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Summer Reading List
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Garden State Capital
 'Trenton Makes, the World Takes.'
 We go inside Market #139.

Page 4

Page 25

Radio World

The Newspaper for Radio Managers and Engineers

June 20, 2001



Nicholas Barbato, Monophoto

INSIDE NEWS



▼ The FCC is getting a new look. **Page 3**

▼ Colleagues remember the late Tony Mezey. **Page 5**

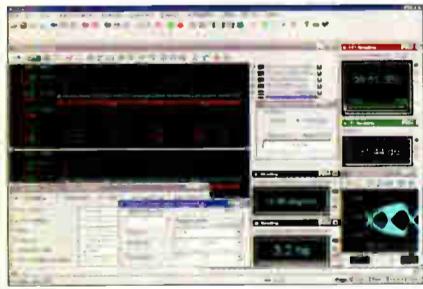
ENGINEERING



▼ Frequency coordination is a pressing matter for the SBE. Richard L. Edwards comments. **Page 17**

STUDIO SESSIONS

▼ Paul Mac checks out the Prism Sound dScope Series III test system. **Page 43**



DIGITAL NIPPER

▼ Harris and Radio World give away a beautiful RCA digital television.



Page 4



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CFA Tests Expected to Begin

Crossed-Field Site Nearly Complete in U.K.; EH Antenna Developer Awaits Test Authority

by Ted Nahil

With the weather finally moderating in Shropshire in the United Kingdom, long-awaited tests on the Crossed-Field Antenna should soon be underway.

Delayed by rain, snow, ice, illness and injury — not to mention access restrictions thanks to foot-and-mouth disease — the construction of a test CFA in the U.K. neared completion at the end of May, with managers hoping to begin tests this month.

EH needs permit

In the meantime, developers of another new AM antenna design, the EH antenna in Eatonton, Ga., await word from the FCC, hoping they'll gain permission to construct and test an antenna in the United States designed for the AM band.

Observers say that real-world tests are critical to determining both antennas' viability as functional and efficient AM radiators.

Dr. Fahti Kabbarly, a co-inventor of the CFA, arrived in early May to finish construction of the CFA antenna, according to Robert Richer, president of Crossed Field Antennas Ltd., Farmington, Conn.

Foot-and-mouth disease has played its part in the CFA delays. The bovine illness produced a quarantine of the test area and its perimeter, halting construction and accompanying tests of the antenna.

"As the weather improves, foot-and-mouth diminishes," Richer said. "Everyone is scared to death, but we have access to the site, which is a great step forward."

The British government has authorized facilities of 2 kW at a frequency of 972 kHz, Richer stated. The government also has allowed an occupied bandwidth of 20

kHz for the tests.

The frequency-agile transmitter is being installed by ntl Group Ltd., a communications facilities provider headquartered in Hook, Hampshire, U.K.

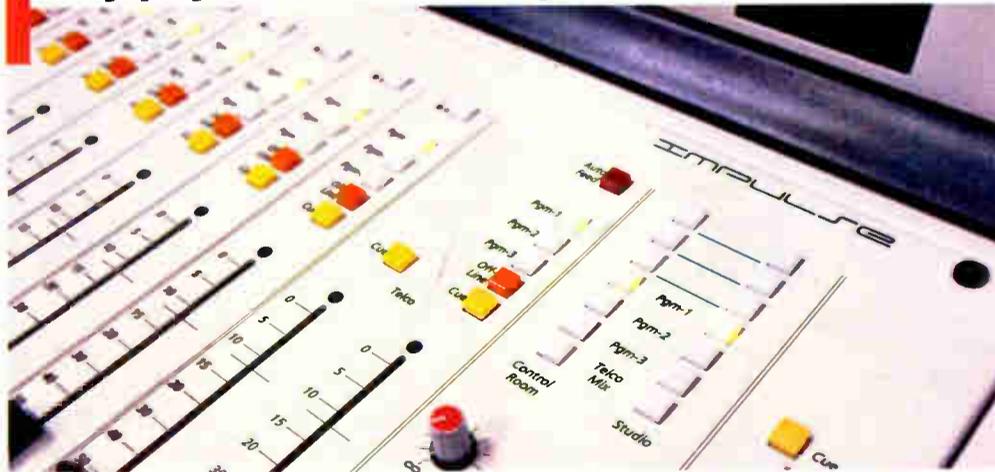
The company is providing a transmitter specialist and a medium-wave antenna expert to assist with impedance matching at the site.

Ben Dawson of Hatfield & Dawson plans
 See ANTENNA, page 6 ▶



Hams Save Classic Transmitters as a Labor of Love
Page 8

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◆ NEWSWATCH ◆

BBC Shortwave Cuts Start July 1

LONDON The British Broadcasting Corp.'s World Service plans to end shortwave transmissions to North America, Australia, New Zealand and the Pacific Islands beginning July 1 as more of its listeners access the BBC via FM, the Internet, cable and mobile devices.

Mark Byford, director of the BBC World Service, stated on the BBC's Web page, "In the U.S., three times as many people listen to us on FM as on shortwave and one and a half million users access online each month."

To meet demand for better quality, the

BBC needs to explore new technologies, he stated. "The money saved by closing shortwave transmission to North America will go toward funding this investment in the future."

The BBC says it remains committed to shortwave and is upgrading transmission relay stations in Oman, Cyprus, and Singapore.

The announcement comes after Swiss Radio International says it, too, will phase out shortwave over the next several years.

In a message on the Radio Netherlands Web site that tells listeners not to panic, spokesman Andy Sennitt stated that cost is a big reason to switch off shortwave.

"Those who listen to international broadcasts generally contribute nothing toward maintaining them. These costs are

borne by the broadcasters. ... It costs a lot of money to operate a high-power shortwave transmitter. There comes a point at which the proportion of listeners relying on shortwave falls below the level at which the service can be economically justified."

He called the BBC decision part of an ongoing "strategy assessment" in which all international broadcasters should take part.

Citadel Stockholders OK Acquisition

LAS VEGAS Stockholders of mid-sized market radio group Citadel Communi-

cations Corp. approved a merger agreement to allow Citadel to be acquired by an affiliate of Forstmann Little & Co.

The transaction, announced in January, is valued at approximately \$2 billion, including assumed and refinanced debt and preferred stock.

The FCC approved the transaction, which is expected to close in late Q2 or early Q3.

Under the terms of the acquisition, Citadel stockholders will receive \$26 per share in cash for each share of common stock held on the effective date of the merger.

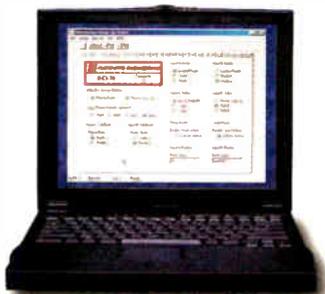
After closing, Citadel Communications will continue to be led by its current management team, headed by founder, Chairman, President and CEO Larry Wilson. Through its operating subsidiary, Citadel Broadcasting Co. will own or operate 140 FM and 65 AM stations concentrated in 42 mid-sized markets.

AUDIOARTS DIGITAL D-70



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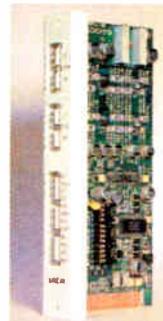
Plug-in modules let you have any combination of mic, analog or digital line inputs, and four stereo busses give you plenty of flexibility (each has both digital and analog outputs). And with sample rate conversion on all the digital inputs plus selectable console clock rates of 32, 44.1 or 48KHz (and an optional external house sync) the D-70 can fit right in with all your facility's present equipment.



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Harris Layoffs At PR&E Plant

CARLSBAD, Calif. A Harris spokeswoman in May confirmed that the Broadcast Communications Division released an unspecified number of "labor employees" who worked on radio console manufacturing from the plant in Carlsbad, Calif., which it acquired when it purchased Pacific Research & Engineering.

The company continues to make
See NEWSWATCH, page 3 ▶

Index

FEATURES	
Chrome and Glass Shine Again by Paul Courson	8
Engineers, Doing More With Less by Richard L. Edwards	17
Workbench: Nigerian Scam: Too Good to Be True by John Bisset	19
GM JOURNAL	
MarketWatch: Suburban Radio Is Key in Trenton by Scott Fybus	25
Branding: Internal or External? by Mark Lapidus	25
Radio Revenue Drops by Laura Dely	32
INTERNET RADIO	
Streaming: How to Get Started by Tom Vernon	35
Web Watch: Whaddya Mean, Net Radio Hostage Crisis? by Carl Lindemann	35
Net-Only Webcasters Pick Up Streaming Slack by Laura Dely	36
Streaming as a Tool for Radio by Darrell Jones	42
STUDIO SESSIONS	
The dScope Goes to Top of Class by Paul Mac	43
CAD Mic Proves Its Value by Paul Kaminski	44
Shecky Peterson Returns: Oh Joy by Alan R. Peterson	47
OPINION	54

NEWS ANALYSIS

FCC, U.S. Senate Get New Look

Upper Chamber Rocked by Jeffords; Meanwhile, Clear Sailing for Commission Nominees

by Leslie Stimson

WASHINGTON Not only was the makeup of the FCC expected to change in June, so now is the chairmanship of the Senate Committee that regulates media.

On the same day the Senate Commerce Committee voted 17-0 for several administration nominations, including those of new FCC commissioners, Republican Sen. James Jeffords of Vermont said he would leave the Republican party to become an independent, giving the balance of power in the Senate to the Democrats for the first time since 1994.

ciled by conference committee and then approved by both bodies.

Lott said if the legislation stalls, the change in control of the Senate was to occur by June 5.

Post-shift, Democrats hold 50 seats, Republicans 49 and Jeffords sits in the sole independent seat in the Senate. If he gives his vote to Democrat Sen. Tom Daschle, as expected, and, assuming senators vote along party lines, Daschle, a Democrat, becomes majority leader, ousting Trent Lott, R-Miss., and gains the ability to control the Senate voting calendar.

Several Senate committee chairmen would change as a result, including the

subcommittee moves from Sen. Conrad Burns, R-Mont. to Sen. Daniel Inouye, D-Hawaii.

Observers said McCain and Hollings have had a balanced approach in running the committee, which likely would not change. But Hollings will now set the committee agenda.

"While we don't agree with Hollings on every issue, NAB has enjoyed a good relationship with him," stated the association in its weekly member newsletter. "We expect his priorities to include aggressively opposing FCC efforts to relax broadcast ownership rules."

Unclear at press time was how the change might affect upcoming hearings reviewing media ownership regulation initially planned for June.

Meanwhile, the Senate approved the FCC nominations May 25. Abernathy and Copps were sworn in shortly after and Martin was expected to be sworn in by July 2. Commissioner Susan Ness said she would step down by June 1 and Commissioner Harold Furchtgott-Roth said after leaving the agency he would join the American Enterprise Institute as a visiting fellow and write a

book on telecommunications policy.

Earlier in May, senators scrutinized the commissioner nominees.

Commerce Committee members spent most of their time questioning Chairman Michael Powell during a May 17 hearing on the nominations.

"I will make the hard decisions. At times, many will not agree with them," said Powell. If his second term is approved, he said, his decisions would be



FCC Nominee Kevin Martin and Chairman Michael Powell



Photos by Leslie Stimson

From Left: Soon-to-be Commerce Committee Chairman Sen. Ernest 'Fritz' Hollings, D-S.C., looks on while Chairman John McCain, R-Ariz., and FCC Chairman Michael Powell shake hands during the nomination hearing.

His decision ended a four-month period in which the GOP controlled not only the White House but both congressional chambers at the same time.

Jeffords planned to make the shift after the president's tax-cut bill is signed into law. The House and Senate passed different versions, which must be recon-

Senate Commerce Committee.

Sen. John McCain, R-Ariz., chairman since 1997, would lose the chair to ranking Democrat Sen. Ernest Hollings, S.C., who previously chaired the committee from 1987 to 1994 before former Sen. Larry Pressler, R-S.D. took over.

Chairmanship of the communications

"principled."

Powell, who appeared before the same committee four years ago when he was nominated as an agency commissioner, said then he was "humbled" by the task ahead. Now he's "in awe."

See NOMINEES, page 5 ▶

NEWSWATCH

▶ NEWSWATCH, continued from page 2

PR&E products. The layoffs came about as Harris decided to outsource a component in the product line to make sure it remained cost-effective.

Harris employs more than 1,000 workers in the Broadcast Communications Division.

Another Crown Unit Stolen

PARIS, Tenn. WKMS(FM), Murray, Ky., hoped its translator that feeds Paris, Tenn., would be operational by June.

Making the job harder was the fact that the station's Crown FM100R, a transmitter with an internal receiver module for translator operation, was stolen in April, according to CE Allen Fowler.

The theft echoes a similar crime in Nashville earlier this year.

Fowler gave the serial number (#53790) to local police. Crown told him that stolen equipment sometimes is returned to the company for maintenance and that the company would inform him if that happened.

The translator was located with the transmitter of the WTPR(AM) tower site. Fowler believes the thief used a crowbar to open the door where the equipment was located, opened the back of the rack, unscrewed all the cables from the unit, and took both the unit and the three-foot rack.

The station's main signal on 91.3 MHz did not go off the air, said Fowler. The translator, at 99.5 MHz to serve Paris, remained off the air in May.

The WKMS Crown unit was similar to one that was stolen from WAY-FM Media Group in Nashville (RW, April 11).



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FROM THE EDITOR

Paul's Summer Reading List

by Paul J. McLane

I love books. Here are recent titles that have landed on my desk. Bring them with you when you head off for vacation at Mackinaw Island, Catalina Island or Coney Island.

"Rockin' Down the Dial: The Detroit Sound of Radio" — From Jack the Bellboy to the Big 8, Tom George to Joel Sebastian, from Mickey Shorr to the payola scandal, from Lee Alan and Dick Purtan to the Keener Sound, author David Courson takes us on a fond tour of pop music radio in the Motor City from the 1940s to the '70s.

Well illustrated in black and white, the 300-page softcover is for radio junkies who love to talk about the golden days of AM music, particularly the rockin' jocks of this important market. Published by Momentum Books, \$24.95. Call (800) 758-1870. The book's ISBN number is 1-879094-62-2.

"Complete Internet Streaming Manual" — What is streaming? What kind of gear do you need? What are the issues in music licensing? Should you do it yourself?

These topics are tackled by Michael J. Langevin in a 60-page self-published, self-bound tutorial in 11 chapters. This is a nice way to start learning about the topic.

Although the price is a bit steep at \$50, Langevin says the manual was a big hit at recent industry conferences. Note, the material was written last fall; like anything on this topic, it must be read with the understanding that some specifics may have changed since.

The book is available from the author at (218) 525-1872 or through NAB or Amazon.com. ISBN 0-9704927-2-3.

"Thinkin' Out Loud" — Former WLS personality Art Roberts provides a first-person narrative about his career in the 1960s and '70s. The book badly needs an editor. It starts with his baby photo, it ends with a picture of the back end of a horse; it

rambles, it has poetry and there are abundant spelling errors.

However, Roberts' love of radio is sincere. And you can hear his voice in his anecdotes and editorials — even if you never heard him on the air. WLS and Roberts fans will want to read it.

Bar5 Publishing, \$15. Visit www.artroberts.com to order.

"The New Communications Technologies: Applications, Policy and Impact" — This is the fourth edition of a book that tries to provide a snapshot of technologies affecting how we communicate.

The 268-page paperback, by educators Michael M.A. Mirabito and Barbara L. Morgenstern, seems a nice introduction to topics like fiber-optic, satellite, desktop video, e-mail and privacy, even futuristic ideas like holography and the paperless society.

But the word "radio" appears only twice in the index (for Internet radio and the Radio-Television News Directors Association). The book virtually ignores the \$20 billion commercial radio indus-

try, not to mention public radio. DAB is mentioned in the briefest of ways.

Hey, radio may not be cutting edge, but it's a helluva lot more immediate for

most people than laser angioplasty. This lack also makes me wonder how thoroughly non-radio topics are researched. ("Broadband" appears once in the index; "Webcast" and "streaming" not at all.)

How about a section next time on how traditional radio is adapting, or might adapt, to the broadband revolution; about the challenges presented by the rollout of Eureka DAB; and more about online Webcasts?

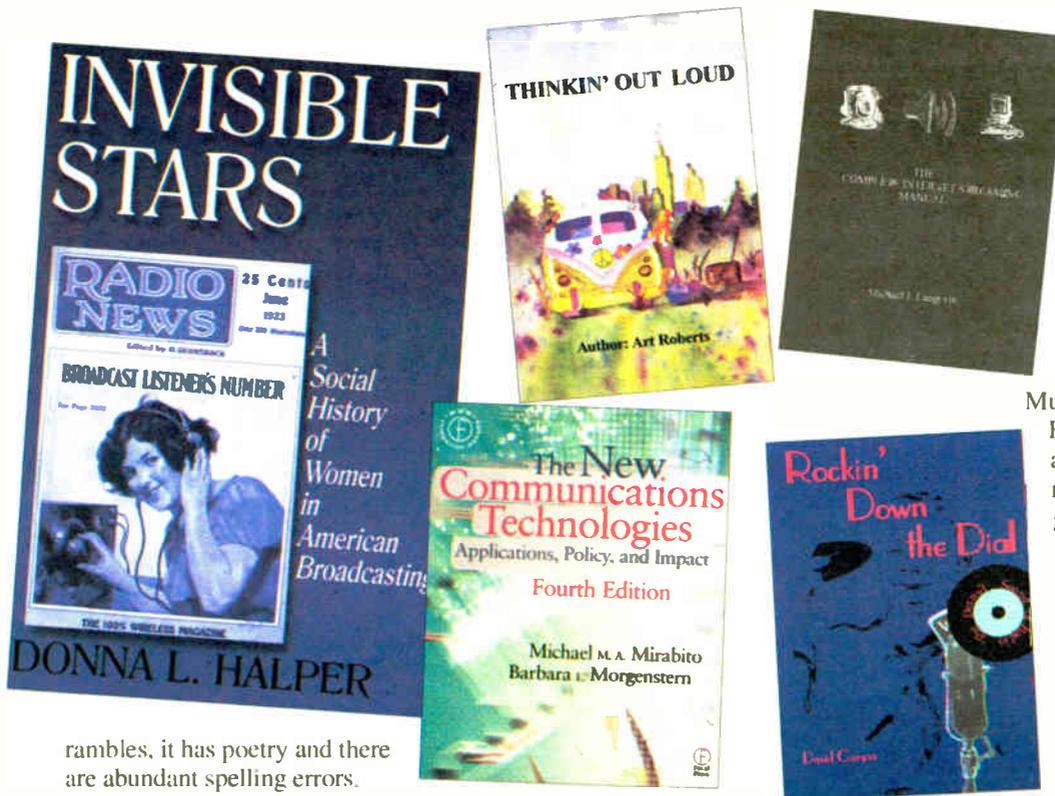
Focal Press, \$32.95. Ask your bookseller for ISBN 0-240-80429-5, or visit www.focalpress.com.

"Invisible Stars: A Social History of Women in American Broadcasting" — Much more to my liking is Donna Halper's 334-page hardcover that looks at the role and impact of females in radio and TV, including pioneer programmers, owners, air talent and assembly line workers.

Halper is a teacher and radio consultant who knows her stuff. Hers is a serious work, deeply researched; although it sometimes reads like a dissertation, it will hold the interest of the thoughtful reader who has an interest in the history of our media.

Published by M.E. Sharpe, \$39.95. Ask your bookseller, call (800) 541-6563 or send e-mail to mes@usa.net. ISBN 0-7656-0581-3.

Happy reading! 📖

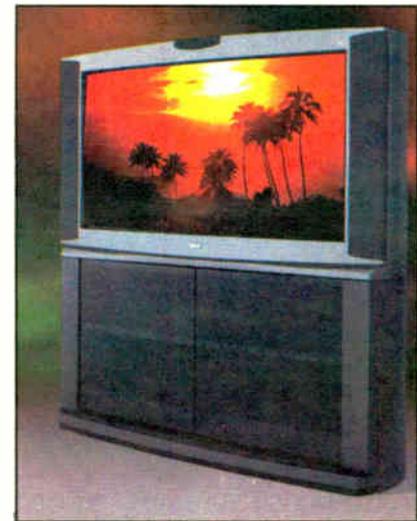


Engineer Richard James of WFAN in New York is the owner of a new RCA 38-inch diagonal HDTV set, courtesy of the good folks at Harris Corp. He's this week's winner in the Radio World Silver Sweepstakes.

The high-definition widescreen picture gives the same proportions as a movie screen, and almost 10 times the resolution of today's TVs. Theater-like Dolby Digital surround sound capability is built in.

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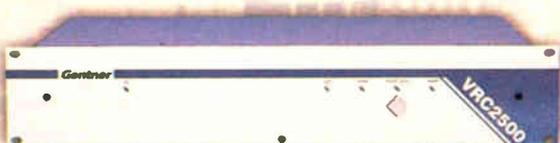


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Colleagues Mourn Tony Mezey

by Gregory J. Robb

VISTA, Calif. His colleagues warmly remember Tony Mezey, sales representative from the Broadcast Center West office of Harris Corp.

"I talk to people constantly from the West half of the country who knew Tony real well. I can't think of anybody who had a bad thing to say about him," said Don Backus, director of sales and marketing for Enco Systems Inc.

Mezey died Feb. 9 of a heart problem. He was 57.

Sales career

"He ushered in a new era of competition," said Fred Holub, who now works as chief engineer for FM stations KLAX/KMJR/KNJR in Los Angeles and KXJO(FM) in San Francisco, owned by the Spanish Broadcasting System.

Holub said Mezey undersold competitors by having little overhead when the other companies had to maintain their

stock. Mezey's competitive nature, said Holub, helped him to attract and retain customers.

Mezey's sales career began when he worked for Allied Broadcast Equipment in the early 1980s. Mezey went to work for Harris Corp. when Harris bought Allied in the late '80s and the company became known as Harris Allied.

In 1991, he formed Tony Mezey Broadcasting Limited, a one-man equipment distribution company that operated from the basement of his home. The company man had gone to work for himself as a representative for dealer Audio Broadcast Group.

Harris purchased ABG in 1999, and Mezey had come full circle, back to the Broadcast Communications Division of Harris Corp.

Several sources said Mezey loved his work.

Holub was impressed when he first met Tony Mezey in 1980 at KACY-AM-FM, Port Hueneme and Oxnard, Calif. respectively. At the time, Mezey was "Tony London" on the air.

"We were typical young crazy radio guys. Although I was chief engineer at a 50,000-watt rock 'n roll AM station, I was still a little wet behind the ears and 'Tony London' had a couple more years in the biz than I did. He was one of those special broadcasters we have all known who inspired and helped us to advance and succeed in this strange business we call 'radio,'" stated Holub. "He loved to kid around,"



Tony Mezey

said Gary Hardwick, sales manager for the Harris Broadcast Center West office. "With the salespeople here, he always (had) little gigs going back and forth. They were always kidding each other about their sales and their sales quota for the day."

Mezey would offer any assistance to anyone who needed it, said Hardwick, even providing guidance to other Harris sales reps with whom he would compete for accounts.

Holub remembered Mezey's personality. "Here's a guy I can learn something about this business from," said Holub. "He was also willing to help out at the station. He was the announcer and the

newsman. I was the CE. He'd see me moving a big, heavy transformer and he'd come over and help me move it."

Don Backus worked with Mezey at Allied. "Tony was the kind of guy that seemed almost unflappable. He always sounded like a late-night jazz DJ (and) he personified southern California even though he was born just outside of Grand Rapids (Mich.)."

Personality

"He had a wonderful demeanor ... even when he was upset."

Stephanie Mabrey, Harris studio sales specialist, described the circumstances of Mezey's death: "He was home alone and apparently died from a fluid accumulation in the sac around his heart. Added to that was some sort of aorta leakage or bursting which resulted in rapid death."

Mezey's professionalism touched even those who worked with him briefly. Gary Hardwick worked with Mezey for a little more than a year at Harris, and said Mezey was an outstanding employee. "He was dependable. He had a very loyal customer following because he took very good care of his customers. He was very focused, very gentle in his ways ... just a great guy," said Hardwick.

"It's bad when a good guy goes too quick," said Backus. "It really hurt to realize that somebody who was just fun to talk with and was just a really good human being in this business. I'm not going to have a chance to do that anymore."

His wife, Yolanda, and their three children survive Mezey.

Nominees

► Continued from page 3

Powell said he would continue the work begun by previous chairmen: to make the agency more efficient. Under his watch, that will include "managing the organization in a manner that promotes cohesion and efficiency, and that leads to clear and timely decisions."

"would raise antitrust questions."

Powell said he's committed to "what Congress ordered me to do;" a biannual review of media ownership rules. Some rules, he said, may be on shaky ground due to recent court decisions.

Powell agreed with Wyden that the agency has the responsibility of reviewing ownership deals for diversity of ownership, which the Federal Trade Commission, which also reviews media mergers, does not do.



FCC Nominees Kevin Martin, Kathleen Abernathy and Michael Copps

He said the agency staff should be trained in technology and economics, and that ways to attract and retain technical talent would need to be aggressively pursued.

Sen. Ron Wyden, D-Ore., had pointed questions for Powell. Wyden referred to Powell's statement before NAB2001 that questioned whether the cross-ownership rule, generally prohibiting one company from owning both a newspaper and a TV station in one market, for example, is still necessary.

Wyden asked whether "on your watch we could have radical ownership concentration" resulting in fewer companies owning the majority of the nation's stations and newspapers.

Powell said it troubled him "that it's ascribed to me before we've done anything." Further, he said, radical levels of concentration Wyden was talking about

The committee spent the majority of its time questioning Powell. Commissioner nominees Kathleen Abernathy, Michael Copps and Kevin Martin briefly appeared before the senators.

Abernathy, a Republican, served as a legal advisor to former Commissioner James Quello and was most recently a vice president at Broadband Office.

Fellow Republican Martin served on the staff of Commissioner Harold Furchtgott-Roth and then joined President Bush's election campaign. He then led the Bush transition team on telecom issues and was most recently a special assistant to the president.

Copps, a Democrat, was chief of staff for Sen. Hollings, and served as assistant commerce secretary for trade development in the Clinton administration.

No objections to the nominations were raised during the hearing.

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Antenna

► Continued from page 1

to take extensive field measurements of the CFA, arriving on site this month. George Hagn, now retired from the Washington office of SRI International, is accompanying Dawson. SRI is a global organization that develops applications for businesses, governments and other organizations.

