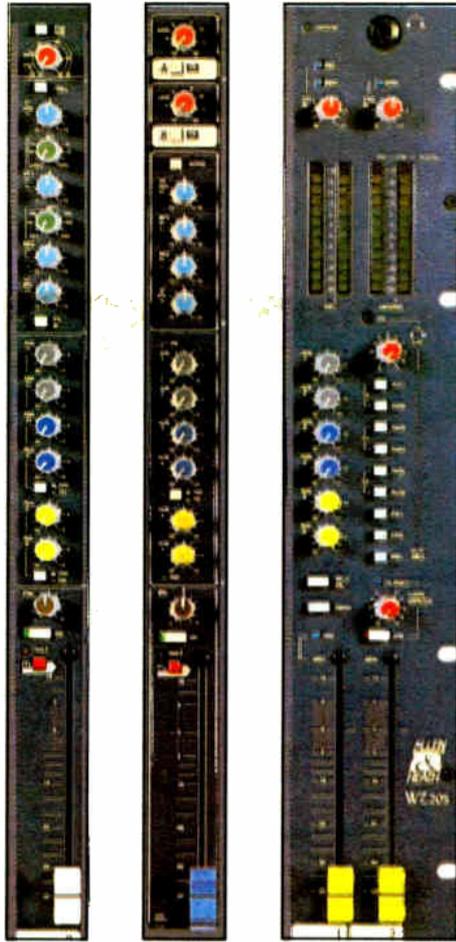
I needed a mixer that had only a few mic inputs but a lot of stereo line connections. Allen & Heath responded with the WZ20S MixWizard board that lists at only \$1,595. The priority of mono sources versus stereo sources appears to be reversed from the conventional mode of thinking.

Big blue from Britain

One big reason that I like this console is that the all-blue, rackmountable WZ20S boasts 100 mm faders. The stubby 4- and 6-centimeter faders I find on comparable mixers feel too short to me. The faders on the WZ20S lack the tight, dampened feel of P&G broadcast-style sliders, but this is to be expected on such a mixer.

The WZ20S offers 18 stereo inputs and two sets of external inputs for a total of 20 stereo sources. There are also four mono mic/line inputs with phantom power and two separate stereo mix busses. One of the external inputs feeds only one of the stereo busses and the other can feed both busses.

The stereo inputs are split up as 16 line ins switched across eight faders. Allen & Heath engineers got around the problem of designing an extra-huge mixer by doubling up stereo inputs on



The mic, stereo and master channels of the board

the eight faders.

At the top of each stereo channel strip are pairs of trimmer pots and input select buttons. With a little planning, it is possi-

ble to lay out a mixer input plot that will not cause any conflicts when a pair of closely-related sources is needed.

You know the difficulty we all run into when mixing balanced +4 and unbalanced -10 components? The stereo inputs on the WZ20S feature RCA jacks on input A and TRS jacks on input B. Problem solved without having to buy a bunch of level-matching interfaces.

Specifications on the WZ20S are as good as any other board. Published specs place THD+noise at less than 0.006 percent and it boasts a frequency response of 20 Hz to 50 kHz, +0/-1 dB.

Mister microphone

The four microphone channels feature individually switched phantom power, a choice of TRS or XLR connections and pre-EQ insert jacks to patch in that compressor announcers love.

The mic inputs each have four bands and six dials worth of parametric EQ. It begins with a 12 kHz HF shelving, a 500 Hz-to-15 kHz variable Midrange control with a 15 dB boost/cut knob, another variable Midrange with 35 Hz-to-1 kHz response and another (15 dB knob, and a 60 Hz LF shelf.

I do not know if Allen & Heath is pitching this as "British EQ," a buzzword tag given to some company's products. To be honest, I would not know British EQ if it hit me over the head with a banjo. I will say that the EQ affords a lot of control over the mic signal and returned a little sparkle to what the compressor robbed from my Sennheiser 421 mic.

The stereo inputs also have four-band EQ on each channel, but these are fixed-frequency.

There are six Auxiliary Sends on the WZ20S for reverb feeds, studio monitor foldbacks, telephone returns and more. However, here is where this mixer falls short.

Sends, returns

On many other boards, the Aux Sends are matched by an equal number of Aux Returns. This is helpful when feeding through multiple effect processors or when different sources need to be processed separately through a rack. While there are six Sends on the WZ20S, there are no dedicated Returns except for a pair of External Inputs.

Product Capsule:
Allen & Heath WZ20S
MixWizard console

Thumbs Up

- ✓ Lots of stereo inputs
- ✓ 100 mm faders
- ✓ Excellent THD and noise specs
- ✓ Versatile EO

Thumbs Down

- ✓ No aux returns
- ✓ Faders have a light feel

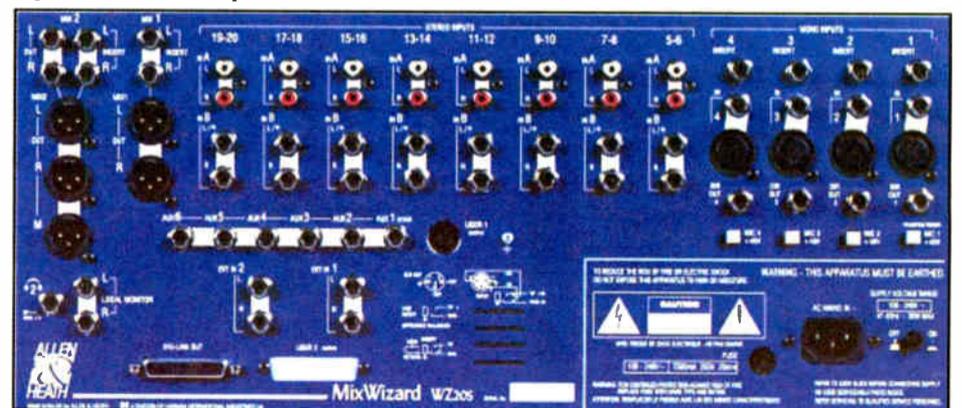
For information contact the U.S. office of Allen & Heath in Utah at (801) 568-7660 or check out the Web site at www.allen-heath.com

rate mixes on the same board with the twin busses, and the inserts and EQ are immensely helpful.

There is a tendency in radio production now to perform compression and EQ decisions in software inside the workstation, primarily *because we can*. But, I still enjoy tuning and tweaking things in the rack and my headphones before committing to the hard drive. For now, that can only be done with a mixer that has those connectivity features.

I needed a mixer that had only a few mic inputs but a lot of stereo line connections. A&H responded with the WZ20S.

The WZ20S is a very effective production mixer, which will find uses in the club DJ booth and in the A/V biz. It is a price-competitive product when compared to other similar mixers, but the extra gold star it earns comes from having all of those stereo inputs ... minus one Brownie point for not having any Aux Returns.



The rear connections of the board

True, this mixer can take a return feed on any unused input and the external line in. But, I feel a board with this much going on should have a set of Returns as well.

However, with two jacks for each stereo input, metering from monitor solo, optional RIAA phono preamps and fader start switching, the WZ20S has a lot going for it.

My mad basement laboratory now has the Allen & Heath WZ20S as its centerpiece. All of my sources run through it just fine. I can do two sepa-

I had to wait until someone saw the wisdom of lots of stereo inputs on an inexpensive mixer, but you don't have to. If you are considering a small mixer with a more "familiar" name, give some thought to the Allen & Heath MixWizard WZ20S. It may help you get the job done without having to glue two faders together to control one stereo source.

Alan Peterson is a technical adviser to RW. Reach him via e-mail at alanpeterson@earthlink.net

NEWS HAPPENS

... and now RWOnline brings it to your desktop every day.

Introducing **RW NEWS BYTES** A new feature on RWOnline

Every business day the Radio World editorial staff will provide you with the latest in radio news and technology. Begin your work day with the scoop on:

- Digital Radio
- Mergers and Acquisitions
- FCC Regulations
- New Product Launches
- Who's Doing What and When
- Trade Show Coverage

Every two weeks, you depend on Radio World to provide you with in-depth coverage of all the happenings in radio. Now turn to www.rwonline.com to provide you the same excellent coverage - every weekday!

Sponsored by

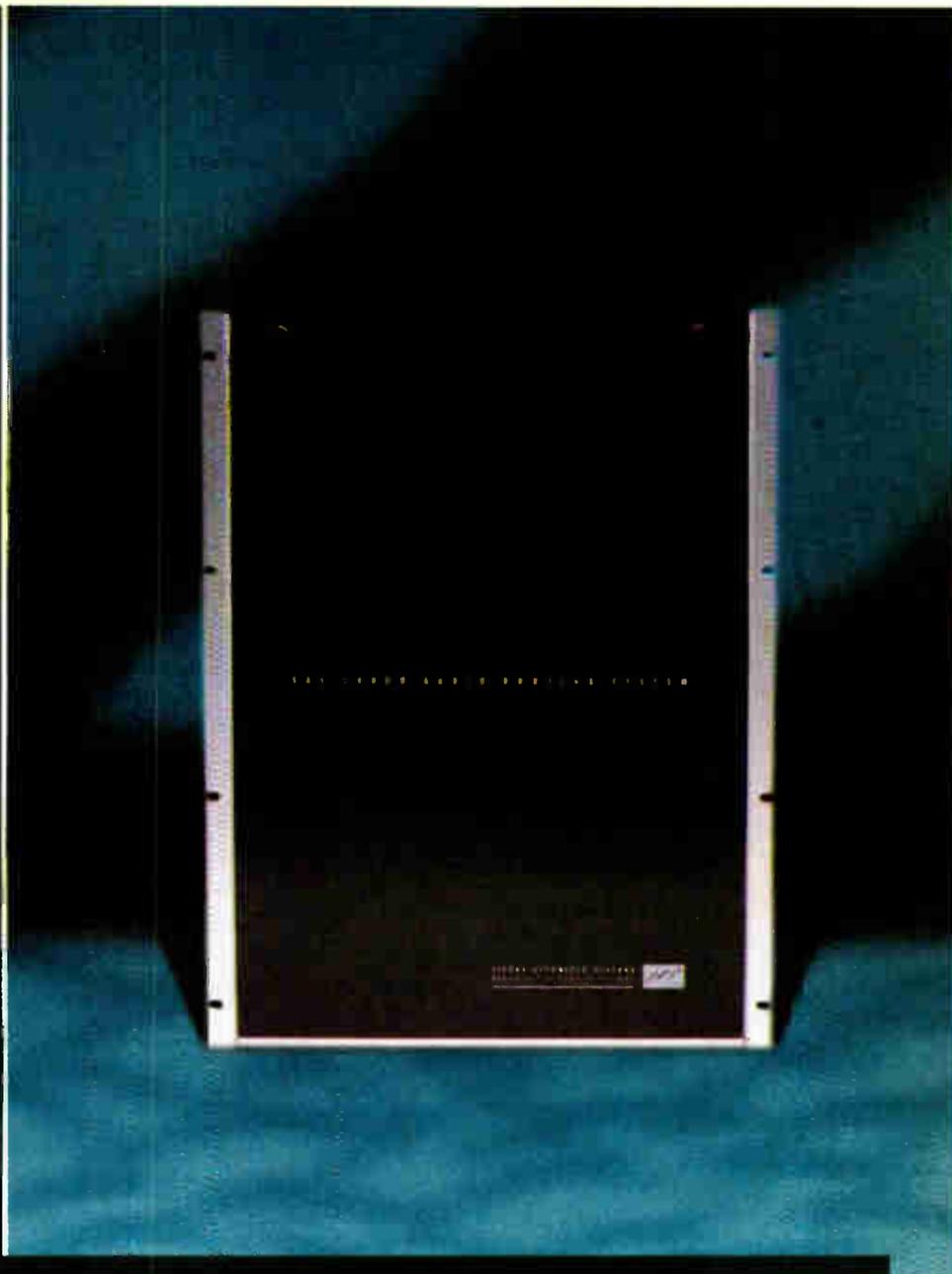


Get your RW News Bytes NOW!
www.rwonline.com/dailynews

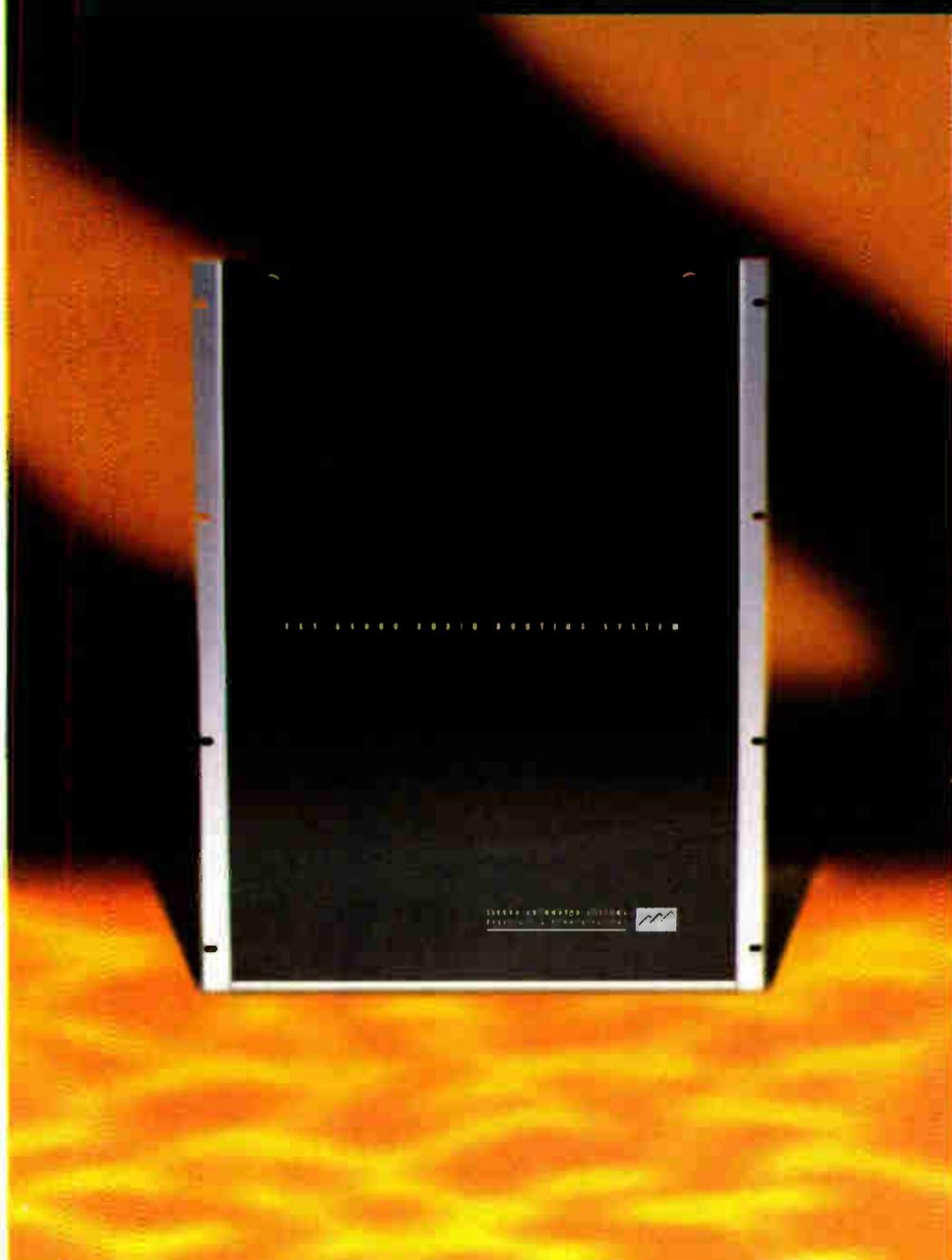
SAS64000 AUDIO ROUTING SYSTEM

E l e g a n t
A n a l o g

I n s t a n t
D i g i t a l



256 X 256 LARGE • MONO/STEREO • WIDE VARIETY OF CONTROL PANELS • 118DB ANALOG DYNAMIC RANGE • DISTRIBUTED MULTI-PROCESSOR ARCHITECTURE



If the migration to digital is in your future, then this is the route to take. Introducing the large size, big performance analog router that also speaks fluent digital. A true hybrid that allows you to scale the number of analog and digital ports as needed, now and in the future. And even better, the SAS64000 creates a forward path to AES/EBU digital audio without creating analog obsolescence.

This means you can mix your analog and digital I/O in the same router frame. Go direct analog to analog, or digital to digital. Or mix it up with 24 bit conversion analog to digital and vice versa. Either way, this unique architecture sports flawless signal integrity and non blocking flexibility.

And it's wonderfully simple, just plug in our new digital port expander and that's it. Welcome to digital! -co-existing richly with analog in the same framework.

There's lots more to tell. Call us: 818 840 6749. Fax us: 818 840 6751. E-mail us: sales@sasaudio.com Check the Web site: sasaudio.com And of course, snail mail: 2625 North San Fernando Blvd. Burbank, California 91504 USA



NPR Goes Mobile at Conventions

Rich Rarey

You could hear their voices over the band as long as they spoke up — and the roar of the delegates made the aural scene sound like a Roman Coliseum, not the First Union Center in Philadelphia.

Nonetheless, NPR hosts Scott Simon and Elizabeth Arnold held their aural ground to give listeners a sense of this summer's Republican National Convention from the skybox. The team would later recreate their host magic at the Staples Center in Los Angeles for the Democratic National Convention.

Progress

Behind the scenes, while five NPR audio engineers mixed the on-air program and worked with producers and reporters to create radio pieces for later airing, a visibly weary Shawn Fox slowly lowered himself into a seat at the NPR convention workspace to review the progress made.

For nine months, Fox has held the title of NPR Elections technical director, with the heavy responsibility of conducting the engineering planning and execution of NPR's coverage of

The skybox could be the place for on-air broadcast with a "general workspace" in a different location where reporters and producers could work comfortably on their pieces.

He developed systematic plans and interconnection schematics that satisfied the goal of a self-contained remote and interconnected widely spaced broadcast sites at the convention.



