SCIENCE & ART: AES Show Preview. Page 35

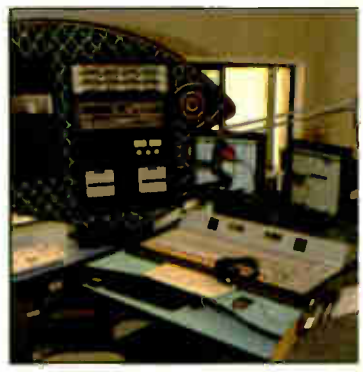
******************AUTO**3-DIGIT 857
S101903 D08 0204
BARRY MISHKIND 707
2033 S AUGUSTA PL
TUCSON AZ 85710 7905
009442

Offending Words
Harry Cole examines FCC actions on indecency.

Page 26

Fresh Fish
Salem takes the plunge with a new aquatic-themed studio in California.

Page 36



Radio World®
$2.50 The Newspaper for Radio Managers and Engineers September 25, 2002

INSIDE

ENGINEERING

▼ Enthusiasm about the potential for wireless Webcasting has cooled off a bit.

Page 3

▼ The staff at Radio Free Asia spearheads an open-source approach that can help your station.

Page 18

GM JOURNAL

▼ RealNetworks and KPIG hope for success with subscription Web radio.

Page 25

STUDIO SESSIONS

▼ Desktop DJs and V/O artists take note: Joemeek wants to move into your spare drive bay.

Page 35

WINNING QUALITY

▼ Audio-Technica and Radio World send a beautiful microphone to our latest winner.

Page 4

Sign Up For NewsBytes Weekly Digest at www.rwonline.com

NEWS ANALYSIS

Green Lights for Amber

The System Works, Where It's Used; But Broadcast Participants Agree It Needs Fine-Tuning

by Randy J. Stine

WASHINGTON Taking advantage of extensive media coverage of recent child abduction cases, organizers of the Amber Alert Plan are accelerating efforts to persuade more states to adopt the notification protocol and establish a national alert program.

But despite the success of the alerts in several instances, some Emergency Alert System participants say they still worry about overuse of the warning system.

Officials at the National Center for Missing and Exploited Children say they expect that this summer's successful recovery of several children in California will encourage more states to adopt Amber plans.

In addition to 15 statewide plans, dozens of local and regional Amber Plans are in

See AMBER, page 6 ▶

Hogan Gets Started at Clear Channel

by Naina Narayana Chernoff

SAN ANTONIO The industry's biggest company remains in a period of introspection under new radio division CEO John Hogan.

Following his promotion on Aug. 20, the company has focused on positioning itself for its next phase of growth. With several years of acquisition and consolidation behind it, observers say the radio division now will look for ways to save costs and combine operations.

Analysts say Hogan, previously the radio group's chief operating officer, is well suited to the job and takes a different approach than his predecessor, Randy Michaels, who was transferred to Clear Channel's technology group in early August.

"Hogan is a good man and has a good reputation," said Lorrin Palagi, a consultant for Zapolean Media Strategies. "He has a different style than Michaels. He tends to be more serious and business-like and less flamboyant."

Still, analysts don't think the Hogan appointment will change operations drastically.

"Since Randy Michaels and John Hogan are both long-time, talented radio

See HOGAN, page 5 ▶

World Radio History

◆ NEWSWATCH ◆

Church Sex Case Simmers

The FCC is investigating Infinity's WNEW(FM) in New York after receiving complaints the station aired a contest involving sex in public places.

FCC Chairman Michael Powell stated he was "deeply disturbed" about the reports of a couple having sex in St. Patrick's Cathedral and directed the agency to begin reviewing the matter. A letter sent to WNEW owner Infinity Broadcasting asked several pointed questions, including the names of anyone involved in the contest and the nature of their responsibility.

A transcript provided by the commission reads as if the sex was simulated, not real. The FCC asked Infinity if this was the case; the owner had not replied at press time.

In the meantime, Infinity cancelled the syndicated show "Opie & Anthony," fired WNEW jocks Greg "Opie" Hughes and Anthony Cumia, and suspended WNEW GM Ken Stevens and PD Jeremy Coleman. The actions appeased the Catholic League, the president of which, William Donohue, had earlier asked for the station's license to be revoked.

Democratic Commissioner Michael Copps said he received hundreds of messages from outraged citizens over the stunt, and urged his colleagues to revoke the station's license.

Station supporters said the critics overreacted to the stunt.

Madison Receives Antenna Fine

LYNCHBURG, Va. The FCC fined Madison Broadcasting Group, owner of five antenna structures in Lynchburg, Va., $12,000 for failure to post antenna structure registration numbers, which are supposed to be near the base of the tower.

Madison said steps had been taken to paint the towers; it said it could not pay the fine and asked that it be cut; the FCC stated it couldn't accept the claim because the station did not provide proof that it cannot pay the penalty.

KOUZ(FM) Fined For Airing Ad

ALEXANDRIA, La. The FCC has found noncommercial KOUZ(FM), Alexandria, La., apparently liable for a $2,000 penalty for airing ads rather than underwriting announcements. The agency defines an ad as material that is aired in exchange for remuneration and intended to promote a service, facility or a product.

Non-coms may air funding acknowledgements for identification purposes only, not to promote the contributors' products, services, or business. At issue are three underwriting announcements aired by the station earlier this year. The licensee, Family Life Educational Foundation, agrees the third announcement, for a nonprofit group, was promotional, aired on behalf of a for-profit sponsor.

The station had 30 days to pay the fine or request that it be reduced or eliminated.

Infinity Sues Over Body Solutions' Ads

SAN ANTONIO Infinity Broadcasting is suing Mark Nutritionals Inc. over approximately $9 million owed for airing Body Solutions' ads. Infinity is suing on behalf of its own stations, plus those of Westwood One Radio Networks and subsidiary Metro Networks, according to the San Antonio Express.

Radio talk show hosts and DJs did testimonial ads for the weight loss product, claiming it helped them lose weight.

A Mark Nutritionals lawyer told the Express that Mark Nutritionals disagreed with Infinity about the exact figure owed.

THE AMAZING LITTLE MIXER

ALM

Routes any INPUT to any FADER...

OR ANY INPUT TO YOUR MONITORS! The new ALM-12d console from Auditronics combines the benefits of a router and a console—all into one cost effective package. It's got everything you need: twelve faders plus two caller faders, four mic pre-amps and of course control room and studio monitoring, built-in cue and headphone amplifiers, and a concealed headphone jack.

It's got the high end features too, like bright LED dot matrix source displays above faders and monitor pots, and 24 bit A>D and D>A ins and outs. Its AES digital inputs have sample rate convertors so it works with virtually any digital source gear you have. It can run your source machines too—up to eight of them—all opto-isolated. It even has DSP digital metering that simultaneously displays VU columns and peak hold full scale digital so you can be assured of pristine performance. It has powerful caller tools that generate MXMs automatically, and you can program any of its four MXMs to be pre or post fader.

Digital so easy you don't install it—you CONNECT it!

And because it's AUDITRONICS, it's built tough as steel, and will be easy to maintain.

DIGITAL CAN BE EASY—JUST CALL AUDITRONICS!

tel 252-638-7000/fax 252-635-4857/sales@wheatstone.com
600 Industrial Drive, New Bern, North Carolina, USA. 28562

AUDITRONICS
www.auditronics.com

copyright © 2002 by Wheatstone Corporation

Index

NEWS

Green Lights for Amber	1
Hogan Gets Started at Clear Channel	1
Newswatch	2
FCC Carves Out Spectrum for 3G	3
Orban/CRL Settles Dispute, Reports Loss	3
He Thinks AM Doesn't Need IBOC	4
Digital News	5

FEATURES

Workbench: He Found the Fix in the Drawer	10
Group Chief Defies Stereotype	12
The Bar Continues to Move Higher	14
Dipping Into the History of Wire	14
At RFA, Putting R-Boss to Work	18

GM JOURNAL

Real Debuts Paid Web Radio	25
Promotions: Make It a Market Event	25
Team Cole's Law Tackles Indecency	26
FM: What a Wild Ride It Was	30
'Stealing' News — Is It Legal?	32

STUDIO SESSIONS

Joemeek Goes Micro With the MQ1	35
AES Gets Back on Track in Los Angeles	35
Salem Studio Catches a Fish	36
Farm Radio Shares Information	40

BUYER'S GUIDE

Susquehanna in Sync With Lucid	43
OPINION	53,54

World Radio History

FCC Carves Out Spectrum for 3G

Enthusiasm for 'Lightning-Fast Mobile Internet' Is Tempered by Economic and Technical Realities

by Dee McVicker

The FCC has allocated new spectrum for third-generation mobile phone services, but analysts aren't naming wireless Webcasting as a beneficiary of that new spectrum just yet.

This is a marked change from two years ago, when 3G wireless Webcasting appeared to be on the same trajectory as satellite radio as a competitor for radio's market base of in-car listeners. At the time, mobile telecom carriers appeared to be flush with capital and enthusiasm for high-speed data streaming over 3G cellular networks. They lauded 3G as the lightning-fast mobile Internet, complete with a wireless Webcasting component that had some broadcasters worried about possibly competing against a new mobile medium.

To hear 3G proponents tell it, 3G was going to put music entertainment on a new plane of existence. Yet, so far, 3G Webcasting remains virtually nonexistent. In the past year, not so much as a peep has been heard about Webcasting from the cell phone industry, whose 3G plans stalled along with the economy.

Little more can be said about the progress of Web phones that were supposed to turn into MP3, Real and Windows Media devices by the dozens for music playback.

Wither Web phones?

The lone voice in the wilderness was the FCC's decision in July to allocate 45 MHz in the 1710-1755 MHz band and another 45 MHz in the 2110-2170 MHz band for 3G use. Auctioning of the bands could happen as early as 2004, although it remains to be seen just how soon cell operators can take possession and at what cost.

Existing occupants on the bands, including the U.S. Department of Defense, will need to vacate and relocate their services before 3G carriers can use these allocations. Furthermore, carriers are expected to pay for the spectrum as well as all incumbent relocation costs in order to take occupancy.

Even if 3G were to jump on the bands immediately, skeptics contend that wireless Webcasting won't be able to compete against existing music services — like radio. Wireless Webcasting may have radio's mobility advantage, but it doesn't have radio's efficient use of spectrum as a one-to-many medium, said Steve Groesbeck, general manager, KLPX (FM), Tucson, Ariz.

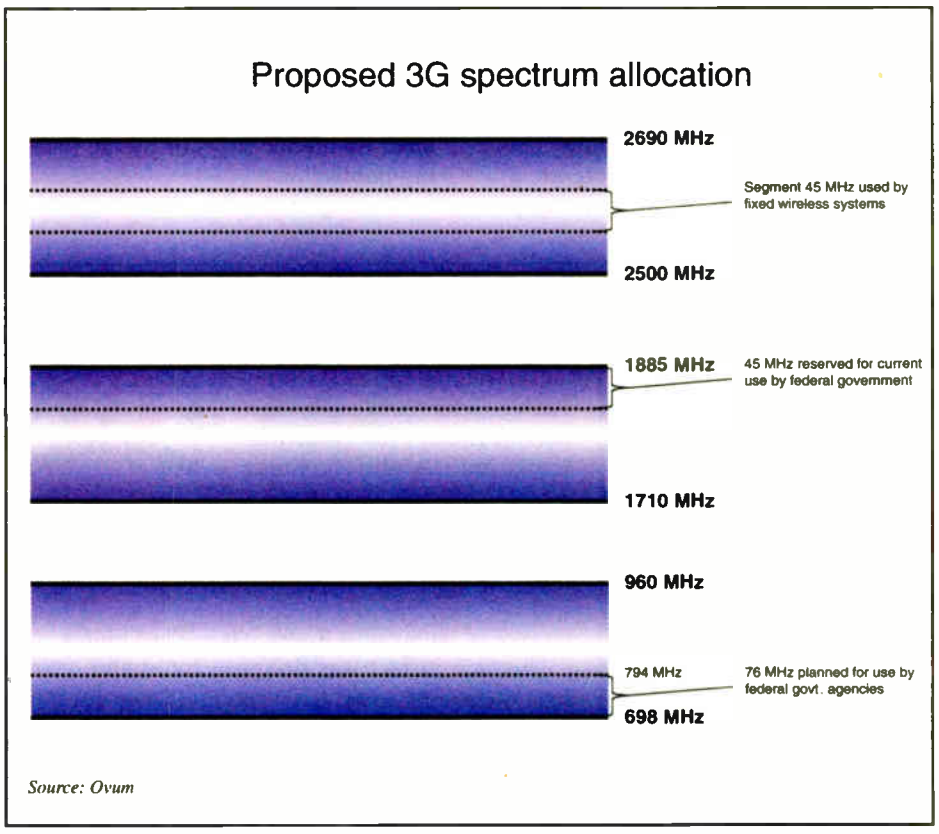
"I'm not sure narrowcasting is a viable commercial model," he said.

Wireless carriers will need all the spectrum they can get for Webcasting, and they haven't shown interest in giving up the spectrum they do have for the high-bandwidth appetite of this yet unproven application. Webcasting to a mass audience is still cost prohibitive, and it's possible mobile users may not be willing to pay for wireless Webcasting at any price, said Michael Doherty, senior analyst for Ovum Research, Wakefield, Mass.

"Besides, a better and cheaper alternative exist today. There's something called the stereo in the car," he said.

Streaming codecs can package stereo music into a 20 kilobits-per-second stream for Webcasting over the cellular network to the Web phone, but many U.S.

See 3G, page 8 ▶



Orban/CRL Settles Dispute, Reports Loss

by Randy J. Stine

SAN LEANDRO, Calif. Processor manufacturer Circuit Research Labs Inc. has settled a dispute with a German-based parts supplier as it continues efforts to pay off debt accumulated from its purchase of Orban two years ago.

Orban/CRL reported to the Security and Exchange Commission net sales of $5.7 million during six months ending June 30. That compares to $7.9 million during the same period in 2001. The company's first-half sales were down approximately 28 percent from one year ago.

The company reported a net loss of nearly $900,000, or 25 cents per share through the first half of 2002.

Orban/CRL attributed the decline in sales to a 58 percent drop in demand for Orban products by Harris Corp., its largest customer, through the first six months of this year compared to the same period in 2001.

CRL President and CEO Jay Brentlinger said the economy has been slow to recover from the events of Sept. 11.

"The reality is the economy still has not returned to where it was. Things have been slow to recover and this is the fallout," Brentlinger said.

"We are doing our best to maximize efficiency. We are pouring more money into our R&D department. We are confident we have a strong enough company with strong enough products to survive," he said.

New product

Orban expects to introduce a new FM audio processor this fall, Brentlinger said.

"We had hoped to have it ready for the NAB Radio show in Seattle, but it wasn't ready," Brentlinger said.

The company has reached an agreement with Solectron GmbH to purchase all remaining inventory of parts related to its Sountainer product for a total price of slightly more than $800,000. The settlement ends a dispute between the two companies following CRL's acquisition of Dialog4 System Engineering GmbH for $2 million earlier this year.

Sountainer was designed by Dialog4 and is described by the Orban/CRL officials as the world's smallest high-quality broadcast MP3 recorder/player.

"It was a disagreement over whether the Solectron's inventory was to be included in the asset purchase of Dialog4," Brentlinger said.

Circuit Research Labs Inc. reached agreement earlier this summer with Harman International Industries Inc. to restructure short-term and long-term loans totaling $8.5 million owed to Harman. CRL paid $10.5 million for Orban in June 2000 in a leveraged buyout and has since received several payment extensions form Harman.

Payments changed

The latest restructuring gives Orban/CRL until Dec. 31, 2003, to satisfy both short-term and long-term notes, with interest-only payments expected in the interim. The notes were converted to payable on demand by Harman.

The company's latest quarterly filing to the Securities and Exchange Commission reported it had missed its last three interest installments totaling $127,230. As a result, Harman agreed to defer the payment of that amount to Nov. 15, 2002.

"We have a very good working relationship with Harman. If that wasn't the case we would not be here still operating," Brentlinger said.

Brentlinger said the company was in negotiations with private investors interested in acquiring a "large equity position" in Orban/CRL.

"We are looking at all options to raise additional capital through sale of our common stock. It would certainly help to fix the balance sheet," Brentlinger said.

Circuit Research Labs Inc. common stock is traded on the OTC Bulletin Board (NASDAQ:CRLI).

World Radio History

He Thinks AM Doesn't Need IBOC

Few debates get radio people cranked up like the debate over to improve the AM band.

Mix in the question of digital radio for AM, and things get really heated.

A recent letter from a major-market radio chief engineer is one example. I share it because I have heard similar sentiments about IBOC, or HD Radio, from a number of radio people in recent months, and I welcome your views.

He wrote, "The problem with declining AM band usage is not primarily due to its inferior sound quality; to paraphrase a Bill Clinton campaign slogan, 'It's the programming, stupid!'

"Listeners will put up with Internet-quality audio to hear a favorite program, and, judging from the early success of XM Satellite radio, some will even *pay* to hear more than the same 300 records and the lame 'talent' that dominates much of the AM and FM radio dials. The Arbitrons show that listeners will seek out and tolerate a marginal signal, if the programming justifies the effort."

The engineer argues that AM quality has deteriorated over the years, mostly due to poor receiver design and greatly increased interference.

"But IBOC is *not* the answer! The present compromise calls for halving the analog bandwidth (to 5 kHz), and works only in the daytime!

"If AM IBOC were implemented, eventually every AM radio in the country would have to be replaced, as the industry migrates to a full digital platform. Unlike televisions, which have a typical life of five to 10 years, radios last indefinitely. I have a radio from 1927 that still works perfectly, and for which parts are still available."

Improving AM quality is a noble and worthwhile goal, he agreed.

"There is appropriate technology available, some of which has been around for over 50 years, which would greatly improve AM reception and would not require massive investment by broadcasters or by the listening public."

The engineer offers three suggestions:

First: "The most obvious problem with AM, especially at night, is first-adjacent interference. If *every* AM station were to broadcast on a single sideband — e. g., Leonard Kahn's Powerside — first-adjacent interference would be virtually eliminated, as well as most selective fading."

Second: "There are several effective methods of noise reduction, including quasi-compatible Dolby B noise reduction, coupled with a reduction of the transmit pre-emphasis to 25 us. This was tried successfully on the FM band around 1980, and it worked; but like a lot of other good ideas (anyone remember Beta home video?) it was not a commercial success. Sophisticated DNR techniques exist that are inexpensive enough to incorporate in consumer radios, and are remarkably effective, especially against transient impulse noise."

Last: "The broadcasting industry and regulatory agencies must rigorously monitor and enforce existing RFI rules. There is simply too much rogue interference (power lines are a major offender) polluting the environment, which also adversely affects other services, even digital.

"The AM band is still alive and well," the engineer concluded. "Some of the top-rated and top-billing stations broadcast using amplitude modulation. I urge all concerned broadcasters to consider these suggestions to further improve a great medium, which has been serving communities all over the country for over 80 years."

Your thoughts are welcome as well to *radioworld@imaspub.com*.

★ ★ ★

I love autumn in New York. So what better time to visit the city than the next few days, for the 2002 Radio Festival of the Museum of Television & Radio?

Things kick off on Sept. 26 with a reception and a 90-minute seminar with Scott Muni, who will talk about his four decades in rock and top-40 radio and his relationships with the Beatles and the Who.

Other highlights of the festival include a look at how 9/11 affected American news and talk radio; a live radio theater performance; a premiere screening of the documentary "Rock Jocks: The FM Revolution," with discussion by Pete Fornatale and Richard Neer; and numerous live shows from the museum by New York-area broadcasters WLIB(AM), WBAI(FM), WFUV(FM), WFMU(FM), WWRL(AM), WBGO(FM), WNYC(AM-FM) and Sirius Satellite Radio, plus out-of-towners KCRW(FM) and KMOX(AM).

Radio World is a media partner of the festival. For information visit *www.mtr.org*.

★ ★ ★

Congratulations to Radio World columnist Al Peterson, who has joined WGOP(AM) in Walkersville, Md., serving the Washington area, as operations director.

He will coordinate a new studio buildout in Washington and a new transmitter and tower site in Damascus, Md. He also will help behind the scenes on the syndicated "Greaseman Show."

Peterson is technical adviser to Radio World and a regular columnist. He will retain those duties.

From the Editor

Paul J. McLane

A Prize for Paulsen

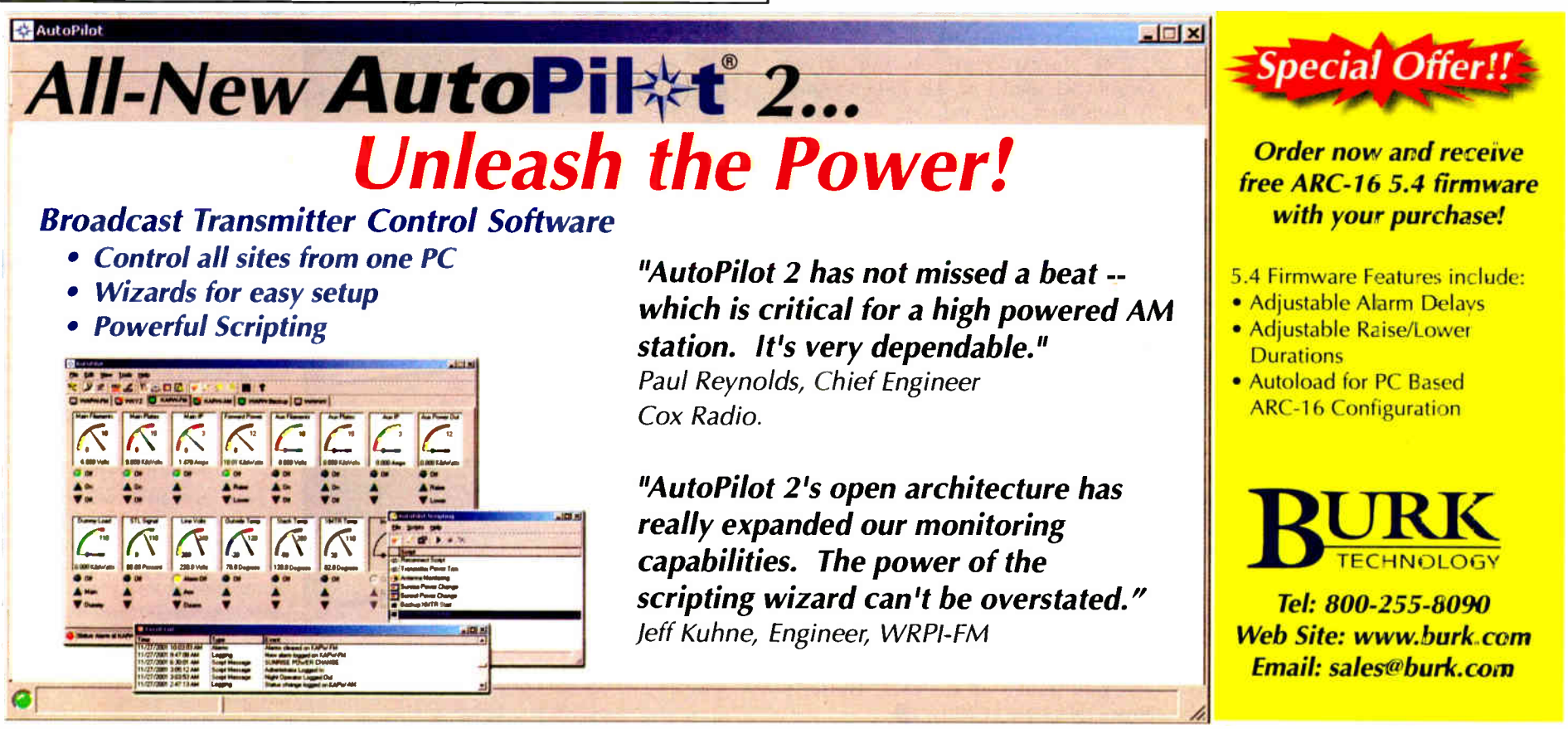
2002 Radio World READERS' CHOICE Sweepstakes

Congratulations to Beverley Paulsen, senior production engineer at Radio Free Asia, who wins an Audio-Technica AT4047/SV Studio Capacitor Microphone in our Reader's Choice Sweepstakes.

Her timing is good. When I called her with the news that she had been picked at random this week, she told me she also does voice-over work and is in the process of setting up a studio at home in Virginia.

This mic in fact was designed for studio, voice-over and on-air work. It's a cardioid capacitor model with dual, gold-plated, aged large diaphragms for extended response. A-T touts the "contemporary replication of early F.E.T. condenser technology" for its warm, natural sound, low self-noise and wide dynamic range. A switchable high-pass filter and 10 dB pad are included.

Retail value: $695.



World Radio History

Hogan

▶ Continued from page 1

executives, it may not be a major change," said Wachovia Securities Analyst James Boyle. "I'm not sure a single executive at the division's top, if comparably experienced and skilled as his predecessor, should be different."

"(The change) makes sense logistically," said Jonathan Jacoby, an analyst from SunTrust Robinson Humphrey. "I don't know if it will make a difference."

Jacoby believes Hogan's significant sales experience will serve Clear Channel Radio well during its current business phase. "John Hogan knows the radio business very well," he said. "They were smart enough not to overlook inside talent."

Hogan relocated to San Antonio days after the announcement, meeting the expectation of Clear Channel executives who wanted a CEO to be located at the parent company's headquarters. Michaels ran the radio division from Kentucky, where he was located when he ran Jacor Communications, which Clear Channel purchased in 1998.

Clear Channel President and COO Mark Mays said the decision to promote Hogan's selection was "an easy decision."

"John brings the combination of sales leadership, operating vision and industry experience that is so important to our next phase of growth," Mays said. "With much if the acquisition activity behind us, the overriding operating goal is to grow our business, organically, leveraging assets now in place."

In an effort to centralize operations, Hogan was expected to take other radio staffers to San Antonio with him. The company confirmed that it would most likely move some of its 40 radio division employees from Covington, Ky., to the Texas headquarters in the coming months.

According to Clear Channel spokeswoman Pam Taylor, some staff members in programming, engineering and accounting were asked to relocate. Following a Hogan visit to the Kentucky office shortly after his promotion, managers spoke to staffers individually to discuss plans, she said.

Who moves?

"John Hogan has said that he is not trying to adversely impact people's lives," she said. "If it's clearly beneficial to operations to have them (in San Antonio), they'll be asked to move, but if their job can be done anywhere, they can stay."

Taylor said the "virtual" areas of the company such as the Internet group, which is responsible for Web site development, are likely to stay in Covington, as are Clear Channel's research arms, the Critical Mass Media group and Duncan's American Radio. Critical Mass Media is a division within Clear Channel and has its own staff. Duncan's has other owners besides Clear Channel, including President Jim Duncan and Emmis Communications, she said.

Hogan had not asked Covington's two senior vice presidents, Dave Crowl and Jay Meyers, who represent the Midwest and the Plains regions, respectively, to move.

"Staff-oriented folks will be affected by this," Taylor said.

Hogan's quieter management style is expected to have an effect on legislators, who have recently scrutinized Clear Channel's business practices.

"Someone like Hogan is going to make it much easier for Clear Channel to not be in the spotlight that often," said Boyle.

Michaels' colorful style drew negative attention to the company's practices — its use of independent promoters and concert promotion methods — and caught the ire of members of Congress this year.

Last spring, Sen. Russ Feingold, D-Wis., introduced a bill aimed at stopping large radio groups from accepting compensation from independent promoters in exchange for playing music on the air.

Rep. Howard Berman, D-Calif., asked the FCC and the Department of Justice to investigate some radio groups for anticompetitive practices.

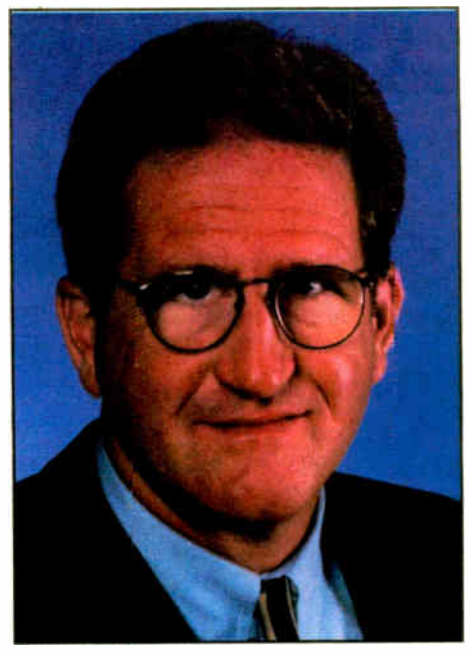
Boyle expects the legislative attention to stop now.

"I don't believe Feingold can get a committee hearing on his bill and I suspect the same thing from Berman."

Nevertheless, as Clear Channel faces merger reviews and fallout from the independent promotion issue, the company has made plans to open a Washington office to lobby the FCC and Congress.

Though he praised Michaels for his achievements, Hogan recently acknowledged that Michaels' flashy style was distracting for the company. He told Reuters in August that he plans to improve the radio groups' relationship with the record industry.

But Boyle thinks that Hogan and Michaels approach to handling hot-button issues such as the use of independent promoters and streaming audio compensation will not differ widely. Both leaders believe that radio stations shouldn't have to pay music royalties to stream audio and defend the use of independent promoters, he said.



John Hogan

In the early going, at least, Hogan seemed willing to stake a clear position on issues. Days after his promotion, for example, the radio group definitively refused to consider hiring shock jocks Opie and Anthony after they had been fired in the St. Patrick's Cathedral sex controversy.

DIGITAL NEWS

CPB Divvies Up Digital Dollars

WASHINGTON The Corporation for Public Broadcasting has decided how to allocate $45 million allocated by Congress to help noncommercial stations make the digital transition.

Of the total, radio gets $5 million to cover costs incurred in fiscal years 2001 and 2002.

One million dollars would go towards engineering development, conversion and testing of up to four public radio AM stations, to provide solutions for daytime and night-time AM operations and resolve potential AM signal propagation issues.

Earlier this year, CPB awarded digital conversion grants in excess of $12.5 million to 26 public television stations, and $2.5 million to the Public Broadcasting Service for the first phase of a new digital distribution traffic system.

"These recommendations are the result of months of intense effort to allocate limited funds to address the very different needs of radio and television public broadcasters," said CPB President/CEO Robert Coonrod.

"They represent an industry-wide consensus that recognizes the different timelines, technologies and costs of the television and radio conversions."

Following adoption an IBOC standard, which proponents expect later this year, $3.5 million would go to convert public radio stations in 13 seed markets. The seed markets are New York, Los Angeles, Chicago, San Francisco, Seattle, Miami, Boston, Dallas, Denver, Atlanta, Detroit, Las Vegas and Washington.

Playboy, Other New Channels Start on XM

WASHINGTON XM Satellite Radio has implemented programming changes based on subscriber comments and requests. New channels include folk, audio books, radio drama and more R&B and Hip Hop. A Christian music channel has also been added. A premium Playboy channel was also available beginning Sept. 3. Some programming was to be dropped to make way for the new programming, including an XM news channel and a club hits channel.

Some subscribers may have the presets on their XM radio set to one or more of the channels affected by these changes. A preset on an XM radio programmed to a channel that moved will still access that channel at its new location, according to the satcaster.

NAN Protests XM

CHEVY CHASE, Md. About 100 supporters of The Word Network protested near the Chevy Chase, Md., home of XM Satellite Radio President/CEO Hugh Panero in August. Police kept them off

See DIGITAL, page 7 ▶

World Radio History

Amber

▶ Continued from page 1

effect, with more statewide plans coming online yet this year, supporters say.

Amber, an acronym for America's Missing: Broadcast Emergency Response, was started by Dallas-area broadcasters after the abduction and murder of 9-year-old Amber Hagerman. It has been credited with saving 30 children.

'Feel-good' bills

Recent media publicity has put pressure on state broadcaster associations to implement child abduction alert plans, a person familiar with the Emergency Alert System said.

"Election year politics also is a factor as politicians move to enact 'feel-good legislation' before November," he said.

Lawmakers in Texas, North Dakota and Iowa passed legislation enacting statewide Amber Plans this summer.

Plan supporters got a boost earlier this year when the FCC amended the Emergency Alert System to include new event codes, including a Child Abduction Emergency. Previously, broadcasters had activated the Amber Plan as a Civil Emergency Message.

The FCC did not mandate the changes, leaving it up to broadcasters to update their EAS encoder/decoders to receive the code if they want to. However the FCC says new EAS equipment installed by broadcasters after Feb. 1, 2004, must be able to send and receive the new event codes.

Several major broadcast groups, including Clear Channel Communications, Entercom and Greater Media, have said they have begun phased upgrades of EAS equipment at their stations.

The majority of established Amber Plans use the EAS system as the alerting method, said Joann Donnellan, media director for the National Center for Missing and Exploited Children. Some plans, however, bypass the EAS system and call for law enforcement officials to contact broadcasters by phone, fax or pager.

EAS experts say broadcaster support of the EAS equipment upgrade process will be vital if local emergency planners are to avoid confusion when implementing Amber alerts.

"Sending alerts with the new child abduction emergency event code works in parts of the country, but not in others," said Al Kenyon, chair of the EAS National Advisory Committee and senior vice president of projects and technology for Clear Channel Radio.

"Software/firmware upgrades are available for about 80 percent of the EAS units in the field. We are doing all we can to encourage stations to make the conversion.

"Right now, if a station originates a child abduction emergency, stations downline that have not upgraded their equipment receive an unrecognized code message."

Police officers and children form a background for Michigan First Lady Michelle Engler as she discusses Amber.

Another principle problem, Kenyon said, is a "disconnect" between what politicians want broadcasters to deliver, and what stations can do in practice.

"We all want a system that works. Sometimes I think people in a rush get a little ahead of themselves," Kenyon said.

Mark Manuelian, president of the Primary Entry Point Advisory Committee for EAS, said expects a learning curve for broadcasters involved in Amber programs.

"Coordination is the key for any alert plan. You have a lot of people jumping on the bandwagon right now, and there is politics involved. But I think broadcasters will see the value to the program if you have strict guidelines in place and as long as it's not used every day," Manuelian said.

Bay State

Manuelian said Massachusetts is close to implementing a statewide Amber Plan.

"It will use the Emergency Alert System as the mechanism to distribute the information. The Massachusetts State Police will be equipped with encoders to originate the alerts for the primary stations across the state," he said.

California has issued several high-profile Amber alerts this year. California Governor Gray Davis signed a bill in August that took Amber protocols a step further.

Richard Rudman, formerly the EAS NAC chair and now a consultant on advanced warning systems with the California Broadcasters Association, said the new legislation means Amber alerts can now be used for abductions of people of any age with a mental or physical disability as well as in cases when a child disappears, police believe a crime has been committed and authorities believe the victim is in imminent danger of serious bodily injury or death.

"An abduction no longer needs to be witnessed in California for an Amber alert to be issued. Broadcasters are increasingly concerned about making sure events are properly qualified in trying to keep interruptions to a minimum," Rudman said.

Under the new plan, local law enforcement will contact the California Highway Patrol to ask for activations in a specified number of the 22 local EAS areas in the state, Rudman said.

"(California) is not at the point where a true statewide activation is possible in a practical way. A statewide Amber test in August resulted in some stations not receiving audio or EOMs," Rudman said, referring to end-of-message notations.

The state uses EAS and its Emergency Digital Information System to issue Amber information. EDIS is a combination Web site, newswire and 24-hour broadcast service used by state emergency managers to inform the news media about emergencies, Rudman said.

California has joined several other states in incorporating electronic highway billboards in its Amber plans. The billboards, typically used to disseminate traffic information to drivers, now alert the public of abducted children, displaying pertinent information about the child, abductor or suspected vehicle that drivers might look for on highways.

Rudman said California is trying to use every tool available to help fill information gaps and retrieve abducted children.

Another heavily populated state, New York, unveiled its statewide Amber system in early September. The Albany area rolled out its own regional plan in 2001, but other communities were brought online this summer, including New York City, said Dick Novik, vice president of the New York State Broadcasters Association, which is leading the statewide effort.

"Currently, only the Albany area is using EAS for Amber alerts. The statewide system will use faxes until a new statewide EAS system is completed by year's end," Novik said.

At least one state is reviewing its guidelines for issuing Amber alerts.

The Amber Alert Plan of Michigan was launched in May 2001 and has been activated 22 times, said Karole White, president of the Michigan Association of Broadcasters.

White said Michigan's plan is not EAS-based. Instead, broadcasters receive notices via fax directly from the Michigan State Police Amber Alert Hotline. Stations air the information every 15 minutes for the first three hours and as often as possible after that.

"We are worried at this point about the number of activations. Broadcasters are increasingly concerned that the overuse of the system will lessen the impact of the warnings," White said.

Real emergencies?

White said of the 22 Amber alert activations in Michigan so far, only six fit the criteria to warrant an alert.

"We are finding more activations for child endangerment and suspected abductions than is necessary, or practical. We think the wording we have in place is very clear. The abduction must be witnessed. Some of what has been airing belongs in the news, maybe, but not as part of an alert message," White said.

The potential for overuse of the Amber system is the exact reason broadcasters in the state did not want to use EAS for issuing alerts, White said.

White said the trade association would work against any effort by the FCC to mandate the use of EAS for Amber alerts.

"There has been talk of standardizing Amber programs across the country. I guess 'Which standard?' is the question. We are a little leery of what the legislation could look like," White said.

Meetings between broadcasters and the Michigan State Police are scheduled for this fall to fine-tune the system, which could include adding a voicemail and pager system to alert broadcasters, she said.

White said Amber was expected be a "hot topic" during meetings of the National Alliance of State Broadcaster Associations during the NAB Radio Show in Seattle.

U.S. Sens. Kay Bailey Hutchison, R-Texas, and Dianne Feinstein, D-Calif., introduced legislation to create a national Amber alert network — "The National Amber Alert Network Act of 2002." It passed unanimously this month.

Companion legislation was also introduced in the House.

NAB supports the bills.

See AMBER, page 7 ▶

DC Area Hopes to Avoid Amber Confusion

WASHINGTON The first Amber alert in Washington in mid-August triggered confusion among some broadcasters and had television stations running a crawl stating that an unspecified civil emergency warning had occurred.

WTOP(AM), the area's Primary Entry Point station, issued the Amber alert as a civil emergency message, which prompted several TV stations to run crawl messages of a vague civil emergency warning.

Jim Farley, vice president of news and programming for WTOP, said the alert on Aug. 15 was for a missing 9-year-old girl from Henry County, Va.

"It was probably a borderline call whether we should have initiated the alert. Our biggest mistake was not waiting until all of the information was on the Amber Web site for stations to access the information. That led to some confusion," Farley said.

A positive result was that flaws in the system were detected and corrected, he said.

"It was discovered that one of the television stations could not receive our audio. We have since buttoned up the system and feel confidant future Amber alerts will go smoothly," he said.

He said the local Amber Plan Task Force has since met and recommended further testing of the system to ensure its appropriate use.

The circumstances surrounding the August activation were compelling, Farley said. The young girl was reported missing after her parents were found shot to death in their Bassett, Va., home.

"We have protocol in place. The abduction typically must be witnessed and a vehicle and suspect description are certainly helpful. We erred on the side of angels in this case. So be it," Farley said.

Washington's year-old Amber system is a cooperative effort by the Metropolitan Washington Council of Governments and local TV and radio stations.

— by Randy J. Stine

World Radio History

Amber

▶ Continued from page 6

"Broadcasters are uniquely positioned to disseminate information rapidly to an entire community. No other industry is capable of broadcasters' reach in conveying this information," stated Eddie Fritts, NAB president/CEO, in testimony before the Senate subcommittee on Technology, Terrorism and Government Information. "Consider this: while driving in their vehicles, as many as 95 percent of adult motorists listen to their local radio stations."

NAB and the Department of Justice developed an Amber kit that was distributed to law enforcement units and stations in 2001. Fritts said that when the effort began last fall, 27 Amber plans were in place. Now, 55 communities, states and regions have adopted Amber plans and more are expected by year's end.

Child safety also is on the agenda at the White House, where President Bush plans to hold a summit in early October to address child abductions and kidnappings.

"The aim of a nationwide Amber Alert Plan is to define a uniform system so that states can honor each other's alerts," Donnellan said. "The intent would not be to have a single alert cover the entire country. Everything would still be done on a regional or state basis."

Donnellan said the National Center for Missing and Exploited Children does not believe Amber is being overused at this point.

"Is there the potential for overuse? Yes, but we will continue to review the process to try and ensure that it doesn't happen."

Boston Station Airs False Alert

BOSTON A newscast by WBZ(AM) in Boston triggered an inadvertent EAS civil emergency message when a reporter used an Amber alert tone as part of the report.

The reporter used an aircheck of an actual Amber alert broadcast issued in another market, said Mark Manuelian, engineering manager for the Infinity station. He declined to identify the journalist.

"The reporter wanted some natural sound for her report and got a recording of the message from a sister station in another state. Unfortunately, it activated EAS boxes at some of the stations who monitor WBZ, the area's LP1 station," Manuelian said.

The report aired in mid-August and contained the encoded alert, which included outdated time codes and invalid county codes in the header, he said.

"I had two calls from stations who received the message. To my knowledge, no station actually forwarded the information."

Manuelian, who also serves as the president of the Primary Entry Point Advisory Committee, said it was unclear how many stations aired the civil emergency message.

"The tone was buried under other audio, so I believe most stations' EAS equipment did not decode it," he said.

"I think this a good reminder for newscasters not to use actual EAS tones in news programming."

— by Randy J. Stine

Digital

▶ Continued from page 5

the property, according to The Washington Times.