Hagn has developed an open-wire line kit to measure ground conductivity, a measurement that will be critical at Shropshire to help determine the antenna efficiency. The efficiency test is a measurement of how well an antenna produces an RF signal given a known input power and impedance. Richer hopes the field tests will be complete by the end of June. These tests include the following procedures:

Horizontal Plane Radiation Efficiency — This conventional, six-radial proof of performance will measure the field strength on radials spaced 60 degrees apart. Fifteen or 20 evenly spaced points will be used on each radial at distances ranging from 0.1 to 3.0 kilometers from the antenna, and 10 points are measured at distances from 3.0 to 10.0 kilometers from the antenna.

Ground Conductivity Tests — These tests will determine the ability of the ground to propagate an RF signal and will be used as a second independent set of measurements of field strength.

Vertical Radiation Pattern — Measurements will be made using a helicopter provided by the BBC and will be taken at known elevations and distances from the antenna, with a 5-degree vertical resolution. These tests will be critical in determining the shape of the antenna's pattern as the signal moves at an angle through the sky, ultimately defining how the antenna propagates without causing undue skywave interference.

Near-Field Radiation — These tests will determine if the CFA meets or exceeds the radio-frequency radiation standards of the FCC's Office of Engineering and Technology. CFA proponents claim exceptional performance in this area.

Impedance Bandwidth — These tests are planned to determine the antenna's ability to produce an audio output of suitable fidelity in a receiver. Critics of the CFA maintain that short radiators, such as the CFA, generally exhibit poor impedance-bandwidth characteristics.

Pattern Bandwidth — Measurements will be taken at carrier and sideband frequencies to determine what effect the CFA has on audio bandwidth and to determine if the antenna might create adjacent-channel interference under nighttime (skywave) conditions.

Stability and Sensitivity — These tests will determine how well stations will be able to maintain their licensed radiation patterns with an operating CFA. Far-field measure-

ments will be used to determine the effects on the field strength and pattern variations under different, but controlled, variations in the system input voltage and current.

Frequency Scalability and Ground Effects — Prior to any FCC approval, it will be necessary to be able to predict the performance of a CFA at frequencies other than the ones used for the tests, specifically across the AM band. If the CFA's performance is less dependent on wavelength than conventional AM towers, it may be possible to define the characteristics of the CFA in a frequency-independent way.

Richer stated that the measurements will be made solely by Dawson and Hagn to eliminate any possible bias introduced into the results by members of the CFA team, including Richer and Kabbary, who will be on site during some of the tests.

Some preliminary test data may be available as early as the end of June.

EH word

Meanwhile, developers of the EH antenna await word from the FCC about a test permit.

In March, the Mass Media Bureau dismissed an application filed in August 2000 by EH Antenna Systems, Eatonton, Ga., with the FCC to test an EH antenna.

The request for authority to test an antenna on 1590 kHz at 100 watts was denied for a variety of technical reasons, one of which concerned potential interference to co- and adjacent channels.

In addition, in a letter to Hart and copied to his consulting engineer Stu Graham of Graham Brockman Inc., the bureau stated, "given the high level of existing interference at the site," the proposed test facility would be subject to interference, resulting in inaccurate measurements of the EH antenna's performance.

Graham has been working since that dismissal with OET to obtain permission to test the antenna.

Ted Hart, CEO of EH Antenna Systems, stated that OET has forwarded a revised application to the MMB for frequency coordination. 🌐



Industry Changes

Programming/Networks/Groups

IBiquity Digital Corp. has appointed **Albert Shuldiner** as vice president and general counsel.

John Scelfo has been named CFO for **Sirius Satellite Radio**.

Moody Broadcasting Network welcomed **Tracy Haney** as co-host of "Midday Connection," a daily call-in program.



Albert Shuldiner

Changes abound at **NBG Radio Network**. It appointed **Ernie Capobianco** to its board of directors, **Ollie Holmes** as vice president of operations; **Loren Henry** is the new production and creative services manager; **George Campbell** has been appointed president of subsidiary **NBG Solutions Inc.** and **Robert Alan** is the new affiliate sales rep for prep service "The Complete Sheet."

In programming news, **NBG** appointed **Michelle Parisi** producer of "Hollywood Hamilton's Weekend Top 30" program and has named **Todd Corbett** producer of the syndicated

See SOUNDWAVES, page 7 ►

FUTURE PROOF



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Soundwaves

► Continued from page 6 show "Honky Tonk Sundays."

A trio of executives has been promoted within Nassau Broadcasting Partners. **Joan E. Gerberding** was promoted to president of Nassau Media Partners, **Gregg Stiansen** has been bumped to the post of senior vice president of Nassau Radio Network Direct and **Glenn Jones** is the new senior vice president of Nassau Radio Network Katz.

Michael Barr, **Steve Futterman** and **Cheri Preston** have joined ABC News Radio.

Edie Hilliard, who previously served as president/GM of Jones Broadcast Programming, Seattle, has been named to the newly created position of vice president/COO for Jones Radio Networks. **Susan Stephens**, meantime, has been promoted to vice president of sales.

Salem Radio Network has announced several promotions. **Greg Lhamon** has been moved to the post of vice president of national sales, **Linnae Young** has also been promoted to vice president of national sales, while **Mike Reed** has been bumped to the post of vice president and GM of Salem Radio Representatives.



Linnae Young

NPR has named **Kathryn Riley Dole** as vice president, national affairs. **Jay Kernis** has been tapped as senior vice president for programming at NPR.

Patrick Talamantes, CFO of Sinclair Broadcast Group, has resigned his position to take a new job. Duties were expected to be assumed by **David Amy**, current executive vice president of Sinclair and the company's former CFO.

Citadel Communications Corp. has promoted nine top programmers to the newly created positions of format general: **Bobby Irwin** (adult contemporary), **Mike Hammond** (country), **Tony Bristol** (contemporary hit radio), **Bruce Jones** (rock/alternative), **John Hager** (classic rock), **Terry Base** (urban), **Jeff Rickard** (sports) and **Tim Miller** and **Ray Marshall** (oldies).

Clear Channel Hawaii has named **Paul Wilson** director of programming for the group's seven stations.

Suppliers

ADC Broadcast Products has undergone reorganization within the domestic and international sales departments. **Doug Buterbaugh** takes on the position of director of domestic sales. **Dave Edmonds** is the new director of international sales, while **Pat Gallagher** has been tapped director of domestic distribution.

The business unit of **Richardson Electronics' Broadcast Richardson** is undergoing some changes. **Tyler Callis** has been hired as west coast district sales manager. **Becky Hilborn** has been promoted to central region district sales manager, while **Christine Chinchilla** will serve as an inside sales specialist. **Carey Trgacevski** has joined the company's Canadian operations. **Chuck Maines**



Tyler Callis



Chuck Maines

Chuck Maines has joined Broadcast Richardson as systems engineer, while **David White** comes on board as product manager, transmitter products.



David White

Continental Electronics named **Bret Brewer** as broadcast marketing manager.

Symetrix Inc. has entered into an agreement with **Dave Burns** of **Allied AirNet Services** to provide consulting services for the launch of **AirTools**, a line of broadcast products.



Dave Burns

American Tower Corp. has a new execu-

utive vice president. **Norman A. Bikales** will serve as special counsel.

Greg Mensching has joined **Klotz Digital America** as sales engineer, while **Christopher Kemp** has been named project engineer at the company.



Greg Mensching

L. Mark Yaeger is the new vice president of sales and marketing at **Staco Energy Products Co.**



Chris Kemp

Doug Butler has been named director of engineering at **A.F. Associates Inc.**

Research Firms/Marketing

Arthur Cohen has been tapped as the new president of the **Radio Research Consortium**.



Arthur Cohen

The **Arbitron Co.** has promoted **Tom O'Sullivan** to the post of eastern divisional manager, **Tony Belzer** western divisional manager, **John Nolan** regional manager, **Jim Remy** southeastern regional manager and **Joie Davis** to the post of regional manager of Arbitron Radio's Dallas regional office.

Transamerica AG has hired **Richard Bowman** as sales manager.

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PHOTO GALLERY

Chrome and Glass Shine Again

Hams Give Second Life to Legendary Transmitters With Names Like RCA, Gates and Raytheon

Paul Courson

Ever wonder what it would be like to fire up your radio station's old transmitter after local signoff to talk casually with someone at the other end? And have them fire up their station's old rig for some nostalgic chit-chat with you?

It's done all the time on ham radio, the new home for fine, old vacuum-tube transmitters from Gates, RCA, Western Electric, Collins, General Electric, Raytheon and other "classic" names of broadcasting.

A retired broadcast transmitter often gets pushed to a dusty, dark back corner of the technical room at a radio station. Increasingly, ham radio operators are giving a second life to these graceful old beauties, donated or sold cheaply to hobbyists by stations with no further need.

Walsh, Dorrrough and Balsamo

The attraction of a "heavy metal" radio is part of a vintage specialty in the hobby, and it resembles old car collecting. Some of the radios even take their styling cues from automobiles of the era.

Technically-minded experimenters

drawn to "hollow-state" vacuum-tube technology nurture, build and restore all manner of "classic" radios, including those from maritime and military communications.

Many broadcast engineers happen also to be ham radio operators. In some cases they have gotten into their careers thanks to years of "playing radio." These hams may play by day with the latest technology, but remain delighted to stay in touch with discrete components, point-to-point wiring and the ornate hardware and craftsmanship not found in the typical contemporary transmitter.

Fans of these heavily chromed, glass-window transmitters include rock star Joe Walsh, whose ham call signs are WB6ACU; Mike Dorrrough, of broadcast audio fame, call sign K06NM; and Nick Balsamo, KG2IR, a recording engineer known for his work with Sony Music, Studer and now NBC. All three gentlemen devote a lot of their ham-radio hobby to vintage, vacuum-tube equipment.

Leisure time spent bringing back a chrome-and-glass transmitter leads to large gatherings on the shortwave ham bands, where the rigs are demonstrated in

their full glory. Nighttime propagation is especially reminiscent of the early days of radio, as people warm up their radios for hours of storytelling and technical discus-

sion nationwide, each with hams at the switch. There are now more than 70 amateur operators across the country who have placed retired broadcast transmitters on the shortwave ham bands (see list on page 10).

The first Heavy Metal Rally honored grand old AM broadcast transmitters, and also marked the centennial of the



A beautiful RCA BTA-1R is freed after years entombed behind some remodeling. The transmitter is now at the home of a Pennsylvania ham who plans to put it on 160 m shortwave.



The Collins 'Twins.' Jim Young, W8MAQ, has done the R&D to allow both of these 300Gs to operate between 1860 and 7300 kilocycles. He is chief engineer at a Cleveland public radio station.

sion with other enthusiasts far and near.

Vintage stations often place an emphasis on high-fidelity reception as well as striving toward good transmitted audio. Some hams listen on the big speaker of an antique floor console with shortwave bands such as those from Philco, GE, Crosley and Zenith. Occasionally, a ham running AM gets reception reports from an "SWL," a shortwave listener who has picked up the signals on an antique radio or perhaps with a modern "world-band" receiver.

The pastime has become so popular that there now is a Heavy Metal Rally on the 160-meter ham band, around 1885 kc (the old fashioned "kc" reference is deliberate). You'll notice this frequency is not far from the Standard Broadcast Band, where the old rigs gave years of faithful service to their communities in the days before television.

The first Heavy Metal Rally last December drew about 25 broadcast

world's first "phone" transmission, Dec. 23, 1900. Experimenter Reginald Fessenden used an amplitude-modulated spark gap transmitter to communicate a short distance from a site at Cobb Island, Maryland along the Potomac River.

Mods

The Heavy Metal event, which featured an award for "best station" decided by popular vote, was sponsored by Electric Radio magazine, a publication dedicated to vintage ham radio activity. The event was the brainchild of Bill Kleronomos, KD0HG, the chief engineer of a broadcast station in Denver. The trophy features a brass portrayal of a classic ribbon mic, with some lightning bolts. The winner was Mike McElhinny, WN3B, running a Gates BC-250GY from his Pennsylvania home.

Technically, it often takes little to recrystal and retune a transmitter from its radio station frequency to a new home on

See CHROME, page 10 ▶

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Chrome

► Continued from page 8
the shortwave ham bands.

Some new owners additionally have done considerable research and have reconfigured driver and RF tank circuits for greater power efficiency, better harmonic suppression and expanded frequency agility.

Modifications typically involve a certain loyalty to the original look and design of the transmitter. The hobbyist-engineer might use components of the

original vintage like ceramic coil forms and mica capacitors, even drawing on NOS (new old stock) components carefully procured from years of searching hamfest "flea markets," or more recently, from online bulletin boards or auction sites catering to vintage equipment.

Reworking the original single-frequency circuitry allows such transmitters to operate not only on 160 meters, as mentioned, but also on 75 meters (around 3880 kc) and all the way to the 40-meter ham band. Here, many AM rigs can be found between 7280 kc and just below

See CHROME, page 12 ►



Phil Galasso, K2PG, literally has given a new home to a pair of Collins 20Vs. One is set for the popular 1885 kc AM frequency, the other is set for 1960 kc, where a group of hams gather on AM for what's called 'The Gray Hair Net.'

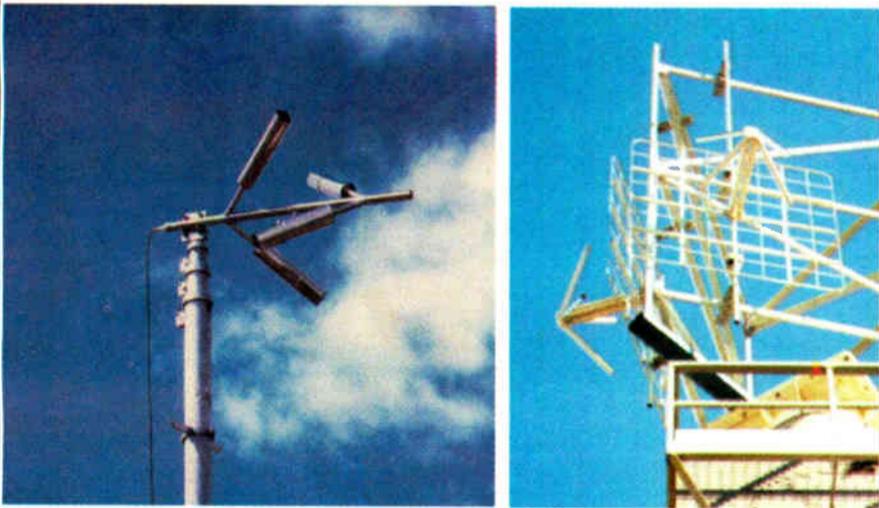
Ham Under Glass — and Chrome

Some 80 amateur radio operators sport retired broadcast transmitters as part of their shortwave setups. To find the city of license for any of the operators, look up their call letters on the free online database at www.QRZ.com.

Martin, WB6OFM, Collins 300-G
Bill, N7OTQ, Collins 20V3, 75m; 20V2, 160m
Barry, N6CSW, Collins 300-G
Rolynn, K7DFW, Collins 20V3, and
Gates BC1-T, 75m
Mike, W2ZE, RCA BTA-250K, 160m
Gregg, WA2IAC, Gates BC1H
William, AB6MT, Collins 20V2, 75m
Larry, WA9VRH, Collins 20V2
Tom, W2ILA, Collins 300-G
Chris, KC4CMR, Gates BC1-G
Clyde, K4UXK, Gates BC1T
Bruce, WX10, Gates BC 250GY
Bill, N3JDR, Gates BC1, 160m
David, W6PSS, RCA BTA-250M, 160m
Richard, W9LDB, Collins 300J, 160m
Marion, W7UO, Gates BC1-G, 160m
Gary, W6UH, Collins 20V-2, 160m
Jim, K7EWE, Gates BC-250GY, 160m
Gary W7GMK Bauer 707, 160m
Fred KF0OW, Gates BC-250GY, 160m
Doug, W5JV, Collins 300-G 160m
Bob, K2NK, Gates BC-250GY, 160m
John, N9QWH, Gates BCA250
Jeff, W5OMR, RCA BTA-1R
Steve, WD8DAS, Gates BC1-H
Ron, WB0MBZ, GE BT-20A
Tim, W3TIM/4, Gates BC1H
Chaz, K8RNM, Gates 250GY
Barry, N6CSW/0, Gates 250GY
Glen, N4VL, 1950 Gates BCA 250 160, 75 & 40m,
1967 Gates BC250GY, 75m
Jim, K4EDK, Bauer 707
Eric, WB4VVI, RCA 250H, 160, CCA AM1000, 160m
Tony, W5OD, Collins 20V3
Dudley, WA5SVL, Collins 20V2
Gregg, K9CBD, Collins 300-J
Dean, KK1K, RCA BTA 250M, 160m
Andy, WA4KCY, Gates BC-250GY, 75m
Gary, W3AM/4 Florida, Collins 20V2
Paul, VE7KHZ, RCA BTA-250M, 160/75
John, WB5OAU/4, Collins 550A-1,
Larry, WB8SKV, Western Electric 451A-1 (6) 211A,
160m, and RCA 250H
Mike, W1JZ, RCA BTA-1 160m TBD,
Raytheon RA-250
Joe, N2YR, 1948 Gates BC-250GY, 75m
Joe, WA3GMS, 1946 Gates 250C-1
Joe, WA2PJP, 1953 Collins 20V2
Chuck, WA4HHG, Collins 20V2, 160m
Tom W2KBW, Collins 20V, 160, 75 & 40m

Sam, K14AE, RCA BTA-500MX
Jim, W3ATV, RCA BTA-1MX
Arnie, KOAS, Raytheon (pair of 304TLs into a pair)
Keith, KOKE, Gates BC-1
Bill, WABLXJ, Collins 231-D, (pair of 450-T into pr. of
750-T) 160/75m
Mike, WN3B, Gates 250C-1, 40m
Dave, WB3ETN, Gates 250C-1, 160m
Frank, K0BRA/4, Gates BC-250GY, 160m
Dale, KW1I, Collins 300-G, 160m
Jim, WA2WHV, General Electric XT-1, 160m
Gary, N2INR, 1949 Collins 21E, 75m
Jerry, WA2BJK, Raytheon RA1000, and RA250
Not currently on-air
Scott, N0BST, Collins 300-G, Gates BC1-T
Steve, WB3HUZ, 1946 General Electric BT-20A,
160m
Steve, N8JRJ, Gates BC-1G, 75m, and Gates
BC500T, 160m, and GE BT-20A, 160m
Mike, KO6NM, Collins 820-D, 75m
Jim, W8MAQ, 1948 Collins 300-G, 160 and 75m
Howard, W3HM/8, Collins 20V and a Gates BC-500,
160m
Phil K2PG: Two Collins model 20Vs on 160
Paul WA3VJB: 1949 Collins 300-G on 40, 75 and
160m
Bill, N2BC, RCA BTA 1R1 160m
Ed N2CJWJ: 1961 Collins 20V3
Bob W2ZM: RCA BTA250K, BTA-1MX, and Northern
Electric 451A-1, all 160m
Sparks W4AES: Bauer 707
Ed, VA3ES, 1968 RCA BTA1-R3; and 1970 RCA
BTA1-S, not on air
Dale, VE3AAM, Gates BC5-P (pair of 3CX2500 into a
pair) 75m
Bill, K2LNU, Gates BC1-H, 160 and 75m
Al, W1UX, RCA RCA BTA-500MX
John, W6BM, Collins 20K 160m, RCA BTA-1R, 75m
Sam, W6HDU: RCA BTA-250K 160m, Western
Electric 443A 160m, W-E 451A-1 and
23A, both on 160m; Collins 20V2, 75m
Mike, W6THW, Collins 300-G 160m, W-E 12B and
71B, 160 m, Collins 20T
Bill, AB6MT, RCA BTA-250M 160m, Bauer 707 75m,
GE BT-20A 160m, and G-E
XT-1A, 75m
Doc, K6HLO, RCA BTA1-K
Mike, K6KKM, Collins 300J, 75m
Ike, W4KKO, Gates BC-1T
Tom, N5AMA, Gates BC-250-GY

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The AM Window. Technical discussion and documentation.
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AM International. Fraternity of vintage hams.
<http://ourworld.compuserve.com/homepages/sweetbay/amintern.htm>

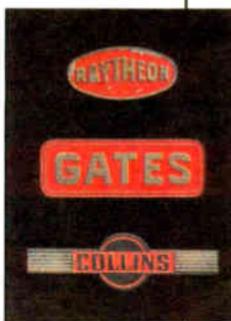
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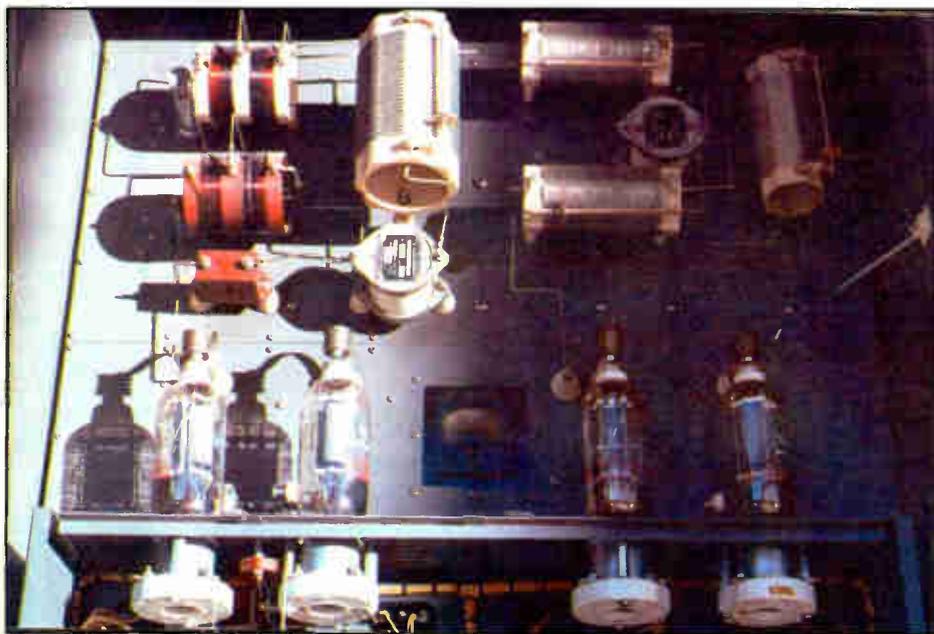
Chrome

► Continued from page 10
7300 kc, the limit of the allocation for the amateur service on this band.

When the revival of interest in vacuum-tube gear first gained momentum, many hams involved with mainstream

activities were puzzled at the "retro" approach taken by others who were getting together in what was seen as an eccentric little sub-group.

Part of the allure involves the pleasure of a technical pursuit, which has become far more difficult for the average ham to accomplish with today's technology. The most common activities in the hobby do



This Collins 300-G, Serial No. 30, now dismantled, suffered a major harness fire, making the transmitter an excellent source of parts. Note the smoke-filled RF Current meter on the panel behind the tubes. The ceramic coil forms were among the 'authentic' components used to create handmade conversion coils tuned at new operating frequencies.



This 1949 Collins 300-G, the original transmitter of WUST(AM) in Washington, is operated by the author. Crystal modules are replaced with a self-contained variable frequency control and RF exciter for operation from 1850 through 7300 kc.

not include much radio homebrew and experimentation, but instead focus on using pre-determined circuitry in radios with a heavy emphasis on computer technology to provide operating features.

Another explanation for the attraction to "classic" radios comes from the feeling of participating in making the radios

"work" to communicate through the ether. Pushing buttons on a modern radio may feel constrained compared to being actively involved manipulating Plate and Load controls, and hearing the solid *ker-thunk* of relay contacts keying a 50-year-old transmitter that you've

See CHROME, page 14 ►

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Zephyr Xstream. Sometimes the sequel is even better than the original.

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Chrome

► Continued from page 12 restored to operating perfection.

These hams might have a modern transceiver of some kind for emergency work, because the amateur community often is called upon to supply disaster communications. But the preference in the "AM Community" is to seek equipment from long-gone American manufacturers like Hammarlund, Hallicrafters and Drake.

Home-sized

Enthusiasts then arrange a delightful mix of vintage ham, military, maritime, industrial and broadcast communications gear in their stations.

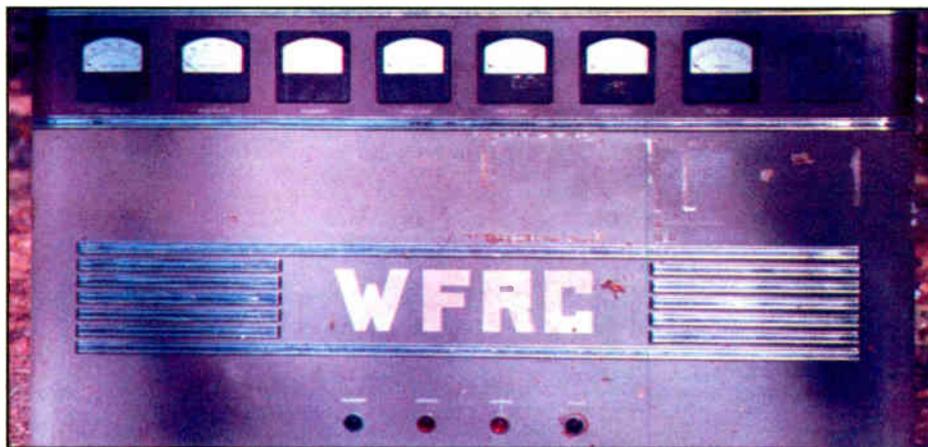
For a ham-radio operator, practical and

residential considerations limit the list of desirable broadcast transmitters to those using single-phase line voltage, designed for RF power output of 1 kilowatt or under, and which take up "only" a single cabinet's worth of space.

That leaves a lot of transmitters to unearth and place in good homes. Among the most popular are the Gates BC-250GY and BC-1, the Collins 300-G and 20V, and the RCA BTA 500 and BTA-1.

Less commonly found are rigs like the GE BT-20A, among the smallest of the vintage broadcast transmitters at roughly the size of a standard 19-inch panel/seven-foot equipment rack. At the other end of the scale is the enormous, 2,300-pound Raytheon RA-1000. At least two examples of the Raytheon have made it to the ham bands.

A company that had a foot in both the



The Raytheon RA1000 was among the first to use a type of fiberglass cloth as wiring insulation. Unfortunately, the transmitter was prone to shorts and fires after a few decades, as the woven material loosened and failed. Working examples include a transmitter held by Jerry Whitney, KG2BK, a broadcast engineer for a chain of stations in upstate New York.