Everything that would be found at in the studio fits into the skybox at the Republican National Convention

On-air broadcasts during the convention proceedings originated from a skybox well above the convention floor. The skybox had enough room to hold an open-air studio with an adja-

transmitters were carefully regulated by mutual consent of the attending media. Any transmitter without an "approved" sticker was confiscated.

The feed was routed to a full-size Sierra Automation Systems model 64000 audio switcher, configured into a combination of IFB and crosspoint modes.

A month later in Los Angeles, Simon and Arnold worked their host magic again at the Democratic National Convention. Even though the venue was similar, Fox had to revise the skybox layout *again*.



The portable newsroom in a trailer at the Republican National Convention

Production staffers needed more external sources, so a larger Mackie SR24-4 console was placed in the skybox and an additional Telos One digital hybrid telephone interface Telos Zephyr ISDN codecs were connected. This kept the engineering staff busy with dialing, cueing and setting up the guests.

Meanwhile, back at the trailer

A trailer was outfitted at both conventions to provide a quieter recording and tracking space. Fox sketched out how the trailer was articulated into a studio, control room and two production-staff-use booths.

Booth one was the ISDN room, using a Musicam USA RoadRunner, mic and headphones for sending voice-overs to NPR headquarters.

Booth two was equipped with a Dalet multi-panel record facility, which essentially was a "Record Central" for recording multiple feeds simultaneously and offered reporters a place to dub from MiniDisc, DAT or other modern media. This booth also had its own ISDN codec for feeding workstation audio to NPR headquarters.

The back of the trailer contained the HVAC, the SAS switcher, the phone router, all computer hubs, remote Dalet server or "The Beast" as we affectionately called it, ISDN units for the T1 connection back to Washington, and it was the termination point for the 50-pair cable from the broadcast booth. This cable was the umbilical to the skybox 2,000 feet away.

Because of the extremely long direct run, no networked data could be placed on the cable, rendering it useless for Dalet workstation use. NPR's Dalet administrators David Gray and Mike Czaplinski came up with a scheme to use PCAnywhere to remotely control a Dalet workstation located at the workspace.

"Fortunately," said Shawn Fox, "the scheme worked perfectly."

To begin the intensive planning for the conventions, Fox drew schematics for the AC voltage requirements.

"It doesn't do any good to plan any-



thing else if you can't power the equipment," Fox said. "After the AC was nailed, I drew the inputs, then outputs, and then routing. The routing plans always suggested themselves from the I/O diagrams. The SAS (router) was always in the original plan, because of the number of I/Os and its IFB capability."

He called the Sierra Automation Systems router a "fantastic device." Originally, NPR planned to purchase the system for the refurbished fourth floor studios. However, the building schedule for the studio was moved up several months, and the system would not be delivered until after the conventions were over. SAS graciously loaned a custom system for a month until the convention "season" ended.

Lastly, Fox planned the Dalet system — the location, cable runs and how to get that data signal 2,000 feet from the skybox to the workspace.

This marked the first time NPR has participated in convention coverage and did not bring any reel-to-reel decks. All editing, recording and lay-ups were done on the Dalet server/client system configured for remote work.

Fox said that his work was never done.

"After all the planning was completed, it was immediately changed and enhanced because of unplanned additional requirements placed by the production staff," Fox said referring to equipment changes and layout.

Fortunately, the connection back to NPR Washington remained unchanged. The entire operation was connected to NPR headquarters by T1. Allocated to "data" were 512 kbps for writing scripts, e-mail, research and other online activities; 384 kbps was allocated for multiple audio channels encoded into a Prima codec, and the remainder of the bandwidth was allocated for voice-grade telephone extensions.

John Keator, telecom director at NPR, was concerned by the telephone company's casual handling of the T1.

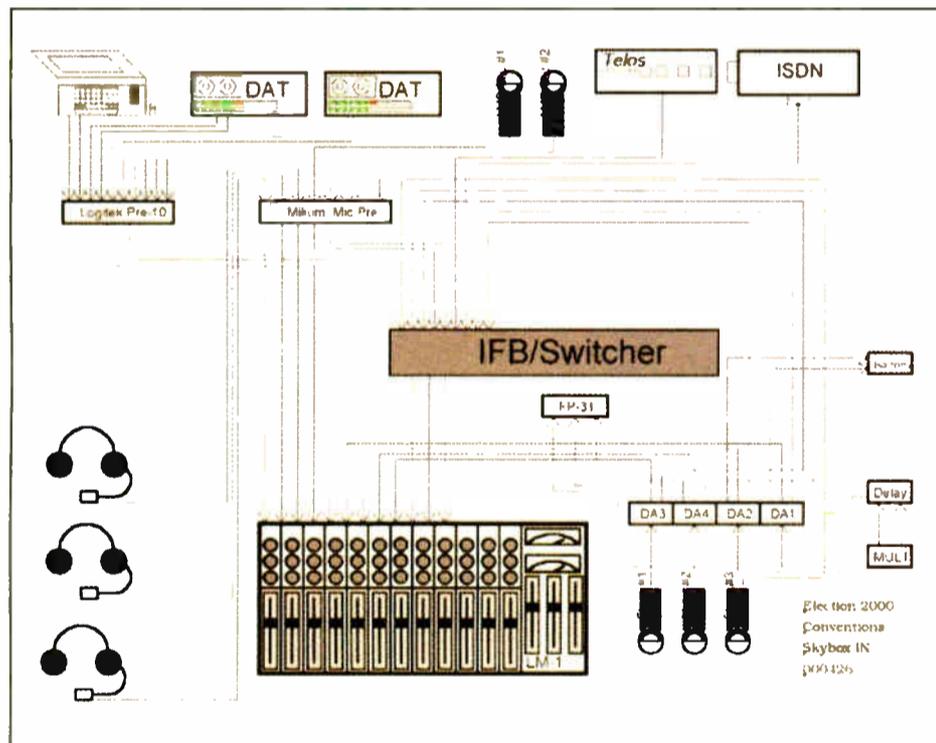
"The data audio and phones cables were laid across the ground, next to inductive loads, through mud, across roads framed by two-by-four lumber," said Keator. "It was amazing the signals reached its destination at all."

Fox said, "We serviced every NPR news program with feeds, raw material, mixed pieces, news spots, edited material, two-way interviews, and I guess it was too successful. After building extensive remote facilities, at 3 p.m. each day (the deadline time for "All Things Considered") it still wasn't enough."

"The best part after eight months of design and planning," said Fox "was hearing the audio go around and around — just as it should."

■ ■ ■

Rich Rarey is the master control supervisor at NPR. He acknowledges the documentation of Shawn Fox and Norb Gallery, without which this column and the convention broadcasts could not have been written. Reach him at rrarey@npr.org



The schematics of the inputs at the skybox

"Election 2000."

This designation includes the two political conventions, the New Hampshire Primary, Election Night 2000 and finally the presidential inauguration in January 2001.

NPR always covers these events, but Fox's job was complicated by the desire of the NPR News staff to create a self-contained, total-service temporary remote bureau.

This could be where on-air, production, digital editing and multiple feeds could be accomplished. The beauty of the plan was that broadcasts could be shunted directly to the NPR satellite system uplink with minimal personnel at the main headquarters for on-air support.

Because both conventions had similar equipment requirements, just different physical spaces, Fox developed a conceptual schematic for the studio portion where production took place.

cent enclosed control room. The open-air aspect caused a problem at the Republican National Convention, because a house PA speaker was close to the open studio window.

The schematics show the In/Out connections for the console. In addition, the space held several digital delay units, two Telos One digital hybrid telephone interfaces, two Musicam USA CDQ Prima 120 ISDN codecs, a Dalet client workstation, Crown headset mics and Lectrosonics wireless mic receivers and IFB transmitters, and several televisions.

Of note is the delay unit used to synchronize the direct feed from the convention floor traveling at the speed of light, with the acoustic version heard through the open mics in the skybox traveling at the speed of sound.

Up to three reporters could be roaming the convention floor using wireless mics. The frequencies of the

PROJECT EVALUATION

Sony Puts Mix in an Actual Hall

Mike Cogan

At the AES convention a year ago, I was drawn to a pedestal in the Sony booth where the Sony DRE-S777 digital reverb sat.

Like most audio engineers, I cannot live without a digital reverb. Added judiciously to a mix, it helps meld the individual elements, add a sense of space and increase the overall musicality of the product. In fact, digital reverbs do everything except sound like a real hall.

After experiencing a lot of location recording, I feel it might be easier to record in the controlled environment of a studio and create a concert hall sound by adding reverb. However, it never works, as at some point the ear starts screaming, "Fake!"

The reason I was so intrigued by the reverb at the AES show is that the literature claimed to use samples of real halls employing something called "convolution sampling" to play a mix in *that* hall. Even listening through headphones in the noisy environment of the show, I was amazed at what I heard.

In fact, **Radio World** heard the same thing happening at the 2000 NAB convention and gave the Sony reverb a "Cool Stuff" Award.

Could this be the Holy Grail of reverbs? I jumped at the chance to review it.

It was of particular interest because I was working on a project by The Persuasions, the acapella vocal group.

Acapella voices have always been difficult for digital reverbs. It has something to do with the tails — the sound you hear when the music stops. Most digital reverbs sound artificial on the voice.

The particulars

The unit is a two-RU box. It is quite hefty, weighing in at 33 pounds and with a depth over 20 inches. It generates a fair amount of heat and should be placed in an area that offers good ventilation top and bottom.

With the weight comes a hefty price tag. The basic unit lists for \$7,375 and only has mono in, stereo out. Fully configured, it has stereo in and out, and mono in, 4-channel out, but the list is a whopping \$12,600.

This may be a product for only the most high-end recording facilities producing work for radio broadcast, but it is using a new technology and I suspect that future models might have a lower price tag. For now, radio production folks with ample budgets would probably find use for this product with vocals.

To be fair, some other new units from TC Electronic and Lexicon have similar price tags, but they can do all sorts of DSP functions besides reverb. Of course, they do not do convolution sampling, so you must be paying for a great reverb but nothing more. Still, a great reverb is hard to find.

The front has a faux wood grain contact-paper look with an LCD display screen and a CD-ROM drive for loading the samples.

The only controls are four small "soft" buttons under the display and a knob to the right of it. Above the CD tray is a slot for a memory stick and below is an eject button for the CD tray.



The look is elegant and simple, but I would prefer more controls and less reliance on the soft buttons.

I had to read the somewhat skimpy manual to learn how to use it. I occasionally loaded the wrong set-up, a function that can take several minutes and cannot be undone until it finishes.

Absent is any form of remote control. There are fewer parameters to control than on most reverbs, but a wired remote would be handy.

There is an RS232 port for troubleshooting, and a set of MIDI connectors on the back. The MIDI jacks have no function in version 1.0. So, it might be

possible for Sony to come out with a remote in the future, whether tied to MIDI or the RS232 port.

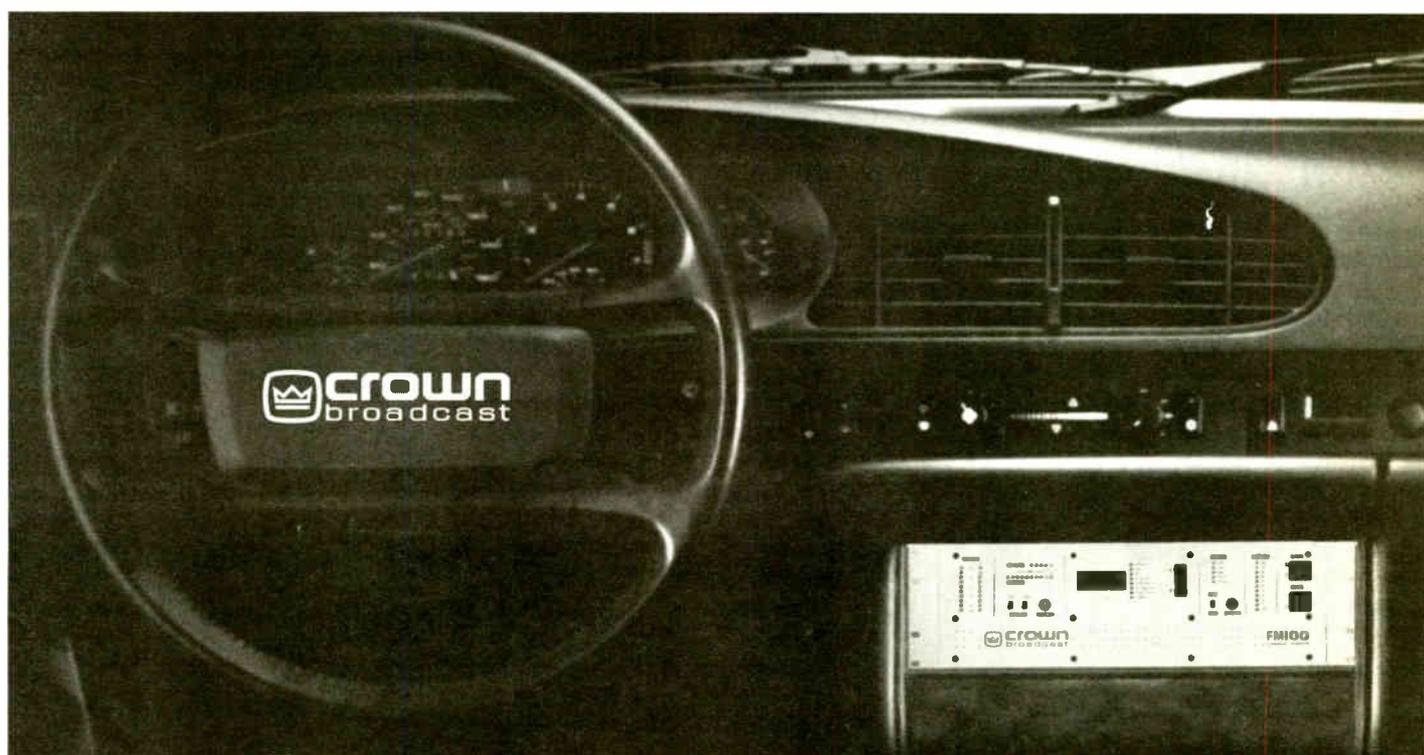
The back also contains AES/EBU digital I/Os on XLR connectors and the analog I/Os with +4 XLRs.

CDs that contain different samples are becoming available as Sony engineers travel around the world and sample locations.

My unit arrived with the generic CD that is included with each unit and one of "European Halls and Churches." CDs are now available of "Japanese Acoustic Spaces" and "American Acoustic Spaces" that includes the Grand Canyon.

Apparently, the engineers set up speakers on the stage, dais, canyon or wherever in each venue and place various types of mics around the space.

See REVERB, page 62 ▶



Drive this...

Just as a car needs a reliable driver, so does every radio broadcast transmitter. The Crown FM series exciters, drivers and low power transmitters offer reliability unsurpassed throughout the world. Incorporating standard features as an integral part of all power levels, the quality in workmanship standard is consistent for all of Crown Broadcast products.

The exciter/driver model offers high reliability as an RF driver while maintaining the audio purity associated with FM broadcasting today. The internal low pass filter allows the exciter to be placed directly on-air in the event of a main transmitter failure.

Crown transmitters are stand alone low power units and can be configured with optional stereo generator and audio processor. Thousands of broadcasters around the world have come to appreciate the rugged, reliability of the Crown Broadcast line of transmitters.

So when making your decision on a new exciter, RF driver or low power transmitter, reliability should be at the top of your list. Crown Broadcast builds reliable transmitters from 1 watt to 2 kilowatts.

Contact Crown for reliable, efficient broadcast transmitters.

Get in the driver's seat

crown
broadcast

P.O. Box 2000 • Elkhart Indiana 46515-2000 • 219-294-8050 • 800-294-8050

Fax 219-294-8222 • www.crownbroadcast.com

Reverb

► Continued from page 61

For each space, there are several samples for different speaker and mic locations. Then, the user can choose what type of mic is used in the front and back. For example, a pair of cardioid mics near the front or a pair of omnis in the back can be chosen.

The mono-in versions are created as separate samples with only one speaker in the center.

The "European Halls and Churches" CD came with a brochure showing color pictures of the various spaces and a chart showing the options for speaker and mic placement with measured dimensions for each space.

Save Your Issues of Radio World in Style



Now there's an easy way to organize and protect your copies of Radio World, the industry's best read newspaper, keeping issues readily available for future reference.

Designed exclusively for Radio World, these custom-made titled cases provide the luxury look that makes them attractive additions to your bookshelf. Each case is sized to hold a year's issues (may vary with issue sizes), and is made of reinforced board covered with durable leather-like material in blue, with the title hot-stamped in gold. Cases are V-notched for easy access and free personalization foil is included for indexing the year.

Cases

1-\$8.95 3-\$24.95 6-\$45.95

Call Toll Free
7 days, 24 hours
1-800-825-6690

Charge Orders (Minimum \$15):
AmEx, Visa, MC, DC accepted.

Jesse Jones Industries,
Dept. 95RW
499 East Erie Ave.
Philadelphia, PA 19134

Allow 4 to 6 weeks for delivery
SATISFACTION GUARANTEED

Add \$1.50 per case for postage & handling.
Outside U.S. (including AK & HI) \$3.50 per case
(U.S. funds only).

PA residents add 7% sales tax

Also, software is now available that allows you to create your own samples. However, Version 2.0 software, available as an N/C upgrade, is required to use the sampling software. It comes standard on optional sample CDs and the upgrade also allows split-mode operation with 2-mono in/stereo out reverbs run simultaneously with the DSP expander board installed.



From left: David Gans, producer; Mike Cogan (leaning on unit), engineer; Jerry Lawson, leader of the Persuasions

Each CD also comes with a Memory Stick, a storage device designed into numerous Sony products, including camcorders and MP3 players. There is a slot for it right above the CD tray.

It serves two functions — it keys the CD so you cannot use a bootleg copy. The CDs cost several hundred dollars each and it allows storage of up to 92 setups. The programs are too big to fit on the memory stick and can take quite a while to load from the CD.

The 777 has nine cache memories, so nine programs can be loaded and then instantly switched from one to another. All of the parameters, but not the samples, can be stored on the memory stick and recalled.

When loading one of the stored sets of parameters from the memory stick, it then loads the sample programs from the CDs and prompts when to change to a different CD. This can take a few minutes, especially if the particular set of parameters uses all nine cache memories.