The group is led by the National Action Network, headed by the Rev. Al Sharpton. Its members want XM to carry an audio feed from The Word, a religious TV network. The group was irked that XM added a premium channel, Playboy Radio.

NAN previously protested outside XM's headquarters and said XM doesn't carry enough urban programming. XM says it carries several programs aimed at the African-American audience, including channels from Radio One, BET and WorldSpace.

Global Outlines Euro Plans

LUXEMBOURG Global Radio S.A., developing satellite digital radio for Europe, is collaborating with Dalet a.n.n. to design digital audio infrastructure for Global Radio's broadcasting facility in Luxembourg and operational by 2005. Dalet developed a similar system for XM Satellite Radio.

The Global Radio system likely will encompass live studio, live-assist and automated capabilities, as well as multilingual programming, a variety of data applications, editing, commercial insertion, security and resource management, and cost-tracking.

Global expects to offer Europeans 70 to 140 channels of subscription-based satellite-delivered digital audio radio. It recently signed Delphi to develop compatible digital car radios.

DAB Developments In Germany, Taiwan

In the German state of Hessen, three new transmitters have been turned on, improving coverage to three towns, including Frankfurt. Hessen now has just under 80 percent digital radio coverage, according to the World DAB Forum.

Separately, in Taiwan, GyroSignal demonstrated a digital radio with Chinese characters displayed on the front. These radios were expected to be available soon to retailers.

— Leslie Stimson

All the world's your studio!

Good Day USA's Doug Stephan broadcasts from anywhere — with Comrex.

"I've owned most of the Comrex products on this shirt, including the Matrix, which I use to broadcast from my favorite studio — my farm."

Doug Stephan, Host, Good Day USA.

From London to LA, from Moscow to his Massachusetts farm, talk show host Doug Stephan never goes anywhere without his Comrex codec. "Since my first STLX in 1986, I've relied on Comrex equipment to deliver high-quality broadcasts from my local studios and remote sites worldwide."

A constant traveler, Doug and his morning show co-hosts are rarely in the same state, let alone the same studio. Using Comrex equipment they can broadcast from any spot on the planet and sound like they're all sitting together. With Comrex in your lineup, broadcast from anywhere and sound great everywhere. You can bet the farm on it.

BLUEBOX

MATRIX

VECTOR

NEXUS

Let Comrex help you broadcast from anywhere. And we'll give you the shirt off our back.

Mail us the warranty card from the purchase of your next Blue Box, Matrix, Vector or Nexus. We'll send you a handsome Comrex shirt like the one Doug is wearing (retail value $65) FREE. Plus, we'll extend your warranty to two years. Act now. No matter where you are.

For a dealer call 800-237-1776 or visit www.comrex.com

COMREX 19 Pine Road, Devens, MA 01432 USA
Tel: 978-784-1776 • Fax: 978-784-1717 • Email: info@comrex.com

World Radio History

3G

▶ Continued from page 3

wireless operators are still converting their analog cellular systems to digital in order to trickle out voice communications in streams of 14.4 kbps, or less. Some are adding next-generation 3G technology to their existing networks, such as 1XRTT or General Packet Radio Service for 144 kbps and 115 kbps respectively.

But, bit for bit, phone calls remain the better return on spectrum spent, so call services continue to take up any bit gains the carrier realizes. That's not likely to change anytime soon.

"Most of the carriers are constrained on spectrum for simple voice capacity," said Doherty.

Carving out new spectrum for 3G services may help jumpstart wireless Webcasting in this country, but available frequencies are hard to come by. The cell-phone industry asked the FCC for an additional 200 MHz of spectrum to run the 100 kbps and up data rates capable of 3G. The FCC delivered on 90 MHz of that with its recent allocation.

Carving out new bandwidth for 3G services may help jumpstart wireless Webcasting in this country, but available frequencies are hard to come by.

"In the future, as events warrant, the commission will consider making additional spectrum available for wireless services," stated FCC Chairman Michael Powell of the spectrum allocation decision.

The NAB was reviewing the action and had no immediate comment.

Finding another 110 MHz won't be easy, however. Had carriers not already used the 1.8 to 2 GHz band for PCS mobile phone services a few years ago, they may have been able to set up 3G here, as their European counterparts did. Carriers have all but given up hope on the 1755-1770 MHz band as well because new communication demands made on the Department of Defense now occupying the spectrum take this band out of consideration entirely, according to an FCC source.

Moving incumbents

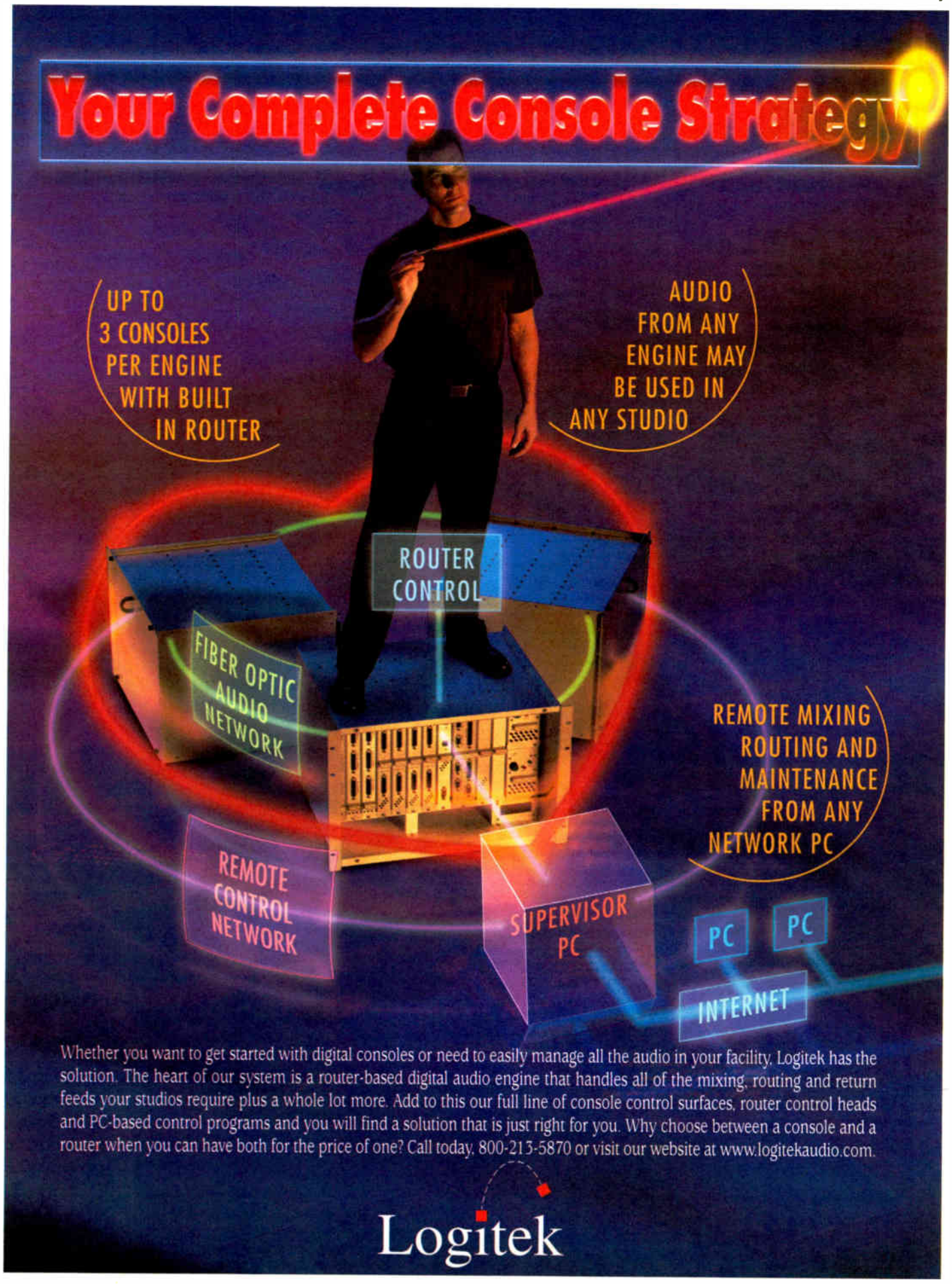
About the only other real estate left with any real potential is the 700 MHz band.

The FCC said it is reviewing this band for 3G purposes; but after calling off two previous auction dates, the commission appears reluctant to set a new auction date. Incumbent issues are at the heart of the on-again, off-again waffling, according to an FCC source. He said the 700 MHz band is used by UHF TV Channels 60 through 69 and probably won't be available until 85 percent of the market population has the ability to receive HDTV, at that time UHF stations may be ready to give up their analog channels to 3G operators.

Even if spectrum is cleared for 3G, carriers still need the capital to get it — which could be the scarcer commodity of the two. Europe auctioned off spectrum for 3G a few years ago for $34 billion, about five times the amount originally expected. U.S. spectrum for 3G isn't expected to draw in the same kind of money because 3G expectations aren't as rich today as months previous, but it will go for "market value," according to an FCC spokesman.

Once spectrum is acquired and paid for, carriers will need more capital to build it out into the high-speed networks they can run audio, and eventually, video over.

The underlying issue: "3G is going to cost more to build that the current generation and the question is, 'Who's going to pay for it?'" asked one broadcaster.



Comrex Buys Former Gentner Line

Comrex Corp. has agreed to buy the digital hybrid product line of ClearOne Communications Inc. The products involved are the DH20, DH22 and DH30.

Comrex also becomes distributor for the TS612 phone system line, which will be made by ClearOne for another year, after which Comrex will take it over.

With this move, ClearOne sells off the remainder of the former Gentner product line upon which the company once was based.

"This sale streamlines ClearOne's focus on the conferencing market by eliminating the non-core broadcast product line and enabling the re-allocation of key human and capital resources to its conferencing products business," ClearOne stated.

Comrex said digital hybrids are a "natural addition."

"Since telephony has been our field for over 40 years, it is regularly assumed that Comrex makes telephone hybrids. With the industry already perceiving us as manufacturing these products, it was a logical decision to adopt this line," said President Lynn Distler.

World Radio History

What flamethrowers use for fuel.

You're scanning the AM dial. Everything sounds harsh, bland, weak. Then you find it: an amazing sounding AM station. Loud, smooth, dynamic, exciting. You glance at your radio to make sure you didn't switch bands. This is AM?

Meet the first digital processor designed especially for AM stations who want to breathe fire. Omnia 4.5AM. We held nothing back – this is the world's best AM processor. Of course it has all the latest bells and whistles: advanced DSP chips, bright color display, Ethernet and modem connections, PCMCIA expansion slots, and powerful remote control software. But the real breakthrough is the sound.

Our algorithm designers spent countless hours studying the great AM stations, listening and learning. We found that the very best sounding stations were using highly tuned, customized analog processors. Then we set out to reproduce the best analog had to offer. But because we were working in an all digital environment, we had vastly improved precision and flexibility than could ever be achieved in analog. The result is, well, breathtaking.

Talk is clean and clear. Bumpers and ID's have more definition. Callers punch through with force. And music jumps off the dial. Everything sparkles. The stations who have tried the new Omnia won't give it back! Some have even told us their coverage has improved.

Omnia for AM. Fire it up and you'll know why Omnia is the hottest selling radio processor in the world today. Scorch the competition.

Omnia
A Telos Company

o m n i a a u d i o . c o m

© 2002 TLS Corporation. All rights reserved. Omnia, the Omnia logo and Telos are registered trademarks of TLS Corporation.

World Radio History

Workbench

Radio World, September 25, 2002

Past columns are archived at *www.rwonline.com/reference-room*

He Found the Fix in the Drawer

by John Bisset

In this era of consolidation, things are done a little differently.

Instead of one satellite receiver, there may be several, each feeding the same or different stations with specialized programming. One of the challenges of today's broadcast engineer is to control multiple-station automation systems with a single relay on the back of a StarGuide II or III receiver. If you parallel all the automation systems across the single StarGuide relay, events will be fired on all the stations, even if you aren't running that specific satellite event on all the stations.

This was the problem facing Jeff Caudell, market engineer for Clear Channel's Harrisonburg, Va., cluster. Simply put, Jeff needed a way to provide isolated multiple pairs of contacts for each automation system.

One certainly can buy a box that will tackle the problem. But in rummaging through his parts drawers, Jeff found a bag full of SK2086 dual transistor opto-isolator chips. A quick trip to Radio Shack provided a couple of proto-boards, and the construction began.

Jeff's plan was to provide four contact pairs for each relay contact pair on the StarGuide. Because the SK2086 provided two opto-isolators per chip, each of the four input LEDs are paralleled together and tied to the relay contact pair on the StarGuide. A single 100-ohm current limiting resistor was calculated.

This calculation isn't difficult. Look at the voltage drop across the LED and use the resistor to limit the current. You'll need the nominal current to light the LED for the supply voltage used. Then calculate the current through resistor "x" to drop the remainder of the supply voltage. (Esupply – Ediode drop = Eresistor drop, where E is the voltage.)

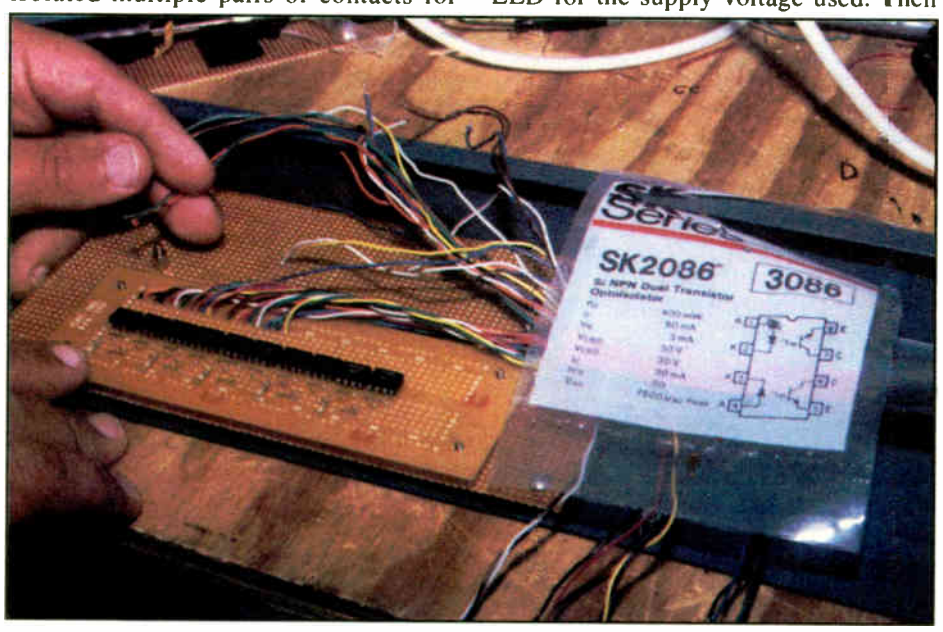


Fig. 1: Jeff Caudell solves a problem using parts on hand.

To get the resistor value, divide the Eresistor drop by the nominal diode current. When making this calculation, though, remember that you are lighting four diodes, so the total current is four times the nominal calculated value.

Once you have the resistor value from the above formula, use I^2R = Power to determine the proper resistor wattage. Jeff experimented with the current limiting resistor, and though the nominal current was 10 mA, he chose 7.5 mA. The lower current draw keeps the size of the wall-wart powering the circuit small.

On the control side of the opto-isolator, tie the emitters to the ground for each system, and connect each of the collectors to the command line for the respective station. The emitter grounds only come live when that particular source is on, so unless that source is selected by the automation system, it won't fire.

Another way to explain the operation of the circuit is that two events must occur for the automation to fire. First, the automation must switch the ground "on," and then the relay closure must occur to fire the event. By isolating each automation system, multiple firing is eliminated.

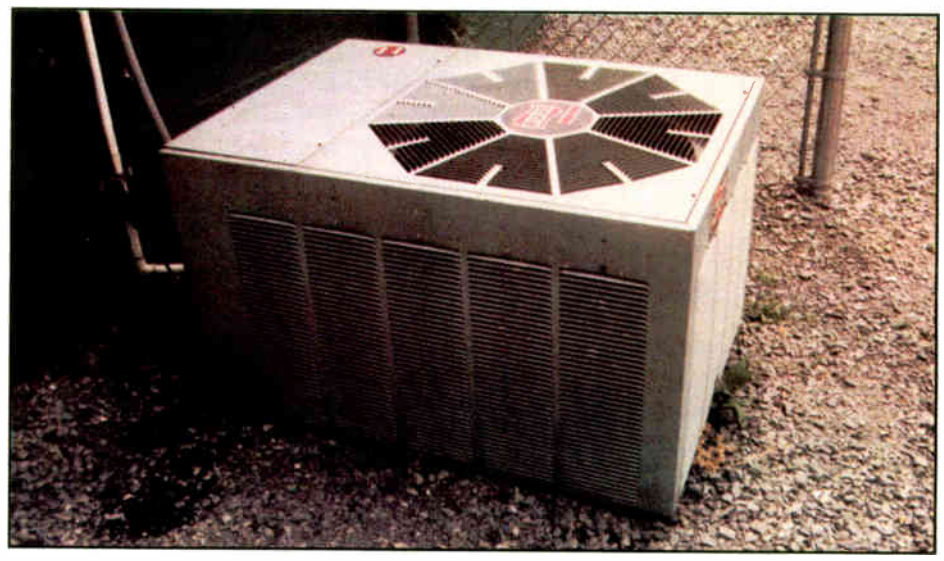


Fig. 2: Clean Machine: Crushed gravel around the perimeter of your building discourages tenacious weeds and unwelcome pests.

Jeff's circuit could be revised to use multiple relays, but keep in mind, he used parts already on hand; and relays are usually much more expensive than opto-isolator chips. The big saving here is the project was completed with parts on hand. Fig. 1 shows the project in process.

The chassis was from an old Broadcast Tools device. Jeff chose the perf-board and the proto-boards to make assembly and troubleshooting easier. The chassis rack has enough room for a second control board if it's needed in the future. The screw-spacers that keep the boards spaced above the chassis are from

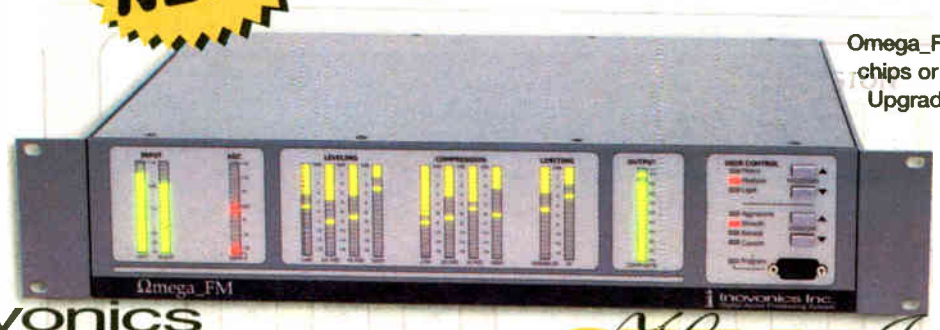
See WORKBENCH, page 20 ▶

Digitally Different

Ωmega_FM – $5880

NEW!

OUR GOAL WAS TO DEVELOP A DIGITAL PROCESSING SYSTEM FOR FM THAT WOULD RIVAL ANYTHING ON THE MARKET. WE MET THAT GOAL...AND THEN SOME.



Omega_FM is a 100%-digital, software-based design. It doesn't use DSP chips or other application-specific parts that rapidly become obsolete. Upgrades don't plug into 'expansion slots,' they're simply uploaded.

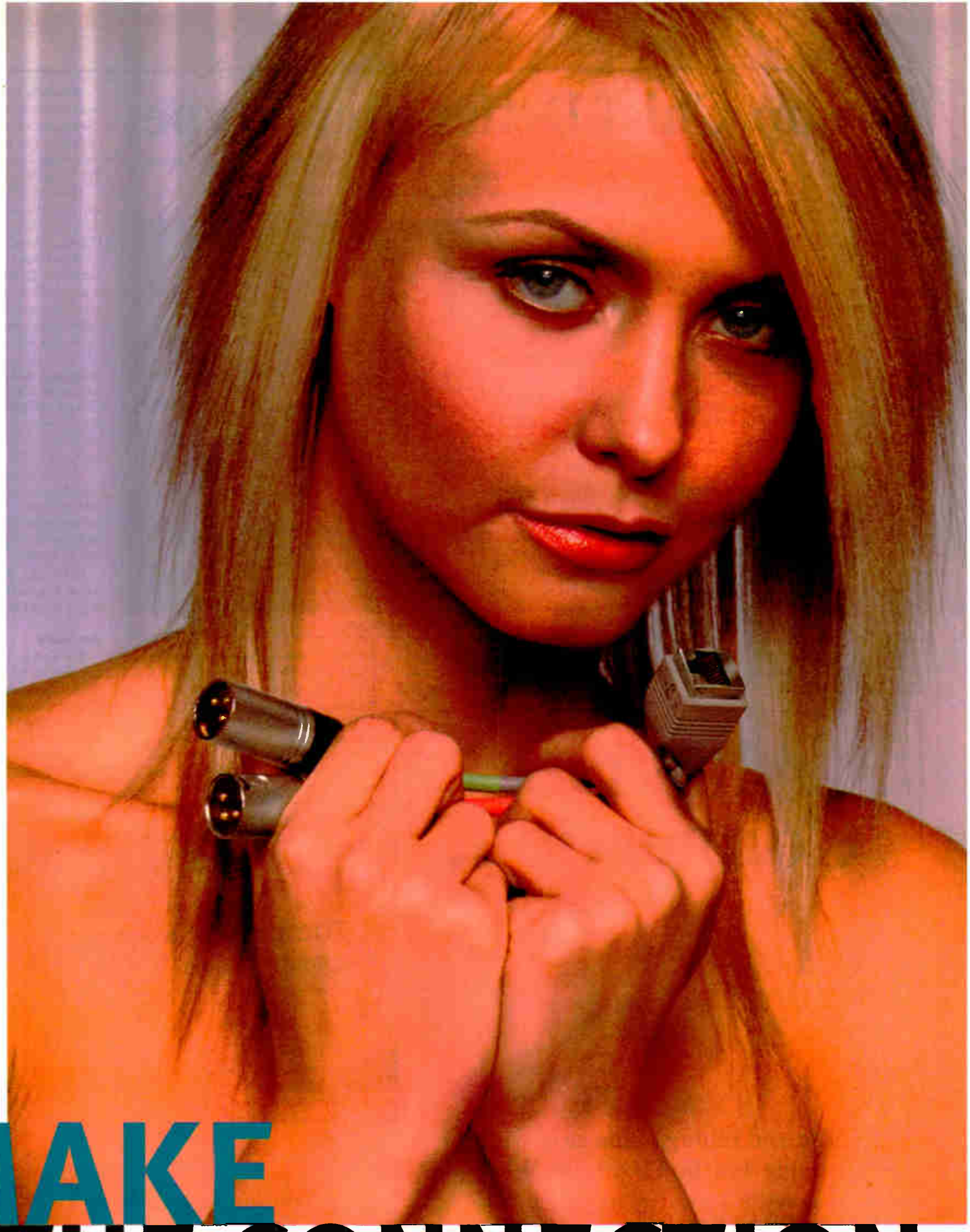
Omega_FM is straightforward and uncomplicated. Hardware simplicity keeps the signal path short and your audio clean. Low latency lets you monitor off-air.

Omega_FM is loud, clean and versatile. We don't expect you to take our word for this, and you shouldn't. Schedule a demo at your station through an equipment supplier of your choice.

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

SEE IT Hear It... *Processing doesn't get any better than this.*

World Radio History



MAKE THE CONNECTION

Do you StudioHub? It's the perfect liaison between analog and digital. If you're building a new facility or just rewiring a single studio, consider using StudioHub – the fast and flexible new universal connection standard.

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

BY Radio Systems StudioHub

World Radio History

Group Chief Defies Stereotype

by Ken R.

A stereotype persists in the minds of many industry people about today's radio engineer.

There he sits, the grizzled, silver-haired veteran in a cramped room in the back of the station, rewiring some sort of old motor, grumbling about the good old days of tubes and how great things were before all these new-fangled digital devices.

Typical comment: "Never had a spec a' trouble with those old Ampex decks."

Today's engineer is far more likely to be found installing a server than fixing a tape deck. But the image of the cranky old engineer lingers.

That was then

Meet Aaron Winski, director of engineering for WPW Broadcasting. He is based in Monmouth, Ill., and oversees 18 stations. He is 25 years old.

Like many in the engineering profession, he started as an amateur radio operator in his early teens.

"After I graduated high school, I worked at a couple of local two-way radio shops and did some installs," he said. "I was also a part-time disk jockey and did a lot of maintenance, like cleaning cart machines."

He was working for WMOI(FM) and WRAM(AM) in Monmouth, when they were purchased on Jan. 1, 1998, by WPW Broadcasting.

Aaron Winski

"CEO David Madison brought up in a meeting that we needed an engineer so I began fixing mic cables, then doing more computer and transmitter work and maintenance too," Winski said.

"I went back to school that spring, on April 6, 1998. I remember the date because it was the day we got inspected by the FCC. They walked in the door as I was walking out, bound for Hamilton Technical College in Davenport, Iowa."

For two years, Winski went to school four nights a week yet awoke at 4 a.m. to serve as news director on the radio. As the group acquired more stations, he would travel to nearby properties and help out there, too. While this was going on he became a father.

"I don't think any of this would have been possible without the support of my wife Dara," he said.

"I literally deal with everything from IT work to plumbing to carpentry," he said. "Sometimes it makes for some long weekends, but I'm learning quickly. The first transmitter I installed took me three days. The fifth one took me just four hours."

Many people in the industry have a mentor; Winski is no exception. His is Andy Andresen, chief engineer for Cumulus Broadcasting for the Quad Cities.

"I met him right after I started going to Hamilton Tech because I was looking for a job as an intern," said Winski. "After I told him everything I could do, he told me I didn't have time to be an intern. We still cover for each other during vacations. This gives me even more diversity, because in addition to all our equipment, I have to be familiar with his group's, too."

And like other engineers, Winski has his favorite gear. He favors Broadcast Electronics AM solid-state transmitters such as the AM-1A and AM-500.

"I'm also a fan of Sine Systems remote controls and the Optimod 9200 AM processor," he said. "When it comes to automation and studio equipment, I like the BE AudioVault Express and the Harris AirWave 12 analog console."

For laughs, Winski hands station interns a note to go to Radio Shack and pick up a bag of BA 1100 NS. Think about it.

Attitude

Speaking of equipment, Winski received an emergency call one day from one of his properties in Rushville, Ill., saying the station was off the air. He drove an hour, met the general manager at the tower site and gave everything a good once-over. He couldn't find any obvious problems until he opened the back door to the BE FM-10A power supply.

"A snake had crawled through the high-voltage interlock and got cooked," he said. "I broke off the handle of a broom and wedged it between the opposite wall of the transmitter and the manual throw on the contactor, which worked great for a few days until I got a new contactor."

The people who know (RF) well are retiring or dying. This is a great field for me.

— Aaron Winski

He received his bachelor of science in electrical engineering technology in May of 2000. By that time, WPW Broadcasting had grown to 17 stations and Winski was overseeing all of them while still going to school.

"I was pretty tired and was traveling from Quincy, Ill., to Whitewater, Wis., to keep these things going, plus dealing with lightning strikes, new automation systems and tower work," Winski said. "We don't have any other contract engineers, and I'm still doing it all. If I get everything done, I try to sneak home to see my family a little early on Friday afternoons."

'Great field'

With the lure of the computer industry, why did Winski choose the world of studios and transmitters?

"I think probably because of my amateur-radio background. And one more thing I noticed," Winski said, "there are very few schools left with a good RF program, and the people who know it well are retiring or dying. This is a great field for me."

Winski still is involved with computers — and lots of other things.

David Madison, Winski's boss, said his engineer's attitude, hard work and dedication make a difference.

"He helped me build this group, and engineers like that are hard to find," said Madison. "We're still buying stations, doing upgrades; and believe me, whatever Aaron needs, we'll give him lots of support. He had a 4.0 average in school while he was attending nights and working for us during the day."

Madison praised Winski's attention to detail and organization.

"I've worked with a lot of people. I can say that Winski really helps our bottom line by overseeing corporate budgets, too."

"You have to eat, sleep and breathe radio to do it," Winski said. "How many people do you know who really enjoy going to work every day like I do? I love the challenge.

"My wife hates it when my pager goes off at midnight and I have to run to fix a transmitter, but deep down I'm ready to go and lick the problem. It's just who I am."

Alleviate Congestion.

Traffic and billing made easy with the affordable Traffic C.O.P. for Windows™

Take the headache out of controlling traffic. The Traffic C.O.P. for Windows can alleviate and automate all those troublesome tasks. Whether it's scheduling logs, printing invoices, or managing receivables, the Traffic C.O.P. will work for you. And, because it's Windows based traffic software, you get a modern, reliable and easy to use program—all backed by the superior customer support of Broadcast Data Consultants.

Call for your FREE CD demo today,
or for more information, please visit our web-site.
Isn't it time you got rid of congestion?

Toll Free: 800-275-6204
www.broadcastdata.com

TRAFFIC C.O.P.™
FOR WINDOWS

Broadcast Data Consultants, 51 South Main Ave., Suite 312, Clearwater, FL 33765

World Radio History

Instant gratification.

Pots only?

You can't always get ISDN at your remote. The new Zephyr Xport connects to ordinary analog (POTS) phone lines in the field and connects with your Zephyr Xstream back at the studio. Rock-solid connection reliability, built-in mixer and monitor sweetening by Omnia, Ethernet for a convenient audio connection to your laptop, and more. Updating your Zephyr Xstream to work with Xport is a simple (and free) software update. And an ISDN option ensures that you're ready for anything on your remotes.

Breathtaking audio quality takes POTS codec performance to a new level.

Immediacy is the nature of radio. Remotes, special broadcasts, breaking news... all must be delivered on time, on demand, with no excuses – and no delay.

That's where Low-Delay MPEG AAC comes in. It is the absolute state-of-the-art in coding technology, maintaining studio-quality audio while shrinking delay by as much as 70% compared to Layer 3. And Zephyr Xstream is the first broadcast codec to offer it.

Zephyr Xstream has what is takes to make remotes smooth and trouble-free – like complete Web-based remote control and a graphic user interface so simple and intuitive even an intern can use it. Portable models include a four-input stereo mixer with smooth, effective DSP audio processing by Omnia and easy to use local + mix-minus monitoring capability. The Ethernet port prepares you for IP-based connections.

With many thousands of Zephyrs installed around the world, you can count on your new Zephyr Xstream to be The Best Way To Hear From There.

Telos

telos-systems.com

© 2005 TLS Corporation. All rights reserved. Telos, Zephyr, Zephyr Xport, Zephyr Xstream, Hear From There and the Telos logo are registered trademarks of TLS Corporation. All other trademarks are the property of their respective holders. All rights reserved.

World Radio History

The Bar Continues to Move Higher

The Ear Is a Stern Judge of Quality, and Radio Must Measure Up as It Makes Technical Decisions

by Skip Pizzi

In the world of electronic media, the two primary content types are audio and video. A commonly heard argument holds that in the digital environment, the differences between these two media is narrowing, since they can each be represented by digital signals, and transmitted interchangeably on an appropriate channel.

"Bits is bits," the saying goes; and the fact is that a digital channel cares little whether a signal it passes is audio, video or text, for that matter. As long as a decoder at the receiving end can make sense of the bit stream, the signal can be successfully passed.

In practical terms, however, a much heftier bit stream is required to represent real-time transmission of video than audio. For example, "broadcast-quality," standard-definition video (uncompressed) generally is considered to require 270 Mbps, while a CD-quality stereo audio signal requires only about 1.5 Mbps.

Thus, not much has changed from the analog days, when a video signal's bandwidth of 3 MHz or more dwarfed the 15 or 20 kHz required by audio. Add to these physical differences the larger crews required to shoot video — lighting, makeup, camera operators, camera control, video switching and tape operator personnel vs. the audio crew of a single mix engineer, plus one or two stage/microphone techs when necessary and/or occasionally a separate tape operator.

The general impression that audio plays a substantially secondary role is confirmed. This is reflected in the pay-scale and advertising-rate differentials between radio and television, as well. (Of course, to be fair, television includes both audio *and* video, but the video component always demands the lion's share of budgets and attention.)

A perceptible difference

The second-class citizenship of audio is not shared where it counts, however: in the human brain. There the perceptual and cognitive processes applied to sound are at least equivalent to those applied to light; and many experts contend that human aural perception is substantially more sophisticated than its visual counterpart.

While this may be hard to accept by those attuned to the electronic media industry, there are plenty of examples to bear out the premise, as follow.

First, consider frequency response. The human hearing sense extends across 10 "octaves," i.e., 10 doublings of frequency, while human vision barely ekes out a single doubling of frequency perception. While the absolute range in Hertz between the red and violet ends of the visible light spectrum may extend across a wider numerical zone, the wavelength difference between extremes is less than 2:1 for vision, while human hearing handles a 10:1 wavelength range with aplomb.

Consider that this implies a sensory perception managing longitudinal waves (i.e., disturbances in the medium of air that surrounds us) ranging from around 50 feet in wavelength down to a fraction of an inch. The physical behavior of the waves at the low end of the audio spectrum is completely different from that at the high end; for example, reflection, absorption and diffraction effects are markedly dissimilar at 100 Hz vs. 10 kHz. Yet a single sensory organ manages the electromechanical coupling process in an equivalent fashion across this vast range.

Not only are the frequencies themselves sensed, but an amazing amount of intelligence can be gleaned from subtle variations in these signals (consider speech or music). Such is the power of the cognitive processes associated with aural perception.

Another amazing parameter is the dynamic range of human hearing. Again, unlike vision, which has a fairly limited range of perception from dark to light, human hearing can manage a dynamic range of about 120 dB, which corresponds to about 40 doublings of intensity (sound power) from quietest to loudest perceptible sounds. To grasp the majesty of this achievement, consider that the displacement of the eardrum at the quiet end of human hearing is approximately equivalent to 1/10 the diameter of a Helium atom.

Small packages

Another amazing factor is the directional resolution of human sound perception. While sight is limited to the so-called binocular field of vision (an essentially oval-shaped region in the direction a person is facing), human hearing can detect a full 360 degrees in three dimensions with remarkable precision in localization of a sound's direction of origin, almost without regard to the direction in which the listener is facing.

The human ear is in itself a marvel.

See JUDGMENT, page 16 ▶

The Big Picture

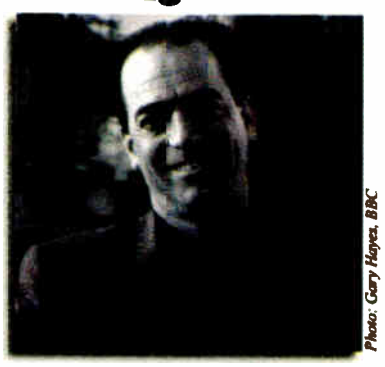


Photo: Gary Hayes, BBC

by Skip Pizzi

WIRED FOR SOUND

Dipping Into the History of Wire

by Steve Lampen

We left our Sept. 1 column talking about VGA (video graphics), S-VGA (super video graphics) and RGB cables, variations of multiple coaxes for supporting analog or digital monitors. (S-VGA cables include pairs for other uses.)

If you're just shipping around VGA signals, such as those used by your computer monitor, you might be tempted to use the same old RGBHV cable you used for those analog video monitors. Most of the time that cable would probably work just fine, especially if the cable is short.

The problem is how the cable is tested. Most RGB cable is tested out to 10 MHz or maybe 25 MHz. VGA and S-VGA applications run much higher sweep frequencies, sometimes out to 400 MHz or more. What are those RGB cables doing at those frequencies?

They weren't tested that high, so you don't really know. Maybe they're fine, maybe not.

Of course, there could be a serious "suck out" at some critical high frequency. This will severely limit the distance such a signal can go down the cable.

So if you are running VGA or S-VGA, use cable that has been tested to an appropriate high frequency. There are multi-coax cables available on the market tested out to 3 GHz, so any sweep frequency below that should be no problem.

There are a number of other similar applications. One is XVGA, extended video graphics, with even higher sweep frequencies. Another is DVI, digital video interface. This is a standard supported by the Digital Display Working Group (www.ddwg.net). This is an open industry group supported by a number of manufacturers such as Intel, Compaq, Fujitsu, Hewlett-Packard, IBM, NEC and Silicon Image.

This cable handles the huge data rate of plasma monitors (1,280 x 1,920 pixels). I'll be honest; despite many requests to the working group and its members, I'm still not certain what is inside the cable, although a number of knowledgeable people have told me that it is all twisted pairs. If true, this explains why these cables are short, three feet or even less, because twisted pairs are not the best choice at these high data rates and bandwidths.

If you know more about DVI, XVGA or any other emerging standard, let me know. I would love to learn more and share it with the madding crowd.

Changing gears

Now, it's time to take your milk and cookies and find a comfortable seat. Grandpa Steve is going on one of his extended reveries to tell you the History of Wire and Cable. Our story will take us over several articles.

The History of Wire and Cable, Part 1: Our story starts a long, long time ago — 5,300 years ago, to be precise. This concerns Otzi, the iceman. Unfortunately, he is dead. He has been dead for a very long time. He is the "iceman" dug up in 1991 in the Otzal Alps on the Austrian/Italian border

Do you know they now believe he was murdered? Researchers found an arrowhead in his shoulder. That probably means he met some bad people in his village over the mountain and was trying to run away. He only got so far until he collapsed. And that was that.

Except for one very interesting thing he was carrying with him, a copper axe. Anyone who plays with copper, as we wire jockeys do, knows that it is a soft metal and makes a very poor axe. But this axe was never used. It is in pristine condition. Metallurgical testing has shown that this copper was 99.7 percent pure, a purity that was only surpassed in the late 1800s. And this gentleman was carrying his axe 5,300 years ago, a full millennium before they had thought the first copper was refined.

So, it occurred to me that there is a good possibility that this axe was a sample, and Otzi was the world's first copper salesman!

I even sent this suggestion to the researchers working on Otzi. For some reason, I never got a reply.

The First Jewelry Scam, 200 BCE: Fast-forward 3,000 years, to around 200 BCE. On the shores of the Caspian Sea lived a culture called the Parthians. They were an aggressive group, always attacking their neighbors. So it's a bit unusual, and still a bit controversial, that they were the people who apparently invented wire — that is, wire that carried electricity. Unfortunately, there is no wire left. But they must have had wire to plate jewelry.

To plate something, to deposit a molecular layer of metal over another, requires a couple of things.

First, you need a metal object to be plated. Then you need a piece of the metal you wish to deposit (often gold, as in this case). The object and the plating metal must be attached to two wires and suspended in an electrolyte (grape juice is suspected).

Then you need to attach the wires to a battery. This is the key. In 1938, archaeologist Wilhem Konig found a series of buried earthenware vessels. They contained remnants of a cylinder of copper and, inside that, a rod of iron. Fill this with grape juice — lemon juice or any acid would also work — and you have an efficient 2-volt battery. Koenig found these in rows, as if they were wired in series.

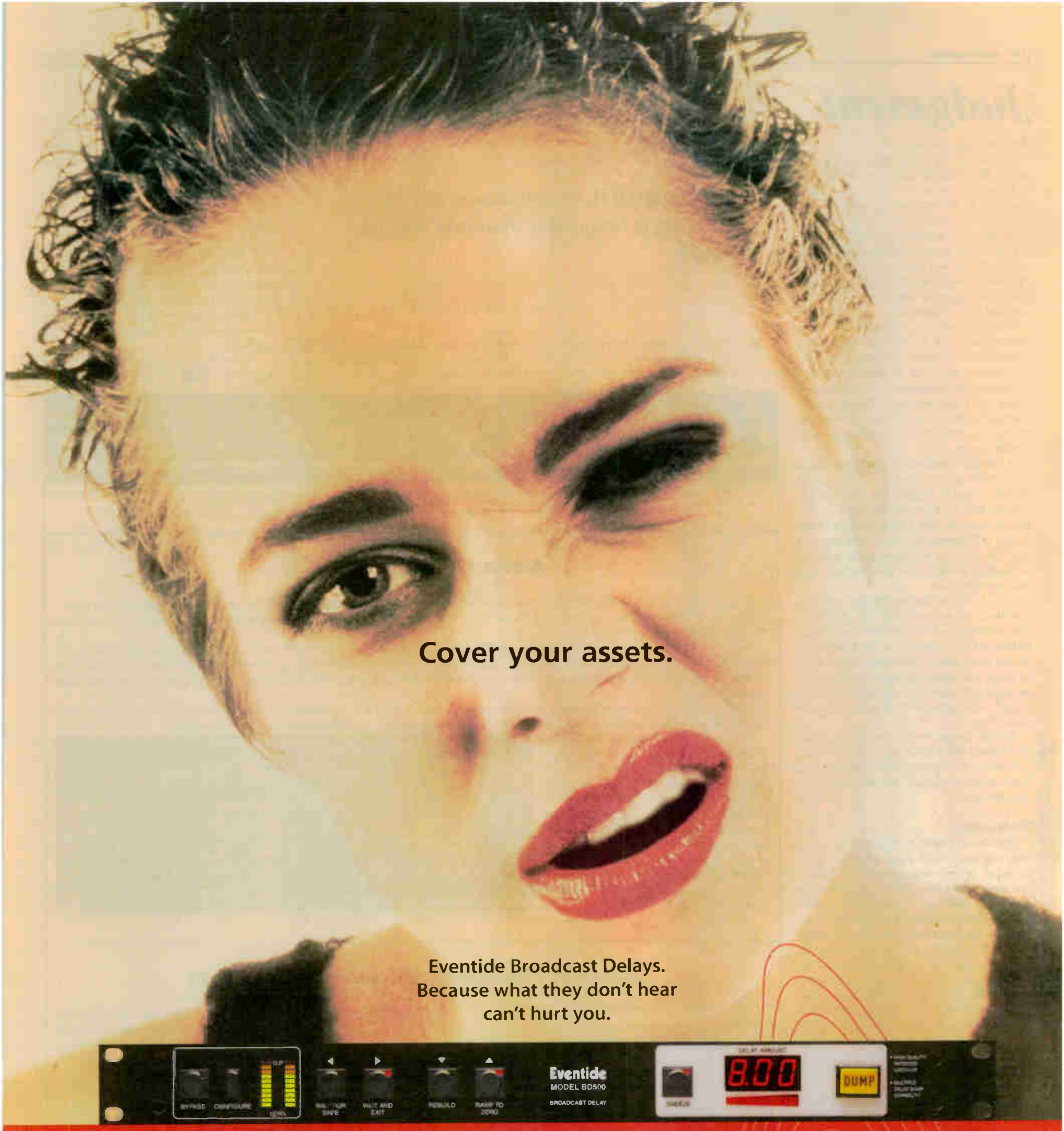
There are many plated objects from the Parthian culture. These are possibly the earliest scam, selling plated object as if they were solid gold. While there is an alternative chemical way to plate objects, using a battery is a lot simpler. And you can't run a battery without wires. So the Parthians must have had wire.