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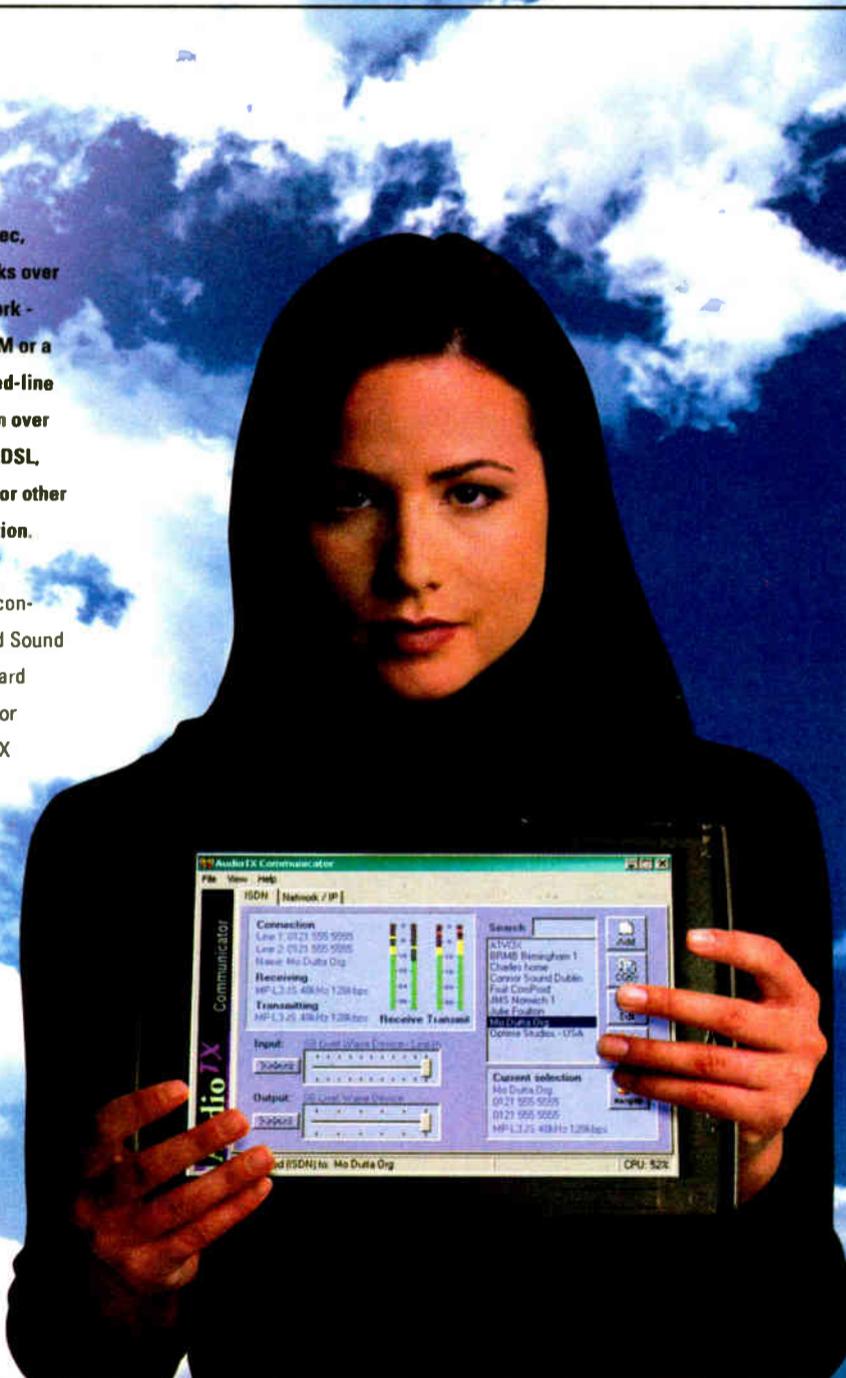
IP PC AUDIO CODEC

AudioTX Communicator is big on audio quality, reliability and ease of use - but low on price.

As an ISDN codec, Communicator offers MPEG 2, MPEG 3 and G.722 coding plus G.711 telephony and connects in mono or stereo to all other MPEG 2, MPEG 3 and G.722 codecs for remote broadcast, STL, voice-over work, reporting and news-gathering.

As an IP-based codec, Communicator works over any IP-based network - from Ethernet to ATM or a Satellite link, Leased-line connections or even over the internet using ADSL, DSL, Cable Modem or other high speed connection.

All you need to get connected is a standard Sound card and an ISDN card installed in your PC or Laptop, plus AudioTX Communicator.



broadcast and ham radio camps was the Collins Radio Co., founded by the late Art Collins, W0CXX. Well-regarded for quality amateur receivers and transmitters, the company's broadcast transmitter offerings now enjoy special status in the vintage community.

The 1946-49 Collins 300-G has a viewing window surrounded by chrome to show off a row of 810 triodes from left to right. In a darkened room, it looks like a quad of barn lanterns at full wick, very impressive.

The same effect comes through the picture window of the Gates BC-1 and the GE XT-1, both with a quad of 833A triodes. The Bauer 707 has a similar layout using 4-400s, each glowing behind a glass chimney like the wick of a kerosene heater.

Familiar technical standards

Ham radio's vintage specialty is one of the last venues where someone can get practical, hands-on expertise at troubleshooting radio circuitry outside of academic or workplace settings.

Experimentation takes place without the pressure of having to get "back on the air" immediately, as when a broadcast station is knocked off by a technical problem. The hobby also provides an opportunity to apply what's been learned elsewhere to a pleasurable pastime.

The Society of Broadcast Engineers has, for years, offered instant certification as a Broadcast Technologist to hams with the highest class of amateur licensing ("Extra" Class). This is in recognition of the technical achievement involved in passing ham radio's most rigorous FCC exam on circuit fundamentals.

In the Amateur licensing structure, federal regulators have discontinued a challenging high-speed Morse code requirement. This challenge had, in recent years, been cited as an obsolete holdover that often blocked many broadcast engineers from joining Amateur radio. Now, any of the shortwave ham licenses require only an entry-level, slow-speed code test. License exams continue to be conducted by certified teams of volunteers.

Paul Courson, a licensed ham since 1971, is a Washington-based network TV producer. He began his career in radio news at a 1 kW daytimer. After hours, he conducted engineering tests with a vintage ham transmitter connected to one of the station's towers.

His first broadcast rig was a 1946 GE BT-20A, a 250-watt unit using two 828 tubes modulating a pair of 810s. "It cost me \$1 a watt," he writes.

Reach him through "The AM Window" bulletin board at www.thebizlink.com/am/wwwboard/wwwboard.html

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*"You just have to speak
to the right people."*



Shannon Black, on-air talent at KRQQ FM, at the VADIS DC console.

"After looking at several options, we decided on the VADIS platform and DC consoles from KLOTZ," says John Decker, Chief Engineer, Capstar Communications, Tucson. "Why? First, our install would be much faster since most of the plant wiring could be reduced to a simple Ethernet line and a fiber optic cable connecting each room with our rack room.

"Secondly, all four stations were to be housed in the same facility, and we had to share audio sources all around the plant. This is a function that is part of the KLOTZ system. Our entire plant is now based on a digital audio 'backbone' that provides an improved audio signal.

"We also purchased five DC consoles. The air talent finds the DC consoles simple to operate. They can put any source in our plant on any fader of the console with a simple LCD button in the meter bridge. Giving the operator the ability to call up any source to a fader is great since each operator prefers a different arrangement of sources on the console."

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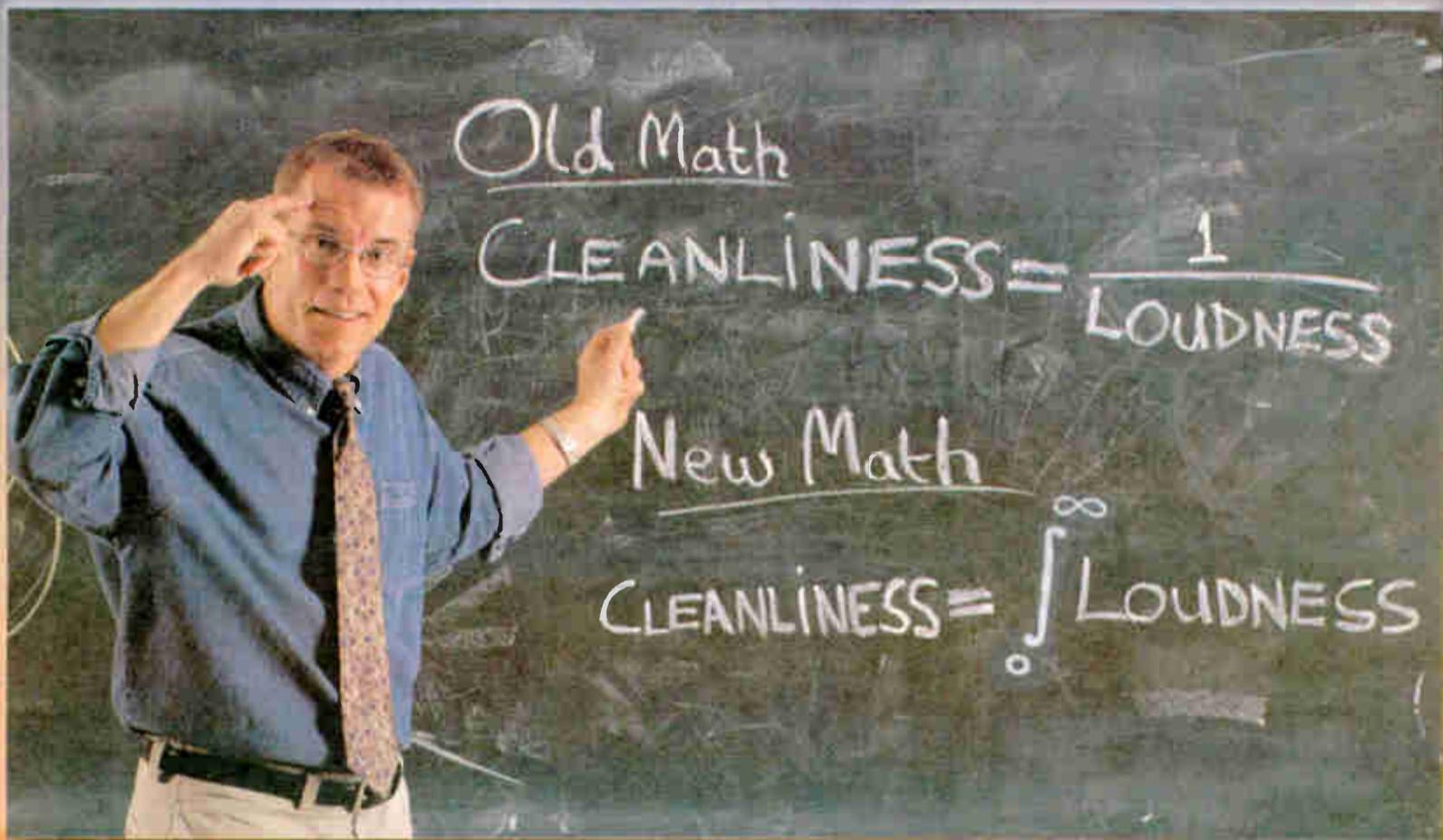
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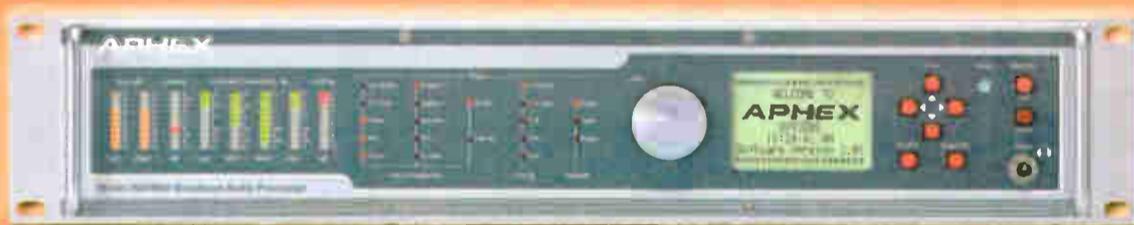
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Audition the new 2020 MkII on your station and you'll find that Aphex has really done its homework— creating a processor with performance and features unmatched at any price. The 2020MkII—in a class by itself.

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SBE NEWS

Engineers, Doing More With Less

Richard L. Edwards, CPBE

The author is vice president of the Society of Broadcast Engineers and chairman of the SBE Frequency Coordination Committee. RW offers this space as a service to the SBE.

Reduced personnel, more work, more responsibility and fewer resources — sound familiar?

Radio and TV stations all across America are trying to do more with substantially fewer resources, in both staff and budget. And, in the short term, this situation is not expected to improve.

We at the Society of Broadcast Engineers are aware of this dilemma and, where possible, we want to help. That is why we are here. We're not just a membership organization; we have programs specifically targeted to help you in your career path and daily work, and these were never more important than in times like these.

A benchmark

The Certification Program, for example, makes it easier for engineering management to find the right people. Certification helps confirm that candidates are qualified in the areas in which you are seeking help. From radio to television, transmitters to computers, SBE Certification serves as a benchmark for

technical achievement.

But benchmarking achievement is not the only purpose of Certification. We also encourage and provide technical education through conventions and chapter meetings, seminars and tutorials. We have developed a new level of Certification that specifically addresses the issues of network technology in broadcasting, an increasingly critical area.

Let's put wireless mics into the proposed guard bands of these new users of Channels 62-69. ... SBE will submit this as a proposed rulemaking for the FCC.

We are constantly upgrading our sample tests and real examinations to ensure that we are stressing the latest in broadcast technology, so you can be certain that your Certification is achievable and meaningful.

But the work of Certification is only part of what SBE offers. Also important to you in your day-to-day operations is the efficient use of the broadcast spectrum.

Unless you have been hiding under a rock, you have heard that the FCC has

discovered a new method of making money for the government. This method is called "auctions"!

In today's environment, if there is not an attached license or a powerful enough lobby to protect it, spectrum is being sliced off in large chunks and auctioned to the highest bidder. Broadcasters have a lot of spectrum, and Congress is eyeballing it with an eye toward fattening the govern-

ment treasury.

The losses: TV Channels 60-69 — gone. Channels 52-59 — gone. And watch out! The 2 GHz ENG channels — gone.

SBE has been attempting to protect those assets actively wherever possible. Dane Ericksen, CPBE, and his FCC Liaison Committee have been burning the midnight oil and wearing out a lot of pencils trying to help you keep spectrum, or at least slow down the loss of usable channels.



With the loss of spectrum, we are working with several groups in an attempt to maintain, or possibly even improve, the status quo.

On guard

The loss of TV Channels 62-69 not only means that those stations have to be displaced, but where will all those wireless mics in that spectrum be moved?

SBE member Karl Voss of Phoenix (yeah, the same guy that somehow waves a magic wand every Super Bowl and makes a lot of people very happy by finding a way to shoehorn in a few thousand RF users into a quarter-square-mile football station — that Karl Voss) came up with a good idea: Let's put wireless mics into the proposed guard bands of these new users of Channels 62-69!

Great idea. Dane Ericksen went to work on this, and SBE will submit it as a proposed rulemaking for the FCC.

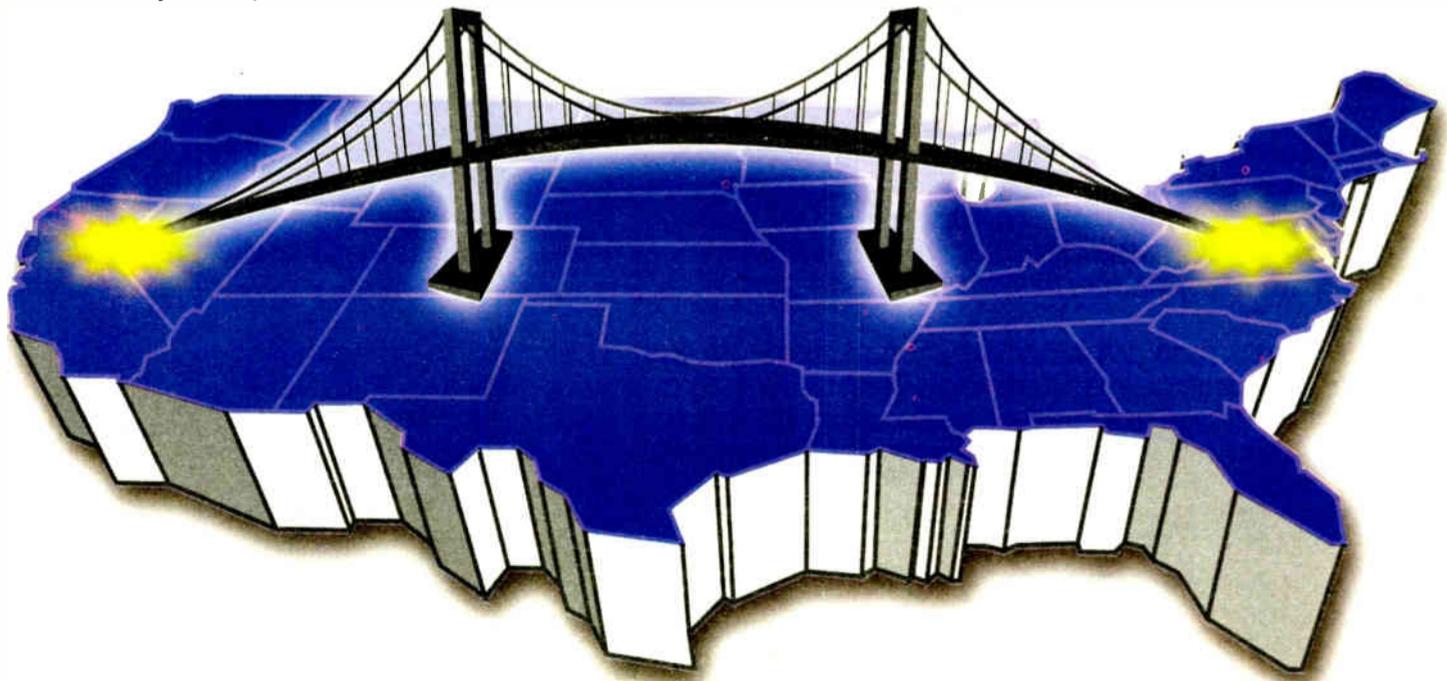
Then we have the loss of Channels 1 and 2 in the 2 GHz ENG spectrum. A few

See SBE, page 18 ▶

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SBE

► Continued from page 17

years back, this spectrum was sought by satellite services — and the FCC determined that it was in the public interest for broadcasters to give it up.

Who knows? This could have happened after some politician had a problem with a sound bite one night and decided to get even. Well, it worked. The FCC felt that we as broadcasters could implement this by reducing the allowable spectrum by 17 MHz (Phase I) while rechanneling the ENG frequencies to 14.5 MHz bandwidth — and you still end up with seven channels as always!

Easy enough, thought the FCC. After all, you reduced your 36 MHz HDTV

requirement to 6 MHz, so you should be able to get ENG down a bit as well. Wrong!

I guess we might need to add the word "live" to breaking ENG reports, because trying to keep what we have while reducing the bandwidth is just a bit difficult.

Just when we started working on this, a reduction of one channel, we learn — hold on — the FCC announces that broadcasters should also give up Channel 2 a little later down the road.

What?! We can't do it with 14.5 MHz, and now you want it reduced to 12? OK, what next? Sell tourist packages to the international space station? Why not! Well, let's just call this Phase II.

OK, broadcasters, develop a new ENG system with seven channels, each 14.5 MHz wide, use this for a short time, and then do it all again and reduce

it to 12 MHz.

Any equipment manufacturers want to gear up your factory to convert analog radios for a short term, and then repeat the same situation again? And at what cost? Not only in money, but also in programming disruptions to your 6 o'clock news. I can't wait to see the look on the faces of news directors. You want to do what? When? Yeah, right!

Team effort

SBE is working with the networks and several station groups, to determine a solution.

Andy Bater of the Tribune Group chairs the *ad hoc* 2 GHz ENG Transition Committee and is working on this with valuable assistance from Craig Strom of WLS(TV) and several others from ABC, CBS, Fox, NBC, Belo and Cosmos.



New SBE Frequency Coordination Director Galen Hassinger, CBT

Representing SBE is Dane Ericksen, SBE General Counsel Chris Imlay, SBE Executive Director John Poray, myself and, in his first major assignment as SBE's newest staff member, SBE Frequency Coordination Director Galen Hassinger, CBT.

As we move forward, we will be advising you of our progress. Should you wish to be more closely involved, contact Hassinger at (941) 267-1742 or gassinger@sbe.org.

He comes to us after a successful history in broadcast engineering and sales. Most recently, he was director of engineering for WINK-AM-FM-TV in Fort Myers, Fla. Prior to that, he held engineering positions in South Carolina, Orlando, Fla. and Nebraska, as well as having served as a sales representative for Harris Broadcast.

Hassinger hails from the state of Nebraska. With his expertise, in addition to the efforts of our Frequency Coordination Committee and the help of all the SBE staff, we are showing how SBE intends to take a more aggressive posture for our membership in this important area. 🌐

Scott Studios' New CD Ripper Saves Time and Money for Stations using APT-X on Older SS, AXS and DCS Digital Systems

At Last...A CD Ripper for APT-X

Now...your stations with classic digital systems like Scott Studios' SS, Electric Works' AXS, or Computer Concepts' DCS air studios can now *save time* by *eliminating dubbing* of music CDs and multi-track production editors like Vegas, Sound Forge, Cool Edit, SAW, Sadie and Audicy.

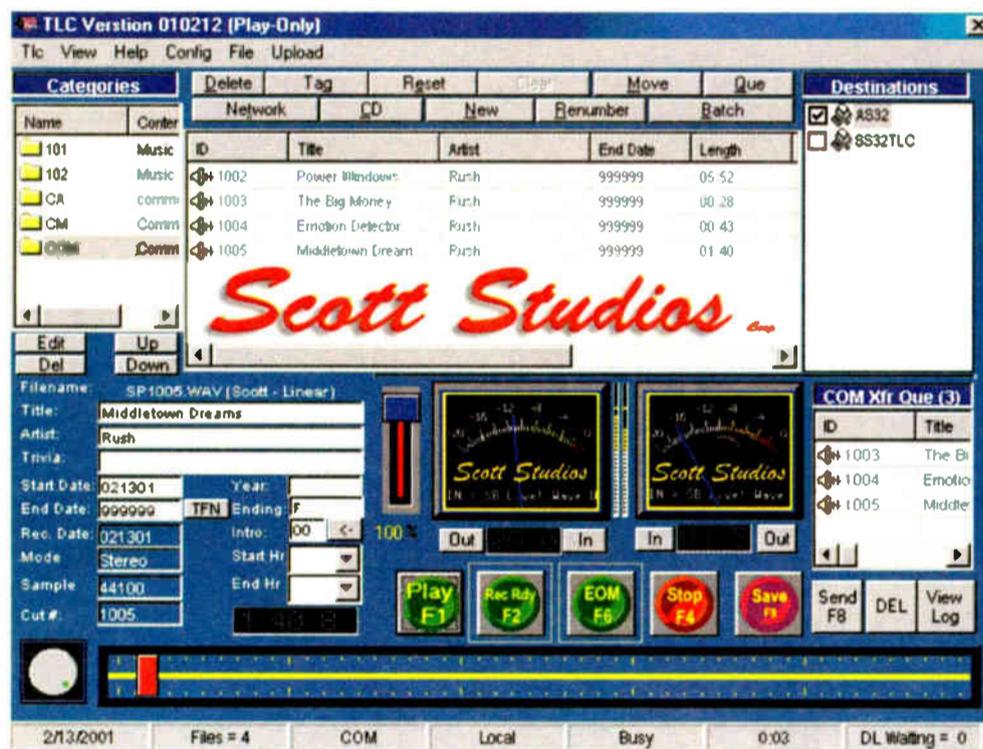
Regardless of the age of your digital system, TLC transfers 5-minute songs to hard drive in about 15 to 20 seconds and uploads 1-minute spots in a few seconds. Multi-hour syndicated CD shows now transfer to hard drive in a fraction of real time, which can save you real money!

Scott Studios' recent customers have been ripping CDs and doing fast no-dub exports from multi-track editors to MPEG or uncompressed Scott Studios systems for years.

Now Scott Studios honors customers of our legacy systems with our new TLC 4 APT. TLC stands for Trim, Label and Convert. Now that we've added APT-X capability, TLC 4 APT is now compatible with older SS, AXS, DCS and Maestro air studio systems!

Audio quality is awesome because you get a direct digit-for-digit transfer from compact disc to hard drive.

TLC also imports and exports BWF (Broadcast Wave Format) audio as well as the upcoming AES Cart



Scott Studios now offers time saving CD Ripping and no dub multi-track production to stations using older Scott, AXS, DCS and Maestro digital audio systems. It's TLC, which stands for Trim, Label and Convert. TLC 4 APT imports and exports between APT-X, MPEG and uncompressed WAVE audio. TLC also converts MP3 audio to any other format.

Chunk standard that virtually every major digital audio vendor promises to support.

TLC is available either with a Scott 1.4 GHz, Pentium 4 1RU slim rack mount computer, or as software only for use on your PC.

CD ripping time varies according to processor and CD ROM speeds, so the faster and newer your Pentium and CD ROM, the faster your music rips onto hard drive.

Stations interested in a free trial of TLC 4 APT can download a test version from scottstudios.com or

tlc4apt.com. The free trial lasts 10 days or allows 20 APT-X exports for quality evaluation.

TLC 4 APT handles APT-X, MPEG and uncompressed import and export as well as MP3 import. TLC 4 APT is only \$1,500 per copy including 90 days of toll-free phone support. This small investment pays for itself in a few months by ripping show CDs to reduce weekend board operator payroll. On-site installation and training is optionally available. Pay by check, Visa, MasterCard or American Express. Order by

phone, mail or Internet.

For copy or sales office computers that want to audition spots but do not need to rip CDs or import spots, a Play-Only TLC 4 APT is only \$500 per copy.

For stations wanting to expand APT-X systems to triple-overlap or add Scott's Voice Tracker, a few APT audio cards are still available.

TLC 4 APT clients who later upgrade to new SS32 or Computer Concepts' Maestro systems can continue to use TLC with the latest digital studio equipment.