The display has three windows — Reverb, Mixer and Setup.

The Reverb window displays a picture representing the type of space selected — a piano on a stage for a concert hall, a spire for a church, for example. There are only two variables: pre-delay and reverb time.

I assumed that because these are real spaces, the reverb time is set by the RT_{60} of the actual space. RT_{60} is the time in seconds that it takes for a reverberant sound to decay through 60 decibels. I envision twisting the dial and watching as timbers crack and walls move.

However, the Sony engineers informed me that the internal clock rates could be varied while keeping the basic sound of the space because this is a DSP process.

This is useful, as most of these spaces have too long of a reverb time. Only a

few variations of the reverb time are possible, and it cannot be set longer than the RT_{60} of the actual space.

The second window has a mixer, which includes four-band EQ. The mixer has a wet/dry balance, and the EQ can be switched to either the wet or dry path, a very useful feature.

The third window has the general set-up. This is where the basic parameters can be stored and recalled on the memory stick. signals can be directed to various outputs and even the contrast of the LCD display can be set.

The 777 has a lot of capability, but it is essential to read the manual.

For instance, the "direct" and/or "reflected" sound can be sent to either pair of outputs. The 777 discriminates between the "direct" (or primary) echoes reaching the sampling mics direct from the speakers and the "reflected" or later echoes bouncing off the walls, ceiling and floor.

This could be useful when mixing in 5.1, as the direct signal can be sent to the L/R front and the reflected signal to the rear.

You may not need to worry about surround sound at the station production level. But should you ever author some of your audio work to DVD, and those disc burners will only come down in price, the Sony 777 will be ready for you when you get there.

So, how did it sound? In a word, great! The reverb sound is smooth with full and rich tails. It is useful to be able to choose which mics were used to make the sample.

My favorite sample is of the Grosser Musikvereinsaal in Vienna. Using the sample from a pair of cardioid mics in the front was good, but not quite rich

Product Capsule:

**Sony DRE-S777
Digital Reverb**



Thumbs Up

- ✓ Incredible sound
- ✓ New sampling technology of real spaces



Thumbs Down

- ✓ Cost
- ✓ No remote

For more information contact Sony in Florida at (800) 686-7669 or visit the Web site at www.sony.com

enough. Switching to a pair of omnis in the back of the hall was better but the tails were too long. I set the reverb time down to 1.8 seconds and found just what I was looking for.

It was so smooth that the producer of the session kept muting the returns to make sure it was really working. Without them, everything sounded dry and uninteresting. With them, the mix sprang to life, but without any apparent reverb artifacts.

You can hear the reverb on The Persuasions "Might As Well" CD on the Grateful Dead label.

Now, could this reverb fool me into thinking I was really in a concert hall? Well, I found that it is like learning a musical instrument, as the more I use it, the more I learn.

While mixing another acapella group, this time a 50-voice men's chorus, I found my Persuasions setting sounded artificial. Just as I started wondering if this unit was really better than my old Lexicon, I tried the Concertgebouw large hall in Amsterdam and got a fairly convincing illusion. It still was not quite 100 percent, but I am still learning.

As it stands, it is still the best sounding reverb, digital or otherwise, this engineer has heard.



Michael Cogan is the owner and chief engineer of Bay Records recording studio. The first artificial reverb he used was hooking up a set of necklace springs from a Hammond organ.

Is Seven Grand Too Grand?

The idea of taking an acoustic "picture" of a performance space as a reverberation template is a high art in the Sony 777. But, if sinking several grand into this technology is beyond your means right now, there is a less expensive alternative.

Sonic Foundry (www.sonicfoundry.com) makes a DirectX plug-in called Acoustic Mirror for \$59.95. It uses "impulse recovery" techniques to read the reverberant characteristics of an acoustic space and then applies them to an audio signal in a host DirectX-compatible program.

Microphones are placed in an acoustic space. The program generates a frequency specific "ping" through a speaker and the mics pick up the acoustic reflections of that ping colored by the response of the acoustic space. Thus, a signature of the room's acoustic nature is recorded and can be applied to digitized audio.

The obvious use for this program would be to duplicate the great concert halls of the world, but information on the Sonic Foundry Web site also stresses its use as a microphone modeler, a stereo image generator and a space simulator for dialogue replacement. The program makes it possible to match the acoustic qualities of a room where a voice recording was made, should it become necessary to replace or add additional dialogue in a different location.

Remember, Acoustic Mirror is a computer plug-in dependent on a host audio program, which means it is not likely to operate in real time. Similarly, audio quality will only be as good as the audio interface or soundcard found in the host PC.

There are valid reasons why Sony charges what it does for the 777, but if all you want to do is experiment, plug-ins such as Acoustic Mirror will expose you to the possibilities offered by this intriguing audio technology.

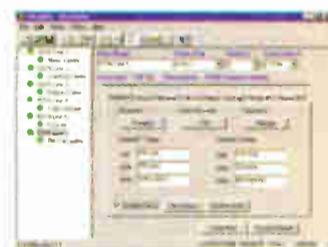
— Alan R. Peterson

Saves space. Saves money. Saves you searching for the codec that was in the control room yesterday.



©1999 Harris Corporation.

We've all been there before. You've got a remote broadcast to get up and running in an hour, and the codec that was in the control room yesterday is missing. The Harris IntraLink by **Intraplex** ensures that you're always ready for your remote by consolidating all of the functions of up to *six* codecs into one, space-saving, 5.25" rack-mounted unit. Because IntraLink is compatible with most popular brands of codecs, you don't need to store and maintain separate codecs in-house and match them to those in the field. You'll always have the codec you need for that traffic report or sports event. Plus, you can control and manage all of your remote broadcasts from a single system—and save money by deploying existing codecs to the field. The Harris IntraLink. You won't have to search hard to see the advantages.



Monitor and control all of your ISDN lines via IntraLink's easy to use Windows®-based user interface.

next level solutions

WIRELESS

BROADCAST

GOVERNMENT

NETWORK SUPPORT

HARRIS

800-622-0022 • www.harris.com

World Radio History

Products & Services Showcase

Take advantage of our FREE CD offer today

The Traffic C.O.P.™ for Windows gets you into the 21st Century with prices you can afford.

Once you view our CD demo, we know you will want the software

No Obligation!
See what the Traffic C.O.P. for Windows can do for you!

Generous Small Market Discounts
CALL NOW for our FREE CD-ROM Demo!
(800) 275-6204
www.broadcastdata.com

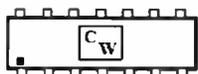
The CircuitWerkes HC-3 Autocoupler



HC-3 shown with optional rack mount

More Features. Better Price.

- Auto-connect and disconnect.
- Two-Year limited warranty.
- LED Indicators for incoming rings/on-line status & power.
- Answers on user selectable number of rings.
- Momentary or latching dry contacts at pickup.
- Audio, control and power connections on screw terms.
- Metal case can be wall/desk or, optionally, rack mounted.
- Dual rack mount available.
- Optional ComboLok provides password security.
- Suggested list only \$229.
- Simple, active hybrid with unbalanced, In/Out for simultaneous send & receive communications.
- Remote connections include: aux. relay closure, pickup-enable, remote pickup trigger, call end sink, & Ring/Online sink.

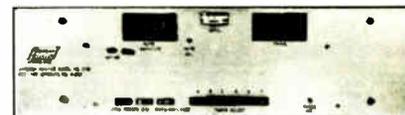


CircuitWerkes

3716 SW 3rd Place
Gainesville, Florida 32607
(352) 335-6555 / fax 380-0230
e-mail sales@circuitwerkes.com
<http://www.circuitwerkes.com>

DIGITAL ANTENNA MONITORS

In-Stock-Available for Immediate Delivery



Price US\$2700.00 2 Towers
Will operate with any remote control equipment.



Price US\$2100.00 2 Towers
For AM directionals with studio located at transmitter site.

These monitors are state-of-the-art instruments of unequalled accuracy (.5% or better on ratio and .5° or better on phase) and stability. With typical modulation the true ratio readout of these monitors is a factor of 10 more stable than instruments that measure normalized amplitude, and their phase readouts are rock solid. Phase sign is automatic, no extra operation. In addition to the analog DC outputs for remote control the Model CMR has a multiplexed BCD digital output which can be used to drive the Remote Indicator Model CMR-1. RF inputs have dual protection. Gas discharge tubes across the sample line terminations plus relay protection.

GORMAN REDLICH MFG. CO.
257 W. Union St. Athens, Ohio 45701
Phone 740-593-3150 • FAX 740-592-3898
www.gorman-redlich.com/jimg@gorman-redlich.com

Tri-Maze Complete AM FM Processing Package



Model TM4013 Tri-Maze

- 60 dB control range.
- Meets all NRSC requirements.
- Time domain contoured, integrated release.
- Easy access compression and mix controls.
- Dip switch selectable pre and de-emphasis, 75 or 150 uS.
- Mix down peak metering, permits precise yet simple setup.
- Triggered absolute level expansion, auto-mode for voice or music.
- Zero hysteresis post filter clipping, provides up to 2 dB loudness without center channel distortion products

Reliable, Quality Processing From:
Broadcast Technology Company
P.O. Box 751 • Lamar, CO 81052 Phone: 719-336-3902

AES3 Switching And Distribution

Made Easy with the AES-200



Features:

- 2 Input AES3 Switcher
- 2 XLR Outputs, 2 BNC Outputs
- Remote Control/Status

Uses:

- Main/Alt. Transmitter Audio Switching
- Digital Studio Switcher
- Professional Digital Dubbing

Broadcast Devices, Inc.



5 Crestview Avenue
Cortlandt Manor, NY 10567
Tel. (914) 737-5032 Fax. (914) 736-6916
Website: www.Broadcast-Devices.com

THE COST EFFECTIVE ALTERNATIVE TO MANUFACTURER SERVICE

SERVICE, REPAIR & CALIBRATION

- STL's • RPU's • TSL's
- Exciters • Optimods
- AM/FM Monitors
- Remote Control Systems

SPECIALIZING IN EQUIPMENT BY

- Belar • Marti
- Moseley
- McMartin
- TFT
- And others...

WE ALSO PROVIDE

- Free, over-the-phone technical assistance
- STL loaner/rentals
- PCL 505 Certification



2198 Hubbard Lane, Grants Pass, OR 97527

(541) 471-2262

Celebrating 60 Years
of Quality Rebuilt Tubes
1940-2000

Freeland Products, Inc.

75412 Highway 25
Covington, LA. 70435 U.S.A.
1-800-624-7626

www.freeland-inc.com

Email freeland-inc.com@freeland-inc.com



If You Can Make It Here ... You Can Make It Anywhere!

Photo by John Lyons

6016 FM Antenna Condé Nast Building New York City
(207) 647-3327
888-SHIVELY
Shively Labs
www.shively.com
sales@shively.com

BOOK REVIEW

Announcing Textbook for PC and Mac

Alan R. Peterson

There is a new workbook from Focal Press, an imprint of Butterworth-Heinemann, that provides aspiring broadcasters the skills and terminology to get a jump on a career in radio or television.

A trio of professors from John Carroll University in Ohio — David E. Reese, Mary E. Beadle and Alan R. Stephenson — wrote the "Broadcast Announcing Worktext." It is a timely and up-to-date workbook that hits topics such as vocal development, performance development, ethical and legal issues, and tips on beginning a broadcast career.

Books on broadcast education and

announcer technique are by no means new. Many can be as dry as Styrofoam packing peanuts.

"Broadcast Announcing Worktext" adds another element that makes it worthy of attention: a CD-ROM filled with samples of good and bad technique.

Fire up the D: drive

Packaged with the textbook, the CD-ROM is authored mostly in HTML and can be read from a Web browser.

Hyperlinks within the HTML documents activate the computer's media player to watch QuickTime movie files and listen to WAV files. Vivid examples of inappropriate vocal performances as

well as solid voice-over demo reel samples bring to life what was limited in the past to dry text on a page.

The recordings are CD quality and sound good even on laptop speakers without being overtly theatrical in nature. Used in conjunction with the textbook, the lessons hit home.

When a cut demonstrates a particular quirk or inflection to avoid, it sounds legitimate without being over the top. For example, the "sing-songy" approach, which turns up frequently with aspiring broadcasters, is admirably represented on the CD-ROM without sounding like a 4th grader reciting a story.

Other cuts that suitably demonstrate incorrect technique include "whiny," "nasal," "sibil" (for sibilance) and "noinflec," a prime example of what flat copy sounds like with no inflection.

Before you think that all the examples on the CD-ROM are of what not to do, be assured there are plenty of correct examples as well. Vocal artists Barbara A. Vidic and Bart Flynn, among others, pro-

vide compelling commercial reads and voice-over audition samples. The CD-ROM also has samples of on-air newscasts, airchecks in various formats and sports play by play.

A separate section of the CD-ROM concentrates on video presentations for prospective news reporters and weathercasters. While not applicable to radio, it is amusing to view one particular cut of a

See ANNOUNCER, page 69 ▶

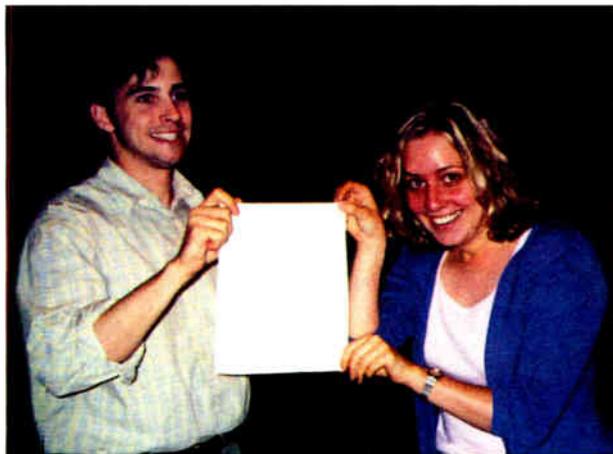
NEWS MAKER

Oink Gives Life to Dead Scripts

National ad agency Oink Ink Radio announced the winners of its Third Annual "Dead Radio Contest."

The contest, named because the radio ads were "killed" by agency clients before production, drew about 500 entries.

Dan Price, president of Oink Ink Radio, said, "Every copywriter we've ever worked with has a drawer or computer full of great radio scripts that never got off the ground. We thought it would be nice to have an annual contest to dust them off. Plus it's a nice way to meet good writers and have folks learn a little about what we do."



Dead Radio winners Phil Gable and Sandra Scher display the winning script. (Not pictured: Phil's left arm.)

Copywriter Phil Gable and Art Director Sandra Scher of Di Massimo Advertising wrote grand-prize-winning script.

The award earned them an all-expense paid trip to Oink Ink Radio's West Coast office to have their script produced.

"Winning the grand prize was like seeing an old friend come back to life," Gable said. "I'm extremely pleased over the resurrection."

Scott Cooney of Fallon McElligott won the silver award and Brad Monk of Vickers & Benson won the bronze award.

For information call (800) 776-6465 or visit the Web site at www.oinkradio.com

Here is the Silver Award script:

Annrcr: I'm here with a blended Carmel Frappuccino from Starbucks. To get the full experience of this cool, creamy treat, I want you to imagine yourself floating on a cloud.

Sfx: Soothing music, wind.

Annrcr: Yes, a nice fluffy cloud, drifting along, high up in the —

Sfx: Person gasping for air.

Annrcr: Oh! Sorry! Let's say for the sake of argument that this cloud has oxygen. Plennnty of oxygen with your Frappuccino.

Sfx: Person begins breathing normally.

Annrcr: And you're lying there, breathing in and out ... that's right ... in ... and out...

Sfx: Teeth chattering.

Annrcr: All right, everybody off the cloud! Let's say having a blended Frappuccino is like being on a tropical island—

Sfx: Gnat buzzing in your ear.

Annrcr: No — How about a memory from childhood?

Kids Chanting: Johnny has a tape worm, Johnny has a tape worm...

Annrcr: Look, forget it. If you're going to take everything I say literally, I can see this demonstration isn't going to work out.

Sfx: workout room noises.

Annrcr: No, don't go down that road—

Sfx: Tires squealing.

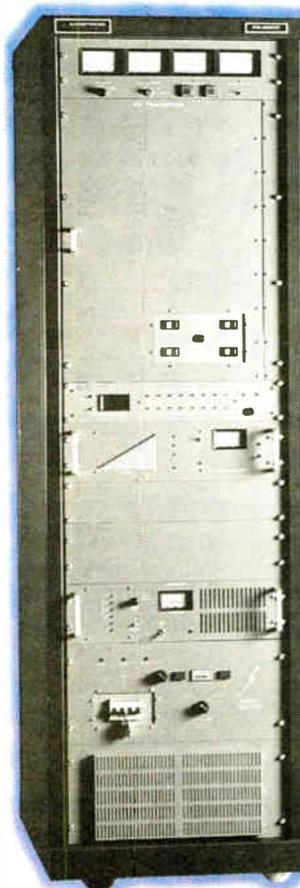
Annrcr: Cut it out—

Sfx: Scissors cutting paper.

Annrcr: To experience a Frappuccino, you're just going to have to go to Starbucks and get one yourself. Thank you. Good Night.

Sfx: Cricket chirp.

ARMSTRONG FM Transmitters



Engineered for Reliability

- ▲ Power Levels from 1kW to 30kW
- ▲ High Efficiency, Grounded Grid Single Tube Design
- ▲ Wideband Quarter Wave Cavity for Lowest Synchronous AM
- ▲ Solid State Driver with Patch Around Capability
- ▲ Optional Automatic Power Control & VSWR Foldback
- ▲ Motorized Tuning Controls
- ▲ Advanced Overload & Protection Circuitry
- ▲ Automatic Re-start After Power Failure
- ▲ INEXPENSIVE!



ARMSTRONG

TRANSMITTER CORPORATION

4835 N. Street • Marcellus, NY 13108 • PH: 315/673-1269 • Fax: 315/673-9972
E-mail: info@armstrongtx.com • www.armstrongtx.com

New Catalog!



Need it after hours?