Now, children, we can only imagine where we would be today if we had not lost this ancient knowledge. Maybe I would be writing this column on Mars, or maybe on a space station, instead of just an airport, where I am at the moment.

This is not the only ancient knowledge that we have lost. In the next few columns, we will look at technology that was resisted or even suppressed. And we will talk about a few instances in which knowledge had to be rethought. Don't miss a single exciting episode!

Steve Lampen's latest book "The Audio-Video Cable Installers Pocket Guide" is published by McGraw-Hill. Reach him at shlampen@aol.com.

World Radio History


Cover your assets.
Eventide Broadcast Delays.
Because what they don't hear
can't hurt you.

Some people call it speaking their mind. But when the FCC hears, it's called trouble.

Fortunately, Eventide® invented the obscenity delay. Today, the BD500 Broadcast Delay can delete obscenities multiple times while our patented catch-up gains back your delay. And the even more affordable BD960 provides up to eight seconds of delay with AutoFill™. Eventide Broadcast Delays. We can keep you out of trouble…and more importantly, on the air.

Eventide
BROADCAST DIVISION

www.eventide.com • 201.641.1200

Eventide is a registered trademark and AutoFill is a trademark of Eventide Inc. © 2002 Eventide Inc.

World Radio History

Judgment

▶ Continued from page 14

Following the complexity of the pinna or outer ear, the folds of which provide subtle cues on direction, the middle ear acts as an extremely sensitive and responsive transducer. Its almost unimaginably complex design includes the smallest bones and muscles in the body, which work to convert the wide range of sound waves they encounter into a manageable set of impulses that are sent to the inner ear.

This is where perhaps the most impressive work is done, in converting mechanical vibrations into neural impulses. Such is the work of the cochlea and its manifestly intricate set of membranes, fluids, cilia and receptors that ultimately feed the auditory nerve bundle with the signal that the brain interprets as perceived sound.

Although substantial study has been devoted to this process in recent decades, and a significant body of literature has been produced, there is still much that is not fully understood. What is becoming clear, however, is that the amount of brainpower applied to hearing is likely far greater than that utilized for sight.

This is not to downplay the amazing abilities of human vision. Perhaps most impressive are the adaptive nature of this sense, in its ability to adjust over fairly brief periods of time to large variations in light intensity, or to trade off color perception or resolution for peripheral vision or motion sensitivity.

But in terms of sensory complexity, perceptual data processing and overall efficiency in extraction of information from external stimuli, the hearing sense wins the day.

Tolerances

The latest round in this eternal sparring occurs in the field of data compression or "perceptual coding." Here the numbers show that video signals can often tolerate around 100:1 compression ratios without significant artifacts, whereas audio can barely manage 10 or 20:1, given today's technology. One argument made to support this seeming order of magnitude difference is that human aural acuity somehow is more advanced than human visual acuity, and therefore we are less tolerant of audio impairments.

While there are too many variables in the compression argument to draw this conclusion unequivocally, there have been other studies through the years that seem to indicate that test subjects are more easily annoyed by technical problems with audio signals than those in video signals.

As a medium that deals only with the aural mode of communication, radio should consider the relatively high bar that has been placed for it. There are also arguments that this bar continues to move higher, as listeners' tastes "evolve" to expect continually improving fidelity. AM begot FM and the LP begot the CD. What's next?

Here's where we return to the compression argument.

The audio industry today seems to be of two distinctly different minds. One group is pushing the envelope in its traditional fashion, toward ever-higher fidelity. This is evidenced commercially at present by developments like the SACD and DVD-A.

Meanwhile, another contingent is concerned with squeezing the best level of fidelity possible out of constrained bit rates. This group is the codec development community, which has most recently extended its art with products like MP3pro, CT-AAC, PAC4 and the like, along with improvement in streaming media players' proprietary codecs, and apparently more to come soon.

The amount of brainpower applied to hearing is far greater than that utilized for sight.

Radio is faced with perhaps its most critical technical challenge as it decides which path to take. The higher-fidelity route seems unreachable with current spectrum availability and technical proposals on the table. Meanwhile, the "more-with-less" route seems possible, but there is substantial concern that the multiple generations of coding that it will bring to bear in practice may seriously harm the original intent of continually improving the standards of audio quality delivered to listeners.

Broadcasters would be well-advised to tread carefully here. The ear is a harsh critic.

Skip Pizzi is contributing editor of Radio World.

MARKETPLACE

Products for the Radio Broadcast Professional

Mail info and photos to: RW Marketplace, P.O. Box 1214, Falls Church, VA 22041

Netia Updates Air-DDO

A new version of Air-DDO software is part of Netia's Radio Assist 7 product line, suitable for automated or live-assist use.

The new playout system is spread over two screens, with one showing the contents of the four playout channels, the second showing the database and tools.

Air-DDO accepts four on-air outputs and one PFL playback at the same time. Four tools are accessible simultaneously: the on-air playlist system, which displays audio scheduled for that day; a cart-stack system that allows access to preselected sounds; another cart-stack system dedicated to memorized stacks of jingles or of stingers; and a playout system solely for urgent items.

The broadcast can be modified by a drag and drop command. Air-DDO takes into account the changes and updates all time calculations. The user accesses the data with a mouse, a touch screen, a mixing console or a remote control.

Sporting New Radio recently ordered Radio Assist 7 systems for use in Boston and Los Angeles, to complement a system already in place in Chicago. Each of the three sites has its own database; the systems are connected via WAN and communicate via T1, allowing instant sharing of audio "documents."

For information contact the company in New Jersey at (973) 575-9909 or visit www.netia.net.

Easi-Set Has Precast Concrete Buildings

Easi-Set and Easi-Span buildings are suitable for transmitter and generator sites. They are available in sizes from 6 x 8 to 40 x 170 feet, with custom sizes and designs offered.

Buildings meet the UL-752 bullet-resistance standard and wind loads to 130 mph, or higher if customized. They are fire-resistant to a standard fire rating of 1.5 hours and rated at Seismic Zone 4.

An example of customization is in the accompanying photo. The Roosevelt Water Conservation District in Mesa, Ariz., houses a hydroturbine in an 18-foot-high structure that includes a 6 x 16 removable concrete hatch for turbine maintenance.

A/C, electrical, plumbing and interior packages are available. The company can provide information on licensing opportunities.

For information contact the company in Virginia at (800) 547-4045 or visit www.easiset.com.

World Radio History

THE XM PLUG 'N PLAY RADIO

THE XM PLUG 'N PLAY STUDIO

☑	REALLY COOL STYLING	☑
☑	SLIPS IN EFFORTLESSLY	☑
☑	EASILY RELOCATABLE	☑
☑	FACTORY CRAFTED	☑
☑	LABORATORY TESTED	☑
☑	GUARANTEED PERFORMANCE	☑
☑	LIGHT WEIGHT	☑
☑	HEAVY SOUND	☑
☑	CONCEALED WIRING	☑
☑	INTEGRATED CIRCUITS	☑
☑	BUILT-IN VENTILATION	☑
☑	DIGITAL QUALITY	☑
☑	EASY TO FINANCE	☑
☐★	ANY SIZE, SHAPE, OR COLOR	☑

82 XM Studios.
All designed by NCC. All fabricated by Acoustic Systems.
All delivered on time. All within budget. All perfectly integrated.
All very simple.

ACOUSTIC SYSTEMS

NCC

SATELLITE RADIO
DEVELOPMENT PARTNERS

(212) 972-1320

NORTHEASTERN COMMUNICATIONS CONCEPTS INC. / NEW YORK CITY

*Sorry, Sony

World Radio History

At RFA, Putting R-Boss to Work

The Staff at Radio Free Asia Spearheads an Open-Source Approach That Can Help You — for Free

by Tom Vernon

The high cost of purchasing and maintaining broadcast software is becoming a concern for many radio stations. Some broadcasters are using applications for five years or more, well past their time of obsolescence. Others are simply biting the bullet and paying for regular maintenance and upgrades from the vendor, which sometimes aren't regular enough. A few small-market stations just go without software and do things the old-fashioned way, by hand or with analog technology.

Some find an attractive alternative to the purchase of commercial applications in the use of open source software, as described by the Open-Source Initiative (OSI). OSI is a nonprofit corporation dedicated to furthering the cause of open source software.

The concept is simple. Software, according to OSI proponents, evolves more efficiently and quickly when users can read, redistribute and modify its source code. Rather than relying on a few programmers, open-source software depends on an entire community of users to improve and adapt programs, as well as fix bugs. The result is better software that evolves more rapidly than applications that are developed in the traditional closed environment, where the source code in unavailable to users.

Free resource

The OSI initiative is not new. For 20 years it has been gaining momentum in the technical cultures that built the Internet and the World Wide Web. Fueled by what many perceive as a closed monopoly controlled by Microsoft, open source is breaking out into the commercial realm, most notably with Linux, an operating system that many feel is superior to Windows. A growing number of open-source office productivity applications such as word processors, spreadsheets and databases are available.

In the broadcast realm, the technical staff at Radio Free Asia is spearheading open source through the Radio-Broadcast Open Source System project. R-Boss is a suite of Web-based programs for radio that is available free for download from the RFA techweb Web site.

Source code and documentation are included with the software, and broadcasters who download and use the programs are encouraged to improve or modify them to suit their needs, and ultimately become part of a community that shares in the creation of radio software.

Leading these efforts at Radio Free Asia is David Baden, chief technology officer, based at the group's Washington headquarters. Baden notes several reasons for RFA to make the move to developing its own software, not the least of which were financial issues.

"We simply didn't have the money to keep up," he said. "For just one application we were looking at a yearly quarter-million dollar maintenance fee."

RFA is a taxpayer-funded organization, and Baden believes that open source is a way to make the software available to those who really helped to pay for it. "It's free to the taxpayers to use," he quipped.

Customization issues played a part in the decision to create applications in-house.

"Our uses are very specialized; for example, many of our applications have to work in multiple languages, a problem most radio stations don't have to face."

Baden sees this in-house application development as a continuation of the original spirit of broadcast engineering.

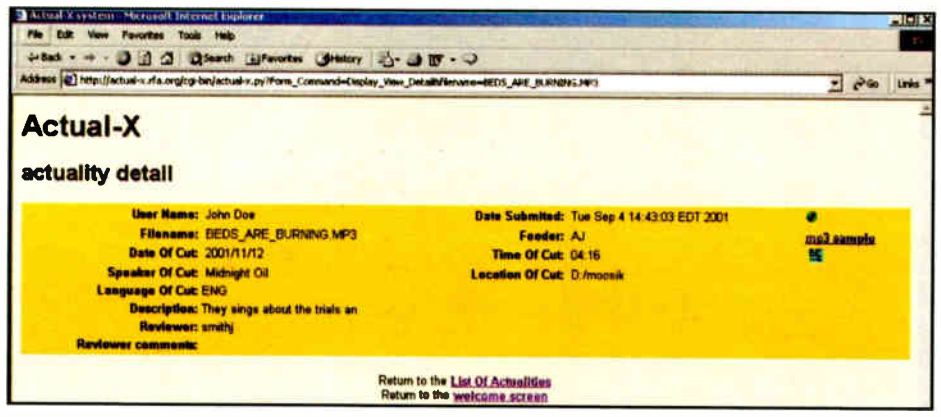
"When a station purchased a console," Baden said, "they would usually modify it or customize it to fit their unique needs. If you couldn't afford a piece of equipment, you scrounged a schematic and built it from scratch.

"Nowadays, most broadcast engineers are seeking off the shelf software solutions, and not interested in customizing or creating their own applications, and that's unfortunate."

Baden, a self-taught programmer, said that while some may be intimidated by applications development, it is no more difficult than wiring a studio. A linear mindset along with some determination and practice are all that is required.

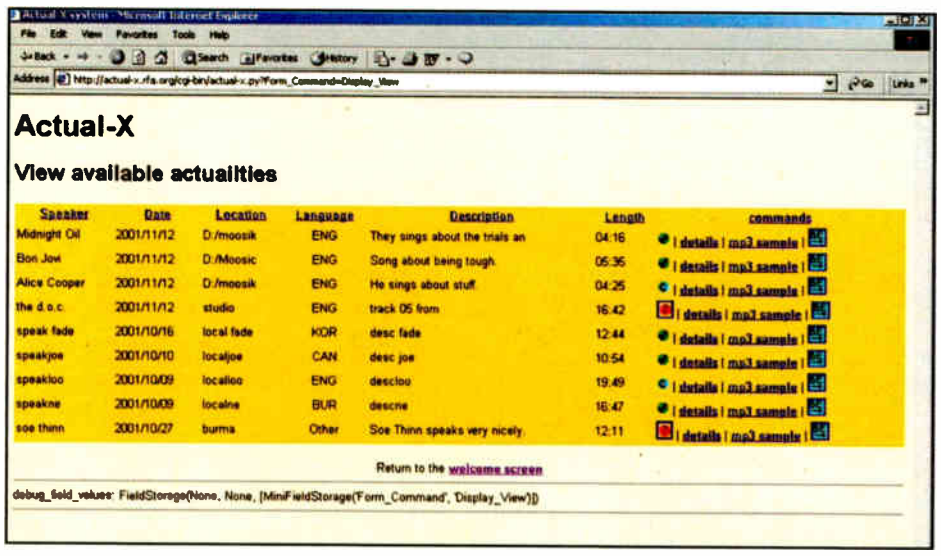
Community

Another reason to go with open source was to build a community of radio broadcasters to share and improve upon the applications that RFA has launched.



Details of an actuality including date, time and location are stored in Actual-X.

That goal has yet to be realized. While a few stations have downloaded applications from RFA's techweb site, none have uploaded materials.



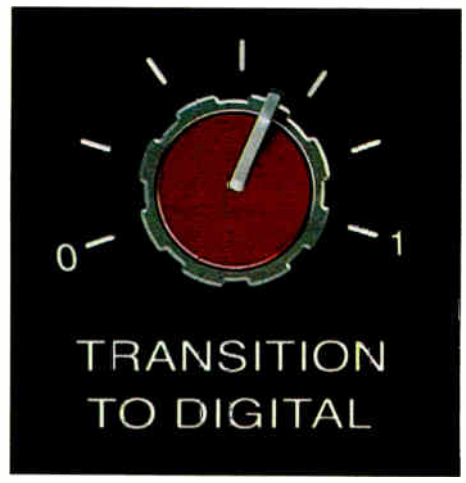
This screen allows users to inspect available sound files in Actual-X.

R-Boss is a suite of Web-based programs for radio that is available free for download from the RFA techweb Web site.

Baden remains philosophical. "We're not discouraged, we needed to develop this software anyways. Any software development cycle can take up to 10 years, and we're only two years into the project. Once we get a killer app out there, it should take off."

Within the suite of R-Boss programs available for download is News-X, a news source application for the storage, searching and editing of incoming text-based news information. The user interface runs under any Web browser; it is multilingual and multi-feed capable, and can also process News Server e-mail input.

Track-X is a SQL database that functions as a broadcast scheduling and archiving tool. Track-X imports and exports meta-data to broadcast content files using the XML standard as an interchange format. The Track-X application not only permits the creation of broadcast schedules but also facilitates the future access of content. Track-X as a SQL database is a search tool for the accessing of archived content for on-demand delivery.



Actual-X is a Web-based program that enables broadcasters to share audio actualities. Digital audio files and information about the actuality are FTP'd from any location with Internet access, into the Actual-X program. The files are verified for accuracy, processed and placed into a Web access page for real-time preview and insertion into a networked digital audio system.

File management

Audio-X is a series of file handling and conversion programs that manages the creation of and audio content within the R-Boss content delivery chain. Among the applications under development: the XEON player, working code that can be given to a network interface to work as-is. XEON uses a simple new standard to send data in and out of the effect, XML-RPC. The eXtensible Markup Language is a popular protocol for describing data, while Remote Procedure Calls are designed to run programs on other machines.

Tagged Access Streaming, another part of Audio-X, is a group of methods for accessing audio devices and files in a network-neutral way. A sound source might be a local WAV file or a mic port on the network server. Data flows can be uni-, bi- or multi-directional, allowing remote I/O, local storage while broadcasting, and multiple versions for different media types (i.e. Web, WAP, future editing or archiving purposes).

Because the R-Boss applications are Web-based, system security can become an issue. Auth-X is being developed by RFA to authenticate users against a central user database. It also determines if a user is allowed to perform various tasks. New users may add themselves to the system, pending administrator approval.

The achievements of Radio Free Asia's engineering staff in developing applications in the R-Boss project are all the more impressive when one considers the people and environment

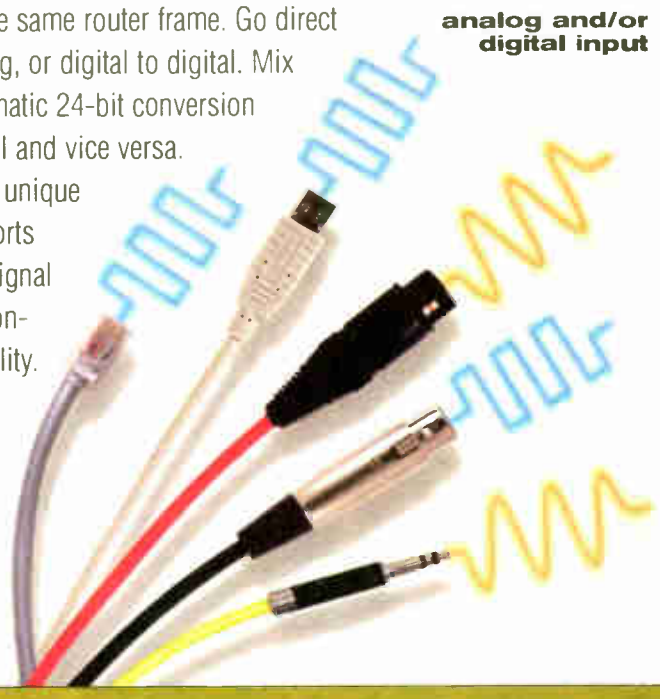
See R-BOSS, page 20 ▶

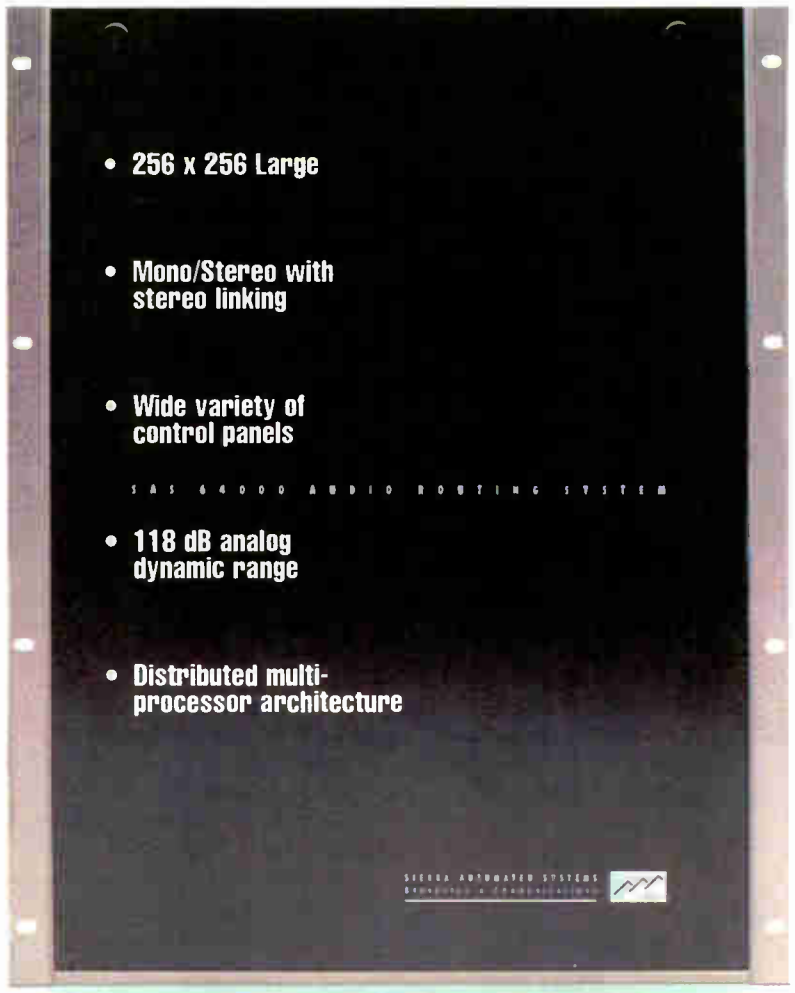
World Radio History

ROUTING SYSTEM

IN 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. Best of all, the SAS64000 Audio Routing System creates a path to AES/EBU digital audio without creating analog obsolescence.

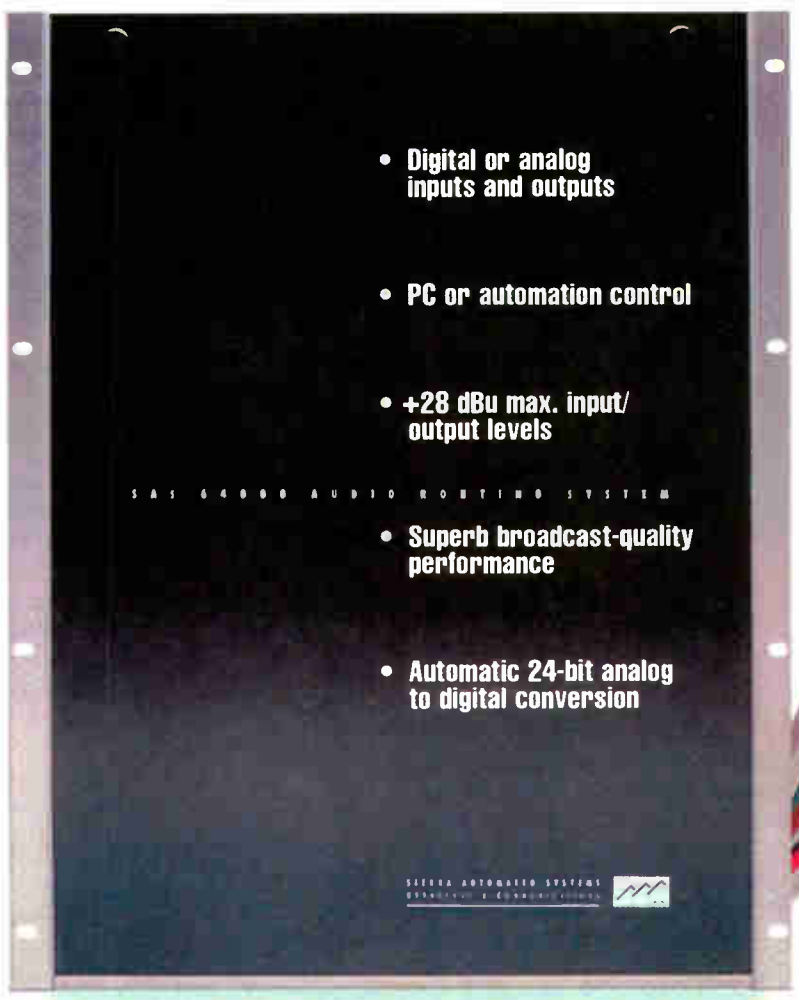
This means you can mix your analog and digital I/O in the same router frame. Go direct analog to analog, or digital to digital. Mix it up with automatic 24-bit conversion analog to digital and vice versa. Either way, this unique architecture sports uninterrupted signal integrity and non-blocking flexibility.





Mix-and-!

SAS64000 AUDIO



OUT And the SAS64000 is wonderfully simple to integrate, upgrade and put into service. Just plug in our new digital port expander and that's it. Welcome to digital!—co-existing flawlessly with analog—and all in the same framework. Interested? There's lots more to tell. Call **818 840 6749**; or e-mail us at sales@sasaudio.com; or check our website at sasaudio.com. If you're moving into digital, then the SAS64000 Audio Routing System is your conduit to the future.

SAS

SIERRA AUTOMATED SYSTEMS

sasaudio.com

World Radio History

R-Boss

▶ Continued from page 18

where it was created. The core development team consists of six RFA staffers. As with many commercial radio stations, RFA is understaffed in the engineering department, and most engineers have about five or six other things on their plate in addition to developing materials for R-Boss. Much of the development work for R-Boss is done in their spare time. Most, like Baden, are self-taught programmers; only one has formal education that includes a degree in information science or computer programming.

As a government-funded organization, RFA can't pay salaries that compare with the kind of money one can earn in the commercial arena, and Baden has worked to create an environment that attracts devoted techies.

"We try and create a liberal work space within RFA. That means being more accommodating with flex time and dress code. Because of the different types of projects that are going on," he said, "we tend to attract people who thrive on variety, as opposed to those who might want to work in an all-Microsoft shop."

As if R-Boss isn't enough to keep Baden and his staff hopping, there are other projects highlighted on the Web site. The 3D-Project provides free distribution and standardization of broadcast-specific 3D drawings, materials and texture bitmap files that were created to document the RFA facilities.

Radio Free Asia also hosts the SBE's Engineer Friendly Documentation project. EFD attempts to standardize broadcast-related technical documentation into an interchangeable XML-based format.

The Debian Project also is hosted on RFE's site. Debian is an association of individuals who have a common interest in creating a free operating system.

For information about Radio Free Asia's R-Boss project, or to download files, visit *www.techweb.rfa.org.* Radio Free Asia's mission and programming efforts are described at www.rfa.org. To learn more about the Open Source Initiative, point your browser to www.opensource.org.

Tom Vernon is a multimedia consultant working in Philadelphia. Reach him via e-mail to TLVernon@blazenet.net *or call (717) 367-5595.*

Workbench

▶ Continued from page 10

subminiature D-connector plugs — again, something on hand in the parts drawer.

★ ★ ★

Planning for emergencies is something we don't like to think about, but with a little care, a lot of confusion can be alleviated.

I saw an emergency vendor contact list that was pretty thorough. It was posted at a CVS Pharmacy! In addition to the building address, phone and fax numbers (for relating to police), the list included such things as the electric utility company (for power failures), the HVAC contractor, the telephone company and the plumbing contractor.

The list also included vendors such as locksmiths, glass companies, security, other utilities and even the cleaning company. Granted, the air staff doesn't need all these numbers; but in an emergency, *you* might. If you're on vacation or cannot be reached, posting this information in your office might help your assistant or fill-in get the problem solved quicker.

Jeff needed
a way to provide
isolated multiple pairs
of contacts for each
automation system.

It's helpful to include the utility account numbers as well as the telephone numbers. Some utilities won't dispatch service personnel until they can identify the property. In the case of transmitter sites, and sites that have changed owners — and call letters — it can take some time to figure out the account.

On a weekend or in the middle of the night, the business manager may not be readily available. These are the times the planning for emergencies will make you shine.

★ ★ ★

Got a rodent or insect problem around your transmitter site?

Tim Parker spearheaded an effort at Bonneville's WWZZ(FM) in Washington to rid the transmitter building of weeds, grass and brush.

A layer of crushed gravel around the perimeter of the building, shown in Fig. 2 on page 10, prevents all but the most tenacious weeds from growing. No brush, no cover for the pests. The pest problem dropped to zero.

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

always n.

IF YOU WANT TO BOOST YOUR REVENUES, PROFIT FROM OUR EXPERIENCE.
At NPR Satellite Services, we understand all the ups and downs of broadcasting—because we do it ourselves. That's why we provide a complete set of affordable satellite solutions to support you. If you need reliable space segment with coverage in all 50 states and the Caribbean, or require custom engineering design, training, and consulting—we've got the experience and technical expertise to get your transmissions up there to generate dollars down here. To find out more, call NPR Satellite Services at 202.513.2626. And discover some very down to earth value.

WWW.NPRSS.ORG/RW

npr satellite services

World Radio History

eXtreme digital... ROADSHOW

IBOC is the Future

Six Cities, Six Dates

Give us one day and we'll provide the rest — training by radio's foremost IBOC experts — Harris, iBiquity and Impulse Radio — all seminar materials, continental breakfast and lunch, and even a special gift. Best of all, you'll get information that will help you determine your most seamless and cost-effective path to the future.

Start your journey at a free IBOC seminar.

Register online at www.broadcast.harris.com

HARRIS

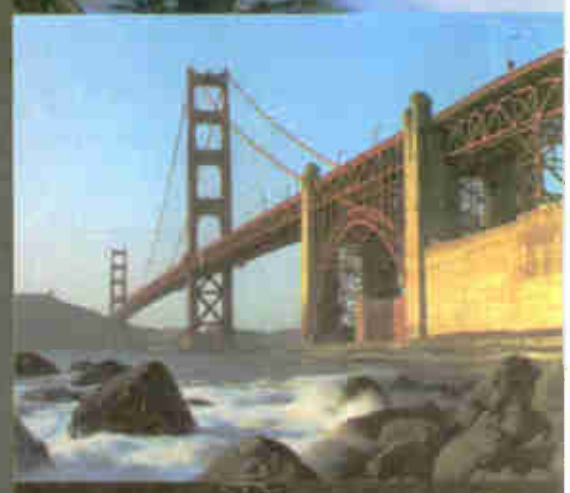
World Radio History

Seattle
Sept. 10, 2002

New York
Sept. 20, 2002

Miami
Sept. 18, 2002

San Francisco
Sept. 24, 2002



Los Angeles
Sept. 25, 2002

Chicago
Sept. 27, 2002

Dallas Is Next

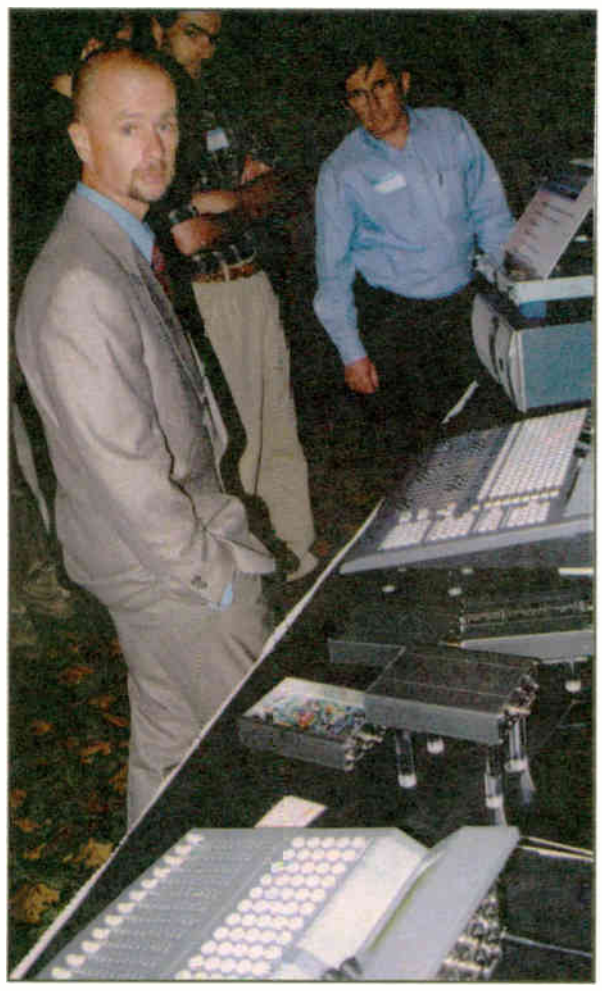
About 75 people turned up in August for the "roadSHOWcase" in Burbank, Calif., sponsored by Klotz Digital and Los Angeles SBE Chapter 47.

Klotz said it plans to hold a similar event in early December in Dallas.

Companies with employees in attendance included Infinity, DirecTV, Liberman Broadcasting, ABC Radio, Clear Channel, Big City Radio, Armed Forces Radio & TV Networks, Hispanic Broadcasting, Lotus Communications and Cumulus Media.

Among those taking part was Jeff Detweiler of Ibiquity Digital.

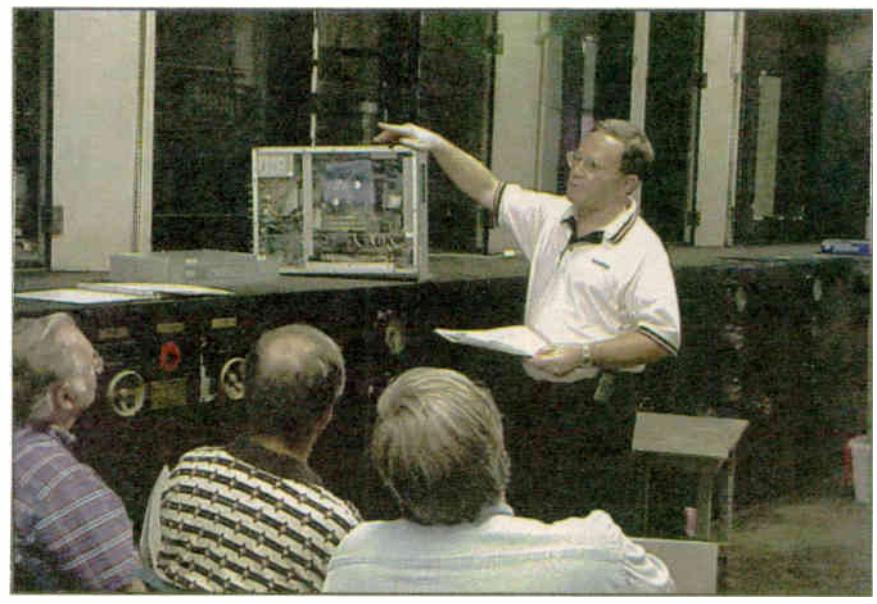
"Broadcast property consolidation and the resulting load on the engineering staff have made it impossible to get away for several days to the national conventions," he said in a statement from Klotz. "When a new technology like IBOC is in commercial rollout, we need this type of forum to communicate effective hardware solutions. I hope we will see more of them in the future."



Keith Knudsen, director of sales and marketing for Graham Patten, stands in front of the company's booth. Behind him are Mike Worrell, center, and Norm Avery from KABC(AM) in Los Angeles.

Old Meets New

Gary Liebisch of Harris Corp. makes a presentation about IBOC digital radio to members of SBE Chapter 33. A recent meeting of the Cincinnati chapter was held at the WLW(AM) transmitter site in Mason, Ohio.



Jeff Johnson caught this photo of Liebisch talking about the future of radio while standing in front of the historic cabinets of WLW's 500 kW transmission system, made by RCA.

WLW broadcast at 500 kW for five years in the 1930s. It was the only U.S. radio station ever authorized to do so. It is now a 50 kW Clear Channel station.

MARKET PLACE

SoftWright Sets New Seminars

More software seminars will be available for users of SoftWright RF system design products. The company said its clients asked for the seminars to be held more than once per year.

It will host four annual conferences in how to operate its Terrain Analysis Package; they are two days each and cost $1,300. The seminar includes instruction on how to design FM/TV, paging, land mobile, PCS, cellular, SCADA and microwave transmitting facilities.

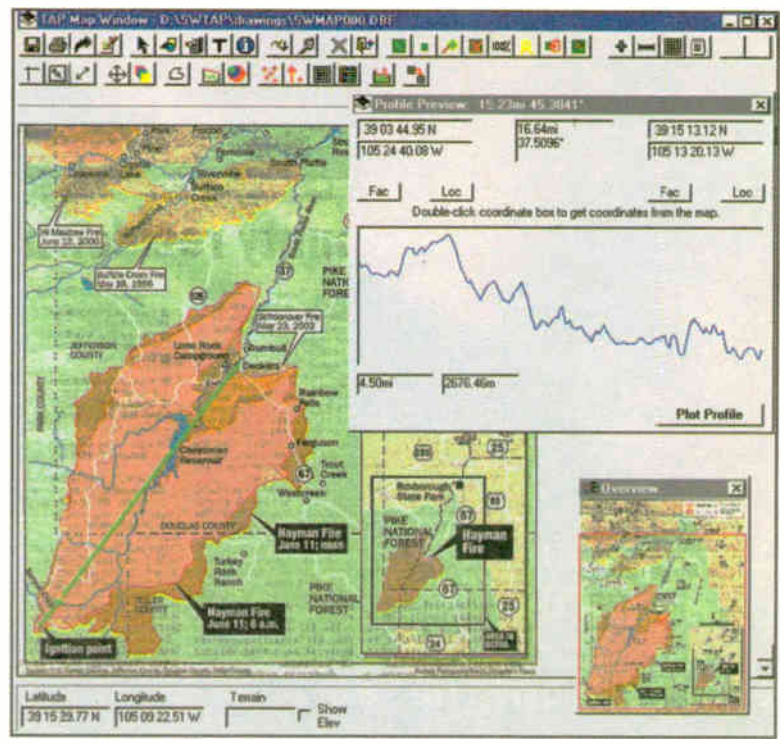
Also offered are one-day conferences ($650) in how to use the SoftWright OverSite product for engineering management of transmitter sites.

Training is in the Denver area. Upcoming seminars are set for mid-September and early December. Computer rentals are available or customers may bring their own notebook computers.

New features to be covered include 1-arc-second-resolution topographical data for the United States, and the ability of TAP to import user-scanned bitmaps into its map window. For example, the graphic shown below8 is of the recent Colorado Hayman Fire, scanned from a Denver newspaper.

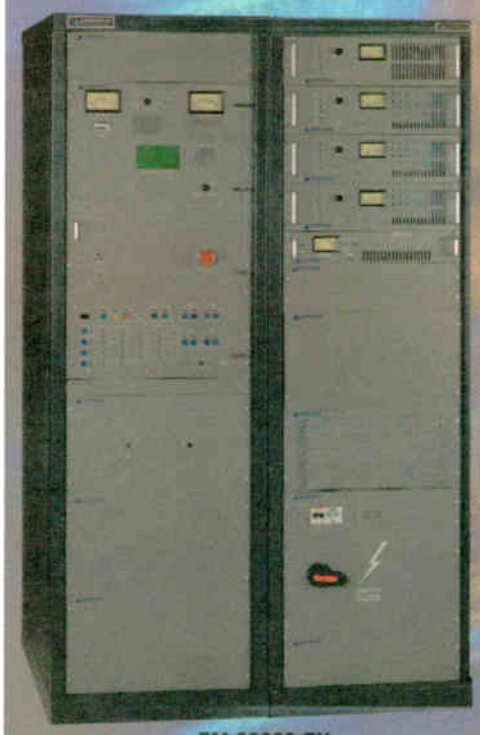
Users thus can scan, import and "georeference" bitmapped maps, making profile and coverage plotting easier. These features are available to customers who have the company's Gold maintenance subscription.

For information contact the company in Colorado at (303) 344-5486 or visit www.softwright.com/seminar.html.



TAP customers can import any scanned images into their RF design software.

Experience Exceptional Quality, Reliability and Service!
Experience Armstrong Transmitter!



FM 30000 TX

Our single tube high power FM transmitters offer you exceptional quality at affordable prices.

Built for the "real world" environment, these RF workhorses offer long term reliability and features not found in any other single tube transmitter available.

Features Include:

1/4 Wave Grounded Grid Tetrode PA

Fiber Optic PA Arc Detection

PA Temperature Protection

Advanced Control System with remote computer interface

More internal status sensors than any other transmitter

CD Quality Audio (AES/EBU optional)

Available from 20 to 35 kW.
Combined systems to 60 kW

Armstrong Transmitter.. the best RF products, the best around the clock support and the best prices

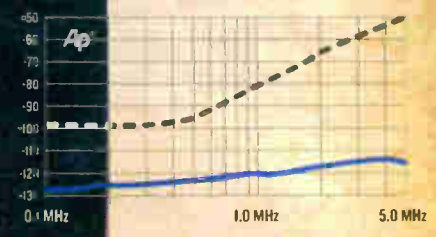
....because you deserve nothing less!

ARMSTRONG
TRANSMITTER CORPORATION

4835 North Street, Marcellus, NY 13108 (315) 673-1269 Fax 315 673-9972 www.armstrongtx.com

World Radio History

–115dB RFI rejection 0.1 MHz to 5 MHz AND OTHER ARCANE DETAILS rarely seen in a Radio World ad headline.