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MARKET PLACE

Pick the Hits Enters Deal With SiteShell

Pick the Hits, a music industry Web site for test-marketing music by popular and emerging artists, announced a deal with SiteShell Corp., an Internet Web site network company, to license dynamic, audience-specific, visual-content Web packages to radio stations.

The agreement will place Pick the Hits content on SiteShell's network of station Web sites. Pick the Hits went live in May on 134 stations, and will be featured on approximately 270 by the end of the year.

"This is the perfect content partnership for our network," said Jim Champlin, president of SiteShell. "Pick the Hits has compelling, interactive music content and SiteShell's affiliates will provide thousands of interested users."

For information contact SiteShell in Connecticut at (203) 929-9101 or visit www.siteshell.com



Radio World, June 20, 2001

Nigerian Scam: Too Good to Be True

John Bisset

It was probably 10 years ago that I received a fax that was too good to be true. Coming into the office early one morning, I found the fax on official letterhead from a government official in Nigeria. It seems there had been some large profits realized on a transaction, and this official was willing to "share" some of the profits with me — if I would launder his money!

your bank information, begin transferring money *out of* — not into — your account.

Turns out the Nigerian scheme is a classic. RW Editor Paul McLane recalled receiving the exact same solicitation years ago at a former job. I sent the fax off to the country's embassy, along with a letter suggesting they investigate the individuals who were tarnishing their country's name. I never got another fax.

Perusing Dave Biondi's *Broadcast.Net*

tor's e-mail service.

If you receive a message or a fax, don't get taken. There is no free lunch, no matter how good the offer sounds. Unfortunately, it seems these offers arrive when you just lost a contract client, or receivables are low — the temptation is high. But the chaos that replying to such offers can create is indescribable. The rules outside of the United States are different. Be careful!

★★★

We've had a few good gully-washers in our area this spring. If your area has experienced heavy rains, it's a good time to check your AM ground system.

off-road vehicles digging in the dirt.

If your site is newly acquired, gently dig with a trowel and inspect your ground radials. The wires should not be corroded, nor brittle.

It's OK for the radial wires to be tarnished green. Most radial wires are buried 6 to 10 inches deep. Check your AM license as to how many radials were buried, and their length. Many of the older original licenses contained this information.

★★★

With the migration of satellite services to all-digital systems, stations with older dishes are encountering problems. The new Starguide receivers must have a 2-degree-compliant dish for effective reception.

Mr. Satellite, Harris' Jerry Weddle,



Fig. 1: Rain can erode soil and expose ground radials.

Well, he didn't say "launder," but as I read on, I could read between the lines. Nonetheless, for a small businessman, the thought of filling my bank account with hundreds of thousands of dollars seemed too good to be true. All I had to do was send him my bank account information, and the funds would be transferred! How simple, how rich!

Knowing that Stevan Dana, founder of Radio World, had experience in the international marketplace, I showed him the fax. After a few moments of laughter, Steve explained how these groups prey on small businesses, and once they get

list server recently, I see that the crooks are at it again, this time using the Internet.

Broadcast Consulting Engineer John Battison reported getting an e-mail version of the letter, which he forwarded to the attorney general.

Alan Kilgore of Moody Broadcasting Network's WMBV(FM)/WMBU(FM) reported his message to the FBI. Alan says the bureau is aware of these groups, and has been tracking them for several years. There now appear to be copy-cats of the originators, and Alan recommends reporting the messages to the origina-



Fig. 2: The result of placing a static mat on shag or deep pile carpeting.

Figure 1 shows the effect of rain eroding the soil on a hill, exposing the ground radials. Not only will this earn you a fine from the FCC when they inspect, if animals or kids run over the radials and break them, your AM signal suffers.

Walk around your site and check the soil. Even if your ground field is on a level plot of land, inspect for evidence of

says if you have an older dish — 10 to 15 years old — it may not be 2 degree-compliant. The result will be interfering signals from adjacent satellites.

Lowell Kiesow of KPLU(FM), Pacific Lutheran University's station in Tacoma, Wash., suggests tweaking the feedhorn polarization to reduce interference, if the

See WORKBENCH, page 20 ▶

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Who's Buying What?

The BBC is creating "the world's largest decentralized computer-assisted radio system," consisting of more than 1,000 workstations across England.

The project partnership of Jutel and IBM began installing Jutel's RadioMan radio station management technology with IBM Netfinity servers and Intellistations at

ital media system designed for large broadcasters. It enables scheduling, program planning, content production, versioning and broadcasting of program to multiple output channels like FM, AM, DAB, satellite, Web and 3G.

John Sullivan is technology manager at Classic FM. ...

that require no plug-ins at the end-user's download location.

The station also uses Apex Compellers, Telos AudioActive Encoders and ZSys Digital Patching equipment. ...

HCJB World Radio entered into an agreement with AudioScience for the development of an MPEG Layer II/III audio adapter designed for use with the ARIEL (Automated Radio In Every Language) automation system.

Dave Pasechnik is director of the HCJB World Radio Engineering Center in Elkhart, Ind.

The ASI6201 will be based on dual TMS320C6711 DSPs from Texas Instruments. It will offer five streams of MPEG Layer II/III playback with simultaneous MPEG-Layer II/III record at different sample rates.

Balanced analog and AES/EBU digital I/O are provided with the adapter sample clock being able to be synched to the AES/EBU input. ...

Omnia said jazz station WDUQ(FM) in Pittsburgh, Ohio, chose two Omnia-3net audio processors for their streaming Internet audio.

Cox Communications purchased an Omnia.fm.HOT for use "somewhere in America's Deep South." Radio One has ordered three Omnia-6fm audio processors for WHTA(FM) and WAMJ(FM) in Atlanta. And Greece's Radio One broadcast group purchased Omnia-3fm audio processors.

Sister company Telos Systems sold 15 Telos ONE+ONE telephone hybrids and three Delta 100 hybrids to Korean
See WBW, page 22 ▶



Photo by Adam Bauer, 2001

Neumann M 150 tube microphones capture NPR's 'Artist in Residence' live performance with resident pianist Jeremy Denk and the Shanghai Quartet.

BBC sites in December. Digigram supplied more than 950 soundcards for the project.

Radio Cornwall was the first of 26 local BBC radio stations to receive the digital makeover.

Also, Classic FM, Britain's popular national classical music radio station, chose the RadioMan editorial and production toolkits.

Classic FM says it was the first U.K. broadcaster to go fully digital. RadioMan will help it enhance its services through the use of program-associated data and Web functionality.

RadioMan is an open-architecture dig-

Apex Systems supplied a Model 2020 Series Broadcast Audio Processor to Christian Pirate Radio for conditioning audio signals destined for broadband broadcast via the Internet.

The station uses the unit to condition signals for two Internet-delivery music channels: CPR and CPRXtreme.

The Model 2020 feeds DAs that connect to data-reduction encoders providing a variety of streaming formats, including a RealAudio G2 SureStream up to 32 kbps, a Microsoft Windows Media Player 64 kbps feed, a lower-quality Microsoft Windows Media Player 24 kbps feed for modem users, plus three WebRadio feeds

Workbench

▶ Continued from page 19

problem still exists on a 2 degree-compliant dish. Lowell believes that polarization of the feedhorn is the first line of defense against adjacent satellite interference.

The process is simple but can take some patience. The method is easiest using a spectrum analyzer, adjusting the polarization to null the garbage from cross-polarized adjacent birds. You tweak the polarization for the cleanest desired spectrum.

If you don't have a spectrum analyzer, Lowell says the same effect can be achieved using the Eb/No reading on the receiver. The display is a slow average reading, which misses a lot of the transient junk that causes reception problems.

However, if you are patient, you will succeed. You'll need a couple of hand-talkies and a partner to watch the Eb/No number as you adjust the polarity. It's a job that will try your patience, because you'll need to wait at least 30 seconds for the Eb/No average to change after each adjustment.

The trick is to take it slow, and be patient. Make small changes followed by long averages. As you adjust, you will find a range where no obvious change in the Eb/No number will occur. Keep moving until you get to the outside limits, the point where you observe deterioration, and mark those

points with a pencil. Then center the feedhorn between these two marks for best rejection of interference.

★ ★ ★

For most of the country, static mat season is over. Now many of us need to endure days of endless humidity! Using static mats in the studio can be a challenge. Their 24-hour use means they wear quickly.

Figure 2, on page 19, shows the result of placing the mat on shag or deep pile carpeting. You can eliminate the ruts if you glue the mat to a piece of 1/4-inch plywood, cut for the size of the mat.

RW Technical Adviser Tom McGinley goes a step further. Instead of buying plastic mats, Tom suggests you purchase a stiff sheet of polished aluminum, 1/8-inch thick.

An added benefit is that the sheet can be connected to the master ground. A sheet metal outfit should be able to make one with tapered edges at a reasonable cost. It's been Tom's experience that when the air is really dry, you need the "real deal" — cheaper plastic mats can't compete with the aluminum equivalent.

John Bisset has worked as a chief engineer and contract engineer for more than 30 years. 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 jbbisset@harris.com



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On The Air

A Monthly Newsletter from Broadcast Software International

Issue 4

Quote of the Month

"WaveCart is really an awesome tool. When I trained our weekend board-ops, who had no radio experience, it took only about 15 minutes before they had a real grasp on it."

Clive Millett
KKVV- Las Vegas, NV

News

First Professional MP3 Audio Cards

BSI and AudioScience have teamed up to create soundcards that play four MP3 files simultaneously without a software CODEC. The \$2095 ASI4344 and the \$2795 ASI4346 were available on May 1st, exclusively at BSI.



This is the first time a professional audio company has created devices specifically for the MP3 format. The two cards decompress audio files on their own hardware so the processor doesn't have to. With these cards, the skipping and slowness that plague broadcasters with MP3 files have been eliminated.

The concept of decompressing audio on an audio card has been used with other formats, however the Fraunhofer Institute has controlled the CODECs for the MP3 format. Putting the CODEC on the card vastly improves PC performance, so playing multiple MP3 files simultaneously will be no different to your PC than playing multiple linear files.

"Our corporate mission is to respond to customer requests. AudioScience has a record of leadership in the digital audio market. When BSI and AudioScience formed the concept of combining our hardware with MP3 technology it made sense for both of us," says AudioScience President Richard Gross.

"The radio industry has been heading towards an audio card like this one ever since the MP3 format became popular. Broadcasters wanted to use MP3 files, but could not get the consistent sound they needed," says Ron Burley, BSI President. "We were happy to have AudioScience as a partner in this because of their record of creating products users want, rather than finding customers for the cards they decided to make."

BSI will be the exclusive distributor of the new audio cards. And only BSI will distribute the upgrades to two other cards, the ASI4334 and the ASI4336, allowing them to play triple MP3 files. The \$200 upgrades allow you to buy the earlier card with upgrade for the same cost.

Online Tech Data

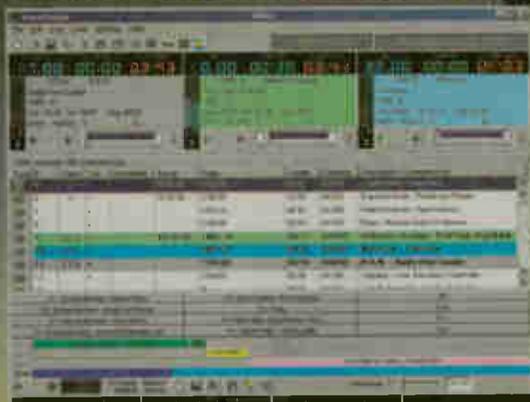
Tip

If the net clock for your station is locked in the PD's office or you can't find the wiring diagram for your audio switcher, you'll probably find the info you need at www.bsiusa.com/support. The BSI web support area has a database that includes wiring instructions for connecting to external devices, whether or not you're using BSI software! It also includes network program & tone clocks. You'll also find complete online manuals for all BSI programs.

Affordable Digital Automation

Our WaveStation 3.0 has all the features of the too-expensive systems, but is priced reasonably like software, not gold-plated broadcast hardware. We often hear, "It can't be true!" Over 3000 satisfied users prove the contrary.

WaveStation uses linear or compressed audio files. Features include WebCast ability, on-screen voice-track editing, time-shift recording and serial port control. Offers full automation, satellite, voice-track and live-assist. Works with Windows 2000, 95, 98 or NT.



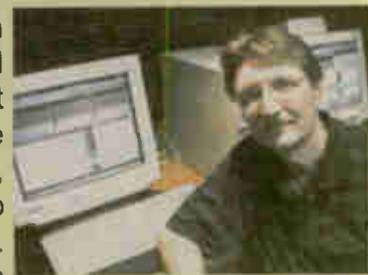
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User File

WJIL - Dan Kolenda

Dan Kolenda visited BSI for WaveStation Weekend in February. "I thoroughly enjoyed it. It's so good to be able to see BSI President Ron Burley demonstrate things. Reading the manual is great, but being able to see him do it, the lights just all come on. He really wants to help us, instead of just trying to sell a product. Ron kept saying that BSI was a user-driven company, and you can really feel that from what he says to you."



Dan has been using WaveStation for a while now. Although he was familiar with the product, there was more to learn. "I've always had a little bit of reluctance to try new things because I might go off the air. WaveStation Weekend really raised my confidence level. I don't mind experimenting more now. And the technology has changed so much that this really brought me up to date. I also think it's good to ask for a roommate," he says, "I planned to go, not for a vacation, but to learn. My roommate and I sat in our room and just bounced ideas off each other."

The thing Dan liked most about the \$1499 WaveStation Weekend was the personal aspect. "I really enjoyed talking to the different technicians. I've talked with them before over the phone, but being able to sit down and pick their brains was worth its weight in gold."

Send us your story.

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WBW

► Continued from page 20
Broadcasting System. And Radio Free Asia installed a Telos Series 2101 multi-studio talkshow system. ...

The Louisiana News Network renewed its agreement with AP Radio for its NewsPower text service.

Clear Channel station KXTA(AM) in Los Angeles, a Fox Sports affiliate, added AP SportsPower, SoundBank and GraphicsBank, while the group's KVET(AM) in Austin, Texas, signed up for AP NewsPower, GraphicsBank, SoundBank and AP Network News. ...

Denver jazz giant KUV0(FM) upgrad-



KUV0(FM) in Denver used the Symetrix 528E processor in its otherwise all-digital upgrade.

ed its signal path to digital, but opted to keep one piece analog: the Symetrix 528E Voice Processor.

The radio station also installed a Nautel transmitter, Logitek Numix digital consoles, Shively antenna, Harris digital microwave and an Omnia FM processor.

The Symetrix 528E is at the head of the signal chain, providing mic pre-amplification, de-essing, compression-limiting, downward expansion, parametric EQ and voice symmetry alignment for air talent.

Mike Pappas, KUV0's CE, said, "Keeping the 'front-end' mic processing separate from the main processing allows us to set the Omnia up to give consistent music performance without overdoing it, which is important for our classic Jazz format." ...

Jones Radio Networks said Lia, "Country's Seven to Midnight Solution," is airing on WBCT(FM) in Grand Rapids, Mich. "We've been looking forward to getting Lia on this monster signal," said Jim LaMarca, VP/GM of JRN's Daypart Personalities unit. Lia is on the air with 130 country affiliates. ...

Buckley's WOR Radio in New York and SiteShell Corp. entered into an affiliate licensing agreement. SiteShell will create and maintain a locally branded, e-commerce integrated Web site for the talk/info station. Separately, SiteShell said it will build and host a site for the syndicated "Doug Stephan Good Day USA" talk show. SiteShell's BlueDot WebSite NetWork hosts approximately 150 sites for affiliated stations, with about 100 more in production. ...

Longtime TV and radio talk show host Joe Franklin teamed up with the Riese Organization to open an eatery in Manhattan's theatre district, called Joe Franklin's Memory Lane Restaurant.

In the center of the front dining room is a triangular stage where Franklin interviews celebrities via a Soundcraft RM100 broadcast mixer.

The eight-channel RM100 features a modification by Bob Casey of dealer Dale Electronics that allows it to mix interviews to a DAT recorder for later broadcast use and to control the restaurant's PA levels. ...

RDA Systems Inc. completed a radio integration project for Hispanic Broadcasting Corp. in San Francisco. The installation involved designing and wiring a master control room, air and news studios and three production rooms. Bill Brooks is CE for HBC San Francisco. ...

NPR's "Performance Today" tried out Neumann's new M 150 Tube, which builds upon the M 50 and has better electrical specifications and a titanium capsule. The mic has an unusual low-frequency-omni, high-frequency-directional pickup pattern. The show arranged to borrow M 150s to coincide with an "artist in residence" feature, a week of on-air performances.

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

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

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MARKET WATCH

Suburban Radio Is Key in Trenton

'Not Philadelphia, Not New York' Is the Battle Cry of Market No. 139 — And No Local Television!

Scott Fybus

It's probably not a good idea to ask residents of New Jersey's Mercer County, "What exit are you from?"

The old joke about the New Jersey Turnpike just isn't relevant in one of the Garden State's fastest-growing regions — and anyway, the turnpike clips only a tiny corner of the county on its way from the industrial plants of Newark down to the farmland of South Jersey.

Good market

With 337,000 residents and a median household income of \$53,626, the Trenton market takes in a broad range of communities. The city of Trenton itself, in the southwestern corner of Mercer County along the Delaware River, is the New Jersey state capital, as well as an old industrial center.

"Trenton Makes, The World Takes" is the slogan emblazoned on one of the steel bridges over the river — not to mention the inspiration for the WTTM(AM) call sign that's been on several stations in the market.

After several decades of decline, the city is on an upswing. Waterfront Park, along the Delaware, is home to the minor-league Trenton Thunder baseball team. Nearby, new restaurants and shops are again drawing people to downtown Trenton.

The real growth in Mercer County, though, is out along U.S. 1 in the northern and eastern parts of the area. In towns like Windsor and West Windsor, farmland is rapidly changing into housing developments that boast price tags in the high six figures.

New upscale retail growth is following the housing trends, with gourmet supermarkets and high-end car dealers moving in alongside the mansions.

What's the appeal? Ask anyone in eastern Mercer County where they live and the answer you'll get is not "near Trenton," but "near Princeton."



Glenn Smith, WWFM Music Director and Afternoon Host

The Ivy League school and its namesake town are powerful draws. A commute of less than 90 minutes to either Philadelphia or midtown Manhattan doesn't hurt, either.

Living so close to markets No. 1 and 4 is a mixed blessing, though, for Trenton's own radio scene.

On the FM dial, most of the big Philadelphia signals are regular occupants of top-10 spots in the Trenton book, while powerful New York AM signals like WABC, WOR and WFAN routinely appear within the top 20.

Even Mercer County's own stations like to think big when it comes to signal reach. All three of the major FM signals licensed to Trenton — Press Communications' WKXW and Nassau Broadcasting Partners' WPST and

WNJO — market themselves to areas far beyond the Mercer County line.

"We happen to be located within Trenton, but we like to think of ourselves as part of a bigger New Jersey market," said Eric Johnson, program director of WKXW.

See TRENTON, page 26 ▶

PROMO POWER

Branding: Internal or External?

Mark Lapidus

As I was weaving amid the bustling crowd of families — eavesdropping whenever possible, of course — one comment from a wife to her husband caught my ear.

"Gee, hon," she said, "there sure are a lot of radio stations here. I wonder what's going on?"

Designate a lead station for all market events at the start of the process.

The husband shrugged his shoulders as he and the kids wondered where they could get something to drink. This incident occurred during the early days of consolidation. We had decided to have all the stations from our company set up booths at a "co-branded" Kids' Fair.

We figured we'd put as many there as we could, hoping to give them all

See PROMO, page 32 ▶

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Trenton

► Continued from page 25

Press Communications' CEO Robert McAllan said the station shows up in six ratings books: New York City, which is the main source of WKXW's revenue; Philadelphia; and Middlesex-Somerset-Union counties, Monmouth, Trenton and Ocean City, N.J.

On the air, though, it programs to the entire Garden State, offering itself as a station that's "not New York and not Philadelphia" to an audience that regularly comes more than 900,000 listeners a week.

Statewide

The station, which bills itself on-air as "New Jersey 101.5," is simulcast on WBSS(FM) Millville in southern New Jersey, reaching listeners from the Holland Tunnel into Manhattan, all the way to the Walt Whitman Bridge into downtown Philadelphia and the Delaware Memorial Bridge to the south.

Since March 1990, its programming has been a mix of talk on the weekdays and oldies on the weekends, created by consultant Walter Sabo.

"There was no newspaper that covered the state, there was no commercial TV station in the state and there was no statewide radio station until we came along," Sabo said.

"New Jersey has 14 million people,

more motor vehicle registrations than the state of California and nobody was talking about it until we came along."

In its first few years as a talker, New Jersey 101.5 garnered plenty of attention, not least at the state capital of



Fourth of July at the Trenton Makes' Bridge

Trenton itself, with an on-air campaign against the state's high taxes that led to the 1993 defeat of Democratic Governor Jim Florio.

More recently, as the political cli-

mate in the state has quieted, the talk hosts on WKXW are more likely to be heard discussing "lifestyle" topics.

Whatever the nature of the talk, Sabo said it's as carefully planned out as the playlist of a top-40 music station. In fact,

he describes New Jersey 101.5 as "WABC without songs," right down to the "chime time" bells borrowed from the old "musicradio 77" format in New York.

"Whenever you tune into this station, they're talking about Jersey, and they're doing it with rhythms and references and pacings that are comfortable to the people who live there," he said.

On June 6, Press announced that it sold two Trenton stations, WKXW and WBUD(AM), a news/talker, to the New York-based Millennium Radio Group, LLC, for \$110 million. The deal also included the sale of a third Press station, WBSS(FM), which is licensed in Corbin City, N. J. The transaction is expected to close by the third quarter.

Until the sale of the three Press stations, companies headquartered within New Jersey owned every station in the Trenton market, a factor that contributed to their success, according to Sabo, who said this is especially true at WKXW.

"Never has there been interference about content from ownership — ever," he said.

There are no plans for change at the two Trenton stations, according to Millennium statements.

Millennium is a partnership formed by UBS Capital Americas, LLC, a private investment fund and Charlie Banta's Mercury Capital, L.P., a media investment firm.

No. 1

While New Jersey 101.5 is talking, Trenton's other heritage FM is cranking out the hits.

Since the late '70s, Nassau Broadcasting's WPST(FM) has dominated the ratings and revenue in Mercer County, while consistently showing up in Philadelphia and several adjacent New Jersey markets.

"We've coined the term GLR — Good Local Radio," said WPST Program Director Michelle Stevens, who also directs the GLR strategy at Nassau.

"We're sandwiched in between New York and Philadelphia in the most densely populated state in the nation,"

Trenton

Market rank: 139
Market revenue rank: 135
Number of FMs: 5
Number of AMs: 5

Estimated Revenue (in \$000s)
 1999 13,000
 2000 14,800
 2001 15,700
 2002 17,100

Note: While we normally report estimated market revenues for 1997 through 2002, BIAfn said it only has Trenton numbers for the years shown, due to probable underreporting for the years prior.

Revenue Growth:
 '94 - '99: 3.1%
 '00 - '04: 7.0% (projected)

Local Revenue: 72%
National Revenue: 28%

2000 Population: 85,403

Per Capita: \$24,500

Median Income: \$53,626

Average Household Income: \$66,591



Background: The Capitol Dome of the New Jersey State House.

Competing With the Big Boys

Sandwiched between markets No. 1 and No. 5, Trenton broadcasters contend with many stations licensed to communities outside its market but competing for listeners within. In fact, only half of the stations licensed to Trenton made the Arbitron Fall 2000 book, the other half pressed out by stations from Philadelphia and New York.

Even market No. 33, Middlesex-Somerset-Union, N.J., makes an appearance or two in the Trenton book.

For an idea of how Trenton radio is affected by "out of towners," here is the Arbitron Fall 2000 average quarter hour share for persons 12-plus, Monday to Sunday, 6 a.m. to midnight for Trenton, market 139.

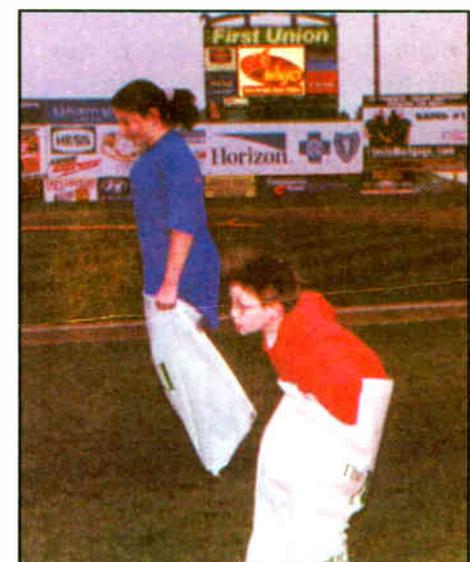


Station	City of License	Fall '00 Share
WPST(FM)	Trenton	11.8
WDAS(FM)	Philadelphia	6.8
WNJO(FM)	Trenton	5.9
WKXW(FM)	Trenton	5.6
WXTU(FM)	Philadelphia	4.9
WYSP(FM)	Philadelphia	3.8
WUSL(FM)	Philadelphia	3.5
WBUD(AM)	Trenton	3.3
WJZJ(FM)	Philadelphia	3.3
WIMJ(AM)	Trenton	2.8
WIOQ(FM)	Philadelphia	2.4
WMMR(FM)	Philadelphia	2.4
WLCE(FM)	Philadelphia	2.1
WABC(AM)	New York	1.9
WOGL(FM)	Philadelphia	1.9
WFAN(AM)	New York	1.6
WXRK(FM)	New York	1.6
WCBS(AM)	New York	1.4
WKTU(FM)	New York	1.4
WMGK(FM)	Philadelphia	1.4
WMGQ(FM)	Middlesex-Somerset-Union, N.J.	1.4
WOR(AM)	New York	1.4
WPHI(FM)	Philadelphia	1.4
WQCD(FM)	New York	1.4
WBEB(FM)	Philadelphia	0.9
WBLS(FM)	New York	0.9
WEJM(FM)	Philadelphia	0.9
WHWH(AM)	Trenton	0.9
WLTW(FM)	New York	0.9
WAWZ(FM)	Middlesex-Somerset-Union, N.J.	0.7
WCHR(AM)	Trenton	0.7
WQHT(FM)	New York	0.7
WPTP(FM)	Philadelphia	0.5
WWDB(FM)	Philadelphia	0.5
WAXQ(FM)	New York	0.5
WHTZ(FM)	New York	0.5
WPLJ(FM)	New York	0.5
WRKS(FM)	New York	0.5

she said, explaining why one trade publication recently rated WPST as the 17th highest-rated CHR station in America.