COMPASS X PRESS

Pro Audio, Video, Lights
800.476.9886
M-F 8am-10pm, Saturday 10am-6pm(CST)
www.compassxpress.com

FULL COMPASS

AUDIO • VIDEO • LIGHTS

1-800-356-5844
fullcompass.com

PRODUCT GUIDE

New Open-System AudioVault Solution

Broadcast Electronics' Vault2 is the newest version of the AudioVault radio studio and digital audio storage system. BE says the Vault2 has the stability and important functions of its popular AudioVault, but without any proprietary hardware or software.

Vault2 is a Windows-based program that is compatible with other BE systems such as AudioVault, VaultXpress and WebVault.

The software is designed with a more open architecture that works with other companies' soundcards, such as Digigram or SoundBlaster. Also, it is designed to work in studio

environments where mixed hardware, software and scalability are necessary considerations.

For information contact the company in Illinois at (888) 232-3268 or visit the Web site at www.audiovault.com

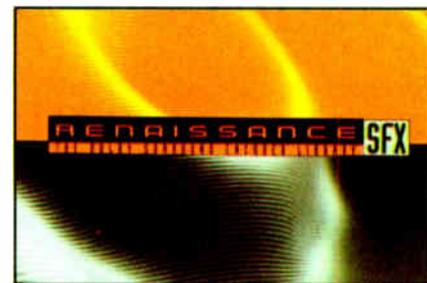


Renaissance Surround Sound Effects

The Renaissance SFX library is produced and encoded in Dolby Surround.

All the sound effects were recorded on location using proprietary miking techniques and software tools developed by the Renaissance sound engineers to create a sound channel for 3D audio imaging. The collection can be played through stereo speakers without a Pro Logic decoder.

The first package is available with seven CDs: World Ambiances, Sounds from Nature, Special



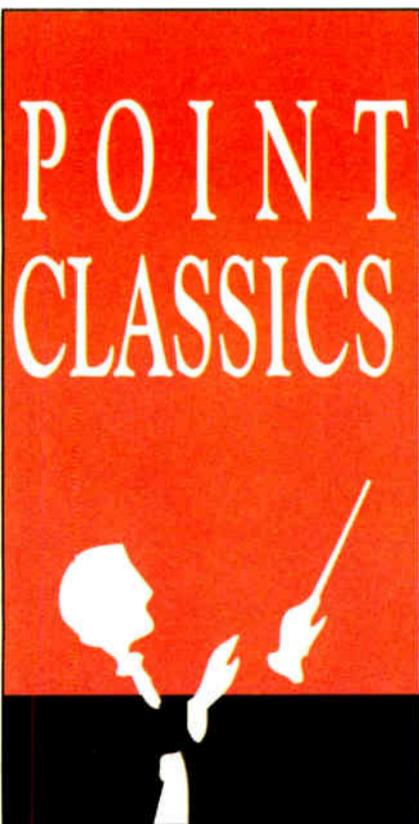
Environments, Impact FX, Voice FX, Emotional Voices and Music Tools.

The collection is available in the U.S. through Sound Ideas for \$895 and includes the royalty-free license.

For information contact Sound Ideas in Ontario at (800) 387-3030 or visit www.renaissancesfx.com

Point Classics LLC Acquires Point Classics Library

Point Classics LLC, a joint venture between OneMusic Corp. and Eclipse Music Group Inc., recently acquired the Point Classics Library, an independent classical music library. OneMusic will handle North American licensing of the Point Classics Library.



The library consists of 300 disks with 1,500 works by some 50 classical composers including Bach, Beethoven, Strauss, Tchaikovsky, Vivaldi and Mozart. Digital recording captured performances including those by The London Philharmonic Orchestra.

For more information contact OneMusic Corp. in California at (310) 285-1840 x28 or by e-mail at onemusic@earthlink.net

It's 2 a.m. Do you know where a Two-Track Recorder is?



Chances are, there's one on Broadcastmarket.com, the auction and classified website designed exclusively for audio and video professionals. Whether you're looking to purchase a few items or an entire studio, Broadcastmarket.com is the first place to look for all of your equipment needs, whenever you want, day or night. Log on to broadcastmarket.com and find just what you're looking for. Any time.

broadcastmarket.com

Your online A/V auction site

Products & Services Showcase



Econco REBUILT POWER TUBES



Approximately One Half
the Cost of New

3,000 Hour Unconditional Guarantee

Please call for quotation

Econco 1318 Commerce Ave. Woodland, CA 95776
Phone: 530-662-7553 Fax: 530-666-7760 Telex: 176756
Toll Free: 800-532-6626 From Canada: 800-848-8841

SOUND GREAT — INSTANTLY!

AIRcorp 500PH Microphone Processor



- Eliminate flanging (hollow room) effect
- Eliminate bad room acoustics
- Hold absolute levels
- Correct voice symmetry

• Front panel input level select +4 to -50 dB

• Three section variable boost and cut equalization

• Compander/Expander cross coupled for maximum punch

• Built-in earphone jack

• DE-ESSER designed to protect pre-emphasis curves

• Simultaneous mic level and line level outputs

• Internal 48 Vdc Phantom Supply

AIRcorp

Call your dealer

or call 972-304-0455 or fax: 972-304-0550

ERI®
ELECTRONICS RESEARCH, INC.

Your complete products
and services provider.



- FM Antennas
- λ Mounting Systems
- Filters
- Towers
- Monopoles
- Lightning Protection
- Grounding Systems
- Structural Analysis
- Installation & Services

Electronic Research, Inc.
812-925-6000
7777 Gardner Road
Chandler, IN 47610
www.ERInc.com

Switcher tools

Designed by broadcast engineers for broadcasters, our audio and digital audio switchers offer excellent sonic quality, removable I/O connections, contact closures and serial remote control capabilities and flexible mounting accessories.



SS 12-4

Active crosspoint switching/routing with 12 stereo inputs and 4 stereo outputs.



10X1

Passive switching/routing with 10 stereo inputs and one stereo output or vice-versa.



SS 8.2

Active crosspoint switching with 8 stereo inputs, 2 stereo plus 2 mono outputs.



8x1 DAS

Routes any one of eight AES/EBU digital inputs to split outputs.



8X2D

Active crosspoint switcher with 8 stereo inputs, 2 stereo and 2 mono outputs



6X1G

Passive switching/routing with 6 stereo inputs and one stereo output, or vice-versa.



3X2B

Active crosspoint switcher with 3 stereo inputs and 2 stereo outputs.



SS 3.1

Passive switching/routing with 3 stereo inputs and one stereo output or vice-versa.



SS 2.1/BNC

Passive switching/routing with 2 composite audio, video, or AES/EBU inputs to 2 composite audio, video, or AES/EBU outputs, or vice-versa.



SS 2.1/TERM

Passive switching/routing with two stereo inputs to one stereo output or vice-versa.

Check out our web site for
product information, list pricing
and a list of distributors!

Internet: www.broadcasttools.com E-mail: bti@broadcasttools.com

Voice: 360 . 428 . 6099
Fax: 360 . 428 . 6719

BROADCAST
tools inc.

Excalibur Electronics HC-1 Handi-Coupler



Here is the simplest, quickest, most convenient way to connect audio to a telephone. The HC-1 connects in series with the handset of any phone using modular connectors. *No* connection to the phone line is needed. Press the front panel button and external audio is available on separate send and receive 1/4" TRS jacks on the rear panel. Release the button and the handset is once more connected for normal use of the phone. Nothing could be simpler!

You can find many uses for the HC-1 around your station: on-air studio, production room, newsroom, sales office, field news kits, sports remotes, etc.

EXCALIBUR ELECTRONICS, INC., CHANTILLY, VIRGINIA
Call your favorite radio broadcast dealer today for Excalibur products!

Without Advertising
A Terrible Thing Happens...



...NOTHING

Place your ad here and reach
key broadcast professionals
with purchasing power.

Call your area sales representative
or Simone Mullins @
703-998-7600 ext. 154
to request a media kit.

Announcer

► Continued from page 65

young man dressed in a blue shirt shown standing in front of a TV chroma-key wall used to overlay electronically weather maps.

When the map was keyed in, his similarly colored shirt vanished into the map, so his head, hands and necktie floated eerily over the United States.

On the page

The written text portion properly bolsters up the CD-ROM. The book is structured as an academic workbook, with multiple-choice tests at the conclusion of each chapter and extracurricular projects beyond what is outlined in the book.

Chapter Four, Vocal Development, impressed me as being comprehensive. It gets into diaphragmatic breathing technique, posture and pronunciation — all of the components you would find in a series of qualified acting or singing lessons. It is possible to get much out of this chapter just from working in a self-guided manner.

There are some cases, though, where an actual instructor should be present. For example, the trick of lying down, placing a book on your abdomen and watching it rise and fall during breathing exercises is not always dependable when

working alone.

Proper posture, too, can be tricky without guidance. Who can remember to shift weight on top of the balls of their feet, keep a straight back, shoulders that don't rise and knees that are gently flexed when trying to read copy? Plan to work in teams of two or three if you intend to use this text without an instructor.

Historic case studies also play well into "Broadcast Announcing Worktext." Photos and mini-biographies of broadcasters both past and present are woven throughout the first chapter in the book.

Old-timers Harold W. Arlin and Arthur Godfrey share page space with contemporaries Howard Stern and Paul Harvey; not necessarily to fill page space, but to establish historical reference points that the student can use as points of departure.

In an industry where many fledgling jocks want to be "the next Howard," exposure to the techniques of earlier talents cannot be bad.

High marks go to the authors of "Broadcast Announcing Worktext" for minimizing the importance of turntables and cartridges. True, many colleges and radio-training centers still use and emphasize carts, but the reality is that many students off to that first job are more likely to encounter a digital storage system than a classic triple-decker. The economics of such systems for small- and medium-market stations, compared to keeping a cartridge library alive, have been proven time and again.

Credit also goes to the authors when it comes to recognizing recent innovations such as DAT, the 360 Systems Short/cut, SAWPlus from IQS and Syntrillium's Cool Edit Pro. This is one book that impressed me as not holding on to sentimental favorites from earlier years.

Play nice with others

An appendix to "Broadcast Announcing Worktext" is especially appropriate: Ethical and Legal Issues for Broadcast Performers.

You will not find chapter and verse dryly quoted from broadcast law documents, but actual contemporary examples of what to watch for, what to avoid and what barely skirt the regulations.

Examples include the cutting of cables during a live Howard Stern broadcast in Cleveland, the April Fool's prank of exchanging "obsolete" \$20 bills when the new twenties were introduced, and the ethical concerns of payola and plugola. More primal issues such as profanity, indecency and obscenity are addressed in two comprehensive paragraphs.

In an age where almost anything goes on radio and TV, this section is a necessary lesson to many aspiring jocks.

Still, the beauty of this book is the CD-ROM. At last, it is possible to hear and see actual examples of mistakes and



trap them before they become bad habits. It works on both Mac and PC platforms, so it does not matter if the dormitory computer is an iMac or daddy's P-166 hand-me-down.

The list price of "Broadcast Announcing Worktext" is \$36.95 direct from the publisher. In my opinion, this book is a worthwhile investment for any student serious about a career in radio or TV broadcasting.

For information, contact the publisher in Massachusetts at (800) 366-2665 or visit www.focalpress.com

The book's ISBN number is 0-240-80356-6.

PRODUCT GUIDE

Microboards Saturn IIP CD-R Publishing System

Microboards Technology offers the Saturn IIP 12x CD-R stand-alone publishing system that lists for \$8,295. The system permits asynchronous duplication as well as simultaneous printing.

The asynchronous duplication allows one of the two 12x recorders to burn while the other is loading. Also, the unit can simultaneously print the label for one CD while it is recording another.

Chuck Alcon Jr., vice president of sales for Microboards Technology, said, "The internal 6 GB hard drive

permits caching of print files, disc images and extracted tracks."

The Saturn IIP operates in three modes: duplication and print, duplication only and print only. It operates independent of a PC and is scalable by the addition of expansion slaves.

It features a gravity-fed autoloading mechanism with a hopper capacity of 150 discs.

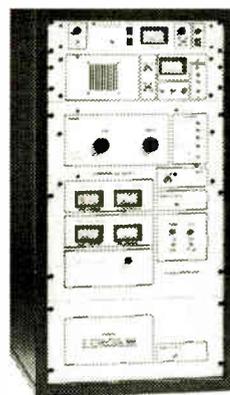
For information contact the company in Minnesota at (800) 646-8881 or visit www.microboards.com



Superior Broadcast Products

Quality Transmitters and Antennas at Reasonable Prices

FM Transmitters



High Performance Solid State Exciter
Solid State IPA Amplifier
One Year Limited Warranty
Factory Service
On site check out by factory
personal available

1,000 watt	\$5,990.00
2,500 watt	\$11,990.00
5,000 watt	\$18,990.00
10,000 watt	\$24,990.00
15,000 watt	\$34,990.00
20,000 watt	\$37,990.00

20 Watt Solid State Exciter - \$995.00 Solid State FM Transmitters with Digital Exciter

120 watt	\$2,800.00	2,000 watt	\$12,900.00
300 watt	\$3,500.00	3,000 watt	\$19,990.00
1,000 watt	\$7,990.00	5,000 watt	\$29,990.00

FM AMPLIFIERS	
100 watt.....	\$995.00
300 watt.....	\$1,790.00
500 watt.....	\$2,990.00

FM STL
Both Transmitter and Receiver
\$3,500.00

FM Antennas

All Power Levels 500 watts to 20,000 watts per bay

As low as.....\$395.00 per bay

FREQUENCY AGILE FM TRANSLATOR \$2,500.00	* RF Coaxial Patch Panels *FM Combiners
---------------------------------------------	--------------------------------------------

Superior Broadcast Products

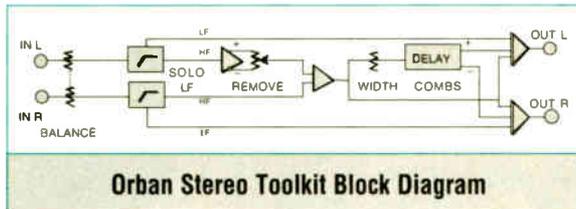
Contact **Jimmie Joynt** 17194 Preston Road, Suite 123-297 • Dallas, Texas 75248
Ph: 972/473-2577 • 800/279-3326 • Fax 972/473-2578 • 800/644-5958
Email: sbp@pulse.net web site: www.sbpj.com

PRODUCT GUIDE

Have You Upgraded Your Audicity to Version 3.0?

For you Audicity users, Orban has version 3.0 software available. It includes support for new effects including pro digital delay, chorus and flange, Orban stereo toolkit and combination compressor/EQ. The stereo toolkit can act as a center-channel vocal eliminator and a mono-to-stereo synthesizer.

Up to 20 custom presets can be created for each effect. These presets can be moved between systems. Each user preset can be named and given a "Notes" descriptor line to describe the preset.



Orban Stereo Toolkit Block Diagram

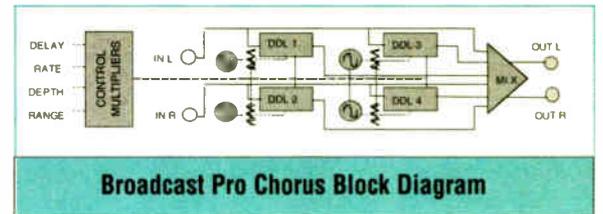
It also has a production import/export feature, allowing full productions to be condensed as single files enabling easier distribution by e-mail or FTP sites.

The Audicity tower now supports SCSI CD Read-Only drives allowing users to import WAV files or condensed productions direct from CD.

The upgrade also includes a more secure way of handling of network and secondary drive failures. This means if the user is shadowing to a network drive and the network goes off-line, the project can be converted to a temporary production, so the user can continue working even though the selected drive

has gone off line. This added measure of security takes advantage of unique RAM architecture to minimize risk in networked installations.

Other new features include enhanced fast wind, new



Broadcast Pro Chorus Block Diagram

Edit Locates menu pick and an updated Name And Edit Locate Points screen.

Software can be upgraded to the current version with Audicity V3.0 Software Installation disks. Some older systems will require additional software disks.

Version 3.0 software can be purchased for \$450 per single license, \$420 per license for quantities of 5 to 9 units, and \$390 per license for 10 or more system licenses through the company. Any new system purchased since November 1998 qualifies for a free upgrade with proof of purchase.

For more information contact Orban in California at (510) 351-3500 or via e-mail at custserv@orban.com

For the most accurate,
up-to-date coverage of **The 2000 NAB Radio Show**,
visit ...



Featuring:

- Comprehensive coverage of The 2000 NAB Radio Show
- Coverage of events from the show floor
- A full line-up of special reports, commentary, news releases, hot picks
- And much, much more.

The site will be active until **October 31**

To visit, click on www.rwonline.com/nabradio today!

This site is sponsored by



Fostex 24-Track Recorder/Editor

Fostex offers an addition to its line of digital multitracks, the D2424 hard disk 24/96 recorder/editor.

It features 24 tracks with 32 virtual tracks for a total of 56. The unit can Copy/Paste between programs and has a dedicated all-input key.

New features include the "Auto EE" mode, which automatically activates all-input monitor when stopped, and a mark-stop function that stops a song at a designated locate point. A foot switch is added to punch in and out remotely. It also offers an extension slot for an Ethernet card.



The copy, cut, paste, move and erase functions have 99 times repeatable levels of undo. The direct locate function is accessed by the Prev/Next key to locate memory points from 00 to 99.

Optional accessories include the 8350 eight-channel AES/EBU card and 9044 DVD-RAM drive.

The unit can be ordered without the hard drive for custom applications. The chassis color is black for a professional appearance. The price is TBA.

For information contact Fostex in California at (562) 921-1112 or visit www.fostex.com

**News Updates
Every Business Day**



<http://www.rwonline.com>

Products & Services Showcase

AM ANTENNA SYSTEMS

**Antenna Tuning Units
Transmitter Combiners
Folded Unipole Antennas
Diplexers, Triplexers
RF Components**

LBA antenna systems will improve your efficiency, performance and reliability. Our products are designed and built to international standards. Call LBA Technology for RF systems and excellent technical service.