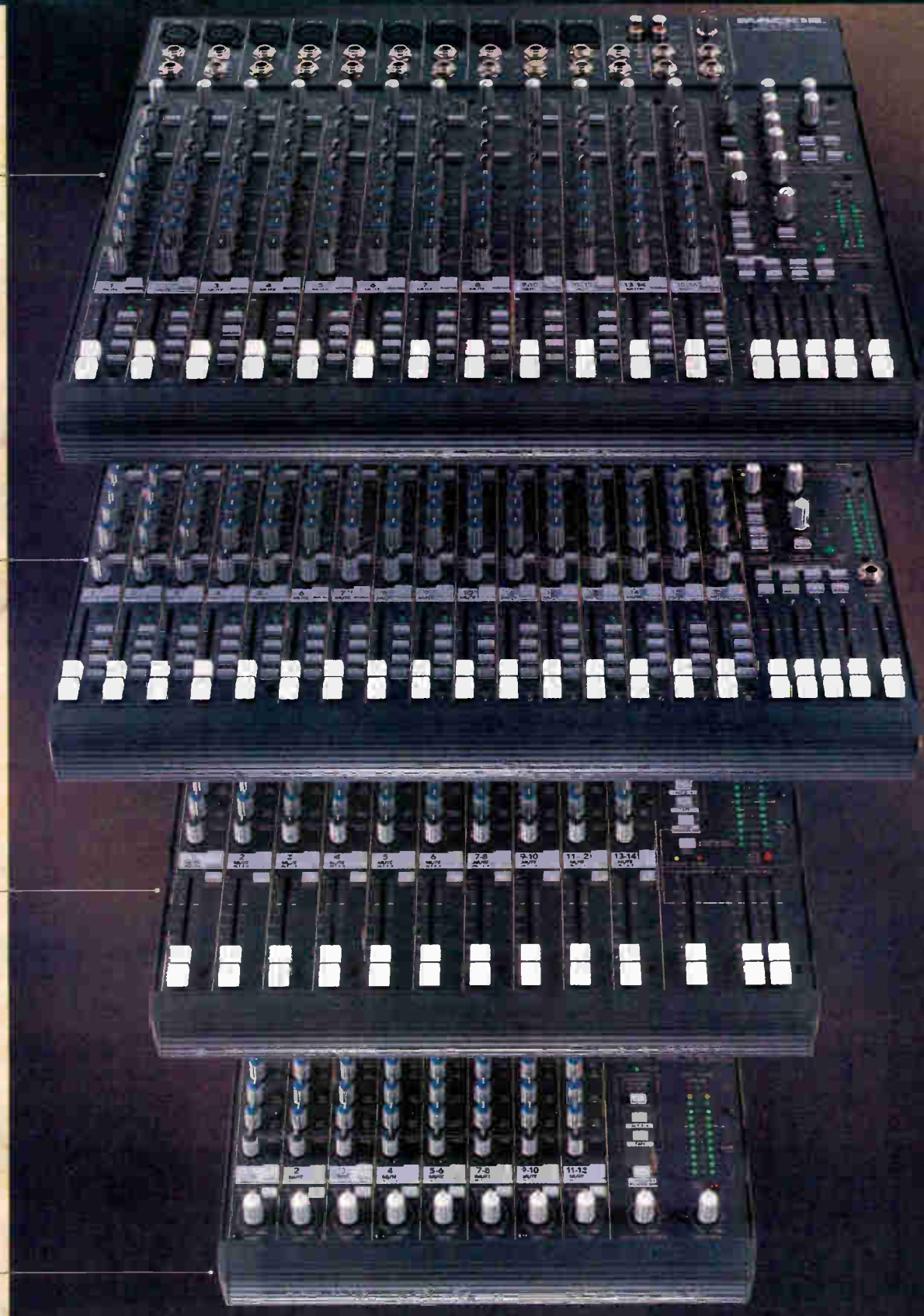
Meet the VLZ® PRO Series compact mixer family...

1642-VLZ® PRO
16 total chs. • 4-bus w/double-bussed outputs • 10 XDR™ premium mic preamps • 8 mono line level channels • 2 hybrid mic/stereo/mono line level channels • 2 stereo/mono line level chs. • 3-band EQ w/swept mid • 75Hz low cut filters on mono chs. • 4 aux sends per channel • 4 stereo aux returns with EFX to Monitor • Control Room/ Phones source matrix • 60mm log-taper faders

1604-VLZ® PRO
16 total chs. • 4-bus design • 16 XDR™ premium mic preamps • 16 mono line level channels • 16 channel inserts • 8 direct outs • 3-band EQ with swept mid • 75Hz low cut filters on all channels • 6 aux sends per channel • 4 stereo aux returns with EFX to Monitor • Control Room/ Phones source matrix • 60mm log-taper faders

1402-VLZ™ PRO
14 total channels • 6 XDR™ premium mic preamps • 6 mono line level channels • 4 stereo line level channels • Extra ALT 3-4 stereo bus • 3-band equalization • 75Hz low cut filters on mono chs. • 2 aux sends per channel • 2 master stereo aux returns with EFX to Monitor • Control Room/ Phones source matrix • 60mm log-taper faders • Switchable AFL/PFL

1202-VLZ™ PRO
12 total channels • 4 XDR™ premium mic preamps • 4 mono line level channels • 4 stereo line level channels • Extra ALT 3-4 stereo bus • 3-band equalization • 75Hz low cut filters on mono chs. • 2 aux sends per channel • 2 master stereo aux returns with EFX to Monitor • Control Room/ Phones source matrix • Rotary gain controls • Built-in power supply



Our VLZ™ PRO Series has the best RFI rejection of any compact production mixers on the market (the black line on the chart above is our most popular competitor; the blue line is us).

They also have our superb XDR® premium mic preamps with specifications that challenge even $2000-a-channel esoteric outboard preamps: 0.0007% THD. ± 3dB bandwidth 1Hz to 192kHz. 130dB dynamic range. And better E.I.N. in the typical +20 to +30dB working range than other compact mixers (and many big expensive ones).

XDR mic preamps also have built-in protection against damage due to hot patching and deliver identical frequency response with any mic/cable impedance from 50 to 600 ohms.

All four VLZ PRO Series mixers are built like tanks to withstand years of abuse. Mil-spec fiberglass circuit boards. Solid steel chassis. Sealed rotary pots. Built-in power supplies. Wear-resistant faders. Real metal ¼" jacks and Neutrik® XLRs.

VLZ PRO mixers are perfect for ad production, live in-studio artist performances, ENG and remote broadcasts.

Equally important to stingy GMs, Mackie VLZ Pro compact mixers are astonishingly inexpensive.

Visit our web site or call your broadcast equipment supplier for details on the VLZ PRO Series.

MACKIE.

2001 Mackie Designs Inc. All rights reserved worldwide. VLZ and the Running Man figure are registered trademarks of Mackie Designs Inc. XDR is a trademark of Mackie Designs Inc. Sooo True? We listen to your suggestions.

World Radio History

◆ MARKETPLACE ◆

Products for the Radio Broadcast Professional

Mail info and photos to: RW Marketplace, P.O. Box 1214, Falls Church, VA 22041

O.C. White Improves Mic Arms

O.C. White has updated its line of microphone arms and risers.

The new combination, Model 61900, hides the mic wire for a nicer appearance. The wire is hidden for most of the length of the arm but is removable.

The base has a vertical wire channel through the riser, prewired to an XLR female embedded at the top, removable with a set screw. Three feet of pigtail extends from the base for the user to wire as needed.

The riser is now 15 inches high. The company says it fits behind low-profile VGAs and most near-field loudspeakers. The mic wire exits down through the countertop or through a side channel at the bottom.

The arm also has a channel for a mic cable to be added by the user. The arm requires no threading and there is no need to remove or reinstall connectors. The riser-installed connector is wired 1 shield, 2 white and 3 blue or red. The channel's cover snaps into place and is removable.

The support system comes in several configurations and with optional mounting choices, including a multiple arm mount for roundtable on-air discussions. A new black and gold finish is suitable for upscale studios.

For information, contact the company in Massachusetts at (413) 289-1751 or visit www.ocwhite.com.

Dayton Updates SCA Receiver

For radio reading services and ethnic broadcasters, Dayton Industrial has updated its tabletop FM/SCA receiver.

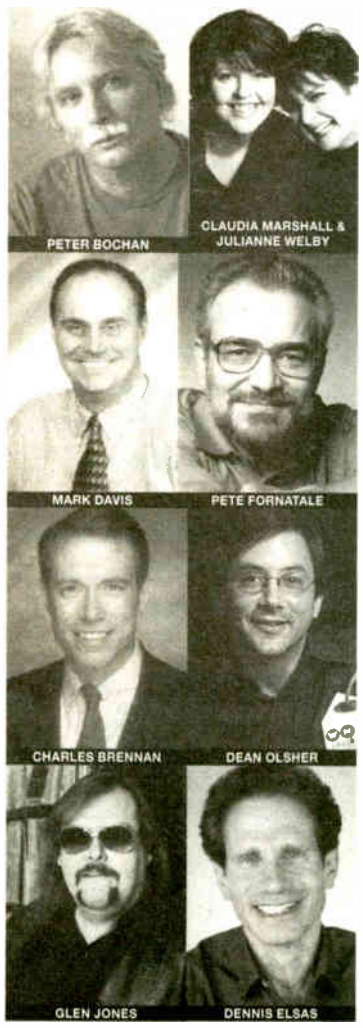
New features include a telescoping antenna that swivels to better receive SCA signals, a headset jack on the front panel so listeners can monitor programming without disturbing others, and better internal circuitry.

The AF565A is a specialized single-channel, crystal controlled FM receiver that is tuned to the desired frequency and subcarrier at the factory. It demodulates the main channel in mono as well as the SCA audio channel. The user selects main or SCA audio by a front-panel switch. Frequency response on the SCA is 25 Hz to 5 kHz. Retail price is $169.95.

The company also makes receivers for FM/RDS, weather, AM and public service fire and police.

For information contact the company in Florida at (941) 351-4454 or visit daytonindustrial.com.

RADIO FESTIVAL 2002



September 26 to October 6

For the complete schedule, please visit www.mtr.org

RADIO FESTIVAL '02

Seminars
Live Broadcasts
Live Radio Dramas
Family Fun

Devoted to the Creativity and the Community of Radio!

FUNDING FOR THIS FESTIVAL IS GENEROUSLY PROVIDED BY

CLEARCHANNEL RADIO

INTEREP

The Mel Karmazin Foundation

ADDITIONAL SUPPORT PROVIDED BY

SIRIUS Satellite Radio

SPECIAL THANKS TO THE FESTIVAL'S MEDIA PARTNERS FOR THEIR IN-KIND SUPPORT

BROADCASTING CABLE · RADIO INK · R&R RADIO & RECORDS, INC. · Radio World

PHOTO CREDITS—GLEN JONES, JEFF TISMAN 2001, STAGE SHADOWS, LAVONNE HALL, KURT ANDERSEN, BRIQUETTE LACOMBE

THE MUSEUM OF TELEVISION & RADIO

25 WEST 52 STREET, NEW YORK, NY 10019

Festival Hotline 212/621-6709

World Radio History

GM Journal

Radio World — Resource for Business, Programming & Sales — September 25, 2002

Cole's Law

See Page 26

Real Debuts Paid Web Radio

by Frank Beacham

KPIG, the eclectic California FM station that became America's first full-time commercial Internet Webcaster in 1995, has again made broadcasting history by becoming the Web's first subscription radio station.

At a news conference in the Rainbow Room at Rockefeller Plaza in Manhattan in August, RealNetworks announced that KPIG has become the nation's first radio broadcaster to begin offering exclusive programming for its ambitious new RealOne RadioPass subscription service.

The Freedom, Calif., station began Webcasting a commercial-free version of its live program feed at about 2 p.m. on Aug. 22.

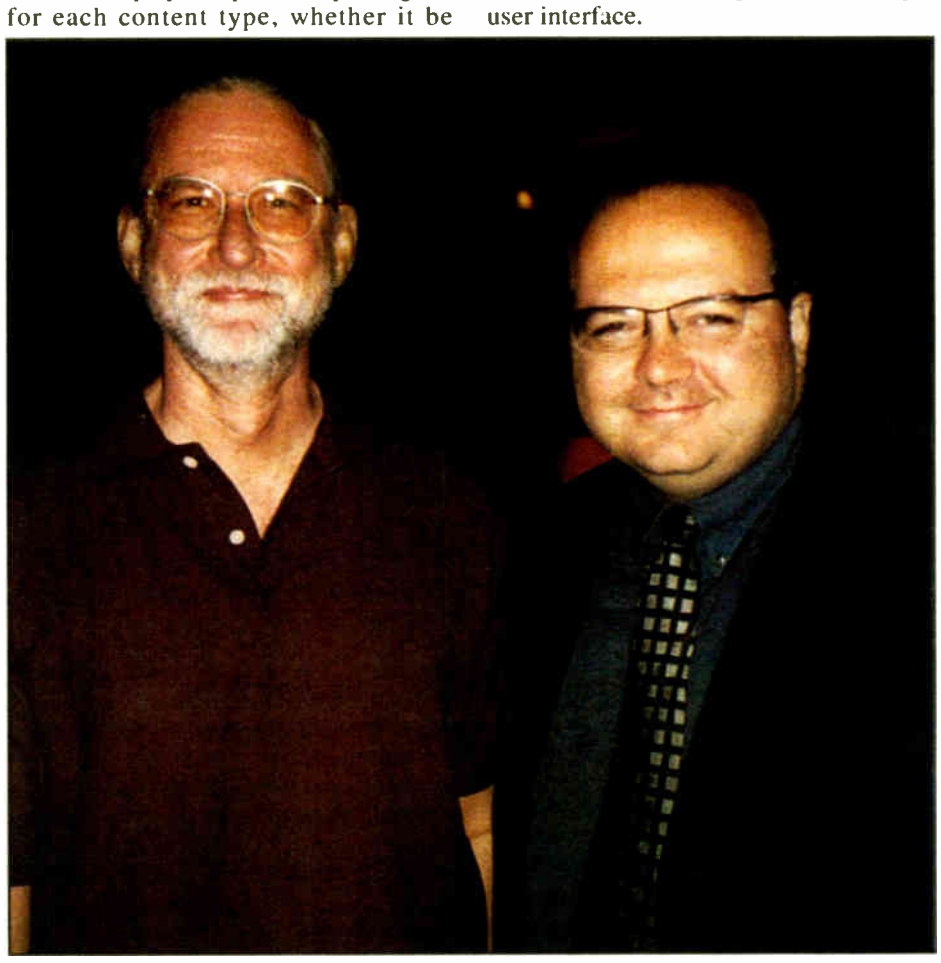
New model

RadioPass is a new business model for radio broadcasters who cannot justify continued free Webcasts in light of new copyright fees imposed for music usage, according to RealNetworks founder and CEO Rob Glaser. RealNetworks' content partners such as KPIG share a portion of the online revenue.

"RadioPass has been set up as an extensible, scalable model for Webcasters who find the new economics unfavorable," said Glaser. "We are here with arms wide open to radio broadcasters who want to join our subscription service."

RealNetworks' new emphasis on subscription radio is part of the ambitious launch of RealOne Player, the Internet's first cross-platform, multiformat universal media player. The application emulates in software a tunable radio or TV receiver, allowing computer users to choose any online content they prefer without concern to the proprietary encoding system used to create the media feed.

Previously, users had to operate separate media players specifically designed for each content type, whether it be RealNetworks' RealAudio and RealVideo, Microsoft's Windows Media, Apple's Quicktime, or other less-popular streaming media standards.



KPIG's 'Wild Bill' Goldsmith and RealNetworks Founder Rob Glaser

Competing codecs

The universal player does not negate the need to have the codecs of competing companies installed on the user's PC. It simply acts as an overview application that consolidates the functions of the different technologies into a single user interface.

In addition to accessing and controlling 50 media formats, the player also enables DVD playback, the creation of a music library with burning of music CDs, and access to new premium interactive pay video and audio services.

RadioPass, available for a standalone monthly subscription price of $5.95, significantly boosts radio content choice

See SUBSCRIPTION, page 27 ▶

Promotions: Make It a Market Event

Managers Are Learning To Put the Power of Clusters to Work Through Special Events

by Lyssa Graham

While many sales managers are still learning the ins and outs of selling for clusters, the debate over which methods are most effective continues. Some managers are using events as a sales tool in new ways.

Jim Zagami, vice president of sales for the Washington Clear Channel cluster, showcased his first market-wide event in February of 2002 and found that using the entire cluster made for a successful debut. Zagami's stations put on the Rock 'N Sports Experience at the Washington Convention Center, drawing 18,000 people over the course of the two-day event.

Market event

"It was an event that we created for the Washington marketplace," Zagami said. "It was created with the thought of making it a market event rather than a station event, and that's what we did."

The event was "primarily a sports event," Zagami said, although sports with a rock-and-roll edge. Using all eight stations within his cluster as well as those from the company's Baltimore, Frederick, Md., and Richmond, Va., clusters, Zagami was able to devise and promote an event with a little something for everybody and a sales niche for all

See PROMOTIONS, page 32 ▶

(Too bad you can't scroll...)

www.BEXT.com

Home | About | Contents | Products | Support | Library | Links | Search | Contact | CGC | User List | Warranty | Specials!

The XL 1000

The most advanced compact kilowatt on the market --

Now available from stock at an amazing promotional price

Tel 619 B·E·X·T·I·N·C or 619 239 8462

US TOLL FREE 1 800 500 5769

REQUEST A FREE CATALOG

Products	Support	Industry News
Radio Products	Library	CGC Newsletter
TV Products	Tech Bulletins	SBE Report
Antennas	24Hr Emergency	FM Analysis
RF Broadcast Line	Field Service	IBOC Evaluation
	Contact us	

...but if you could, you'd see a world of RF equipment, from 10 watts to 30 kW liquid cooled, with monthly specials and other interesting information. Guess you'll just have to do it the old-fashioned way: Look it up on the internet. ***www.bext.com***

World Radio History

Team Cole's Law Tackles Indecency

by Harry Cole

The law of indecency seemed to take a few steps recently, but the Dirty Words Cadre of Team Cole's Law can't tell whether those steps were forward, backward or sideways.

On the one hand, there's the long-running case of KROQ(FM), Pasadena, Calif., which, more than five years ago, apparently broadcast one or another version of a dainty ditty delicately dubbed "You Suck." (Who says romance was dead back in the '90s?)

One (and, apparently, only one) person who happened to be listening to the station that evening was so offended by whatever was broadcast that she lodged a complaint with the commission.

But the complainant did not have a tape or transcript of the broadcast. Instead, she apparently obtained a copy of the commercially available, unedited "You Suck," presumably from a local CD store, and included that with her complaint.

In response, the station acknowledged that it had a copy of the unedited version of the song on hand, but pointed out that it also had an edited version.

Edits matter

The station sent the FCC a copy of the lyrics of the edited version and, in an admirable display of candor, acknowledged that it could not be 100 percent sure which version was actually aired, because the station did not keep specific records or logger tapes and since the announcer on duty at the time had not listened to the song while it was broadcast.

But the station pointed out that, had the unedited version been broadcast, the station was reasonably confident that more than one complaint would have been raised about the song.

The commission's staff sent a copy of the station's response, complete with the edited version of the lyrics, to the complainant, and asked her which version had been broadcast. She responded that she recalled hearing certain words that did not appear in the edited version. From this, the staff concluded that the station had in fact broadcast the unedited version. The station got hit with a $2,000 fine.

The station objected that there was no actual evidence that the unedited version — which everyone seems to agree contains "offensive" language — was actually broadcast.

have been broadcast is enough to take care of that.

Obviously, there are some conceptual problems here.

From an evidentiary perspective, it is difficult to understand how the mere existence of a commercially available CD is relevant to what a particular station actually broadcast on a particular night at a particular time.

While the complainant in this case asserted that she recalled hearing some words during the broadcast that did not appear in the station's edited version (but which did appear in the unedited, commercially available version), it is clear that the complainant had her own copy of the commercially available version because she sent a copy to the commission with her complaint.

That being the case, it seems to us hard to tell whether her recollection of what she heard on the air may have been affected in some way by the CD.

Circumstantial evidence

At most, the combination of the complainant's recollection and the unedited CD amount to circumstantial evidence. Against that evidence, the commission could and should have weighed the station's own circumstantial evidence, which included the observation that no other complaints had been received concerning the broadcast in question. But the commission chose to ignore that.

And from a policy perspective, one can only wonder what other materials the commission will review in future cases to get "sufficient context" concerning a particular broadcast.

The previous requirement (er, excuse us, the previous non-requirement) that a tape or transcript be submitted with the complaint at least had the salutary effect of

The FCC seems to have moved away from its long-standing requirement that a complainant submit a tape or transcript of the offending programming.

So what, responded the full commission in late May of this year; as far as the commission was concerned, the commercially available CD of the song was enough to provide "sufficient context" and "information regarding what was said in the broadcast in question," even though the station disputed whether that particular version had in fact been broadcast.

The significance of the FCC's decision is that the commission seems to have moved away from its long-standing requirement that a complainant submit a tape or transcript of the programming that the complainant believes to have been offensive. According to the commission now, that requirement never really existed.

Instead, the commission's "general practice of requesting a significant excerpt" is simply a way "in which the commission attempts to ensure that it has sufficient information regarding what was said" during the broadcast. In its most recent KROQ decision, the FCC seems to be saying that a CD that *might* focusing the commission's, and licensee's, attention on what was actually broadcast.

But now the commission has indicated that it will be willing to consider materials that may not have been broadcast at all. And faced with consideration of such materials, the licensee now will have the difficult, if not impossible, burden of proving a negative.

That is, if a complainant now alleges the broadcast of offensive language and provides, for example, a CD that contains offensive language, it will be up to the station to state unequivocally that that CD was not in fact broadcast on the station. But how do you prove that, especially if you don't maintain an infinite library of logger tapes?

In the KROQ case, the station admirably declined to state unequivocally that it had not broadcast the unedited version, presumably *not* because the station thought that it had in fact broadcast the unedited version, but rather because it could not prove that it hadn't.

See COLE'S LAW, page 30 ▶

Interep: Affluent Adult Market Gains Ground

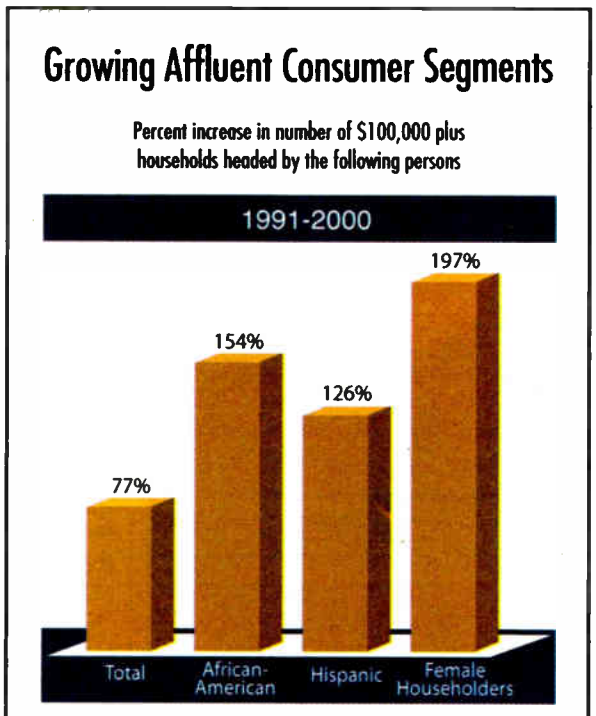
A new Interep study finds the affluent adult market jumped 21 percent over the past year and a half.

"Reaching the Affluent Consumer" profiles the 31.6 million affluent adults (16 percent of the population) who live in U.S. households with yearly incomes of $100,000 or more.

Despite recent economic troubles, the number of affluent adults increased from 26 million in 2000, or 13 percent of the population. 1997 numbers reveal affluent adults constituted only 9 percent of the population.

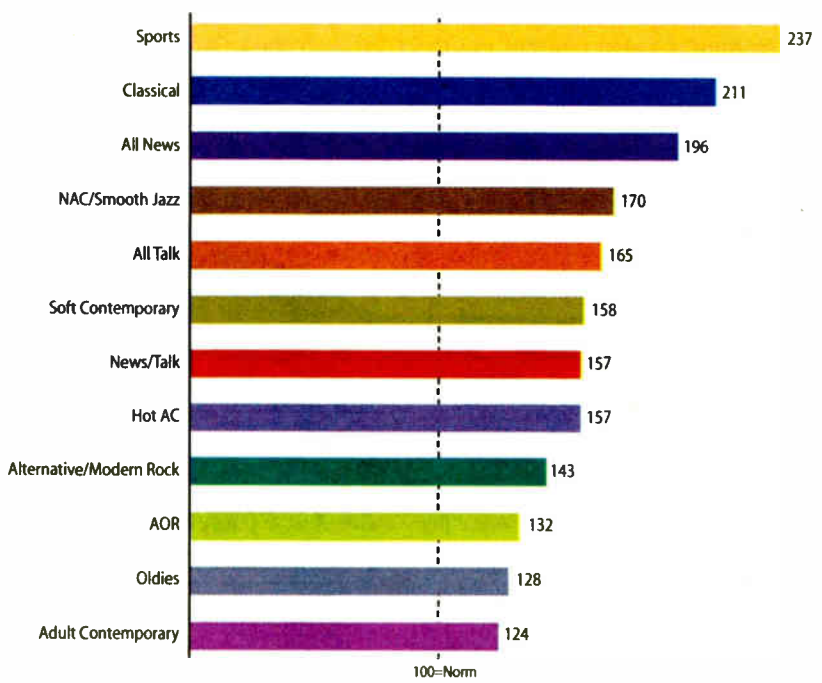
"The number of minorities and women living in $100,000-plus households continues to increase," stated Michele Skettino, Interep vice president of marketing communications.

"This means that marketers will need to expand their approach to targeting affluent consumers in order to fully capitalize on all segments of the current affluent community."



Radio Formats With Highest Concentration Of Affluent Listeners

A wide variety of radio formats have a higher than average concentration of listeners from $100,000 plus households. Those with the highest concentration of affluent listeners include the Sports, Classical, All News and Smooth Jazz.



World Radio History

Subscription

▶ Continued from page 25

and audio quality from Real's earlier premium offerings. With the new service, streamed audio feeds escalate from the standard 32 kbps to 64 kbps.

"We've found that nine out of 10 people can't distinguish that (64 kbps) quality from CD quality," said Larry Jacobson, president and COO of RealNetworks.

With RadioPass, a "Now Playing" feature shows what songs are in play on 50 new ad-free music channels. The service also offers subscribers access to global talk radio schedules with links to stations where a particular show might be playing at the moment.

The new universal media player allows access to 3,200 Internet radio stations regardless of whether that station is being streamed in RealAudio, Windows Media, Apple Quicktime or another supported audio format.

The alliance with KPIG, however, was clearly RealNetwork's crown jewel in announcing the RadioPass service. Only weeks earlier, the station had announced that it would discontinue streaming its popular programming due to the increased cost of paying music royalties under a fee schedule set by the Librarian of Congress.

RadioPass has been set up as an extensible, scalable model for Webcasters who find the new economics unfavorable.

— Rob Glaser

The end of KPIG's Webcast had been a symbolic blow to streaming media. The station became the nation's first full-time commercial Webcaster on Aug. 2, 1995, just months after Glaser's company introduced the first streaming audio technology.

"Work with the thought leaders and the rest will follow," Glaser said as he embraced "Wild Bill" Goldsmith, KPIG's self-described "Webmaster, GeekGuru, programming consultant and occasional fill-in DJ."

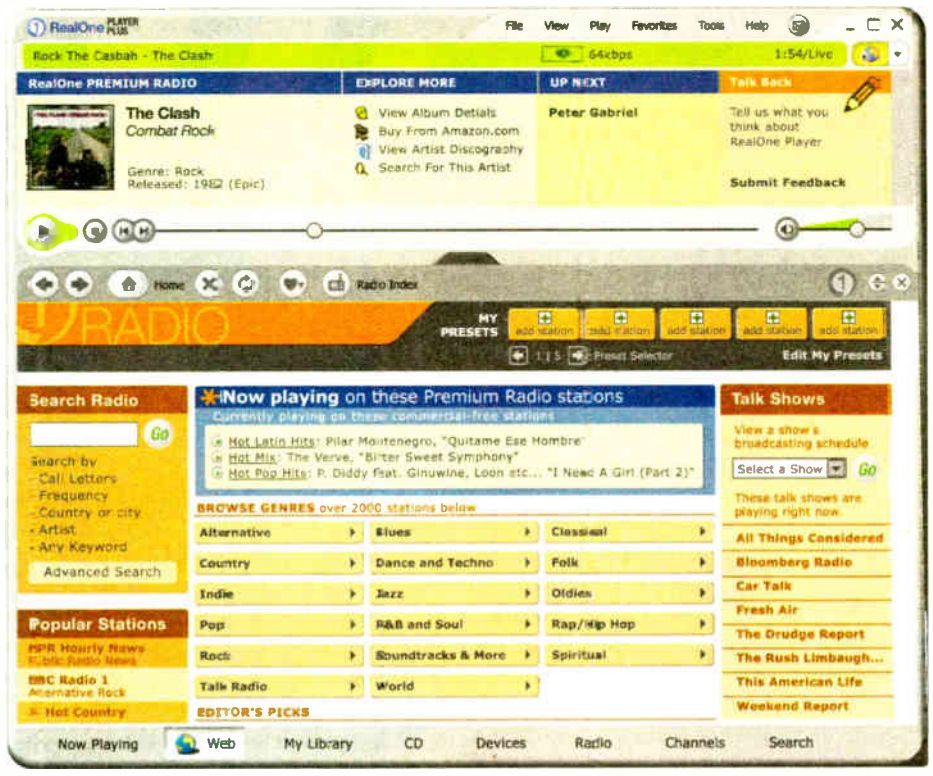
'Bring it back!'

Goldsmith, who led the original KPIG Webcast project, said the station had an outpouring of complaints from its estimated 250,000 online listeners after discontinuing the free Webcasts.

"So we started looking for ways to bring the station back online in a way that would make sense," he said. This effort led to the deal with RealNetworks.

Goldsmith said the subscription model not only allows KPIG's Webcast to be profitable after paying the music license fees, but it offers Internet listeners a commercial-free experience with audio quality that equals the station's FM signal.

"One very innovative thing that we're doing is completely replacing all of our commercial content on the FM station with music content for the Webcast," he said. "We are generating



RealOne Player Plus

— on-the-fly and in real-time — a second commercial-free stream."

KPIG encodes that stream at its studio near Santa Cruz and sends it to Seattle for national distribution over the Real Broadcast Network.

One technical challenge was how to remove commercials from a continuous live program feed. Limited automation provided the answer. As soon as a commercial break starts on the FM station, Goldsmith said, a custom automation system selects a song that fits exactly the time window of the commercials. (The automation software, written by Goldsmith, will be released as a Linux-based open-source project near the end of the year and available from freeradio.com.)

"If we have three minutes and 12 seconds of commercial material, it picks out a song that 3:12 long," he said. "The DJ can see a list of other songs that are the same length that can replace the automated selection. The DJ has complete control over the Web listener's experience. We will soon add the ability for the DJ to program that period live so he can talk directly the Internet audience."

Goldsmith said that prior to the formal announcement there had been rumblings in the radio industry about KPIG's association with RealNetworks and he has been receiving calls from other broadcasters who are interested in the new business model.

"Some said this is the way they want to present their programming on the Internet. This is a way to offer a superior product to listeners and guarantee a revenue stream to cover costs."

The subscription model, Goldsmith warned, probably will not work for all stations, especially those owned and programmed as a group by large broadcast owners.

"Most radio stations are doing exactly what other stations are doing everywhere else in the country," Goldsmith said. "There's not a lot of motivation for listeners to seek out or pay for content online that they can easily get free on FM."

KPIG works online because its programming is different from what's usually heard on FM radio, Goldsmith said.

"We are closer to free-form FM than anybody else in the country. We are an eclectic kind of rootsy blues slash acoustic-based rock station. We play almost nothing that's popular and none of the hits. We play a lot of older classic rock artists, but we tend not to play the same songs."

KPIG's "jocks have complete control over what gets played on their shows," Goldsmith said. "They know the music forward and backward and we depend on their knowledge of the music. There's not one song at KPIG that a jock has to play."

The old days

KPIG(FM), which serves the Salinas, Monterey and Santa Cruz area south of San Francisco, is owned by Mapleton Communications of Monterey.

On its Web site, the station describes itself: "We're an anachronism — a throwback to the days when real DJs picked out the music, and listeners expected something more from a radio station than just a couple of hundred songs repeated over and over, with some 'big voice' guy yelling about how great it all is.

"We're also — to the amazement of all of the radio 'professionals' who make the rules we thumb our noses at — very successful, though we try not to let it go to our heads."

The free version of RealOne Player for Windows can be downloaded from www.real.com. RealOne Player Plus, with additional features including universal playback, is available for $19.95 or as a free component of RealOne SuperPass or RadioPass. The SuperPass service, available now for Windows only, was expected to be available for the Macintosh OS X platform shortly.

STATION/STUDIO SERVICES

SPACE AVAILABLE
Call Simone For Details
1-703-998-7600 ext. 154

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 **1-703-998-7600, ext. 154.**

Modular Sound Isolation Studios

For the best performance, choose a modular enclosure from Acoustic Systems for your studio's sound foundation.

ACOUSTIC SYSTEMS
The science of silence

800/749-1460
FAX: 512/444-2282
www.acousticsystems.com
e-mail: info@acousticsystems.com

World Radio History

TOP SELLERS

RE20/RE27 – Famous for Eliminating Proximity Effect

The venerable Electro-Voice RE20 dynamic cardioid studio mic is a favorite of broadcasters and engineers worldwide and built extremely durable. Its patented, Variable-D® design is famous for eliminating bass-boosting proximity effect when close micing and its bass roll-off switch helps to shape low-end response. An internal element shock mount reduces vibration-induced noise. Frequency response is 45 to 18,000 Hz.

Similar to the RE20, the RE27ND is a N/DYM® dynamic cardioid microphone. The neodymium alloy magnet technology provides wider frequency response and higher output.

The Electro-Voice 309/A is the high-quality Electro-Voice suspension shock mount. Black.

RE20 List $798.00 **$399.00** RE27 List $840.00 **$449.00**

309A List $178.00 **$99.00**

Symetrix

SALE $488.00

Industry-Standard Voice Processor

The Symetrix 528E is the broadcast standard analog voice processor with 5 major functions in a single-rack-space unit. **Features:** microphone preamp with a switchable 15 dB pad; front panel mic/line level switch; 48-volt phantom power; voice symmetry switch (phase rotator) that corrects for excessive positive or negative signal peaks; de-essing with frequency and range controls; compression/limiting with downward expansion; 3-band parametric EQ. Balanced XLR mic and line level inputs; balanced XLR and unbalanced 1/4" outputs; 1/4" in and out patchpoints on each section.

528E List $749.00 **$488.00**

Hafler

SALE $99.00

SALE $999.00

APHEX SYSTEMS

World-Class Aphex Compellor Compressor

Intelligent Compressor

The renowned dual-channel 320A delivers intelligent compression, levelling and peak limiting simultaneously for automatic gain riding that is artifact-free. **Features:** dynamic silence gate and quick compression recovery; 3 modes of stereo/dual mono operation; comprehensive metering; balanced or unbalanced I/O via XLR connectors.

320A List $1,350.00 **$999.00**

Super Value Studio Monitor Only $99.00

This is absolutely the best speaker buy of the year! The Hafler M5 is a passive reference monitor utilizing an elaborate crossover network and tweeter overload protection. The result is a compact package offering high power handling and unmatched sound quality for the price. **Features:** 1" tweeter, 5.25" woofer; magnetically shielded; power handling 20 to 200 watts. Priced as each.

M5 List $124.50 **$99.00**

A R T
APPLIED RESEARCH AND TECHNOLOGY

SALE $199.00

100 Watts of Power

Need a boost in the power amp department but short on rack space? The SLA-1 from is rated at 100 watts/channel into 8 ohms. This slim amp features a toroidal transformer, XLR and 1/4" inputs, ground lift switch, fan-cooled design, power, clip, signal and protect LEDs, all for a real low price!

SLA1 List $279.00 **$199.00**

Powered

FOSTEX

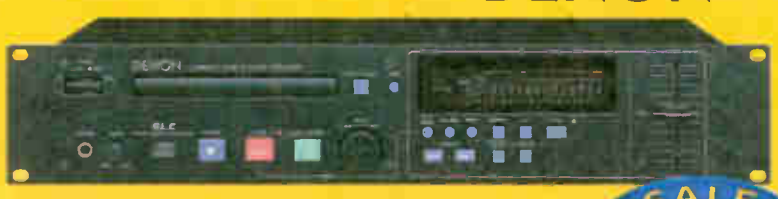
SALE $159.00

Mini-Monitor

6301BEAV are the perfect personal powered monitors. **Features:** 4" speaker; built-in 10-watt amplifiers; magnetically shielded to protect nearby computer monitors; rotary level control; automated protection circuitry; balanced XLR and phone jack inputs. Priced as each.

6301BEAV List $189.00 **$159.00**

DENON



SALE $469.99

Professional CD Player with XLR Outputs

The Denon DNC630 CD player is built robust for continuous use. **Features:** instant start; auto cue; cue to audio with adjustable threshold; variable speed; time remaining display; recue or next functions; program play with 25 tracks; fade-in function; balanced XLR and unbalanced RCA outputs; coaxial digital output.

DNC630 List $599.00 **$469.99**

Remember – BSW Offers Package Pricing.
Call Us with Your Next Quote.

World Radio History

The World's Best

EC

BROADCAST SUPP

VoxPro Availabl

from Audion

Fast, Two-Track Digi

Audion's VoxPro PC software system i recording and digital editing system use at stat ons nationwide. VoxPro PC softw USB- or Serial-port controller for fast re Key" playback. In addition to importing seamlessly networkable, allowing files to between the production room, on-air st software required).

VoxPro PC software is optimized to qu phone conversations for on-air use. The color sound window displays your record are non-destruct ble. Edits are stored in unlike other software products, all edits

All VoxPro PC users have their own pa create their own recordings and Hot Ke for instant playback when the correspon appear on the control panel's backlit LC

Call or go to our webs te to get VoxPr

Order Today 1.8
Go Online ww

Source for Professional Audio Products

BSW®

LY WORLDWIDE

PC Now
e at BSW
Laboratories

tal Editor for Radio

s the fast, easy-to-use two-track
d by deejays, producers and reporters
are comes with an accessory hardware
cording/eciting as well as on-air "Hot
nd exporting files, the system is
be moved instantly back and forth
dio and newsroom (optional PC network

ickly record and edit voice-overs and
single screen interface with large full-
ng the instant you make it. Masters
their own folder on the same page (and
remain with the original file).
sword protected space where they can
s. Anything recorded can be assigned
ding Hot Key is pressed. Hot Key titles
directly above the corresponding key.
PC today.

00 . 426 . 8434 or
w.bswusa.com

INCREDIBLE DEALS

HHB
FIRST WE LISTEN

Get this Complete HHB MiniDisc Reporter's Kit!

SALE $1,395.00

Housed in a waterproof Pelican case, the Reporter's Kit contains an HHB PORTADISC MDP500 MiniDisc recorder, Sennheiser MD46 meanviewer's microphone with cable, universal charger/AC adapter, two battery saddles, a USB cable and six 80-minute MDs. HHB's rugged MDP500 uses ATRAC compression to ensure optimum sound quality. Sonic performance is further enhanced by a quality balanced microphone input circuit, which also features switchable phantom power, limiting and ganging. Connectivity is comprehensive, including balanced XLR mic/line inputs, RCA phono line outputs, headphone jack, coaxial and optical S/PDIF digital I/O, and a USB interface. A 6 second pre-record buffer ensures you never miss a take.

MDP550R/KIT List $1,995.00 **$1,395.00**

Save on MiniDiscs

BSW carries high-quality recordable MiniDiscs. Get this 20-pack for only $33.00.

MD74MEM20 **$33.00**

SALE $89.00

Buy in Bulk – Rack-Shelf 4-Pack

Middle Atlantic Products, Inc.

Rack 'em up people. This heavy duty 2-space rack shelf is perfect for racking gear without rack ears. Fits equipment up to 17-3/8" wide. Save money with this exclusive 4 pack!

U2PACK List $223.00 **$89.00**

Digigram

SALE $399.00

Top-Quality Card

This high-quality, versatile sound card for your computer includes balanced analog inputs and outputs with 24-bit converters (as well as digital input/output in AES/EBU or S/PDIF formats). It's designed to work with a wide variety of applications using Microsoft's WAVE protocol (under Windows 95/98 and NT 4.0) and the MacOS Sound Manager (under MacOS 8.x). An ASIO driver is available for 24-bit operation with compliant applications.

VX222 List $549.00 **$399.00**

KOSS

Incredible Value 5-Pack Headphones!

Koss makes great low cost headphones. This lightweight, sealed ear TD61 delivers great sound, provides good isolation to help prevent feedback and is very affordable. Get them in our exclusive 5-pack for less than $18.00 each.

TD61PKG **$89.00**

5 Interview Mics Only $99.00

You'll be pleasantly surprised at the first rate sound from these very well built, very inexpensive mics. Includes a hard case for each and an on/off switch. An unbelievable deal from BSW!

You can also purchase multi-colored windscreen 5-packs for your Behringer microphones for only $24.00!