"It's an astute market; we have some very sophisticated consumers here," Stevens said.

While that means WPST's air product has to sound just as professional as the big-city stations up and down the dial, it also gives the station an opportunity to connect more deeply within its own market than the major-market outsiders ever can.



WNJO(FM)'s 'Family Fun Night' took place at Waterfront Park, home of the Trenton Thunder minor league baseball team.

"(WPST) is constantly involved in the community," Stevens said. "You'll see our trucks out in the marketplace, you'll see our talent out there."

That local focus pays off; in addition to drawing twice the 12-plus ratings of its nearest competitor, WPST boasts top spots in the 18- to 24-year-old and



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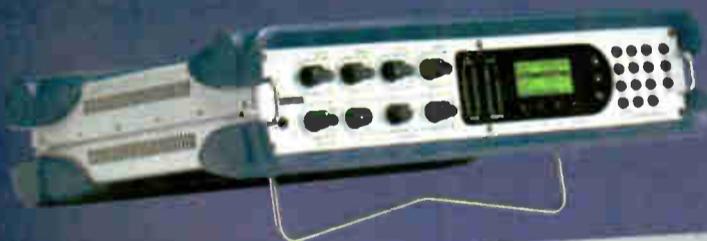
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Trenton

► Continued from page 26
25- to 34-year-old demographics, Stevens said.

Down the dial at 94.5, a newer Nassau entry is also banking on local focus to build its audience. In 1998, Nassau bought Great Scott Broadcasting's WTTM(AM) and WCHR(FM). The company moved the religious programming from the FM signal to the weaker AM position and re-launched the 50 kW 94.5 FM outlet as oldies WNJO(FM).

"We launched the station and took it from worst to first in its demographic (listeners 35 to 64)," Stevens said.

While Mercer County listeners could already hear oldies on Philadelphia's powerful WOGL(FM) and New York's heritage WCBS(FM), Stevens said WNJO offered them something they weren't getting from the big markets.

"(WNJO) is much more contemporary in its presentation," she said. "And

we research the music locally."

The Trenton stations are part of a broader Nassau corporate strategy to build a cluster of signals in a broad ring around the giant New York market. Over the past few years, Nassau has acquired stations from the Jersey Shore out to the Pocono Mountains in Pennsylvania.

May the circle be unbroken

Last year, the company hoped to extend its cluster to the Hudson Valley with a multi-station cluster, but the economic downturn that forced the withdrawal of a planned IPO left that deal unable to close.

Still, Stevens said, Nassau is confident in its strategy of targeting areas outside the big cities.

"I really believe in suburban radio," she said.

While the three big FM signals aim for listeners all over the Garden State, there's no dearth of programming targeted just at Mercer County.

Flip the radio to the AM dial and you will find no fewer than five stations

that target the local audience.

At the top of the heap, with a 3.3 share of listeners 12-plus, Monday to Sunday, 6 a.m. to midnight in Arbitron's Fall 2000 book, is Press Communications' WBUD(AM), the

ters building in Princeton, the AM counterparts to WPST and WNJO are business-news WHWH(AM) and sports WTTM(AM).

WHWH migrated to the business format after decades as a local full-ser-



WPST(FM) was a sponsor at the sold-out Matchbox 20 show in April.

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local sister station to WKXW's statewide service. (Trenton is a "two-book" market — Arbitron surveys it only in the spring and fall, the latest figures available.)

Local focus

"It's kind of interesting programming a station with a cume of 900,000 (WKXW) vs. a cume of 25,000 (WBUD)," said Eric Johnson, program director for both stations.

WBUD, Johnson said, is "totally focused on Trenton and Mercer County."

"We do news and information in the mornings and then we do 'Sinatra meets Elvis' the rest of the day," he said. WBUD also broadcasts Trenton Titans minor-league hockey and other local sports, with news provided by a full-time staff of eight shared with WKXW.

"It's a big expense for us," said Johnson of the news department, "but it's worth it, because research shows us the 'cume magnets' for the stations are the traffic, weather and the news."

Over at Nassau's year-old headquar-

vice outlet, while WTTM signed on in 1999 as the market's first expanded-band AM operation.

"WHWH is an ideal format for Princeton, where the station is licensed," said Nassau's Stevens. "(WTTM) is niche programming where we're going for the sports audience."

Owning that all-sports niche has helped Nassau do business with the Thunder, the Eastern League affiliate of the Boston Red Sox.

"We use all their stations in our campaigns," said Matt Armentano, the team's assistant director of public and media relations. "1680 (WTTM) broadcasts our games and we have promotions in the park with WNJO and WPST."

Armentano said all that promotion has helped the Thunder to one of the best attendance records in minor-league baseball. In a stadium that holds 6,400 fans, the team averages 6,000 tickets sold for each game.

In addition to WTTM and WHWH, Nassau continues to operate the religious format of WCHR, now on the

See TRENTON, page 31 ►

Trenton Commercial Radio Market Overview

Station	Owner	Format	Est. Station Revenue (\$000s)	BIAfn's 2000 Fall '00 Share
WPST(FM)	Nassau Broadcasting	CHR	7,500	11.8
WNJO(FM)	Nassau Broadcasting	Oldies	4,150	5.9
WKXW(FM)	Press Comm.	Oldies/Talk	7,600	5.6
WBUD(AM)	Press Comm.	Full Service	1,000	3.3
WIMG(AM)	Morris Broadcasting	UrbAC/Gospl	850	2.8
WHWH(AM)	Nassau Broadcasting	Bus News	350	0.9
WCHR(AM)	Nassau Broadcasting	Religion	600	0.7
WPRB(FM)	Princeton Brdcst. Serv.	Rck/Cls/Jazz	200	0.5
WTTM(AM)	Nassau Broadcasting	Sports	150	0.2

Note: WKXW(FM), although licensed to Trenton, considers its home market to be Middlesex-Somerset-Union, N.J. While BIAfn and other sources report its revenues with the Middlesex market, we have included the station in our Trenton Overview chart for reference purposes.



Stations are ranked in order of Arbitron Fall 2000 12+ share. Copyright 2001 the Arbitron Company. May not be quoted or reproduced without the prior written permission of Arbitron. Other information provided by BIA Financial Network through its MEDIA Access Pro Radio Analyzer Database software.

Background: The Trenton Thunder AA baseball team is a big part of the city's fun. Here, Aaron Capista at his post in the infield at Waterfront Park.

Trenton

► Continued from page 30
original WTTM facility on 920 AM instead of its longtime home on 94.5 FM, now WNJO.

Just across the Delaware River in Pennsylvania sits what may be the most local station in Trenton, WIMG(AM), licensed to Ewing, N.J.

For the last six years, former Nassau Broadcasting head John Morris has owned the station, which runs a mix of urban adult contemporary and gospel music aimed at Trenton's black community.

"In our coverage area there are lots of African-American pockets," he said, most notably the city of Trenton itself and nearby Willingboro, N.J.

WIMG's philosophy in serving those listeners is to stay as local as possible.

"We (as an industry) have kind of gotten away from true community service broadcasting," Morris said. "When the mayor of Trenton speaks, if it's 10 minutes, if it's 20 minutes, an hour and a half, we carry all of it."

Internet

The addition of live audio streaming a year ago has helped WIMG's staff of 21 bring that local programming to the world.

"Last week we had trivia winners from New Orleans, Sacramento (Calif.) and one from Fort Lauderdale, Fla.," Morris said.

Staying tightly focused on his niche market has kept Morris protected from some of the wild swings in the radio sales market in the last few years.

"Our station has not been affected with peaks and valleys," he said. "It's been just a steady climb since I bought it."

Meanwhile, on the noncommercial side of the dial, coverage beyond Trenton is the order of the day for two of the city's signals.

WWFM(FM), licensed to Mercer County Community College, has spent the last decade adding new signals across New Jersey and eastern Pennsylvania — not to mention six translators in Colorado.

"With classical music, there's such a finite audience out there that to expand our listenership, we had to expand our reach," said WWFM General Manager Walt Gradzki.

The station began with a transmitter at the Jersey Shore in Ocean County and has since added another full-power signal in Cape May, N.J., as well as translators around the Delaware Valley (including one in center city Philadelphia).

As for those Colorado signals, Gradzki explains that the demise of commercial classical radio there left the translator operators without a local primary signal. WWFM was already using a satellite feed to its outlying transmitters, so it was easy to add the Rocky Mountains to its Garden State coverage.

New Jersey's state-owned public broadcasting arm is expanding beyond Trenton. New Jersey Network, or NJN, has operated four public TV transmitters statewide since the early 1970s.

In the mid-'90s, NJN added several FM signals around the Garden State as "NJN Radio," beginning with

WNJT(FM) in Trenton.

"Their problem is they haven't really zeroed in on a particular type of program," Gradzki said. "They run NPR news, classical and then jazz from WBGO(FM) Newark all night."

Two more signals round out the Trenton dial: high school outlet WWPH(FM) in Princeton Junction, operated by students and the high-powered FM signal of WPRB(FM) in Princeton.

Licensed as a commercial station, WPRB is operated by students at the Ivy League school under the name "Princeton Broadcasting Service," running a diverse music format aimed primarily at the student community.

Back on the commercial side, all of Mercer County's broadcasters say the market is healthy and thriving. With

BIAfn projecting revenue growth of 7 percent in the market over the next five years, the outlook among sales executives is a decent one.

"I think the radio market in Trenton is healthy and has always been healthy," said WIMG's Morris.

"Everything is down a little bit," said Press Communications General Sales Manager Frank Calderaro, "but we're not as affected as some of the bigger markets."

The Trenton stations never had the volume of dot-com sales that major markets briefly enjoyed. Press CEO McAllan said other market sectors have remained healthy.

"Building activity is still very robust in the state and automotive is down somewhat," he said.

Even so, "if we are in a slowdown,

New Jersey overall has weathered it quite well," he said.

Being wedged between Philadelphia and New York has one more advantage when it comes to sales: Since there is no local commercial TV outlet, Trenton radio stations face fewer rivals in other media competing for each advertising dollar.

"We're primarily competing against print and outdoor," Calderaro said, "and even outdoor is tough here, since it's not as well-boarded as other markets."

"We focus on the local newspapers and radio much more than you would in a TV market," said the Thunder's Armentano.

Scott Fybush, a regular contributor to Radio World, covers Trenton as editor of NorthEast Radio Watch. Contact him via e-mail to scott@fybush.com

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Promo

► Continued from page 25
more visibility. And if you're wondering what the problem was, you are not alone.

Many station groups still don't understand that when all of them do something together, none of them get to "own" it. Most consumers will simply remember that there "sure were a lot" of radio stations there.

Take a gander

Take the next logical gander and you may conclude, as I have, that whenever we co-brand with sister radio stations — like putting multiple logos on everything from TV spots to T-shirts — we water down the impact of each of our properties in the marketplace.

Why are so many people still con-

fused about this subject? They have not considered carefully enough what they're attempting to accomplish.

For radio stations, the common misuse of internal and external branding typically begins when the marketing director doesn't think about the target audience of the message.

For example, if your station(s) is (are) interested in reaching either potential corporate employees or advertising clients, then you'll most want to utilize internal branding.

They're a lot more likely then to recall the product and give that station credit for being present at that event.

Yes, I understand the pickle you are now in. Your parent owner has made it very clear that you're to "exercise the power of your cluster" with the audience in your market. How can you meet this corporate dictate and do what I'm suggesting?

Be smart. Realize that you can promote events and even sell products through nonbranded means over several stations. How? Let's go back to the

site. If you've got a "cluster site" where a consumer "picks" their station from a laundry list, tear that baby down.

Here's another hint: The pennies you may save on co-branding specialty items — multiple logos on T-shirts, coffee mugs, etc. — are not worth it! Get rid of your present supply and next time you order, go back to single-station stuff.

If I could turn back time ...

Some may see this as my longing to turn back the hands of time on consolidation. I am not. As a matter of fact, not that long ago, AM and FM co-owned stations would make the same mistakes I'm referring to in this article.

It's just gotten more obvious because so many stations are now co-owned in one market. This is a simple concept, but before you proceed, take the idea to your leader. If he doesn't think it sane, ask him to do a little eavesdropping the next time he wants, say, to show off seven or eight logos to consumers.

In this case, his ears may open his mind in a way that would make corporate proud.

Mark Lapidus is president, Lapidus Media. Contact him via e-mail to marklapidus@yahoo.com

Do you have pictures from your last station promotion event? Send them with caption information to GM Journal editor Laura Dely via e-mail to LD@imaspub.com

Many station groups still don't understand that when all of them do something together, none of them get to 'own' it.

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For this purpose, you could use either your corporate name or the names/logos of all of your stations. The target audience in this case will understand what you're attempting to accomplish because they're familiar with your internal brand and would even enjoy hearing you take your corporate sell a bit over the top.

It's ideal to take this approach if you want to show off the power of your cluster to potential advertisers: "You can reach 1.9 million listeners by advertising with Jumbo-Sized Broadcasting."

And here's an example of internal branding for attracting and even keeping employees: "Jumbo-Sized Broadcasting is a great place to work because of this, this, this and that."

For your listeners, you'll almost always want to use external branding. They don't know who your parent corporation is, nor do they care, because the information contains no benefit for them.

But picture your listeners at the next Kids' Fair where all they see is dozens of logos for only your oldies station.

Kids' Fair example.

We want it to be owned by the oldies station, but promoted on several properties. Easy! Simply call it the "oldies 92.5 Kids' Fair" when mentioning it on the oldies station. When you mention it on the other stations in your cluster, just refer to it as "The Kids' Fair." This solution can make everyone happy. The Kids' Fair people you're working with will feel privileged that you're using the power of your group to drive audience.

Your corporation will approve that you're using all your stations. And most importantly, one of the stations in your group can actually benefit by taking ownership of the event. This scenario becomes a lot easier to execute over time as your market leader (executive vice president, market GM — whatever the applicable title) sees that there is an all-win way to split up events, advertising schedules and even specialty items.

Designate a lead station for all market events at the start of the process. Next, make sure each station has its own Web

Radio Revenue Drops

Radio sales continue to lag, suffering in part from comparison to very strong performance a year earlier.

The Radio Advertising Bureau's April radio revenue report said local dollars declined 5 percent, while national dollars were down 20 percent for the month compared to the same period last year. Combined local and national sales dropped 9 percent.

The RAB pointed out that last year, April's combined sales were up 22 percent from the the year before.

Overall, it said, radio revenues still have increased significantly since 1998. Local dollars have increased 31.3 percent, national 18 percent and combined radio revenue has almost 31 percent since 1998, according to RAB.

RAB President and CEO Gary Fries said the industry still must face the worse month of all: May 2000, when the dot-com dollars peaked.

"We are nearing the end of the tremendous comparisons from 2000," Fries said. "While we still have May ahead of us with the biggest and toughest comparison, we are seeing a resurgence in specific categories, and the outlook for the second half of 2001 remains positive."

RAB monthly revenue reports are based on a 100-market survey conducted by the accounting firms Miller, Kaplan, Arase & Co and Aldrin, Nichols and Carter.

— Laura Dely



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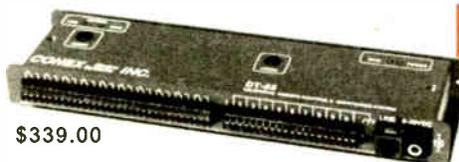


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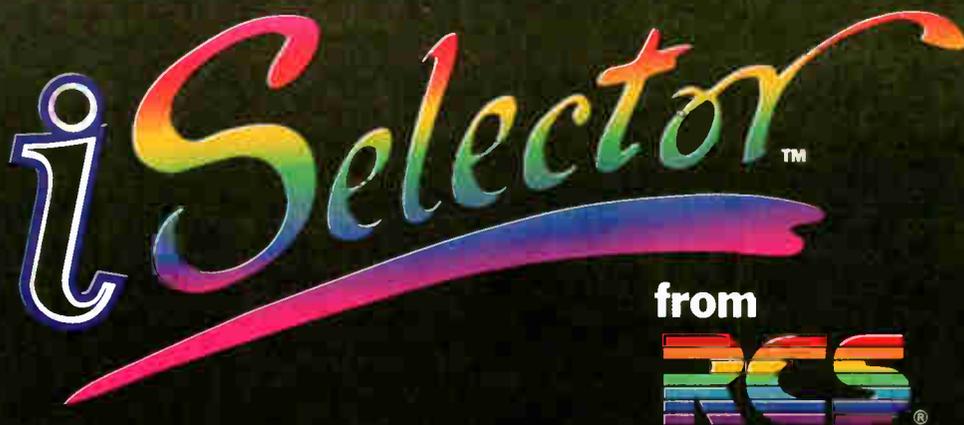
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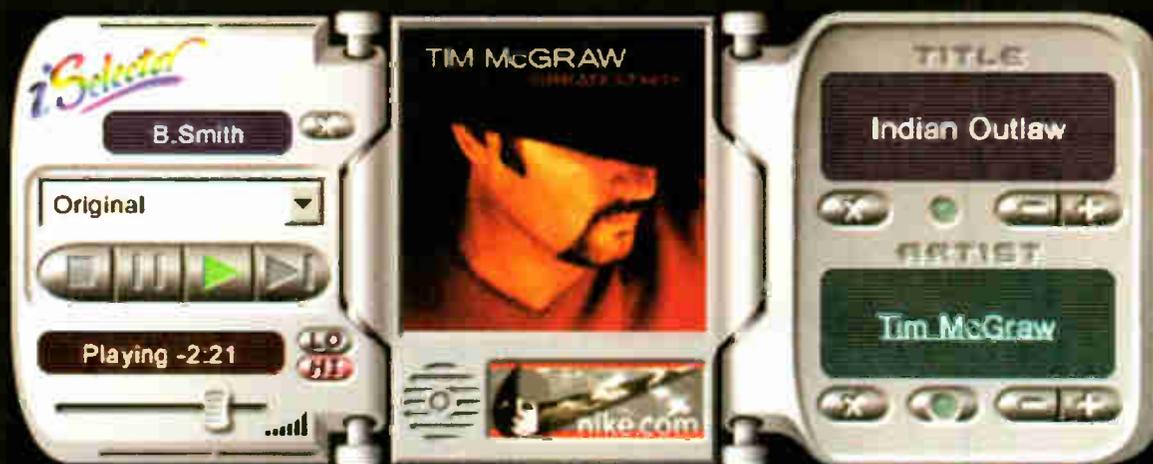
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Internet Radio

Webcasters
Move In
Page 36

Radio World

How to Succeed in the Dot-Com World

June 20, 2001

Streaming: How to Get Started

Tom Vernon

In just a few years, Webcasting has gone from an auxiliary service to an essential part of many stations' operations. Despite recent setbacks over licensing and talent fees, many experts feel Webcasting will be an important part of radio station strategy in the future.

If you've been waiting on the sideline to see if streaming media on the Internet is going to catch on, now may be the time to get on board.

Setting up a Web site for Netcasting is an undertaking that shouldn't be taken lightly. It requires planning, sufficient revenue and technical expertise outside the realm of that required to maintain digital audio systems.

Step one

It can be demanding on both technical resources and content developers. While Netcasting may seem daunting at the outset, it becomes easier when broken down into a series of small steps.

To begin, decide which format or formats you will use to stream your content. While there are several formats from which to choose, Real Audio and Microsoft command the majority of the market. While it is hard to get an exact fix, each has roughly half the market of installed

the server on the premises and buy the bandwidth required to service audience needs from the local Internet Service Provider (ISP), or to co-locate the server at the ISP's site.

Most stations target their streams to users with 28.8 dial-up service, making a 20-kilobits-per-second stream the average bit rate. As ISDN and DSL service continue to make inroads, there is a growing interest in 32 kbps service.

You don't want the reliability of your server to be dependent on five guys in a converted garage.

servers and players.

Issues such as sound quality, cost of ownership and scalability must be considered. If the station has a digital automation system, check with the vendor to find out if there is software to integrate your automation into the streaming system you are considering.

Once format(s) have been determined, the next step is to purchase the appropriate server software.

Estimate the size of your online audience and purchase a server to support the audience size. At this point, you'll have to decide whether to locate

Microsoft's Digital Media Division Product Manager Geordie Wilson said there is a small but growing market for premium-quality bitstreams.

Bandwidth

"For some musical formats such as classical and jazz, which are more demanding of a codec and attract an audiophile audience, some stations also offer even higher bit rate streams."

For Netcasting, there is a linear relationship between required bandwidth

See STREAM, page 38 ▶

WEB WATCH

Whaddya Mean, Net Radio Hostage Crisis?

Carl Lindemann

Web Watch is a roundup of all things radio and the Web. Send your news and tips to Internet Radio editor Laura Dely via e-mail at ld@imaspub.com

If you're still thinking that you can ignore the Web, look at the results of the new Media Audit study that finds that the "late arrivals" are coming online now.

Minority participation is climbing. Forty-four percent of African-American households are now on the Web, an increase of 41 percent in the past three years. Hispanic households show similar increases: Forty-two percent are now online, up 45 percent from three years ago.

Asians, who were "early adapters," are now more than 70 percent online; 58 percent of white households are online.

Everybody's in

Seniors' participation is up 84 percent over the same period; almost half of all homemakers and blue-collar workers are now online too, according to the Media Audit report.

"No one knew for certain how the market was going to respond to the Internet," said Bob Jordan, co-chairman of International Demographics Inc., the company that produces the "Media Audit" reports.

"Now we're seeing an incredible democratization of the Web audience. Even senior citizens and retirees who may have had no previous familiarity with the personal computer are now on the Web. For marketers the new numbers offer exciting possibilities. We're witness-



ing the rollout of a direct-response, interactive medium that will penetrate every segment of the market."

Walking around this year's NAB show, you'd hardly know that there was a "hostage crisis" going on.

That's what some commentators have dubbed the streaming radio blackout.

In case you've been terminally tuned-out, this is the crisis over on-air spots that are made with American Federation of Television & Radio Artists talent repurposed online that incur an added obligation as per the union's contract negotiated last year.

With no easy way to skim the spots from the streams, most stations simply pulled the plug on their Webcasts altogether. Ad insertion suppliers rushed to fill the need.

While this is obviously a matter of some consternation to radio executives, listeners apparently aren't too bent out of shape about it. They're simply switching to Internet-only stations unaffected by the fracas.

According to MeasureCast, the last Internet Radio Index taken

See WEB WATCH, page 36 ▶

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Web Watch

► Continued from page 35

before the shutdown in early April showed that the total hours streamed was up 63 percent over January, when less than a third of the top-25 "stations" were Internet-only Webcasters. Over the next three weeks Net radio total hours streamed first plummeted to 32 percent, but since, the index nearly regained its former track, sliding up to 149 on the Index in May, with more than half of the top-25 Internet-only Webcasters.

MeasureCast spokesman Sven Haarhoff sees this bounce as akin to what happens when the in-car audience runs into trouble tuning in a station.

"They don't turn off the radio; they simply scan for other stations. There's so many options for Internet radio that the only people tuning out are hardcore fans of particular stations," he said.

For Haarhoff, the flap may actually help raise awareness of radio streams. He said that with the coverage of the Net radio roll-up from major media outlets, much of the general public is finding out about streaming audio for the first time.

Perhaps more incredible is the amount of time it's taken for mainstream media to catch on to this story. It's a sharp contrast to the time that the NPR satellite died and generated headlines around the globe. It's a powerful reminder that despite strong, steady growth, streaming media is still in its infancy.

We have product

Another reminder is in Arbitron's recent "Webcasters Speak Out" survey. What are they speaking out about?

They're telling ad agencies that they have something to sell. According to Bill Rose, Arbitron Webcast services general manager and vice president, last year nearly half of the agencies said they had never been approached by Webcasters trying to sell advertising.

Now, the latest study shows that Webcasters have been beating on more than a few Madison Ave. doors. (Perhaps the death of venture capital inspired this invigorated sales effort.)

The survey of senior-level executives at broadcast and Webcast companies, content delivery Networks and technology companies showed the progress — and key obstacles — to put the fledgling medium on a paying basis.

"Webcasters say that the biggest obstacles to growth are the need for credible third-party metrics and the need to continually educate advertisers and agencies about the value of Webcast advertising," Rose said.

All this is pretty much a moot point for stations with silenced streams.

Kevin Mayer, chairman and CEO, Clear Channel Internet Group, (one group with many such silenced streams), said that the much-vaunted ad insertion technology isn't a panacea for the current conflict with AFTRA.

"Even if you strip the ads out, how many advertisers will make their ads available if they have to pay exorbitant fees to talent to do so?" Mayer said as a panelist at the NAB.

"So even with the (ad stripping) technology, the question in my mind is whether there will be a demand for advertising.

See WEB WATCH, page 40 ►



Kevin Mayer

NET-ONLY WEBCASTERS PICK UP STREAMING SLACK

The latest Webcast ratings are a study in contrast thanks to the American Federation of Television and Radio Artists announcement in April that it will enforce the online triple-rate provision in its recorded commercial contract.

Arbitron's Webcast Ratings below cover the month of February — before the AFTRA move — while the latest MeasureCast report, for May, reflects the notable increase that Internet-only Webcasters received as terrestrial stations rolled up their streaming services following the AFTRA action.

Listeners wasted no time experimenting with stations that were still online, including many that were Internet-only channels.

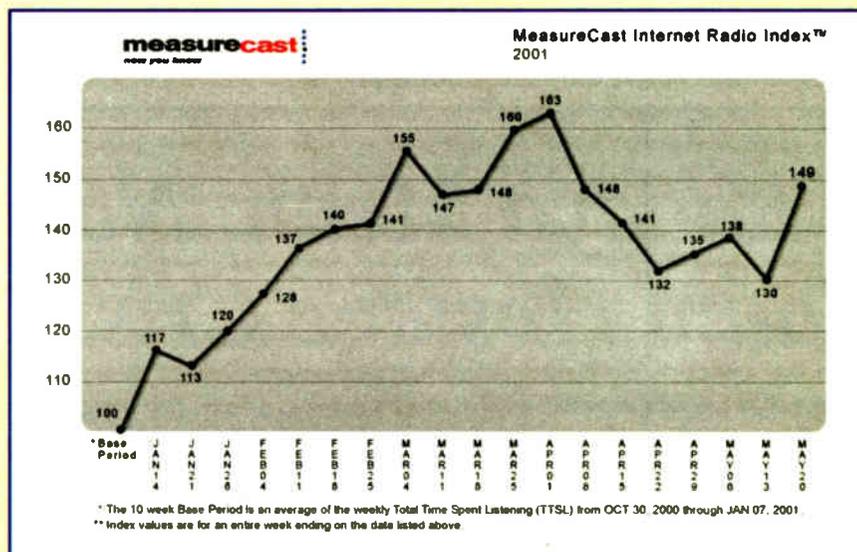
According to MeasureCast, Net-only Webcasters enjoyed a 29 percent increase in total time spent listening in April over the previous month and a further 14.8 percent increase over that in May. Terrestrial broadcasters declined 38 percent in April over the previous month and gained 4.8 percent more hours in May. Net-only Webcasters were unaffected by the AFTRA/SAG move, as AFTRA and SAG contested only the rebroadcast of terrestrial commercials online.