800-522-4464 / 252-757-0279
Fax 252-752-9715

Email: lbatech@lbagroup.com
or Contact Our Representatives Worldwide



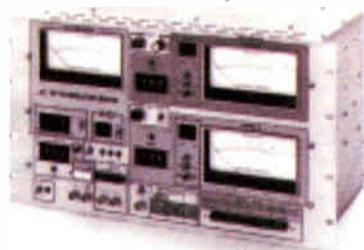
LBA Technology, Inc.

P O Box 8026 Greenville, NC 27835 USA
35 YEARS OF WORLDWIDE
ENGINEERING SERVICES

An LBA Group Company



THE MOST COMPLETE FM TEST SET AVAILABLE AND IT'S A GREAT MOD MONITOR TOO!



- Complete proof of performance instrument
- Frequency agile
- Converts standard X-Y scope into a spectrum analyzer

The QEI Model 691 Modulation Monitor and Test Package is a high technology precision instrument that set a new standard for FM performance measurement tools. We also manufacture a very comprehensive FM transmitter Line. Contact QEI today and let us put our innovations to work for your station. Contact our sales department at 800-334-9154 (International 856-728-2020) or by e-mail at qeisales@qei-broadcast.com.



<http://www.qei-broadcast.com>
QEI CORPORATION
PO Box 805
Williamstown NJ 08094 USA
800-334-9154/856-728-2020
856-629-1751 Fax

ARE POWER POLES DEFORMING YOUR AM COVERAGE PATTERN?

**DIRECTIONAL
OR
NON-DIRECTIONAL
PROBLEMS CAN BE SOLVED
SIMPLY
AND
INEXPENSIVELY
WITH THE
FERROLINEAR
RF CHOKE**

FOR INFORMATION CONTACT
NOTT LTD

PHONE 505-327-5646

FAX 505-325-1142

EMAIL k5ynr@tjantenna.com



Affordable Custom Broadcast Furniture



32 Pennsylvania Avenue, Malvern, PA 19355

Delivered and
installed by

**STUDIO
TECHNOLOGY**

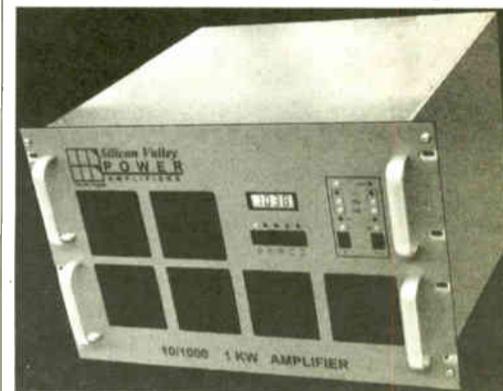
TEL: 610-640-1229

FAX: 610-296-3402

email: sales@studiotechology.com

web: www.studiotechology.com

POWER AMPLIFIERS



10 WATTS IN, 1000 WATTS OUT
All solid state, no tuning, 3 year warranty Unbeatable prices
Models from 150w to 3 kW. www.svpa.com



**Silicon Valley
POWER
AMPLIFIERS**

The RF People

Phone 408 986 9700 Fax 408 986 1438



FM BROADCAST ANTENNA

FMR Series

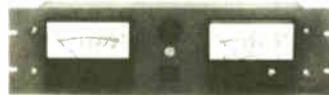


- Circular polarization
- Series fed
- Internal feed
- Brass/Copper construction
- Excellent bandwidth

PROPAGATION SYSTEMS, INC.

719 Pensacola Road
Ebensburg, PA 15931 USA
814-472-5540 Fax 814-472-5676
E-mail: psiba@surfshop.net

WATTCHMAN® TRANSMITTER PROTECTION SYSTEMS



WATTCHMAN protects your transmitter and transmission line system. A permanent 19" rack installation used with any dual socket line section 7/8" through 6 1/8" and elements (additional) to monitor CW, TV, and FM power. Model 81070 features two easily read meters to monitor both forward and reflected power. Abnormal conditions quickly cause transmitter shut down.

TERMINATING LIQUID/AIR LOADS

(84000/85000 series) available to cover CW power ranges of up to 10,000 Watts over a frequency range of DC to 2.4 Ghz. All models are available with optional thermal overload switches to interface with the user's interlock or warning circuit.

NEW



COAXIAL DYNAMICS, INC
15210 Industrial Parkway
Cleveland, Ohio 44135 (216) 267 2233
Toll Free 1 800 COAXIAL (262 9425)
FAX (216) 267 3142
Web Site <http://www.coaxial.com>
Email: coaxial@apk.net



Attention Advertisers!

Radio World
Reach key broadcast
professionals!

**RADIO WORLD'S
Products and Services Showcase
provides a perfect medium
for marketing your
products and services.**

**It's an efficient, effective and
affordable advertising option!**

**For more information including rates
and deadlines contact your sales
representative or Simone Mullins
at 703-998-7600, ext. 154
to request a media kit.**

PAMS

► Continued from page 55

why he bought these tapes. He said he planned to bulk erase and reuse them to record syndicated religious shows. To a jingle fanatic such as myself, this would be like using the Mona Lisa for its scrap canvas value.

After renting a giant van, a lady friend and I loaded and hauled everything we could grab up to Toledo, Ohio.



The Ampex 10-track

My inventory showed more than 5,000 1/4-inch reference reels with mono or stereo mixes of jingle packages, about 150 master 1/2-inch tapes in either 3-track or 4-track format, about 95 master 1-inch tapes recorded in a unique 10-track configuration (see sidebar) and about 180 master 2-inch tapes recorded in 16-track format beginning in about 1971.

I turned my condo into a warehouse and had special floor-to-ceiling shelves built. There the tapes remained until the late 1980s.

By 1987, it occurred to me that the original tapes would eventually self-destruct, as some were already 30 years

old. I purchased the first of many DAT machines in late 1987 and began archiving the mono and stereo reference reels.

Many tapes recorded between 1960 and 1969 had paper leader between the jingles. Over the years, the adhesive from the splicing tape had dried out so the reels came apart at almost every splice. I could see this was going to be a task.

I had to laboriously re-leader many of the tapes with plastic timing tape and add fresh splices before I even could play them.

Of course, most of the tapes from the mid-1970s squeaked because of that infamous back-coating problem. When a reel was bad enough that neither reducing the tape tension nor bypassing the left tension bar helped, baking was necessary. Baking allows you to play the tapes a few times in order to transfer them successfully to another medium.

To harden the coating, simply transfer the squeaky tapes to metal flanges and place them in a kitchen oven at the lowest temperature setting, which is about 130 degrees, for about eight hours.

A few more tips: Check with your wife before attempting this and let the tapes cool for a couple of hours before grabbing them.

Also, some of the non-stereo reels sound much better using either the left track or the right track only, panned to mono. This is from storing the tapes when one of the edges became wrinkled, causing a fluttering dropout sound.

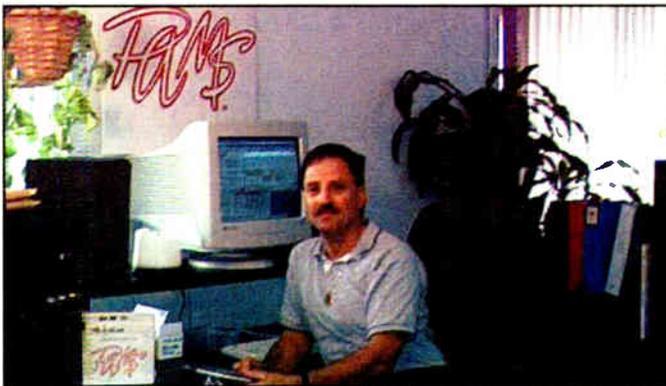
I brightened tapes that were muddy sounding. I rolled off the appropriate frequencies if it had an overly bassy sound. A handful of tapes was recorded badly out of azimuth and I just did the best I could.

Transferring this many tapes took several years.

Even when noise reduction algorithms

became available, I decided not to use them. The reason is that other techniques for removing tape hiss will be developed in the future that work better and I did not want to do that process twice.

About 80 percent of the tapes were in surprisingly good condition. Many pack-



Comfort is important when transferring hundreds of hours of tape

ages recorded between 1962 and 1967 sounded like they were recorded yesterday.

Occasionally, I would find a tape that shed a lot of oxide. In those cases, I transferred a few jingles, cleaned the heads and guides, and then dubbed a few more cuts.

On a very few occasions, the speed of the original reel seemed to be off slightly. Using the vari-speed on the Otari MX 5050 reel-to-reel decks, I was able to compensate.

Here is another tip: Always use a large-hub 7-inch reel and take-up reel. It minimizes tension problems and slight speed fluctuations.

Transferring these precious master tapes was partially a mechanical job that involved copying the information down properly and setting good levels. Part of the job required careful listening as the EQ and speed had to be just right. And often, the cut sheet inside the boxes did not accurately describe what was on the tape. I had to figure out when to ignore information provided by the original mixing engineers.

One of my jingle collector friends is transferring every single jingle package from my DAT tapes to CD. I think it is a good idea to have redundancy when storing priceless audio on something as unreliable as DATs.

A 10-CD set called "The Magic of PAMS" chronicles all of the numbered series and is available through www.pams.com

The Tenth Dimension

In 1968, William Meeks, president of PAMS, decided he was going to top his competitors. If the other studios had eight tracks to record on, Meeks wanted 10. But how could it be done?

"Dick McGrew, a fellow PAMS engineer, gathered 10 Ampex 'B' model amps and stacked them one above the other in an open rack," said Tom Loy, former PAMS recording engineer and musician. "He used an Ampex 300 top plate and capstan drive."



Engineer Bruce Collier keeps the 10-track Ampex within arm's reach

Meeks ordered the specially made 10-track head from Ampex and later ordered a second one for another studio.

"They were always hard to maintain and difficult to align," said Loy, "and noisy as hell!"

These heads were designed for a 1-inch tape width.

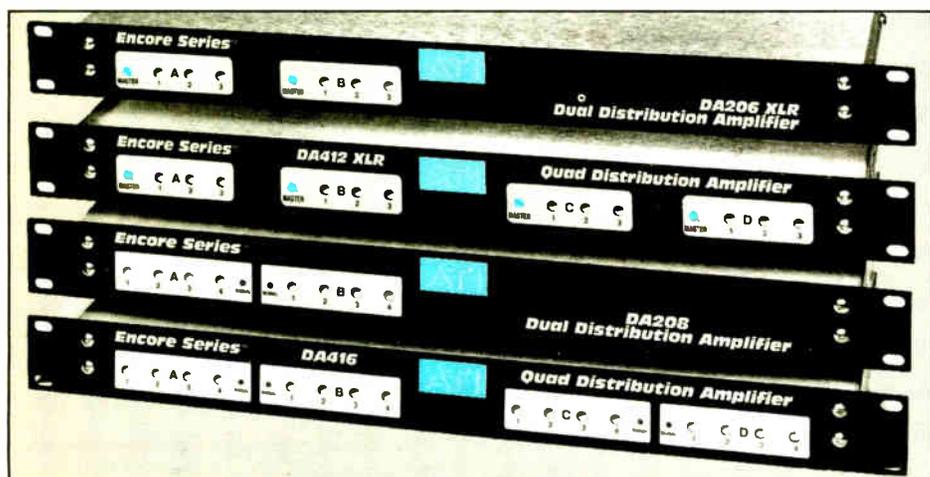
Jon Wolfert, now president of JAM Creative Productions in Dallas and owner of PAMS Productions Inc., worked at the original PAMS from 1971 through early 1974 and had occasion to work with this unique machine.

"It was a pain in the neck to use," said Wolfert. "It had manual head lifters that you had to activate every time you wanted to rewind or fast forward. It was just an Ampex on steroids."

One of the first jingle packages PAMS recorded with this new machine was called "The Tenth Dimension," in honor of the 10-track head. PAMS writer, arranger and singer Marvin Shaw also used this format to realize his concept of a "grid" package of jingles.

These grid packages involved the vocal group singing the station call letters on two tracks, and various slogans and feature intros on the other tracks. With careful mixing and cross-fading of these layers of voices, PAMS could deliver a large and flexible group of cuts wherein the same call letters would be joined with a great number of other lyric lines.

The 10-track machine was phased out in the early 1970s when PAMS purchased a 16-track 2-inch machine. That format remained the studio standard for the next 20 years.



A small price to pay

(For real protection)



ENCORE SERIES™ DISTRIBUTION AMPLIFIERS

Isolate, balance and set levels precisely

- Dual and Quad, 1x3 or 1x4 each
- Transformer or active balanced outputs
- XLR inputs and outputs (DA206/DA412)
- Barrier strip connections (DA208/DA416)
- Individual smooth log taper controls
- Jumper inputs to multiply outputs

Call or write for free detailed brochure



AUDIO TECHNOLOGIES INCORPORATED

328 W. Maple Avenue, Horsham, PA 19044 • TEL: (215) 443-0330
(800) 959-0307 • Fax: (215) 443-0394 • <http://www.atiguys.com>

Radio World

Broadcast Equipment Exchange

"Broadcast Equipment Exchange" accepts no responsibility for the condition of the equipment listed or for the specifics of transactions made between buyers and sellers.

ACOUSTICS

Want to Sell

AcousticsFirst™
Toll Free 888-765-2900
Full product line for sound control & noise elimination.
www.acousticsfirst.com

ANTENNAS/ TOWERS/CABLES

Want to Sell

ERI 7 bay antenna. 3.3028 gain. Originally tuned to 92.7 FM, \$2000 plus shipping. Albert Cox, 361-289-0887.

S.W.R. FM Antennas
Great Antenna
Great Price!
HE HALL Electronics (804) 984-4255

Rohn 55G, 150' including 55TG tapered base section, guy wires, turnbuckles & TA55 torque arm, gd cond, no rust, on ground. Rod Rogers, 929 Plaza Dr. Salina KS 67401-4664. 785-827-4772.

Weather-resistant aluminum tower signs for compliance with 47 CFR Part 17.4(g)
AntennaSigns.com
800-526-4817, ext. 115
from The Driftline Line, a div. of Hand Industries, Inc.

Dielectric 3-1/8" motorized four port coaxial switch; Dielectric 3-5/8" motorized four port coaxial switch. Continental Communications, 800-664-4497. Email: contcomm@fiastl.net.

Transmitters, Antennas, STL Systems

superiorbroadcast.com

contact **Jimmie Joynt**
Phone 800/279-3326 Fax 800/644-5958

AUDIO PRODUCTION

Want to Sell

Broadcast Tools console controller CCI1A, interfaces non broadcast consoles & digital workstations to broadcast studio, used/gd cond w/power supply, \$50/BO +shpg. Bob Riukin, KPLM/KJJZ, 441 S Calle Encilia #8, Palm Springs CA 92262. 760-320-4550.

Stanton 310B pre-amp, used, gd cond, \$50/BO +shpg. Bob Riukin, KPLM/KJJZ, 441 S Calle Encilia #8, Palm Springs CA 92262. 760-320-4550.

Aphex Type C aural exciters (2), excel cond, no manual but simple to use, \$100 ea. Dean Bailey, 10027 Church Rd, Dallas TX 75238. 214-343-0879.

Ramsa WU8101, (2) Panasonic work modules for Ramsa WU 8100 Series, WR8616, WU8091, brand new in box, \$100 ea/BO +shpg. Bob Riukin, KPLM/KJJZ, 441 S Calle Encilia #8, Palm Springs CA 92262. 760-320-4550.

JBL/Urei M712 stereo limiting/compressor, like new, \$400; Urei LA-12 stereo limiter, excel cond, \$550. Mark Schackow, Mark Schackow Recording, 307 4th Ave E. Lemmon SD 57638. 605-374-3424.

Want to Buy

Yamaha BP-2 bass generator (pedals) schematic. Would prefer electronics but will settle for schematic & owners manual. Bob Meuse, Muse Audio Arts, 191 E El Camino Real #209, Mtn View CA 94040. 650-969-2433.



AUTOMATION EQUIPMENT

Want to Sell

Smartcaster, complete, never used, BO. J Lalino, WLAL, 319 State Rt 29, Middleville NY 13406. 315-891-3110.

ABC 1600S sequential automation programmer, 16 step, 9 sources, w/built-in silence sense, cue speaker, audio switcher, works well w/manual, ideal for small automation system, \$300. Hank Landsberg, KCHZ FM, 503 Key Vista Dr, Sierra Madre CA 91024. 626-355-3656.

CART MACHINES

Want to Sell

Harris/Gates stereo R/P, also BE, Beaucart, ITC, BO. J Lalino, WLAL, 319 State Rt 29, Middleville NY 13406. 315-891-3110.

ITC Delta (2) singledeck R/P, \$350 ea. Tom Toenjes, KJTY, 6120 Riley Cr, St Marys KS 66536. 785-437-6549.

ITC Delta system, 2 stereo decks + stereo record amp w/rack mount, manual, like new cond, units have all 3 cue tones, \$1000. Hank Landsberg, KCHZ FM, 503 Key Vista Dr, Sierra Madre CA 91024. 626-355-3656.

Want to Advertise?
Call Simone Mullins @
703-998-7600, ext. 154

CD-R DUPLICATORS

Want to Sell

www.mrsmedia.com
MRSmedia
Master Recording Supply
CD, DVD, Audio & Video Duplication Equipment
Packaging Supplies • Blank Media
TOLL FREE (800)-860-4560

COMPLETE FACILITIES

Picture This:
Your Y2K
Complete
Equipment Dealer
* Experienced Professionals
* RF and Studio Packages
* Personal Service
New Stations and Modernization
Atlantic Media Broadcast
* Toll Free *
888-744-6635
email - rick@estone.net

NEW OR USED
COMPLETE PACKAGES
STUDIO/STL/TRANSMITTER/ANTENNA
OR ANY COMBINATION OF ABOVE.
-LEASE OPTIONS-
-EMERGENCY RENTALS-
-REMOTE BROADCAST RENTALS-
SCMS, Inc. (800) 438-6040
"You Know We Know Radio"

CONNECTORS

Want to Sell

GENEX
CONNECTORS
Stocked to 3-1/8" for Corrugated Coax
Cable Assemblies Made To Order
e. l. marsden wireless, inc.
15741 Nike Drive Terrell, Texas 75160
Tel: (972) 563-2861 Fax: (972) 563-0859
Order on-line at: www.elmwi.com

CONSOLES

Want to Sell

LPB Signature 2 1982 vintage studio console, might work, has round pots, 8 channels, VU meters, \$250/BO +shpg. Bob Riukin, KPLM/KJJZ, 441 S Calle Encilia #8, Palm Springs CA 92262. 760-320-4550.