XM2000SPKG **$99.00**

WS912PACK **$24.00**

HURRY, Sale Ends 10/31/02

World Radio History

BOOK REVIEW

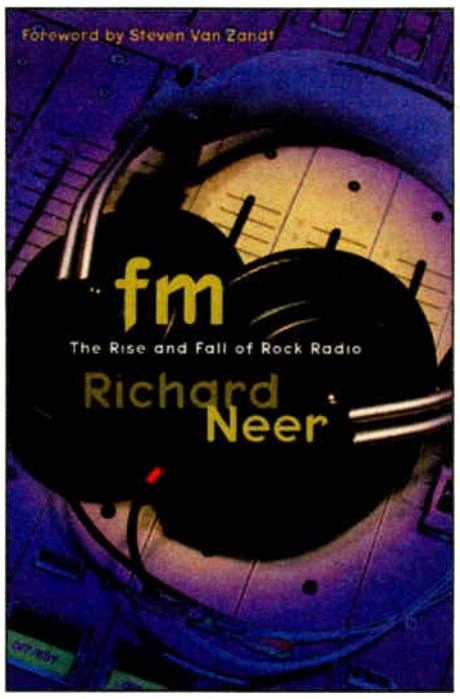
FM: What a Wild Ride It Was

by Peter King

"Why did you become a disc jockey?" It is a question most jocks have been asked. For many in the past, the answer was, "Because I get to play the songs I like on the air."

Of course, these days, that's the wrong answer; it's been decades since most jocks got to choose the music for their shifts. But in the pre-consultant 1960s and early '70s, it was a way of life for progressive or free-form radio.

Richard Neer's "FM: The Rise and Fall of Rock Radio" tells the story of the birth, evolution and what he calls the eventual death of rock radio. Like most memoirs, "FM" comes with a point of view, but it appears Neer went out of his way to get the recollections of others rather than rely only on his memory and opinion.



Lost jobs, backstabbing, format changes, drug abuse — and plenty of fun stories about FM's pioneers.

Neer's radio years

These days, Neer is a talk-show host on Infinity's WFAN(AM). But his years as a personality and program director for rock radio legend WNEW(FM) give him a unique vantage point to decades of change.

The scope and revered place of WNEW's place in radio history are summed up by the next-to-last line of the book, which calls WNEW "the one station that broke all the rules and got away with it longer than anyone else." Start with that thought, then go back to the beginning.

The primary focus of "FM" is on WNEW, one of the city's first progressive stations. Neer also writes about a relatively short experiment in free-form radio at WOR(FM) in New York. That station's demise led to the seeds that spawned success at WNEW by then-General Manager George Duncan.

Duncan understood that rock music was changing; its lyrics were becoming more meaningful than its early "moon, June and spoon" mentality, and in 1967, there was a new emphasis on albums rather than short 45-rpm singles, the mainstay of top-40.

Duncan professed the station would go "all the way with meaningful music," but Neer writes Duncan probably had no idea of what he was starting. As former WNEW personality Jonathan Schwartz said, "We spoke Russian, they (management) didn't understand it." But "they" went along with it.

Circumstances helped fuel the change; by late 1967, the FCC was beginning to change its rules about FMs simulcasting their more successful AM sister stations. The numbers of high-quality FM receivers for home stereos and cars were increasing, and although it would be more than a decade before FM passed AM for listeners in music formats, the opportunity was there.

Schwartz, Bill "Rosko" Mercer, John Zacherle and Scott Muni were hired to lay the foundation for WNEW's progressive format in late 1967 and early 1968. (Alison Steele was already there, a holdover from the station's old "all-female" jock lineup.)

They would become staples on New York radio for decades, as would future stars like Vin Scelsa, Pete Fornatale, Dave Herman, Dennis Elsas and others who would remain on the New York airwaves into the 21st century.

WNEW was unique, depending on the personality of each jock to set the tone — and the music — for each shift. There was no Selector back then, no grid cards to tell jocks what to play and when to play it. If an album wasn't part of the station's library, chances are the jock brought it in from home.

It was a mulligan stew of music. At any given moment in the station's earliest days, listeners never knew if they'd hear the Beatles, Frank Zappa, Led Zeppelin or Miles Davis. WNEW brought listeners music not heard on any other station.

Neer writes that as a child of the '60s and early '70s, free-form radio essentially was improvised — but that doesn't mean it wasn't thought out well. Jocks not only had the freedom to choose music; they took care and time to plan their sets based on songs that sounded good together, or expressed themes. They were allowed time to talk, to express their views and opinions between musical sets, which helped listeners feel kinship with the personalities, even an ownership stake in those stations. Listeners felt that WNEW and its counterparts in other cities were there for *them*, Neer writes; and they pledged their loyalty.

Radio revolution

While Neer primarily writes about the radio revolution at WNEW, it doesn't take a New Yorker to enjoy this book. He pays plenty of attention and respect to changes around the country. Chapters are devoted to the stories of stations like San Francisco's KSAN(FM), with programmer and personality Tom Donahue; WBCN(FM) in Boston; and WMMR(FM) in Philadelphia.

There are lots of stories about the jocks and programmers. The competition and in-fighting among the eclectic group at WNEW played a prominent role in the station's success and ultimate failure; Neer writes of parades of programmers and executives who attempted to keep the flame lit — or worked to extinguish it.

By the way, skeptics who consider current Viacom president and Chief Operating Officer Mel Karmazin the Antichrist might also be surprised to read Neer's recounting of Karmazin's positive role in managing WNEW during some of its most successful years. (Viacom owns the station, now running a talk format.)

"FM" also addresses the rise of consultants, in particular Jeff Pollack and the team of Kent Burkhardt and Lee Abrams, now with XM Radio, whose "Superstars" format changed album rock radio. It looks at how progressive radio stations evolved into moneymaking album rockers as owners realized the potential gold mines they had in their FM signals.

Neer shares the spotlight with friend Michael Harrison, whose career paralleled his own for a time in New York. (Harrison is the publisher of "Talkers," an industry trade for talk stations.) The personal experiences of both provide a solid foundation for understanding what rock radio was during the early '70s and what it became.

Their careers are talked about in the context of the greater sum, not in the "glory" of their own accomplishments. The personalization of the story makes "legends" like Muni come to life, rather than seem like figures in a history book.

There's some interesting trivia as well; for example, how the "WPLJ" calls came to being, the future talk show host who was part of WNEW's experimental all-female lineup and the true inspiration for the TV series' "WKRP in Cincinnati" infamous "turkeys don't fly" Thanksgiving episode.

While there's no shortage of trauma and drama — lost jobs, backstabbing, changed formats, drug and alcohol abuse — the book also provides an abundance of fun stories about some of the best-known people in radio and rock and roll.

"FM" may not make you long for the good old days but it's a great revisiting of the emergence of FM radio. Some of the stories will amaze young veterans, who may find it incredulous that jocks, at one time, were allowed to program their own shows. At the least, "FM" will help with the understanding of how rock radio got to its present state.

This 367-page hardcover from Villard Books lists for $24.95 and is available from Amazon.com. Its ISBN number is 9462953.

Peter King is a CBS News Radio staff correspondent based in Orlando, Fla., who, as a top-40 jock during the '70s, tried to bend the rules when he thought the PD wasn't listening. Reach him via e-mail to pkingnews@aol.com.

Cole's Law

▶ Continued from page 26

But the commission then jammed that back down the station's throat, stating that "a licensee may not avoid liability 'by claiming that he doesn't know what did or did not go out over his station.'"

So the take-home message here is that licensees must continue to be concerned about possible indecency complaints, and should seek to establish internal programming policies that will enable them to state, unequivocally, that particular material was *not* broadcast. That may be an impossibility, but it certainly seems to be what the commission now expects.

But against that somewhat discouraging news, let's look at another case that suggests some betterment in the area of indecency regulation.

In June, the FCC's Enforcement Bureau had occasion to consider a complaint which alleged that an announcer on station WGR(AM), Buffalo, N.Y., had (a) invited listeners to call the station to discuss "who in the NHL they would 'piss on,'" and (b) used the term "sawed-off little prick." Amazingly, the bureau expressly found the use of those terms *not* to be indecent.

According to the bureau, neither "prick" nor "piss on" was being used by the announcer to "describe or depict" a sexual or excretory activity or organ.

Instead, "prick" was merely a "vulgar insult," while "piss on" (and the related expressions "pissed at" and "pissed off") are "commonly used slang terms indicating or describing a sense of anger."

The bureau held that these expressions, as used here, are "clearly not indecent."

This is something of a breakthrough. Students of indecency regulation will recall that in the seminal case of *FCC v. Pacifica Foundation*, the indecent broadcast in question was George Carlin's monologue focusing on "seven dirty words."

Dirty words

One of the points of the monologue was to demonstrate how the words in question really had little if any connection to sexual or excretory functions. And yet it was the broadcast of the Carlin monologue that opened the way for aggressive commission regulation of the use of particular language on the air.

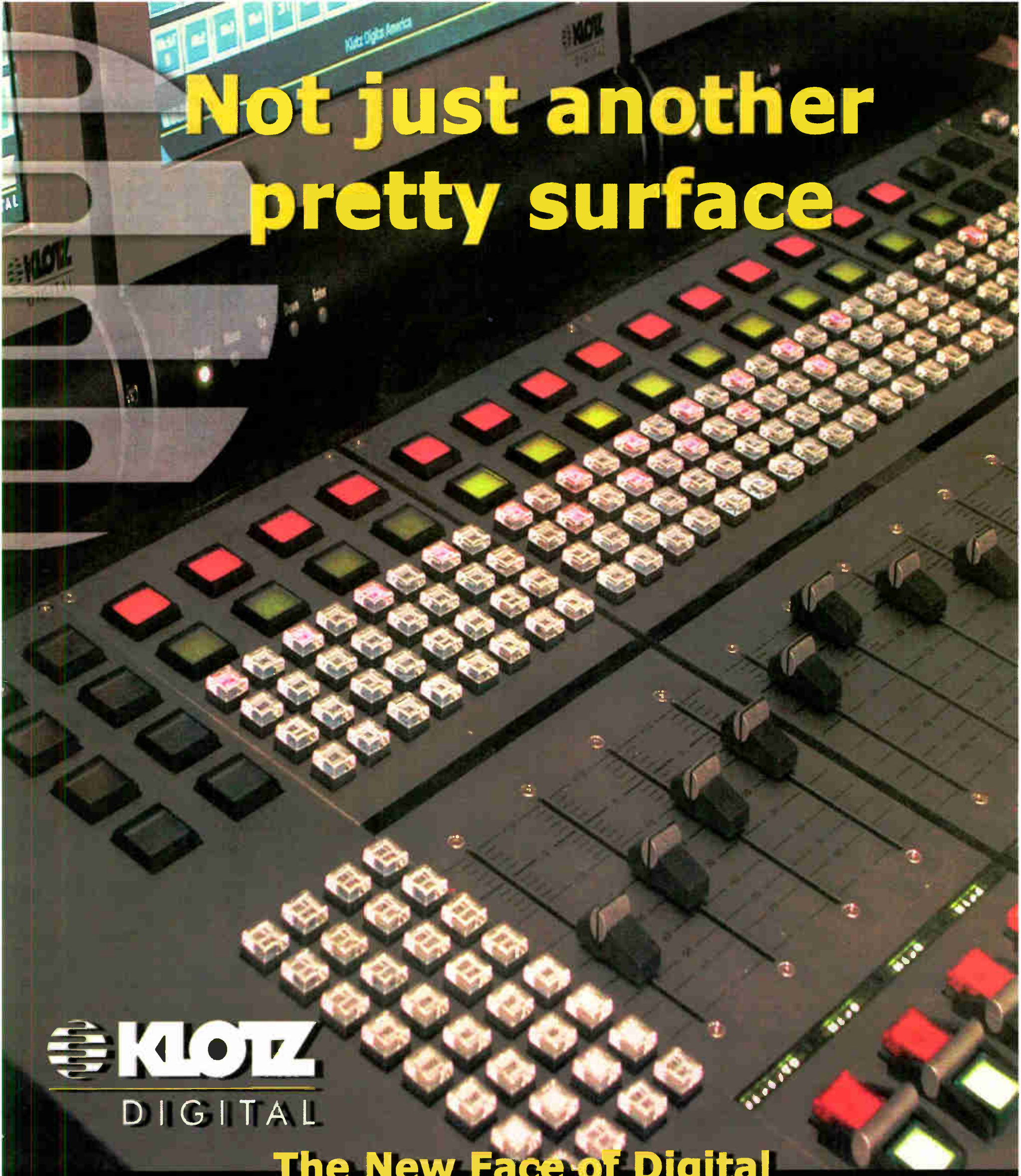
In the WGR case, the commission appears finally to be recognizing what Carlin was trying to tell it 25 years ago — that particular words themselves have no inherent "bad" meaning or effect, and that any effort to proscribe the broadcast of particular words is, at best, ill-advised.

So it appears that, for the time being at least, the terms "prick" and "piss off" (and variations thereon), if used properly, will not be deemed "indecent."

If you have any questions about the impact of the recent indecency decisions on your own operations, contact your communications counsel.

Harry Cole is a member of the law firm of Fletcher, Heald & Hildreth, P.L.C. He can be reached at (703) 812-0483 or via e-mail to cole@fhhlaw.com.

World Radio History



World Radio History

Promotions

▶ Continued from page 25

departments.

"The radio guys could promote it and sell it," he said. "The outdoor division could promote and sell. Sports arranged for the athletes, entertainment arranged for the music. Each department had a hand in it and made it successful."

The event featured professional athletes from all of the Washington-area professional teams, an appearance by Howie D. of the Backstreet Boys and 30 interactive games for children and adults covering 100,000 square feet in the Washington Convention Center.

Unique challenges

Selling an event of that magnitude presented special challenges.

"Creating the concept and painting the picture of what the event will look like — that's a hard thing for some people to wrap their arms around," Zagami said.

The terrorist attacks of Sept. 11, 2001, added to the challenge. Pitching a new event in the wake of the attacks was difficult on many levels.

"Nobody wanted to hear a sales pitch at that time. Efforts had to stop for about three weeks," Zagami said, "Not only did the clients not want to hear the pitch, our reps didn't want to pitch, not 10 miles from where people had just died."

Despite the challenges of promoting a new concept and working through the aftermath of a national and local tragedy, the Rock 'N Sports Experience was successful.

"We were happy with the sales effort," Zagami said, "We were happy with the revenue that we brought in and we did make money. On a first year event, not losing money is a big goal. We didn't lose any money."

And money is what it's all about. Nontraditional revenue consultant Max Schmitz of Maximillian Communications, said he does not see many clusters working events as a unified project.

"I think that the majority of the groups that I work with, honestly, are not doing a lot of cluster promotions," Schmitz said. Instead, he sees clusters going back to the individual stations for promotional events.

"A lot of people are trying to do cluster selling," Schmitz said. "Usually there's a weaker station in the cluster and that station winds up getting bonused or something. That's not very good from a revenue standpoint."

While Schmitz said he might sell the same general idea to one client for all of the stations in a cluster, he would prefer to individualize the idea for each station in the cluster.

"My advice has always been the same," he said. "I look at having a cluster to sell as just having more tools in the toolbox. You look at what the client needs. It might be that two of the stations work very well for what they need or it might be all of them. And then you go back to the toolbox and select the right tool."

Sometimes, you need to use the right combination of the tools in the box. Bryan Paul, marketing and promotions director for the Queen Bee stations in Spokane, Wash., uses all seven of the stations in his cluster when the need arises, typically for charity events, but more often pairs his stations with his secret weapon: a cluster-owned television station.

"It's really a huge advantage," Paul said. "We're able to use any unsold inventory, when we have it. It's a great extra tool."

I look at having a cluster to sell as just having more tools in the toolbox.

— Max Schmitz

Paul's cluster has one promotions department for the entire group. For big events, he said, one station typically will take the lead in promotions with one or two more acting as support stations in conjunction with the television station.

Another advantage, Paul said, is using one person to centralize the project.

"In cluster promotions, one of the keys is having a central hub person who knows everything," he said.

The Queen Bee cluster uses Promo Suite software from Broadcast Manager Inc. to coordinate between the promotions, sales and on-air staff. The software helps to prevent lost spots and mistakes.

"If it's not in Promo Suite from the sales staff," Paul said, "then it's not happening."

Pulling off a cluster-wide promotion takes time and organization. Zagami said his staff already is selling the second Rock 'N Sports Experience, scheduled for February. He said his cluster promotion was a success because it provided something for everybody and made the most of the tools at his disposal within the cluster.

"It was extraordinarily successful from our standpoint," he said. "We created an event that, hopefully, will go on every year."

Lyssa Graham is a free-lance journalist and morning radio personality based in the U.S. Virgin Islands.

Correction

The name of the Source Magazine Radio Network was incorrectly reported in the story "Source, XRN Launch New Network" in the Aug. 14 issue of Radio World.

AP Acquires Web-Based News Service

Associated Press has picked up Capitol Wire, which operates a subscription Web site providing news from state capitals in Pennsylvania, New York, New Jersey, Ohio and Virginia. Terms of the asset purchase agreement were not disclosed.

The site serves subscribers affected by state legislation, regulations or contract bids in various industries. AP said the deal strengthens its offerings in regional markets for government and corporate information.

Louis D. Boccardi, president and CEO of AP, said, "We are already in the business of licensing certain content to corporate and government customers and this acquisition provides a sound base to extend our reach in that growing market."

Peter J. Shelly, a founder, stays with the company, which was begun in 1998 and is headquartered in Middletown, Pa.

'Stealing' News — Is It Legal?

The following is excerpted from material provided by AP Broadcast.

Top myths about rewriting someone else's news reporting:

1. *All news on the Internet is in the public domain.*

News on the Internet or on the radio, television or in newspapers is not automatically in the public domain. In fact, copyright law and state misappropriation law protect news, including text, photographs, videos, graphic images and audio found on the Internet, in a newspaper, on television or radio, or anywhere else.

2. *It's OK to rewrite someone else's story for my news.*

Courts protect the investment of news organizations in gathering facts through the law of "hot news" misappropriation. While the news is "hot," you can't take it from someone else. Copyright law protects the story and the aggregation of facts in the total story. Don't cheat. Only use news you are licensed to use or gather yourself.

3. *Copyright protects only "artistic" works.*

Copyright does not protect just "artistic" works like movies, novels and songs, but news as well. This includes news stories, photos, videos, graphic images and audio found on the Internet, in a newspaper on the television or radio, or anywhere else.

4. *Because I'm using material for "news purposes," it's automatically OK.*

There is no general "news purpose" exception to copyright infringement —especially if you use the copyrighted works of another news organization in creating your news. Taking news from a competitor or another news organization is almost never going to be considered a "fair use."

5. *Copying seven seconds of audio is a "fair use."*

Copying *any* portion of audio, text, video, graphics, photographs, etc., can violate the copyright law. There is no minimum amount for copyright infringement — copying two notes of music has been alleged to be a copyright infringement.

6. *As long as I give credit to my source, I'm OK.*

Some people believe that they can take news from someone else as long as they give the source credit (e.g., "According to The Associated Press ... "). However, attribution is no defense to copyright infringement or to misappropriation. Only use news you are licensed to use.

7. *Unless there is a © or other copyright notice on material, I can use it.*

Long ago this was true — but not anymore. Even if there is no copyright notice on a work, it is protected by copyright law. And because copyright law is a "strict liability" law (like speeding), you can be found guilty even if you didn't know you were taking someone else's material.

8. *I got my news from a news service, so I have no worries.*

Just like speeding tickets, copyright liability is a "strict" liability. In other words, if the source you used for news took it without permission, your use of that news on your station makes *you* guilty of copyright infringement as well — even if you didn't know. Make sure you know your news service's source for its news.

Taking news from a competitor or another news organization is almost never going to be considered a 'fair use.'

9. *Copyright penalties are small and meaningless.*

Copyright violations are subject to severe penalties — including criminal penalties with jail time. Courts can award up to $150,000 per story copied — even without any showing of actual loss by the copyright owner. Furthermore, courts can make you pay the attorneys' fees for the copyright owner, which can be even higher than the penalties!

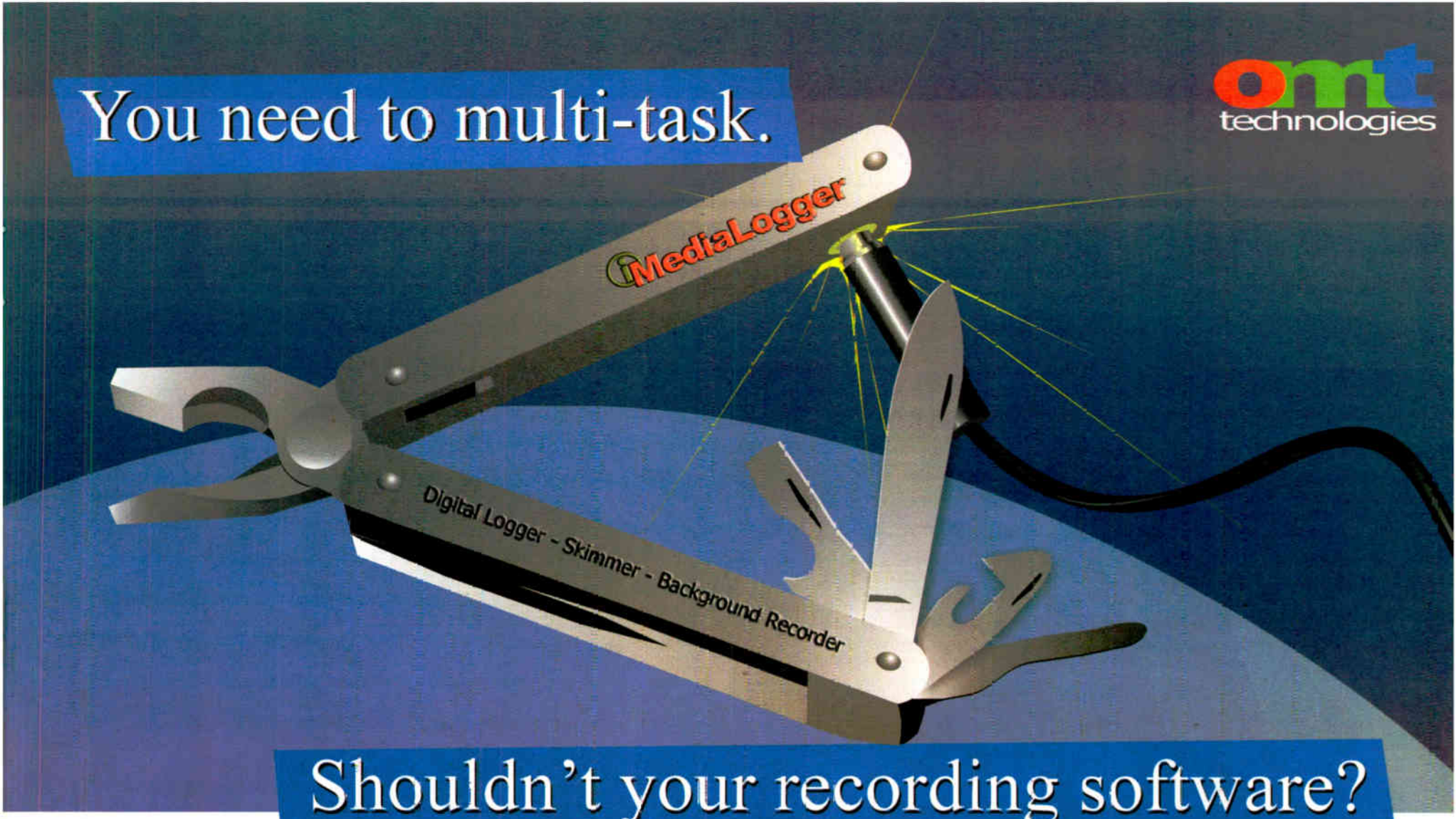
10. *There is nothing I can do about people stealing my news.*

Protect your investment in your own news — AP does. Federal and state laws prohibit people from using your news without your permission. If you see someone doing it, ask him or her to stop. If you see someone stealing AP news, contact us at *iprights@ap.org* and we will take action.

11. *I can share content with other stations in the market or in my group.*

If the content you plan on sharing contains *any* third-party content — news, information, a graphic, video, etc. — you may not be able to share it with another TV or radio station without violating your contract. Check your content provider's licensing agreement *before* you share.

World Radio History



iMediaLogger

From $695

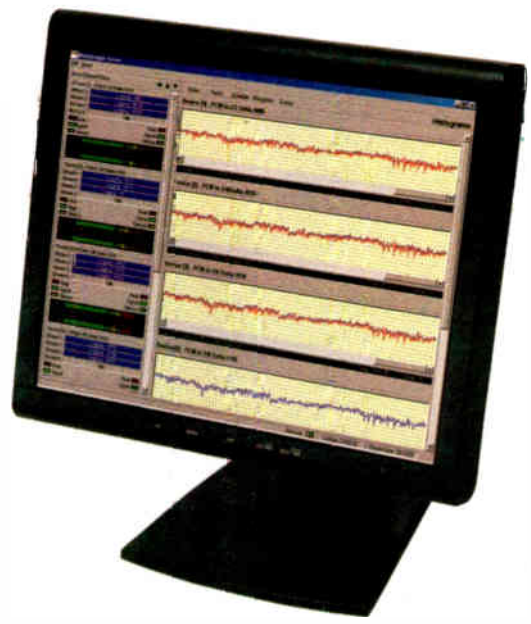
(ī-mē'dē-d-ə lô'gər) *definition:* The most complete, affordable, and easy-to-use, all-in-one automated audio recording solution available.

With today's ever increasing workload you have to do more with less and that's why having a multipurpose tool like iMediaLogger is key. Using a single computer workstation, iMediaLogger frees you from the costly maintenance of conventional and outdated equipment used for logging, recording, and skimming including reel to reel, DAT, and VCR recorders.

Used in hundreds of stations including all of the top 10 markets, this award-winning product allows you to:

- Simultaneously record up to 16 stereo or mono audio sources or streams
- Multiple compression formats
  - MP2, MP3, Windows Media Audio, Real Audio, PCM, and ADPCM
- Access your recordings anytime, from anywhere using its built in web browser interface
- Schedule time or closure based recordings
- Remotely configure and manage your iMediaLogger system

The next time you need to log, skim, or record, save yourself - and your station - plenty of time, money and headaches. With iMediaLogger, you will never have to change a tape again.



Winner of the NAB 2000
Radio World Cool Stuff Award

To learn more about iMediaLogger, visit www.omt.net or call 1-888-665-0501

World Radio History

Synergy

Combining the best in broadcast audio for 90 years

DENON

The first name in digital audio

Number One 一番

www.denon.com • Denon Electronics, 19 Chapin Rd., Pine Brook, NJ 07058 (973) 396-0810
Denon Canada, Inc., 5 - 505 Apple Creek Blvd. Markham, Ontario L3R 1B5 (905) 475-4085

World Radio History

Studio Sessions

Salem Unveils Fish Studio

See Page 36

Radio World — Resource for Radio On-Air, Production and Recording — September 25, 2002

PRODUCT EVALUATION

Joemeek Goes Micro With the MQ1

by Stephen Murphy

Desktop DJs and voiceover artists take note: Joemeek is coming over and he wants to move into your spare drive bay.

This preamp-compressor-equalizer is from the growing line of products named in Joe Meek's honor.

Fletcher Electronics, based in Torquay, England, is known for its line of bright green preamps and compressors inspired by Meek, the late pioneering engineer.

With the introduction of the MQ1 recording interface ($299.99), Fletcher takes classic Joemeek circuitry and retrofits it into a green drive bay-mountable box for the desktop recording market.

MicroMeek range

The MQ1 is one of several devices in the relatively new "MicroMeek" range. These diminutive products feature the same circuitry found in the bigger, more expensive Joemeek products but with fewer features (no analog VU meters, built-in power transformers or full rack cases).

in the back of the computer. This panel is host to a pair each of balanced 1/4-inch auxiliary inputs and main outputs. An XLR breakout cable emanates from the top of the panel, just under which is a +48-volt phantom power button.

The front panel of the MQ1 is densely populated with knobs, switches and LEDs, yet they are laid out in a logical manner.

A switch enables MicroMeek microphone or instrument input when turned on. When off, the auxiliary inputs are fed directly to the computer's sound card.

The next two controls are the input gain and compression knobs. Input attenuates the incoming level fed by either the XLR microphone line or 1/4-inch instrument jack. It has no effect on signals at the auxiliary inputs. The hybrid compression knob essentially acts as the optical compression circuit's "threshold" control.

The ATT button chooses between two preset compressor attack times (1 or 5 ms) and the REL button sets the release time of the compressor (500 or 1,500 ms).

Next is the Meekqualizer section, a three-band +/-16 dB EQ. The LF and HF knobs are shelving filters set to 80 Hz and 8 kHz respectively. The MF filter is a peaking filter centered around 1.8 kHz with a Q value of one.

OUT VOL is a final stage volume control for the output of the MQ1. It operates after the three-stage LED VU meter and does not affect the overload margin.

In keeping with the computer product paradigm, Fletcher Electronics forgoes a printed manual in favor of an electronic version provided on an enclosed "installation" CD. The CD contains demo software from Sonic Foundry, Cakewalk and others. I put installation in quotes because, with regard to the MQ1, there is no software to install.

Simplify

Here I think the MQ1 is being marketed in a misleading way and I am not sure why, for the MQ1 is a worthwhile idea that sounds great and is a great value.

Fletcher Electronics should be more straightforward with what it has: a single-channel preamp, compressor and equalizer that has no dealings with the host computer other than that they utilize the same power supply.

Yet the unit is called the MQ1 *PC/Mac Recording Interface* and contents of the package include the aforementioned *Installation CD* (though it requires installation drivers no more than any other preamp you own). A *26-way Audio/Data Cable* (which carries no computer data) attaches the preamp unit to the *MicroMeek Connection Card*, "requiring a free PCI or ISA slot."

This last bit is more than a little confusing because it clearly implies the ill-named Connection Card is a card that mounts in a card slot, though it is simply a back plane-mounted breakout panel to access the unit's audio I/O.

See JOEMEEK, page 39 ▶

The vocal quality that the MQ1 and similar Meek units produce is perfect for voiceover and broadcast use.

The audio signal path, however, has not been downsized — the MicroMeek line boasts the famous Joemeek sound as their big brothers.

The MQ1 mounts in a PC or Mac drive bay and works in conjunction with the computer's existing sound card. The unit derives its operating power and +48 volt phantom power directly from the computer power supply.

With the exception of a front-panel instrument 1/4-inch input jack, inputs and outputs are accessed via a panel mounted

AES Gets Back on Track in Los Angeles

by Brett Moss and Michele Kramer Peterson

Last year at this time there was serious discussion as to whether there would even be an AES convention for 2001 in New York after the events on Sept. 11.

Gory details and safety concerns notwithstanding, the AES committed to a December convention in New York. Although the event was understated, with not a lot of new products or selling, by all accounts the convention was deemed by organizers and most participants as a muted success.

Almost a year later, with continued sluggishness in the audio industry, no one expects an avalanche of new products. Yet there is an undercurrent of thought that AES 2002, set for Oct. 5-8 at the Los Angeles Convention Center, may offer more new products than expected.

Perhaps reflecting the growing dominance of digital media and audio/video media convergence, this year's keynote speaker will be Dr. Leonardo Chiariglione.

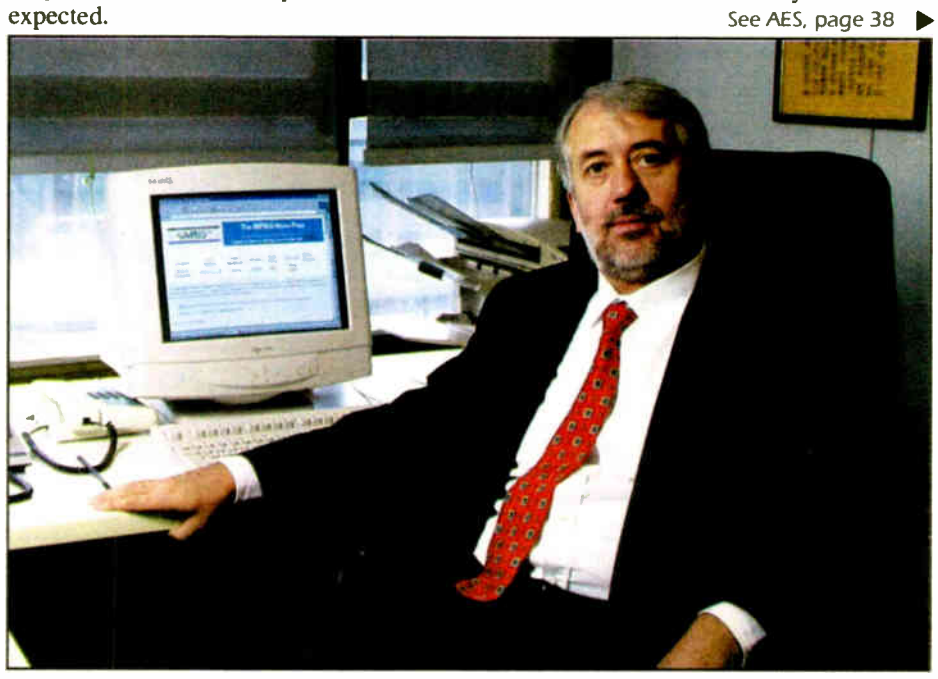
Keynoter

Chiariglione has been instrumental in the development of the MPEG specification and is involved with HDTV and media content delivery specifications.

Sessions and seminars will range from surround-sound miking techniques to line array theory to the ever-changing role of producer/engineer.

Technical paper sessions will include a session on audio networking and automotive radio. The session on Oct. 7 from 2-4:30 p.m., will include assessment of sound fields and the measurement of speech intelligibility in cars. Also being discussed will be "mutually immersive

See AES, page 38 ▶



Dr. Leonardo Chiariglione will speak at the AES show.

World Radio History

Salem Studio Catches a Fish

by Paul J. McLane

There's something fishy about KFSH(FM), 95.9 The Fish, in southern California — and that's just the way the station likes it.

The Salem Communications adult-contemporary Christian station has unveiled an aquatic-themed broadcast studio built by a technical team led by Salem Los Angeles Director of Engineering Mark Pallock and Chief Engineer Bill Sheets. The fish was a symbol for early Christians, and many biblical stories in both the Old and New Testaments involve fish.

Effects in the studio include sand-patterned carpeting; ceiling-to-floor beveled glass wrapping the studio in an aquarium motif including shells, starfish, bubbles and sea plants; a tabletop with a 3-D water effect; and a console with swordfish on the sides.

Mark Pallock and Bill Sheets come up for air from Salem's aquatic adventure.

Prominent among the studio furnishings is a 6-foot illuminated fish that holds a CD player, telephone and ISDN gear. Talent stools are upholstered in a seaweed pattern. Colored clamshell lights hang overhead.

On the wall is a virtual fish tank with an assortment of tropical fish and a projection of the 95.9 The Fish logo. The project took about a year to complete.

Clamshell track lights help illuminate the new studio.

Salem Los Angeles stations also include KKLA(FM), KRLA(AM) and Internet station Christian Pirate Radio.

"We're always looking to do the unexpected, to bring our listeners even more," stated Dave Armstrong, vice president and general manager of Salem Los Angeles, in an announcement about the project.

"Mark, Bill and company have done a tremendous job of creating a state-of-the-art facility with a lot of creativity that provides a really fun environment for our on-air personalities. We look forward to inviting in music artists and other guests who'll appreciate the whimsical atmosphere."

Radio World inquired further with Mark Pallock.

RW: What was the reason for the project?
Pallock: The reason we went with this type of studio is because we could. Most studios in our Glendale facility are very nice but are very institutional-looking, and we wanted something that would make a statement.

RW: What unusual problems did you encounter?
Pallock: The hardest part of this project was schlepping the fish furniture up five flights of stairs. The tabletops are designed to look like fish and are about 7 to 8 feet long and weight a couple of hundred pounds each.

RW: What was scope of the job?
Pallock: The station was purchased from Clear Channel in August of 2000; the call letters at the time were KXMX. When we acquired the 95.9 frequency and changed the call letters to KFSH, we relocated the studio to a small studio here in Glendale, which up to that time had been used as a small production suite.

It was cramped even for one person, but when it was decided to move Lauren Kitchen out from Nashville and have a two-person morning show, we knew we would have to build a larger studio. Thus the Fish was born.

RW: Did you put in new equipment? Did the station upgrade to digital?
Pallock: All equipment used on this project was brand-new, state-of-the-art *analog* equipment. (Some gear) may have digital ports, i.e. DATs have optical ports; but we have chosen to use all analog I/O ports. The cards used in the Prophet workstation are CardDeluxe, using the balanced analog I/O ports.

I don't know why almost everyone thinks that when you go to digital it is an upgrade. "Digital" is a buzzword, and most of the time it is the wrong word.

All the equipment used in this studio is set up for analog.

RW: Who were the major venders/contractors?
Pallock: All studio equipment was provided by Harris Broadcast in Mason, Ohio. They provided all the ancillary equipment such as DAT machines, MiniDiscs, etc.

Pacific Research & Engineering out of Carlsbad, Calif., provided the Digital Airwave console and they designed and built the Fish furniture. This equipment was the last true PR&E to come out of Carlsbad. *(Note: Pacific is part of Harris Corp.)*

For this studio to happen, two offices had to be demolished and two walls had to be moved. Forest Construction from Camarillo, Calif., provided the construction work.

The architectural firm of Tracy Lloyd Aguilar Design was involved with some

See SALEM FISH, page 38 ▶

PRODUCT GUIDE

ProFiler Is Ready To Log and Roll

Telos Systems has released ProFiler, a system that logs program audio automatically using MP3 audio compression technology and runs on a Windows PC.

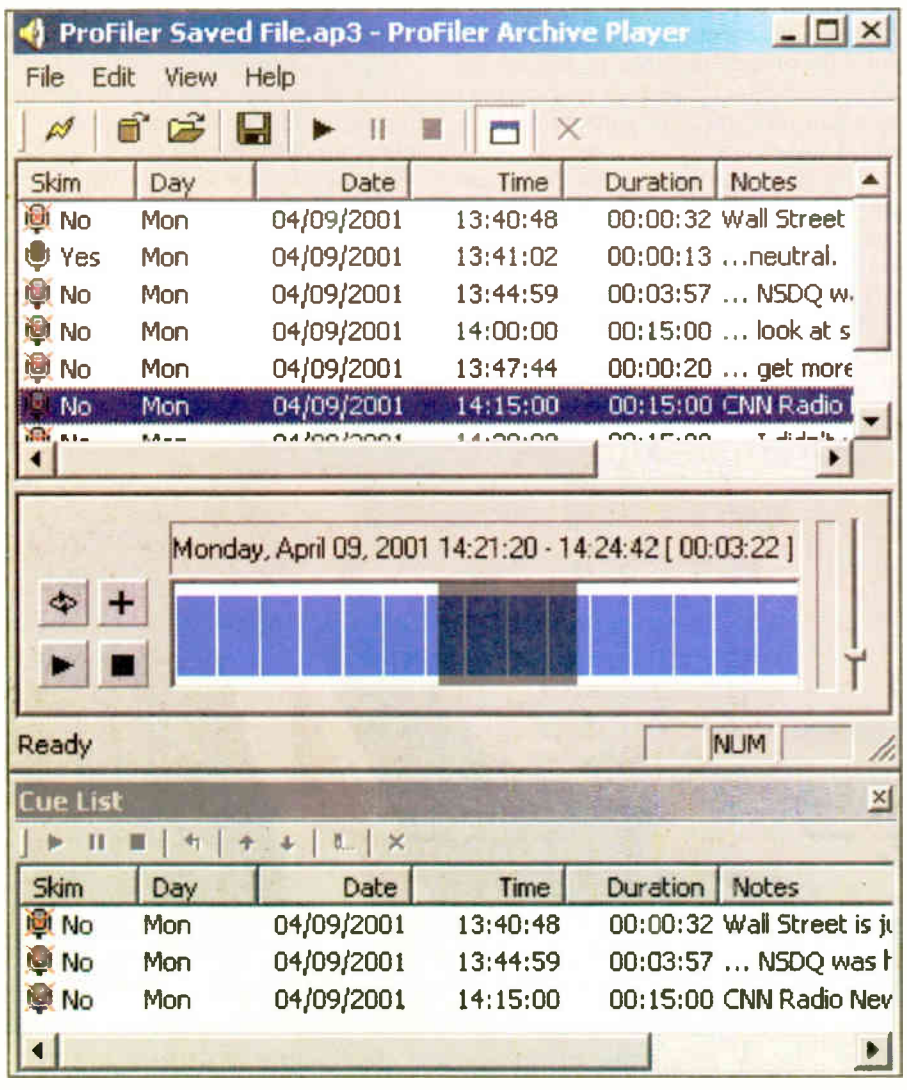
A notable feature is SmartSkimming, in which low-bit rate logging switches to a user-specified higher bit rate for quality captures when talent is on-mic.

ProFiler can run unattended. It records one stereo channel per audio card with a maximum of four streams.

The company says its product is suitable for use by stations that need to log program content, for assembling audio composites and for archiving broadcasts. Archived audio can be accessed remotely, and live audio can be listened to during the encoding process.