Clear Channel Internet Group, which debuted in the March MeasureCast Top 10 as well as the December Arbitron ratings, dropped its streaming Webcasts and thus dropped out of the May MeasureCast report. Because Arbitron's most recent report covers February, CCIG still appears in its ratings, with an impressive 531,400 aggregate tuning hours for the month with just two stations, KNAC.com (No. 5) and Groove Radio (No. 9), more than five times its ATH in the previous Arbitron report.

ABC Radio, which dropped its streaming Webcasts in mid-April, still made an impressive showing in the MeasureCast ratings in that month (not shown). But with all its streams closed down in May, ABC Radio dropped off May's MeasureCast report.

While the overall online audience dipped for a few weeks following the AFTRA action in April, according to MeasureCast's Weekly Internet Radio Index, by June 5 the audience began to build again, reaching 52 percent more listeners since January of this year.

— Laura Dely



The MeasureCast Top 10 — May, 2001

Stations are rated by TTSL — the number of hours streamed by the broadcaster in the reported time period.

Channel/Format	Owner	URL	TTSL
1. MEDIAmazing/Listener Formatted	MEDIAmazing	www.medi amazing.com	715,614
2. Virgin Radio/Adult Alternative	Ginger Online	www.virginradio.co.uk	254,204
3. 3WK Underground/Alt. Rock	3WK	www.3wk.com	246,746
4. Radio Margaritaville/Classic Rock	InternetAmerica	www.radiomargaritaville.com	229,794
5. Cablemusic/CHR-Top 40	Cablemusic.com	www.cablemusic.com	192,308
6. ESPN Radio/Sports Talk	Walt Disney Internet Group	www.espnradio1250.com	131,562
7. WFXZ (FM)/Classic Rock	Sea-Com Media	www.937thebone.com	123,598
8. HardRadio/Album oriented rock	HardRadio.com	www.hardradio.com	110,514
9. Cablemusic Country/Country	Cablemusic.com	www.cablemusic.com	84,062
10. KCRW (FM)/College	Santa Monica College	www.kcrw.org	82,880

Arbitron Webcast Ratings Top-10 Report — February, 2001



Webcast ratings measure the ATH — aggregate tuning hours — the sum total of all hours that listeners tune to an Internet station.

Channel	Owner	URL	ATH
1. Beethoven.com	Beethoven.com	www.beethoven.com	741,500
2. WABC(AM)	ABC Radio	www.wabcradio.com	310,900
3. NetRadio - 80s Hits	NetRadio.com	www.netradio.com	292,900
4. KING(FM)	Classic Radio, Inc.	www.king.org	287,800
5. KNAC.com	Clear Channel Internet Group	www.knac.com	235,900
6. Virgin Radio	Scottish Media Group	www.virginradio.co.uk	204,600
7. NetRadio - Smooth Jazz	NetRadio.com	www.netradio.com	199,800
8. RadioWave - Hits Happen	RadioWave	www.radiowave.com	198,400
9. Groove Radio	Clear Channel Internet Group	www.grooveradio.com	195,500
10. CFNY(FM)	Corus Entertainment	www.edge102.com	193,400

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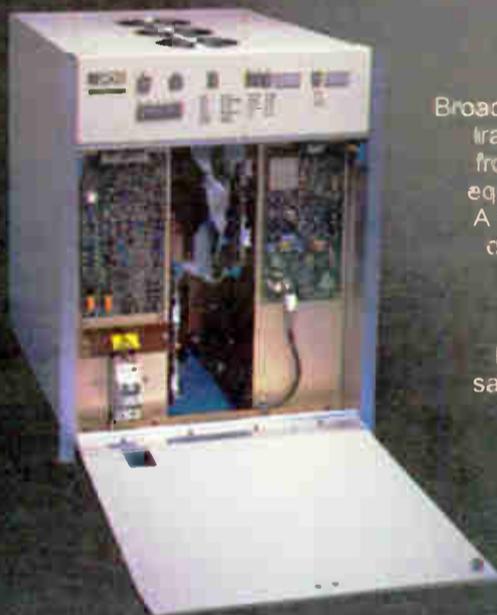
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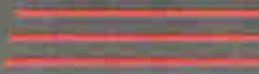
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Stream

► Continued from page 35 and the number of listeners. The server typically delivers one 20-kbps stream per listener. If 100 people listen, it must deliver 100 20-kbps streams.

This means if a station purchases a DSL with 350 kbps, there can be 17 concurrent listeners. For a T-1 line with 1.54 Mbps, the maximum number that can be served is 60 to 70 listeners.

If a station locates the streaming media server in-house, it needs to estimate accurately the maximum number of listeners and purchase sufficient bandwidth from the ISP.

Pattern recognition

One problem is that Internet radio listenership usually peaks around midday, meaning the station pays for bandwidth that is unused for much of the time.

Real Broadcast Networks Product Manager Jim Kreyenhagen said this model works in some situations.

"Small local radio stations actually could have an online audience of around 60 people and realize a cost savings by locating the server in-house. Paying for the extra bandwidth still is usually less expensive than co-locating with an Internet Service Provider."

For medium-market stations, there are definite advantages for having the server at the ISP.

With the audio server off-site, the station may plug directly into the ISP's backbone, using its ample bandwidth when needed.

This arrangement may result in some flexibility with usage fees.

"When you go with a co-located ISP," Kreyenhagen

said, "they have much bigger pipes into the backbone providers and may be able to provide larger concurrency numbers, but may bill the radio station on a scalable usage model."

Other arrangements are negotiable, and some ISPs will own and maintain the server for you, providing 24/7/365 tech support. Some



Georgie Wilson

lease rack space where you can install and maintain your own equipment.

As the server system grows in complexity, so do the time and expertise required to maintain it. At some point, most medium- and large-market stations decide to hand the entire task over to the ISP and devote engineering resources

to the ISP's equipment is.

Are the servers and routers on an uninterruptible power supply? If so, how long can they hold out with no AC power? How large is the company's tech staff? With a very large organization, you may get lost in the shuffle.

On the other hand, you don't want the reliability of your server to depend on five guys in a converted garage. How long has the ISP been in business? Those guys in the garage may offer you a good price, but they may not have a business plan and might not be around in another year.

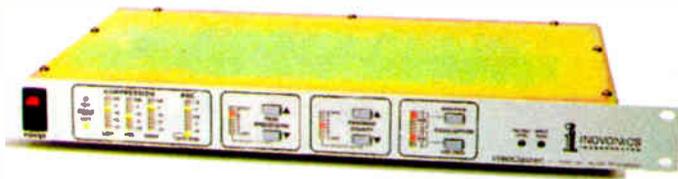
Reliability

Will the ISP back up your server? If so, how often? If you rent rack space and own your gear, can you get 24/7 access?

Large-market stations have their own unique requirements for streaming media.

While many small- and medium-market stations will be content to break even at the end of the year, major-market operations tend to see Netcasting as another profit center.

"The days of streaming radio just to have a Web presence are over," Microsoft's Wilson said. "People now expect to see some return of



Inovonics Webcaster Audio Processor

to the traditional tasks of maintaining studio and transmitter facilities.

Choose an ISP with care. Develop a checklist and be ready with some tough questions when shopping for an Internet Service Provider. Find out how fault-tolerant

revenue."

Major-market stations also have proportionally larger Web audiences and must plan for several thousand concurrent users.

Many of these users turn to outsource hosting solution providers. These companies

meet the needs of larger users, typically hosting sites for several stations and providing the capacity to accommodate hundreds of thousands of concurrent streams.

They also will work with stations on issues such as digital automation system integration, live ad replacement and AFTRA concerns.

Some organizations specialize in enhancing the revenue stream for medium-to-large Webcasters. Lightningcast President and CEO Karl Spangenberg said over-the-air broadcasters and Webcasters play by different rules when it comes to advertising.

"With terrestrial broadcasting, the more people that tune in, the greater the potential to make money, because there are no incremental costs to increased listenership."

It's just the inverse with streaming media. The more people who tune in to a Webcast, the higher cost per stream has to be accounted for by the Webcaster, Spangenberg said.

"The more successful you are in building a Web audience, the more your costs increase. Webcasters need to work with an organization who knows how to turn these streams into very targeted opportunities for advertisers who will pay a progressively higher cost per thousand."

Audio processing

Whether you stream in-house or go with an ISP, audio processing is an important issue. Many stations make the mistake of using an off-air tuner or post-processing tap as the feed for the Web server.

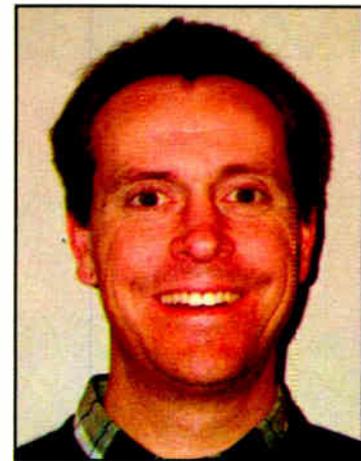
Internet encoders have different requirements than over-the-air broadcasting. Heavily processed audio can actually sound worse than no processing at all, experts say. Equipment manufacturers have responded to this need and there are now Internet audio processors available in a wide price range.

Most Internet streams are not FM quality. Trying to push high-frequency signals into the pipe will result in the hollow ringing sound heard on many Webcasts. For a typical 20-kbps encoder, the maximum bandwidth is around 10 kHz.

Perhaps the best plan when setting up the audio feed is to have a separate path for broadcast and Internet audio. This will give you the flexibility to do customized, Net-only broadcasts in the future.

If an Internet audio processor is beyond your budget, use an equalizer to roll off the high-frequency audio that can cause problems with 20-kbps streams.

Technology may drive the Internet, but it is the content



Jim Kreyenhagen

that keeps visitors coming back to a station's Web site. Most Webcasters started out by streaming existing content and not creating material specifically for the Internet.

That model is changing rapidly. Stations are turning to e-commerce and special promotions to get listeners to spend more time at their site. In addition to Internet ad insertion, some stations are offering side channels, streaming media directed to a very targeted audience.

A pay-per-view model is evolving. Successfully integrating graphics and video will become more important to maintain a competitive edge. All of this means that stations may need to plan for the additional staff, production facilities and server space to accommodate growth.

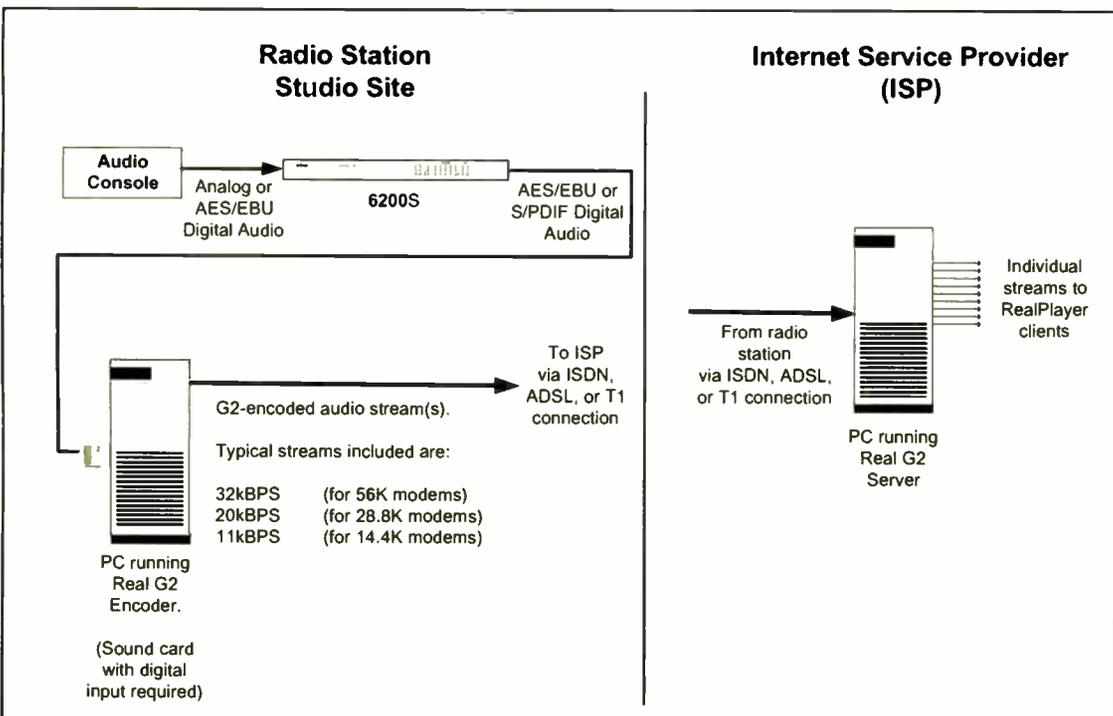
Keeping track of the burgeoning number of audio, video, graphics and text files used on a streaming media site is a daunting task in itself. Specialized database applications known as media asset management systems are designed to keep it all organized and maintain associative links between different types of media.

These programs are available from several vendors and are customized to each user's unique requirements. No matter which system is selected, it may be easier and less expensive to install a system before the media files grow to an unmanageable number.

Tom Vernon is a multimedia consultant in Philadelphia. Reach him in c/o RW.

Correction

The photo on page 35 of the May 23 issue was not Kelvin Arcelay of Cumulus. His photo is shown here.



Webcasting Using Orban Optimod 6200S With RealNetworks G2 Encoder and Server.

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Web Watch

► Continued from page 36

"I certainly hope so. I certainly hope that AFTRA and SAG (The Screen Actors Guild) will see that the demands that they've made for additional compensation to talent for Internet streams are absurd. They are not supported by any economic rationale that I can think of," Mayer said.

Mayer sees a speedy resolution to today's problems that plague radio streams.

He expects a quick fix to get Clear Channel streams flowing again with the aid of ad insertion to strip out ads using AFTRA talent. More substantive solutions will follow.

"The short-term problems will work themselves out because it's in everyone's interests — our interests, the Recording Industry Association of America's interests and the actors' union's interests — to have this evolve as a new medium. Where there's an alignment of interests, things always end up working out one way or another."

In the meantime, he sees that working with the RIAA to arrive at an amicable solution may be easier than working with the unions.

"With the RIAA, I think there's a business solution to be had. In fact, we're rather close to that. As far as the unions, I don't have much experience with that. They just went through a messy six-month-long strike. The out-

come of it was this agreement. So altering it could be messy," he said. As always, pioneering a new medium involves calculated risks.

"As businessmen, we have to think of the long-term value creation opportunities and not be scared off by the

in. Simple, huh?"

Again, this is hardly a long-term solution. However, making this fix on the station side may be a lot simpler than using ad-insertion technology to simply strip ads. Rest assured that the real value to ad insertion is in seg-

Now, **Digital Fountain** claims to have achieved a "quantum leap" over this limitation.

"In quest of the Holy Grail of efficient, economical distribution of large files and streaming media over the Internet, much has been promised but very little delivered," said **Cliff Meltzer**, Digital Fountain's CEO.

This technological sleight-of-hand is achieved through what the privately held company calls "Meta-Content" technology whereby data packets are sent out as if to a single end-user yet, *voilà!*, are reconstructed individually.

Meanwhile, as the streaming of terrestrial radio trauma works itself out, others are growing businesses elsewhere.

Windows Media announced a new streaming media player for pocket PCs, the **7.1 Player**.

This player supports *wireless* access to digital audio and video for pocket PC users, which can be streamed over high-speed wireless Internet access such as **Metricom's Ricochet Network** or **802.11 Wireless LANs**, according to **Microsoft**.

The technology also allows for playback of downloaded audio and video content, such as that a user would locate via the new **WindowsMedia.com Mobile**, a new wireless digital media guide for mobile users that Microsoft previewed at the 7.1 Player's debut.

Microsoft said in a press release that the new player includes "break-through Windows Media Audio and

See WEB WATCH, page 41 ►

With the coverage of the Net radio roll-up from major media outlets, much of the general public is finding out about streaming audio for the first time.

short-term considerations. It takes some guts but you have to bite the bullet and just do it. If people wait too long, they'll be left behind. There's always a speed-to-market advantage," Mayer said.

Motoring full away

Speaking of speed-to-market, some enterprising radio managers have come up with a workaround to get their streams back up without using ad insertion.

With all the excess computing capacity in many on-air automation systems, just generate an identical playlist with the problematic ads filled

menting listener demographics and interests and targeting appropriate ads to them.

Besides, letting listeners know that there's a way to strip out ads may give them the wrong idea.

Besides the licensing costs, the major overhead in online audio is the high cost to deliver the streams or plug-in the listeners. Scalability seems to be an inherent advantage of broadcast over streams when it comes to reaching large audiences: When a listener tunes into a broadcast, it costs the broadcaster nothing, while each additional online listener (stream) is an additional charge on your bill.

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Web Watch

► Continued from page 36

Video 8 codec technology providing the best-quality audio and video in the smallest file size."

So truly, you can see, that just repurposing your terrestrial signal not only will cost you too much money but very soon it will be inadequate if it doesn't include some video content too.

Maybe as you work out your AFTRA/SAG issues, you should also be shopping for Webcams to be installed in your studios or digital cameras to go out with your news reporters.

Subscription addiction

RealNetworks is forging onward with MusicNet, the joint business-to-business venture with AOL/Time Warner, Bertelsmann and EMI announced in early April. Company CEO Rob Glaser described the back-office platform designed to enable entrepreneurs to launch online music retailing outfits to a Congressional committee in May.

The oversight hearing about "Music on the Internet" was held by the Courts, the Internet and Intellectual Property Subcommittee of the House Judiciary Committee.

As usual, for anyone working closely with the RIAA, Glaser spoke about what artists and songwriters need.

In this case, they need "a simplified licensing regime" to facilitate online retail sales. It is unclear whether such "simplification" will leave licensing in the hands of the RIAA (under its Sound-Exchange alias) or under the aegis of a legit third-party organization as many musicians would prefer.

Of course, in the interests of "simplicity," why bother with what musicians want? Why not just let the RIAA and its affiliates have complete control without the awkward intrusion of an independent audit?

Deep

Real & Co. are not the only ones forging ahead. Vivendi Universal SA announced on May 20 that it would acquire MP3.com for some \$372 million in cash and stock.

Michael Robertson, MP3.com's founder, chairman and CEO will become a "special adviser" to Vivendi Universal's chairman and CEO, Jean-Marie Messier. This is the closing chapter of the acrimonious litigation brought by Vivendi Universal against the online upstart.

While all the other major labels settled with MP3.com in the controversial case surrounding copyright violations committed by making MP3 copies of CD's purchased by consumers, Vivendi Universal pushed for penalties as high

as \$250 million and eventually settled for a mere \$53.4 million. Was this about the purported crusade to protect artists' copyrights or just softening MP3.com up to cut a sweet deal?

Forget the "if you can't beat 'em, join 'em." Today, it's "once you beat 'em up, buy 'em." With MP3.com now in control, the Vivendi Universal/Sony Music joint venture, Duet, will be squaring off against the MusicNet collaboration.

Well, we can all now rest assured that there will be competition in the digital music business ... or, at least, two "competitors" all quite chummy under the RIAA umbrella. Can you say "cartel"?

Still more

OK. A few indie holdouts are still in the game. In early May, MusicMatch launched Radio MX, a music subscription service.

For \$49.95 yearly, Radio MX adds on-demand music to the MusicMatch jukebox, the popular digital song management software. Also, 3Com's abandoning of the Kerbango Internet Radio isn't the end of consumer electronics interest in developing devices beyond the computer.



Jean-Marie Messier

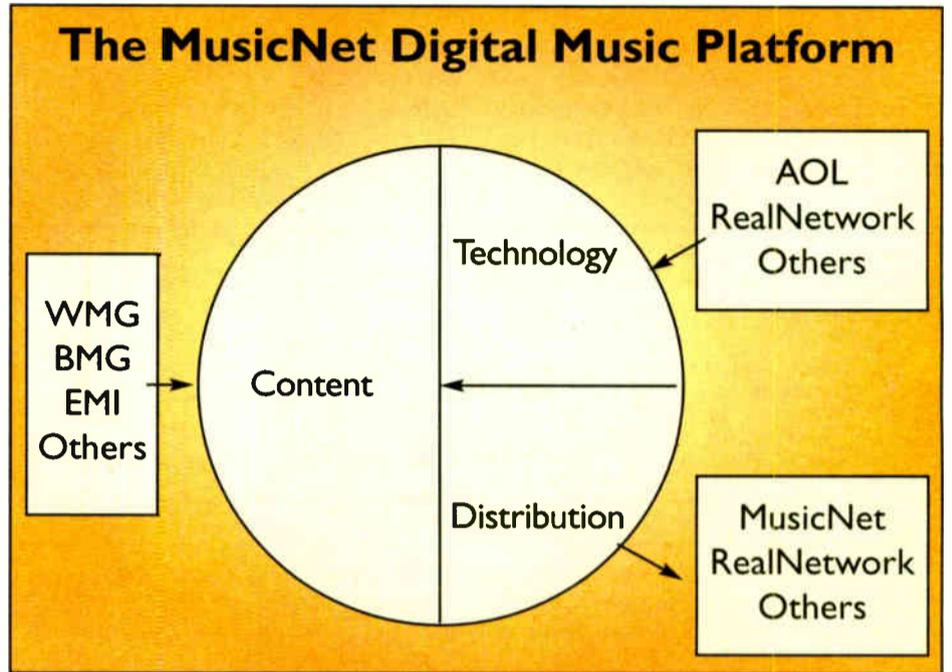
fond farewell to Web Watch. Handing over the reins here to other capable hands is as good an excuse as any to reflect on these past three years.

Since my initial Internet-related features in '98 that eventually evolved into this column, we've been through

of a rebirth.

So much for the past.

Now for the closing credits: Many thanks to Paul McLane for his help and guidance in creating this, and many more still to Laura Dely for her tireless efforts in realizing the vision.

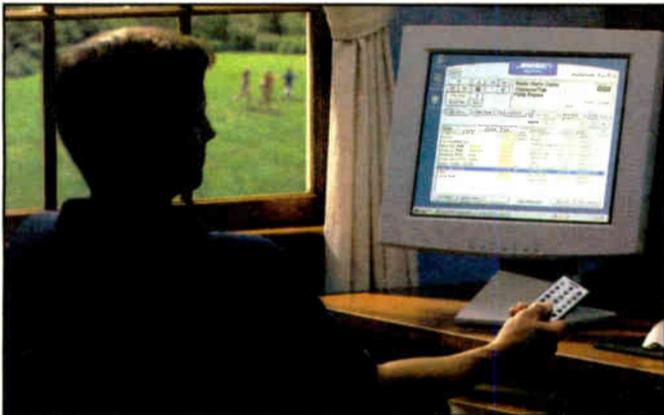


some historic times together.

Given that "Internet Time" was (and, to a lesser extent remains) vastly accelerated over "normal" time, the business cycle has gone from boom to bust and now is undergoing something

Carl Lindemann has worked in radio as a field reporter and production director. He consults on radio/new media projects and writes extensively on these subjects.

Reach him via e-mail at carl@cyber scene.com



A user demonstrates the Bose Wave/PC Interactive Audio System.

The Bose Home Audio Wave/PC looks like a combination of the radios that Paul Harvey has been pitching with software and a home computer hookup. Look for a review in RW soon.

These seem to be natural evolutions for these companies.

The bug bombs

Not so for Volkswagen's foray into Web radio. RadioVW.com is a play to extend the auto manufacturers success in creating TV ads featuring signature musical styling.

The motivation, according to the announcement on the site, is that "Maybe we could find a way to feature even more music than one song here and there on a TV spot."

Unfortunately — at least until VW offers a wireless Internet hookup — this is liable to keep drivers deskbound. So much for the company slogan "Drivers Wanted."

When you start talking about "listeners wanted," you're into an altogether different driving motivation, something broadcasters are all-too-familiar with.

Finally it's time for me to bid a

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GUEST COMMENTARY

Streaming as a Tool for Radio

Darrell Jones

The purpose of this article is to provide radio managers with insights and knowledge about today's streaming technology.

Our company, the GMV Network, provides standards-based software technology for streaming media. When we make a presentation to radio broadcasters about how to stream, the following is what we present.

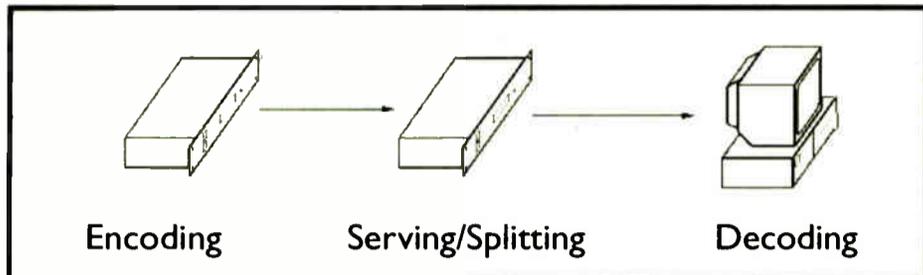


Fig. 1: The Encoding, Splitting, Serving and Decoding Process

The article is in two parts; the second will appear in a subsequent issue of Radio World. You can find the entire article online at www.rwonline.com.

New prospects

Last year, when MP3 was adopted as a technical standard for streaming audio content, radio broadcasters benefited, although many were unaware of their new opportunity.

With MP3 as a standard, individual radio stations and networks have the opportunity of not only saving money vs. older non-MP3 based systems, but also actually using streaming as a system to provide nontraditional revenues.

Live streaming involves the distribution of multimedia information for playback by one or more users in real time. Three processes are involved when conducting live streaming: encoding, serving (often called splitting when streaming live) and decoding/playback (see Figure 1).

For live streaming to be successful, all processes must occur in real-time.

Encoding involves turning the live broadcast signal into compressed digital data suitable for streaming.

Serving (or splitting) involves launching the live stream to users who wish to receive it.