Audio amplifier console model 80E, 100W stereo system in 3 piece cabinet, 4' long console, (2) 2' speaker cabinets, all enclosed. Has HHS Scott 296 integrated dynaural lab amp, Fisher 200B Fm tuner, Collaro RC-440 TT/changer. Also has 50 factory recorded stereo tapes, 1950 & 1960 LPs & some classical records. SASE for full details. Francis Yonker, 1229 Inverary Pl, State College PA 16801. 814-867-1400.

Behringer MX2642A 16 chnl console, new in boxes (3), \$600 ea. Serge Petit-Homme, C&S Network, POB 1517, Port Chester NY 10573. 914-966-3436/800-898-1011.

Harris Stereo 80 8 channels w/manual, no power supply, \$300. Tom Toenjes, KJTY, 6120 Riley Cr, St Marys KS 66536. 785-437-6549.

Auditronics 210 24 mixer broadcast console. Continental Communications. 800-664-4497. Email: contcomm@fiastl.net.

Want to Buy

25B consoles or any other WE items, paying up to \$7500. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.

FASTENERS

Want to Sell

GRIFF-WRAP
THE ULTIMATE VELCRO REUSABLE STRAPS
Designed for the Busy Broadcast Engineer
For special pricing call
GRIFFITHS BROADCAST
203-746-3231
Fax: 203-746-3366



Buying Or Selling
Used Equipment?
You're in the right place!
Radio World
Broadcast Equipment Exchange

Want to Buy

Teletronics LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

MISCELLANEOUS

Want to Buy

Gates PWR-5 power supply modules & schematic. These have one 6x4 tube. Need six. Also, BA-20 bases for above & PAS-1 shelf. Mark, 925-426-2300 (message) or ideo@home.com.

RF Warning Signs

9"x 12" \$13.95

10"x 19" \$19.95

HE HALL Electronics (804) 984-4255

RCA on-air or stand-by lights, paying \$200 ea. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.

MICROPHONES

Want to Buy

77 & 44's, paying up to \$2000 for RCA mics. Larry Drago, WELI, POB 85, New Haven CT 06501. 203-230-5255.

RCA 77-DX, 44-BX, KU-3A's, WE-639's, On-Air & recording lights wanted, top dollar paid! 615-352-3456, FAX: 615-352-1922.

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 972-271-7625.

BAY COUNTRY BROADCAST EQUIPMENT

BUY - SELL - TRADE
Your #1 Source For
Quality Used Radio
Broadcast Equipment

View The Latest List On Line At:
<http://www.baycountry.com> Or
Call And We Will Fax It To You.

7117 Olivia Rd., Baltimore MD 21220
Phone 410-335-3136
FAX 786-513-0812
E-mail: baycountry@pccbank.net
Member of BBB

Sell your used equipment here!
Radio World Broadcast Equipment Exchange

HE HALL Electronics
706 Rose Hill Dr. Charlottesville Va. 22901
804-984-4255 (Voice) 804-984-3299 (Fax)

This Months Deal:
Tascam DA-30 MKII
DAT Recorders
Rebuilt \$595.00
w/ 30 day warranty

Lots more Used / Rebuilt
gear on our website.

Visit our web site for more information.
sales@halls.com www.halls.com tech@halls.com

MONITORS

Want to Sell

Used Mod Monitors, McMartin & Belar. Many to choose from, tuned & calibrated on your frequency, full guaranteed. Goodrich Ent. 402-493-1886.



RECORDERS

Want to Sell

Otari ARS-1000 automation PB decks, stereo, w/built-in 25Hz tone decoder, 7.5 & 15 ips, near-new heads w/manual, 3 decks avail, \$300 each. Hank Landsberg, KCHZ FM, 503 Key Vista Dr, Sierra Madre CA 91024. 626-355-3656.

ITC Cart Recorders

Parts & Service

Now At

SEQUOIA ELECTRONICS
(800) 848-4428

Tascam 32, 2 track analog production machine, excel cond, \$650. Mark Schackow, Mark Schackow Recording, 307 4th Ave E. Lemmon SD 57638. 605-374-3424.

Want to Buy

Stellavox recorders & accessories. Charles King, King Audio, POB 116, East Berlin CT 06023. 860-832-4930.

REMOTE & MICROWAVE

Want to Sell

RENTALS

TELOS-Zephyr
COMREX-Hotline, Vector
MUSICAM-Prima
COMPLETE AUDIO PACKAGES

Silver Lake Audio
(516) 763-1776

internet: silverlakeaudio.com

Marti RMC-15 16 chnl remote control, \$200; Marti MR-30 receiver, 166.25 MHz, tube type, gd working cond, \$250; Marti RPT-15 xmtr w/rack mount & CW lder, \$400. Tom Toenjes, KJTY, 6120 Riley Cr, St Marys KS 66536. 785-437-6549.

WE RENT FOR LESS

Hotlines FM Exciters
Zephyrs STL's
Nexus FM Power Amps
Audio Test Equipment

If we don't have it, we will get it!
SCMS, INC. (800) 438-6040
"You Know We Know Radio"

SATELLITE EQUIPMENT

Want to Buy

Scientific Atlanta Sedat/DAT rack mounted receiver. Jenny Ponzia, Laser Light & Sound, 10719 Winner Rd, Independence MO 64052. 816-252-2808.

SOFTWARE/ DATABASES

Want to Sell

BUILD A COMPUTER TOOL-BOX AT www.epix.net/~ronnieb

SCA/SUBSCANNERS

Major Baltimore market radio station WLIF-FM SCA/Subcarrier available. Call Alan Hay, 410-823-1570. One West Pennsylvania Ave, Towson MD 21204.

STATIONS

OWN A COMMERCIAL RADIO STATION ANYWHERE IN THE COUNTRY FOR ONLY \$1500!!

Buy an FCC Certified low power AM transmitter & cover up to a 4-mile radius. Why wait 3 years or more for Non-Commercial low power FM. Call (401) 322-1743 or online: www.wblo.org for more info. No FCC license required. To order a transmitter, send down payment of \$500, along with your address to: DiPonti Comm, 244 Post Rd, Westerly RI 02891. FCC ID#: DPD624TA100

Want to Buy

AM or FM station located in RI, MA or CT area. Non commercial or commercial, no station to small, will consider partnership. Michael Cardillo, 151 Morgan St, Cranston RI 02920. 401-942-8341.

TAPES/CARTS/ REELS/CD's

Want to Sell

300 10" reels of Drake Chenault Great American Country Music, BO +shpg. Gene Kirchner, WRDN, 114 West Main St, Durand WI 54736. 715-672-8989 or fax 715-672-4622.

Various used carts, \$50 each, 10.5" reels, empty, \$1 ea, full \$3 ea. J Lalino, WLAL, 319 State Rt 29, Middleville NY 13406. 315-891-3110.

Space is available
To advertise call
703-998-7600 ext 154.

Want to Buy

Revox-Studer 215B cassette deck. Donald Bisbee, 685 S Roys Ave, Columbus OH 43204. 614-279-4163.

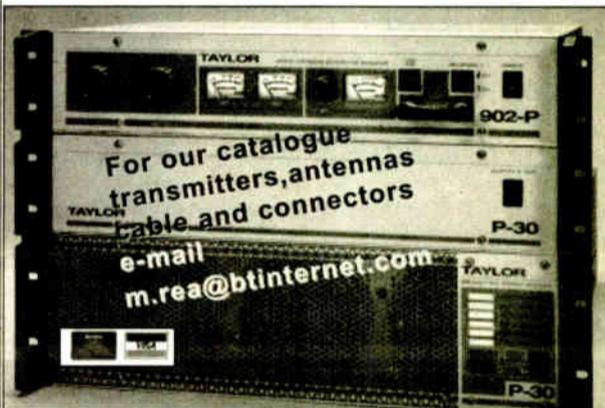
TRANSMITTERS

Want to Sell

Harris TE-3 FM exciter in working cond w/stereo generator, \$500. Kinnon Thomas, The Thomas Sound Group, 619 S Main St, Gainesville FL 32601. 352-376-8742.

Ramsey FM-100 hobby bdct xmtr, 1W, deluxe model, \$375; Ramsey FM-25 hobby bdct xmtr, 1W stereo, \$300. Gene Whittenberger, Whittenberger Studio, POB 396, Mexico IN 46958. 765-985-2224.

TRANSMITTERS



FM RADIO		TV NTSC	
Including Stereo Encoder		PAL, OR SECAM	
1Watt	\$1,183	1Watt	\$1,614
50Watt	\$1,658	2Watt	\$1,730
100Watt	\$1,900	4 Watt	\$2,268
300Watt	\$3,300	20 Watt	\$4,035
600Watt	\$6,198	40 Watt	\$5,247
1KWatt	\$9,064	100 Watt	\$6,825
2KWatt	\$12,376	200 Watt	\$10,268
		400 Watt	\$11,158
		800Watt	\$19,026
		1KWatt	\$23,816
		2KWatt	\$37,152

Taylor Bros. (O/M) Ltd.
Orlando FL
FreePhone (1) 877 329 2669
FreeFax (1) 877 329 2670
Fax Int 407 363 1922
European Sales office Oldham England
(44)161 652 3221
Fax (44)161 626 1736

CONSULTANTS



Consulting
Communications
Engineers

FCC Applications • Design • Field Engineering • Tower Detuning
Upgrade & Relocation Studies • AM Directional Array Tuning & Proof

EXPERTS IN:

TV • DTV Transition • FM • Directional Antennas • RF Exposure

210 S. Main St., Thiensville, WI 53092, (262) 242-6000, FAX (262) 242-6045
<http://www.evansassoc.com> Member AFCCE

Consulting Communications Engineers EMC Test Lab

- FCC Applications and Field Engineering
- Frequency Searches and Coordination
- AM-FM-CATV-ITFS-LPTV

• EMC Test Lab-FCC and European (IEC)



OWL ENGINEERING, INC.

1-800-797-1338

E-mail: info@owleng.com Fax (763) 785-4631

8899 Hastings St NE, Minneapolis, MN 55449 (763) 785-4115 Member AFCCE

T. Z. Sawyer Technical Consultants

AM-FM-TV-LPTV

- FCC Applications & Exhibits
- Frequency Studies
- Experimental Authorizations
- Class Upgrades
- AM Directional Antennas
- STL Applications
- High Power Antenna Arrays
- Station Inspections

1-301-913-9287

FAX: (301) 913-5799 • 5272 River Rd, #460 • Bethesda, MD 20816

MUNN-REESE, INC.

Broadcast Engineering
Consultants

AM - FM - TV

P.O. Box 220, 100 Airport Dr.
Coldwater, MI 49036
517-278-7339 or Fax 517-278-6973

wayne@munn-reece.com

GRAHAM BROCK, INC.

BROADCAST TECHNICAL CONSULTANTS
Full Service From Allocation to
Operation AM/FM/TV/AUX Services:
Field Work, Antenna and
Facilities Design

Over 35 years engineering
and consulting experience

912-638-8028

202-393-5133

www.grahambrock.com

PC - SOFTWARE

AM FM TV Search Programs
Signal Mapping—STL Paths
RFHAZ—US Census PopCount
FAA Tower—Draw Tower

Doug Vernier

Engineering Consultant
1600 Picturesque Drive
Cedar Falls IA 50613

800-743-DOUG

System One Communications

Broadcast Constructors & Consultants
Houston, Texas
888-625-5649

- AM-FM Site Construction Specialists
- Complete Tower Service
- Antenna & Transmission Line Diagnostics
- Custom Studio Designs & Furniture

MULLANEY ENGINEERING, INC.

Consulting Engineers
• Design & Optimization of AM Directional Arrays
• Analysis for New Allocation, Site Relocation, and Upgrades AM-FM TV LPTV
Wireless Cable (MDS/MMDS/ITFS/OFS)
• Environmental Radiation Analysis
• Field Work
• Expert Testimony

9049 Shady Grove Court
Gaithersburg, MD 20877
Phone: (301) 921-0115
Fax: (301) 590-9757
email: mullengr@aol.com

FREQUENCY SEARCH - \$199

FM APPLICATIONS - \$1199
LPTV APPLICATIONS - \$748
(LPTV fee includes freq. search)
Amendments & Upgrades
Field Work • Site Construction
MX Resolutions • Petitions
Coverage Maps - \$39

MBC Consulting
(800) 219-7461
www.mbcradio.org/consulting

AM Annual NRSC Spectrum Measurements

Low Cost Flat Fee
We make trips all across the U.S.
Call to get on our schedule.

T and T Measurements
800-687-9161
email: ltaft@2fords.net
tandtmeasurements.com

PROMOTE YOUR BUSINESS! SPACE IS AVAILABLE!

Call Simone Mullins for more information at
1-800-336-3045 x. 154.



Market Analysis
Engineering Software
Ethnic/Demographic Data
Custom Full-color Mapping
Sales Marketing Packages

www.dataworld.com
800-368-5754

info@dataworld.com
fax: 301-656-5341

DISTRIBUTOR DIRECTORY

The following distributors serving the broadcast industry would be glad to help you with any of your requirements.

CORNELL-DUBILIER MICA CAPACITORS

FROM STOCK

JENNINGS VACUUM CAPACITORS

FROM STOCK

JENNINGS VACUUM RELAYS

SURCOM ASSOCIATES

2215 Faraday Ave., Suite A
Carlsbad, California 92008
(760) 438-4420 Fax: (760) 438-4759
e-mail: link@surcom.com web: www.surcom.com

...Republicans say that's the way it was... Democrats say that's the way it is... the people say this is the way it's going to be... and some things never change...

RADIO! The beat goes on! CROUSE-KIMZEY OF ANNAPOLIS

tops in broadcast equipment

1-800-955-6800

ask for Kathleen

kkannapolis@worldnet.att.net



**REBUILT
POWER TUBES
APPROXIMATELY
1/2 THE
COST OF NEW!**

ECONCO

**TEL: 800-532-6626
INTL: +1-530-662-7553
FAX: +1-530-666-7760
SE HABLA ESPAÑOL
EXT. 110**



TRANSMITTERS (cont.)

TRANSCOM CORP.

Serving the Broadcast Industry Since 1978

Fine Used AM & FM Transmitters and Also New Equipment

100 W FM 1985 Harris FM100K Single Phase	400W AM 1996 Nautel AMFET 400
1 KW FM 1981 Harris FM 1K	5KW AM 1980 CSI T-5-A
2 KW FM 1996 BE FM 2C Solid State Single Phase	5KW AM 1982 Continental 315R-1
2.5 KW FM 1984 Harris FM 2.5K Single Phase	10KW AM 1975 Continental 316F
2.5 KW FM 1980 Harris FM 2.5K Single Phase	25KW AM 1985 CSI T-25-A
2.5 KW FM 1976 Collins 831D Single Phase	25KW AM 1989 Nautel AMPFET 25 Solid State
3 KW FM 1975 CSI FM3000E	50KW AM 1978 Continental 317C-1
5 KW FM 1989 Harris HT-5 Single Phase	50KW AM 1982 Harris MW-50B
5 KW FM 1985 Harris FM 5K	
5 KW FM 1984 Harris FM 5K	
5 KW FM 1967 Collins 830E	
6 KW FM 1994 Henry 6000D	
10 KW FM 1974 Harris FM10H/K	
20 KW FM 1980 Harris FM20K	
20 KW FM 1988 CCA FM 20,000G	
30 KW FM 1995 QEI FMQ30,000B-1 Single Phase	

2655 Philmont Ave #200, Huntingdon Valley, PA 19006
800-441-8454 • 215-938-7304 • FAX No. 215-938-7361
 VISIT OUR NEW INTERNET SITE: WWW.FMAMTV.COM
 SEND YOUR E-MAIL REQUESTS TO: transcom@fmamtv.com

Collins 21E/M TX, gd unit, has been stored in dry environment, you pick up or have shipped, \$3000/BO. Gary McAvin, WMLK, POB C, Bethel PA 19507. 717-933-4781.

Decade MS100S low power xmtr part 15, new \$740; BW TX150 low power 100W xmtr, 25-150W adjustable, call for price. Serge Petit-Homme, C&S Network, POB 1517, Port Chester NY 10573. 914-966-3436/800-898-1011.

Continental 831-D2 2.5KW FM xmtr. Continental Communications. 800-664-4497. Email: contcomm@fiastl.net.

CSI T-20-F 20KW FM w/CSI exciter, \$9500; Continental 831-D-2 2.5KW FM w/exciter, \$5000. Tom Toerjes, KJTY, 6120 Riley Cr, St Marys KS 66536. 785-437-6549.

BEXT TRANSMITTERS - Call for demos, closeouts, full warranty. 619-239-8462.

USED: FM/AM Transmitters, RPU's, STL's, FM Antennas, Consoles, Processing, etc.

CONTINENTAL COMMUNICATIONS

3300 Chippewa, St. Louis MO 63118
 1-800-664-4497
 FAX 1-800-700-9427
contcomm@fiastl.net

McMartin BF3.5M, w/McMartin BFM-8000 exciter, \$8500. Ernesto Baez, KANA FM, 9659 Pagewood Ln, Houston TX 77063. 713-952-2090.

McMartin BF-10K 10 kW FM, factory rebuilt, in perfect, like new cond, includes new tubes, tested & tuned on your freq. Guaranteed. Adjustable from 5.5 kW to 15 kW, FCC type accepted. Goodrich Ent, 402-493-1886.

OFF THE AIR? Emergency Back-up Rentals

FM Exciters - STL's - FM Pwr Amps - Antennas - Studio & Test Equipment

SCMS Inc (800) 438-6040
 "You Know We Know Radio"

McMartin BF-5K 5 kW FM, factory rebuilt in perfect, like new cond, includes new tubes, tested & tuned on your freq, guaranteed, fully adjustable from 0 to 5.5 kW. Goodrich Ent, 402-493-1886.