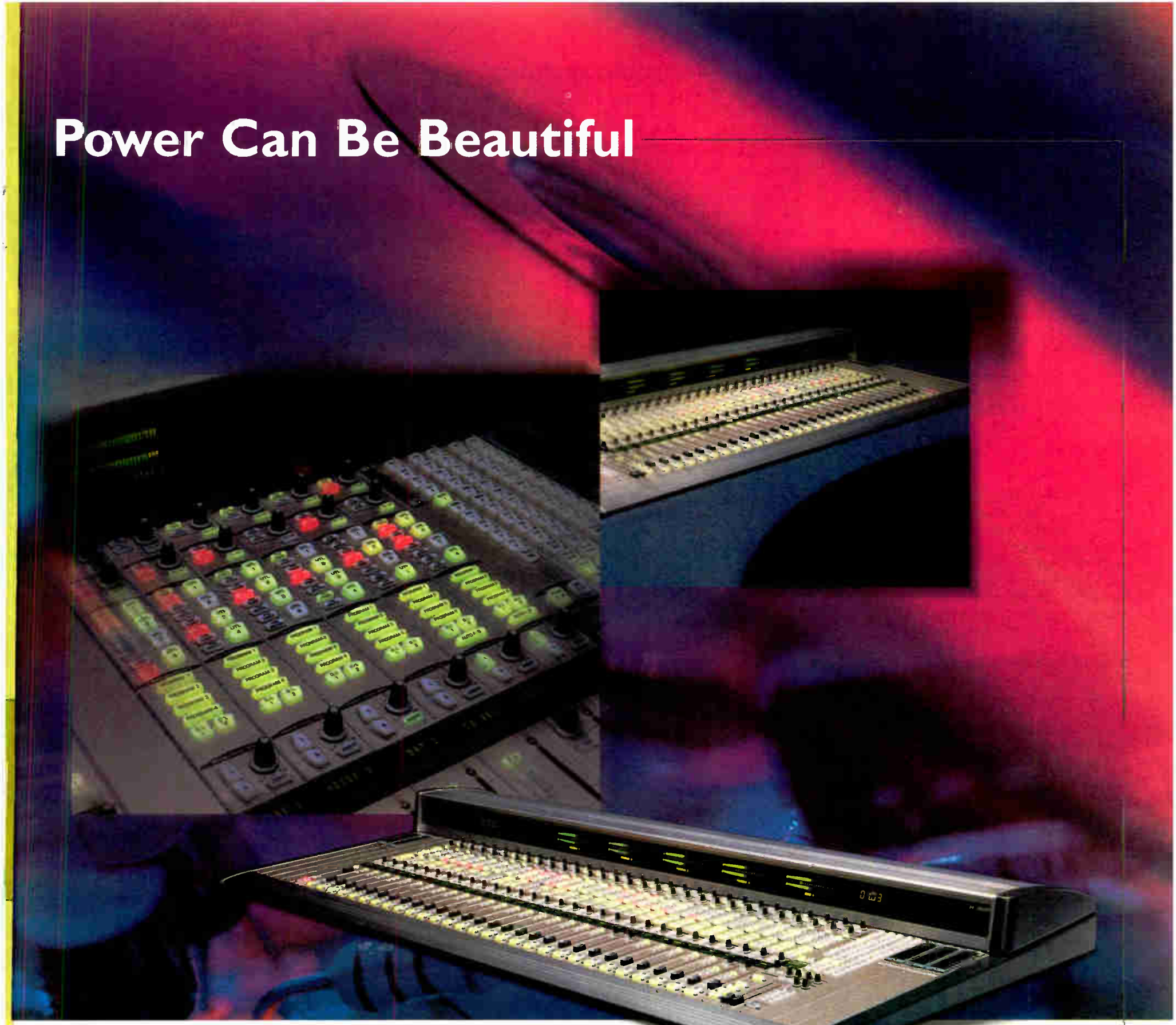
Price: $990.

For more information contact Telos in Ohio at (216) 241-7225 or visit www.telos-systems.com.



World Radio History

Power Can Be Beautiful



Sure, it's the best looking broadcast console you've ever seen. But, beneath the sleek, elegant exterior beats the heart of a true warrior! Harris' BMX*digital* by Pacific has everything you need to win the digital revolution. Whether it's the number of output buses, mix-minuses, off-line mixes, stereo sends, direct IFB's, monitor inputs and outputs, inter-communication paths or logic interface, BMX*digital* offers more.

Incredible Flexibility including all input modules accommodate analog and digital signals without reconfiguring, swapping, or even removal from the mainframe.

Amazing Adaptability with easy storage, recall and reconfiguration of set-ups for various day parts, and built in connectivity to routing switchers, digital storage systems and other networked sources.

Low Cost of Ownership by design, Harris' BMX*digital*'s true cost of installation, operation and maintenance is markedly lower than other consoles.

Legendary BMX Reliability is what you expect in a Harris console by Pacific. The table pounding of your resident shock jock won't faze this beauty.

Harris' BMX*digital* by Pacific. Beauty that's a lot more than skin deep.

BMX*digital*

next level solutions

SERVICE

SYSTEMS

AUTOMATION

TRANSMISSION

HARRIS

www.**broadcast.harris.com** • 1.800.622.0022

World Radio History

AES

▶ Continued from page 35

audio telepresence." This technology attempts to create the audio perception in the listener of being in a remote location, while simultaneously creating the perception for people in the remote location that the user of the system is present there.

Noise filtering is the latest from Drawmer. The DF330 is designed to eliminate broadband noise, low-frequency rumble and high-frequency noise.

Consoles and mixers are another area in which AES usually has promising debuts or significant upgrades.

The Max Air from Euphonix is a 96-channel digital audio board for broadcast duties based on the System 5 platform. On the upgrade front is the latest for the System 5 operating system along with improvements to the R-1 digital multitrack recorder system.

A double-barrel blast is what Yamaha will give many show attendees, with two new digital consoles. The O2R96 is the long-awaited, more-powerful followup to the popular O2R console while the DM-2000 is a full-featured multipurpose mid-sized digital board.

Calrec's Sigma 100 will be new to most attendees. The broadcast-oriented board is based on the Alpha platform and handles HDTV/surround-sound duties.

In something of a new direction for audio, Sony is debuting a field mixer. The DMX-P01 is a four-channel digital mixer with up to 24-bit/96 kHz resolution. More traditionally, Sony is rolling out the SIU-100, a 160-channel routing matrix/format converter for the DMX-R100 console.

Adding its two yen to the resurgent ENG/location mixer field is Kamesan of Japan, distributed in the United States by HHB. Kamesan has a line of ENG and film location mixers, including a modular system for swapping in an EQ/compressor module when needed.

To go with those mixers HHB is giving many their first look at the PortaDrive, an eight-channel hard drive-based field recorder designed to replace the PortaDAT. Fostex promises to show a "field" version of its DV-40 DVD-RAM recorder.

Portability was obviously on the mind of Lucid Audio in designing the Freedom converter. It is a battery-operable two-channel A/D-D/A with 48 V phantom power, USB and traditional I/O and up to 96 kHz-performance.

Will 'mutually immersive audio telepresence' become a substitute for business travel and live concerts?

The system is being explored as a substitute for business travel, but could conceivably be developed to bring the live concert experience to listeners.

Workshops will include tutorials on the application of multichannel sound formats in vehicles, what audio engineers should know about human sound perception and studio production and practices.

Special events

Special events at the show include the annual AES Business Meeting, Oct. 5 from 8:30-9 a.m. The opening ceremonies, 11:30 a.m. to 1 p.m. will include the AES Awards Presentation.

The awards acknowledge the work of individuals whose contributions to the AES enhance the audio industry. A list of recipients, unavailable at press time, will appear in the convention program.

On Oct. 6 from 6:30-8 p.m., an old-time radio recreation of the Lux Radio Theatre production of "The Jazz Singer" will be staged. Richard Halpern will be featured in the starring role; Herb Ellis directs.

As is traditional, microphones will lead the product introductions. Expect new handheld mics from Electro-Voice, ADK, Brauner and Soundelux amongst others.

Dirk Brauner offers AES attendees their first look at his first nontube microphone. The Phantom C is a FET mic geared for studio use.

Wireless mics continue to ride the technology train by offering expanded features, ranges and accessories along with improved performance.

Many affordable "contractor" systems now offer the features and specs you would have seen on a high-end system a couple of years ago and at a quarter of the price.

Promising more hefty processing features, TC Electronics is showing an upgraded System 6000 digital processing platform. Also new is TC's Reverb 6000, a processor designed more toward the high end (think Yamaha SREV1 and Sony DRE-S777) rather than a simple spring reverb box or bargain multieffects processor.

Aphex has an upgrade too. The Model 2020 Broadcast Audio Processor is up to MkIII with improved processing algorithms and new circuitry.

Summit Audio has a new preamp out, the 2BA-221 Microphone and Line Module (fancy talk for a mic pre/DI box). The 2BA-221 offers solid-state and tube signal paths.

AES Info

Secure online registration is available at *www.aes.org/events/113/registration.cfm.*

A downloadable registration form to mail in or fax is available at *www.aes.org/events/113/registration.pdf.*

Fees: Nonmember registration for the full program is $350 after Sept. 23. Discounts apply for members, students and exhibit-only passes.

Salem Fish

▶ Continued from page 36

of the design concepts also.

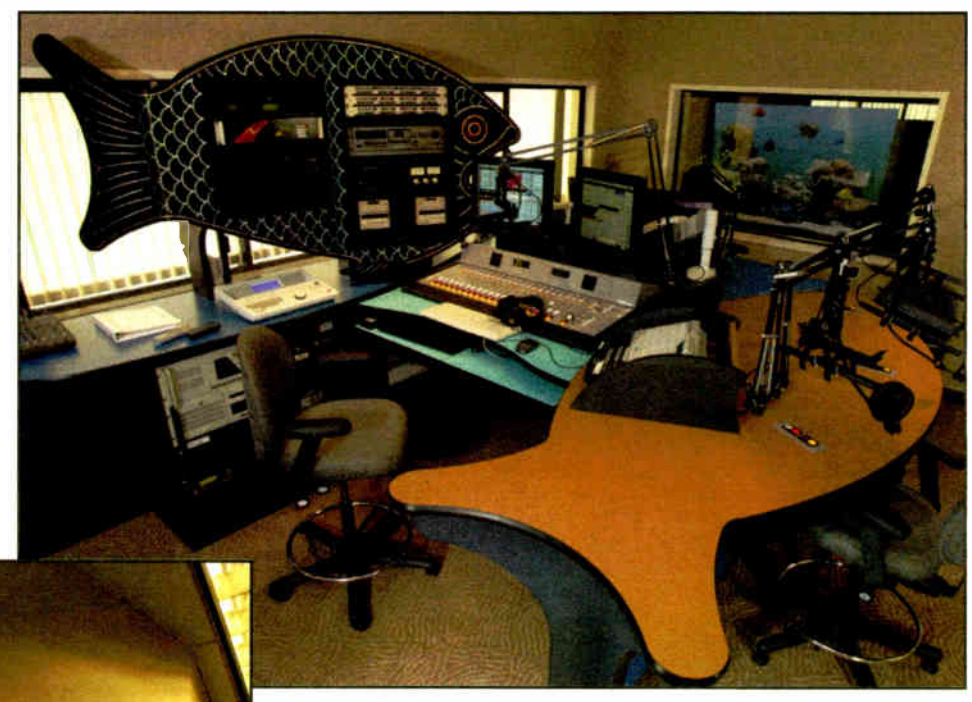
The studio uses some pretty innovative design concepts such as clamshell-type track lighting and a large plasma screen that acts a surreal fish aquarium. Ideas such as these were provided by Gary Urke of Electek electrical contractors in Long Beach.

***RW:** Describe the station's air chain.*

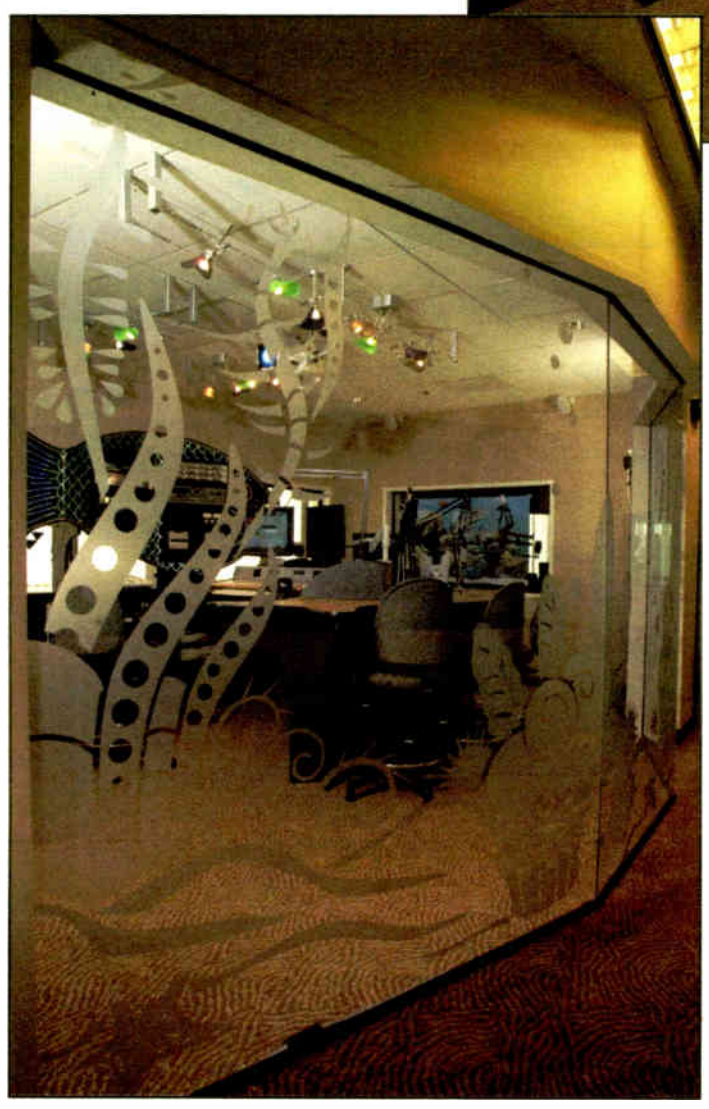
Pallock: The audio chain consists of a Pacific Digital Airwave console operating strictly as an analog mixer. This is connected to a Modulation Sciences StereoMaxx. This gives the station's stereo music a three-dimensional feel.

Since we cannot get an STL shot to the transmitter, I am using a pair of stereo phone lines to the transmitter. These are protected at the studio with a Manley tube-type peak limiter.

Once the audio arrives at the transmitter, it is connected to an Aphex 2020 Mk II audio processor.



Call him Jonah? The 6-foot illuminated fish on the left holds studio equipment.



Beveled glass wraps the studio in an aquarium motif.

The hardest part of this project was schlepping the fish furniture up five flights of stairs.

— Mark Pallock

Prior to us owning the radio station, the studio was located at the legendary 1190 Ball Road studios. The signal was sent via a composite STL to the transmitter.

(We are) using an Omnia audio processor. The transmitter is a Nautel fm-8 using an NE-50 exciter.

***RW:** If you were telling a radio engineer about this installation, what interesting insider stuff would you tell him or her?*

Pallock: Make sure all working drawings are complete and accurate. Go over everything with all the contractors involved and hold all parties accountable for a timetable.

World Radio History

Joemeek

▶ Continued from page 35

Marketing rant aside, the MQ1 sounds and acts like the other Joemeek products I have used (and owned) — and that is a good thing

Once I found the ideal ground connection within my computer (grounding cable included), I experienced no unusual buzzes, noises or hums despite the unit's proximity to the sonically hostile environment inside a computer.

Vocal quality

The vocal quality that the MQ1 and similar Meek units produce is perfect for voiceover and broadcast use. With proper adjustment of the compressor and equalizer sections, the resulting vocal sound can only be described as warm and full, yet upfront and present — crisp yet commanding. It doesn't get any better for radio.

Despite some identity issues, there is no doubt the MQ1 is another great-sounding product from the Joemeek/Fletcher Electronics folks. The MQ1 is designed especially for those who record to a nearby computer.

As with any other recording channel, frequent visual and hands-on access of the MQ1 is required for proper setting of gain structure and compression — make sure that mounting the Meek unit in your computer will not be overly limiting.

For more flexibility in preamp placement, consider the slightly more expensive MicroMeek MQ3, a standalone model with its own power supply (wall transformer) and a few extra features. Either way, you won't be disappointed with the sound.

The MQ1 is being marketed in a misleading way and I am not sure why; it is a worthwhile idea and a great value.

For experienced audio producers, operation of the MQ1 is intuitive. For beginners in audio production, operation of the unit should be straightforward and learned quickly, provided they read the well-written basics explained in the brief electronic handbook.

Stephen Murphy, former editor of Pro Audio Review, is a free-lance engineer/producer with 20 years experience in audio, radio and video production. He can be reached at editor@smurphco.com.

'Dead Radio' Contest Winners Announced

Ad agency Oink Ink Radio recently announced the winners of its fifth annual Dead Radio Contest.

The contest solicits radio ads that were killed by the client before production, hence "Dead Radio." A record 600 entries were received from copywriters nationwide.

Dan Price, president of Oink Ink Radio, said he started the contest "because most radio ad copywriters have a drawer or computer filled with great radio scripts that never got off the ground."

This year's winner was "Table Tennis," written for The Sporting News by Scott Kaplan of DeVito/Verdi in New York and Chris Turner, formerly of DeVito/Verdi (and now with Ogilvy/Chicago).

"The Sporting News loved the script, but did not have the money at the time to produce it."

The prize is an all-expense-paid trip to Oink Ink's West Coast office to have the script produced. The writers hope that once the spot is produced The Sporting News will be able to pick it up.

World Radio History

Farm Radio Shares Information

Learning to Use Radio to Meet the Needs Of Rural Audiences in the Third World

by Frederick Noronha

Can the sweet potato be a dependable friend? Does planting trees in a maize field improve yields?

How do you make sound effects come alive to grab the attention of listeners?

These are just a few of the questions meant to echo on the airwaves as a global initiative called the Developing Countries Farm Radio Network gets on with its unusual task.

The Toronto-based non-governmental organization is trying to find out how best to use radio to meet the needs of rural audiences in the Third World.

It does so by sharing information in the form of radio scripts. These are free-to-air in any language the broadcaster chooses. But the job of putting together neat packages of well-researched agricultural information for radio is done by the Canadian network.

The latest package of scripts includes tips for farmers about how to take responsibility for livestock health, basic facts about 12 animal diseases, the role of native breeds in maintaining livestock health, the value of indigenous veterinary practices and related subjects.

The scripts are accessible via the Developing Countries Farm Radio Network Web site, *www.farmradio.org*, and are provided free to network partners. Partners also receive a newsletter with resources for additional information, guides about using the scripts and information for radio broadcasters.

The printed material is distributed in English, French and Spanish.

Partnership in the network is free to anyone broadcasting to rural audiences in Africa, Asia or Latin America.

Under a membership agreement, partners agree to return questionnaires and surveys. They also undertake to participate in the network by sending in ideas for scripts, copies of programs produced using network scripts and examples or photographs showing how farmers use ideas from the script.

Each of the scripts is contributed by a researcher and is reviewed by a relevant specialist. Information sources are offered in each case.

Guidance

Notes to broadcasters, which accompany some of the scripts, help guide the broadcaster to make optimal use of the material.

For example, one note reads: "The following messages about the nutritional value of dark-green leafy vegetables are presented as radio spots. Radio spots are short messages that are meant to change people's behavior or actions. They usually last five seconds to two minutes.

"In a radio spot, the broadcaster must appeal to the audience's emotions and intelligence. Spots are repeated every day for a week, a month, or more. Or they can be broadcast two or three times a day for just a few days, depending on the message. Spots can be presented in a variety of different formats: narratives, testimonials, dialogues or dramas."

The quarterly newsletter Voices works to support broadcasters in strengthening small-scale farmers and rural life.

It recently advised radio broadcasters: "What is the secret to great sound effects? Simplicity. In order to draw your audience into your story and help them 'see' the action in their imaginations, you need only a few well-placed and familiar sounds."

Greater variety

Several issues back, Voices noted network partners were asking for a greater variety of information to be covered by the radio scripts, such as health and nutrition, HIV/AIDS, rural incomes and farm and rural household management.

Broadcasters also use the network to seek out written material and workshops to help them develop professional skills.

They wanted to know how to work with agriculture and health experts to understand information and put it in a format their audiences can use, how to manage a radio station and how to communicate effectively.

Internet-based services — including access to online scripts, electronic discussion groups on topics of interest to farm radio broadcasters and the like — were seeing increasing demand, too.

For information from the Developing Countries Farm Radio Network, contact the organization in Ontario at (416) 971 6333 or visit www.farmradio.org.

Correction

A story in the Sept. 1 issue incorrectly described the HDA600 stereo headphone amplifier as part of ATI's Nanoamp series. The HDA600 is part of the company's Encore series.

Enter to win one of 26 great prizes in Radio World's reader appreciation contest giveaway!

Dear *Radio World* Reader: Last year, many of the greatest names in our industry teamed up with *Radio World* for a year-long sweepstakes extravaganza that resulted in almost $50,000 in prizes given away. Due to the overwhelming response from you, we've decided to do it all again in 2002 as a way of showing our appreciation to our loyal readers.

Throughout 2002, *Radio World* will conduct 26 random drawings. Prizes and winners will be announced in every issue of Radio World. ***That's 26 chances to win!***

2002 Radio World READERS' CHOICE Sweepstakes

To enter the contest you need to complete these three easy steps:

1. Go to our Web site: www.rwonline.com
2. Click the Readers' Choice icon on our home page.
3. Follow the instructions and fill out the electronic entry form — *that's it, you're done!*

This is your chance to participate in our Readers' Choice program and win great prizes from these fine *Radio World* supporters:

AETA AUDIO · Broadcasters General Store · ANTEX ELECTRONICS FOR THE SIGHTS AND SOUNDS OF THE WORLD · APT AUDIO PROCESSING TECHNOLOGY · Audioscience · AKG · Audio TX · audio-technica · BRADLEY BROADCAST PRO AUDIO · BSI · BSW BROADCAST SUPPLY WORLDWIDE · BURK TECHNOLOGY · COMREX · ERI · ESE · Fibox · GEPCO INTERNATIONAL, INC. · HENRY ENGINEERING · HHB FIRST WE LISTEN · Lighthouse Digital · MACKIE · MediaTouch · RDL Radio Design Labs · S.C.M.S. · SONIFEX · YAMAHA

Contest Rules: To enter the drawing, simply register online at www.rwonline.com/sweeps. 26 drawings will be held throughout the year. Contest registration expires Dec. 4, 2002. Final contest prize announcement on Jan. 1, 2003. One prize per winner. All contestants MUST reside in the United States and have a valid mailing address. Winners should receive prizes within 30 days of notification; however, actual delivery time may vary and is not guaranteed by IMAS Publishing. Federal, state and local tax laws may apply to prizes and are the sole responsibility of the winner. Employees and affiliates of IMAS Publishing are not eligible.

World Radio History

◆PRODUCT GUIDE◆

Products for Radio Air & Production Studios

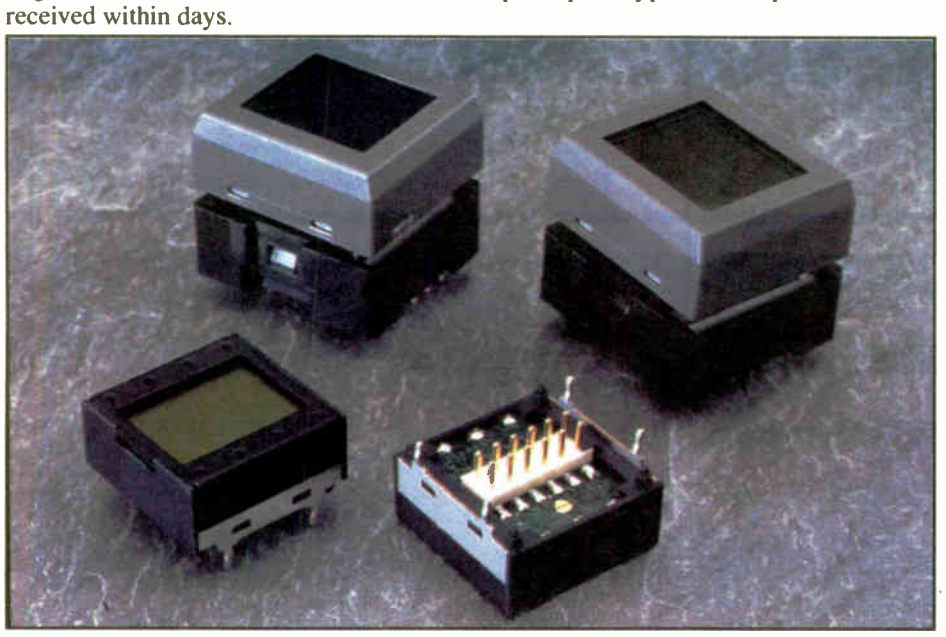
Mail info and photos to: RW Product Guide, P.O. Box 1214, Falls Church, VA 22041

Web Site Supports LCD Pushbutton

NKK has improved its IS Series SmartSwitch to support LCD pushbuttons. The programmable SmartSwitch displays text, graphics or moving images. The IS switch has positive tactile feedback. Enhancements include faster clock speeds and additional LED options.

The software-controlled pushbutton switch can be programmed online at *www.nkkswitches.com*. The Web site is dedicated to SmartSwitch and permits engineers to program the software-controlled pushbutton switch directly online.

Engineers also can visualize ideas, experiment with layout designs and validate and test programs. Projects can be saved in a file created for them by NKK Switches. If an engineer likes his or her creation, the complete prototype can be purchased and received within days.



The switch is available in two styles: low-profile and high-profile. The low-profile LCD suits tight-fitting applications requiring a graphic display. The viewing area is 15 mm by 10 mm and it is one of the smallest LCDs available.

Price: TK.

For more information from NKK Switches, contact the company in Arizona at (480) 991-0942 or visit www.nkkswitches.com.

AudioScience Adapter Solution for Broadcast

An audio adapter from AudioScience includes MP3 record and playback abilities with multiple simultaneous sample rates. The ASI6114 provides four stereo outputs, one stereo input, one record stream and four play streams. As well as MP3, other format choices include MPEG Layer 2 and big and little endian 16-bit PCM.

The adapter features a proprietary technology, Multirate Mixing (MRX), which enables playback, recording and digital mixing of multiple audio streams of any sample rate to 1 Hz.

Analog and digital interfaces are standard on the ASI6114. The analog side uses oversampling converters to deliver more than 100 dB of dynamic range with THD+N better than 0.002 percent. The digital interface can be software-configured for either AES/EBU or S/PDIF operation. It has sample rate converters on all inputs.

Flexible synchronization options allow the card to be clocked from a dedicated AES/EBU sync or a word-clock input. A word-clock output is provided to allow the adapter to be a master clock source. Card includes breakout cables; driver support includes Windows 98, Me, 2000 and Windows XP as well as Linux. Price: $2,995; volume discounts are available.

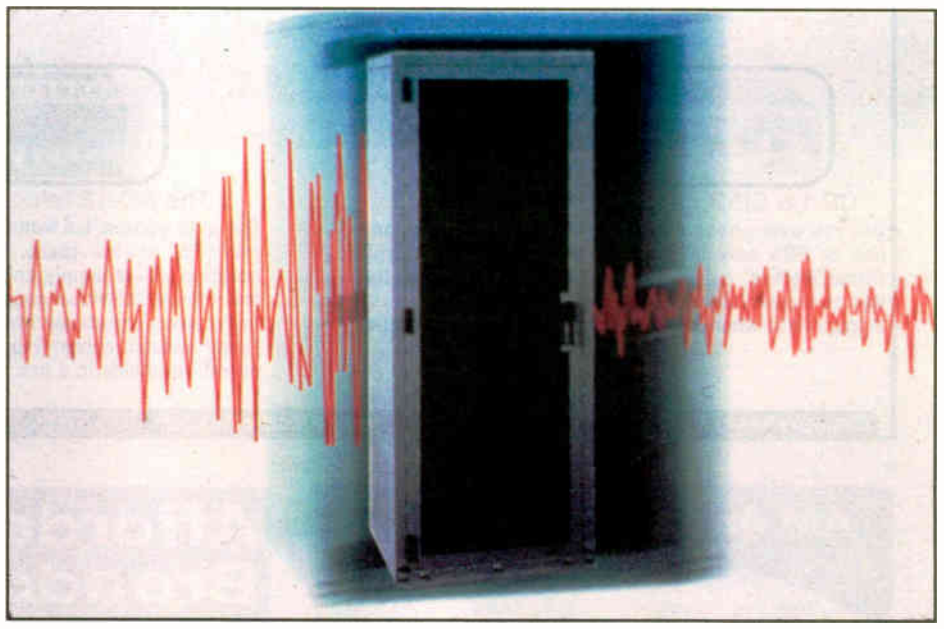
For more information from AudioScience contact the company in Delaware at (302) 324-5333, e-mail sales@audioscience.com *or visit* www.audioscience.com.

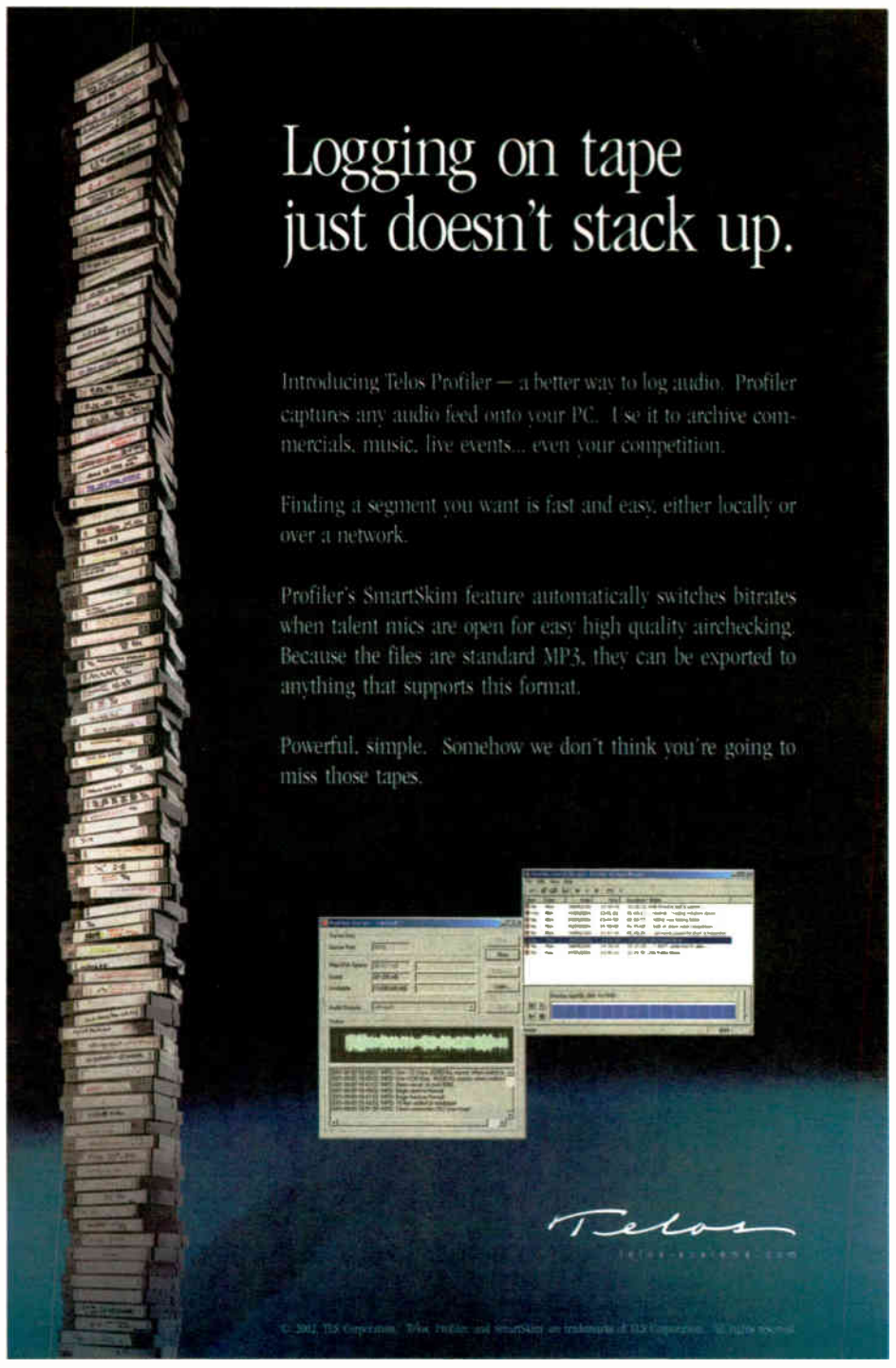
Equipto Plans for Quakes

Seismic-hardened electronic cabinets from Equipto Electronics Corp. meet standards for Zone 4 earthquakes, the most severe.

The Equipto product line includes standard enclosures and EMI/RFI-shielded cabinets available in 37 panel heights, from 21-1/8-inch to 84-1/8-inch openings; four depths, 17 to 36 inches; and three widths: 19, 24 and 30 inches.

For more information from Equipto Electronics Corp., contact the company in Illinois at (800) 204-7225 or visit www.equiptoelec.com.





World Radio History

Products & Services SHOWCASE

Telephone Solutions by CircuitWerkes

The HC-3 hybrid telephone autocoupler

The HC-3 is ideal for many tasks like listen & concert lines, remote broadcasting, IFB interfaces, & More.

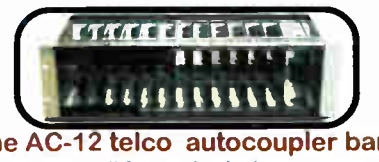
The *New* Telco-6, six line, incoming, ring detector

Is someone calling? Find out with the new Telco-6! The telco-6 detects telephone ring signals from one to six lines and provides a dry relay output for each line.

More Features. Better Price.

CP-1 & CP-2 call progress decoders

Did you ever connect a telephone coupler to a phone line or PBX only to discover that it won't hang up? CircuitWerkes' call progress decoders can save the day on most systems. They listen for dial-tone or busy signals and, when present, force your couplers offline.



The AC-12 telco autocoupler bank

Get up to a dozen, full featured, telephone autocouplers in just 5.25" of rack space. The coupler bay features a common power supply and two audio busses for easy mass feeds. Individual couplers can be used for sending or receiving seperately from the rest - perfect for IFBs. Newly updated design improves audio performance and overall reliablility to a new standard of excellence!

CircuitWerkes - 352 335-6555 Fax 380-0230 http: www.circuitwerkes.com 2805 NW 6th Street. Gainesville. FL 32609

SIX MILLION

THUNDERSTORMS HIT PLANET EARTH EVERY YEAR! IT TAKES ONLY ONE TO PUT YOU OFF THE AIR!

STATI-CAT

The STATI-CAT LIGHTNING PREVENTION SYSTEM provides a continuous, low-resistance discharge path for the static electric charge on tall structures. Dissipation points are 1/8" stainless steel rods.

This affordable and rugged system has proven itself in the field for over 20 years.

Cortana Corporation Inc.

Write or call for a free brochure and design
P.O. Box 2548, Farmington, N.M. 87499-2548
Toll Free: 888-325-5336 • Fax: 505-326-2337 • www.cortanacorporation.com

---

AM Antenna Solutions

LBA Tunipole™ Folded Unipole Systems

RF Components

Diplexer, Triplexer and Phasor Systems

Antenna Tuning Units

LBA Since 1963

LBA Technology Inc is your proven supplier of innovative digital-ready AM antenna systems. Our products include tuning units, phasing systems, multiplexers, AM/wireless isolation systems and components for every power level. We help hundreds of broadcasters in the USA and worldwide to --

Reach further – sound better!

LBA Technology, Inc.

3400 Tupper Drive Greenville NC 27834
800-522-4464 / 252-757-0279 / Fax 252-752-9155 / Email Lbatech@Lbagroup.com
www.Lbagroup.com

Affordable Custom Broadcast Furniture

Designed, Constructed, Delivered and Installed by

STUDIO TECHNOLOGY

32 Pennsylvania Avenue, Malvern, PA 19355

TEL: 610-640-1229
FAX: 610-296-3402

email: sales@studiotechnology.com
web: www.studiotechnology.com

Remotetools

BROADCASTtools, INC.

BROADCAST tools™ INC.

Innovative Problem Solving Tools for Broadcast

DC-8 Plus Dial-Up Remote Control
Controls and monitors 8 external devices from any touch-tone telephone with extremely flexible programmable features.

SRC-1616L Serial Remote Control
Equipped with 16 opto-isolated and CMOS/TTL compatible inputs and 16-Relay (Form C) outputs that may be controlled from a host computer or a pair of units can be used in a stand-alone confutation (relay extension cord).

SRC-8 Serial Remote Control
The SRC-8 provides a means of adding 8 channels of remote control to RF, wireline, and fiber type STL systems and may also be used with dedicated modems (full and half duplex models).

AVR-8 Alarm Voice Response
Used as a voice response and remote control system, the AVR-8 automatically reports changes detected on any of its eight digital inputs to a remote telephone and/or pager.

BOS, ROS & PBB-24 Switch Panels
The BOS offers 12 N.O. dry contact switches with status LEDs in a desktop panel. The ROS is similar, but is a single-space rack unit. The PBB-24 provides 24 momentary buttons that can be programmed to output ASCII or hex character strings.

SSM Smart Silence Monitor
Monitors any stereo or two independent monaural sources and generates alarms indicating loss of carrier when white noise and/or silence is detected.

PSC Programmable Schedule Controller
Stores and controls up to 160 events with Hour/Minutes/Seconds, Day/Month/Year, or Day of Week with Daylight Savings Time correction. 20 SPST relays and/or 32 serial custom commands provided.

MC-16 Telephone Hybrid/Coupler
Full-featured telephone line coupler/hybrid provides 32 programs; 32 ASCII strings (DTMF to ASCII); 64 macros; 16 relays; auto answer; 4-digit access codes and more.

UI-411 Universal Interface
Perfect for adding logic functions to mechanical switches/relays, adding remote functions to transmitter control/logic, detecting phone line "ring", etc.

DEC-16 Decoder, Auto-Coupler & Dialer
A dial-up, dial-out or direct connect DTMF decoder. The DEC-16 is capable of automatically calling in, out or connecting to an ENC-16, DTMF encoder or other DTMF encoders.

PSC-II Programmable Schedule Controller
With 512 events intended for controlling up to two RS-232/RS-422 serial devices; 16 - SPDT relays; auxiliary serial ports and relays all in a single rack space. The PSC II controls functions by either scheduled time and date, time and day of week, serial port commands and remote input contact closures.

BOR-4 (Box 'O Relays)
The BOR - 4 provides four independent 2PDT relay interfaces with two optically isolated or 5-volt TTL/CMOS compatible inputs.

ENC-16 Encoder, Auto-Coupler & Dialer
A dial-up, dial-out or direct connect DTMF encoder. The ENC-16 is capable of automatically calling in, out or connecting to the DEC-16, DTMF decoder or other DTMF decoders.

SRC-32 Serial Remote Control
Equipped with 32 opto-isolated and CMOS/TTL compatible inputs, 24 open-collector outputs and 8-Relay (Form C) outputs that may be controlled from a host computer or a pair of units may be used in a stand-alone configuration (relay extension cord).

Check out our web site for product information, list pricing, and distributor locations!
web: www.broadcasttools.com • email: support@broadcasttools.com • phn 360.854-9559

Designed by broadcast engineers for broadcasters, our flexible line of remote access and control equipment gives you elegantly functional solutions for your control equipment without the need for "custom boxes".

World Radio History

USER REPORT

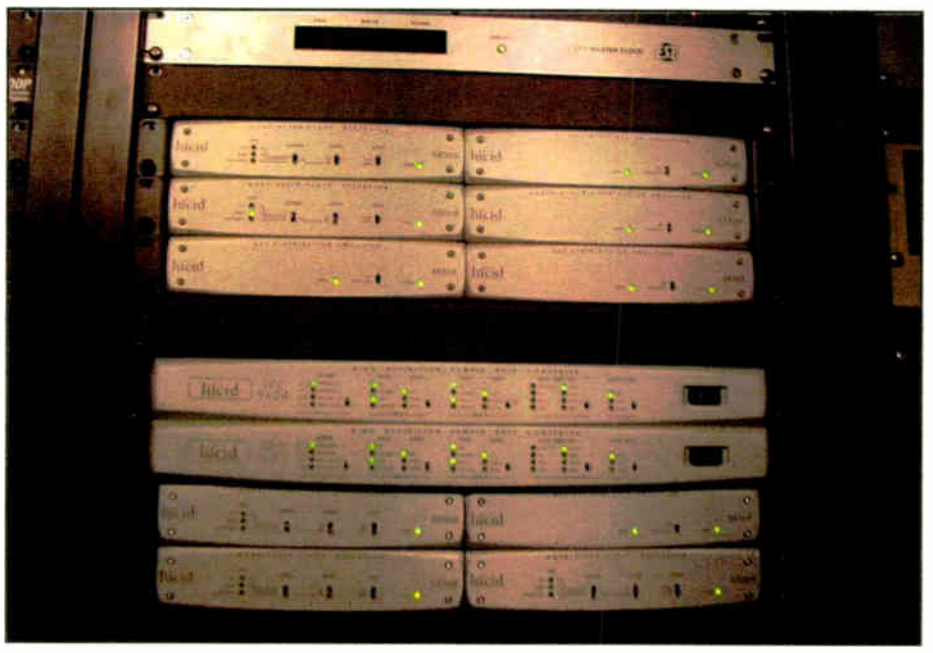
Susquehanna in Sync With Lucid

by Norman Philips
Director of Technical Operations
Susquehanna Radio Corp.

DALLAS Your clean digital audio is great until it is passed from device to device, eventually arriving at the transmitter site after multiple sample-rate conversions. Cascading multiple digital audio sources with different sample rates can result in sync problems; and inexpensive, jittery internal equipment clocks can produce digital distortion. These result in degradation of the original clean audio.

Now imagine synchronizing your digital studio with the console, digital editor, CD and CD burner locked together to the same reference frequency to eliminate these problems. Many manufacturers of digital equipment provide an external reference clock port to facilitate this.

AES master clock systems have been relatively expensive until **Lucid** came out with a reasonably priced line of devices to meet the needs of the broadcast and recording industries.