Decoding is the process of decompressing the encoded stream so that it can be heard and/or seen by an end user. The decoding and playback process typically is handled by player software like RealNetworks RealPlayer or Microsoft's Windows Media Player.

The problem, the choice

Imagine a world where a Ford car could only be driven using Mobil gasoline or where a Sony television could only view shows produced by NBC.

This is the world of multimedia streaming today. None of the major software players have streams that are compatible with

each other. In other words, a proprietary RealNetworks-encoded audio stream can only be served by a RealNetworks server and played with the RealNetworks RealPlayer. The same is true for Microsoft (see Figure 2).

Because many Internet radio listeners are unlikely to have installed all media players, the broadcaster is forced to make a choice: either choose one of the proprietary

streaming formats that some listeners won't be able to hear, or simultaneously encode and stream in all proprietary formats.

Because most broadcasters want to stream to a large audience, these broadcasters incur the costs and headaches of supporting multiple encoding platforms and multiple serving platforms.

Layer 1, Layer 2 or Layer 3 audio.

MPEG-1, Layer 3 audio can compress CD-quality audio to more than one-tenth its original size. Audio files created under this standard are commonly known as MP3 files.

The wide-scale adoption of the MP3 format, however, is a result of more than just great compression. Because MPEG is an open international standard, anyone is allowed to create products that encode and play MP3 files.

In other words, no single vendor (e.g. RealNetworks, Microsoft) holds the key to the MP3 format. Therefore, more compressed digital audio content is stored in the MP3 format than any other format available today, proprietary or otherwise.

Such a large wave of support for a standards-based approach is difficult to ignore. Due to the overwhelming popularity of the MP3 format, RealNetworks and Microsoft have each added support for their players to receive and playback standard MP3 audio streams.

RealNetworks and Microsoft servers, however, do not have the capability to deliver fully standards-based MP3 streams.

Standards-based servers, like GMV Network's AudioEdge and Nullsoft's ShoutCast, deliver MP3 streams for play-

radio industry for several years. In these systems the radio stations are given encoders that are then pointed to servers at the stream hosting company.

In return for streaming services, the radio station surrenders portions of its advertising inventory or even Web site real estate to the hosting company.

The hosting company then sells this advertising space to offset their costs and hopefully turn a profit.

This method has definite cost and ease-of-use benefits for the broadcaster. The main disadvantage is that broadcasters lose control of their streaming system and the potential revenues that can be derived from it.

Alternatively, a broadcaster can choose to host their entire streaming system in-house. The main advantage to this method is the degree of control over the process.

The main disadvantages include the hassle of managing the large amounts of bandwidth that must be brought on-site to support the streaming listener base.

Co-location is the third method available to broadcasters for deploying streaming. Co-location involves placing one or more streaming servers at a site designed to provide dedicated Internet connectivity.

The main advantages to this approach are simplicity and scalability. The disadvantage of this method is cost; it shows return on investment (ROI) only with hundreds of listeners at a given time.

The cost of co-location will vary for carri-

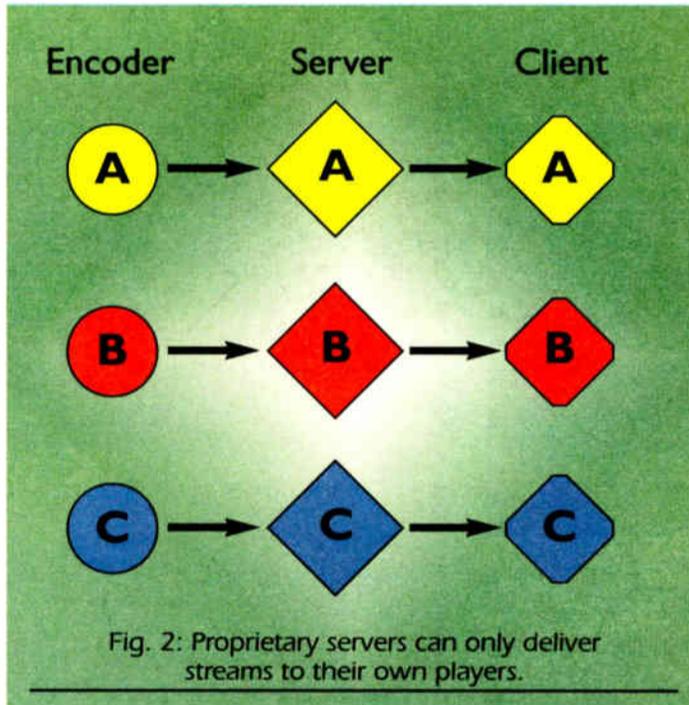


Fig. 2: Proprietary servers can only deliver streams to their own players.

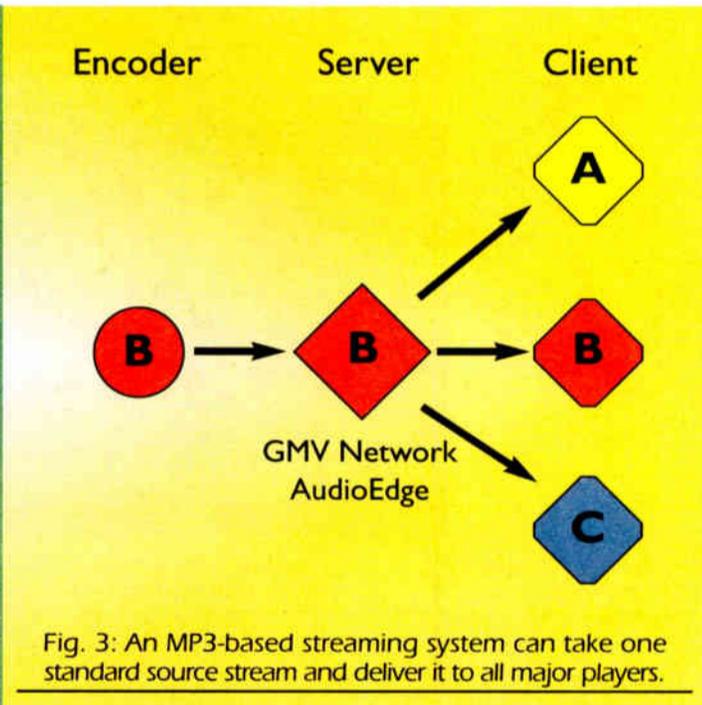


Fig. 3: An MP3-based streaming system can take one standard source stream and deliver it to all major players.

Additionally, files archived during the streaming process will be in a proprietary format, subjecting the broadcaster to the negative effects of technological lock-in.

MPEG

The Moving Picture Experts Group is the world's leading standards body for digital multimedia encoding and compression. The group's first international standard, MPEG-1, was designed to compress video so that it could easily fit on CD-ROMs. Audio can also be compressed under the standard as

back by all popular players (see Figure 3). As an added bonus — consumer devices, portable players and Internet radios that connect to the home stereo and soon, car radios — all support the MP3 format.

Deployment

There are three principal ways for radio stations to transmit their content via Internet (see Figures 4 through 6). Each has advantages and disadvantages.

Figure 4 shows the once "free" streaming systems that have been offered to the

er to carrier as well as location in the country.

I thank those who contributed information for this white paper, who are named in the online version of this article. We'll complete our discussion and cover streaming economics, encoders, servers, bandwidth, ROI, hosting providers and how to sell streaming in the July 18 issue.

Do you have a story to tell about your station's start-up streaming experience? Send a brief outline of your tale to Internet Radio editor Laura Dely via e-mail to ld@imaspub.com

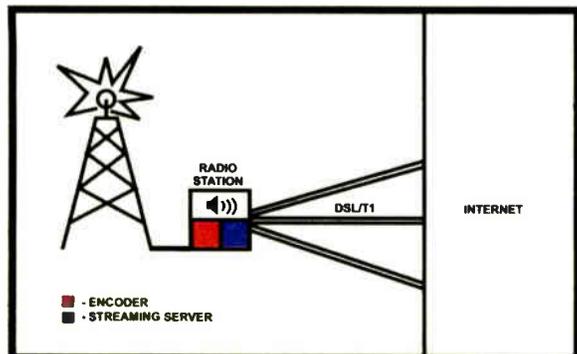


Fig. 4: Streaming Hosting Companies

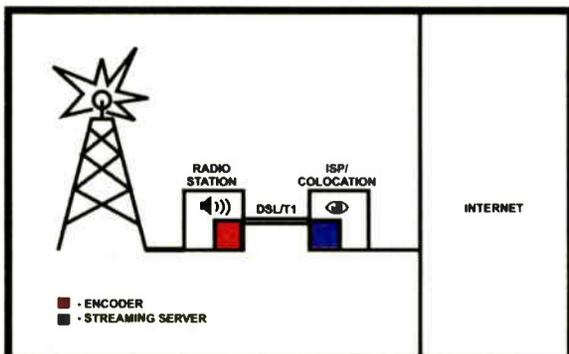


Fig. 5: In-house Solution

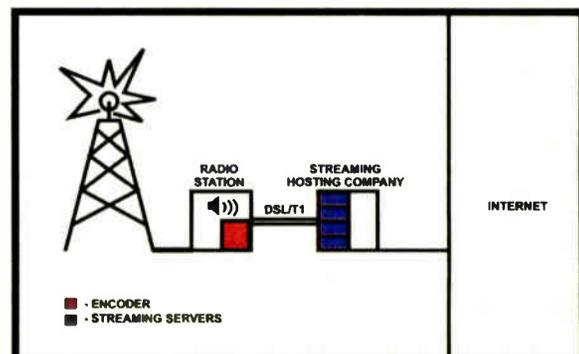


Fig. 6: Co-location Scenario



PRODUCT EVALUATION

The dScope Goes to Top of Class

Paul Mac

The Prism Sound dScope has always been a solid performer. The latest incarnation of the box reveals itself to be another solid addition to the family.

The dScope Series III is a multifunction, two-channel, analog/digital test and measurement device based around a hardware box coupled with Windows-based software.

Signal generation is "per channel," and the system can handle sample rates up to 192 kHz. The dScope Series III contains signal generation and analysis sections.

FFT detectors also can employ standard or user-defined weighting filters, which can be set up from a list of measurement results that includes amplitude; balance; band-pass; band-reject; crosstalk; gain; IMD CCIF; IMD DIM-TIM; IMD SMPTE-DIN; THD; THD+N; and second-, third- and fourth-harmonic distortion.

Special extras

The dScope Series III supports advanced techniques such as multitone testing by combining arbitrary waveform generator capabilities with multiple, pro-

and output channel status may be completely customized.

Users can also simulate the degrada-

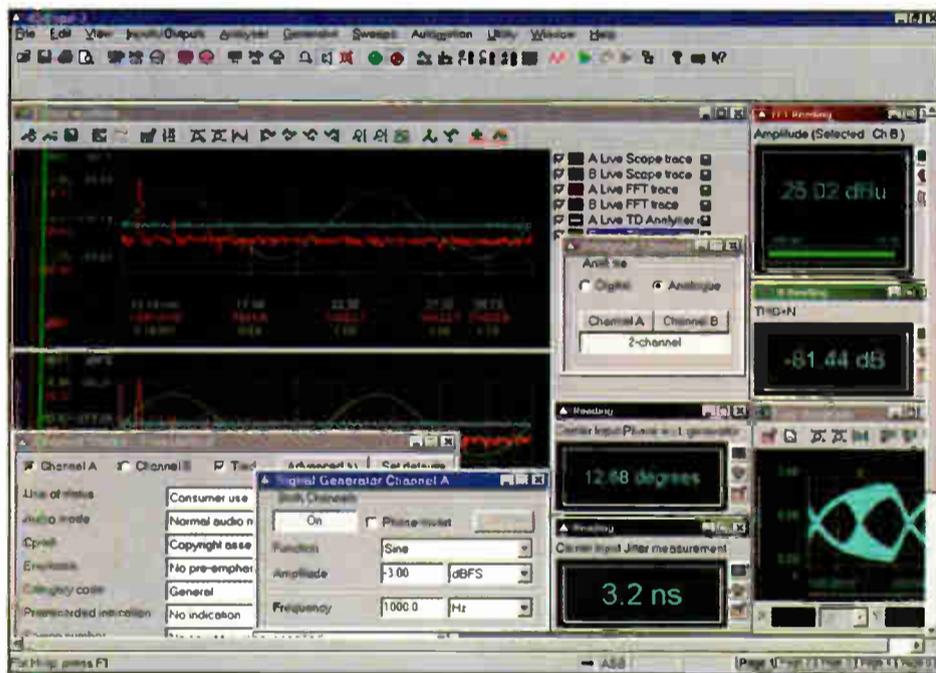
tion of the output carrier signal over long cables by adding source jitter, noise and common-mode interference.

Users can also simulate the degradation of the output carrier signal over long cables by adding source jitter, noise and common-mode interference.

frame-rate and frame-rate accuracy, fs (source) jitter, data jitter (intersymbol interference), eye-narrowing and (AES) carrier amplitude, as well as providing a view of the AES waveform itself and the eye diagram.

For many of these tests, a "trace window" is often necessary or desirable and

The signal analyzer provides real-time readings of RMS amplitude, frequency and inter-channel phase for a stereo or two-channel input.



Shown are windows for Trace, Channel Status and Signal Generator.

The signal generator uses standard waveform types — such as sine, square, ramp and twin-tone — as well as customized signals like multitones, bursts, bongs, pseudo-random signals, modulated tones and special signals like the Prism Sound JTEST.

The analyzer section consists of the signal, continuous-time and FFT analyzers.

Real-time analysis

The signal analyzer provides real-time readings of RMS amplitude, frequency and interchannel phase for a stereo or two-channel input.

The continuous-time analyzer is based on a conventional distortion analyzer, offering a selection of weighting and band-limiting filters, as well as a variable-frequency notch filter that supports band-pass and band-reject modes with tracking or fixed frequency settings.

Measurements include amplitude, distortion, noise, IMD and others are included.

The FFT analyzer supports multiple detectors or readings, which may be customized using Microsoft Virtual Basic (VB) scripting to carry out further processing of the measurement data.

grammable FFT detectors.

A complex signal is generated with several individual frequencies. This type of test signal enables rapid display of FFT-derived readings for various results, such as noise, distortion, crosstalk and frequency response.

These tests are based on user scripts and they may be designed to user specifications. Preset test examples also exist.

The sweep analyzer provides control of a wide range of variables and can measure up to four quantities simultaneously. Swept variables include generator frequency and amplitude, and sweeps can be controlled by data table lookup, by timer, on manual advance or autosensing audio input frequency.

The measurement can also be swept along the BP/BR frequencies. Results of the test include amplitude, frequency, phase, TD detector result (for example, THD+N), digital interface frame rate, deviation, carrier amplitude, jitter and carrier phase.

Digital interface testing is comprehensively supported.

Series III allows digital output frame rate setting up to 11,500 ppm deviation

tion of the output carrier signal over long cables by adding source jitter, noise and common-mode interference.

For digital inputs, Series III measures

the dScope software offers one. It includes scope and FFT traces, real-time FFT averaging, sweep displays and also

See PRISM, page 44

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PRODUCT EVALUATION

CAD Mic Proves Its Value

American-Born M177 Cardioid Condenser Dispels Theory That Quality Means a Steep Price

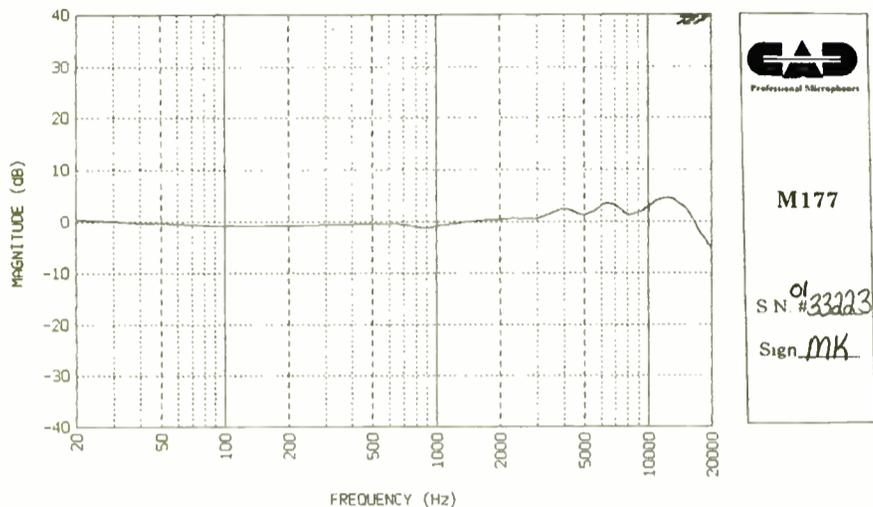
Paul Kaminski

A quiet revolution has begun in the manufacturing of side-address condenser microphones.

Those looking for the clarity, warmth, tonal quality and low-noise

mV/Pascal and an equivalent SPL noise level of 10 dB A-weighted.

The unit requires phantom power of 24, 48 or 52 V with at least 8 mA for proper power. Even at this price, the microphone comes with its own frequency response plot. We found the



Frequency Response Plot

figures of the condenser mic can get improved sound quality for less money. In fact, the \$200 street price for some models is driving equipment replacement and upgrade decisions.

The American-made CAD M177 cardioid condenser mic is a solid addition to this market segment and perhaps the best of the bunch.

Attractive mic

The M177 is a single-pattern, side-address condenser mic. It does not look like the typical Neumann imitator, but reminds us of the RCA 77-DX.

When asked if that was a design cue, C.P. Pores, national sales manager audio products group of CAD, said, "We'll never apologize for making an attractive microphone."

response to be flat out to 2 kHz with a slight rise thereafter.

The microphone has a bass roll-off switch and a 20 dB pad on the front of the mic. CAD recommends you engage the pad before setting any mic preamp

level. On our Mackie 1202 VLZ mixer, we followed instructions and got clean sound.

The channel gain was at the 2 o'clock position, which was the setting for our dynamic mic. We then disengaged the pad on the mic and began to set the channel gain for optimum output.

With the pad disengaged, we only needed to set the channel gain to 10 o'clock — or just a bit above the "U" unity gain setting on the 1202 VLZ. We suspect users with outboard preamps will have much the same result.

We had to change our mic technique for this test. No longer could we use the same technique used to enjoy New York City pushcart hot dogs.

Don't get too close

I found I could get a warm, clear and authoritative sound if I kept my mouth four inches from the M177 business end. Any closer and the proximity effect and resulting plosives would be exaggerated. To bring back a little of that warmth, I raised the 80 Hz equalizer on the Mackie channel strip about one notch.

The polar pattern is more full on the right side of the mic between 0 and 60 degrees, so the sweet spot is more to



the right. With the integral mount, you can swivel the mic so the sweet spot flatters your approach.

The M177 also solves another problem some small and large studio users
See CAD MIC, page 49 ▶

Prism

▶ Continued from page 43
the residual output of the time domain analyzer.

This test allows, for example, viewing of the distortion waveform on a computer screen alongside the FFT and waveform traces.

Trace signal

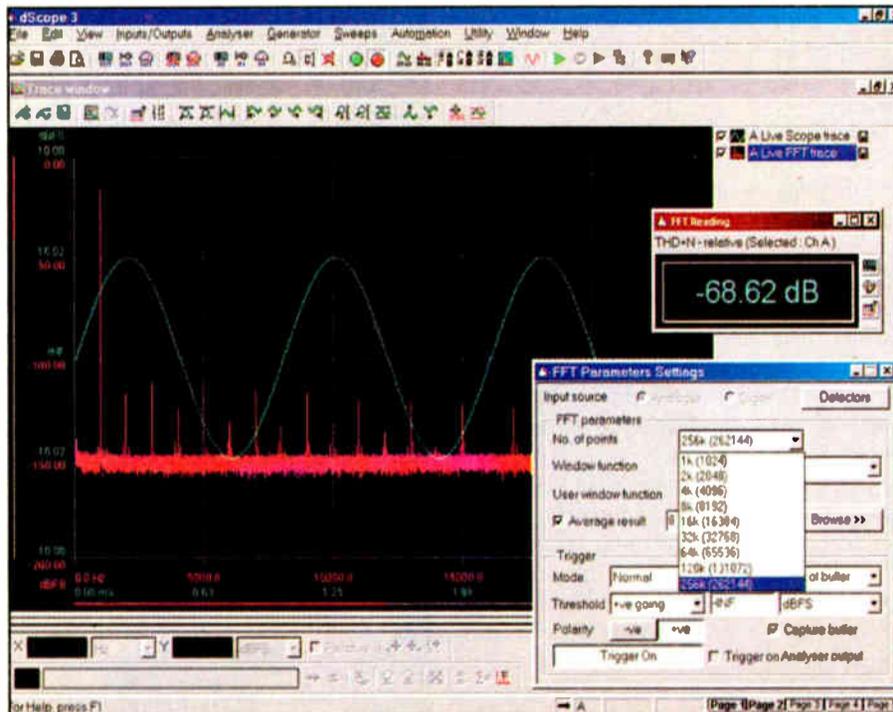
From the trace window, trace data can be printed, stored, recalled or exported. In addition, multiple markers

can be placed on each trace and comments and labels may be entered.

Markers provide discrete reading of trace points, plus "limit lines" for testing within tolerance — visual "outside limit" indications can be set up for immediate indication. If an oscilloscope is still needed, dScope provides four BNC connections for a variety of monitor outputs.

While dScope has numerous variables and setup windows, its test automation enables timesaving standardization of test procedures.

Using VB Script, dScope Series III



FFT and Scope Traces

It also works well on the most frequency-challenged medium of all — the POTS interview through a hybrid.

Behind the business end of the mic, there is a 1.1-inch large gold-sputtered diaphragm.

That diaphragm — a version of the original Equitek 300 capsule — and op-amp circuitry instead of the typical field effect transistors (FETs) give the M177 a published frequency response of 10 Hz to 20 kHz, a dynamic range of 133 dB, an output level of 15.9

Product Capsule:

**Prism Sound
dScope Series III**

- Thumbs Up**
- ✓ A plethora of tests
 - ✓ Windows-based
 - ✓ User-definable tests

- Thumbs Down**
- ✓ Trying to justify test equipment to station manager

The suggested list price is \$7,995.

For more information contact
Prism Media Products Inc. in
New Jersey at (973) 983-9577,
fax (973) 983-9588 or visit the Web
site at www.prismmpi.com

allows a series of test workstations to run automated test procedures and to port results automatically into a networked database.

Again, examples of such scripts are provided with the product. dScope Series III also provides a snapshot store system for saving/recalling the whole or part of the instrument setup — including the desktop layout.

Several aspects of this device make it a serious contender for the standard test-set throne in the audio field.

If all its capabilities are summed up with the customizable aspects and, importantly, the price, the dScope Series III is not just in a class of its own; it has created a whole new class.

Paul Mac is editor for *Audio Media Europe*, a sister publication of *Radio World*.



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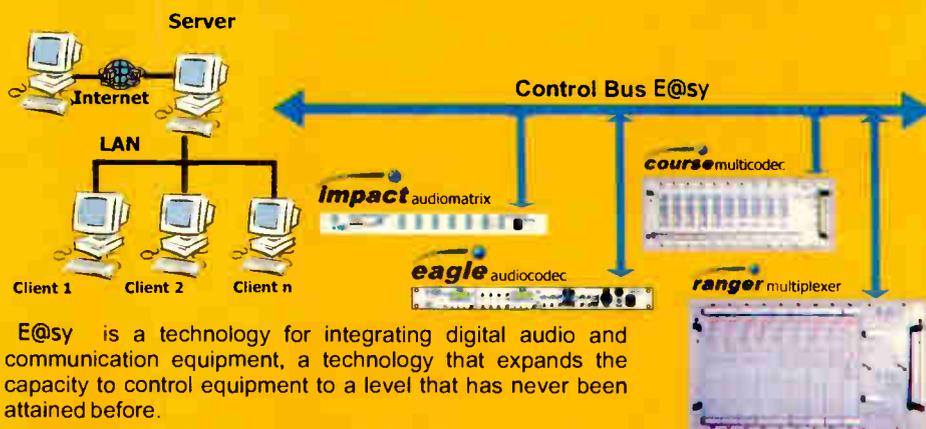
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Remote Control IP

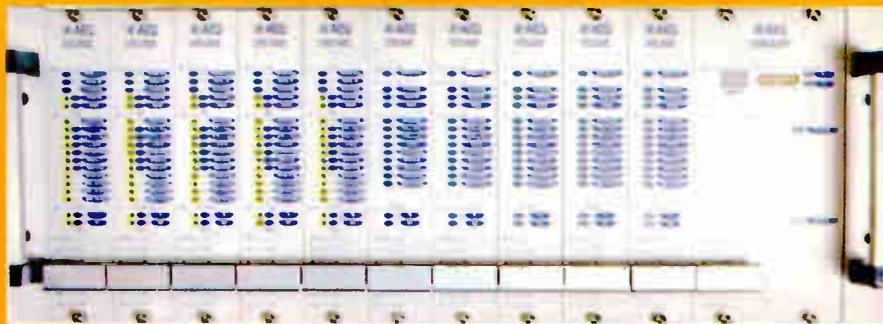


E@sy is a technology for integrating digital audio and communication equipment, a technology that expands the capacity to control equipment to a level that has never been attained before.

E@sy integrates equipment and software applications. The equipment are connected to an application server through an RS 422 bus. In the client computers, applications are run that, together with the connected equipment resulting a system that provides high-end features and very powerful functions.

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course Multicoder



COURSE is a set of up to ten one- or two-channel multiformat codec boards in a four-unit-high rack with a dual power supply.

As options, the **COURSE** equipment can include AES-EBU inputs and outputs, V35/X21 communications boards and a universal terminal adapter for S or U interfaces.

eagle Audiocoder



EAGLE is a multi-format dual-channel audio codec with analog and AES/EBU digital input and output, with a dual display to facilitate operation, and with multiplexing capability between the two ISDN "B" channels, in one rack unit height.

EAGLE include V35/X21 communications boards and a universal terminal adapter for S or U interfaces.

Get more information about these products or how to contact the nearest AEQ distributor at www.aeq.es, or request additional information at the following address.

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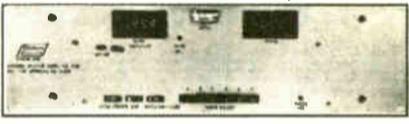
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Shecky Peterson Returns: Oh Joy

Alan R. Peterson

Now that the NAB show is a memory, time for my alter ego to dust off the dinner jacket and hit the stage for another annual barrage of groaners.

Yes, it is the triumphant return of Shecky Peterson, part broadcast technician, part lounge comic, always quick with a broadcast pun worthy of a tomato right in the puss.