Want to Buy

McMartin AM/FM xmtr, any model, exciter or stereo modules. Goodrich Ent., 11435 Manderson, Omaha NE 68164. 402-493-1886.

TUBES

Want to Sell

AMPEREX, EIMAC, SVETLANA 3CX400A7/8877, 3CX3000A7, 3-500ZG, 4CX250B, 4-400, 4CX400A, 807, 833C, ETC. Westgate 800-213-4563.

FOR THE BEST PRICE & 24 Hr service on transmitting tubes & sockets/parts, new & rebuilt call Goodrich Ent. at 402-493-1886 day or night, FAX 402-493-6821.

TUBES, Eimac, Svetlana
800-430-6683
 Fax: 905-469-4291
ams@hard-to-find.net
www.hard-to-find.net

D And C Electronics Co.

NEW TUBES

We have the alternatives for all your needs, at the lowest prices, direct from OUR STOCK!!!

EIMAC, SVETLANA, PROTEK®, EEV and many others.
 (352) 688-2374
 PH: (800) 881-2374
 FAX: (352) 683-9595

SE HABLA ESPAÑOL WE EXPORT VISA/MASTERCARD ACCEPTED

Since 1947 Since 1947

Eimac Thomson Freeband EEV Burle Svetlana RCA ARS

**4CX15000A - EEV
 4CX250B - Eimac
 3CX800A7 + more**

New & Rebuilt Tubes Export Shipping

ARS Electronics

USA 800-422-4250 Ca. 800-422-4277
 Same Day World Wide Shipping

POWER Eimac YOU CAN TRUST

ISO 9001 Certified

The Choice of Successful Broadcasters Since 1934

NEW POWER TUBES

Triodes
 Tetrodes
 Pentodes

NEW SOCKETS & REPLACEMENT PARTS

Worldwide Availability

Made in U.S.A.

CALL 800-414-8823
 Int'l (650) 592-1221
 Fax (650) 592-9988

Visit our Web Site at www.eimac.com



Radio World

EMPLOYMENT

HELP WANTED

NAB™ COMMUNICATIONS ENGINEER

National Association of Broadcasters is looking for a talented communications engineer to join our Science & Technology department. NAB is actively involved in developing specifications and implementing digital broadcasting technology to position the broadcasting industry in the areas of DTV, digital radio, data broadcasting and media convergence.

This engineer will work with industry/government standards committees and regulatory agencies on a variety of technical issues; develop technical programs to improve the broadcasting services available to the American public; create technical publications and services for NAB members and organize technical conferences and demonstrations at the annual NAB Convention.

Qualifications: BSEE required; strong communications engineering background; knowledge of digital multimedia technology; some public speaking; excellent business writing; and the skills necessary to interact effectively in executive-level environments; knowledge of broadcasting systems highly desirable. NAB offers a generous compensation package; tuition assistance; 401(k) and pension plans and is located near Dupont Circle metro. Fax your cover letter, resume and salary history to (202) 775-2983 or mail to NAB/Personnel Dept S&T/1771 N Street, NW, Washington, DC 20036 or e-mail to hr@nab.org. EOE/M/F/D/V.

THE CUTTING CORPORATION

a Bethesda based audio book publisher, is seeking an Audio/Electronic Technician for the duplication and studio portion of the company. The successful candidate will have a working knowledge of analog audio and should be comfortable with new technology. This person should have a high mechanical aptitude and be willing and able to learn quickly. We will consider training a promising candidate. There is ample opportunity for advancement. PT/FT. Flex scheduling can be discussed. For more information, or to submit your resume, please contact me, Bob Norton @ 301-654-2887 x27 or fax your resume to my attention @ 301-657-9057. Email: nisadele@aol.com.

ASSISTANT CHIEF ENGINEER Infinity Broadcasting Pittsburgh KDKA-WBZZ-WDSY- WZPT

Candidates for this position will need a minimum of a two-year Associate degree in Electronics Technology and at least five years experience in a broadcast facility working on AM and FM broadcast equipment. Background with high power transmitting systems is essential. Candidates should also be proficient at installing, troubleshooting and maintaining studio equipment such as cart machines, tape recorders, consoles, routing switchers and other common equipment. Experience with computer systems is a plus but not a requirement. Submit resume to Engineer Search, c/o Lisa Shannon, Infinity Broadcasting, 651 Holiday Drive, Pittsburgh PA 15220. Infinity Broadcasting is an equal opportunity employer.

STAFF ENGINEERS

Greater Media has several rare openings for staff engineers at our Philadelphia & Boston clusters. At least five years of radio engineering experience is required with a broad range of audio, RF & digital expertise preferred. Greater Media is a long time, privately held radio company that has a long history of solid commitment to technical excellence & to its technical people. Please send resumes & references to: Milford Smith, Greater Media, Inc., 2 Kennedy Blvd, East Brunswick NJ 08816. Fax to: 732-247-0215 or email to: msmith@greater-media.com. Greater Media is an equal opportunity employer.

EMMIS COMMUNICATIONS has an immediate opening for an assistant engineer at our AM/FM stations in Indianapolis. Responsibilities encompass the maintenance and repair of studio and transmitter site equipment, technical support for remote broadcasts, and project construction. The position requires a valid driver's license and reliable transportation, with the ability to share on-call duties and work evening and weekend hours when required. Please send resumes to: Dave Hood, Chief Engineer, WTLC-AM/FM, 40 Monument Circle, Suite 500, Indianapolis IN 46204. 317-684-8128 voice; 317-684-2010 fax; dhood@wtlc.emmis.com. Emmis Communications is an equal opportunity employer.

SERVICES

START YOUR OWN RADIO STATION LEGALLY!

ONLY \$748

FREE FREQUENCY SEARCH!

MBC Consulting
 800-219-7461
www.mbcradio.org/lpfm

CBS BROADCAST

LPFM Application --- \$495
 LPFM Frequency Search --- \$170
 FM Applications --- \$1,369
 Full Color Coverage Maps --- \$86
 Low Power Xmt's 100 W Part 73 FCC Approved
 Low Power Xmt's Part 15 FCC Approved
 All Low Power Equipment
(914) 966-3436
 Ask for Serge or Cecilia
Csb1118@usa.net

*LPFM Freq Searches: \$189
 *LPFM Application Preparation: \$949
 *Full Color Coverage Maps (single station to any contour): \$79

MonsterFM.com
 903-562-1978
 Email: hawkfm@netzero.net
www.MonsterFM.com
 -Financing Available-

SIMPLE CONNECTION

200 Product Lines, Integrated & Prewired

Connect to the USA Turnkey Distributor

BROADCAST RICHMOND

E-mail broadcast@infocom.com

Tel 765-966-6468 Fax 765-966-5505

www.broadcast-richmond.com

**Continued
 On
 Next
 Page**

EMPLOYMENT

HELP WANTED

Clear Channel Radio



Clear Channel Radio has openings for Regional Engineers, Market Engineers, Project Specialists and Assistant Engineers in several areas of the country.

We offer Excellent Pay, Technical Training programs, 401K, Employee Stock Purchase Plans, Great Benefits and many Opportunities for growth and advancement.

If you have great technical skills and are ready to work with our highly qualified team... If you are tired of your job and are ready for a career... If you are ready to make a move up...

Contact:
 Jeff Littlejohn - VP Engineering Services
 Clear Channel Communications
 50 East RiverCenter Blvd #1200
 Covington, KY 41011
 859-655-6535 Direct
 859-655-9345 FAX
 jefflittlejohn@clearchannel.com

Clear Channel is an Equal Opportunity Employer.

Lakeland, Florida has an opening for a full-time Chief Engineer. Responsibilities include overseeing all engineering duties for two AM & two FM, highly active radio stations with three remote transmitter sites. Minimum 5 years experience. Must be qualified in electronic maintenance, repair & installation of all types of broadcast equipment, computers, digital audio & LAN experience; AM & FM RF skills & transmitter experience a must. FCC General Class License or SBE Certification a plus. Send resume to: Edd Monskie, VP/Engineering, Hall Communications, Inc., PO Box 4368, Lancaster PA 17604-4368. Hall Communications is an Equal Employment Opportunity group & encourages women & minorities to apply.

JEFFERSON-PILOT COMMUNICATIONS has a rare opening for a skilled and experienced Radio Engineer to be a key member of our Engineering team in South Florida. Responsible for project execution, maintenance, and all technical operations at state of the art multi-station radio facility. At least 3 years experience as a Chief Engineer, and familiarity with digital audio systems required. Background in high power AM directional, FM combined RF transmission systems, and some IT experience desired. Direct experience with MediaTouch and Novell networking a plus. Send your resume today to: Gary Blau, Director of Engineering, WAXY/WLYF/WMXJ, 20450 NW Second Ave, Miami FL 33169. Or, email to: gblau@jpc.com. Jefferson-Pilot Communications is an Equal Opportunity Employer. No calls, please.

Bright, funny, modest, right-of-center ex-network host, seeks quality market for mayhem & brain massage. E-mail: seeitheart@aol.com.

Experienced CE seeks FT/PT, contract, seasonal work NE. Friendly, outgoing seeking work in the Northeast. Radio, AM/FM/TV work. FCC licensed, CET, amateur radio operator, exper in carrier current AM & MDS also. Mitchell Rakoff, 81-12 Roosevelt Ave #702, Jackson Heights NY 11372. 718-969-5224. Or email to: mitchell-rakoff@yahoo.com.

Seasoned broadcast engineer ready for more, all personal & professional noble qualities, real, technologically progressive & ratings motivated team player for the "tri-state area" (IN,IL,WI), seasons-engineer@aol.com

Young ambitious announcer/production whiz. A value to your team. Willing to work in any market. A real conversation piece. Mike, 918-494-9600.

Experienced CE 15 yrs with great people skills, wishes to accept new challenges in Radio see resume at www.funport.com/mychucky/resume.htm. I can reduce your headaches. Only top 25 market or equivalent need apply. Good references.

Fresh radio talent looking for position in production, DJ, news, board ops. Creative, hard working, intelligent. Grian Allen Ennlow, 817-695-2474 or listen to me at www.radioschool.com.

Hot Momma with attitude, recently graduated from broadcasting school, FT position needed, live on-air experience, willing to relocate. Noel, 405-524-0100.

Rookie offering more than just simple conversation. Energetic, out-going, detailed oriented, pushing the art form to the next level, let's make great music business together. Robin, 323-292-4194.

Trained, intelligent, innovative female seeking position w/classic rock format, excellent people skills as well as production, copywriting and news delivery. Connie Le, 405-275-0810.

ACTION-GRAM

EQUIPMENT LISTINGS

Radio World's Broadcast Equipment Exchange provides a FREE listing service for radio stations only. All other end users will be charged. This FREE service does not apply to Employment Help Wanted ads or Stations For Sale ads. These are published on a paid basis only. Send your listings to us by filling out the form below. Please be aware that it takes one month for listings to appear. The listings run for two consecutive issues and must be resubmitted in order to run again. Thank you

Please print and include all information:

Are you currently a subscriber to Radio World?
 Yes No

Signature _____ Date _____

Contact Name _____
 Title _____
 Company/Station _____
 Address _____
 City/State _____
 Zip Code _____
 Telephone _____

Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Broadcast Equipment Exchange on a paid basis. Line ad listings & display advertising are available on a per word or per inch basis.

WTS WTB Category: _____ Model: _____
 Make: _____
 Brief Description: _____
 Price: _____

WTS WTB Category: _____ Model: _____
 Make: _____
 Brief Description: _____
 Price: _____

WTS WTB Category: _____ Model: _____
 Make: _____
 Brief Description: _____
 Price: _____

WTS WTB Category: _____ Model: _____
 Make: _____
 Brief Description: _____
 Price: _____

WTS WTB Category: _____ Model: _____
 Make: _____
 Brief Description: _____
 Price: _____

Advertise your employment ad on our website for only \$2 per word!
www.rwonline.com



5827 Columbia Pike, 1st Floor • Falls Church, VA 22041
 PHONE: 703-998-7600 • FAX: 703-998-2966

Call Simone Mullins, Classified Ad Manager, to reserve space in the next issue. Use your credit card to pay, we now accept VISA, MASTERCARD and AMERICAN EXPRESS.

Select from these categories for best ad positioning:

- | | | |
|-------------------------|------------------------|-----------------------|
| Acoustics | Furniture | |
| Amplifiers | Limiters | Stations |
| Antennas/Towers/Cables | Microphones | Stereo Generators |
| Audio Production | Miscellaneous | Tapes/Carts/Reels/CDs |
| Automation Equipment | Monitors | Tax Deductible |
| Business Opportunities | Receivers/Transceivers | Equipment |
| Cart Machines | Recorders | Test Equipment |
| CD Players | Recording Services | Transmitter/Exciters |
| Computers | Remote & Microwave | Tubes |
| Consoles | Repair Services | Turntables |
| Disco-Pro Sound Equip. | Satellite Equipment | Employment |
| Financial/Leasing Svcs. | Software/Databases | |

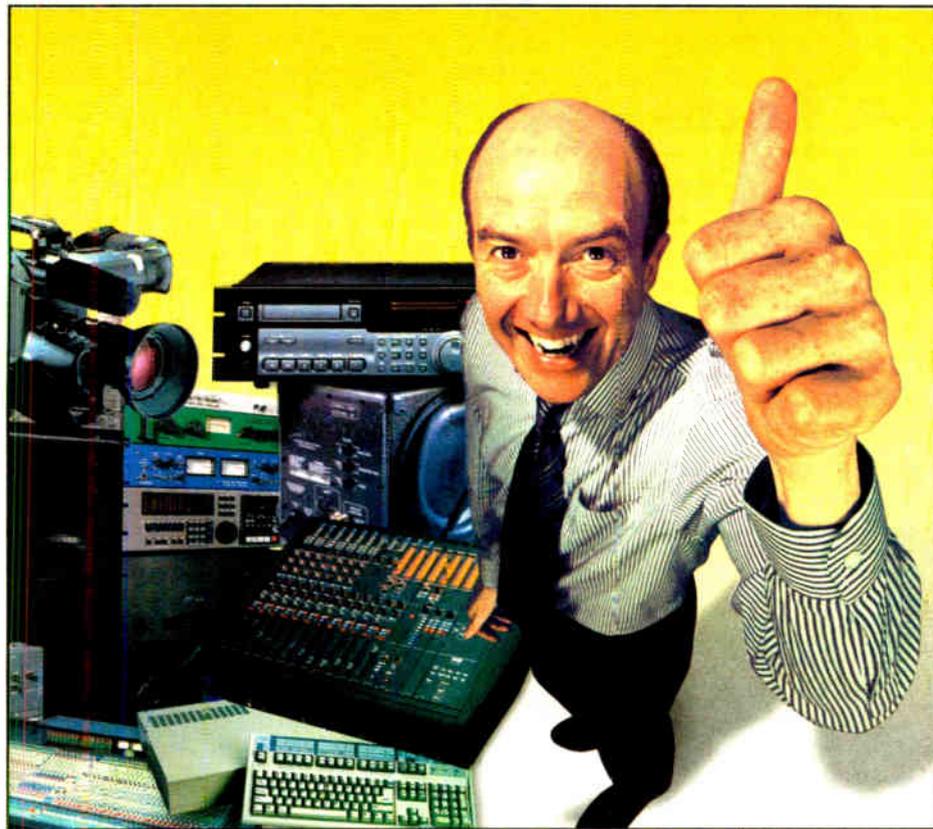
Classified Advertising Rates Effective January 1, 2000

	1x	6x	13x	26x
1-9 col inch (per inch)	\$83	81	79	76
10-19 col inch (per inch)	\$78	76	74	70
Distributor Directory	\$120	115	110	105
Professional Card	\$90	85	80	75
Classified Line Ad	\$2.00 per word			
Blind Box Ad	\$15 additional			
Station/Studio Services	\$175			

*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

Broadcast Equipment Exchange

PO BOX 1214, Falls Church, VA 22041 • Tel: 800-336-3045 • Fax: 703-998-2966



broadcastmarket.com

You can count on broadcastmarket.com as a great source for used professional audio and video equipment deals in a fast-paced, exciting on-line auction environment! Whatever you need -- from mics to consoles, cameras to DAWs -- get ready to place your bids.