A Rack of Lucid Gear at Susquehanna's Atlanta Stations

Reference standard

Susquehanna Radio Corp. became familiar with Lucid at the NAB show and has installed several of the systems in our digital studio facilities since then.

We were building our Atlanta WNNX(FM) 99X and WWWQ(FM) Q100 studios at that time, and were looking for a way to lock equipment to a 44.1 reference standard.

Lucid had just come out with a series of new products. We chose a pair of GENx6 Word/Super Clock Generators connected in series as the master clock operating at 44.1 kHz. Each unit can act as a master or slave, allowing you to generate or distribute 44.1- or 48-kHz Word Clock or Superclock to six BNC outputs.

In this configuration they give us built-in backup as well as a total of 12 Word Clock outputs. These Word Clock outputs then are fed to six Lucid AESx4 Distribution Amplifiers and two SRC9624 Sample Rate Converters.

The AESx4 is a one-in-four-out DA that can be used for a myriad of applications in a studio. You can use them to split a digital console out to four separate digital inputs or processors without any sample rate conversion, as well as clock distribution. The AESx4 DAs allow the clock signal to be fed longer distances into the studios and throughout the plant using balanced 110-ohm cable.

Every ENCO Digigram audio card in TOC is fed this 44.1, as well as all studios. Once in a production studio, the AES sync can be converted to Superclock for Pro Tools using either a CLKx6 Audio Clock Distribution Amplifier or another GENx6. If you need 44.1 Word Clock for consoles or other devices, a CLKx6 will deliver that.

The Airwave digital consoles have a fixed 48-kHz output, so we purchased Lucid SRC9624 sample rate converters for them. The SRC9624 supports real-time sample rate conversion at five sampling frequencies and can be locked to the master clock as well.

Each unit has two converters and a lot of options, including triangular PDF-based dithering and a lot of little LEDs showing status. We put a protective panel over these to keep jock fingers from tampering with them.

After recently installing SRC9624s in our Indianapolis facility, Chief Engineer Jeff Goode commented, "The difference was immediately apparent in clarity and low-level detail. Surprised me!"

We are installing a Lucid system in our Cincinnati facility and have purchased the new SSG192 High-Definition Studio Sync Generator as the master clock. This new generator simultaneously outputs multiple formats and generates 15 audio clock rates.

The units are well-constructed in a metal enclosure and are all one rack space high. Some products are full-width with internal power supplies; the others are half-width, having external lump supplies with seven-pin DIN.

I would like to see Lucid build a master AES clock using GPS as the reference and an internal clock as backup.

The lumps do start to take up a bit of space, and a power "Y" splitter is available to power two units from one supply. There is a shelf option for mounting two half-rack units side by side. It takes a bit of planning when installing a master clock, but the audio difference is noticeable.

I have been pleased with the price and performance of the Lucid products. I would like to see Lucid build a master AES clock using GPS as the reference and an internal clock as backup. That way all sites could be on the same clock.

For more information, including pricing, contact Lucid in Washington at (425) 742-1518 or visit www.lucidaudio.com.

World Radio History

Products & Services SHOWCASE

Got a problem? We Build Solutions...

Since 1982, Henry Engineering's "blue boxes" have been solving your problems!

- Audio Interface
- Audio Mixing
- Audio Distribution
- Telephone Information
- Digital Audio Storage
- Control Interface

Over 60,000 units in use worldwide. How can we help you?

HENRY ENGINEERING

www.henryeng.com
Tel: 626.355.3656
Fax: 626.355.0077

S.C.M.S., Inc

Charlotte, N.C

26 Years of Service 1976-2002

- ✓Competitive Prices
- ✓Extensive Rental Fleet (RF Codecs Test Equipment, Audio)
- ✓Experienced Staff
- ✓Used Trade-Ins Welcomed
- ✓New and Rebuilt RF and Audio
- ✓Custom Studio Design and Furniture
- ✓Representing Over 600 Quality Manufacturers
- ✓Turnkey Installations Available

You Know We Know Radio

800-438-6040 • www.scmsinc.com • Fax 704-889-4540

RAMSEY — The Complete Radio Station... IN A BOX!

Everything you need to get on the air FAST!

- ✔ 35 watt FM stereo transmitter
- ✔ Integrated CD player
- ✔ Integrated cassette player
- ✔ Integrated audio mixer
- ✔ Professional microphone and cables
- ✔ Omnidirectional antenna and coax
- ✔ Installed and prewired in a high impact road case!

ONLY $3795.00

One of the most requested FM broadcast products over the past year has been a "radio station in a box". Overseas customers, as well as some of the new LPFM licensees have a need to quickly "get on the air" at temporary locations or in the interim to their installed studio/transmitter setup. A number of overseas customers also had to originate short term programming from various remote origination sites for disaster preparedness broadcasts! Well, here you go...a radio station in a box!

RAMSEY ELECTRONICS, INC.
793 Canning Parkway • Victor, NY 14564
(800) 446-2295 • (585) 924-4560
www.highpowerfm.com fmsales@ramseyelectronics.com

ENCORE SERIES™ HDA400 and HDA600

Stereo Headphone Amplifiers

Complete monitoring solutions for Interview Studios, Broadcast Remotes, Production Rooms, Learning Centers, Live Sound and Recording Studios.

HDA400 Basic 1X4 with front and rear headphone program outputs.
HDA600 Full featured 1X6 includes program, cue and direct channel inputs.

FEATURES:

- Drives most 32 to 600 ohm phones over 120dB SPL
- Master Program inputs Balanced TRS and XLR*
- Master Mono/Stereo switch and Level control
- Cue* Mic or Line Balanced TRS and XLR input
- Cue Send* Left/Right/Both channel selector
- Direct* inputs, unbalanced stereo or balanced mono
- Signal Present* and Input Overdrive indicators
- Internal 115/230VAC power supply

** HDA600 only*

CE

http://www.atiguys.com
Call or write for detailed brochure

ATI AUDIO TECHNOLOGIES INCORPORATED

328 W. Maple Ave. • Horsham, PA 19044
(800) 959-0307 • (215) 443-0330 • FAX (215)443-0394

SF1000 SERIES

$3,995 AS SHOWN

- LAMINATED PLYWOOD TOP WITH T MOLDING
- INDUSTRIAL GRADE MELAMINE VERTICALS
- REVERSIBLE PUNCH BLOCK PANEL
- 4 3/8" KICK BASE
- 30" HIGH TABLE TOP (38" OPTIONAL)
- 12 RACK UNIT UTILITY HOUSING
- 7 - 12 RACK UNIT PEDESTAL BAYS
- POP OUT REAR PANELS
- CABLE WIRE TRAYS
- OPTIONAL VENTED PANELS FOR AIR FLOW
- OPTIONAL ASSORTMENT OF COLORS
- OPTIONAL GUEST WINGS AVAILABLE
- OPTIONAL OVERBRIDGES AVAILABLE

SF2000 SERIES

$4,995 AS SHOWN

- LAMINATED PLYWOOD TOP 1 1/2" THICK
- RICH STAINED OAK TRIM
- LAMINATED PLYWOOD VERTICALS
- REVERSIBLE PUNCH BLOCK PANEL
- 4 3/8" KICK BASE
- 30" HIGH TABLE TOP (38" OPTIONAL)
- 12 RACK UNIT UTILITY HOUSING
- 7 - 12 RACK UNIT PEDESTAL BAYS
- POP OUT REAR PANELS
- CABLE WIRE TRAYS
- OPTIONAL VENTED PANELS FOR AIR FLOW
- OPTIONAL ASSORTMENT OF COLORS
- OPTIONAL GUEST WINGS AVAILABLE
- OPTIONAL OVERBRIDGES AVAILABLE

SF3000 SERIES

$5,995 AS SHOWN

- SOLID SURFACE TOP
- RICH STAINED OAK TRIM
- LAMINATED PLYWOOD VERTICALS
- REVERSIBLE PUNCH BLOCK PANEL
- 4 3/8" KICK BASE
- 30" HIGH TABLE TOP (38" OPTIONAL)
- 12 RACK UNIT UTILITY HOUSING
- 7 - 12 RACK UNIT PEDESTAL BAYS
- POP OUT REAR PANELS
- CABLE WIRE TRAYS
- OPTIONAL VENTED PANELS FOR AIR FLOW
- OPTIONAL ASSORTMENT OF COLORS
- OPTIONAL GUEST WINGS AVAILABLE
- OPTIONAL OVERBRIDGES AVAILABLE

RAM BROADCAST SYSTEMS, INC. USA (847) 487-7575 www.ramsyscom.com CANADA (705) 722-4425

World Radio History

TECH UPDATES

Sony Expands MiniDisc Line

Sony has expanded its line of professional MiniDisc recorders and players with the MZ-B100 and MZ-N707 MiniDisc.

The portable MZ-B100 can record 320 minutes of content using standard 80-minute MDs.

The unit can provide 14 hours of recording time or 45 hours of playback with one AA battery. Features include voice-operated recording; playback speed control; multiple track marks, which mark points during recording sessions for later reference; a large, three-line dot matrix LCD; a front speaker; a search function; and an external microphone jack.

The MZ-N707 MiniDisc Walkman Recorder has a 32-times transfer rate for MP3s or CDs from a PC to the MiniDisc player. It offers Music Management Software, allowing storage and management of digital music files, custom playlist development and music transfer capabilities into the Net MD player. The unit can record five hours of audio on an 80-minute disk when set in the SP mode.

For more information, including pricing, contact Sony in New Jersey at (800) 686-7669 or visit www.sony.com/professional.

HHB Portadrive Records and Mixes

HHB's Portadrive is a portable 24-bit/96-kHz multichannel recorder with on-board mixing. It is suitable for professional location recording.

The Portadrive records audio onto a shock-resistant, removable 2.5-inch hard drive that uses the BWF and SDII formats for compatibility with Mac and PC-based digital audio workstations.

The unit connects via a drive-docking station and can record approximately two hours of eight-track, 24-bit/96-kHz sound, or more than nine hours of four-track, 24-bit/48-kHz audio.

It has a 6-into-2 digital mixer, enabling the simultaneous recording of a stereo mix alongside six discrete inputs. Microphone inputs have increased sensitivity with six high-gain, low-noise balanced XLR mic/line inputs with individual phantom powering, "gangable" limiters, attenuation, high-pass filter, delay and phase reverse. The two-channel return input and the main and auxiliary analog stereo outputs are balanced.

Digital connectivity features include eight channels of AES I/O, one S/PDIF input and AES and S/PDIF stereo digital outputs.

The Portadrive is equipped to read and generate time code at popular frame rates, and will synchronize to word clock, video sync and digital inputs. SCSI interface is provided for data transfer to and from external storage devices. USB and Ethernet ports are included for control, logging and upgrades.

Remote control is facilitated via RS422 and a parallel remote socket. A keyboard port is available for logging and labeling.

For more information, including pricing, contact HHB in California at (805) 579-6490 or visit www.hhbusa.com.

Yamaha Debuts AW16G Recorder

The AW16G Professional Audio Workstation is from the professional audio division of Yamaha Corp. of America.

The portable unit measures roughly 17 x 13 x 4 inches. It contains a front-mounted CD drive and can record eight simultaneous tracks of 16-bit, CD-quality digital audio without data compression.

Each track features eight virtual tracks and records directly to the internal 20-GB IDE hard drive; 16 tracks may be exported simultaneously as WAV files to CD-ROM for editing on a computer.

The AW16G also functions as a 36-channel digital mixer and features a 240 x 64 backlit LCD display; a Quick Navigation button; eight 24-bit mic/line inputs (XLR with +48-V phantom power and high-impedance input); two effects busses; and two aux sends plus stereo, with four channels of effects return.

An eight-channel, four-pad Quick Loop Sampler contains 250 preset phrase samples and drum samples, and can capture 16 samples for a total of 47 seconds. Phrases may be captured and looped via the Sound Clip function. Sixteen tracks may be played back simultaneously.

The channels contain digital attenuators, four-band parametric EQ, dynamics and channel split. Two stereo multi-effects processors may be routed to buses or input channels directly, or rerouted during recording for layered effects. Effects include a 35-preset library for instruments and a 13-preset library for mastering.

The AW16G contains MIDI remote control templates for Cakewalk Sonar, E-Magic Logic, Steinberg's Cubase, Digidesign Pro Tools, Steinberg's Nuendo and the Yamaha MOTIF. An optical I/O allows direct digital connections to a synthesizer, MD player or DAT.20.

The unit carries a retail price of $1,299.

For more information contact Yamaha Corp. of America, Professional Audio, in California at (714) 522-9011 or visit www.yamaha.com/proaudio.

World Radio History

Products & Services SHOWCASE

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

COOL STUFF AWARD 2002

Electronics Research, Inc.
812-925-6000
7777 Gardner Road
Chandler, IN 47610
www.ERIinc.com

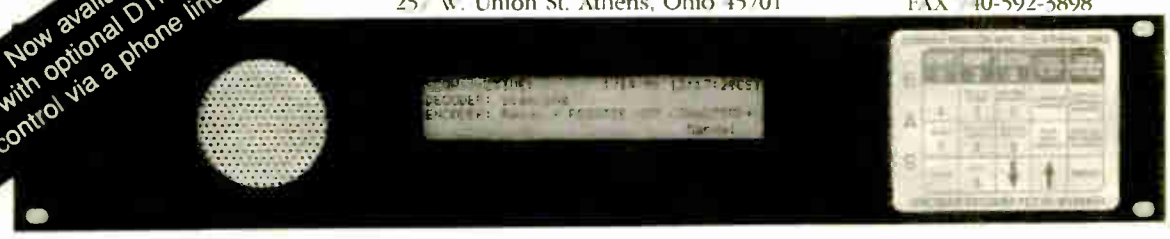
Buy simplicity, reliability and service

EAS
Price $1750.00

Equipment is in stock for immediate delivery!

Now available with optional DTMF control via a phone line.

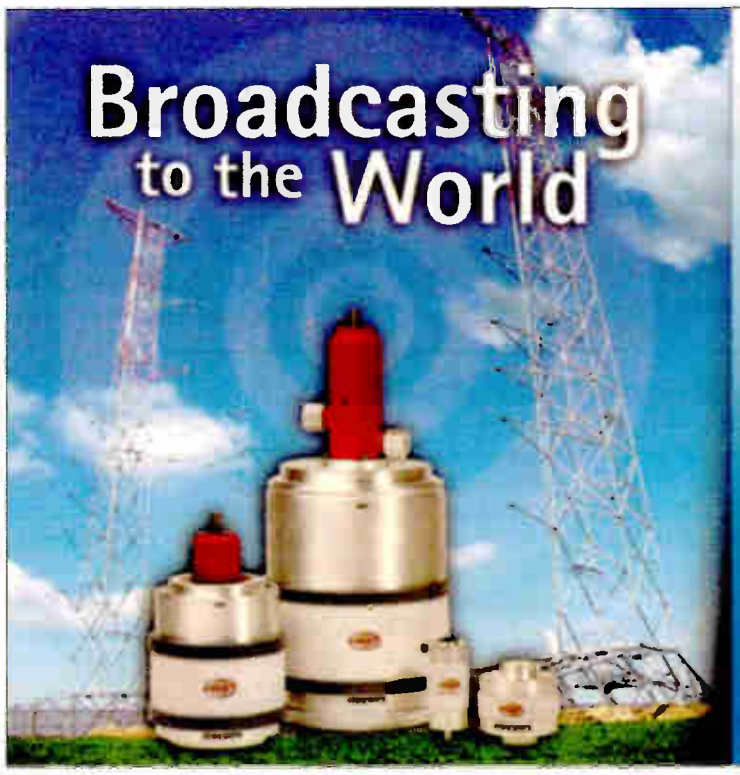
GORMAN-REDLICH MFG. CO.
257 W. Union St. Athens, Ohio 45701
Phone 740-593-3150
FAX 740-592-3898



- 5 two-way RS-232 inputs/outputs for computer, remote signboard & character generator
- 6 audio inputs on standard models. All audio inputs & outputs are transformer isolated from encoder-decoder board
- Automatic interruption of program audio for unattended operation
- 4 line 40 character LCD display with LED backlighting
- 20 key keypad to program unit, set modulation level, set input levels
- Will handshake with automation equipment
- 2 year warranty
- 2 minutes of digital audio storage
- 25 pin parallel printer port for external printer
- 52 terminals on the rear to interface with other equipment by removable plugs
- BNC fitting with 600ohm balanced audio out for second transmitter

jimg@gorman-redlich.com Web Site: www.gorman-redlich.com

◆ *Also available: weather radios, antennas for weather radios, crystal controlled synthesized FM digitally tuned radios, remote signboards, cables for interconnection, character generators*



COMET NORTH AMERICA
421 Wards Corner Road
Cincinnati, Ohio 45140
Ph: (513) 831-5000
Fx: (513) 831-7889
www.cometna.com

- 2 kW range of transmitters for broadcasting
  - Directional VSWR/IL
  - Air and Water Cooled
- Standard equipment is 20 kW single & 2kW translators
- Professional RF test equipment to regularly test spares
- Trained in North America with Kintronic Labs to provide engineering expertise to broadcasters

Kintronic Labs, Inc
144 Pheasant Grove Road
Bluff City, TN 37618
Ph: (423) 878-3141
Fx: (423) 878-4224
www.kintronic.com

CUSTOMIZABLE REAL FURNITURE STUDIO SYSTEMS ARE AT SPACEWISE.

SAVE AT LEAST 5%
CORPORATE MULTIPLE PURCHASE DISCOUNT!

DELUX SYSTEMS START AT $2090!

FULL U "DELUX" AS SHOWN $4395!

QUALITY WOODSHOP STUDIO FURNITURE! EASILY CUSTOMIZED! HARD LAMINATED & BULLNOSED 1½" COUNTERS! EURO HINGED REMOVABLE ACCESS PANELS! PRE ASSEMBLED STURDY BASE COMPONENTS! UP TO SIX RACK UNITS PER FULL U SYSTEMS! ROOM FOR 2 OR MORE PC'S! WOOD TRIM AND KICKS! AVERAGE SYSTEMS SHIP IN 5-8 LARGE COMPONENTS! NOT A KIT! SHIPPED CRATED FOR FAST, SAFE DELIVERY!

STARTING AT $2329!

GUEST "RADIAL" AS SHOWN $4540!

SPACEWISE.
"Quality Broadcast Furniture for Every Budget!"
CALL US TODAY AT 800-775-3660
www.spacewise.com info@spacewise.com

Need a new STEREO FM
TRANSMITTER?

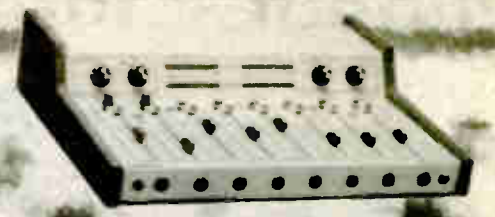
Compact size, Lightweight unit, Switched mode power, Universal 85-260 mains, Adjustable RF Power, Harmonic Filtering, Built-in Stereo Encoder & Compressor/Limiter, BNC Composite/mpx input, Fan Cooled, RS-232 Controllable, SWR & Overtemp Protection. Unsurpassed Specifications. Available in 5 power ranges.

Model TX5 from 100mW to 5 watts output:
Only $899 plus shipping

Model TX20: 2-25 watts. TX50: 2-50 watts. TX150: 10-150 watts. TX300: 25-300 watts.
Call for pricing on these and other fine products

Progressive Concepts
305 South Bartlett Rd., Streamwood, IL 60107
(630)736-9822 Fax (630)736-0353
www.progressive-concepts.com

Mini Mix 8A
Proven...Affordable...
Reliable.



AUTOGRAM

800.327.6901
www.autogramcorp.com

World Radio History

TECH UPDATES

Marantz Touts Portable CD-R

Marantz Professional is out with the CDR300, its first portable CD recorder.

It offers the functionality of a professional tape recorder but records to blank CD-R/RW media. Recorded discs will play back in most CD players.

Users place the compact unit on a tabletop, plug it into an AC electrical outlet or use an optional external battery and record live using the internal microphone or external mics that attach to stereo XLR or 1/4-inch mic/line inputs.

A preamplifier is built in, so an external mixer or mic preamp is unnecessary. A speaker and headphone jack allow users to monitor the recording. RCA analog inputs/outputs and a digital (S/PDIF) input/output are provided on the rear panel.

High and low EQ and high- and band-pass filtering can be adjusted independently for each mic/line input in the preset menu; 48-V phantom power is available for condenser microphones. The unit provides manual or automatic level control, a limiter and digital level meters.

For more information, including pricing, contact Marantz in Illinois at (630) 820-4800 or visit www.marantzpro.com.

Mayah's Flashman Records on the Go

Mayah's Flashman is a professional digital MPEG/linear audio recorder that provides recording and playback from a flashcard. It is touted as easy to handle and robust in the field, with no moving parts, tape or hard disk.

Current flashcards can store 1 GB of information, which corresponds to 16 hours of stereo Layer III audio at 128 kbps, eight hours of stereo Layer II at 256 kbps or four hours of mono when using linear audio at a 32-kHz sampling rate. The three standards are combined with the WAV and Broadcast WAV file formats as well as the major bit rates. Within the Broadcast WAV file format, Flashman also supports Markers, which are used to indicate important segments for later editing.

The unit has XLR connectors for microphone use with phantom power and a digital interface. Features include an interface for PC transmission, S/PDIF in and out, rechargeable batteries with an external loading station and sampling rates of 32, 44.1 and 48 kHz.

Flashman is offered in combination with EditPro, a Layer II and Layer III editing tool, and optionally includes a metal case and accessories such as a recharger, Flashcard Reader and others.

For more information, including pricing, contact Mayah in Germany at 011 49 811 5517 0 or visit www.mayah.com.

The Mayah Flashman With Its Accessories Kit

Denon Features CD/Tape Combi Deck

Denon Electronics recently introduced the DN-T645 combination CD/tape deck player recorder. The unit is marketed as a step up from the DN-T620.

The DN-T645 has CD/CD-R/RW and MP3 playback capability. Controls feature direct-access buttons and a track-select knob. Selectable repeat and single/continuous modes plus custom program playback of 99 tracks allow multiple combinations of playback options.

A folder button gives access to MP3 files. TRS mic inputs with selectable AGC control, input level control and mode switch make recording to cassettes easier. An optically sensed high-speed auto reverse for extended-play record is included. The unit has Dolby B & C noise reduction with HX-Pro. Variable +/-12-percent pitch is provided for CD and cassette.

The unit offers RCA unbalanced and XLR balanced input and outputs. A mono +4/-10-dB switch is provided for XLR level matching.

Digital output is via an RCA jack, and an IR remote sensor is located on the front. An RS-232C/422A port allows for serial control and a DB-25 GPI port provides contact closure control. A mini-remote jack is for use with the optional RC-620 remote. Multiple deck playback and record operation using cascade and external sync is provided.

For more information, including pricing, contact Denon in New Jersey at (973) 396-7469 or visit www.usa.denon.com/pro.

RDL Offers Audio-Isolation DA

Radio Design Labs' STM-DA3 Mic Level Distribution Amplifier is for commercial sound, broadcast and recording applications.

The 1.2-kohm balanced input accepts a variety of microphone input levels. A multi-turn trimmer is user-adjustable for gain or loss to match the facility standard microphone levels. The frequency response is 30 Hz to 20 kHz.

Three balanced outputs provide isolation between the output lines. Unlike mic-splitting transformer systems, the STM-DA3 also provides audio isolation. A +4-dBu signal fed into one output is below the noise floor on the adjacent output. Loading of one output, including a direct short, has no effect on the other outputs.

The unit is built on the electrical architecture of RDL's low-noise, studio-quality mic preamplifiers. Dynamic or condenser microphones may be used with the STM-DA3. Standard 24-V phantom is supplied to the input when the supply voltage is connected to the PHM terminal.

The optimum operating level is set using RDL's Dual-LED VU meter, located adjacent to the terminal block. A green LED illuminates at 15 dB below optimum level. The adjacent red LED illuminates when the operating level exceeds the optimum level. The VU meter is designed to make the STM-DA3 easy to set up without external test equipment, and to provide operating levels that can be monitored at the module.

For more information, including pricing, contact RDL in California at (800) 281-2683 or visit www.rdlnet.com.

Mackie Adds to Recorder Family

Mackie Designs debuted its SDR24/96 24-bit/24-channel nonlinear hard-disk recorder recently.

The SDR24/96 has processing power for 24 simultaneous channels at 24 bit/48 kHz or 12 channels at 24 bit/96 kHz. An internal IDE hard drive can store 90 minutes of 24-track recording, while a drive bay will accommodate the same Mackie Media M-90 pullout disks and Mackie Media Project drives used by the company's other recorders.

Front-panel controls are fashioned after familiar tape-based systems. Unlike tape-based recorders, the SDR24/96 uses nonlinear recording and editing capabilities. Nonlinear recording allows it to record multiple versions of a track or track segment without destroying the original. During playback, the recorder recombines the nonlinear segments into a seamless audio stream. In addition, the SDR24/96 is able to increase recording time per GB by using only the space needed for actual audio.

Ready to use out of the box, the unit comes with fixed rear-panel inputs and outputs that include 24 channels of analog via six DB-25 ports, ADAT optical, MIDI I/O for MMC and MTC, SMPTE and clock inputs and outputs. Also included is a USB port for the export of standard WAV files to PC or Macintosh computers. It retails for $2,499.

For more information contact Mackie in Washington at (800) 258-6883 or visit www.mackie.com.

World Radio History

TECH UPDATES

Mackie Rolls Out Soundscape 32

Mackie Designs has introduced the Soundscape 32, a workstation with special recording features. The DAW is suitable for high-end broadcast and post-production facilities, as well as music production.

The 32-track Sound-scape 32 provides common DAW tools and features, but without a native record engine. Instead, it uses a dedicated microprocessor board and embedded record engine. Audio travels straight from the I/O to the hard disk, unaffected by possible instability in a PC motherboard or operating system.

The hardware features two internal and two external EIDE hard drive bays, two 24-bit/96-kHz mic inputs and four 24-bit/96-kHz balanced line-level outputs. It also has

an RS-422 (nine-pin) Remote Device Control, MIDI I/O for MMC and/or MTC, Ethernet support for network access and a multipin connector that connects to the host interface PCI card. Also available is an optional Synch A/V board that supports video sync, word clock and SMPTE I/O.

The unit provides digital and analog audio I/O, real-time mixing through a user-defined environment, DSP-based effects, an automation package, professional synchronization support, Edit Decision List compatibility with a variety of video editing systems and support for a number of plug-ins. The software includes options for a number of surround applications, selection of edit functions, a flexible dynamics package, multiple undo and redo levels, audio file import/export including WAV or Broadcast WAV, MPEG Layer 1 and MPG Layers 2 and 3. It retails for $6,500.

For more information contact Mackie in Washington at (800) 258-6883 or visit www.mackie.com.

ATI's DA103 and DMA103 Nanoamp Distribution Amplifiers

ATI Debuts Two Distribution Amplifiers

ATI's newest distribution amplifiers are the Nanoamp Series models DA103 and DMA103. The models each offer one input to three servo-balanced outputs at +22 dBm into 600-ohm lines, and have a master gain control and independent output level trimmers

The DA103 uses individual two-piece, quick-change Phoenix-type connectors, one set for each input and output. Its internal gain selections are at 16, 30 and 40 dB.

The DMA103, a distribution microphone amplifier, has XLR inputs and outputs. Phantom power and preamp gain for high-output microphones and line-level inputs are manipulated through dip-switch selection at 30, 40, 60 or 80 dB. The frequency response is +/-25 dB at 20 Hz-20 kHz. External 24-V DC remote power modules can drive several Nanoamps, which can be stacked or rackmounted. Each box is 1.75 inches x 5.6 x 5.75 and weighs 1.25 pounds. Unit protection kits and carrying cases are available.

For information, including pricing, contact ATI in Pennsylvania at (800) 959-0307 or visit www.atiguys.com.

Akai Records, Mixes With DAW

Akai Musical Instrument Corp.'s DPS24 is a 24-track, 24-bit/96-kHz digital audio workstation with recording capabilities. The unit supports 32-, 44.1-, 48- and 96-kHz sampling rates and 16- and 24-bit resolutions, and employs no data compression. It's equipped with a 60-GB IDE internal drive and CD burner.

Sample-accurate, multichannel waveform editing is simplified with the use of a large, multiangle LCD (320 x 240) screen. The multimode edit suite features variations of cut, copy, move, insert and erase functions, plus time-stretch, pitch-shift, normalize, reverse, BPM matching and a fast transport/edit high-resolution jog mode.

The DPS24 includes a digital mixer, which eliminates the need for complex multi-product interfacing. The mixer uses 46 channels and 20 busses with eight subgroups and four stereo returns. Twenty-eight balanced analog inputs with 24-bit/96-kHz A/D converters allow for constant connection to the vital components of a studio. Also part of the system are 100 mm touch-sensitive faders.

The unit has 12 mic/line inputs on balanced XLR/phone combo jacks and 12 mic/line inputs on TRS phone jacks, plus a stereo line-level AUX input, two-track tape return, coaxial stereo assignable S/PDIF and ADAT-S/PDIF switchable multipurpose light pipe (MPLP). Analog outputs and digital outs that include S/PDIF coaxial and ADAT-S/PDIF switchable MPLP are also part of the system, which retails for $5,499.

For more information, contact Akai in Texas at (800) 433-5627 or visit www.akaipro.com.

Products & Services SHOWCASE

Call Today before $5,995* Introductory Price Expires!

SOUND CHOICE FURNITURE
High quality stock studio furniture from the manufacturers of The Best Custom Studio Furniture

Starting as low as $3,295

*As shown, excluding Console & Guest Top

Introducing "Sound Choice Furniture," new from Mager Systems, Inc. the manufacturer of The Best in Sound Furniture. Sound Choice Furniture is high quality Stock studio furniture, featuring the same high quality construction methods and materials found in Mager Systems, Inc. custom furniture. All "Sound Choice Furniture" includes solid surface countertops. The standard color is stormy gray for the solid surface top and a medium speckled gray on the cabinets (see photos). Call today to see how Sound Choice Furniture will benefit your studio.

Winner NAB 2002
2002 PICK HIT
Radio
BE Radio Magazine

Sound Choice Furniture offer these Fine Standard Features:
- Solid Surface Tops
- 1-½" thick 19-ply plywood cabinet construction
- 13-ply Finland Birch access panels
- No Particle Board or melamine
- 10-year Limited Warranty
- Reversible Punch Block cabinet
- Modular - Many Configurations, add-ons and colors available
- Built in ventilation
- Fast Installation - No cabinet assembly

MAGER SYSTEMS, INC.
The Best in Sound Furniture
TEL: 623-780-0045 • FAX: 623-780-9860
www.magersystems.com • mager@magersystems.com
Visit our website for more information

raduga.automation

Automate your station in minutes
...No Degree Required

- Great for Music Formats
- LPFM, NCE, Small & Medium Comms
- Live Assist or Full Blown Automation
- Schedule Spots, IDs, Build Rotations
- Plays mp3, wav, wma

Did we mention...Free Support

www.raduga.net/rw.htm
Download your FREE Demo
(513) 887-0714

$649 Buyout

World Radio History

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

Want to Buy

University T50 tweeter driver. E Davison, WNNS, 1129 Willowbrook Dr, Springfield IL 62707. 217-793-0400 or imed@insightbb.com.

Monitor amp, consumer type, integrated, 100W. Ed Davison, WNNS, 1129 Willowbrook Dr, Springfield IL 62707. 217-793-0400 or imed@insightbb.com.

RW Online

AMPLIFIERS

Want to Buy

Older Altec, RCA or WE tube equipment. Larry Drago, WELI, 495 Benham St, Hamden CT 06514. 203-230-5255 or email: weliman@webtv.net.

ANTENNAS/ TOWERS/CABLES

Want to Sell

AM GROUND SYSTEMS: Reliable, On-time Installation, Quality Workmanship, Ground System Evaluation & Repair. www.amgroundsystems.com, 1-877-766-1999.

THE ANTENNA SITE STORE
Tower Registration Signs
FCC and OSHA Compliance
Tower Leasing Signs
Your Wording Added
610-458-8418
www.antennaID.com
• Antenna ID Products Glenmoore, PA •

Gates/ERI 5 bay horizontal with deicers, $4500. Brian Larson, WNGN, 65 Kings Rd, Buskirk NY 12028. 518-686-0925.

Jampro JSCP-1 cir.pol. on 102.3 with heaters. Also Gates 4 bay ring antenna with heaters, BO. Duane or Reid, WDOS, 7112 Angola Rd, Holland OH 43528. 419-865-5551.

YES!
Space is available!
Advertise in Radio World's Broadcast Equipment Exchange
For more information, call Simone Fewell @ 703-998-7600, ext. 154 or e-mail: sfewell@imaspub.com

AUDIO PRODUCTION

Want to Sell

Precision PE2 line/isolation amps, bal/unbal in & out, new, very quiet, $20 ea +shpg. E Davison, WNNS, 1129 Willowbrook Dr, Springfield IL 62707. 217-793-0400 or imed@insightbb.com.

AUTOMATION EQUIPMENT

Want to Sell

DigiLink DL-2, updated extra hard drive & memory, CD multi play controller, 2 additional 6-channel switchers, in top condition, $2500. Mark Taylor, Sky High Broadcasting Corp/KNFO, 10827 Hwy 86 East, Neosho MO 64850. 417-451-5636.

QEI ARC-27 automatic remote control, $300. Mike Raley, Bible Bdctg Network, 11530 Carmel Commons Blvd, Charlotte NC 28226. 704-523-5555 or email: MRaley@bbnradio.org for pictures.

CART MACHINES

Want to Sell

A Bol 3-300 lazy susan cart rack, holds 520 carts, BO. Bilmer Borneman, WBYN, 280 Mill St, Boyertown PA 19512. 610-369-7777.

BE triple deck in good condition, record mode needs work, 200 carts free, $300/BO. Curt Marker, WHWL, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

ITC Delta I, single play, 2 stereo, excellent condition, BO. Wilmer Borneman, WBYN, 280 Mill St, Boyertown PA 19512. 610-369-7777.

ITC Delta III, triple play stereo, excellent condition, BO. Wilmer Borneman, WBYN, 280 Mill St, Boyertown PA 19512. 610-369-7777.

ITC Delta IV stereo record amp, needs work, BO. Wilmer Borneman, WBYN, 280 Mill St, Boyertown PA 19512. 610-369-7777.

Want to Advertise?
Get all the details by calling 703-998-7600, ext. 154.

COMPLETE FACILITIES

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"

CONSOLES

Want to Sell

Mackie 24 input by 8-buss console with meter bridge, $1300 +shpg. Joel Block, The Production Block Studios, 512-472-8975; voicetrack@aol.com.

McCurdy, Penny & Giles slide pots, $2500 ea. Brian Larson, WNGN, 65 Kings Rd, Buskirk NY 12028. 518-686-0925.

Ramko DC38019S & DC3805S, both in gd working condition. 10S has upgraded input BDS, spare parts, manuals, BO. Duane or Reid, WDOS, 7112 Angola Rd, Holland OH 43528. 419-865-5551.

Soundtracs Topaz 32 input by 8-buss console with meter bridge, immaculate, $1600 +shpg. Joel Block, The Production Block Studios, 512-472-8975; voicetrack@aol.com.

Sparta 5-channel A-15B mixers (2), $50 ea; (2) **Cetec** 5-channel mixers model 001-2003, $50 ea; (2) **Shafer** 5-channel mixers model 2003, $50 ea; **ATI** Vanguard Series console, power supply missing, $100. Mike Raley, Bible Bdctg Network, 11530 Carmel Commons Blvd, Charlotte NC 28226. 704-523-5555 or email: MRaley@bbnradio.org for pictures.

Want to Buy

WE 25-B and power supply desperately needed, will pay $12,500 for one in good condition. Larry Drago, WELI, 495 Benham St, Hamden CT 06514. 203-230-5255 or email: weliman@webtv.net.

LIMITERS/AUDIO PROCESSING

Want to Sell

BE FX 30 exciter, $3000. Mike Raley, Bible Bdctg Network, 11530 Carmel Commons Blvd, Charlotte NC 28226. 704-523-555 or email: MRaley@bbnradio.org for pictures.

Inovonics Map II multi band processor, $800. Mike Raley, Bible Bdctg Network, 11530 Carmel Commons Blvd, Charlotte NC 28226. 704-523-5555 or email: MRaley@bbnradio.org for pictures.

Optimod Stereo Generator 8000A, gd cond, $500. Mike Raley, Bible Bdctg Network, 11530 Carmel Commons Blvd, Charlotte NC 28226. 704-523-5555 or email: MRaley@bbnradio.org for pictures.

Want to Buy

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

MICROPHONES

Want to Buy

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. E-mail: billbryantmgmt@yahoo.com.

RCA, Neumann, WE 77's, 44', lollipop, will pay $1000+ for any of these ribbon or tube type mics in good condition. Larry Drago, WELI, 495 Benham St, Hamden CT 06514. 203-230-5255 or email: weliman@webtv.net.

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 972-271-7625.

RCA 44BX & 74B, should look good, need 1 of each. Bob Lindahl, 10680 SW Wedgewood St, Portland OR 97225. 503-644-9643 or email: bob@webgypsy.net.

MISCELLANEOUS

Want to Sell

ROTRON BLOWERS AND PLATE BLOCKERS, new & rebuilt for Elcom, Harris, CCA, CSI, McMartin. Goodrich Ent. 11435 Manderson St. Omaha, NE 68164 402 493 1886 FAX 402 493 6821

Eventide VR201, 500 hour digital DAT based audio logger, DAT tapes included, $4500. Julie Cudahy, WMSE, 1025 N Broadway, Milwaukee WI 53072. 414-277-7556.

Gyyr TCC2196HD, 96 hour triple density VCR, needs head repair, $200. Julie Cudahy, WMSE, 1025 N Broadway, Milwaukee WI 53072. 414-277-7556.

Mobile Studio, trailer 10'x46', 4 rooms, bathroom, air conditioner, wired for electrically LAN, telephone, audio, built in cabinets & counter, call for more info & pictures, $25,000. Jerry Mathis, Lifetalk Radio/KLRO, POB 209, Vonore TN 37885. 423-884-2800.

Ptek FM25E FM exciter, like new, 25 watts output with manual, $500. E. Davison, WNNS, 1129 Willowbrook Dr, Springfield IL 62707. 217-793-0400 or imed@insightbb.com.

QEI 7775 automatic transmitter control, has manual, works, BO. Duane or Reid, WDOS, 7112 Angola Rd, Holland OH 43528. 419-865-5551.

Zercom 25 Hz dual tone detect & notch filter (tone detector) (4), $75 ea; **Symetrix** TI 101 hybrid, $125. Mike Raley, Bible Bdctg Network, 11530 Carmel Commons Blvd, Charlotte NC 28226. 704-523-5555 or email: MRaley@bbnradio.org for pictures.

Want to Buy

Jazz, Classical, Blues record albums from the 40's, 50's, 60's in good condition, highest prices paid. Larry Drago, WELI, 495 Benham St, Hamden CT 06514. 203-230-5255 or email: weliman@webtv.net.

Old Audio/Audio Engineering magazines prior to 1949. Mike Stosich, Esoteric Sound, 4813 Wallbank Ave, Downers Grove IL 60515. 630-960-9137.

Radio World EQUIPMENT EXCHANGE

MONITORS

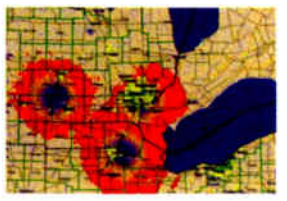
Want to Sell

Used Mod Monitors, McMartin & Belar. Many to choose from, tuned & calibrated on your frequency, full guaranteed. Goodrich Ent. 402-493-1886.

HollyAnne HV-961 EAS encoder-decoder with all accessories, $700. Kent Smith, WMJZ, POB 1766, Gaylord MI 49734. 989-732-2341.

BROADCAST ENGINEERING CONSULTING SOFTWARE

Professional software packages for preparing FCC applications and plotting coverage. For Windows and NT.



✓ Create "real-world" coverage maps with Longley-Rice, TIREM, PTP & other models using polygon map features.
✓ Prepare concise FCC model coverage maps and allocation studies using USGS geographic map databases. Census calculations, tower and airport databases.
✓ Search for AM, FM, TV, DTV & LPTV channels with graphics oriented programs and FCC databases.
✓ Plot STL paths in 3-D using NGDC terrain databases... and more!

V-Soft Communications
800-743-3684
www.v-soft.com

RECEIVERS/ TRANSCEIVERS

Want to Sell

SCA receivers, McMartin TRE5, Erko T4A, 67KC & 92KC on rack panel, $25 ea +shpg. E Davison, WNNS, 1129 Willowbrook Dr, Springfield IL 62707. 217-793-0400 or imed@insightbb.com.

RECORDERS

Want to Sell

Ampex AG 440-2, 2 track, good condition, rackmount, has Gentner track motion pic sync playback, $400. Bob Lindahl, 10680 SW Wedgewood St, Portland OR 97225. 503-644-9643 or email: bob@webgypsy.net.

CCA 3000 tuned to 99.3, easy removal, removed from service when station was sold, BO. Jim Parman, WHIR, 2063 Shakertown Rd, Danville KY 40422. 859-236-2711.

REMOTE & MICROWAVE

Want to Sell

REMOTE EQUIPMENT RENTAL
Silver Lake Audio
(516) 763-1776
silverlakeaudio.com

MUSICAM CDQ Prima 220 audio codec with timecode option, 2 years old, mint condition, barely used, $4500. 818-676-0950.