Post-convention traditions create a feeling of closure. Frank Foti celebrates by blasting The Who at top decibel level from the Omnia booth on the convention center floor, right at 4 o'clock sharp. Those of us behind the scenes at *The World According to ARP* trot Shecky out shortly after each show as our own little tradition.

He even brings along his own rim shots to punctuate perfectly the jokes that fall flatter than the rest.

Don't think of it as "giving back," but more like "heaving up."

So folks, without further ado ...

Cue the band

(Cheesy fanfare music, polite golf clapping)

Heyyy folks, welcome to the show. Good to see so many of you here in Las Vegas. Anyone here from *out of town*? (big laughs) Anyone here from back east? (A few hands go up) Anyone here work for CBS?

(Stone cold silence)

O-kayyy ... let's just get to the jokes.

What does a snowman use in a production room? *Cool Edit*.

What does a lumberjack use in a production room? *SAW (duh!)*.

What does the morning drive jock use in a production room? *Hey, my contract says I don't have to do production!*

What do you call the truck that makes deliveries to the Ventriloquists Hall of Fame? *A dummy load*.

What occurs when you replace FM transmission line with a stalk of bananas? *Skin effect!*

Ba-da-bum!

Heyyy, why won't fiber optics ever completely replace copper? *How can you take a crook seriously when he yells, "You'll never take me alive, optic!"?*

Hear about that new cartoon show for engineers? Yeah, a wisecracking antenna teams up with a digital audio cable to go around stealing picnic baskets. *The Adventures of Yagi and EBU-Boo*.

What do you get when you stick a diode up Clint Eastwood's nose? *A Varactor — and a punch in the chops*.

Implant implode

Did you get to see all of those little tiny cell phones and pagers everybody had at the convention? Can they *get* any smaller? Well, yes they can. I think they can implant them into people now!

See, I was sitting in the bar at the Hard Rock here in Vegas, talking to some engineering buddies. They were yakking it up about how many folks out there want them to donate their time and effort to build and run their LPMF stations for free ... anyway, one guy stopped talking for a moment, pressed the side of his head, said "hello," then carried on a one-sided conversation as if he had a cell phone.

He said goodbye, pressed his temple again and said, "Yes, I do have a cell phone. I had a phone circuit board

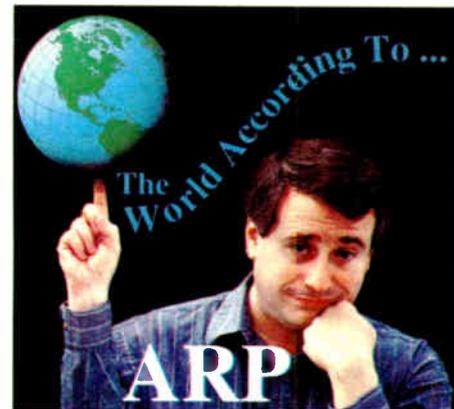
conventional cell phone."

Anyway, we got back to our conversation, and wouldn't you know, the second

Shecky Peterson is always quick with a broadcast pun worthy of a tomato right in the puss.

implanted in my head, which I answer by pressing on my temple. Now I never miss calls and I never need to carry around a

guy said, "Hold on for a moment," grabbed his nose and began moving it all around like a joystick while his eyes dart-



ed all over the place. It looked as if he was reading something in front of him.

"Well, yes I was," he told me. "I had a wireless Internet connection surgically implanted to my optic nerve. I can check my transmitter and my stock quotes just

See ARP, page 49 ▶

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FM 30



FM 100



FM 250



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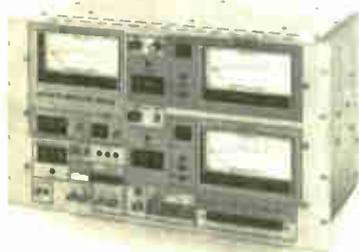


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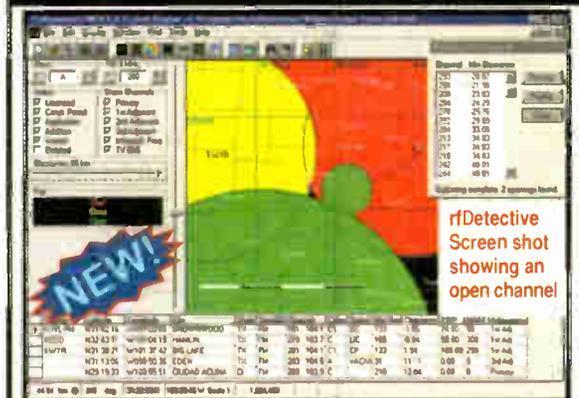
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Remote tools

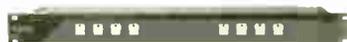
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SRC-1616L Serial Remote Control
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BOS, ROS & PBB-24 Switch Panels
 The BOS offers 12 N.O. dry contact switches with status LEDs in a desktop panel. The ROS is similar, but in a single-space rack unit. The PBB-24 provides 24 momentary buttons that can be programmed to output ASCII character strings.



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 & half duplex models).



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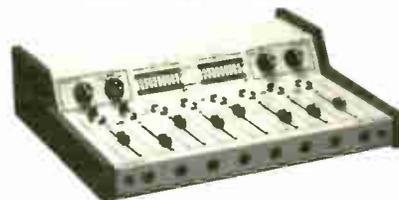
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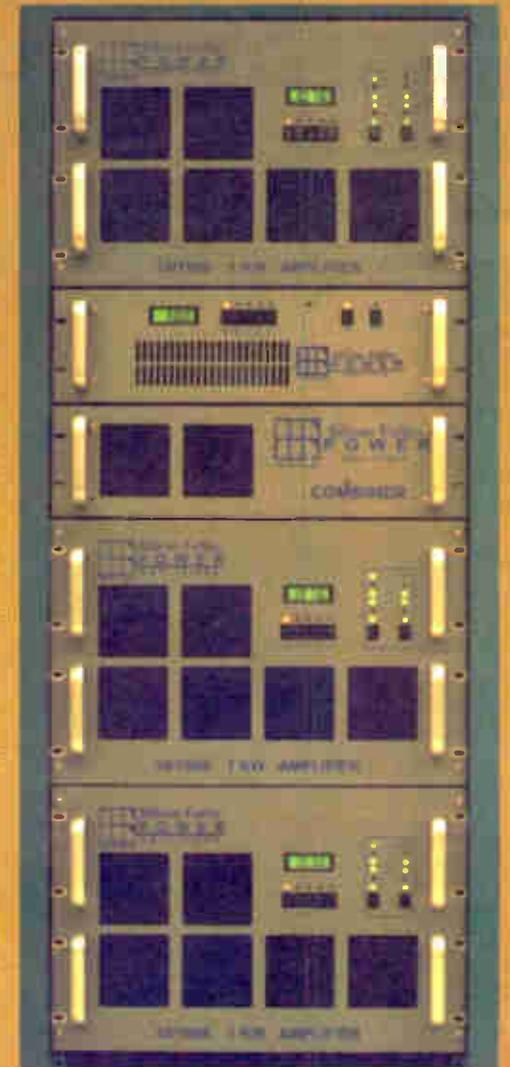
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ARP

▶ Continued from page 47
by mousing around with my nose and I 'see' the information in the air right in front of me. I don't need a computer and I get all my info when I need it."

Ribald rips

By this time, these guys were starting to annoy me with their little toys. So I swallowed my club soda in one single gulp while they weren't looking, and within seconds — Rrrrrrrrp! — I let loose a belch that rattled the chandeliers in the bar and startled everybody in the room into silence.

The two guys stared at me, I smiled and said, "Hold on for a moment ... I'm getting a fax!"

Ba-da-bum!
So why did the dentist lose his part-time job building tetrode amplifiers? *He kept filling the cavity resonators.*

What did the weekend DJ at the AM standalone say at the end of his shift? "It's now okay to turn off your computer."

What do you get when your smear your RPU with Miracle Whip? *Sandwich Spread Spectrum.*

Here's one for you academic types: *It's a bird! It's a plane! It's the super-position theorem!*

(Crickets heard in room.) Yeah, I knew that one would tank. Okay, here's one for you amateur radio guys: You know Cole Porter was a ham?

"Yep," he wrote, "It's De-lightful, It's De-licious, It's D Layer."
(Very feeble clapping)

Schmaltzy tearjerker finish

Thanks, folks. I'd like to get serious for a moment here ... (Cue single spotlight for dramatic effect, gentle piano vamp)... and close with a song for you. Every Vegas performer has to have a

song to close with, so here's mine.
You all know "My Favorite Things" from *The Sound of Music*, don't you? Good.

*Neat automation rigs running on Linux,
Arrakis' freebie for all of you cynics,
Big generators that sit up on springs,
These are a few of those N-A-B things ...*

*Convention hall employees: big as gorillas,
Mic booms with fuzzy springs like caterpillars,
Cover those spots or the AFTRA phone rings,
These are a few of those N-A-B things ...*

*Watch the boss whip — out his checkbook,
For new gear, he'll pay,
And you'll be in heaven until you get home,
And find it won't ship — 'til May.*

*Click once and e-mail your favorite DJ,
Audion's VoxPro and 360's Replay,
Airline employees that fill gear with dings,
These are a few of those con-fer-ence things ...*

*Great big compressors that clip your composites,
Tiny hotel rooms with tinier closets,
Overpriced food makes the cashiers cha-ching!
These are a few of those Las Vegas things ...*

*"That's a mock-up, that's a demo,
That don't work at all ...
When we write the drivers for Windows ME,
I think we can ship ... next fall."*

Thank you, thank you, you're a wonderful audience. See you at the 10 o'clock show.

Shecky tips his hat to The Greaseman for the fax joke and to the authors and publishers of the technical reference books that make this special appearance possible.

Send e-mail to alanpeterson@earthlink.net

CAD Mic

▶ Continued from page 44
encounter: negating hum from computer monitors.

Hum created by the CRT rides for free when dynamic microphones are positioned near the screen. With the channel gain turned up to maximum, and the mic channel open, we could not hear any noise from the computer monitor.

This feature makes a big difference when you are mastering digitally. It also works well on the most frequency-challenged medium of all — the POTS interview through a hybrid.

Our test period coincided with the Daytona 500 in February and the resultant controversy surrounding the death of Dale Earnhardt. The unit performed well, whether laying down voice tracks or doing two-way interviews over our POTS hybrid.

Affordable

The M177 is made in Conneaut, Ohio, near the shores of Lake Erie. What CAD learned in 12 years of making microphones — like the Equitek E-100, 200 and 300 — was important in the design, manufacturing and subsequent pricing of the M177.

The list price for the mic is \$249.95. The street price is in the \$200 category. The unit comes with a padded case, frequency plot and a two-year warranty.

"The design, quality and ability to assemble the product efficiently saved us a chunk of change," said Pores. Those savings are passed on to the consumer.

Given the innovative and efficient

Product Capsule: CAD M177

Cardioid Condenser Microphone

Thumbs Up

- ✓ Clear, warm, quiet-sounding mic
- ✓ Easy mount
- ✓ Attractive, looks similar to RCA 77-DX
- ✓ Price
- ✓ Immune to computer monitor hum

Thumbs Down

- ✓ Like all condensers, increased sensitivity
- ✓ Highlights acoustic problems in the studio
- ✓ Talent may have to change mic technique

The suggested list price is \$249.95

For more information contact CTI Audio in Ohio at (440) 593-1111, fax (440) 593-5395 or visit the Web site www.cadmics.com

means of manufacturing the microphone, the introduction of the CAD M177 could be compared to the debut of the similarly well-thought-out Mackie 1202 and 1402 series mixing boards only a few years earlier.

American-built products bring professional results and quality to the value-priced segment of the equipment market. Since I am a charter member of the value-priced segment, I always like to solve a major-league problem with a minor-league expenditure.

Paul Kaminski is the news director of the Motor Sports Radio Network, and host of its "Race-Talk" and "Radio-Road-Test" programs. Send him plain text e-mail at motorsportsradio@compuserve.com

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Gentner Digital Hybrid III; Musicam USA Prima CDQ 110, 20 kHz stereo bi-directional codec. James Phillips, WZOM, 301 Third St, Defiance OH 43512. 419-782-8591.

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Quantum QM-168 & QM-120, 16 x 8 audio board with patch bay & console, this is a recording console, \$3000. Art Baker, Broadcast Productions of America, 804 E 38th St, Indianapolis IN 46205. 317-925-7371.

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Orban 8000-A, \$1600/BO +shpg. Joseph Bahr, WVIS FM, POB 6556, San Juan PR 00914. 787-725-3732.

Orban 8100A refurbished. James Phillips, WZOM, 301 Third St, Defiance OH 43512. 419-782-8591.

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IFR 1200S service monitor/spectrum analyzer, \$6000. Rob Lankton, Lankton Engineering, 5053 Ocean Blvd #18A, Sesta Key FL 34242. 941-544-6842.

Tektronix 7L14/7L18 spectrum analyzer, \$4500/BO. Rob Lankton, Lankton Engineering, 5053 Ocean Blvd #18A, Sesta Key FL 34242. 941-544-6842.

Tektronix digital multimeter DM 501A, \$150; Tektronix digital multimeter DM 502A, \$150; Eico 150 solid state signal tracer, \$100; Nuvisitors (assorted), \$25. J Price, 214-321-6576.

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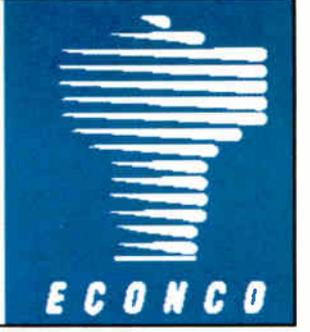


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◆ READER'S FORUM ◆

NAB responds

I read with interest the comments of Joe Klinger, president of JK Audio Inc. in the May 9 *Reader's Forum*. I wanted to take this opportunity to lay his fears about NAB's plans for The NAB Radio Show in New Orleans to rest.

Yes, we have created a new convention, NAB Xstream, and we are very excited about the potential for this show to reach a new audience that has much in common with radio broadcasters. We contemplated launching this show after hearing a demand from our attendees for more information about interactive content and delivery and after seeing an increased demand from exhibitors offering these products and services.

We made the final decision to launch the show after receiving strong support from our members and the Executive Committee. NAB Xstream will provide Radio Show attendees with the opportunity to learn more about online content delivery and how they can utilize this new technology as a potential revenue generator and as an added service to listeners.

NAB is committed to delivering Radio Show attendees with an event of the highest quality — and we strongly believe that the addition of NAB Xstream will enhance that effort.

While these industries do have a lot in common, there are also issues that separate them. That is why we've created NAB Xstream as a separate show. It will have a separate exhibit hall floor, separate sessions, a separate registration area, etc. Attendees will, however, be able to move from convention to convention, sampling "the best of both worlds."

NAB is committed to delivering Radio Show attendees with an event of the highest quality — and we strongly believe that the addition of NAB Xstream will enhance that effort. We are putting the finishing touches on a show that will

highlight the latest trends in radio management, programming, sales, engineering and new technologies.

We are confident that we can maintain the intimacy and focus of the Radio Show while running the two events concurrently. NAB understands that Radio Show attendees have an unmatched passion for Radio, and we look forward to hosting a terrific event.

*Chris Brown
Senior Vice President,
Conventions & Expositions
National Association of Broadcasters
Washington*

Trademark notice

We noticed the attached clipping (*Workbench*, March 30) which unfortunately misuses the registered trademark VELCRO®. We are sure the misuse was unintentional, however, such an oversight can serve to weaken the identity and value of our VELCRO® hook and loop fastener trademark.

Many terms that we all use frequently in our everyday language were once trademarks, like "escalator," "thermos," "cellophane" and "nylon." All of these terms lost their distinction as trademarks because their owners allowed them to be misused by the public.

That's why the Velcro companies pay close attention to how the VELCRO® trademark is used in the media. We must ensure that the VELCRO® trademark continues to be used as a brand name for the produce we manufacture — and not as a name for just any fastener.

The VELCRO® trademark must modify the goods it distinguishes and because VELCRO® is a registered trademark, it needs to be easily distinguished from the rest of the printed text. If you mean to refer to our product, please capitalize the mark followed by the symbol "®," the word "brand" and the generic term "hook and loop fastener," "touch fastener" or "closure," i.e. "VELCRO® brand hook and loop fastener."

However, the product must incorporate genuine VELCRO® fasteners in order for the trademark to be used. If you mean to refer to the type of fastener or if you are unsure whether or not the product is or incorporates genuine VELCRO® brand fasteners, use the generic term, "hook and loop fastener" or "touch fastener."

Your assistance in properly using the VELCRO® trademark is greatly appreci-

Time to Mourn Shortwave?

With its decision to cut shortwave service to North America, Australia, New Zealand and the Pacific Islands (see page 2), the British Broadcasting Corp. is doing what's economical for its service.

The BBC is not abandoning shortwave entirely. But it says listeners have "migrated away" from shortwave, and now tune in via FM, the Internet, satellite, cable and mobile devices. Three times as many people in the United States listen to "The Beeb" on FM as on shortwave; half a million users access its broadcasts online each month.

The BBC is using the money it would have spent to maintain these aging transmission facilities to beef up its infrastructure in the Middle East and Asia, where shortwave is still the predominant way listeners hear the service.

Given a life expectancy for a typical modern shortwave transmitter of 20 to 30 years, the BBC seems serious about committing resources to protect such an infrastructure where it makes business sense to do so.

While the trimming of shortwave is heart-wrenching to those who understand the history of broadcast communications, technology changes with the times. It is more important for a broadcast entity to deliver a message effectively, to meet its defined mission, than to protect its infrastructure for the sake of doing so.

U.S. government broadcasters that send their transmissions overseas, such as the Voice of America, are wrestling with similar questions: When is shortwave the most economical way to get programming to the widest possible audience? Where do other methods make sense? These decisions are being made in a post-Cold War world, with much different needs than in the past.

Some would argue that shortwave remains necessary in countries where people can't afford computers and mobile devices, and where governments intentionally interfere with broadcasts for political reasons.

The BBC agrees shortwave is vital in many areas, and estimates it has a total worldwide potential listening audience of 153 million.

But while shortwave will retain a role for many years, a movement away from it is inevitable. The world's leading broadcast organizations are wise to consider more efficient ways of reaching their audiences.

— RW

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*Joyce M. Belanger
Legal Assistant
Velcro Group Corp.
Manchester, N.H.*

Marconi's experiments

So what was Belrose's answer to Hooley's assertion that we don't know what harmonic Marconi was receiving ("What Did Marconi Hear?" RW, May 9)? Does Belrose sidestep this? Or was his answer just left out, not sought, or a repetition of his previous statements?

It seems to me that Hooley's explanation is believable. In Marconi's day frequency was a somewhat nebulous area. Spark transmitters became notorious in later days for the copious harmonics they produced and how wide their emissions were compared to later continuous-wave technology.

It was even hard to determine what frequency they were on! Receivers certainly weren't particularly selective, either. Why would they have needed to be?!

So it is quite likely that Mr. Marconi's transmitting station was actually transmitting a quite powerful signal on many different frequencies, and that his receiver actually picked up a harmonic. Didn't pick it up very well, mind you. It wasn't designed for those frequencies! And the antenna was too long! We know that today but he didn't. Marconi probably inadvertently stumbled upon "skywave" propagation at that time without realizing it!

*Mike Shane
Operations Director
KCRO Radio
Omaha, Neb.*

Write to Us

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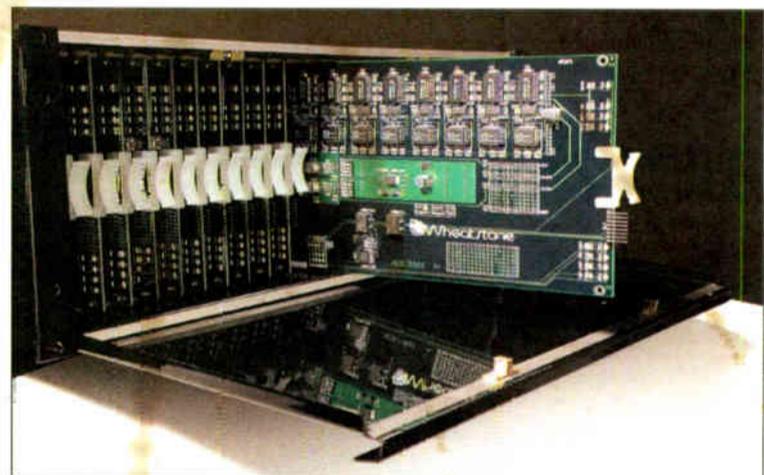
THE 2001 MAKES AUDIO NETWORKING PRACTICAL. It's simple to install, easy to learn, and certain to reduce system costs. Compact enough for small applications, yet stackable for tremendous growth potential, it's design consists of 7" rackmount digital routing cages, each capable of handling 512 simultaneous audio channels on its backplane.

Units can be stacked to suit particular card complements (analog or digital input and output cards or optical network cards) but more significantly cages can be separated by great distances and network their audio through either bidirectional fiberoptic links or a single CAT-5 wire. **ONE INTERCONNECT DOES IT ALL:** 64 channels of simultaneous bidirectional digital audio, intercage communication, X-Y controller commands plus auxiliary RS-232 data streams. This single interconnect between your studio and central rackroom can save you tens if not hundreds of thousands of feet of wire in a typical installation.

The 2001's graphic based setup software is intuitive and easy to use, with all the authorization and security levels you could want. And of course we have a full

complement of control panels and PC applications to choose from—all designed for straightforward operation and a rapid learning curve.

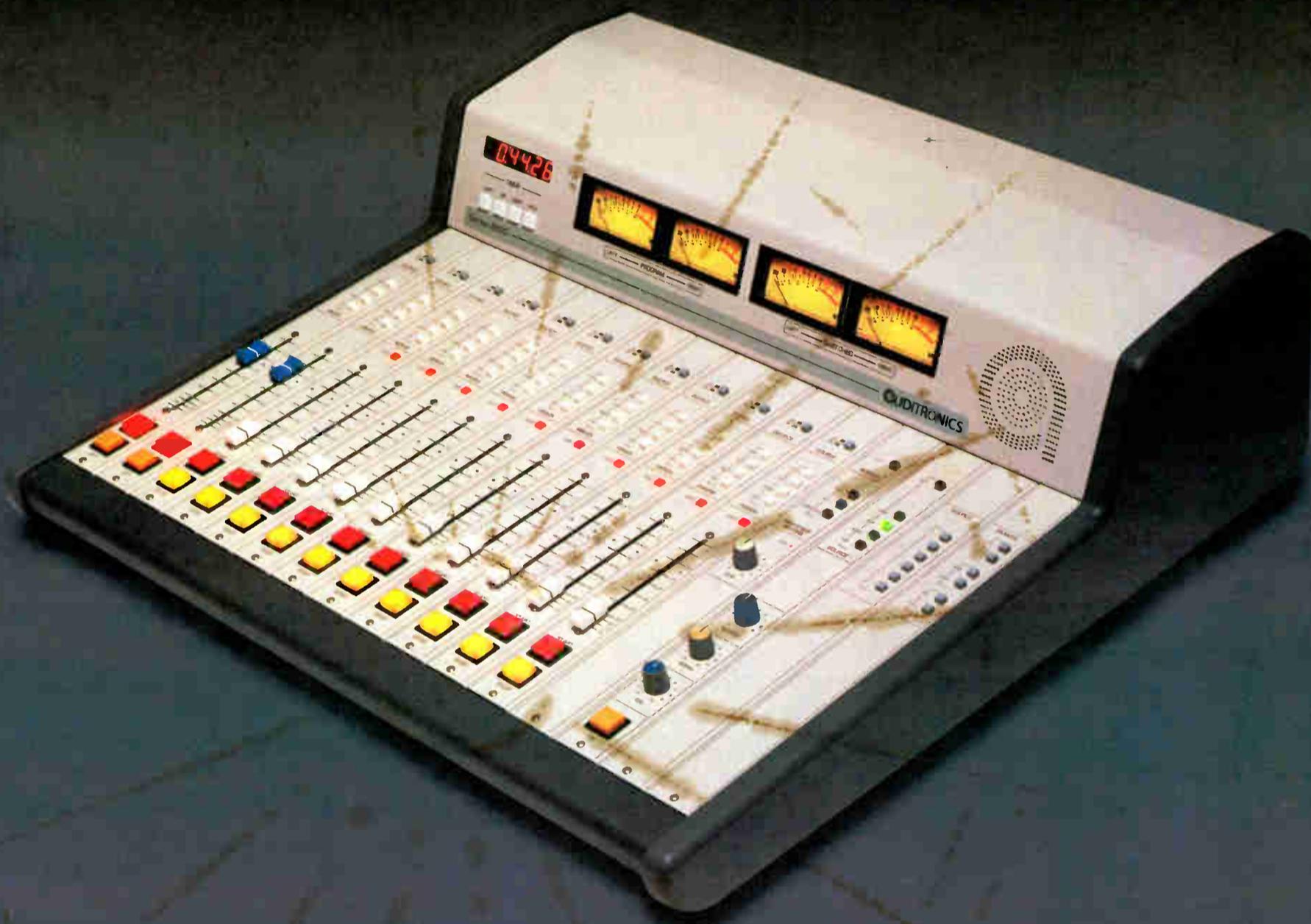
With 25 years of experience, Wheatstone has the infrastructure in place to help you build your OWN infrastructure. Contact us for answers.



MIXED SIGNAL SWITCHING is easily accomplished with a choice of AES digital or ANALOG 24-bit A>D input cards, and of course 24-bit digital or 24-bit D>A ANALOG output cards, all of which can be serviced from the front of the cage. All signals are routed entirely in the digital domain.

THE AUDITRONICS TRADITION

C o n t i n u e s



OUR BRAND NEW 2600 SERIES is the PERFECT UPGRADE for those thousands of stations that have had AUDITRONICS consoles over the past thirty years. Designed for the **TIGHTEST** of BUDGETS, it is nonetheless the **highest performance** console Auditronics has ever offered!

A **MODULAR DESIGN**, the 2600 features twelve input channels, a monitor module with control room, studio, cue,

headphone and talkback circuits, and an output module with PROGRAM, AUDITION, both pre and post fader MONO outputs, and independent meter selection. Optional line selector and tape remote modules are also offered.

This countertop design fits efficiently in only 25 by 26 inches of space, and like all our consoles is fabricated from steel to withstand the rigors of a broadcast environment.

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

AUDITRONICS

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