Whether you're a buyer or a seller, get set for broadcastmarket.com to bring you the widest selection, the best prices and the fastest sales on the Net.

going ONCE

going TWICE

SOLD



A new Reader Service from IMAS PUBLISHING:
Radio World TV Technology Pro Audio Review Audio Media

ADVERTISER INDEX

This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

PAGE	ADVERTISER	WEBSITE URL
25	360 Systems	www.360systems.com
64	Air Corp	See ad for contact information
45	Aphex	www.aphex.com
65	Armstrong Transmitters	www.armstrongtx.com
40, 41	Arrakis	www.arrakis-systems.com
72	ATI	www.atiguys.com
32	Audemat by Auditem	www.audemat.com
8	Audio Precision	www.audioprecision.com
2	Auditronics/Wheatstone	sales@wheatstone.com
42	Belar	www.belar.com
35	Bext	www.bext.com
63	Broadcast Data	www.broadcastdata.com
63	Broadcast Devices, Inc.	www.broadcast-devices.com
3	Broadcast Electronics	www.bdcast.com
75	Broadcast Richmond	www.broadcast-richmond.com
34	Broadcast Software Int'l (BSI)	www.bsiusa.com
63	Broadcast Technology Company	www.broadcasttech.com
64	Broadcast Tools	www.broadcasttools.com
43	BSW	www.bswusa.com
4	Burk Technology	www.burk.com
63	Circuit Werkes	www.circuitwerkes.com
68	Coaxial Dynamics, Inc.	www.coaxial.com
32	Commercial Communication Assoc.	www.cca.ws
7	Comrex	www.comrex.com
61	Crown Broadcast	www.crownbroadcast.com
49	Dalet Digital Media Systems	www.dalet.com
51	Dielectric Communications	www.dielectric.com
64	Econco	www.econco.com
64	Electronic Research Inc.	www.eriinc.com
15	ENCO Systems	www.enco.com
64	Excalibur Electronics	See ad for contact information
18	Fairlight On Air Systems	www.fairlightonair.com
63	Freeland Products, Inc.	www.freeland-inc.com
66	Full Compass	www.fullcompass.com
63	Gorman-Redlich Mfg. Co.	www.gorman-redlich.com
1	Harris	www.harris.com
63	Harris	www.harris.com
23	Henry Engineering	www.henryeng.com
32	Henry Engineering	www.henryeng.com
19	Inovonics	www.inovon.com
24	Inovonics	www.inovon.com
53	Inovonics	www.inovon.com
63	J Squared Technical Service	jsquared@cdsnet.net
20	Kintronic Labs	www.kintronic.com
21	Klotz Digital AG	www.klotzdigital.com
68	LBA Technology	www.lbagroup.com
33	Live365.com	www.live365.com
6	Logitek	www.logitekaudio.com
32	LPB	www.lpbinc.com
36	Management Data AG	mdata-us.com
28	MeasureCast	www.measurecast.com
39	MediaTouch	www.mediatouch.net
54	Neutrik USA	www.neutrikusa.com
68	Nott Ltd.	www.tjantenna.com
37	NPR Satellite Services	www.nprss.org/this
10	NSN Net	www.nsn.net
47	OMB America	www.omb.com
9	Omnia, a Telos Company	www.omniaaudio.com
57	Omnia, a Telos Company	www.omniaaudio.com
16	Orban	www.optimod8400.com
17	Orban	www.optimod8400.com
68	Propagation Systems	psiba@surfshop.net
68	QEI	www.qei-broadcast.com
32	Radio Design Labs	www.rdlnet.com
29	Radio Frequency System (RFS)	info@rfsbroadcast.com
5	Radio Systems	www.radiosystems.com
32	SBS/Broadcasters General Store	www.bgsfl.com
27	Scott Studios	www.scottstudios.com
63	Shively Labs	www.shively.com
59	Sierra Automated Systems	www.sasaudio.com
68	Silicon Valley Power	www.svpa.com
50	Sine Systems	www.sinesystems.com
11	Sony Business & Professional	www.sony.com/proaudio
68	Studio Technology	www.studiotechnology.com
69	Superior Broadcast Products	www.sbpjj.com
55	Syntrillium Software	www.cooledit.com
13	Telos Systems	www.telos-systems.com
79	Wheatstone	www.wheatstone.com
80	Wheatstone	www.wheatstone.com

◆ READER'S FORUM ◆

Struble kudos

Dear RW,

Warm congratulations on Leslie Stimson's coverage of the iBiquity merger in the Aug. 2 RW ("USADR + LDR = iBiquity Digital). It was very thoroughly researched and the most comprehensive set of articles I saw anywhere.

Your checking with other sources (NRSC, CEA, etc.) was well-accomplished and it painted the entire picture very well.

The series of different articles really covered all the angles.

Great job. Let me know how we can help going forward.

*Bob Struble
President and CEO
iBiquity Digital Corp.*

Shortwave stats

Dear RW,

I am glad Paul McLane liked my book, "On the Short Waves, 1923-1945" (RW, July 19).

Shortwave broadcasting has much to commend it in terms of cost and unrestricted access to target areas. However, notwithstanding huge advances in shortwave receiver design, it is viewed as a bit of a dinosaur.

While still of value to religious and governmental broadcasters, it is easy to forget that in the 1930s it was thought, even in the United States, that shortwave might serve as a replacement for, or at least a serious supplement to, regular domestic news and entertainment broadcasting.

All shortwave listeners know the puzzled look of someone to whom they are trying to explain their hobby today (followed invariably by, "Do you talk?" — people have at least heard of ham radio).

But international shortwave has always confounded those who have predicted its demise. It has at least taken on a new look, with program exchanges and time rentals on 250 and 500 kW senders now standard procedure.

This has produced some strange bedfellows, with religious organizations and western governments now buying transmitter time from broadcasters in such unlikely places as Russia and the former Soviet republics.

You know something has changed when Vatican Radio is broadcasting via Uzbekistan.

Whatever the future of shortwave

broadcasting, I still find it odd to listen to BBC programming over NPR. Any shortwave fan knows that a BBC broadcast without at least a little static or fading cannot possibly be authentic.

*Jerome S. Berg
Lexington, Mass.*

The new face of engineering

Dear RW,

In response to Aug. 2 focus on radio engineering careers, there are a growing number of technical types who have vowed to never seek or accept employment by companies run by certain operators — hence an added exodus from the profession.

I have a great deal of respect for many of the self-made billionaires out there who grew from GM to mega-owner. However, my respect ends at that point for I know what has gone on at some stations behind the scenes and the outcome usually resulted in the technical department taking hits of one kind or another in favor of the PD or sales gumps.

Unless you have a GM who is staunchly on your side, the positions are a nightmare.

Groups that have shunned or dissolved DOE or corporate technical manager/structure are unmistakable indications of where their priorities lie ... technical "resources" isn't one of them. There are a couple of large groups that choose to not follow that practice. The brass do know the ins and outs and realize for there to be station, there has to be infrastructure that is solidly built and well-maintained.

Nonetheless, some unenlightened local managers are very demanding or simply not aware of the *real* benefits an engineer can bring to the bottom line.

Depending on personalities involved, the situation has already degenerated in both compensation/worth and conditions. Seven stations ... \$40K. Typical. Crazy.

As has been said before, (most recently in Dear Abby), only you can allow yourself to be taken advantage of. If you feel you are being taken advantage of, then it is your obligation to tell the GM/owner that feeling. And if he/she is indifferent to that, be prepared to walk and back it up by doing so if necessary.

It's tough ... but sometimes the shoe needs to get put on the other foot. Then let them attempt to find someone new in a short period of time offering starting pay scales for certified seasoned vets.

A Code of Conduct

"Other than that, Mrs. Lincoln, how was the play?"

Many journalists limit their ethics considerations to such an example: sticking a mic in a grieving widow's face.

But ethics involve much more.

The Radio-Television News Directors Association recently adopted a revised code of ethics that addresses some of the issues that decision-makers face in today's newsrooms.

The revised code was created by the RTNDA Ethics Task Force with input from RTNDA members, nonmembers and experts in media ethics. Public focus groups around the country provided feedback. The document is intended to preserve basic principles while offering realistic guidance that can grow and change with the profession.

With increasingly tough calls in the modern newsroom, combined with what appears to be a rise in sensationalism in an effort to top the ratings race, a better code of ethics is what this industry needs.

The preamble of the Code of Ethics and Professional Conduct states: Professional electronic journalists should operate as trustees of the public, seek the truth, report it fairly and with integrity and independence, and stand accountable for their actions.

Each concept — public trust, truth, fairness, integrity, independence and accountability — is discussed at length within the document.

So what types of issues involve ethics considerations? Most instances are obvious, such as covering children, grieving families, race relations and hostage negotiations. Sometimes, however, in the chase to get the story first, some reporters tend to overlook ethics considerations. Live or breaking stories involve a unique set of concerns — from protecting the victim to staying out of the way of police efforts to find a suspect.

Radio journalists, often overshadowed by their print and TV brethren, must remember that service to the public is our first and greatest responsibility. They should read the updated code and discuss how it applies to their own work.

Newsrooms and news managers need to be on top of sometimes split-second decisions in a breaking-news situation. Effective coverage is ethical coverage.

— RW

Unlike PDs and "talent," technical types who know transmission systems aren't a dime a dozen these days.

*Michael G. McCarthy, CSRE
Principal
McCarthy Radio
Chicago*

AM receiver standards

Dear RW,

I would like to applaud Scott Todd on his well-thought-out article on AM receiver standards in the Aug. 2 issue ("AM Isn't Bad — It's Receivers Are").

I have long maintained that AM stereo should be required on all radios sold in the United States since there is an accepted standard in place (C-QUAM). After all, the addition of the expanded AM band was integrated into even the cheapest of radios, why not AM stereo? It can't be the cost. I paid only \$30 for a brand-new Sony AM stereo/FM stereo Walkman a few years ago.

It makes little sense for a broadcaster to offer a very fine and listenable product in AM stereo, only to tell the public

"good luck on actually finding an AM stereo radio." It figures that the FCC's current policy (or should I say, non-policy) allows such a travesty to happen.

Many AM station owners should feel responsible as well, because if they treated their AM stations as valuable franchises they wouldn't stand to be treated in this second-class manner.

*Dan Updike
Affiliate Relations
Finger Lakes Productions
International
Ithaca, N.Y.*

Write to Us

RADIO WORLD
READER'S FORUM

P.O. Box 1214
Falls Church, VA 22041

radioworld@imaspub.com

—EDITORIAL STAFF—

Paul J. McLane	ext. 117	Editor
Sharon Rae Pettigrew	ext. 126	Managing Editor
Leslie Stimson	ext. 129	News Editor/Wash. Bureau Chief
Laura Dely	ext. 198	Business Editor/GM Journal
Paul Cogan	ext. 146	Associate Editor/Studio Sessions
Bernie Cox	ext. 183	Associate Editor/Buyer's Guide
Thomas R. McGinley	—	Technical Adviser
Alan Peterson	—	Technical Adviser
T. Carter Ross	ext. 120	Editor-in-Chief (International)
Marguerite Clark	—	Editor (International), Milan
Christine Joaquim	ext. 138	Managing Editor (International)
Rogelio Ocampo	ext. 121	Latin America Editor in Chief
Karina Gerardi	ext. 137	Latin America Assistant Editor
Renata Beck	ext. 196	Latin America Assistant Editor
Marie Cirillo	ext. 130	Editorial Assistant
Linda Sultan	ext. 141	Editorial Assistant
Peter Finch	—	Editorial Assistant, Milan

—EDITORIAL CONTRIBUTORS—

W.C. Alexander, Bruce Bartlett, Read Burgan, Harry Cole, Troy Conner, Vince Dittingo, Mark Durenberger, Ty Ford, Scott Fybus, Harold Hallikainen, Paul Kaminski, Peter King, Mel Lambert, Mark Lapidus, Carl Lindemann, Bill Mann, Lynn Meadows, Naina Narayana, Tom Osenkowsky, Ken R., Rich Rarey, Bruce Rogow, Bob Rusk, Randy Stine, Steve Sullivan, Travis the VO Guy, Barry Umansky, Tom Vernon.

Radio World
Vol. 24, No. 21 October 11, 2000

Telephone: (703) 998-7600 • Business Fax: (703) 998-2966 • Editorial Fax: (703) 820-3245
E-mail: radioworld@imaspub.com • Web site: www.rwonline.com

—ADVERTISING SALES REPRESENTATIVES—

Sales Mgr., US Southeast & Mid-Atlantic: John Casey	330-342-8361	Fax: 330-342-8362	email: jdcasey@compuserve.com
US Northeast & Central: Sandra Harvey	765-966-0669	Fax: 765-966-3289	email: ads4sales@aol.com
US West: Dale Tucker	916-721-3410	Fax: 815-352-1698	email: dtucker@ns.net
Classified Ads: Simone Mullins	703-998-7600 x154	Fax: 703-671-7409	email: smullins@imaspub.com
Germany, Austria: Dagmar Hänle	+39-02-7030-0310	Fax: +39-02-7030-0211	email: dhanle@imaspub.com
France: Silvia Di Stefano	+39-02-7030-0310	Fax: +39-02-7030-0211	email: sdsimas@aol.com
European Sales Mgr., Africa, Middle East: Raffaella Calabrese	+39-02-7030-0310	Fax: +39-02-7030-0211	email: rcalabrese@imaspub.com
Japan: Eiji Yoshikawa	+81-3-3327-2688	Fax: +81-3-3327-3010	email: callems@msn.com
Asia/Pacific: Wengong Wang	+852-2787-4727	Fax: +852-2787-4041	email: imashk@ctmail.com
Latin America: J.O. Lima e Castro	+55-11-3873-1211	Fax: +55-11-3873-1499	email: limcas@uol.com.br

NEXT ISSUE OF RADIO WORLD OCTOBER 25, 2000

For address changes, send current and new address to RW a month in advance at P.O. Box 1214, Falls Church, VA 22041. Unsolicited manuscripts are welcomed for review: send to the attention of the appropriate editor.

World Radio History

—ADMINISTRATION & PRODUCTION—

Stevan B. Dana	President/CEO
Carmel King	VPI/Group Publisher/COO
Marlene Lane	Editorial Director/Assistant COO
Chuck Inderrieden	CFO
Eric Trabb	Sales & Marketing Director
Lisa McIntosh	Production Director
Annette Linn	Production Department Manager
Davis White	Production Publication Coordinator
Kathy Jackson	Ad Traffic Manager
Christopher Duerk	Senior Graphic Designer
Julie Wielga	Marketing Manager
Sheryl Unangst	Circulation Director
Robert Green	Circulation Manager
Alexander Sisson	Accounts Receivable

Radio World (ISSN: 0274-8541) is published bi-weekly by IMAS Publishing (USA), Inc., P.O. Box 1214, Falls Church, VA 22041. Phone: (703) 998-7600, Fax: (703) 998-2966. Periodicals postage rates are paid at Falls Church VA 22046 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 1214, Falls Church VA 22041. REPRINTS: Reprints of all articles in this issue are available. Call or write Joanne Munroe, P.O. Box 1214, Falls Church, VA 22041; (703) 998-7600; Fax: (703) 998-2966. Copyright 2000 by IMAS Publishing (USA), Inc. All rights reserved.

—Printed in the USA—

THE WHEATSTONE D-5000

DIGITAL AUDIO CONSOLE

HIGH TECH — FOR LESS!



This new D-5000 audio console from WHEATSTONE gives you our top-of-the-line D-600 digital technology—at a modest price!

- Totally modular design lets you hot-swap all modules for on-air servicing; even DSP and CPU functions reside on easily changed modules.
- Traditional user interface with clean layout and familiar control surfaces.
- Available with up to 26 input modules (any mix of analog and digital).
- 4 stereo mix busses, each with digital and balanced analog outputs.
- Flexible mainframe layout options.
- Inputs can be field-converted from analog to digital (and back) through a simple daughterboard change.
- Choice of 32, 44.1 or 48KHz console clock rates (can be synced externally).
- Serial port allows true integration with routers and automation systems.
- Dedicated phone module with DSP generated MXM—two modules can be combined for up to 4 MXM sends.
- 8-character alphanumeric source displays above each fader.
- All channel fader, display and switch settings are addressable via the serial port for remote control and router/automation communication.
- Exclusive VDIP™ software lets you configure console with a laptop PC (no pulling modules, installing jumpers or setting dipswitches). Once configured console runs standalone.

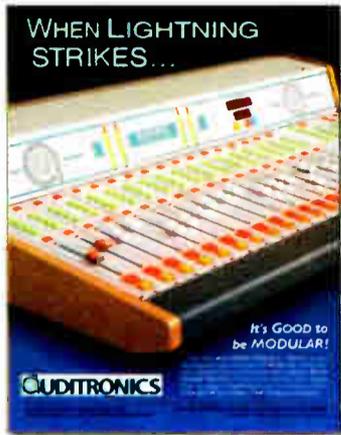


Wheatstone Corporation

600 Industrial Drive, New Bern, North Carolina, USA. 28562
tel 252-638-7000/fax 252-635-4837/sales@wheatstone.com

www.wheatstone.com
copyright © 2000 by Wheatstone Corporation
specifications and features subject to change without notice

Didn't get to NAB this year? Here's the NEW STUFF you MISSED:

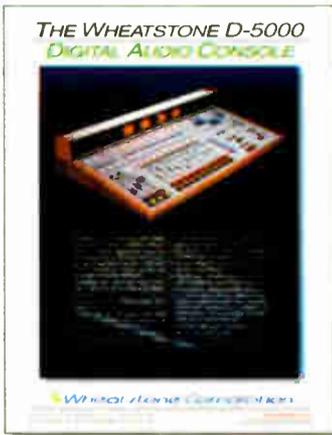


AUDITRONICS 220
Modular, easy to install, serial control standard to work with most automation systems. Auditronics quality at a price to keep you under budget.

AUDITRONICS NuStar 4.0
A whole new generation NuStar can handle up to 128 input/output signals in its rackmount engine, letting you select any source directly to each channel. Eight character alpha displays above each fader keep your operator informed and in control.



WHEATSTONE'S VDIP™
Virtual Dipswitch Software lets you configure our consoles with a laptop computer. There's no pulling cards, setting dipswitches or installing jumpers. Once configured the consoles run standalone.



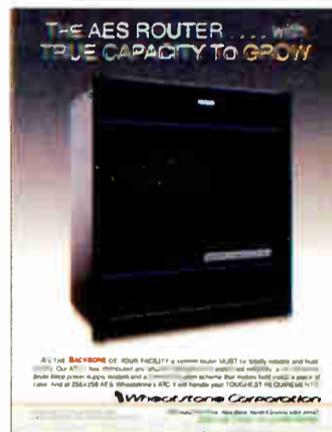
WHEATSTONE D-5000
D-600 technology at a modest price; serial control for most automation systems, 8 character alpha source displays, hot-swap modules.



CONSOLE MOUNT X-Y
Controller can bring hundreds of shared resources to your station.



D-700 — THE LATEST SUPERSTAR FROM AUDIOARTS
Serial interface, digital domain metering (fullscale digital peak plus simultaneous dual ballistic VU), sample rate conversion on all digital inputs, plus selectable console clock rates. And you can get one for less than \$7900!



WHEATSTONE ATC-1
A digital AES router with all the routing capability you need today—plus the expansion you'll definitely need tomorrow. Handles up to 256 AES inputs and routes them to 256 outputs. All switching done in the digital domain, with sample rate converters on every digital input, plus a complete family of X-Y and input controllers for every need.



TEAM PLAYERS — Wheatstone D-600 and D-700 CONSOLES command the ATC-1 digital router; the ROUTER talks to the 8-character console channel displays. Station AUTOMATION can talk to BOTH.

WHEATSTONE'S D-700

Serial protocol is only part of the story! Each input channel can also have two stereo aux sends, four bands of EQ, compression, assignable ducking, and digital input gain control, panning and HPF—with all settings stored and recalled in up to ninety-nine security protected presets—so your talent can be up and running in just seconds. Presets can even recall bus assigns, source selection, mode, channel ON/OFF and fader settings—all through simple front panel control.