Visit us online at: www.rwonline.com

WE RENT FOR LESS
Hotlines — FM Exciters
Zephyrs — STL's
Nexus — FM Pwr Amps
Audio — Test Equipment
If we don't have it, we will get it!
SCMS, INC. (800) 438-6040
"You Know We Know Radio"

REPAIR SERVICES

Broadcast Equipment Repair
• AM Antenna Monitors
• AM/FM Modulation Monitors
• Audio Processing
• Exciters
• RPU Transmitters/Receivers
• STL Transmitter/Receivers
• Test Equipment
• Transmitter Field Repair
Rapid Turnaround - Professional Service
DCS DIVERSIFIED COMMUNICATIONS SYSTEMS
(814) 756-3053
E-mail: rpogson@aol.com

Scully 280B's in Rusland consoles, $500 ea. Brian Larson, WNGN, 65 Kings Rd, Buskirk NY 12028. 518-686-0925.

Tascam 32 (2), excellent condition, very little use, rack mount, $800/BO. Curt Marker, WHWL, 130 Carmen Dr, Marquette MI 4985. 906-249-1423.

To advertise, fax Simone @ 703-671-7409

SATELLITE EQUIPMENT

Want to Sell

Zephyr satellite receiver (analog), $200; **Wegener** DN 86 digital audio receiver, freq can be changed on the field, $750. Mike Raley, Bible Bdctg Network, 11530 Carmel Commons Blvd, Charlotte NC 28226. 704-523-5555 or email: MRaley@bbnradio.org for pictures.

World Radio History

SATELLITE EQUIPMENT WTS (cont.)

Zephyrs 4 cards #304, excellent condition, BO. Curt Marker, WHWL, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

STATIONS

Want to Buy

Want to Purchase or Lease Small Market Radio Stations 1-800-330-7292

TELEPHONE EQUIPMENT

Want to Sell

Need donation of radio towers for construction of shortwave antenna system. We are non-profit and can give tax receipt. Charlie Riddle, 703-561-8001 or WRCRadio@yahoo.com.

TRANSMITTERS

Want to Sell

BE FM-30-B 30KW FM. Continental Communications, 314-664-4497. Email: contcomm@fiastl.net.

Continental 814-R1 2.5 KW FM. Continental Communications, 314-664-4497. Email: contcomm@fiastl.net.

Harris-Gates FM-5G 5KW FM & **Harris-Gates BC-5-H** 5KW AM. Continental Communications, 314-664-4497. Email: contcomm@fiastl.net.

McPherson Radio Corporation

Specializing in pre-owned QEI FM transmitter products. All tuned and tested on your frequency, 6 month warranty included!

MRC has a facility to meet your broadcast needs for repair and complete overhaul of QEI exciters and low power transmitters. Other broadcast manufacturer products are also welcome.

Bob Brown
Phone: 856-232-1625 • Fax: 856-232-2075
Email: rjbeme@aol.com

McMartin BF-5K, 5kW FM. Factory rebuilt in perfect, like new condition, includes new tubes, tested & tuned on your frequency. Guaranteed, fully adjustable from 0 to 5.5 kW. Goodrich Enterprises Inc, 402-493-1886.

RCA BTF-20-E1 20KW FM. Continental Communications, 314-664-4497. Email: contcomm@fiastl.net.

Gates 1BG 1 kW AM, spare or parts, $2500. Brian Larson, WNGN, 65 Kings Rd, Buskirk NY 12028. 518-686-0925.

OFF THE AIR?
Emergency Back-up Rentals
FM Exciters - STLs -
FM Pwr Amps - Antennas -
Studio & Test Equipment
SCMS Inc (800) 438-6040
"You Know We Know Radio"

Gates FM10H on 102.3, solid state rectifier, spare tubes, some parts, works good, BO. Duane or Reid, WDOS, 7112 Angola Rd, Holland OH 43528. 419-865-5551.

OSI FM1200E on 102.3, spare tubes, service manual, multi meter not working properly, BO. Duane or Reid, WDOS, 7112 Angola Rd, Holland OH 43528. 419-865-5551.

QEI 675 exciter in good working condition, some new spare parts, service manual, BO. Duane or Reid, WDOS, 7112 Angola Rd, Holland OH 43528. 419-865-5551.

TRANSCOM CORP.
Serving the Broadcast Industry Since 1978
Fine Used AM & FM Transmitters and Also New Equipment

300W	FM	1988	Harris FM 300K Solid State Single Phase
2.5KW	FM	1984	Harris FM 2.5K Single Phase
2.5KW	FM	1980	Harris FM 2.5K Single Phase
5 KW	FM	1992	Continental 815A
10KW	FM	1974	Harris FM10H/K
15KW	FM	1980	McMartin BF15,000
20KW	FM	1981	Harris FM20K
20KW	FM	1980	Harris FM20H/K
25KW	FM	1980	CSI T-25-F
25KW	FM	1987	Harris FM 25K-1
50KW	FM	1982	Harris Combiner w/auto exciter-transmitter switcher

5KW	AM	1980	Harris MW5A
5KW	AM	1978	Harris MW5
10KW	AM	1982	Continental 316F
10KW	AM	1982	Harris MW10A
10KW	AM	1986	Continental 316F
50KW	AM	1982	Continental 317C2
50KW	AM	1986	Nautel Ampfet 50-Solid State

EXCITERS
Harris MX-15
BE FX30
Harris MS-15
"New" 30 wt synthesized

Miscellaneous Equipment:
Potomac Ins. AA51 Audio Anyl. (new)
Moseley TRC-15 Remote w/ Hallikainen
SCA Generator (MX-15 Module)
Optimod 8100A (cards 3, 4, and 5 only)
Dummy Load 80 KW air cooled
Technics SH9010 Equalizer

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

CONSULTANTS

EVANS ASSOCIATES *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.
E-mail: info@owleng.com **1-800-797-1338** Fax (763) 785-4631
8899 Hastings St NE, Minneapolis, MN 55449 (763) 785-4115 Member AFCCE

T. Z. Sawyer
Technical Consultants
www.sawyer.com
AM-FM-TV-LPTV
• FCC Applications & Exhibits
• Experimental Authorizations
• AM Directional Antennas
• High Power Antenna Arrays
• Frequency Studies
• Class Upgrades
• STL Applications
• Station Inspections
1-301-913-9287
FAX: (301) 913-5799
5272 River Rd, #460, Bethesda, MD 20816

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

Doug Vernier
Telecommunication Consultants
Broadcast Engineering Consulting
AM/FM/TV/LPTV/DTV
Custom mapping service
Frequency searches
Propagation prediction
FCC application preparation
VSoft Software for your PC
(800) 743-3684
www.v-soft.com

System One Communications
Broadcast Constructors & Consultants
Houston, Texas
888-625-5649
➢ AM-FM Site Construction Specialists
➢ Complete Tower Service
➢ Antenna & Transmission Line Diagnostics

Radiotechniques
402 Tenth Avenue - PO Box 367
Haddon Heights, NJ 08035
856-546-8008 - Fax 856-546-1841
E-mail: ted@radiotechniques.com
Consulting Engineers
AM - FM - TV
FCC Applications
Directional Antennas
Transmitter & Studio Design
Edward A. Schober, PE
Member AFCCE

M Celenza Communications Consultants
TV-$550; LPTV-$550; FM-$250;
AM Freq Searches-Call for quote
Applications, Amendments & Upgrades
Antenna Structure Registration,
Field Work Avail
631-928-0077
Fax: 631-928-1905

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

FASTER... MORE ACCURATE RADIO COVERAGE
• Real Time 3-D Displays
• Interference calculations
• Cost effective mapping
• Fully integrated databases
• Used by the FCC
• Latest standards built-in
RADIO SOFT
Visit us on the the web at www.radiosoft.com
109 West Knapp Ave. • Edgewater • FL • (386) 426-2521

dataworld®
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

FM FREQUENCY SEARCH - $250
FCC FM APPLICATIONS - $1350
Amendments & Upgrades
Field Work * Site Construction
New Allotments * Petitions
Duopoly Studies * Maps
MBC Consulting
800-219-7461
www.mbcradio.org • engineer@mbcradio.org

Communications Technologies, Inc.
Broadcast Engineering Consultants
AM FM TV LPTV
Cellular/PCS Site Analysis
P.O. Box 1130, Marlton, NJ 08053
Phone: (856) 985-0077
Fax: (856) 985-8124
Internet: commtechrf.com
Clarence M. Beverage
Laura M. Mizrahi

Structural Analysis
ERI
Electronics Research, Inc.
7777 Gardner Road
Chandler, IN 47610
(812) 925-6000
www.ERIinc.com
REGISTERED PROFESSIONAL ENGINEERS STRUCTURAL ANALYSIS TOWER REINFORCING
ERI Incorporated 1943

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

...country, top 40, news, urban, talk, jazz, the classics, mixed bag...
RADIO! The beat goes on!
CROUSE-KIMZEY OF ANNAPOLIS
tops in broadcast equipment
1-800-955-6800
ask for Kathleen
kkannapolis@worldnet.att.net

STUDIO FURNITURE?
Durable - Attractive - Quality
Room systems starting at $2695!
PRE-BUILT COMPONENTS!
FAST & EASY ASSEMBLY!
WE CUSTOMIZE!
VERY AFFORDABLE SHIPPING!
SPACEWISE®
"It fits as well into your budget... As it does into your studios!"
800-775-3660 spacewise.com

World Radio History

ECONCO

NEW

ECONCO NEW TUBES

New tubes are now manufactured by ECONCO at our award winning facility in Woodland California! Of course, we continue our 34 year tradition of high quality power tube rebuilding.

TEL: 800-532-6626
INTL: +1-530-662-7553
FAX: +1-530-666-7760
www.econco.com
SE HABLA ESPAÑOL

ECONCO

RCA BTF-20E1 20 kW FM transmitter with Harris MX15 exciter, $15,000. Jon Zecherie, WCCN, W10273 Walkers Rd, Humbird WI 54746. 715-964-2515.

Tepco J-340 translators, used 2 yrs, like new, (2) available, $2000 ea. Curt Marker, WHWL, 130 Carmen Dr, Marquette MI 49855. 906-249-1423.

CSI FM-12,000E, 12KW 89.9Mhz, 3 phase 208/230. 76"x39"x34". Harmonic filter. Good condition, spare parts & manual, doesn't include exciter, $1899 +shpg. David Green, KCRW, 1900 Pico Blvd, Santa Monica CA 90405. 310-314-4651.

Harris 3.5KW FM transmitter tuned to 105.5, $10,000/BO. Cale Tharp, 270-766-1035.

Buying or selling used equipment? You're in the right place!
Radio World
Broadcast Equipment Exchange

TUBES

Want to Sell

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**.

EIMAC, AMPEREX, ED-COM, 3CX2500F3, 3CX3000A7, 4CX250B, 4CX300A, 4CX1000A, 4CX1500B, 4CX5000A, 4-400C, 811, 833C, ETC. WESTGATE 800-213-4563.

RF PARTS COMPANY
• Broadcast • Industrial Communications

• EIMAC • TAYLOR
• ECONCO • SVETLANA
Also
Motorola • Toshiba • SGS-Thomson & Mitsubishi Semiconductors
Catalog: www.rfparts.com
Se Habla Español • We Export
760-744-0700 • 800-737-2787
Fax: 760-744-1943
E-mail: rfp@rfparts.com

D And C Electronics Co.
NEW TUBES
We have the alternatives for all your needs, at the lowest prices, direct from OUR STOCK!!
Svetlana
EIMAC, SVETLANA, PRO-TEK®, EEV and many others.
(352) 688-2374
PH: (800) 881- 2374
FAX: (352) 683- 9595
SE HABLA ESPAÑOL
WE EXPORT
VISA/MASTERCARD ACCEPTED

Want to Buy

WE 274B & 350B & others. Ed Davison, WNNS, 1129 Willowbrook Dr, Springfield IL 62707. 217-793-0400 or imed@insightbb.com.

POWER Eimac YOU CAN TRUST
ISO 9001 Certified
The Answer for a Reliable Clean Signal
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
CPI Communications & Power Industries division

EMPLOYMENT

HELP WANTED

Rapidly expanding radio group has stations top billing list available for experienced professional. Good $$$ plus, great benefit package for the right person. Is that you? If you're hard working, hungry to earn and an absolute hammer on the streets, come join us here in the sunny Southwest. Please send resume, qualifications and professional references to KICA Radio, 1000 Sycamore St, Clovis NM 88101. C/O Ron Pierson. We are an EOE.

TV & RADIO ENGINEERS

Holston Valley Broadcasting Corp., located in the beautiful mountains of East Tennessee & Southwest Virginia has immediate openings for a Chief Engineer & a staff engineer. The Chief should have at least 5 years' maintenance experience on AM, FM & UHF TV transmitters, radio & TV studio equipment maintenance & be computer literate. Holston is a privately-owned company with good health benefits, both 401(k) & qualified retirement plans, & generous vacation benefits. EEO & drug-free. Send resume to gdv@wkpttv.com or call George DeVault at 423-246-9578.

SPACE IS AVAILABLE!
To advertise, call 703-998-7600, ext. 154.

POSITIONS WANTED

Friendly, industrious, FCC commercial-1st class, w/Radar-amateur-extra radio licensed, CE, asst CE, seeking FT, PT, contract work, AM/Fm, cable, TV, within 75 mile radius or metro NYC area. Mitchell Rakoff, 81-12 Roosevelt Ave #702, Jackson Heights NY 11372-6726. 718-969-5224 or email: MitchellRakoff@Yahoo.com.

Hot new chick needs a job quick! Energetic rookie DJ great at on-air, newscasting, sportscasting & more! Allow me to help you stay at the top. Lakeysha, 405-733-4531 or Nyceqt@sbcglobal.net.

Looking for a challenge in the radio world. 25 yr old male with ambition 7 desire to be the best. Will 405-670-3866.

Brand new "baby broadcaster" need "gig"! Will travel for enough money! Prefer OK, KS, AR, MO, OR AZ. Want to stay west of the Mississippi river. Roger 405-282-7397.

I'm your Huckleberry, Nascar lovin, Dixie whistling, son-of-the-south ABS graduate who looks forward to bringing southern spirit to your station. Shelby 405-789-7712 or simpleman0977@cs.com.

Looking to boost ratings? ABS graduate, 4.0 GPA, 1.5 years on-air experience. Excellent digital production skills. Will work anywhere & a variety of formats. Matt 405-924-2943.

Rookie DJ on the hunt for on-air job. I can produce, write news & copy & do sports & newscasts. Willing to do anything required for the job. Ken 405-273-5359.

Small town girl with a BIG TIME VOICE ready to go on air! Extensive training in voice, board ops, production & news. Killer personality is a bonus! Misty, 918-341-8042 or mistykay23@hotmail.com.

ADVERTISE YOUR EMPLOYMENT AD ON OUR WEB SITE FOR ONLY $2 PER WORD!

ADS GET POSTED THE NEXT BUSINESS DAY AND WILL RUN FOR A FULL TWO WEEKS!

COMBINE THIS WITH AN AD IN OUR RADIO WORLD NEWSPAPER EMPLOYMENT SECTION AND REALLY COVER THE BROADCAST INDUSTRY AND THEN SOME!

www.RWonline.com

Call Simone Fewell for all the details at

703-998-7600 Ext. 154

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: _____
Make: _____ Model: _____
Brief Description: _____
_____
_____
_____
Price: _____

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
_____
_____
_____
Price: _____

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
_____
_____
_____
Price: _____

***Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.**

Broadcast Equipment Exchange
PO BOX 1214, Falls Church, VA 22041 • Tel: 703-998-7600 • Fax: 703-998-2966

World Radio History

Radio World

5827 Columbia Pike, 1st Floor • Falls Church, VA 22041
PHONE: 703-998-7600 • FAX: 703-671-7409

Classified Advertising Rates
Effective January 1, 2002

	1x	6x	13x	26x
1-9 col inch (per inch)	$100	95	90	85
10-19 col inch (per inch)	$85	75	65	55
Distributor Directory	$125	120	115	110
Professional Card	$95	90	85	80
Station/Studio Services	$185	157	133	113
Classified Line Ad	$2/word			
Blind Box Ad	$15 additional			

Call Simone Fewell, Ext. 154, Classified Ad Manager, to reserve space in the next issue. Use your credit card to pay, we now accept VISA, MASTERCARD and American Express.

Radio World

The Newspaper for Radio Manager and Engineers

"I love **Radio World**! Every issue has something for everyone in the business."

Bill Diehl, Entertainment Correspondent
*—**ABC Radio Networks, New York, NY***

"The most important magazine on radio."

John Stortz, Chief Engineer
*—**WKES/WKZM Moody Broadcasting, St. Petersburg, Fla.***

Our readers have something to say

"Pound for pound, **Radio World** is the best trade magazine of the bunch. I truly enjoy reading it and I have a notebook of articles I've kept from past issues."

Ed Towey, President
*—**Ed Towey & Associates Inc., Tallahassee, Fla.***

"Last April (2001), wind-shear took our 328-foot self-supporting tower down. **Radio World** was a 'life saver' in giving me contacts of firms who were a part of the total effort of getting a new tower back in place of the old one. WGNS was on the air with a 'horizontal wire' antenna the next day, but we were not back at full-power until July 14, 2001. **Radio World** was a treasured source of information during that time of crisis."

Bart Walker, Owner/President
*—**WGNS Talk Radio, Murfreesboro, Tenn.***

Advertiser Index

This listing is provided for the convenience of our readers.
Radio World assumes no liability for inaccuracy.

PAGE	ADVERTISER	WEB SITE URL
27	Acoustic Systems	www.acousticsystems.com
43	AEQ	www.aeqbroadcast.com
22	Armstrong Transmitters	www.armstrongtx.com
42	ATI	www.atiguys.com
39	AudioScience	www.audioscience.com
2	Auditronics/Wheatstone	www.auditronics.com
46	Autogram Corporation	www.autogramcorp.com
45	Belar	www.belar.com
25	Bext	www.bext.com
12	Broadcast Data Consultants	www.broadcastdata.com
42	Broadcast Tools	www.broadcasttools.com
28-29	BSW	www.bswusa.com
4	Burk Technology	www.burk.com
42	Circuit Werkes	www.circuitwerkes.com
46	Comet North America	www.cometna.com
7	Comrex	www.comrex.com
1	Continental Electronics	www.contelec.com
42	Cortana	www.cortanacorporation.com
34	Denon Electronics (USA) Inc.	www.denon.com
46	Electronic Research Inc.	www.eriinc.com
15	Eventide	www.eventide.com
46	Gorman-Redlich Mfg. Co.	www.gorman-redlich.com
21	Harris	www.broadcast.harris.com
37	Harris	www.broadcast.harris.com
44	Henry Engineering	www.henryeng.com
10	Inovonics	www.inovon.com
31	Klotz Digital AG	www.klotzdigital.com
42	LBA Technology	www.lbagroup.com
8	Logitek	www.logitekaudio.com
23	Mackie	www.mackie.com
48	Mager Systems	www.magersystems.com
33	MediaTouch	www.omt.net
17	Northeastern Communication Concepts	Not Available
20	NPR Satellite Services	www.nprss.org/rw
9	Omnia, a Telos Company	www.omniaaudio.com
46	Progressive Concepts	www.progressive-concepts.com
5	Radio Systems	www.radiosystems.com
11	Radio Systems	www.radiosystems.com
48	Raduga Automation	www.raduga.net
44	RAM Broadcast Systems, Inc.	www.ramsyscom.com
44	Ramsey Electronics, Inc.	www.highpowerfm.com
44	S.C.M.S., Inc.	www.scmsinc.com
19	Sierra Automated Systems	www.sasaudio.com
3	Sine Systems	www.sinesystems.com
46	Spacewise Broadcast Furniture	www.spacewise.com
44	Studio Technology	www.studiotechnology.com
13	Telos Systems	www.telos-systems.com
41	Telos Systems	www.telos-systems.com
24	The Museum of Television and Radio	www.mtr.org
55	Wheatstone	www.wheatstone.com
56	Wheatstone	www.wheatstone.com

World Radio History

Radio World, September 25, 2002

GUEST COMMENTARY

Satellite Radio Falling to Earth?

by Frank McCoy

OK, so XM has maybe 350,000 subscribers now, and Sirius is trying to break out above 10,000 (a bit like the Dow in that respect). With about 100 channels apiece, that works out to 3,500 and 100 subscribers per program offering, respectively. This presumes all channels will get equal audiences, although the Lithuanian channel may not have the draw of ESPN or CNBC, I'm thinking.

Most of these subscribers are in cars, and the conventional wisdom is that automobile listening is maybe two hours a day. So if the regular FM radio in the dash never gets turned on and Sirius or XM get all the listening, we're looking at about 200,000 subscriber-hours of actual ear time each month for each of market-leader XM's channels.

Leading sites

Arbitron says the leading Webcast sites blow the doors off those numbers. Virgin Radio got 1.38 million listener hours in July. Jazz FM UK was second with just over a million listener hours. In third place was WQXR, a classical FM out of New York! A 200,000-hour performer would have been ranked between number eight and nine, between KPLU(FM)'s jazz and Ozzy Osbourne on KNAC(FM).

Alright, maybe the money is in the subscriber fees, which regular FM and Webcasting don't have. The market capitalization of XMSR (found on NASDAQ) as of this writing is about $275 million, and it has a price-to-book ratio of 0.21, meaning they've got about $1.3 billion in the deal overall. They've been cut off from further borrowing and have been told it's pretty much do or die.

I'm ignoring Sirius since it has already been downgraded and investment bank Salomon Smith-Barney's analyst used the phrase "time to throw in the towel" on the firm's Web site, which is probably good news for XM, although Sirius might live on in bankruptcy and/or be acquired by Ford. So don't count them out altogether.

How many $10 subscribers do you have to have to cover the vigorish on $1.3 billion? Presuming an average margin of 50 percent (a wild-ass guess at best), you need about 3 million folks sending in their checks every month based on my guess of a 15-percent cost of funds. Maybe they borrowed the money for less than 15 percent on average, though I doubt it, since the funding came on the heels of Motorola's Iridium disaster.

The business model XM trumpeted is that costs are mostly fixed while revenue is determined by the number of subscribers and advertising dollars. Iridium's was the same — once it's built, every increase in revenue is an increase in profit.

"Holy cash-flow, Batman! That means if we double the number of subscribers, we quadruple the profit! How can we lose?"

'The birds named Rock and Roll will soon will be delivering pictures of the kids to Grandma's color-screen cell phone.'

Well Robin, partly because the FM stations you expect to get your listeners and ad revenue from may not take this lying down. You'll need to buy advertising from terrestrial FM (though probably not from Mel Karmazin, who prohibited ads for streaming media on Infinity stations) to get the subscribers you need. And if you are successful at getting ads off the FM band, you'll face the age-old revenue vs. clutter problem with your subscribers. And the alternative for the subscribers is to go back to free FM.

So by all estimates, with the capital market spigot shut off for XM and Sirius, and with enough money in the bank to run the store for maybe another year (although marketing expenses must surely increase to improve penetration), I'm thinking the birds named Rock and Roll (XM's geostationary satellites) will soon be delivering pictures of the kids to Grandma's color-screen cell phone. Or the entire enterprise will just become a wholly-owned subsidiary of GM and Ford, delivering the latest news on zero-percent-financing and a constantly updated map giving directions to the nearest dealership.

Frank McCoy is vice president of American Media Services, based in Chicago.

Voice Tracking Homogenizes Radio

by Ty Ford

The July 3 story "N.Y. Jocks Wary of Voice Tracking" was most interesting. Having spent 17 years on-air and a concurrent six-year period as operations manager for WIYY(FM) in Baltimore, I find Randy Michaels' justification for voice tracking to be consistent with a corporate management position.

Tenacious managers often spend much of their time on the slippery slope of such issues. His comments on the fight over using phonograph records in the early days of radio — "They [announcers] believed that all music should come from a live orchestra. Voice tracking is just a tool, and like all tools, it can be used in good and bad ways. ... Expect voice tracking to be a big benefit to our talent in New York" — are proof of his understanding of the history of broadcasting, the evolving nature of technology and the bottom line of business.

I would like to offer a caution to those N.Y. talents and the industry at large. I recently had an offer to go back on the air here in Baltimore. It's been about 13 years since I was on the air, but amazingly, I am still fondly remembered. My own business has done well, to the point where I simply couldn't afford to take on a weekday airshift, although one was offered.

Instead, management and I set our sights on a four-hour weekend slot. I explained that, in my position as a location audio technician for film and video shoots, I would charge a four-hour "half-day rate" of $250, and that's what I'd expect from the radio station for a four-hour show.

Their response was that they would pay me $70 for an hour to come in and voice track a four-hour show. I responded that I wasn't smart enough to figure out how the "pay me for one hour, use me for four hours" deal was good for me; with no alternatives in sight, no deal was made.

In the aftermath, several thoughts keep bothering me. Automation, by whatever name you call it, has always been a cost-cutting device. It robs the audience of the "in the moment" or "deemed to be live" aspect of an announcer's performance. I believe the audience has an expectation that there is a live human being communicating with them.

Granted, robot radio does improve consistency by letting the announcer get the timing and performance of each break right. I know a number of announcers as far back as the late 1960s who used recording cart machines in the on-air booth to record every break during the music sweeps, airing the cart instead of doing it live. However, they were still there, on the air, to take calls, interact with the audience and the happenings of the day. They were real-time announcers, approachable personalities.

'I wasn't smart enough to figure out how the "pay me for one hour, use me for four hours" deal was good for me.'

Robot radio prevents the audience from calling the announcer on the phone. One-to-one communication forms the bedrock of communication theory, radio or otherwise. Whether over the air or over the phone, that link, when handled properly, is a vital means of interacting with the audience and accumulating information for programming research. To suggest that it isn't relevant and important is simply wrong.

Mr. Michaels and others can put whatever coat of paint on it they wish. They will be smart enough to make it appear to be a good deal. Their supreme sales ability remains unquestioned.

Offering N.Y. talent the possibility of wider exposure for a modest increase in pay may be all it takes. Those few talents will be able to take their profits to the bank. The audience won't know what they lost until they try to call a station.

Ever call a business only to be totally unable to communicate with a sentient human? At some point, you stop trying. Breaking that link between a listener and their radio station would be a shame and an incalculable loss.

In addition, although the management position will be that voice tracking has "cleaned up" the airwaves by bringing the best talent to your local radio station (which they probably own anyway), many of the lower-tier announcers will lose their jobs. Smaller markets always have acted as the training ground for tomorrow's major-market talent. Voice tracking cannibalizes that talent-development process.

If your business model includes owning as many radio stations as possible, creating a monopoly and keeping operational costs down by supplying even the smaller markets with "major-market talent" via voice tracking, then Mr. Michaels is right on target and his plan makes perfect sense. He wins a year's supply of McDonald's hamburgers, because they all taste the same, whether you're in Oshkosh, Neb., or Miami.

On the other hand, if your business model is a station with a localized, creative, cultural partnership that interacts with individuals in its community, the "Michaels über alles" form of broadcasting seems to fall short.

Ty Ford is the CEO/chief science officer of Technique Inc. in Baltimore and a frequent contributor to Radio World. The views expressed are his own.

Write to Us

RADIO WORLD READER'S FORUM
P.O. Box 1214 Falls Church, VA 22041
radioworld@imaspub.com

World Radio History

◆ READER'S FORUM ◆

Inside Radio and Clear Channel

It was announced on Aug. 5 that the fax publication "Inside Radio," run by Jerry Del Colliano since 1975, has been bought by M Street Publications. Let me explain why I'm concerned about this "merger."

Del Colliano has spent a considerable amount of time over the past several years being a vocal (some say too vocal) critic of Clear Channel. In fact, he had written some rather negative assessments of Clear Channel's stock, and often criticized Clear Channel's business practices.

But now, he has lost a lawsuit that CC had filed against him for libel. During that legal battle, Jerry charged that CC was trying to silence him and drive him out of business. So imagine my surprise when the announcement came that Jerry is suddenly out of the biz completely, and M Street will publish the sheet as well as own the right to use the name "Inside Radio." The irony there is that M Street is a subsidiary of Clear Channel.

I go back years with Tom Taylor, the editor of M Street. He is well-respected. He insists that the newly merged sheet will still be independent.

But although I am certain of his sincerity, I must ask how independent he really can be when his company is owned by the very people Jerry used to cast in such a negative light. I am sure Tom will say that he plans to call 'em as he sees 'em, but let's be realistic. Is he really going to be free to criticize the very people for whom he works?

Based on what I have seen in the past few days of the "new" Inside Radio, there are many more help wanted ads (CC obviously didn't advertise when Jerry was so critical of them), and much of the news about Clear Channel is positive. This may be because there is in fact positive news to report; but it just makes me wonder if once again CC has won, having been able to stamp out another adversary and assure more upbeat reporting rather than any criticism or scrutiny.

I have no ax to grind with Clear Channel. But I find it troubling that the mainstream media haven't followed the merger of Inside Radio with M Street, just as they have seldom reported about how broadcasting today is dominated by a small group of giant conglomerates, who sometimes seem more oriented towards the bottom line than towards doing good radio. I did not always agree with what Jerry wrote, but it was nice to know he was independent. For that reason alone, I am sorry to see him go.

Donna Halper
Programming Consultant, Media Historian
Halper & Associates
Boston

AM and IBOC

Great article on IBOC by Mario Hieb (June 19, "Arrays Are Esoteric, Misunderstood"). It is obviously not one that most want to see, especially if one is a member of the founding team.

I was employed by Gannett in St. Louis at the time IBOC (ACORN) was created, and primarily worked on the determination of IBOC's impact on the analog signal from the variety of FM digital methods designed at the time by EDI, Electronic Decisions Inc., in Champaign, Ill. Later I worked with the AM system impact and testing designed by Xetron in Cincinnati.

I am discouraged at what politics have done to the IBOC system. The shortfalls of the AM system seem to be getting handled like political damage control.

When was it ever that you witnessed an array that the near or far-field measurements were reasonably symmetrical from 10 kHz below to 10 kHz above the carrier? I pointed this out in 1995.

The typical DAs were not going to be compliant with IBOC, for two reasons:

First, the bit errors as a result of the asymmetry and phase distortion in the array to the data carrier. This is possibly compensated by broadbanding the array or even pre-equalizing the data to precompensate for the roll-off. But it depends on the design of the array. (But that further exaggerates the other ...)

Second, the emitting of RF in directions not allowed by the protections, thus filling in the nulls with digital signal, at levels in some directions exceeding that allowed by the license! I saw this firsthand in Chicago on in-band tests ran on my station then, WGCI(AM) 1390.

AM has the most to gain from IBOC, but has most of the obstacles against it! Not just technical ones, either. Although the last time I heard the AM system, it sounded like a bad Internet stream. I would prefer my AM stereo to that any day.

FM has the least to gain and will most likely cause IBOC to turn into another AM stereo debacle. Even IBOC investor Clear Channel is questioning its implementations of IBOC. You can bet that will set an example to the other broadcasters.

The NRSC's proposal to do a daytime version of IBOC is a joke. This from a group that imposed a 10-kHz audio limit to AM stations in the day! What were they thinking? What are they thinking now?

Then when you pile on the Ibiquity and/or other "fees," it's for sure the AM stereo issue, times two. Not to mention the satellite radio impact. The fact that XM Radio chose the MPEG-4 bit-compression scheme and not PAC has to negatively affect the IBOC implementation in the receivers. To implement the multiple formats will cause a cost increase to develop and thus the Motorola/Kahn issue with AM stereo. (BTW, thank you Sony for going that extra mile or two then!) Another stumbling block thus is added to the convincing of the manufacturers in adding IBOC.

Can you see the writing on the wall? With no standards, consumers will be facing higher prices and less product to choose from. I am sure the manufacturers can do that math, and I don't think they will be too enthusiastic about it. What are the real benefits to either the industry or the consumers? Going digital for the sake of saying it digital is not the way to go, but appears to be the driving force behind IBOC.

It's time for a change in the RF allocations. Everyone should be sharpening pencils to draw out a new design that actually improves the broadcasters' and consumers' product. I am tired of seeing the audio quality being sacrificed in an effort to get IBOC on the air.

It's time for the license holders to speak up and voice their opinions to the commission. Let's consider new spectrum! The days of AM's broadcasting nationally via skywave conditions will be over with digital. But how many stations are surviving on revenue generated from their nightly national coverage? I would guess very few are marketed that way, if any.

I think we should redevelop the 60-108 MHz area and include both AM and FM allocations into a properly coordinated digital radio spectrum. *Then* get away from the stereotyped AM and FM monikers. Then we'll all be playing the same game on the same fields!

Scott Clifton
Director of Radio Engineering
SportingNews Radio
Chicago

Paying For Radio Online

The slugfest over streaming radio fees features a bevy of contenders intent on fighting the same match but punching in different directions. It's the RIAA vs. CARP vs. AFTRA vs. NAB vs. the Librarian of Congress vs. simulcasters vs. Web-only streamers vs. college radio and a dozen other interested parties.

It's a giant mess of internecine warfare fought with arguments about protecting copyrights and providing easily-available Internet entertainment. It won't end soon; meanwhile, casualties mount as streamers go off-line in the face of performance fees they can't afford.

What about subscription radio? If the problem with Webcasting is raising enough money to pay performance fees, subscription radio can offer a direct revenue source.

A case in point is KPIG(FM), a station that broadcasts an eclectic mix of Americana from Freedom, Calif. KPIG became the first full-time Webcasting commercial radio station in 1995, and eventually claimed online listenership of 250,000. When KPIG shut down its stream because of the threat of performance fees, listeners demanded it back.

So KPIG broke ground by becoming the first subscription radio station. In a deal with streaming media enabler RealNetworks, a commercial-free stream will be available to subscribers who pick up the service from Real. Revenue will be shared by the companies.

The station might lose listeners this way, but at least it gets back online, and the die-hards willing to afford $6 a month should be satisfied. Considering that a basic pass offers 3,000 other music streams and 50 ad-free stations, that's not a bad selection. But is this the new model for online streaming success?

Some consumers are getting used to the idea of paying for online audio. According to a study by Arbitron and Edison Media Research, nearly a quarter of Internet audio "streamies" — recent users of streaming audio — indicated they'd be willing to pay a small fee to listen to their favorite audio channel, up from 14 percent six months earlier. That's some 3.5 million Americans who may be willing to pay up.

Meantime, taking another approach, a company called Decisionmark says its technology will allow a radio station to limit its online programming only to listeners in the station's licensed coverage area, thus avoiding streaming fees. Whether this approach will work, and whether content providers will accept that argument even if the material is strictly simulcast, remains to be seen; but if the system catches on, the resulting audience still is limited by definition.

It's time for broadcasters to look at something new, and subscription radio may be that choice. Expect more of it.

—RW

More Opinion
Page 53

—EDITORIAL STAFF—

Paul J. McLane	ext. 117	Editor
Sharon Rae Pettigrew	ext. 126	Managing & Business Editor
Leslie Stimson	ext. 129	News Editor/Wash. Bureau Chief
Michele Kramer Peterson	ext. 149	Studio Sessions Editor
Michael Hedrick	ext. 146	Buyer's Guide Editor
Thomas R. McGinley	—	Technical Adviser
Alan Peterson	—	Technical Adviser
John Bisset	—	Contributing Editor
Skip Pizzi	—	Contributing Editor
T. Carter Ross	ext. 120	Editor-In-Chief (International)
Marguerite Clark	—	Editor (International), Milan
Rogelio Ocampo	ext. 121	Latin America Editor in Chief
Karina Gerardi	ext. 137	Latin America Editor
Terry Hanley	ext. 130	Administrative Assistant
Peter Finch	—	Editorial Assistant, Milan

—EDITORIAL CONTRIBUTORS—

W.C. Alexander, Bruce Bartlett, Frank Beacham, Naina N. Chernoff, Harry Cole, Troy Conner, Vince Ditingo, Mark Durenberger, Ty Ford, Scott Fybush, Harold Hallikainen, Paul Kaminski, Peter King, Mel Lambert, Mark Lapidus, Carl Lindemann, Frank R. Montero, Ted Nahil, Tom Osenkowsky, Ken R., Rich Rarey, Bruce Rogow, Randy Stine, Travis the V/O Guy, Barry Umansky, Tom Vernon.

Radio World
Vol. 26, No. 20 September 25, 2002
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—

US East: John Casey	330-342-8361	Fax: 330-342-8362	e-mail: jcasey@imaspub.com
US West: Dale Tucker	916-721-3410	Fax: 815-352-1698	e-mail: dtucker@imaspub.com
Product Showcase & Classified Ads: Simone Fewell	703-998-7600 x154	Fax: 703-671-7409	e-mail: sfewell@imaspub.com
Germany, Austria, Switzerland: Charles Kingston	+49-69-4908-5785	Fax: +49-69-4908-5804	e-mail: chaskingston@t-online.de
France: Silvia Di Stefano	+39-02-7030-0310	Fax: +39-02-7030-0211	e-mail: sdistefano.imaspub@tin.it
European Sales Mgr., Africa, Middle East: Raffaella Calabrese	+39-02-7030-0310	Fax: +39-02-7030-0211	e-mail: rcalabrese.imaspub@tin.it
Japan: Eiji Yoshikawa	+81-3-3327-2688	Fax: +81-3-3327-3010	e-mail: callems@msn.com
Asia/Pacific: Wengong Wang	+86-755-5785161	Fax: +86-755-5785160	e-mail: wwg@imaschina.com
Latin America: Alan Carter	703-998-7600 x111	Fax: 703-671-7409	e-mail: acarter@imaspub.com

NEXT ISSUE OF RADIO WORLD OCTOBER 9, 2002

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.

—ADMINISTRATION & PRODUCTION—

Stevan B. Dana	President/CEO
Carmel King	VP/Group Publisher
Marlene Lane	Editorial Director/COO
Chuck Inderrieden	CFO
Eric Trabb	Sales & Marketing Director
John Casey	Associate Publisher
Lisa McIntosh	Production Director
Annette Linn	Production Department Manager
Melissa SE Robertson	Production Publication Coordinator
Kathy Jackson	Ad Traffic Manager
Amy Gutowski	Marketing Manager
Sheryl Unangst	Circulation Director
Robert Green	Circulation Manager

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 2002 by IMAS Publishing (USA), Inc. All rights reserved.

—Printed in the USA—

World Radio History

It's a Good Thing!

Introducing our NEW flagship radio console: the D-8000 Digital On-Air Board

It's NOT just Zeros and Ones...

When it comes to digital, ***EXPERIENCE COUNTS***

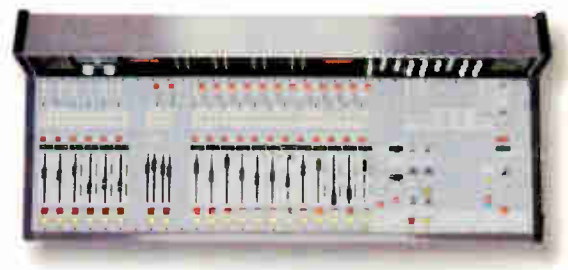
WHEATSTONE'S TRADITIONAL CONTROL INTERFACE *gets your operators up and running in minutes — not days.*

THE D-8000 HAS IT ALL:

- **UNIVERSAL INPUT MODULES** accept analog or digital signals — no upgrades required
- **WHEATSTONE'S EXCLUSIVE BUS-MINUS®** gives you an individual MXM feed (w/talkback interrupt) from every Bus-Minus® input module
- **ALL INPUT CHANNELS** have alphanumeric source displays above each fader
- **BUILT-IN SERIAL COMMUNICATION** interfaces with WHEATSTONE BRIDGE network router and many automation systems
- **CHOICE OF MASTER CLOCK RATES:** 32, 44.1, 48KHz or external reference

PRODUCTION VERSION ADDS:

- **PROGRAMMABLE SENDS**: every input generates two aux sends; each selectable pre/post-fader and pre/post-on/off
- **INDIVIDUAL CHANNEL DSP**: each input has its own four-band EQ, HPF, compressor-limiter, ducking and digital level trim
- **EVENT RECALL**: up to 99 preset snapshots of all channel settings



THE WHEATSTONE D-8000

Digital that WORKS!

Wheatstone

tel 252-638-7000/sales@wheatstone.com/www.wheatstone.com

World Radio History

copyright © 2002 by Wheatstone Corporation

THINK *INSIDE* THE BOX

ONE INTERCONNECT DOES IT ALL!

THAT'S RIGHT— ONE DUPLEX FIBEROPTIC LINK OR A SINGLE CAT-5 WIRE = 64 channels of simultaneous bi-directional digital audio, intercage communication, logic signals, X-Y controller commands, plus auxiliary RS-232 data streams. *This single interconnect between your studio and central rackroom can save you thousands—if not TENS of thousands—of feet of wire in a typical installation!*

THE WHEATSTONE BRIDGE DIGITAL AUDIO NETWORK ROUTER can start small with a single cage and only a few cards, or fully populated units can be stacked to form larger systems. Wheatstone's STAR TOPOLOGY ARCHITECTURE lets you connect multiple locations to your central rack room, providing shared resources for all yet still permitting independently functioning studios, each with its own combination of plug-in modules specifically suited for a select set of gear.

SIGNALS ARE ROUTED entirely in the digital domain. All AES cards have sample rate converters on each input, freeing you from worry about varying sample rates throughout your facility. A family of plug-in connector modules makes installation easy, letting you mix varied signal technologies and standards all within the same cage. WHEATSTONE'S intuitive graphic based setup software handles system configuration, matrix selection and salvo pre-sets. All systems interface directly with Wheatstone consoles for seamless source selection and display.

THE BRIDGE
DIGITAL AUDIO
NETWORK ROUTER

Wheatstone

tel 252-638-7000/sales@wheatstone.com/www.wheatstone.com

copyright © 2002 by Wheatstone Corporation (mini-technician not included)

World Radio History